**Union Pacific Railroad**

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July 2, 2015

Ms. Karel Detterman
Alameda County Health Care Services Agency
Environmental Health Services
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

Subject: Submittal of the Human Health Risk Assessment, 744 and 758 High Street, Oakland, California, Fuel Leak Case No. RO1135 and GeoTracker Global ID T0600101305

Dear Ms. Detterman:

On behalf of Union Pacific Railroad (UPRR), enclosed is the Human Health Risk Assessment (HHRA) report, which presents the methodology and results for a HHRA performed for the 744 and 758 High Street site in Oakland, California.

I declare, under penalty of perjury, that the information and recommendations contained in the attached document is true and correct to the best of my knowledge.

If you have any questions or comments after reviewing this material, please feel free to contact me by email at LAMANCUS@up.com or by phone at (916) 789-5184.

Sincerely,

Lauren A. Mancuso
Manager of Site Remediation
Union Pacific Railroad Company

C: David Hodson/CH2M HILL

Enclosure: referenced report

REPORT

# Human Health Risk Assessment, 744 and 758 High Street, Oakland, California

*Prepared for*

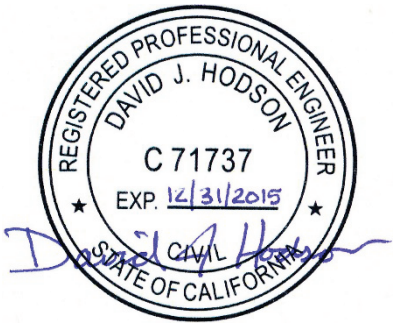
## Union Pacific Railroad Company

July 2, 2015

155 Grand Avenue
Suite 800
Oakland, CA 94612

# Technical Certification

This report was prepared under the supervision of a Professional Engineer registered with the State of California, whose signature appears below.




David Hodson, P.E.
Project Manager

July 2, 2015
Date

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# Acronyms and Abbreviations

| | |
|---|---|
| µg/dL | microgram(s) per deciliter |
| ACEH | Alameda County Health Care Services Agency, Department of Environmental Health Services |
| amsl | above mean sea level |
| ATSDR | Agency for Toxic Substances and Disease Registry |
| BAF | bioavailability adjustment factor |
| BEHP | bis(2-ethylhexyl) phthalate |
| bgs | below ground surface |
| Cal-EPA | California Environmental Protection Agency |
| CHHSL | California Human Health Screening Level |
| COPC | constituent of potential concern |
| CSF | cancer slope factor |
| DNA | deoxyribonucleic acid |
| DTSC | California Environmental Protection Agency, Department of Toxic Substances Control |
| E&E | Ecology and Environment |
| EDR | Environmental Data Resources |
| ELCR | excess lifetime cancer risk |
| EPA | U.S. Environmental Protection Agency |
| EPC | exposure point concentration |
| HHRA | human health risk assessment |
| HI | hazard index |
| HQ | hazard quotient |
| IRIS | Integrated Risk Information System |
| IUR | inhalation unit risk |
| kg | kilogram(s) |
| mg/kg | milligram(s) per kilogram |
| mg/kg-day | milligram(s) of chemical per kilogram of body weight per day |
| $mg/m^3$ | milligram(s) per cubic meter |
| OEHHA | California Environmental Protection Agency, Office of Environmental Health Hazard Assessment |
| PPRTV | provisional peer-reviewed toxicity value |
| REL | Reference Exposure Level |
| RfC | reference concentration |

| | |
|---|---|
| RfD | reference dose |
| RME | reasonable maximum exposure |
| RSL | Regional Screening Level |
| SPTCo | Southern Pacific Transportation Company |
| TPH | total petroleum hydrocarbons |
| UCL | upper confidence limit on the mean |
| UCL95 | 95 percent upper confidence limit on the mean |
| UPRR | Union Pacific Railroad Company |
| VOC | volatile organic compound |
| Water Board | California Regional Water Quality Control Board, San Francisco Bay Region |

SECTION 1

# Introduction

On behalf of the Union Pacific Railroad Company (UPRR), CH2M HILL (CH2M) prepared this report for the former UPRR property located within the property currently identified as 750 High Street, in Oakland, California (the site). Historically, the site was known to be located at 744 and 758 High Street. A site location map is illustrated on Figure 1-1. This report presents the approach, analysis, and results for the human health risk assessment (HHRA) conducted for the site. This HHRA was conducted using the following federal and state regulatory guidance:

- U.S. Environmental Protection Agency's (EPA) Risk Assessment Guidance for Superfund: Volume I – Part A (EPA, 1989), Part B (EPA, 1991a), and Part E (EPA, 2004)
- HHRA Note 1: "Recommended DTSC Default Exposure Factors for Use in Risk Assessment at California Hazardous Waste Sites and Permitted Facilities" (California Environmental Protection Agency [Cal-EPA], Department of Toxic Substances Control [DTSC], 2014)
- Cal-EPA Toxicity Criteria Database (Cal-EPA, Office of Environmental Health Hazard Assessment [OEHHA], 2015)

Environmental investigation and evaluation at the site have been conducted under regulatory oversight by the Alameda County Health Care Services Agency, Department of Environmental Health Services (ACEH), as directed in correspondence dated September 23, 2011 (ACEH, 2011); December 4, 2012 (ACEH, 2012); and July 19, 2013 (ACEH, 2013).

## 1.1 Document Organization

This HHRA is organized into the following sections:

- Section 1 presents the site description and history.
- Section 2 presents an evaluation of the data used for the HHRA.
- Section 3 presents an evaluation of the exposure assessment for the HHRA.
- Section 4 presents an evaluation of the toxicity assessment for the HHRA
- Section 5 presents an evaluation of the risk characterization for the HHRA.
- Section 6 presents an evaluation of the uncertainties for the HHRA
- Section 7 presents a summary of the HHRA.
- Section 8 presents risk management considerations for the HHRA
- Section 9 lists references for information cited in this HHRA.

## 1.2 Document Objectives

The objective of an HHRA is to assess the potential human health risks associated with the exposure to chemicals detected at the site in the absence of remedial action. This HHRA will be used to determine whether any short-term or long-term cleanup actions are warranted at the site.

The potential human receptor groups evaluated in the HHRA, which are the likely receptors currently, in the future, or both, are as follows:

- Commercial workers
- Construction workers
- Hypothetical residents as unrestricted use receptors to support risk management decisions.

Visitors to the site, included customers, are potential receptors. However, the potential exposure duration is much less than assumption of a 30-year duration for a commercial worker.

## 1.3 Site Description

The site consists of one parcel, with an area of 1.86 acres (Alameda County Assessor's Parcel Number [APN] 34-2293-6-7), currently owned and operated as a lumber yard by the Economy Lumber Company (Economy Lumber), located at 750 High Street, Oakland, California. The parcel is located south of the UPRR tracks, extending southeast from High Street to an open channel section of Peralta Creek. Peralta Creek drains to East Creek Slough approximately 1,600 feet to the south-southeast, and East Creek Slough drains to San Leandro Bay (Figure 1-1). San Leandro Bay is part of San Francisco Bay. The site is relatively flat and, with the exception of an area in the southern portion of the site, paved with asphalt or covered with buildings. The site elevation is approximately 15 feet above mean sea level (amsl), as estimated from the U.S. Geological Service (USGS) 1997 Oakland East Quadrangle topographic map (USGS, 1997).

The site parcel was previously part of a larger Southern Pacific Transportation Company (SPTCo) holding located along the railway corridor before purchase by Economy Lumber in November 1990. Prior to 1990, numerous addresses were associated with businesses operating at the site (758, 770, 772, 774, and 774 ½ High Street). Following purchase by Economy Lumber in 1990, the parcel was combined with adjacent Economy Lumber holdings and given the address 750 High Street. The site address used in regulatory correspondence and reporting concerning the site (748 and 755 High Street) appears to have been assigned erroneously and is retained here for historical consistency. The historical and current site features adjacent to the site are shown on Figure 1-2.

The property owned and operated by Economy Lumber (750 High Street) is zoned for warehouse-industrial land use, and the surrounding land uses are industrial and commercial (City of Oakland, 2015). Economy Lumber has developed the property with retail spaces, warehouses, and a lumber yard for the sale and storage of building materials. The nearest residential properties are approximately 900 feet to the north-northwest, on 40$^{th}$ Avenue.

## 1.4 Site History

The site was acquired by SPTCo in 1872 from the Contract and Finance Company (Ecology and Environment [E&E], 1989a). As depicted on an 1877 real estate map (Brown, 1877), the site is located in a triangular block of land bounded by High Street to the west, an east-west rail line to the north, and a southwest-northeast rail line to the south. The 1897 fire insurance map shows no development at the site, with the nearest documented structures belonging to the Western Fuse and Explosives Company, to the southeast (Environmental Data Resources [EDR], 2013). The 1850 limit of tidal marshes in the East Creek Slough area of San Leandro Bay is approximately 1,000 feet south to southeast of the site (Sowers and Richard, 2009) (Figure 1-1). Development north of the site, culverting of urban creeks, and infilling of wetlands adjacent to San Leandro Bay are evident on a 1910 USGS topographic map and a 1912 real estate map (USGS, 1910) (Realty Union Investment Company, 1912).

The earliest development at the site is documented on a 1925 fire insurance map (EDR, 2013). In 1925, the site contained a wood-frame warehouse in the northern half of the property and a vacant, dirt-floored structure with an outbuilding to the west in the central portion of the property. The 1939 aerial photograph shows that the northern portion of the site was redeveloped with a new structure and that a rail spur traversed the northeast corner of the property to a terminus west of High Street (EDR, 2013). The nature of the onsite activities between 1925 and 1939 is unknown.

During the 1940s and 1950s, an evolving complex of structures was developed on the northern half of the site. A second rail spur terminating in the central portion of the site is first shown on a 1944 SPTCo valuation map. The 1946 aerial photograph shows that the northern portion of the site was redeveloped with a new structure for sheet metal works, dirt roads near the central rail spur, and some materials stored in the center of the site (EDR, 2013). The 1950 fire insurance map documents that the north-

central portion of the site was used for scrap metal storage and salvage and contained one outbuilding (EDR, 2013). Additionally, this map documents the presence of a storage bunker with unknown contents at the southeast corner of the main building.

In 1956, the Scrap Metal Supply Company (SMS) began leasing the property from SPTCo (E&E, 1989a). In addition to standard scrap, ACEH inspection notes document that SMS received hazardous wastes, including wet batteries, and stored potentially hazardous wastes in various drums and approximately 200-gallon rinse tanks. The 1957 fire insurance map lists site activities as sheet metal and welding fabrication, and scrap metal warehousing (EDR, 2013). In the 1958 aerial photograph, abundant materials are visible around the rail spur and peripheries of the central portion of the site, as are several outbuildings and a fence that encloses the northern two-thirds of the site (EDR, 2013). The southern third of the site, adjacent to Peralta Creek, was undeveloped and possibly unused.

With the exception of a scale office and outbuildings present in the central portion of the site, the 1958 site configuration remained largely unchanged until at least 1989. However, limited site documentation is available for the period between 1969 and 1989; the available aerial photographs are of low quality and fire insurance map coverage ceases. One notable change during this time is the expansion of the fence line to encompass the entire parcel from High Street to Peralta Creek. This expansion opened the previously undeveloped southern portion of the site to onsite activities.

Between at least 1986 and 1989, both SMS and Kayak America Works (an auto body repair shop), occupied portions of the site. SPTCo real estate documents indicate that Hollander and Associates (a real estate and business investment firm) held a ten year lease on the property beginning in July 1986; in turn, Hollander and Associates subleased the property to SMS. The nature of any contractual arrangements between Kayak America Works, SMS, SPTCo, and/or SPTCo is unknown. An invoice included in SPTCo real estate documents for the cleanup and shuttering of vacant structures on the property from the City of Oakland to SMS indicates that the property had been abandoned sometime before May 1989. The property was purchased by John Bacon of Economy Lumber in November 1990, apparently in a simultaneous sale between Hollander and Associates and SPTCo, and Hollander Associates and John Bacon. Most of the property was paved in 1991, after purchase of the property by Economy Lumber SPTCo was acquired by UPRR in 1996. Economy Lumber currently operates a building materials supply business and lumber yard on its property, which includes the site and two adjacent parcels (APNs 34-2290-7-2 and 34-2290-11) southwest of the site.

SECTION 2

# Analytical Data Evaluation

Soil samples were collected during field investigations conducted from 1988 through February 2015 to characterize the nature and extent of contamination at the site. A summary of field investigations and results associated with the site is presented in the *Soil and Groundwater Investigation and Updated Site Conceptual Model Report* (CH2M, 2015).

The analytical data evaluation step for the HHRA consisted of reviewing and evaluating available and applicable data to select constituents of potential concern (COPC) and estimate exposure point concentrations (EPCs). The analytical data were reviewed according to the data evaluation procedures specified in EPA guidance documents, including *Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part A)* (EPA, 1989) and *Superfund Guidance for Data Useability in Risk Assessment* (EPA 1990). These procedures include evaluation of analytical methods, quantitation limits, qualified data, blank contamination, and background concentrations.

## 2.1 Analytical Data Collection for the Human Health Risk Assessment

This section describes the analytical data obtained by collecting samples at the site. Additional discussion of the analytical data used in this HHRA was presented in the *Soil and Groundwater Investigation and Updated Site Conceptual Model Report, 744 and 758 High Street*, Oakland, California (CH2M, 2015).

For the purpose of evaluation and presentation of risk estimates, site soil data was grouped into one exposure area. To evaluate direct contact by COPCs to commercial workers, construction workers, and hypothetical residents, results from surface soil (0 to 2 feet below ground surface [bgs]) and total soil (0 to 10 feet bgs) samples collected as part of site investigations were evaluated. In some cases, surface and/or total soil is beneath asphalt or concrete.

Soil sampling was conducted at the site in July 1988 (4 locations; No 1, No 2, No 3, and No 4-1, No 4-2, No 4-3, and No 4-4), May, July and November 1989 (51 locations; B-1, B-3, B-5 through B-9, B-10, C-1 through C-40, D-1, MW-A-1, A-2, A-3, A-4; MW-B-2, B-3; MW-C-2, C-3, C-4; and MW-B-2, and MW-C-2), April and May 1990 (17 locations; A-100, A-101, A-200, A-201, B-100, B-101, B-200, B-201, C-100 through C-104, and C-200 through C-203), August 2013 (29 locations; GB001 through GB029) and February 2015 (23 locations; GB030 through GB049, MW-01, MW-02 and MW-04).

All available soil samples collected at the site since 1988 were included in the HHRA dataset, except those samples that were located in soil removed during remedial actions. The soil samples include both grab (discrete) samples and horizontal composite samples. Soil samples were collected at varying depths from the ground surface to 19 feet bgs. Samples with a sample start depth less than 2 feet bgs were included in the surface soil depth interval and samples with a start depth less than 10 feet bgs were included in the 0 to 10 feet bgs depth interval (total soil).

For samples collected at the same location and depth on the same date (for example, field duplicates), only one result was selected for inclusion in the HHRA. The sample was selected using the following criteria:

- When only one of the results was detects, the detected results was selected.
- When both results are detects, the highest detected result was selected.
- When both results are non-detects, the lowest non-detected result was selected.

Sampling locations used in the HHRA are illustrated on Figure 2-1 and in Table A-1 of Appendix A.

## 2.2 Constituents of Potential Concern

Constituents reported in at least one soil sample at concentrations greater than the sample detection limit were initially considered COPCs. COPCs are assessed quantitatively in an HHRA; risk estimates are only quantified (that is, calculated) for COPCs. Constituents were not excluded as COPCs based on comparison to background soil concentrations. Potential risks associated with ambient levels of metals in soil were also calculated, to provide an understanding of the total risks at the site (that is, potential risks from site-related COPCs and ambient levels of metals).

Calcium, magnesium, potassium, and sodium, which are known to be essential human nutrients, were eliminated as COPCs. EPA (1989) and DTSC (1992) guidance documents state that these elements can be deleted from the list of COPCs because of their low toxicity when detected at ambient concentrations. Even if these constituents are present at concentrations slightly above naturally occurring levels, they are eliminated as COPCs because they are toxic only at very high doses.

Table 2-1 presents the COPCs for each medium (surface and total soil) evaluated to assess potential risk to human receptor groups identified in Section 1.2.

## 2.3 Exposure Point Concentrations

EPCs represent the concentrations of the COPCs that receptors may be exposed to over a period of time. EPCs were calculated for COPCs identified in soil samples. EPC estimates do not include physical, chemical, or biological processes that could result in the reduction of chemical concentrations over time. The EPCs are assumed to remain constant at levels reflected in the analytical results. This general assumption of steady-state conditions also applies to sources and contaminant release mechanisms. This assumption may result in a conservative evaluation of long-term exposure conditions.

The measure of exposure appropriate for an HHRA is the average concentration of a contaminant throughout an area to which humans are exposed. The premise is based on the assumption that, over a long enough period of time, a receptor would contact all parts of the exposure area. A conservative estimate of the average concentration of a chemical across an exposure area is the 95 percent upper confidence limit (UCL) on the mean (UCL95); UCL95s were calculated for the soil and groundwater data sets using ProUCL Version 5.0 software (EPA, 2013). Summary statistics are provided in Tables 2-2 and 2-3. ProUCL output is provided in Appendix B for each COPC in soil.

ProUCL computes parametric UCLs based on normal, lognormal, or gamma distributions, and nonparametric UCLs using one of several nonparametric methods. The UCLs selected as the EPCs are based on the data distribution and the associated skewness. For this HHRA, if a data set contained less than four samples, the maximum sample concentration was used as the EPC, because a UCL95 could not be calculated. EPCs are the lesser of the maximum detected concentration and the UCL95 recommendation provided in the ProUCL software output.

SECTION 3

# Exposure Assessment

Exposure assessment is assessment of the magnitude, frequency, duration, and route of exposure. The objective of the exposure assessment is to estimate the types and magnitudes of exposures to COPCs that are present at or migrating from a site. The three primary steps in exposure assessment are site characterization, exposure pathway identification, and quantification of exposure.

## 3.1 Potentially Exposed Populations

The site (750 High Street) property is zoned for warehouse-industrial land use, and the surrounding land uses are industrial and commercial. The site property includes retail spaces, warehouses, and a lumber yard for the sale and storage of building materials. The nearest residential properties are approximately 900 feet to the north-northwest, on 40$^{th}$ Avenue.

The following possible human receptor groups and exposure routes have been identified:

- **Commercial workers:** Under current and potential future site conditions, workers could be exposed to surface soil (0 to 2 feet bgs) during maintenance or other work activities at the site. Potential routes of exposure to surface soil would include incidental ingestion, dermal contact, and inhalation of volatiles and ambient dust. The commercial worker was assumed to be an 80-kilogram (kg) adult exposed to soil anywhere across the site for 250 days per year (5 days per week for 50 weeks) over a duration of 25 years.
- **Construction workers:** Current and potential future construction workers may be exposed to total soil (that is, 0 to 10 feet bgs; assuming that construction activities occur to 10 feet bgs and that subsurface soil is brought to the surface and mixed with surface soil during construction activities) through incidental ingestion, inhalation of volatiles and particulates, and dermal contact. The construction worker was assumed to be an 80-kg adult exposed to soil during a single 200-day construction event. A 200-day event (40 weeks x 5 days per week) was selected as a conservative estimate of a construction project where soil is excavated and exposed for contact.
- **Hypothetical Residents:** Hypothetical future residents may be exposed to surface soil (0 to 2 feet bgs) and total soil (0 to 10 feet bgs; assuming that subsurface soil is brought to the surface and mixed with surface soil) through incidental ingestion, inhalation of volatiles and particulates, and dermal contact. For future residents, this HHRA conservatively assumes that residential development would consist of single-family dwellings within the facility boundaries. This assumption is health-protective and yields conservative risk estimates that are greater than the risk estimates for multi-family dwellings such as apartments or condominiums. A future resident was assumed to be exposed for 350 days per year over a duration of 30 years (for the first 6 years, a 15-kg child, followed by 20 years as an 80-kg adult).

Because volatile organic compounds (VOCs) have not been identified as chemicals of potential concern (CH2M, 2015), the vapor intrusion pathway (inhalation of VOCs migrating from subsurface soil to indoor air) will not be evaluated in this HHRA. In addition, groundwater is not evaluated for exposure through domestic use because it is unlikely at this site that groundwater would be used as a drinking water source.

## 3.2 Exposure Assumptions

Table 3-1 lists exposure assumptions. Standard exposure assumptions were available and were used for the commercial workers, construction workers and hypothetical resident.

# 3.3 Calculation of Chemical Intake

Exposure (or intake) is defined as contact of an organism with a chemical. Intake is normalized for time and body weight, and is expressed as milligrams of chemical per kilogram of body weight per day (mg/kg-day). Six basic factors are used to estimate intake: chemical concentration, contact rate, exposure frequency, exposure duration, body weight, and averaging time. Intake estimates are calculated for each COPC and exposure pathway. For noncarcinogenic effects, the intake is averaged over the period of time that receptors are exposed to the COPCs and is referred to as the average daily dose. For carcinogenic effects, the intake is averaged over a receptor's lifetime (assumed to be 70 years) and is referred to as the lifetime average daily dose.

The quantification of exposure intake considers chemical EPCs, as well as general exposure assumptions or parameters. The intake assumptions are based on information that is highly conservative in nature and are intended to overestimate exposure to be protective of sensitive members of the population, such as children. EPA guidance states that actions at Superfund sites should be based on an estimate of the reasonable maximum exposure (RME) (EPA, 1989). The RME is defined by EPA as the "highest exposure that is reasonably expected to occur at a site." The intent of the RME is to estimate a conservative exposure case (that is, exposure well above the average case) that is still within the range of possible values. To the extent possible, the HHRA has selected values for the exposure factors that result in an estimate of the RME scenario.

## 3.3.1 Intake Equation for Incidental Ingestion of Soil

The following equation was used to calculate the intake associated with the incidental ingestion of carcinogenic and noncarcinogenic contaminants in soil under the commercial worker, construction worker, and residential exposure scenarios:

$$Intake = \frac{C_S \times IR \times BAF \times EF \times ED \times 10^{-6}\, kg/mg}{BW \times AT} \quad (1)$$

Where:

Intake = Chemical intake (mg/kg-day)
$C_s$ = Chemical concentration in soil (mg/kg)
IR = Soil ingestion rate (milligrams per day)
BAF = Bioavailability adjustment factor
IR = Soil ingestion rate (milligrams per day)
EF = Exposure frequency (days per year)
ED = Exposure duration (years)
BW = Body weight (kilograms [kg])
AT = Averaging time (days)

A bioavailability adjustment factor (BAF) of 1 was used for all COPCs. Although an arsenic BAF of 0.6 is recommended in EPA's *Compilation and Review of Data on Relative Bioavailability of Arsenic in Soil* (EPA, 2012) it was not used.

## 3.3.2 Intake Equation for Dermal Contact with Soil

The following equation was used to calculate the intake from dermal contact with carcinogenic and noncarcinogenic chemicals in soil under the commercial worker, construction worker, and hypothetical residential exposure scenarios:

$$Intake = \frac{C_S \times ABS \times SA \times AF \times EF \times ED \times 10^{-6}\, kg/mg}{BW \times AT} \quad (2)$$

Where:

Intake = Chemical intake (mg/kg-day)
$C_s$ = Chemical concentration in soil (mg/kg)
ABS = Dermal absorption factor
SA = Exposed skin surface area (square centimeters)
AF = Soil-to-skin adherence factor (milligrams per square centimeter)
EF = Exposure frequency (days per year)
ED = Exposure duration (years)
BW = Body weight (kg)
AT = Averaging time (days)

The exposure assumptions for estimating exposure from dermal contact with soil (DTSC, 2014) are provided in Table 3-1. Dermal absorption factor values were obtained from Cal-EPA DTSC (2013) Preliminary Endangerment Assessment Manual or the EPA dermal guidance, (Exhibit 3-4) (EPA, 2004) and are provided in Table 4-1.

### 3.3.3 Intake Equation for Inhalation of Dust and Volatiles in Soil

The following equation was used to calculate the intake of carcinogenic and non-carcinogenic contaminants associated with inhalation of dust emissions from soil under the commercial worker, construction worker, and hypothetical residential exposure scenarios:

$$Intake = \frac{C_s \times \left( \frac{1}{PEF} + \frac{1}{VF} \right) \times EF \times ETF \times ED}{AT} \quad (3)$$

Where:

Intake = Chemical intake (milligrams per cubic meter [mg/$m^3$])
$C_s$ = Chemical concentration in soil (mg/kg)
EF = Exposure frequency (days per year)
ED = Exposure duration (years)
ETF = Exposure time fraction (unitless)
PEF = Particulate emission factor ($m^3$/kg)
VF = Volatilization factor ($m^3$/kg)
AT = Averaging time (days)

The exposure assumptions used to estimate exposure from inhalation of dust and volatiles in ambient air are provided in Tables 3-1 and 3-2. A particulate emission factor is used to relate the concentration of a chemical in soil to the concentration of dust particles in air. A particulate emission factor of $1.32 \times 10^9$ $m^3$/kg was used to evaluate the dust inhalation pathway (EPA, 2002). It was assumed that metals concentrations in airborne dust were similar to metals concentrations in soil. The volatilization factor is used to relate the concentration of a volatile chemical in soil to the concentration in ambient (outdoor) air (EPA, 1996). Physical and chemical properties from EPA (2015).

SECTION 4

# Toxicity Assessment

The toxicity assessment seeks to develop—according to readily available published information—a reasonable association between the degree of exposure to a chemical and the possibility of adverse health effects. A chemical may not cause adverse toxic effects in biological systems unless the agent or its metabolic byproducts reach critical receptor sites in the body at specific levels and for a period of time sufficient to elicit a particular effect. Whether a toxic response occurs depends on the chemical and physical properties of the toxic agent, the degree of exposure to the agent, and the susceptibility of an individual to the effect. To characterize the toxicity of a particular chemical, the type of effects it can produce and how much is needed to produce those effects must be known.

The toxicity assessment consists of two components:

- Hazard identification – The process of determining what adverse human health effects, if any, could result from exposure to a particular chemical
- Dose-response evaluation – A quantitative examination of the relationship between the level of exposure and the probability of adverse health effects in an exposed population

## 4.1 Hazard Characterization

Health effects are divided into two categories: non-cancer effects and cancer effects. The division is based on the different mechanisms of action associated with each category. Chemicals with non-cancer effects may also have cancer effects. Chemicals are assessed in both categories.

### 4.1.1 Non-cancer Effects

Non-cancer, or systemic, effects are assumed to occur only after a finite level of exposure (that is, toxic threshold) is exceeded. Exposure levels below the threshold can be tolerated by the receptor without causing an adverse health effect. Non-cancer health effects include a variety of toxicological endpoints and may include effects on specific organs (for example, pulmonary toxicants affect lungs) or systems (for example, neurotoxicants affect the nervous system).

Non-cancer health effects fall in two basic categories: acute effects and chronic effects. Acute toxicological effects typically occur after a short exposure and are usually observed within 1 to 14 days (EPA, 1989). Chronic toxicological effects usually occur after repeated exposure and are observed weeks, months, or years after the initial exposure.

### 4.1.2 Cancer Effects

Carcinogenesis is generally thought to be a phenomenon for which risk evaluation, based on presumption of a threshold, is inappropriate. For carcinogens, it is assumed that a small number of molecular events can evoke changes in a single cell that can eventually lead to cancer. This hypothesized mechanism for carcinogenesis is referred to as “non-threshold,” because there is assumed to be essentially no level of exposure that does not pose a finite probability, however small, of generating a carcinogenic response.

EPA has developed a carcinogen classification system (EPA, 1989) that uses a weight-of-evidence approach to classify the likelihood of a chemical being a human carcinogen. Information considered in developing the classification includes human studies that associate cancer incidence with exposure. Also considered are long-term animal studies conducted under controlled laboratory conditions. Other supporting evidence considered includes short-term tests for genotoxicity, metabolic and

pharmacokinetics properties, toxicological effects other than cancer, structure-activity relationships, and physical and chemical properties of the chemical.

## 4.2 Dose-Response Evaluation

Toxicity values are quantitative expressions of the dose-response relationship for a chemical. These values are expressed as cancer slope factors (CSF) and non-cancer reference doses (RfD), both of which are specific to the route of exposure.

## 4.3 Reference Doses and Reference Concentrations for Non-cancer Effects

The toxicity value used to describe the dose-response relationship for non-cancer health effects is the RfD. The EPA defines the RfD as follows (EPA, 1989):

> …an estimate (with uncertainty spanning perhaps an order of magnitude) of a daily exposure to the human populations (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious effects during a lifetime.

The oral RfD is generally expressed in units of mg/kg-day. RfDs for effects associated with inhalation of a particular chemical are given as a reference concentration (RfC) ($mg/m^3$) that can be converted to an intake value (RfD in terms of mg/kg-day). Dose-response criteria for assessing the potential for non-cancer health effects from exposure to chemicals have been developed by EPA on the principle supported by scientific data that non-cancer health effects occur only after a threshold dose is reached. A threshold dose is the dose below which most people can be exposed without adverse effects occurring. This threshold dose is usually estimated from the No Observed Adverse Effect Level or the Lowest Observed Adverse Effect Level determined from long-term chronic animal studies. The No Observed Adverse Effect Level is defined as the highest dose at which no adverse effects are observed, while the Lowest Observed Adverse Effect Level is defined as the lowest dose at which adverse effects are observed.

RfDs developed by EPA are used to evaluate non-cancer health hazards in an HHRA. The RfDs used in this HHRA were compiled from EPA's Integrated Risk Information System (IRIS) database (EPA, 2015a). The non-cancer toxicity values for the COPCs are listed in Table 3-2; this table also identifies the toxic endpoints observed in each investigation used to derive each RfD, as well as the cumulative uncertainty factor used to derive each RfD. Route-to-route extrapolation was frequently used when no toxicity values were available for a given route of exposure. Oral RfDs were used for both oral and inhaled exposures for organic compounds lacking inhalation values, and inhalation RfDs were used for both inhaled and oral exposures for organic compounds lacking oral values. Route extrapolation was not performed for inorganics because of portal of entry effects and known differences in absorption efficiency for the two routes of exposure. In addition, oral toxicity values were used to evaluate dermal exposures; in general, dermal toxicity values are not listed in EPA databases, and must be estimated from oral toxicity information.

## 4.4 Slope Factors and Inhalation Unit Risk for Cancer Effects

The dose-response relationship for cancer effects is usually expressed as a CSF. Generally, the CSF is a plausible upper-bound estimate of the probability of a response per unit intake of a chemical over a lifetime. The CSF toxicity values for the COPCs are listed in Table 3-2. The CSF is usually, but not always, the UCL95 of the slope of the dose-response curve and is expressed as the inverse of milligrams of chemical per kilogram of body weight per day (or $(mg/kg\text{-}day)^{-1}$). CSFs associated with inhalation of a particular chemical are provided as inhalation unit risk (IUR). An IUR is the upper-bound excess lifetime

cancer risk (ELCR) estimated to result from continuous exposure to an agent at a concentration of 1 microgram per cubic meter in air.

Chemical carcinogens are generally divided into two classes according to the mechanism by which they cause cancer. The two classes are genotoxic agents (capable of causing deoxyribonucleic acid [DNA] damage) and non-genotoxic (toxic through mechanism not related to DNA damage). For genotoxic carcinogens, it is generally assumed that no threshold exists below which the agent cannot cause cancer. In other words, no matter how small the dose, there is some carcinogenic response, even if that response cannot be measured in animal experiments or in an exposed human population. In contrast, non-genotoxic carcinogens are likely to have a threshold dose, below which no adverse toxicological impact is expected to occur. The dose-response curve used by regulatory agencies is typically derived using the linearized multistage model, which extrapolates the tumor response in animals exposed to high doses of a chemical to a theoretical cancer risk for humans exposed to low doses. EPA acknowledges that this approach likely overestimates cancer risks, as follows (EPA, 1986):

> It should be emphasized that the linearized multistage procedure leads to a plausible upper limit to risk that is consistent with some proposed mechanisms of carcinogenesis. Such an estimate, however, does not necessarily give a realistic prediction of the risk. The true value of the risk is unknown and may be as low as zero. The range of risks defined by the upper limit given by the chosen model and the lower limit, which may be as low as zero, should be explicitly stated. An established procedure does not yet exist for making 'most likely' or 'best' estimated of risk within a range of uncertainty defined by the upper and lower limit estimates.

The linearized multistage procedure is used to develop chemical-specific CSFs. A CSF is a measure of the carcinogenic potency of a chemical. As the CSF increases, the toxicity of the chemical also increases.

## 4.5 Toxicity Values

The cancer and non-cancer toxicity values used in the HHRA were obtained from the following sources in order of selection priority:

- "OEHHA Cancer Potency Values" (OEHHA, 2015). This table, from the OEHHA Toxicity Criteria Database, provides a compilation of CSFs developed or approved by divisions of Cal-EPA.
- "OEHHA Acute, 8-hour and Chronic Reference Exposure Level [REL] Summary" (OEHHA, 2014). This table provides reference exposure levels, which are RfC published by OEHHA.
- The IRIS database available through the EPA National Center for Environmental Assessment. IRIS, prepared and maintained by EPA, is an electronic database containing health risk and EPA regulatory information on specific chemicals (EPA, 2015a).
- The EPA's provisional peer-reviewed toxicity values (PPRTV), provided by the Office of Research and Development, National Center for Environmental Assessment Superfund Health Risk Technical Support Center, which develops these values on a chemical-specific basis under EPA's Superfund program (EPA, 2015b).
- The Agency for Toxic Substances and Disease Registry (ATSDR) minimal risk levels (ATSDR, 2014).
- Screening toxicity values in an appendix to certain PPRTV assessments from EPA Regional Screening Level (RSL) Table (EPA, 2015c).
- Health Effects Assessment Summary Tables, provided by the EPA Office of Solid Waste and Emergency Response (EPA, 1997a). These tables are a compilation of toxicity values published in various health effects documents issued by the EPA.

The total chromium concentration was evaluated using chromium III toxicity values.

For the construction worker scenario, subchronic toxicity values were used, when available.

Toxicity values are presented in Table 4-1.

## 4.6 Lead

Intake of lead is assessed differently than intake of other chemicals. Much of the toxicological data collected on the effects of lead on the human body relates exposure and effect in terms of the amount of lead in blood associated with an observed effect, expressed as micrograms of lead per deciliter of blood (micrograms per deciliter [µg/dL]). California EPA has identified childhood blood levels of 1 µg/dL as the level of concern above which significant health risks may occur (OEHHA, 2009).

For commercial workers and residents exposed to lead in soil, the screening level is assumed to be the OEHHA California Human Health Screening Level (CHHSL) of 320 mg/kg for commercial workers and 80 mg/kg for residents (OEHHA, 2009). DTSC uses the Adult Lead Model to estimate CHHSLs for a commercial setting and the LeadSpread model to estimate CHHSLs for a residential setting. The commercial/industrial CHHSL is intended to protect a fetus that may be carried by a pregnant female worker. It is assumed that a cleanup goal that is protective of a fetus will also afford protection for male or female adult workers. The LeadSpread model was queried for the soil lead concentrations that would produce a 90$^{th}$ percentile estimate of increase in blood lead of 1 µg/dL.

SECTION 5

# Risk Characterization

The risk characterization summarizes the estimated health risks for potentially complete exposure pathways, expressed as non-cancer hazard indices (HI) and ELCRs. For this evaluation, the exposure area-specific estimates of potential risks (ELCRs and HIs) were compared with the following risk thresholds:

- For chemicals with cancer-causing properties, ELCR estimates were compared with the risk management range of $1 \times 10^{-6}$ to $1 \times 10^{-4}$.
- HIs (ratios of the chemical intake to the RfD or concentration in the air to the RfC) were compared with the regulatory threshold of 1.

A constituent was identified as a primary contributor to carcinogenic risk or non-cancer hazard according to following criteria: the chemical risk exceeds 1E-06 or the chemical hazard quotient (HQ) exceeds 1. Cancer risk estimates are presented in the results section below and the HHRA tables in E-notation (for example, 1E-06 is equivalent to $1 \times 10^{-6}$).

## 5.1 Cancer Risk Estimation Method

The potential for cancer effects is evaluated by estimating the ELCR. This risk is the incremental increase in the probability of developing cancer during one's lifetime in addition to the background probability of developing cancer (that is, no exposure to site chemicals occurs). For example, a $2 \times 10^{-6}$ ELCR means that, for every 1 million people exposed to the carcinogen throughout their lifetimes, the average incidence of cancer might increase by two cases of cancer. In the United States, the background probability of developing cancer for men is a little less than one in two, and for women is a little more than one in three (American Cancer Society, 2003). The product of intake multiplied by the CSF or IUR is the ELCR:

$$ELCR = I \times CSF \text{ or } IUR \quad (6)$$

Where:

ELCR = Excess lifetime cancer risk (unitless probability)
I = Chronic daily intake averaged over a lifetime (mg/kg-day or µg/m$^3$)
CSF = Cancer slope factor ((mg/kg-day)$^{-1}$)
IUR = Inhalation unit risk ((µg/m$^3$)$^{-1}$)

Although synergistic or antagonistic interactions might occur between cancer-causing chemicals and other chemicals, information is generally lacking in toxicological literature to quantitatively predict the effects of these potential interactions. Therefore, cancer risks were treated as additive within an exposure route in this assessment; this is consistent with the EPA guidelines on chemical mixtures (EPA, 1989). To estimate the cancer risk from exposure to multiple carcinogens in a single exposure route, the following equation was used:

$$Risk_T = \sum_1^N Risk_i \quad (7)$$

Where:

$Risk_T$ = Total cancer risk from route of exposure
$Risk_i$ = Cancer risk for the $i^{th}$ chemical
N = Number of chemicals

## 5.2 Non-cancer Risk Estimation Method

For non-cancer effects, the likelihood of an adverse effect is estimated by comparing the predicted level of intake with the RfD. The RfD divided by the RfC is the highest level of intake that is considered protective. As shown in the following equation, the ratio of the intake (I) divided by the RfD or RfC is the HQ:

$$HQ = \frac{I}{RfD \text{ or } RfC} \quad (8)$$

Where:

HQ = Non-cancer hazard quotient
I = Chemical intake (mg/kg-day) or exposure concentration (mg/m$^3$)
RfD = Reference dose (mg/kg-day)
RfC = Reference concentration (mg/m$^3$)

For exposure to multiple chemicals, the potential adverse health effects are conservatively considered to be additive and the HQs are summed, creating an HI:

$$HI = \sum_1^n HQ_{1-n} \quad (9)$$

Where:

HI = Non-cancer hazard index
$HQ_1$ = Hazard quotient for each chemical
n = Number of chemicals having the same toxic endpoint

When either the HQ or HI exceeds 1 (that is, exposure exceeds RfD), there is a concern for potential non-cancer health effects. If the HI for each chemical exceeds 1, the chemicals are grouped by target organ or mechanism of action and HIs are recalculated for each group of chemicals.

## 5.3 Lead Evaluation

Potential risks associated with exposure to lead in soils were evaluated by comparing the lead EPC to the CHHSL (OEHHA, 2009) for lead in soil for commercial (320 mg/kg) and residential (80 mg/kg) scenarios. Lead concentrations in groundwater samples were compared with the EPA and California regulatory action level for lead in water of 15 micrograms per liter (California Department of Public Health, 2008) (EPA, 2013d).

## 5.4 Risk and Hazard Estimates

The following receptors were evaluated:

- Current and future commercial workers
- Current and future construction workers
- Hypothetical future residents

The cancer risk and non-cancer hazard estimates for each exposure scenario are summarized in the following subsections and in Table 5-1. The risk calculation data sheets used to develop the risk summary tables for each exposure scenario are provided by receptor in Appendix C.

### 5.4.1 Current and Future Commercial Worker

The estimated ELCR associated with commercial worker exposure to surface soils is 3E-04. The primary contributor to the carcinogenic risk is carcinogenic PAHs (74 percent contribution), arsenic (15 percent

contribution), nickel (8 percent contribution), cadmium (3 percent contribution), and bis(2-ethylhexyl) phthalate (BEHP) [1 percent contribution]. The HI of 5 is greater than the regulatory threshold of 1. Arsenic is the primary contributor (93 percent).

PAHs, the primary risk driver, are commonly present in soil because of natural and anthropogenic sources. They are naturally formed in fires (for example, forest fires, prairie fires, and agricultural burning), fossil fuels and other bituminous soils, during volcanic activity, and some bacteria and plants also biosynthesize PAHs (ATSDR, 1995). PAHs are commonly found in soil because of contributions from human activity such as automobile and truck exhaust, road asphalt, and cigarette smoke (Teaf, 2008). Arsenic is another primary contributor to the ELCR and HI estimates but may be partially due to non-site-related sources. For example, the surface soil arsenic EPC (15.3 mg/kg) and total soil EPC (12.2 mg/kg) only slightly exceeds the regional arsenic background value of 11 mg/kg (Duverge, 2011).

### 5.4.2 Current and Future Construction Workers

The estimated ELCR associated with construction worker exposure to total soil is 2E-05. The primary contributor to the carcinogenic risk is arsenic (25 percent contribution), nickel (21 percent), carcinogenic PAHs (17 percent contribution), and cadmium (10 percent contribution). The HI of 11 is greater than the regulatory threshold of 1. The primary contributor to non-cancer hazard is total chromium (85 percent contribution). No other COPC has an HQ that exceeds 1.

As noted above (Section 5.4.1), arsenic and the other metals, and PAHs are potentially related to naturally occurring or anthropogenic sources.

### 5.4.3 Hypothetical Future Residents

The estimated ELCR associated with hypothetical future residential exposure to surface soil is 9E-04, which exceeds the risk management range. The primary contributors to the carcinogenic risk are carcinogenic PAHs (59 percent), arsenic (25 percent), nickel (11 percent), cadmium (4 percent contribution), BEHP (0.7 percent contribution), beryllium (0.4 percent contribution), and Aroclor-1248 (0.2 percent contribution). The HI of 72 is above the regulatory threshold of 1. The primary contributor to the site HI is arsenic (94 percent contribution).

The estimated ELCR associated with residential exposure to total soil is 5E-04, which exceeds the risk management range. The primary contributors to the carcinogenic risk are nickel (30 percent contribution), carcinogenic PAHs (27 percent), arsenic (25 percent), cadmium (14 percent contribution), Aroclor-1260 (2 percent contribution), beryllium (0.9 percent contribution), Aroclor-1248 (0.3 percent contribution), and BEHP (0.2 percent contribution). The HI of 37 is greater than the regulatory threshold of 1. The primary contributor to the site HI is arsenic (91 percent contribution).

As noted above (Section 5.4.1), arsenic and the other metals, and PAHs are potentially related to naturally occurring or anthropogenic sources.

### 5.4.4 Evaluation of Lead (Commercial Workers, Construction Workers, and Residents)

The comparison of lead EPCs in soil samples with the commercial/industrial and residential CHHSL is presented in Table 5-2. The EPCs for lead in surface soil samples (219 mg/kg) and total soil samples (238 mg/kg) that do not exceed the commercial/industrial CHHSL for lead of 320 mg/kg. Both EPCs, however, exceed the residential CHHSL of 80 mg/kg.

SECTION 6

# Uncertainty Discussion

Full characterization of human health risks requires that numerical estimates of risks be accompanied by a discussion of the uncertainties inherent in the assumptions used to estimate those risks. Uncertainties in risk assessment methods may result either in understating or overstating the risks. The latter is likely the case when health-conservative assumptions are used to characterize risk. Several sources of uncertainty can affect the overall estimates of human and ecological health presented in this HHRA. In general, risk estimates are subject to uncertainty from a variety of sources, including the following:

- Hazard identification
- Exposure assessment
- Toxicity assessment
- Risk characterization

Site-specific uncertainties associated with the above-mentioned sources are presented in the following subsections.

## 6.1 Hazard Identification

Uncertainties associated with sampling and analysis include the inherent variability (standard error) in the analysis, representativeness of the samples, sampling errors, and heterogeneity of the sample matrix. Although the quality assurance/quality control program used in conducting the sampling and analysis reduces errors, it cannot eliminate all errors associated with sampling and analysis. The risk assessment is based on the sampling results obtained from multiple investigations over time. Errors in sampling results can arise from field sampling, laboratory analyses, and data analyses. Errors in laboratory analysis procedures are possible, although the impacts of these sorts of errors on the risk estimates are likely to be low. Older samples may no longer be reflective of concentrations of chemicals that may be degraded or decrease with time. This may have resulted in overestimation of associated risks. The number and locations of samples at the site are generally considered adequate for assessing risk. However, in many cases, numbers of surface soil and total soil samples were not sufficient to calculate UCL95s. In such cases, maximum concentrations were used as EPCs, resulting in overestimated risk.

## 6.2 Exposure Assessment

### 6.2.1 Exposure Assumptions

The estimation of exposure requires using many assumptions to describe potential exposure situations. There are uncertainties regarding the likelihood of exposure, frequency of contact with contaminated media, the concentrations of contaminants at exposure points, and the period of exposure. These tend to simplify and approximate actual conditions at the site. In general, these are upper-bound assumptions intended to be conservative and to yield an overestimated risk or hazard.

The estimate of exposure assumes receptors are consistently in contact with contaminated media. Various factors – for example, time spent away from the site – will limit exposure to soil. In these cases, the potential risks to human health presented in this HHRA may be overestimated.

### 6.2.2 Bioavailability of Chemicals in Soil

Another uncertainty for the risk assessments is the bioavailability of the forms of metals that occur in soil at the site. Site-specific bioavailability data were not available for detected chemicals metals. The HHRA assumes that bioavailability from soil is the same as that in the toxicological studies from which

the toxicity values were derived. Depending on whether the chemical form at the site is less or more bioavailable than assumed, actual risk could be proportionately lower or higher, respectively. However, because metals are primary contributors to the site at risk and because the available toxicity studies are generally conducted using very bioavailable constituent forms, the use of toxicity values based on these more available forms may overestimate risk.

## 6.3 Toxicity Assessment

### 6.3.1 Toxicological Data

The toxicological database was also a source of uncertainty. EPA has outlined some of the sources of uncertainty in the *Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual (Part A)* (EPA, 1989). These sources might include or result from the extrapolation of toxicity from high to low doses and from animals to humans; the species, gender, age, and strain differences in a toxicant's uptake; metabolism, organ distribution, and target site susceptibility; and the human population's variability with respect to diet, environment, activity patterns, and cultural factors.

### 6.3.2 Dermal Toxicity Values

Dermal exposure is different from oral exposure because not all of a chemical that contacts a person's skin travels across the various layers of epidermal tissue, as indicated by a skin permeability factor, and because the toxic effects produced from this route of exposure may not be the same as when the chemical is ingested. In lieu of available toxicity values for the dermal route, this HHRA uses oral toxicity values to estimate the effects of dermally available chemicals. This approach may result in underestimated or overestimated risks, depending on whether the chemical is more or less toxic through the dermal route than through ingestion.

### 6.3.3 Use of Surrogate Toxicity Values

Surrogate chemicals with associated toxicity criteria were applied to chemicals without toxicity criteria, as detailed in Section 4.3. Because the surrogates chosen are generally considered more toxic, the risk estimates for these constituents are likely conservatively high.

For the construction worker scenario, if sub-chronic toxicity values were not available, chronic toxicity values were used to estimate the risks. Chronic oral toxicity values were used for chromium. Chronic inhalation toxicity values were used for aluminum, arsenic, barium, beryllium, cadmium, cobalt, mercury, nickel, selenium, and vanadium. Therefore, risk estimates for these constituents are overestimated.

## 6.4 Risk Characterization

In the risk characterization, it was assumed that the total risk of developing cancer from exposure to site contaminants is the sum of the risk attributed to each contaminant. Likewise, the potential for the developing non-cancer adverse effects was assumed to be the sum of the HQs estimated for exposure to each contaminant. This approach is consistent with EPA guidance, but does not account for the possibility that constituents act synergistically or antagonistically. Therefore, there is uncertainty associated with the cumulative risks for carcinogens and HIs for non-carcinogens.

SECTION 7

# Summary

This section summarizes the results of the HHRA for potential exposure to metals, PAHs, PCBs, semivolatile organic compounds, and VOCs detected in soil at the site. The following media and receptors were evaluated:

- Commercial worker exposure (incidental ingestion, dermal contact, and inhalation of particulates) to surface soil (0 to 2 feet bgs)
- Construction worker exposure (incidental ingestion, dermal contact, and inhalation of particulates) to total soil (0 to 10 feet bgs)
- Hypothetical residential exposure (incidental ingestion, dermal contact, and inhalation of particulates) to surface soil (0 to 2 feet bgs) and to total soil (0 to 10 feet bgs)

The ELCR (3E-04) for commercial worker exposure to surface soil is cumulatively greater than the risk management range, and the HI (5) is greater than the threshold of 1. The risk drivers (chemicals with ELCR greater than 1E-06 or HQ > 1) for potential exposure to surface soil are carcinogenic PAHs, three metals (arsenic, nickel, and cadmium), and BEHP. The PAH cancer risk estimates for the commercial worker exposure scenario (3E-04) is greater than the risk management level; individual ELCRs associated with other risk drivers (primary metals) are less than 1E-04. The primary contributor to the HI is arsenic, which comprises 93 percent of the total HI. No other COPC has an HQ greater than 1.

Lead concentrations in soil do not exceed the commercial CHHSL of 320 mg/kg (surface soil [219 mg/kg] and total soil [238 mg/kg]).

The ELCR (2E-05) for construction worker exposure to soil (0 to 10 feet bgs) are cumulatively within the risk management range. The risk drivers for exposure to total soil are carcinogenic PAHs and three metals (arsenic, nickel, and cadmium). The HI (11) for the construction worker soil exposure scenario exceeds the target threshold of 1, primarily due to total chromium, which comprises 85 percent of the total HI. No other COPC has an HQ greater than 1.

The ELCR for hypothetical future resident exposure to surface soil (9E-04) is cumulatively greater than the risk management range. The risk drivers for exposure to surface soil are carcinogenic PAHs, four metals (arsenic, nickel, cadmium, and beryllium), BEHP, and Aroclor-1248. Risk drivers with individual ELCRs greater than the threshold of 1E-04 include arsenic, nickel, and PAHs. The non-cancer HI (72) is greater than the target threshold HI, due to arsenic, which represents 94 percent of the HI. No other COPC has an HQ greater than 1.

The ELCR for hypothetical future exposure to total soils (5E-04) is cumulatively greater than the risk management range. The risk drivers for exposure to surface soil are four metals (nickel, arsenic, cadmium, and beryllium), carcinogenic PAHs, Aroclor-1260, Aroclor-1248, and BEHP. Risk drivers with individual ELCRs greater than the threshold of 1E-04 include arsenic and nickel. The non-cancer HI (37) is greater than the target threshold HI, due to arsenic, which represents 91 percent of the HI. No other COPC has an HQ greater than 1; the HQ for thallium in total soils equal 1.

Concentrations of lead in surface soil (219 mg/kg) and total soil (238 mg/kg) exceed the residential CHHSL of 80 mg/kg.

Arsenic is a primary contributor to the ELCR and HI estimates. However, the surface soil EPC (15.3 mg/kg) and total soil EPC (12.2 mg/kg) only slightly exceed the regional arsenic background value of 11 mg/kg (Duverge, 2011). Site concentrations of arsenic in soil are not significantly greater than regional background concentrations; therefore, arsenic levels at the site may be due to non-site-related sources (that is, natural or anthropogenic background sources). PAHs, another primary risk driver, are also

commonly present in soil because they are naturally formed in fires fossil fuels and other bituminous soils, during volcanic activity, automobile exhaust, road asphalt, cigarette smoke, and some bacteria and plants also biosynthesize PAHs (ATSDR, 1995) (Teaf 2008). A portion of the estimated risks from PAHs in soil may be attributed to non-site-related activities.

SECTION 8

# Risk Management Considerations

The results of the HHRA, based on sampling data collected from 1988 through February 2015 and current exposure setting information, indicate that further action is required to address potential human exposure risks associated with COPCs in surface (0 to 2 feet bgs) and total (0 to 10 feet bgs) soils. The estimates of risks and hazards posed by exposure to soil for the commercial workers and residential receptors were driven by metals and carcinogenic PAHs. A portion of the risks associated with these drivers are possibly due to natural, background sources (metals) and anthropogenic sources (PAHs) in soil, metals (possibly naturally-occurring), and carcinogenic PAHs.

SECTION 9

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# Tables

**Table 2-1. List of Constituents of Potential Concern by Medium**

*Human Health Risk Assessment, 744 and 758 High Street, Oakland, California*

| Analyte Group | Analyte | CAS | Surface Soil (0 - 2 feet bgs) | Total Soil[a] (0 - 10 feet bgs) |
|---|---|---|---|---|
| MET | Antimony | 7440360 | X | X |
| MET | Arsenic | 7440382 | X | X |
| MET | Barium | 7440393 | X | X |
| MET | Beryllium | 7440417 | X | X |
| MET | Cadmium | 7440439 | X | X |
| MET | Chromium | 7440473 | X | X |
| MET | Chromium VI | CR6 | X | X |
| MET | Cobalt | 7440484 | X | X |
| MET | Copper | 7440508 | X | X |
| MET | Lead | 7439921 | X | X |
| MET | Mercury | 7439976 | X | X |
| MET | Molybdenum | 7439987 | X | X |
| MET | Nickel | 7440020 | X | X |
| MET | Selenium | 7782492 | X | X |
| MET | Silver | 7440224 | X | X |
| MET | Thallium | 7440280 | X | X |
| MET | Vanadium | 7440622 | X | X |
| MET | Zinc | 7440666 | X | X |
| PAH | Acenaphthene | 83329 | X | X |
| PAH | Acenaphthylene | 208968 | X | X |
| PAH | Anthracene | 120127 | X | X |
| PAH | Benzo(a)anthracene | 56553 | X | X |
| PAH | Benzo(a)pyrene | 50328 | X | X |
| PAH | Benzo(b)fluoranthene | 205992 | X | X |
| PAH | Benzo(g,h,i)perylene | 191242 | X | X |
| PAH | Benzo(k)fluoranthene | 207089 | X | X |
| PAH | Chrysene | 218019 | X | X |
| PAH | Dibenz(a,h)anthracene | 53703 | X | X |
| PAH | Fluoranthene | 206440 | X | X |
| PAH | Fluorene | 86737 | X | X |
| PAH | Indeno(1,2,3-cd)pyrene | 193395 | X | X |
| PAH | Naphthalene | 91203 | X | X |
| PAH | Phenanthrene | 85018 | X | X |
| PAH | Pyrene | 129000 | X | X |
| PCB | Aroclor-1242 (PCB-1242) | 53469219 | X | X |
| PCB | Aroclor-1248 (PCB-1248) | 12672296 | X | X |
| PCB | Aroclor-1254 (PCB-1254) | 11097691 | X | X |
| PCB | Aroclor-1260 (PCB-1260) | 11096825 | X | X |
| SVOC | 1,2,4-Trichlorobenzene | 120821 | | X |
| SVOC | 2-Chloronaphthalene | 91587 | | X |
| SVOC | 2-Methylnaphthalene | 91576 | X | X |
| SVOC | bis(2-Ethylhexyl)phthalate | 117817 | X | X |
| SVOC | Butyl benzylphthalate | 85687 | X | X |
| SVOC | Dibenzofuran | 132649 | X | X |

**Table 2-1. List of Constituents of Potential Concern by Medium**

*Human Health Risk Assessment, 744 and 758 High Street, Oakland, California*

| Analyte Group | Analyte | CAS | Surface Soil (0 - 2 feet bgs) | Total Soil[a] (0 - 10 feet bgs) |
|---|---|---|---|---|
| SVOC | Diethyl phthalate | 84662 | | X |
| SVOC | Di-n-butyl phthalate | 84742 | | X |
| SVOC | Di-n-octyl phthalate | 117840 | | X |
| SVOC | Nitrobenzene | 98953 | | X |
| SVOC | N-Nitrosodiphenylamine | 86306 | | X |
| SVOC | Phenol | 108952 | | X |
| VOC | 1,2-Dichloroethane | 107062 | X | X |
| VOC | Acetone | 67641 | X | X |
| VOC | Benzene | 71432 | X | X |
| VOC | Carbon disulfide | 75150 | X | X |
| VOC | Chloroform (Trichloromethane) | 67663 | X | X |
| VOC | Dichlorofluoromethane | 75434 | X | X |
| VOC | Diisopropyl ether | 108203 | X | X |
| VOC | Ethylbenzene | 100414 | X | X |
| VOC | Methyl Tert Butyl Ether | 1634044 | | X |
| VOC | Methylene chloride | 75092 | X | X |
| VOC | Toluene | 108883 | X | X |
| VOC | Xylene (total) | 1330207 | X | X |

**Notes:**

[a] Soil from 0 to 10 feet below ground surface including sampels from the surface soil (0 to 2 feet bgs) depth interval.

bgs: below ground surface

COPC: chemical of potential concern

MET: metal

PAH: polyaromatic hydrocarbon

PCB: polychlorindated biphenyl

SVOC: semi-volatile organic compound

VOC: volatile organic compound

**Table 2-2. Summary Statistics and Exposure Point Concentrations for Surface Soil**

*Human Health Risk Assessment, 744 and 758 High Street, Oakland, California*

| Analyte Group | Analyte | Depth (feet bgs) | Number of Detects | Number of Non-detects | Total Observations | Frequency of Detects | Percent Detects | Units | Minimum Detection Limit for Non-detects | Maximum Detection Limit for Non-detects | Minimum Detected Concentration | Maximum Detected Concentration | Sample Location of Maximum Detected Concentration | Depth of Maximum Detected Concentration | Arithmetic Mean Detected Concentration | Median Detected Concentration | Standard Deviation Detected Concentration | 95% UCL | Basis | EPC | Basis |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PAH | Acenaphthene | 0 to 2 | 4 | 33 | 37 | 4 / 33 | 11% | ug/kg | 76 | 15000 | 190 | 1200 | GB005 | 1 | 470 | 245 | 487.4 | 307 | 95% KM (t) UCL | 307 | 95% KM (t) UCL |
| PAH | Acenaphthylene | 0 to 2 | 12 | 25 | 37 | 12 / 25 | 32% | ug/kg | 77 | 6900 | 15 | 44000 | GB005 | 1 | 4787 | 225 | 12662 | 14,039 | 99% KM (Chebyshev) UCL | 14,039 | 99% KM (Chebyshev) UCL |
| PAH | Anthracene | 0 to 2 | 14 | 23 | 37 | 14 / 23 | 38% | ug/kg | 76 | 6900 | 7.2 | 25000 | GB005 | 1 | 2615 | 345 | 6792 | 8,238 | 99% KM (Chebyshev) UCL | 8,238 | 99% KM (Chebyshev) UCL |
| PAH | Benzo(a)anthracene | 0 to 2 | 22 | 15 | 37 | 22 / 15 | 59% | ug/kg | 380 | 34000 | 24 | 51000 | GB005 | 1 | 6492 | 965 | 14558 | 23,566 | 99% KM (Chebyshev) UCL | 23,566 | 99% KM (Chebyshev) UCL |
| PAH | Benzo(a)pyrene | 0 to 2 | 23 | 14 | 37 | 23 / 14 | 62% | ug/kg | 77 | 6900 | 42 | 110000 | GB003 | 1 | 11441 | 1300 | 28505 | 45,140 | 99% KM (Chebyshev) UCL | 45,140 | 99% KM (Chebyshev) UCL |
| PAH | Benzo(b)fluoranthene | 0 to 2 | 22 | 15 | 37 | 22 / 15 | 59% | ug/kg | 77 | 6900 | 43 | 94000 | GB003 | 1 | 10427 | 1350 | 24137 | 18,789 | 95% Adjusted Gamma KM-UCL | 18,789 | 95% Adjusted Gamma KM-UCL |
| PAH | Benzo(g,h,i)perylene | 0 to 2 | 21 | 16 | 37 | 21 / 16 | 57% | ug/kg | 77 | 6900 | 52 | 93000 | GB003 | 1 | 10400 | 1200 | 23522 | 17,934 | 95% Adjusted Gamma KM-UCL | 17,934 | 95% Adjusted Gamma KM-UCL |
| PAH | Benzo(k)fluoranthene | 0 to 2 | 21 | 16 | 37 | 21 / 16 | 57% | ug/kg | 77 | 6900 | 34 | 68000 | GB003 | 1 | 8121 | 1400 | 17913 | 27,789 | 99% KM (Chebyshev) UCL | 27,789 | 99% KM (Chebyshev) UCL |
| PAH | Chrysene | 0 to 2 | 21 | 16 | 37 | 21 / 16 | 57% | ug/kg | 77 | 6900 | 43 | 78000 | GB003 | 1 | 10745 | 1800 | 22710 | 17,086 | 95% Adjusted Gamma KM-UCL | 17,086 | 95% Adjusted Gamma KM-UCL |
| PAH | Dibenz(a,h)anthracene | 0 to 2 | 16 | 21 | 37 | 16 / 21 | 43% | ug/kg | 77 | 6900 | 20 | 13000 | GB003 | 1 | 2438 | 745 | 3810 | 2,785 | 95% GROS Adjusted Gamma UCL | 2,785 | 95% GROS Adjusted Gamma UCL |
| PAH | Fluoranthene | 0 to 2 | 24 | 13 | 37 | 24 / 13 | 65% | ug/kg | 77 | 6900 | 28 | 180000 | GB005 | 1 | 17166 | 1095 | 48774 | 76,933 | 99% KM (Chebyshev) UCL | 76,933 | 99% KM (Chebyshev) UCL |
| PAH | Fluorene | 0 to 2 | 8 | 29 | 37 | 8 / 29 | 22% | ug/kg | 76 | 6900 | 14 | 17000 | GB005 | 1 | 2394 | 89.5 | 5922 | 4,252 | 95% Adjusted Gamma KM-UCL | 4,252 | 95% Adjusted Gamma KM-UCL |
| PAH | Indeno(1,2,3-cd)pyrene | 0 to 2 | 21 | 16 | 37 | 21 / 16 | 57% | ug/kg | 77 | 6900 | 41 | 74000 | GB003 | 1 | 8391 | 1100 | 18993 | 14,462 | 95% Adjusted Gamma KM-UCL | 14,462 | 95% Adjusted Gamma KM-UCL |
| PAH | Naphthalene | 0 to 2 | 13 | 24 | 37 | 13 / 24 | 35% | ug/kg | 76 | 6900 | 21 | 77000 | GB005 | 1 | 6970 | 360 | 21199 | 23,860 | 99% KM (Chebyshev) UCL | 23,860 | 99% KM (Chebyshev) UCL |
| PAH | Phenanthrene | 0 to 2 | 24 | 13 | 37 | 24 / 13 | 65% | ug/kg | 77 | 6900 | 5.2 | 260000 | GB005 | 1 | 15240 | 645 | 54238 | 82,478 | 99% KM (Chebyshev) UCL | 82,478 | 99% KM (Chebyshev) UCL |
| PAH | Pyrene | 0 to 2 | 25 | 13 | 38 | 25 / 38 | 66% | ug/kg | 77 | 330000 | 53 | 210000 | GB005 | 1 | 19980 | 1400 | 55922 | 90,396 | 99% KM (Chebyshev) UCL | 90,396 | 99% KM (Chebyshev) UCL |

**Table 2-3. Summary Statistics and Exposure Point Concentrations for Total Soil**

*Human Health Risk Assessment, 744 and 758 High Street, Oakland, California*

| Analyte Group | Analyte | Depth (feet bgs) | Number of Detects | Number of Non-detects | Total Observations | Frequency of Detects | Percent Detects | Units | Minimum Detection Limit for Non-detects | Maximum Detection Limit for Non-detects | Minimum Detected Concentration | Maximum Detected Concentration | Sample Location of Maximum Detected Concentration | Depth of Maximum Detected Concentration | Arithmetic Mean Detected Concentration | Median Detected Concentration | Standard Deviation Detected Concentration | 95% UCL | Basis | EPC | Basis |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MET | Antimony | 0 to 10 | 74 | 24 | 98 | 74 / 98 | 76% | mg/kg | 0.45 | 7.4 | 0.1 | 13 | GB022 | 3 | 1.646 | 0.77 | 2.591 | 2.409 | 95% KM (Chebyshev) UCL | 2.4 | 95% KM (Chebyshev) UCL |
| MET | Arsenic | 0 to 10 | 98 | 0 | 98 | 98 / 98 | 100% | mg/kg | N/A | N/A | 1.5 | 49 | GB047 | 5 | 8.679 | 6.1 | 7.955 | 12.18 | 95% Chebyshev (Mean, Sd) UCL | 12 | 95% Chebyshev (Mean, Sd) UCL |
| MET | Barium | 0 to 10 | 104 | 0 | 104 | 104 / 104 | 100% | mg/kg | N/A | N/A | 36 | 1500 | D-1 | 1 | 226.6 | 170 | 218 | 319.8 | 95% Chebyshev (Mean, Sd) UCL | 320 | 95% Chebyshev (Mean, Sd) UCL |
| MET | Beryllium | 0 to 10 | 83 | 15 | 98 | 83 / 98 | 85% | mg/kg | 0.071 | 0.25 | 0.047 | 1.1 | GB007 | 1 | 0.332 | 0.34 | 0.171 | 0.326 | 95% KM (Percentile Bootstrap) UCL | 0.33 | 95% KM (Percentile Bootstrap) UCL |
| MET | Cadmium | 0 to 10 | 92 | 10 | 102 | 92 / 102 | 90% | mg/kg | 0.11 | 0.28 | 0.014 | 27 | GB028 | 2 | 1.251 | 0.375 | 3.261 | 3.063 | 97.5% KM (Chebyshev) UCL | 3.1 | 97.5% KM (Chebyshev) UCL |
| MET | Chromium | 0 to 10 | 98 | 0 | 98 | 98 / 98 | 100% | mg/kg | N/A | N/A | 20.4 | 470 | GB014 | 2 | 71.75 | 61.35 | 53.41 | 81 | 95% Modified-t UCL | 81 | 95% Modified-t UCL |
| MET | Chromium VI | 0 to 10 | 4 | 4 | 8 | 4 / 8 | 50% | mg/kg | 0.011 | 0.012 | 0.012 | 0.084 | B-1, MW-B-2, B-3 | 5.5 | 0.038 | 0.028 | 0.032 | 0.0429 | 95% KM (t) UCL | 0.043 | 95% KM (t) UCL |
| MET | Cobalt | 0 to 10 | 98 | 0 | 98 | 98 / 98 | 100% | mg/kg | N/A | N/A | 3.64 | 37 | GB048 | 5 | 12.68 | 12 | 6.057 | 13.77 | 95% H-UCL | 14 | 95% H-UCL |
| MET | Copper | 0 to 10 | 99 | 0 | 99 | 99 / 99 | 100% | mg/kg | N/A | N/A | 14 | 680 | GB028 | 2 | 78.51 | 28 | 126 | 133.7 | 95% Chebyshev (Mean, Sd) UCL | 134 | 95% Chebyshev (Mean, Sd) UCL |
| MET | Lead | 0 to 10 | 108 | 0 | 108 | 108 / 108 | 100% | mg/kg | N/A | N/A | 3.2 | 2000 | GB029 | 2 | 122.9 | 18.45 | 274.9 | 238.2 | 95% Chebyshev (Mean, Sd) UCL | 238 | 95% Chebyshev (Mean, Sd) UCL |
| MET | Mercury | 0 to 10 | 89 | 9 | 98 | 89 / 98 | 91% | mg/kg | 0.011 | 0.12 | 0.04 | 9.5 | GB029 | 2 | 0.538 | 0.21 | 1.16 | 0.985 | 95% KM (Chebyshev) UCL | 0.99 | 95% KM (Chebyshev) UCL |
| MET | Molybdenum | 0 to 10 | 82 | 15 | 97 | 82 / 97 | 85% | mg/kg | 0.45 | 3.7 | 0.076 | 46 | GB028 | 2 | 2.761 | 0.38 | 7.418 | 6.768 | 97.5% KM (Chebyshev) UCL | 6.8 | 97.5% KM (Chebyshev) UCL |
| MET | Nickel | 0 to 10 | 104 | 0 | 104 | 104 / 104 | 100% | mg/kg | N/A | N/A | 18.3 | 570 | GB048 | 5 | 98.95 | 86 | 70.87 | 109.1 | 95% Approximate Gamma UCL | 109 | 95% Approximate Gamma UCL |
| MET | Selenium | 0 to 10 | 41 | 56 | 97 | 41 / 97 | 42% | mg/kg | 0.6 | 5 | 0.17 | 3.5 | GB028 | 2 | 0.583 | 0.38 | 0.546 | 0.566 | 95% KM (% Bootstrap) UCL | 0.57 | 95% KM (% Bootstrap) UCL |
| MET | Silver | 0 to 10 | 49 | 49 | 98 | 49 / 98 | 50% | mg/kg | 0.22 | 1.2 | 0.06 | 2.2 | GB033 | 1 | 0.395 | 0.22 | 0.445 | 0.342 | 95% KM (% Bootstrap) UCL | 0.34 | 95% KM (% Bootstrap) UCL |
| MET | Thallium | 0 to 10 | 36 | 47 | 83 | 36 / 83 | 43% | mg/kg | 0.4 | 1.1 | 0.13 | 8.6 | GB036 | 9 | 1.24 | 0.945 | 1.418 | 0.942 | 95% Approximate Gamma KM-UCL | 0.94 | 95% Approximate Gamma KM-UCL |
| MET | Vanadium | 0 to 10 | 97 | 0 | 97 | 97 / 97 | 100% | mg/kg | N/A | N/A | 10.2 | 90 | GB033 | 1 | 38.66 | 37 | 10.82 | 40.51 | 95% Modified-t UCL | 41 | 95% Modified-t UCL |
| MET | Zinc | 0 to 10 | 99 | 0 | 99 | 99 / 99 | 100% | mg/kg | N/A | N/A | 23 | 2420 | B-1 | 1.5 | 211.4 | 54 | 394.1 | 384.1 | 95% Chebyshev (Mean, Sd) UCL | 384 | 95% Chebyshev (Mean, Sd) UCL |
| PAH | Acenaphthene | 0 to 10 | 12 | 123 | 135 | 12 / 135 | 9% | ug/kg | 5.8 | 15000 | 6.8 | 6900 | GB029 | 2 | 955.6 | 240 | 1939 | 319.3 | 95% Approximate Gamma KM-UCL | 319 | 95% Approximate Gamma KM-UCL |
| PAH | Acenaphthylene | 0 to 10 | 20 | 115 | 135 | 20 / 135 | 15% | ug/kg | 5.8 | 6900 | 10 | 44000 | GB005 | 1 | 2923 | 135 | 9916 | 2595 | 97.5% KM (Chebyshev) UCL | 2,595 | 97.5% KM (Chebyshev) UCL |
| PAH | Anthracene | 0 to 10 | 41 | 94 | 135 | 41 / 135 | 30% | ug/kg | 5.8 | 6900 | 6.1 | 25000 | GB005 | 1 | 1348 | 96 | 4414 | 1788 | 97.5% KM (Chebyshev) UCL | 1,788 | 97.5% KM (Chebyshev) UCL |
| PAH | Benzo(a)anthracene | 0 to 10 | 57 | 78 | 135 | 57 / 135 | 42% | ug/kg | 5.8 | 34000 | 22 | 51000 | GB005 | 1 | 3412 | 480 | 9634 | 5073 | 97.5% KM (Chebyshev) UCL | 5,073 | 97.5% KM (Chebyshev) UCL |
| PAH | Benzo(a)pyrene | 0 to 10 | 73 | 62 | 135 | 73 / 135 | 54% | ug/kg | 5.8 | 6900 | 9.5 | 110000 | GB003 | 1 | 4409 | 260 | 16665 | 9111 | 97.5% KM (Chebyshev) UCL | 9,111 | 97.5% KM (Chebyshev) UCL |
| PAH | Benzo(b)fluoranthene | 0 to 10 | 68 | 67 | 135 | 68 / 135 | 50% | ug/kg | 5.8 | 6900 | 11 | 94000 | GB003 | 1 | 4227 | 310 | 14440 | 7792 | 97.5% KM (Chebyshev) UCL | 7,792 | 97.5% KM (Chebyshev) UCL |
| PAH | Benzo(g,h,i)perylene | 0 to 10 | 58 | 77 | 135 | 58 / 135 | 43% | ug/kg | 5.8 | 6900 | 27 | 93000 | GB003 | 1 | 4396 | 520 | 14735 | 5652 | 95% KM (Chebyshev) UCL | 5,652 | 95% KM (Chebyshev) UCL |
| PAH | Benzo(k)fluoranthene | 0 to 10 | 59 | 76 | 135 | 59 / 135 | 44% | ug/kg | 5.8 | 6900 | 20 | 68000 | GB003 | 1 | 3720 | 430 | 11293 | 4552 | 95% KM (Chebyshev) UCL | 4,552 | 95% KM (Chebyshev) UCL |
| PAH | Chrysene | 0 to 10 | 52 | 83 | 135 | 52 / 135 | 39% | ug/kg | 5.8 | 6900 | 43 | 78000 | GB003 | 1 | 5805 | 720 | 15362 | 7634 | 97.5% KM (Chebyshev) UCL | 7,634 | 97.5% KM (Chebyshev) UCL |
| PAH | Dibenz(a,h)anthracene | 0 to 10 | 37 | 98 | 135 | 37 / 135 | 27% | ug/kg | 5.8 | 6900 | 18 | 13000 | GB003 | 1 | 1423 | 270 | 2769 | 1036 | 95% KM (Chebyshev) UCL | 1,036 | 95% KM (Chebyshev) UCL |
| PAH | Fluoranthene | 0 to 10 | 71 | 64 | 135 | 71 / 135 | 53% | ug/kg | 71 | 6900 | 1.1 | 180000 | GB005 | 1 | 6869 | 230 | 29192 | 15173 | 97.5% KM (Chebyshev) UCL | 15,173 | 97.5% KM (Chebyshev) UCL |
| PAH | Fluorene | 0 to 10 | 17 | 118 | 135 | 17 / 135 | 13% | ug/kg | 5.8 | 6900 | 10 | 17000 | GB005 | 1 | 1546 | 100 | 4193 | 1079 | 97.5% KM (Chebyshev) UCL | 1,079 | 97.5% KM (Chebyshev) UCL |
| PAH | Indeno(1,2,3-cd)pyrene | 0 to 10 | 59 | 76 | 135 | 59 / 135 | 44% | ug/kg | 5.8 | 6900 | 21 | 74000 | GB003 | 1 | 3563 | 330 | 11818 | 4607 | 95% KM (Chebyshev) UCL | 4,607 | 95% KM (Chebyshev) UCL |
| PAH | Naphthalene | 0 to 10 | 30 | 105 | 135 | 30 / 135 | 22% | ug/kg | 5.8 | 6900 | 5.9 | 77000 | GB005 | 1 | 3215 | 230 | 14049 | 4383 | 97.5% KM (Chebyshev) UCL | 4,383 | 97.5% KM (Chebyshev) UCL |
| PAH | Phenanthrene | 0 to 10 | 60 | 75 | 135 | 60 / 135 | 44% | ug/kg | 71 | 6900 | 1.2 | 260000 | GB005 | 1 | 7234 | 260 | 34837 | 15888 | 97.5% KM (Chebyshev) UCL | 15,888 | 97.5% KM (Chebyshev) UCL |
| PAH | Pyrene | 0 to 10 | 83 | 53 | 136 | 83 / 136 | 61% | ug/kg | 72 | 330000 | 1.8 | 210000 | GB005 | 1 | 7185 | 240 | 31690 | 17933 | 97.5% KM (Chebyshev) UCL | 17,933 | 97.5% KM (Chebyshev) UCL |
| PAH | Aroclor-1242 (PCB-1242) | 0 to 10 | 3 | 144 | 147 | 3 / 147 | 2% | mg/kg | 2.1000E-5 | 5.4 | 0.00015 | 0.0023 | C-1, MW-C-2, C-3, C-4 | 2 | 0.00107 | 7.7000E-4 | 0.00111 | 7.16E-04 | 95% KM (t) UCL | 0.00072 | 95% KM (t) UCL |
| PCB | Aroclor-1248 (PCB-1248) | 0 to 10 | 11 | 136 | 147 | 11 / 147 | 7% | mg/kg | 2.1000E-5 | 5.4 | 0.056 | 4.5 | GB029 | 2 | 1.455 | 0.34 | 1.887 | 0.296 | 95% Approximate Gamma KM-UCL | 0.30 | 95% Approximate Gamma KM-UCL |
| PCB | Aroclor-1254 (PCB-1254) | 0 to 10 | 12 | 134 | 146 | 12 / 146 | 8% | mg/kg | 2.1000E-5 | 5.4 | 0.00019 | 0.48 | GB036 | 4 | 0.116 | 0.019 | 0.169 | 0.0269 | 95% Approximate Gamma KM-UCL | 0.027 | 95% Approximate Gamma KM-UCL |
| PCB | Aroclor-1260 (PCB-1260) | 0 to 10 | 66 | 93 | 159 | 66 / 159 | 42% | mg/kg | 2.1000E-5 | 0.57 | 0.000024 | 32 | GB014 | 2 | 1.24 | 0.058 | 5.144 | 2.189 | 97.5% KM (Chebyshev) UCL | 2.2 | 97.5% KM (Chebyshev) UCL |
| PCB | 1,2,4-Trichlorobenzene | 0 to 10 | 1 | 119 | 120 | 1 / 120 | 1% | ug/kg | 69 | 6900 | 22 | 22 | GB022 | 3 | 22 | 22 | N/A | N/A | N/A | 22 | Maximum Detected Concentration |
| SVOC | 2-Chloronaphthalene | 0 to 10 | 1 | 119 | 120 | 1 / 120 | 1% | ug/kg | 69 | 6900 | 140 | 140 | GB048 | 5 | 140 | 140 | N/A | N/A | N/A | 140 | Maximum Detected Concentration |
| SVOC | 2-Methylnaphthalene | 0 to 10 | 24 | 109 | 133 | 24 / 133 | 18% | ug/kg | 69 | 15000 | 7.9 | 4800 | GB005 | 1 | 379.1 | 100 | 994.9 | 189.5 | 95% KM (BCA) UCL | 190 | 95% KM (BCA) UCL |
| SVOC | bis(2-Ethylhexyl)phthalate | 0 to 10 | 51 | 70 | 121 | 51 / 121 | 42% | ug/kg | 340 | 34000 | 8.3 | 3200000 | C-26 | 1 | 63271 | 130 | 448016 | 192,858 | 97.5% KM (Chebyshev) UCL | 192,858 | 97.5% KM (Chebyshev) UCL |
| SVOC | Butyl benzylphthalate | 0 to 10 | 10 | 110 | 120 | 10 / 120 | 8% | ug/kg | 180 | 17000 | 41 | 1400 | GB014 | 2 | 347.2 | 170 | 419.2 | 174.3 | 95% KM (Percentile Bootstrap) UCL | 174 | 95% KM (Percentile Bootstrap) UCL |
| SVOC | Dibenzofuran | 0 to 10 | 7 | 126 | 133 | 7 / 133 | 5% | ug/kg | 69 | 15000 | 13 | 2500 | GB029 | 2 | 767.1 | 350 | 982.3 | 141.7 | 95% KM (Percentile Bootstrap) UCL | 142 | 95% KM (Percentile Bootstrap) UCL |
| SVOC | Diethyl phthalate | 0 to 10 | 1 | 119 | 120 | 1 / 120 | 1% | ug/kg | 180 | 17000 | 44 | 44 | GB006 | 6 | 44 | 44 | N/A | N/A | N/A | 44 | Maximum Detected Concentration |
| SVOC | Di-n-butyl phthalate | 0 to 10 | 4 | 116 | 120 | 4 / 120 | 3% | ug/kg | 180 | 17000 | 140 | 1400 | GB020 | 3 | 820 | 870 | 519.2 | 215.3 | 95% KM (t) UCL | 215 | 95% KM (t) UCL |
| SVOC | Di-n-octyl phthalate | 0 to 10 | 7 | 126 | 133 | 7 / 133 | 5% | ug/kg | 180 | 37000 | 5.5 | 95 | GB023 | 2 | 24.2 | 16 | 31.64 | 46.18 | 95% KM (% Bootstrap) UCL | 46 | 95% KM (% Bootstrap) UCL |
| SVOC | Nitrobenzene | 0 to 10 | 1 | 12 | 13 | 1 / 13 | 8% | ug/kg | 75 | 15000 | 51 | 51 | GB002 | 6 | 51 | 51 | N/A | N/A | N/A | 51 | Maximum Detected Concentration |
| SVOC | N-Nitrosodiphenylamine | 0 to 10 | 2 | 118 | 120 | 2 / 120 | 2% | ug/kg | 69 | 6900 | 25 | 53 | GB019 | 3 | 39 | 39 | 19.8 | 62 | 95% KM (t) UCL | 53 | Maximum Detected Concentration |
| SVOC | Phenol | 0 to 10 | 2 | 118 | 120 | 2 / 120 | 2% | ug/kg | 69 | 6900 | 17 | 64 | GB019 | 3 | 40.5 | 40.5 | 33.23 | 79 | 95% KM (t) UCL | 64 | Maximum Detected Concentration |
| SVOC | 1,2-Dichloroethane | 0 to 10 | 4 | 77 | 81 | 4 / 81 | 5% | ug/kg | 0.5 | 6.25 | 0.33 | 6 | MW-A-1, A-2, A-3, A-4 | 5.5 | 1.81 | 0.455 | 2.794 | 0.632 | 95% KM (t) UCL | 0.63 | 95% KM (t) UCL |
| VOC | Acetone | 0 to 10 | 8 | 1 | 9 | 8 / 9 | 89% | ug/kg | 10000 | 10000 | 21 | 120 | D-1 | 1 | 65.5 | 65.5 | 31.81 | 86.41 | 95% KM (t) UCL | 86 | 95% KM (t) UCL |
| VOC | Benzene | 0 to 10 | 18 | 79 | 97 | 18 / 97 | 19% | ug/kg | 0.5 | 6.25 | 0.3 | 130 | GB005 | 1 | 9.929 | 1.95 | 30.14 | 5.94 | 95% KM (BCA) UCL | 5.94 | 95% KM (BCA) UCL |
| VOC | Carbon disulfide | 0 to 10 | 2 | 8 | 10 | 2 / 10 | 20% | ug/kg | 6 | 5000 | 1.2 | 3.8 | No 3 | 0 | 2.5 | 2.5 | 1.838 | 4.883 | 95% KM (t) UCL | 3.8 | Maximum Detected Concentration |
| VOC | Chloroform (Trichloromethane) | 0 to 10 | 2 | 8 | 10 | 2 / 10 | 20% | ug/kg | 6 | 5000 | 0.7 | 0.9 | No 2 | 0 | 0.8 | 0.8 | 0.141 | 0.983 | 95% KM (t) UCL | 0.90 | Maximum Detected Concentration |
| VOC | Dichlorofluoromethane | 0 to 10 | 1 | 2 | 3 | 1 / 3 | 33% | ug/kg | 0.5 | 6.25 | 1 | 1 | No 3 | 0 | 1 | 1 | N/A | N/A | N/A | 1.0 | Maximum Detected Concentration |
| VOC | Diisopropyl ether | 0 to 10 | 1 | 71 | 72 | 1 / 72 | 1% | ug/kg | 3.8 | 6.2 | 1.1 | 1.1 | GB012 | 1 | 1.1 | 1.1 | N/A | N/A | N/A | 1.1 | Maximum Detected Concentration |
| VOC | Ethylbenzene | 0 to 10 | 15 | 82 | 97 | 15 / 97 | 15% | ug/kg | 0.5 | 6.25 | 0.72 | 570 | GB024 | 2 | 64.84 | 4.9 | 148.1 | 51.13 | 97.5% KM (Chebyshev) UCL | 51 | 97.5% KM (Chebyshev) UCL |
| VOC | Methyl Tert Butyl Ether | 0 to 10 | 1 | 13 | 14 | 1 / 14 | 7% | ug/kg | 4.3 | 6.1 | 1.7 | 1.7 | GB004 | 6 | 1.7 | 1.7 | N/A | N/A | N/A | 1.7 | Maximum Detected Concentration |
| VOC | Methylene chloride | 0 to 10 | 4 | 6 | 10 | 4 / 10 | 40% | ug/kg | 6 | 5000 | 2.1 | 7 | C-1, MW-C-2, C-3, C-4 | 5.5 | 4.575 | 4.6 | 2.304 | 4.91 | 95% KM (t) UCL | 4.9 | 95% KM (t) UCL |
| VOC | Toluene | 0 to 10 | 17 | 80 | 97 | 17 / 97 | 18% | ug/kg | 0.5 | 6.25 | 0.82 | 33 | GB026 | 2 | 5.462 | 2.1 | 8.421 | 3.126 | 95% KM (BCA) UCL | 3.1 | 95% KM (BCA) UCL |
| VOC | Xylene (total) | 0 to 10 | 25 | 72 | 97 | 25 / 97 | 26% | ug/kg | 0.5 | 12 | 1 | 4000 | GB024 | 2 | 202.1 | 3.9 | 799.9 | 317.5 | 97.5% KM (Chebyshev) UCL | 318 | 97.5% KM (Chebyshev) UCL |

**Notes:**

bgs: below ground surface

EPC: Exposure Point Concentration

EPC is the maximum detected concentration when proUCL does not generate a 95% UCL or when the 95% UCL is greater than the maximum detected concentraiton

N/A: Not applicable

UCL95: 95 percent upper confidence limit of the mean

**Table 3-1. Exposure Assumptions**

*Human Health Risk Assessment, 744 and 758 High Street, Oakland, California*

| Exposure Parameter | Symbol | Units | Commercial Worker | Reference | Construction Worker | Reference | Adult Resident | Reference | Child Resident | Reference |
|---|---|---|---|---|---|---|---|---|---|---|
| Exposure Duration | ED | yr | 25 | DTSC, 2014 | 1 | DTSC, 2014 | 20 | DTSC, 2014 | 6 | DTSC, 2014 |
| Body Weight | BW | kg | 80 | DTSC, 2014 | 80 | DTSC, 2014 | 70 | DTSC, 2014 | 15 | DTSC, 2014 |
| Exposure Frequency | EF | day/yr | 250 | DTSC, 2014 | 200 | site-specific[a] | 350 | DTSC, 2014 | 350 | DTSC, 2014 |
| Exposure Time | ET | hrs/day | 8 | DTSC, 2014 | 10 | site-specific[a] | 24 | DTSC, 2014 | 24 | DTSC, 2014 |
| Averaging Time for Carcinogens | ATc | yr | 70 | DTSC, 2014 | 70 | DTSC, 2014 | 70 | DTSC, 2014 | 6 | DTSC, 2014 |
| Averaging Time for Noncarcinogens | ATnc | yr | 25 | DTSC, 2014 | 1 | DTSC, 2014 | 20 | DTSC, 2014 | 6 | DTSC, 2014 |
| Conversion Factor (L to $cm^3$) | CF1 | $L/cm^3$ | 0.001 | NA | 0.001 | NA | 0.001 | NA | 0.001 | NA |
| Conversion Factor (ug to mg) | CF2 | ug/mg | 0.001 | NA | 0.001 | NA | 0.001 | NA | 0.001 | NA |
| Conversion Factor (yr to day) | CF3 | yrs/day | 2.7E-03 | NA | 2.7E-03 | NA | 2.7E-03 | NA | 2.7E-03 | NA |
| Conversion Factor (mg to kg) | CF4 | kg/mg | 1.0E-06 | NA | 1.0E-06 | NA | 1.0E-06 | NA | 1.0E-06 | NA |
| Volatilization Factor | VF | $m^3/kg$ | | | | See Table 3-2 | | | | |
| Particulate Emission Factor | PEF | $m^3/kg$ | 1.36E+09 | DTSC, 2014 | 1.00E+06 | DTSC, 2014 | 1.36E+09 | DTSC, 2014 | 1.36E+09 | DTSC, 2014 |
| COPC Concentration | Csoil | mg/kg | 95% UCL of mean | calculated | 95% UCL of mean | calculated | 95% UCL of mean | calculated | 95% UCL of mean | calculated |
| Incidental Soil Ingestion Rate | IRsoil | mg/day | 100 | DTSC, 2014 | 330 | DTSC, 2014 | 100 | DTSC, 2014 | 200 | DTSC, 2014 |
| Bioavailability Adjustment Factor | BAF | unitless | 1 | RAIS / RSL | 1 | RAIS / RSL | 1 | RAIS / RSL | 1 | RAIS / RSL |
| Arsenic | BAF_As | unitless | 0.6 | | 0.6 | | 0.6 | | 0.6 | |
| Skin Surface Area (soil contact) | SA | $cm^2/day$ | 6,032 | DTSC, 2014 | 6,032 | DTSC, 2014 | 6,032 | DTSC, 2014 | 2,900 | DTSC, 2014 |
| Soil-to-Skin Adherence Factor | AF | $mg/cm^2$ | 0.2 | DTSC, 2014 | 0.8 | DTSC, 2014 | 0.07 | DTSC, 2014 | 0.2 | DTSC, 2014 |

**Notes:**

[a] Assumed construction work for 200 days in a year (5 days per week for 40 weeks and work days of 10 hours).

COPC: chemical of potential concern

DTSC : California Environmental Protection Agency, Department of Toxic Substances Control

EPA: U.S. Environmental Protection Agency

NA: Not Applicable

RAIS : Risk Assessment Information System (ORNL, 2015)

RSL: Regional Screening Level (EPA, 2015)

UCL95: 95 Percent Upper Confidence Limit on the mean

Sources:

September 30.

Oak Ridge National Laboratory (ORNL), 2105. Risk Assessment Information System. http://rais.ornl.gov/. Accessed June 2015.

EPA. 2015. Regional Screening Level Tables. January.

**Table 3-2. Calculation of Volatilization Factor**

*Human Health Risk Assessment, 744 and 758 High Street, Oakland, California*

| Chemical | Diffusivity in Air ($D_i$) | Henry's Law Constant (H') | Diffusivity in Water ($D_w$) | Soil Organic Carbon Partition Coeff. ($K_{oc}$) | Soil Water Partition Coeff. ($K_d = K_{oc} \times F_{oc}$) | Solubility in Water (S) | Apparent Diffusivity ($D_A$) | Volatilization Factor (VF) | Soil Saturation Concentration ($C_{sat}$) |
|---|---|---|---|---|---|---|---|---|---|
| 1,2,4-Trichlorobenzene | 4.0E-02 | 5.8E-02 | 8.4E-06 | 1.4E+03 | 8.1E+00 | 4.9E+01 | 1.5E-05 | 3.9E+04 | 4.0E+02 |
| 1,2-Dichloroethane | 8.6E-02 | 4.8E-02 | 1.1E-05 | 4.0E+01 | 2.4E-01 | 8.6E+03 | 6.4E-04 | 5.9E+03 | 3.0E+03 |
| 2-Chloronaphthalene | 4.5E-02 | 1.3E-02 | 7.7E-06 | 2.5E+03 | 1.5E+01 | 1.2E+01 | 2.1E-06 | 1.0E+05 | 1.8E+02 |
| 2-Methylnaphthalene | 5.2E-02 | 2.1E-02 | 7.8E-06 | 2.5E+03 | 1.5E+01 | 2.5E+01 | 4.0E-06 | 7.5E+04 | 3.7E+02 |
| Acenaphthene | 5.1E-02 | 7.5E-03 | 8.3E-06 | 5.0E+03 | 3.0E+01 | 3.9E+00 | 6.7E-07 | 1.8E+05 | 1.2E+02 |
| Acenaphthylene | 5.1E-02 | 7.5E-03 | 8.3E-06 | 5.0E+03 | 3.0E+01 | 3.9E+00 | 6.7E-07 | 1.8E+05 | 1.2E+02 |
| Acetone | 1.1E-01 | 1.4E-03 | 1.2E-05 | 2.4E+00 | 1.4E-02 | 1.0E+06 | 7.1E-05 | 1.8E+04 | 1.1E+05 |
| Anthracene | 3.9E-02 | 2.3E-03 | 7.9E-06 | 1.6E+04 | 9.8E+01 | 4.3E-02 | 4.9E-08 | 6.8E+05 | 4.3E+00 |
| Aroclor-1242 (PCB-1242) | 3.9E-02 | 2.3E-03 | 7.9E-06 | 1.6E+04 | 9.8E+01 | 4.3E-02 | 4.9E-08 | 6.8E+05 | 4.3E+00 |
| Aroclor-1248 (PCB-1248) | 9.0E-02 | 2.3E-01 | 1.0E-05 | 1.5E+02 | 8.7E-01 | 1.8E+03 | 1.1E-03 | 4.6E+03 | 1.8E+03 |
| Aroclor-1254 (PCB-1254) | 5.1E-02 | 4.9E-04 | 5.9E-06 | 1.8E+05 | 1.1E+03 | 9.4E-03 | 1.3E-09 | 4.2E+06 | 1.0E+01 |
| Aroclor-1260 (PCB-1260) | 4.8E-02 | 1.9E-05 | 5.6E-06 | 5.9E+05 | 3.5E+03 | 1.6E-03 | 2.3E-11 | 3.1E+07 | 5.7E+00 |
| Benzene | 9.0E-02 | 2.3E-01 | 1.0E-05 | 1.5E+02 | 8.7E-01 | 1.8E+03 | 1.1E-03 | 4.6E+03 | 1.8E+03 |
| Benzo(a)anthracene | 5.1E-02 | 4.9E-04 | 5.9E-06 | 1.8E+05 | 1.1E+03 | 9.4E-03 | 1.3E-09 | 4.2E+06 | 1.0E+01 |
| Benzo(a)pyrene | 4.8E-02 | 1.9E-05 | 5.6E-06 | 5.9E+05 | 3.5E+03 | 1.6E-03 | 2.3E-11 | 3.1E+07 | 5.7E+00 |
| Benzo(b)fluoranthene | 4.8E-02 | 2.7E-05 | 5.6E-06 | 6.0E+05 | 3.6E+03 | 1.5E-03 | 2.9E-11 | 2.8E+07 | 5.4E+00 |
| Benzo(g,h,i)perylene | 2.8E-02 | 4.9E-04 | 7.2E-06 | 5.4E+04 | 3.3E+02 | 1.4E-01 | 2.3E-09 | 3.1E+06 | 4.4E+01 |
| Benzo(k)fluoranthene | 4.8E-02 | 2.4E-05 | 5.6E-06 | 5.9E+05 | 3.5E+03 | 8.0E-04 | 2.7E-11 | 2.9E+07 | 2.8E+00 |
| bis(2-Ethylhexyl)phthalate | 1.7E-02 | 1.1E-05 | 4.2E-06 | 1.2E+05 | 7.2E+02 | 2.7E-01 | 5.1E-11 | 2.1E+07 | 1.9E+02 |
| Butyl benzylphthalate | 2.1E-02 | 5.2E-05 | 5.2E-06 | 7.2E+03 | 4.3E+01 | 2.7E+00 | 2.1E-09 | 3.3E+06 | 1.2E+02 |
| Carbon disulfide | 1.1E-01 | 5.9E-01 | 1.3E-05 | 2.2E+01 | 1.3E-01 | 2.2E+03 | 9.8E-03 | 1.5E+03 | 7.4E+02 |
| Chloroform (Trichloromethane) | 7.7E-02 | 1.5E-01 | 1.1E-05 | 3.2E+01 | 1.9E-01 | 8.0E+03 | 1.9E-03 | 3.4E+03 | 2.5E+03 |
| Chrysene | 2.6E-02 | 2.1E-04 | 6.7E-06 | 1.8E+05 | 1.1E+03 | 2.0E-03 | 3.1E-10 | 8.4E+06 | 2.2E+00 |
| Dibenz(a,h)anthracene | 4.5E-02 | 5.8E-06 | 5.2E-06 | 1.9E+06 | 1.1E+04 | 2.5E-03 | 4.1E-12 | 7.4E+07 | 2.9E+01 |
| Dibenzofuran | 4.1E-02 | 8.7E-03 | 7.4E-06 | 9.2E+03 | 5.5E+01 | 3.1E+00 | 3.5E-07 | 2.5E+05 | 1.7E+02 |
| Dichlorofluoromethane | 7.6E-02 | 1.4E+01 | 1.1E-05 | 4.4E+01 | 2.6E-01 | 2.8E+02 | 1.9E-02 | 1.1E+03 | 8.5E+02 |
| Diethyl phthalate | 2.6E-02 | 2.5E-05 | 6.7E-06 | 1.0E+02 | 6.3E-01 | 1.1E+03 | 1.1E-07 | 4.6E+05 | 7.9E+02 |
| Diisopropyl ether | 6.5E-02 | 1.0E-01 | 7.8E-06 | 2.3E+01 | 1.4E-01 | 8.8E+03 | 1.4E-03 | 4.0E+03 | 2.3E+03 |
| Di-n-butyl phthalate | 2.1E-02 | 7.4E-05 | 5.3E-06 | 1.2E+03 | 6.9E+00 | 1.1E+01 | 1.7E-08 | 1.2E+06 | 7.9E+01 |
| Di-n-octyl phthalate | 3.6E-02 | 1.1E-04 | 4.2E-06 | 1.4E+05 | 8.4E+02 | 2.2E-02 | 2.7E-10 | 9.1E+06 | 1.9E+01 |
| Ethylbenzene | 6.8E-02 | 3.2E-01 | 8.5E-06 | 4.5E+02 | 2.7E+00 | 1.7E+02 | 4.1E-04 | 7.3E+03 | 4.8E+02 |

**Table 3-2. Calculation of Volatilization Factor**

*Human Health Risk Assessment, 744 and 758 High Street, Oakland, California*

| Chemical | Diffusivity in Air ($D_i$) | Henry's Law Constant (H') | Diffusivity in Water ($D_w$) | Soil Organic Carbon Partition Coeff. ($K_{oc}$) | Soil Water Partition Coeff. ($K_d = K_{oc} \times F_{oc}$) | Solubility in Water (S) | Apparent Diffusivity ($D_A$) | Volatilization Factor (VF) | Soil Saturation Concentration ($C_{sat}$) |
|---|---|---|---|---|---|---|---|---|---|
| Fluoranthene | 2.8E-02 | 3.6E-04 | 7.2E-06 | 5.5E+04 | 3.3E+02 | 2.6E-01 | 1.7E-09 | 3.6E+06 | 8.7E+01 |
| Fluorene | 4.4E-02 | 3.9E-03 | 7.9E-06 | 9.2E+03 | 5.5E+01 | 1.7E+00 | 1.7E-07 | 3.6E+05 | 9.3E+01 |
| Indeno(1,2,3-cd)pyrene | 4.5E-02 | 6.6E-05 | 5.2E-06 | 3.5E+06 | 2.1E+04 | 2.2E-05 | 9.1E-12 | 4.9E+07 | 4.6E-01 |
| Methyl Tert Butyl Ether | 7.5E-02 | 2.4E-02 | 8.6E-06 | 1.2E+01 | 6.9E-02 | 5.1E+04 | 5.5E-04 | 6.3E+03 | 8.9E+03 |
| Methylene chloride | 1.0E-01 | 1.3E-01 | 1.3E-05 | 2.2E+01 | 1.3E-01 | 1.3E+04 | 2.8E-03 | 2.8E+03 | 3.3E+03 |
| Naphthalene | 6.0E-02 | 1.8E-02 | 8.4E-06 | 1.5E+03 | 9.3E+00 | 3.1E+01 | 6.2E-06 | 6.0E+04 | 2.9E+02 |
| Nitrobenzene | 6.8E-02 | 9.8E-04 | 9.4E-06 | 2.3E+02 | 1.4E+00 | 2.1E+03 | 2.5E-06 | 9.5E+04 | 3.0E+03 |
| N-Nitrosodiphenylamine | 5.6E-02 | 2.1E-04 | 6.5E-06 | 2.6E+03 | 1.6E+01 | 3.5E+01 | 4.1E-08 | 7.4E+05 | 5.6E+02 |
| Phenanthrene | 3.9E-02 | 2.3E-03 | 7.9E-06 | 1.6E+04 | 9.8E+01 | 4.3E-02 | 4.9E-08 | 6.8E+05 | 4.3E+00 |
| Phenol | 8.3E-02 | 1.4E-05 | 1.0E-05 | 1.9E+02 | 1.1E+00 | 8.3E+04 | 1.0E-07 | 4.6E+05 | 1.0E+05 |
| Pyrene | 2.8E-02 | 4.9E-04 | 7.2E-06 | 5.4E+04 | 3.3E+02 | 1.4E-01 | 2.3E-09 | 3.1E+06 | 4.4E+01 |
| Toluene | 7.8E-02 | 2.7E-01 | 9.2E-06 | 2.3E+02 | 1.4E+00 | 5.3E+02 | 7.2E-04 | 5.5E+03 | 8.2E+02 |
| Xylene (total) | 8.5E-02 | 2.1E-01 | 9.9E-06 | 3.8E+02 | 2.3E+00 | 1.1E+02 | 3.9E-04 | 7.5E+03 | 2.6E+02 |
| **Units:** | ($cm^2/s$) | (unitless) | ($cm^2/s$) | (L/kg) | ($g/cm^3$) | (mg/L) | ($cm^2/s$) | ($m^3/kg$) | (mg/kg) |

**Formulas:**

$$\text{Volatilization factor (VF)} = \frac{Q/C * (3.14 * D_A * T)^{1/2} * 10^{-4}\ m^2/cm^2}{2 * r_b * D_A}\ (m^3/kg)$$

$$\text{Apparent Diffusivity } (D_A) = \frac{[(Q_a^{10/3} * D_i * H' + Q_w^{10/3} * D_w)/n^2]}{(r_b * K_d + Q_w + Q_a * H')}\ (cm^2/s)$$

$$\text{Soil Saturation Concentration } (C_{sat}) = S/r_b * (K_d * r_b + Q_w + H' * Q_a)$$

| Parameters: | Values |
|---|---|
| Q/C - Inverse of the mean concentration at the center of a 0.5-acre-square source located in Harrisburg, PA ($g/m^2$-s per $kg/m^3$) | 81.9 |
| T - Exposure interval(s) | 9.5E+08 |
| $r_b$ - Soil bulk density ($g/cm^3$) | 1.5 |
| $Q_a$ - Air-filled soil porosity ($L_{air}/L_{water}$) = n - $Q_w$ | 0.28 |
| n - Total soil porosity (Lpore/Lsoil) = 1 - ($r_b/r_s$) | 0.43 |
| $Q_w$ - Water-filled soil porosity (Lwater/Lsoil) | 0.15 |
| $r_s$ - Soil particle density ($g/cm^3$) | 2.65 |
| $f_{oc}$ - fraction organic carbon in soil (g/g) | 0.006 |

**Notes:**

Equations from USEPA, 1996. *Soil Screening Guidance: User's Guide.* EPA/540/R-96/018.

Physical/chemical properties from Oak Ridge National Laboratory (ORNL), 2105. Risk Assessment Information System. http://rais.ornl.gov/. Accessed June 2015.

**Table 4-1. Toxicity Values and Dermal Absorption Factors**
*Human Health Risk Assessment, 744 and 758 High Street, Oakland, California*

| Chemical of Potential Concern [(1)] | Chronic Oral Reference Dose mg/kg-day | Source | Subchronic Oral Reference Dose mg/kg-day | Source | Chronic Inhalation Reference Concentration $mg/m^3$ | Source | Subchronic Inhalation Reference Concentration $mg/m^3$ | Source | Cancer Slope Factor - Oral $(mg/kg\text{-}day)^{-1}$ | Source | Inhalation Unit Risk $(ug/m^3)^{-1}$ | Source | Dermal ABS | Source | GI ABS | EPA Classification of Carcinogen |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1,2,4-Trichlorobenzene | 0.01 | IRIS | 0.09 | PPRTV Current | 0.002 | PPRTV Current | 0.02 | PPRTV Current | 0.0036 | OEHHA TCDB | | | | | 1 | D |
| 1,2-Dichloroethane | 0.006 | PPRTV Current | 0.02 | PPRTV Current | 0.4 | OEHHA TCDB | 0.07 | PPRTV Current | 0.047 | OEHHA TCDB | 0.000021 | OEHHA TCDB | | | 1 | B2 |
| 2-Chloronaphthalene | 0.08 | IRIS | 0.2 | PPRTV Current | | | | | | | | | | | 1 | -- |
| 2-Methylnaphthalene | | | | | | | | | | | | | 0.15 | C | 1 | -- |
| Acenaphthene | 0.06 | IRIS | 0.2 | PPRTV Current | | | | | | | | | 0.15 | C | 1 | -- |
| Acenaphthylene | 0.06 | IRIS | 0.2 | PPRTV Current | | | | | | | | | 0.15 | C | 1 | -- |
| Acetone | 0.9 | IRIS | 2 | ATSDR Final | 30.9 | ATSDR Final | 30.9 | ATSDR Final | | | | | | | 1 | -- |
| Anthracene | 0.3 | IRIS | 1 | PPRTV Current | | | | | | | | | 0.15 | C | 1 | D |
| Antimony | 0.0004 | IRIS | 0.0004 | PPRTV Current | | | 0.0004 | PPRTV Archive | | | | | 0.01 | C | 0.15 | -- |
| Aroclor-1242 (PCB-1242) | | | | | | | | | 2 | SURROGATE. Polychlorinated Biphenyls | 0.000571 | SURROGATE. Polychlorinated Biphenyls (derived from SFO) | 0.14 | RSL | 1 | B2 |
| Aroclor-1248 (PCB-1248) | | | | | | | | | 2 | SURROGATE. Polychlorinated Biphenyls | 0.000571 | SURROGATE. Polychlorinated Biphenyls (derived from SFO) | 0.14 | RSL | 1 | B2 |
| Aroclor-1254 (PCB-1254) | 0.00002 | IRIS | 0.00003 | ATSDR Final | | | | | 2 | SURROGATE. Polychlorinated Biphenyls | 0.000571 | SURROGATE. Polychlorinated Biphenyls (derived from SFO) | 0.14 | RSL | 1 | B2 |
| Aroclor-1260 (PCB-1260) | | | | | | | | | 2 | SURROGATE. Polychlorinated Biphenyls | 0.000571 | SURROGATE. Polychlorinated Biphenyls (derived from SFO) | 0.14 | RSL | 1 | B2 |
| Arsenic | 0.0000035 | OEHHA TCDB | 0.005 | PPRTV Archive | 0.000015 | OEHHA TCDB | | | 9.5 | OEHHA TCDB | 0.0033 | OEHHA TCDB | 0.03 | RSL | 1 | A |
| Barium | 0.2 | IRIS | 0.2 | ATSDR Final | 0.0005 | HEAST | 0.005 | HEAST | | | | | 0.01 | C | 0.07 | D |
| Benzene | 0.004 | IRIS | 0.01 | PPRTV Current | 0.003 | OEHHA TCDB | 0.08 | PPRTV Current | 0.1 | OEHHA TCDB | 0.000029 | OEHHA TCDB | | | 1 | A |
| Benzo(a)anthracene | | | | | | | | | 1.2 | OEHHA TCDB | 0.00011 | OEHHA TCDB | 0.15 | C | 1 | B2 |
| Benzo(a)pyrene | | | | | | | | | 2.9 | OEHHA TCDB | 0.0011 | OEHHA TCDB | 0.15 | C | 1 | B2 |
| Benzo(b)fluoranthene | | | | | | | | | 1.2 | OEHHA TCDB | 0.00011 | OEHHA TCDB | 0.15 | C | 1 | B2 |
| Benzo(g,h,i)perylene | 0.03 | IRIS | 0.3 | PPRTV Current | | | | | | | | | 0.15 | C | 1 | -- |
| Benzo(k)fluoranthene | | | | | | | | | 1.2 | OEHHA TCDB | 0.00011 | OEHHA TCDB | 0.15 | C | 1 | B2 |
| Beryllium | 0.002 | OEHHA TCDB | | | 0.000007 | OEHHA TCDB | | | 8.4 | OEHHA TCDB | 0.0024 | OEHHA TCDB | 0.01 | C | 0.007 | B1 |
| bis(2-Ethylhexyl)phthalate | 0.02 | IRIS | 0.1 | ATSDR Final | | | | | 0.003 | OEHHA TCDB | 0.0000024 | OEHHA TCDB | 0.1 | RSL | 1 | B2 |
| Butyl benzylphthalate | 0.2 | IRIS | 2 | HEAST | | | | | 0.0019 | PPRTV Current | | | 0.1 | RSL | 1 | C |
| Cadmium | 0.0005 | OEHHA TCDB | 0.0005 | ATSDR Draft | 0.00002 | OEHHA TCDB | 0.0009 | PPRTV Archive | 15 | OEHHA TCDB | 0.0042 | OEHHA TCDB | 0.001 | RSL | 0.025 | B1 |
| Carbon disulfide | 0.1 | IRIS | 0.1 | HEAST | 0.8 | OEHHA TCDB | 0.7 | HEAST | | | | | | | 1 | -- |
| Chloroform (Trichloromethan | 0.01 | IRIS | 0.1 | ATSDR Final | 0.3 | OEHHA TCDB | 0.244 | ATSDR Final | 0.019 | OEHHA TCDB | 0.0000053 | OEHHA TCDB | | | 1 | B2 |
| Chromium | 0.02 | OEHHA TCDB | | | 0.000002 | OEHHA TCDB | | | | | | | 0.01 | C | 1.30E-02 | D |
| Chromium III | 0.02 | OEHHA TCDB | 0.005 | ATSDR Final | 0.0002 | OEHHA TCDB | 0.0003 | ATSDR Final | 0.5 | NJEPA | 0.15 | OEHHA TCDB | 0.01 | C | 0.013 | A |
| Chromium VI | 0.02 | OEHHA TCDB | | | 0.0002 | OEHHA TCDB | | | 0.5 | OEHHA TCDB | 0.15 | OEHHA TCDB | | | 0.025 | A |
| Chrysene | | | | | | | | | 0.12 | OEHHA TCDB | 0.000011 | OEHHA TCDB | 0.15 | C | 1 | B2 |
| Cobalt | 0.0003 | PPRTV Current | 0.003 | PPRTV Current | 0.000006 | PPRTV Current | 0.00002 | PPRTV Current | | | 0.009 | PPRTV Current | 0.01 | C | 1 | -- |
| Copper | 0.04 | HEAST | 0.01 | ATSDR Final | | | | | | | | | 0.01 | C | 1 | -- |
| Dibenz(a,h)anthracene | | | | | | | | | 4.1 | OEHHA TCDB | 0.0012 | OEHHA TCDB | 0.15 | C | 1 | B2 |
| Dibenzofuran | 0.001 | PPRTV Current | 0.004 | PPRTV Current | | | | | | | | | 0.03 | C | 1 | D |

**Table 4-1. Toxicity Values and Dermal Absorption Factors**
*Human Health Risk Assessment, 744 and 758 High Street, Oakland, California*

| Chemical of Potential Concern [1] | Chronic Oral Reference Dose mg/kg-day | Source | Subchronic Oral Reference Dose mg/kg-day | Source | Chronic Inhalation Reference Concentration $mg/m^3$ | Source | Subchronic Inhalation Reference Concentration $mg/m^3$ | Source | Cancer Slope Factor - Oral $(mg/kg\text{-}day)^{-1}$ | Source | Inhalation Unit Risk $(ug/m^3)^{-1}$ | Source | Dermal ABS | Source | GI ABS | EPA Classification of Carcinogen |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dichlorofluoromethane | 0.2 | IRIS | 0.05 | RAIS | 0.1 | PPRTV Current | 1 | PPRTV Current | | | | | | | | -- |
| Diethyl phthalate | 0.8 | IRIS | 6 | ATSDR Final | | | | | | | | | 0.1 | RSL | 1 | D |
| Diisopropyl ether | | | | | 0.7 | PPRTV Current | 0.7 | PPRTV Current | | | | | | | 1 | -- |
| Di-n-butyl phthalate | 0.1 | IRIS | 1 | HEAST | | | | | | | | | 0.1 | RSL | 1 | D |
| Di-n-octyl phthalate | | | | | | | | | | | | | 0.1 | RSL | 1 | -- |
| Ethylbenzene | 0.1 | IRIS | 0.05 | PPRTV Current | 2 | OEHHA TCDB | 9 | PPRTV Current | 0.011 | OEHHA TCDB | 0.0000025 | OEHHA TCDB | | | 1 | D |
| Fluoranthene | | | | | | | | | | | | | 0.15 | C | 1 | D |
| Fluorene | 0.04 | IRIS | 0.4 | ATSDR Final | | | | | | | | | 0.15 | C | 1 | D |
| Indeno(1,2,3-cd)pyrene | | | | | | | | | 1.2 | OEHHA TCDB | 0.00011 | OEHHA TCDB | 0.15 | C | 1 | B2 |
| Lead [2] | | | | | | | | | | | | | | | | |
| Mercury | 0.00016 | OEHHA TCDB | | | 0.00003 | OEHHA TCDB | 0.0003 | HEAST | | | | | 0.01 | C | 1 | D |
| Methyl Tert Butyl Ether | | | 0.3 | ATSDR Final | 8 | OEHHA TCDB | 2.52 | ATSDR Final | 0.0018 | OEHHA TCDB | 0.00000026 | OEHHA TCDB | | | 1 | -- |
| Methylene chloride | 0.006 | IRIS | 0.06 | HEAST | 0.4 | OEHHA TCDB | 1.04 | ATSDR Final | 0.014 | OEHHA TCDB | 0.000001 | OEHHA TCDB | | | 1 | B2 |
| Molybdenum | 0.005 | IRIS | 0.005 | HEAST | | | | | | | | | 0.01 | C | 1 | -- |
| Naphthalene | 0.02 | IRIS | 0.6 | ATSDR Final | 0.009 | OEHHA TCDB | | | 0.12 | OEHHA TCDB | 0.000034 | OEHHA TCDB | 0.15 | C | 1 | C |
| Nickel | 0.011 | OEHHA TCDB | 0.02 | HEAST | 0.000014 | OEHHA TCDB | 0.0002 | ATSDR Final | 0.91 | OEHHA TCDB | 0.00026 | OEHHA TCDB | 0.01 | C | 0.04 | A |
| Nitrobenzene | 0.002 | IRIS | 0.005 | HEAST | 0.009 | IRIS | 0.02 | HEAST | | | 0.00004 | IRIS | | | 1 | B2 |
| N-Nitrosodiphenylamine | 0.02 | PPRTV Archive | | | | | | | 0.009 | OEHHA TCDB | 0.0000026 | OEHHA TCDB | 0.1 | RSL | 1 | -- |
| Phenanthrene | 0.3 | IRIS | 1 | PPRTV Current | | | | | | | | | 0.15 | C | 1 | D |
| Phenol | 0.3 | IRIS | 0.6 | HEAST | 0.2 | OEHHA TCDB | | | | | | | 0.1 | RSL | 1 | D |
| Pyrene | 0.03 | IRIS | 0.3 | PPRTV Current | | | | | | | | | 0.15 | C | 1 | -- |
| Selenium | 0.005 | OEHHA TCDB | 0.005 | HEAST | 0.02 | OEHHA TCDB | | | | | | | 0.01 | C | 1 | D |
| Silver | 0.005 | IRIS | 0.005 | HEAST | | | | | | | | | 0.01 | C | 0.04 | D |
| Thallium | 0.00001 | PPRTV Current | 0.00004 | RAIS | | | | | | | | | 0.01 | C | 1 | -- |
| Toluene | 0.08 | IRIS | 0.8 | PPRTV Current | 0.3 | OEHHA TCDB | 5 | PPRTV Current | | | | | | | 1 | -- |
| Vanadium | 0.00504 | SURROGATE | 0.0007 | PPRTV Current | | | | | | | | | 0.01 | C | 0.026 | -- |
| Xylene (total) | 0.2 | IRIS | 0.4 | PPRTV Current | 0.7 | OEHHA TCDB | 0.4 | PPRTV Current | | | | | | | 1 | -- |
| Zinc | 0.3 | IRIS | 0.3 | ATSDR Final | | | | | | | | | 0.01 | C | 1 | D |

Notes:
(1) For chronic toxicity values, the following surrogates were used: acenaphthene for acenaphthylene, dichlorodifluoromethane for dichlorofluoromethane, pyrene for benzo(g,h,i)perylene, and anthracene for phenanthrene. For subchronic toxicity values following surrogates
(2) Lead is evaluated using the California Human Health Screening Level (CHHSL) for a Residential or Industrial Scenario ; http://oehha.ca.gov/risk/chhsltable.html.
mg/kg-day: milligrams of chemical per kilogram of body weight per day
mg/m3: milligrams per cubic meter
µg/m3: micrograms per cubic meter
cm/hr: centimeters per hour
ABS: dermal absorption factor
ATSDR: The Agency for Toxic Substances and Disease Registry (ATSDR) minimal risk levels (MRLs) were developed as an initial response to The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).
C: Cal-EPA DTSC Preliminary Endangerment Assessment Guidance Manual, 2013.
CALEPA The California Environmental Protection Agency (OEHHA) Office of Environmental Health Hazard Assessment's Chronic Reference Exposure Levels (RELS) from December 18, 2008 and the Cancer Potency Values (PDF) from July 21, 2009.
GI: gastrointestinal
HEAST: Health Effects Assessment Summary Tables (EPA, 1997)
IRIS: Integrated Risk Information System: http://www.epa.gov/iris/
NJDEP: New Jersey Department of Environmental Protection
OEHHA TCDB: California Environmental Protection Agency, Office of Environment Health Hazard Assessment (OEHHA) Toxicity Criteria Database (TCDB): http://oehha.ca.gov/tcdb/.
PPRTV: Provisional Peer Reviewed Toxicity Values for Superfund
RAGS: Risk Assessment Guidelines for Superfund (2004)
RAIS: Risk Assessment Information System: http://rais.ornl.gov/
RSL: Regional Screening Level (EPA, 2015)

**Table 5-1. Summary of Site Risk and Hazard Estimates**

*Human Health Risk Assessment, 744 and 758 High Street, Oakland, California*

| Media | Current and Future Commercial Worker | | | | Current and Future Construction Worker | | | | Hypothetical Future Resident | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cancer Risk | Primary Contributor | Noncancer Hazard | Primary Contributor | Cancer Risk | Primary Contributor | Noncancer Hazard | Primary Contributor | Cancer Risk | Primary Contributor | Noncancer Hazard | Primary Contributor |
| Surface Soil | 3E-04 | cPAHs (74%), Arsenic (15%), Nickel (8%), Cadmium (3%), BEHP (1%) | 5 | Arsenic (93%) | -- | -- | -- | -- | 9E-04 | cPAHs(59%), Arsenic (25%), Nickel (11%), Cadmium (4%), BEHP (0.7%), Berllyium (0.4%), Aroclor-1248 (0.2%) | 72 | Arsenic (94%) |
| Total Soil | -- | -- | -- | -- | 2E-05 | Arsenic (25%), Nickel (21%), cPAHs (17%), Cadmium (10%) | 11 | Total Chromium (85%) | 5E-04 | Nickel (30%), cPAHs (27%), Arsenic (25%), Cadmium (14%), Aroclor-1260 (2%), Berllyium (0.9%), Aroclor-1248 (0.3%), BEHP (0.2%) | 37 | Arsenic (91%) |

**Notes:**

Primary contributors are those chemicals with Cancer Risk > 1 x 10-6 or Noncancer Hazard (Hazarad Quotient) > 1.

-- not applicable

BEHP: bis(2-ethylhexyl) phthalate

cPAHs: carcinogenic polyaromatic hydrocarbons (benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene, and naphthalene)

**Table 5-2. Comparison of Lead Exposure Point Concentrations with California Human Health Screening Levels**

*Human Health Risk Assessment, 744 and 758 High Street, Oakland, California*

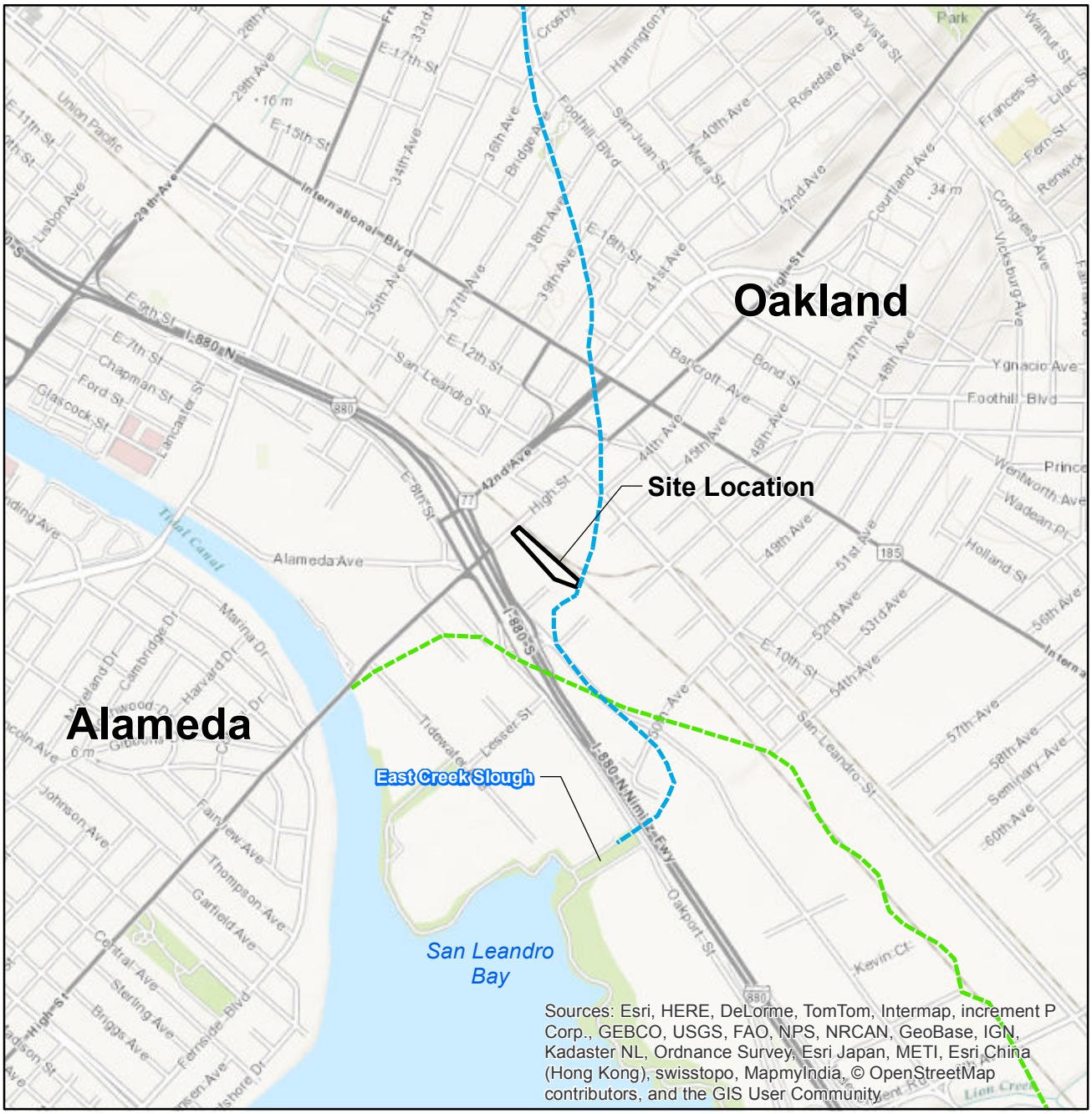
| Medium | Lead Exposure Point Concentration (mg/kg) | Does Lead Concentration Exceed California Commercial/Industrial Human Health Screening Level of 320 mg/kg? | Does Lead Concentration Exceed California Residential Human Health Screening Level of 80 mg/kg? |
|---|---|---|---|
| Surface Soil | 219 | No | Yes |
| Total Soil | 238 | No | Yes |

**Note:**

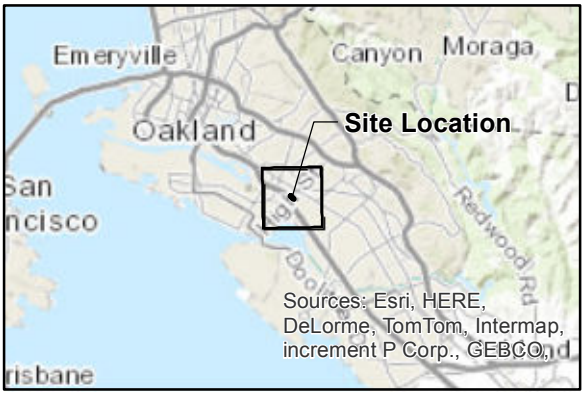
mg/kg: milligrams per kilogram

Source: Office of Environmental Health Hazard Assessment. 2015. California Commercial/Industrial Human Health Screening Levels. http://oehha.ca.gov/risk/chhsltable.html

# Figures




VICINITY MAP




LEGEND

- Site Location
- Approximate Location of Peralta Creek
- Approximate Boundary of 1850 Tidal Marshes

Note:
Creek and historical shoreline features from Sowers (2000)

N

0 750 1,500
Feet

**FIGURE 1-1**
**SITE LOCATION MAP**
HUMAN HEALTH RISK ASSESSMENT,
744 AND 758 HIGH STREET, OAKLAND, CALIFORNIA



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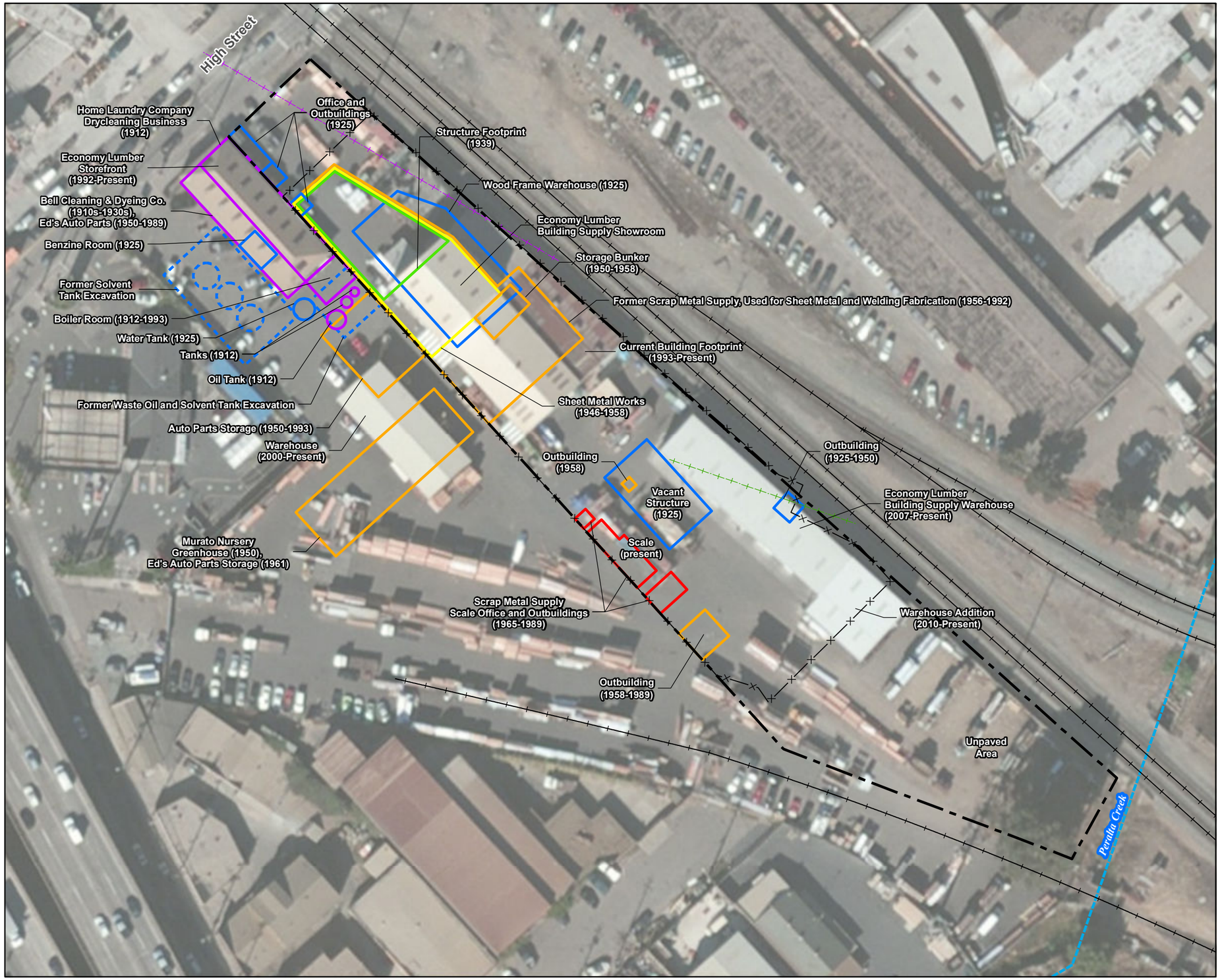
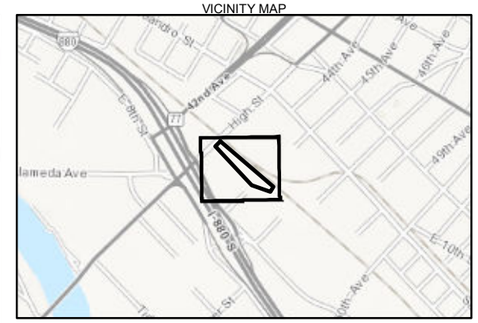



VICINITY MAP




LEGEND

- Active Rail Line
- Former Rail Spur (1939-1958)
- Former Rail Spur (1944-1989)
- Former Fenceline (1948-1965)
- Site Boundary

Decade Feature Was Potentially Built

- 1910s
- 1920s
- 1930s
- 1940s
- 1950s
- 1960s
- Approximate Boundary of 1989 Tank Removal Excavation

Notes:

1. The years cited represent the earliest and latest documented dates for the feature.
2. Aerial photograph was last modified on December 2012 and reflects current site features.

N

0 35 70

Feet

**FIGURE 1-2**
**SITE AND VICINITY MAP AND HISTORICAL FEATURES**
HUMAN HEALTH RISK ASSESSMENT,
744 AND 758 HIGH STREET, OAKLAND, CALIFORNIA



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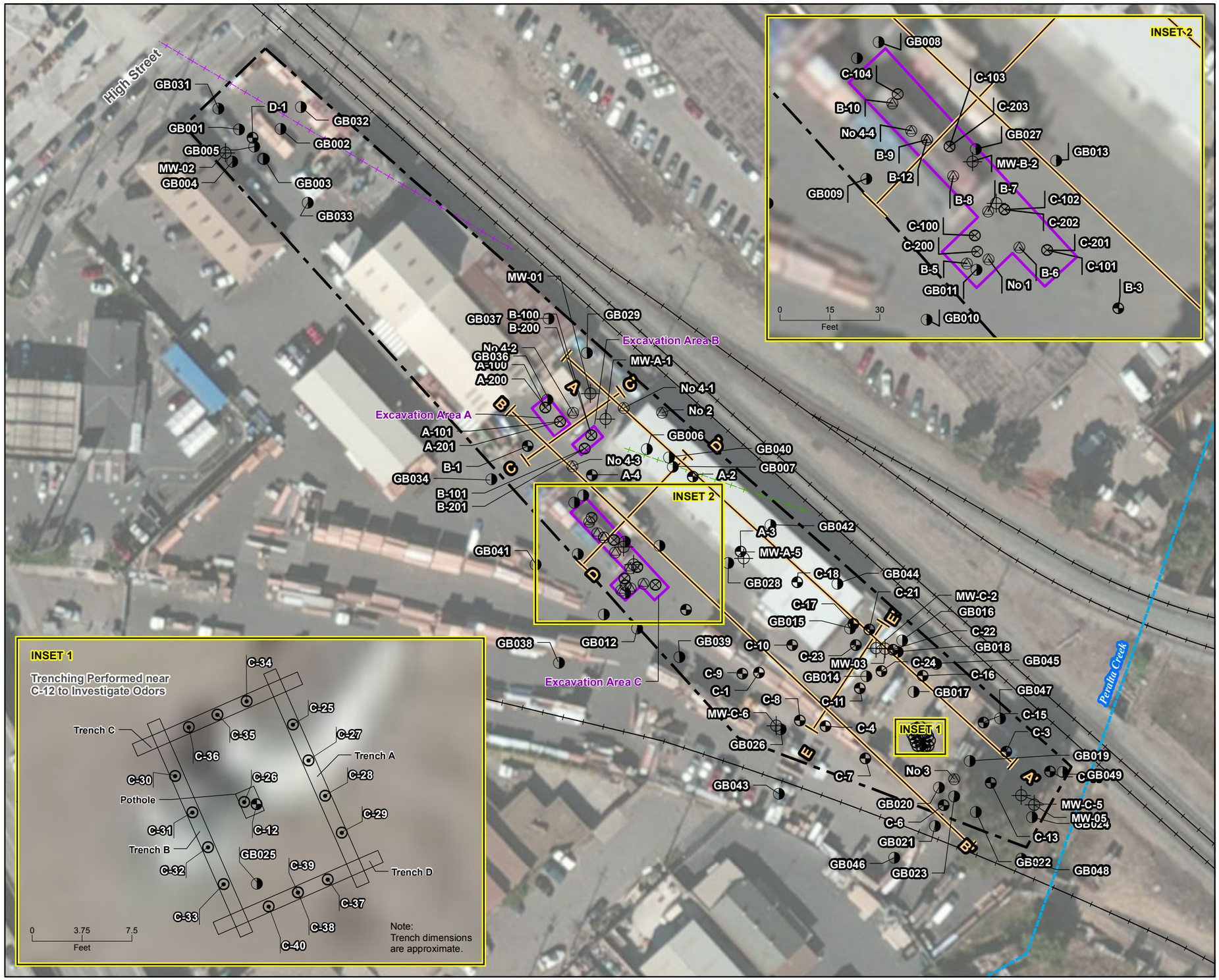
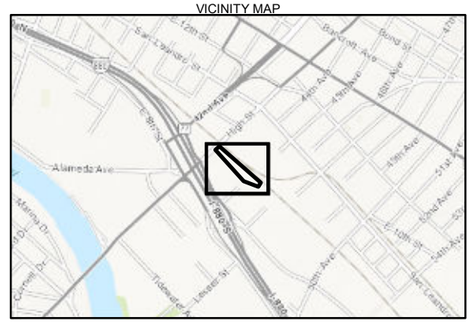



VICINITY MAP




LEGEND

- Geoprobe Sample
- Surface Soil Sample
- Soil Boring
- Monitoring Well
- Trench Sample
- Excavation Bottom Sample
- Cross-Section Line
- Active Rail Line
- Former Rail Spur (1939-1958)
- Former Rail Spur (1944-1989)
- Approximate Location of 1990 Excavation Area
- Site Boundary

Notes:

1. The years cited for the rail spurs and fenceline represent the earliest and latest documented dates for the feature.
2. Monitoring wells MW-A-1, MW-A-5, MW-B-2, MW-C-2, MW-C-5, and MW-C-6 are considered former features. Despite no definite information indicating that the monitoring wells were destroyed, none were located during a site visit on February 13, 2013.
3. All locations from previous investigations are approximate and based on positioning from historical documents.



0 35 70
Feet

N

**FIGURE 2-1**
**SAMPLING LOCATIONS AND EXCAVATIONS**
HUMAN HEALTH RISK ASSESSMENT,
744 AND 758 HIGH STREET, OAKLAND, CALIFORNIA



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# Appendix A
# Samples Used in the Human Health Risk Assessment

**Table A-1. Human Health Risk Assessment Data Set**

*Human Health Risk Assessment, 744 and 758 High Street, Oakland, California*

| Sample Location | Sample Identifier | Sample Date | Sample Type Code | Start Depth (feet bgs) | End Depth (feet bgs) | Surface Soil Depth Group (0 to 2 feet bgs) | Total Soil Depth Group (0 to 10 feet bgs) |
|---|---|---|---|---|---|---|---|
| A-100 | A-100-4/30/1990 | 4/30/1990 | N | 1 | 1.5 | Included | Included |
| A-101 | A-101-4/30/1990 | 4/30/1990 | N | 1 | 1.5 | Included | Included |
| A-200 | A-200-5/8/1990 | 5/8/1990 | N | 2 | 2.5 | | Included |
| A-201 | A-201-5/8/1990 | 5/8/1990 | N | 2 | 2.5 | | Included |
| B-1 | B-1A-7/28/1989 | 7/28/1989 | N | 1.5 | 2 | | Included |
| B-1, MW-B-2, B-3 | Comp B 1A-3A-5/25/1989 | 5/25/1989 | N | 1 | 3 | Included | Included |
| | Comp B 1B-3B -5/25/1989 | 5/25/1989 | N | 5.5 | 6.5 | | Included |
| B-10 | B10-11/29/1989-SCRN | 11/29/1989 | N | 0 | 0.25 | Included | Included |
| B-100 | B-100-4/30/1990 | 4/30/1990 | N | 1 | 1.5 | Included | Included |
| B-101 | B-101-4/30/1990 | 4/30/1990 | N | 1 | 1.5 | Included | Included |
| B-200 | B-200-5/8/1990 | 5/8/1990 | N | 2 | 2.5 | | Included |
| B-201 | B-201-5/8/1990 | 5/8/1990 | N | 2 | 2.5 | | Included |
| B-3 | B-3A-7/28/1989 | 7/28/1989 | N | 2.5 | 3 | | Included |
| B-5 | B11-11/29/1989-SCRN | 11/29/1989 | FD | 0 | 0.25 | Included | Included |
| | B5-11/29/1989-SCRN | 11/29/1989 | N | 0 | 0.25 | Included | Included |
| | B-5-19891129 | 11/29/1989 | N | 0 | 0.25 | Included | Included |
| B-6 | B6-11/29/1989-SCRN | 11/29/1989 | N | 0 | 0.25 | Included | Included |
| | B-6-19891129 | 11/29/1989 | N | 0 | 0.25 | Included | Included |
| B-7 | B7-11/29/1989-SCRN | 11/29/1989 | N | 0 | 0.25 | Included | Included |
| B-8 | B8-11/29/1989-SCRN | 11/29/1989 | N | 0 | 0.25 | Included | Included |
| B-9 | B12-11/29/1989-SCRN | 11/29/1989 | FD | 0 | 0.25 | Included | Included |
| | B9-11/29/1989-SCRN | 11/29/1989 | N | 0 | 0.25 | Included | Included |
| C-1 | C-1A-7/28/1989 | 7/28/1989 | N | 2.5 | 3 | | Included |
| C-1, MW-C-2, C-3, C-4 | Comp C 1A-C4A-5/25/1989 | 5/25/1989 | N | 2 | 4 | | Included |
| | Comp C 1B-C4B-5/25/1989 | 5/25/1989 | N | 5.5 | 6.5 | | Included |
| C-10 | C-10-19891129-SCRN | 11/29/1989 | N | 2 | 4 | | Included |
| C-100 | C-100-4/30/1990 | 4/30/1990 | N | 1 | 1.5 | Included | Included |
| C-101 | C-101-4/30/1990 | 4/30/1990 | N | 1 | 1.5 | Included | Included |
| C-102 | C-102-4/30/1990 | 4/30/1990 | N | 1 | 1.5 | Included | Included |
| C-103 | C-103-4/30/1990 | 4/30/1990 | N | 1 | 1.5 | Included | Included |
| C-104 | C-104-4/30/1990 | 4/30/1990 | N | 1 | 1.5 | Included | Included |
| C-11 | C-11-19891129-SCRN | 11/29/1989 | N | 2 | 4 | | Included |
| C-12 | C-12-19891129-SCRN | 11/29/1989 | N | 2 | 4 | | Included |
| C-13 | C-13-19891129-SCRN | 11/29/1989 | N | 2 | 4 | | Included |
| C-14 | C14-11/29/1989-SCRN | 11/29/1989 | N | 2 | 4 | | Included |
| C-15 | C15-11/29/1989-SCRN | 11/29/1989 | N | 2 | 4 | | Included |
| C-16 | C16-11/29/1989-SCRN | 11/29/1989 | N | 2 | 4 | | Included |
| C-17 | C17-11/29/1989-SCRN | 11/29/1989 | N | 2 | 4 | | Included |
| C-18 | C18-11/29/1989-SCRN | 11/29/1989 | N | 2 | 4 | | Included |
| C-200 | C-200-5/8/1990 | 5/8/1990 | N | 2.5 | 3 | | Included |
| C-201 | C-201-5/8/1990 | 5/8/1990 | N | 2.5 | 3 | | Included |
| C-202 | C-202-5/8/1990 | 5/8/1990 | N | 2.5 | 3 | | Included |
| C-203 | C-203-5/8/1990 | 5/8/1990 | N | 2.5 | 3 | | Included |
| C-21 | C-21A-11/21/1989 | 11/21/1989 | N | 2.5 | 3 | | Included |
| C-22 | C-22A-11/21/1989 | 11/21/1989 | N | 2.5 | 3 | | Included |
| C-23 | C-23A-11/21/1989 | 11/21/1989 | N | 2.5 | 3 | | Included |
| C-24 | C-24A-11/21/1989 | 11/21/1989 | N | 2.5 | 3 | | Included |
| | C-24B-11/21/1989 | 11/21/1989 | FD | 2.5 | 3 | | Included |
| | C-24C-19891121 | 11/21/1989 | N | 5 | 5.5 | | Included |
| C-25 | C-25A-11/29/1989-SCRN | 11/29/1989 | N | 1 | 1.5 | Included | Included |
| C-26 | C-26A-11/29/1989-SCRN | 11/29/1989 | N | 1 | 1.5 | Included | Included |
| | C-26A-19891129 | 11/29/1989 | N | 1 | 1.5 | Included | Included |
| C-27 | C-27A-11/29/1989-SCRN | 11/29/1989 | N | 1 | 1.5 | Included | Included |
| C-28 | C-28A-11/29/1989-SCRN | 11/29/1989 | N | 1 | 1.5 | Included | Included |
| C-29 | C-29A-11/29/1989-SCRN | 11/29/1989 | N | 1 | 1.5 | Included | Included |
| C-3 | C-3A-7/28/1989 | 7/28/1989 | N | 1.5 | 2 | Included | Included |
| C-30 | C-30A-11/29/1989-SCRN | 11/29/1989 | N | 1 | 1.5 | Included | Included |
| C-31 | C-31A-11/29/1989-SCRN | 11/29/1989 | N | 1 | 1.5 | Included | Included |
| C-32 | C-32A-11/29/1989-SCRN | 11/29/1989 | N | 1 | 1.5 | Included | Included |
| C-33 | C-33A-11/29/1989-SCRN | 11/29/1989 | N | 1 | 1.5 | Included | Included |
| C-34 | C-34A-11/29/1989-SCRN | 11/29/1989 | N | 1 | 1.5 | Included | Included |
| C-35 | C-35A-11/29/1989-SCRN | 11/29/1989 | N | 1 | 1.5 | Included | Included |
| C-36 | C-36A-11/29/1989-SCRN | 11/29/1989 | N | 1 | 1.5 | Included | Included |
| C-37 | C-37A-11/29/1989-SCRN | 11/29/1989 | N | 1 | 1.5 | Included | Included |
| C-38 | C-38A-11/29/1989-SCRN | 11/29/1989 | N | 1 | 1.5 | Included | Included |
| C-39 | C-39A-11/29/1989-SCRN | 11/29/1989 | N | 1 | 1.5 | Included | Included |
| C-4 | C-4A-7/28/1989 | 7/28/1989 | N | 2.5 | 3 | | Included |
| C-40 | C-40A-11/29/1989-SCRN | 11/29/1989 | N | 1 | 1.5 | Included | Included |
| C-5 | C5-11/29/1989-SCRN | 11/29/1989 | N | 2 | 4 | | |
| C-6 | C6-11/29/1989-SCRN | 11/29/1989 | N | 2 | 4 | | |
| C-7 | C7-11/29/1989-SCRN | 11/29/1989 | N | 2 | 4 | | |
| C-8 | C8-11/29/1989-SCRN | 11/29/1989 | N | 2 | 4 | | |
| C-9 | C-9-19891129-SCRN | 11/29/1989 | N | 2 | 4 | | |
| D-1 | D-1A-5/25/1989 | 5/25/1989 | N | 1 | 1.5 | Included | Included |

**Table A-1. Human Health Risk Assessment Data Set**

*Human Health Risk Assessment, 744 and 758 High Street, Oakland, California*

| Sample Location | Sample Identifier | Sample Date | Sample Type Code | Start Depth (feet bgs) | End Depth (feet bgs) | Surface Soil Depth Group (0 to 2 feet bgs) | Total Soil Depth Group (0 to 10 feet bgs) |
|---|---|---|---|---|---|---|---|
| | D-1B-5/25/1989 | 5/25/1989 | N | 5.5 | 6 | | Included |
| | D-1C-5/25/1989 | 5/25/1989 | FD | 5.5 | 6 | | Included |
| GB001 | GB001-S1 | 8/23/2013 | N | 1 | 2 | Included | Included |
| | GB001-S3 | 8/23/2013 | N | 3 | 4 | | Included |
| | GB001-S6 | 8/23/2013 | N | 6 | 7 | | Included |
| GB002 | GB002-S1 | 8/23/2013 | N | 1 | 2 | Included | Included |
| | GB002-S3 | 8/23/2013 | N | 3 | 4 | | Included |
| | GB002-S6 | 8/23/2013 | N | 6 | 7 | | Included |
| GB003 | GB003-S1 | 8/23/2013 | N | 1 | 2 | Included | Included |
| | GB003-S3 | 8/23/2013 | N | 3 | 4 | | Included |
| | GB003-S3-FD | 8/23/2013 | FD | 3 | 4 | | Included |
| | GB003-S6 | 8/23/2013 | N | 6 | 7 | | Included |
| GB004 | GB004-S1 | 8/23/2013 | N | 1 | 2 | Included | Included |
| | GB004-S3 | 8/23/2013 | N | 3 | 4 | | Included |
| | GB004-S6 | 8/23/2013 | N | 6 | 7 | | Included |
| GB005 | GB005-S1 | 8/23/2013 | N | 1 | 2 | Included | Included |
| | GB005-S3 | 8/23/2013 | N | 3 | 4 | | Included |
| GB006 | GB006-S1 | 8/21/2013 | N | 1 | 2 | Included | Included |
| | GB006-S3 | 8/21/2013 | N | 3 | 4 | | Included |
| | GB006-S3-FD | 8/21/2013 | FD | 3 | 4 | | Included |
| | GB006-S6 | 8/21/2013 | N | 6 | 7 | | Included |
| GB007 | GB007-S1 | 8/21/2013 | N | 1 | 2 | Included | Included |
| | GB007-S3 | 8/21/2013 | N | 3 | 4 | | Included |
| | GB007-S6 | 8/21/2013 | N | 6 | 7 | | Included |
| GB008 | GB008-S1 | 8/21/2013 | N | 1 | 2 | Included | Included |
| | GB008-S3 | 8/21/2013 | N | 3 | 4 | | Included |
| | GB008-S6 | 8/21/2013 | N | 6 | 7 | | Included |
| GB009 | GB009-S1 | 8/28/2013 | N | 1 | 2 | Included | Included |
| | GB009-S3 | 8/28/2013 | N | 3 | 4 | | Included |
| | GB009-S6 | 8/28/2013 | N | 6 | 7 | | Included |
| GB010 | GB010-S1 | 8/22/2013 | N | 1 | 2 | Included | Included |
| | GB010-S3 | 8/22/2013 | N | 3 | 4 | | Included |
| | GB010-S6 | 8/22/2013 | N | 6 | 7 | | Included |
| GB011 | GB0011-S9 | 8/28/2013 | N | 9 | 10 | | Included |
| | GB011-S3 | 8/28/2013 | N | 3 | 4 | | Included |
| | GB011-S6 | 8/28/2013 | N | 6 | 7 | | Included |
| | GB011-S6-FD | 8/28/2013 | FD | 6 | 7 | | Included |
| GB012 | GB012-S1 | 8/21/2013 | N | 1 | 2 | Included | Included |
| | GB012-S3 | 8/21/2013 | N | 3 | 4 | | Included |
| | GB012-S6 | 8/21/2013 | N | 6 | 7 | | Included |
| GB013 | GB013-S1 | 8/22/2013 | N | 1 | 2 | Included | Included |
| | GB013-S3 | 8/22/2013 | N | 3 | 4 | | Included |
| | GB013-S6 | 8/22/2013 | N | 6 | 7 | | Included |
| GB014 | GB014-S2 | 8/20/2013 | N | 2 | 3 | | Included |
| | GB014-S6 | 8/20/2013 | N | 6 | 7 | | Included |
| | GB014-S8 | 8/20/2013 | N | 8 | 9 | | Included |
| | GB014-S8-FD | 8/20/2013 | FD | 8 | 9 | | Included |
| GB015 | GB015-S2 | 8/20/2013 | N | 2 | 3 | | Included |
| | GB015-S2-FD | 8/20/2013 | FD | 2 | 3 | | Included |
| | GB015-S6 | 8/20/2013 | N | 6 | 7 | | Included |
| | GB015-S9 | 8/20/2013 | N | 9 | 10 | | Included |
| GB016 | GB016-S2 | 8/20/2013 | N | 2 | 3 | | Included |
| | GB016-S6 | 8/20/2013 | N | 6 | 7 | | Included |
| | GB016-S8 | 8/20/2013 | N | 8 | 9 | | Included |
| GB017 | GB017-S2 | 8/20/2013 | N | 2 | 3 | | Included |
| | GB017-S6 | 8/20/2013 | N | 6 | 7 | | Included |
| | GB017-S9 | 8/20/2013 | N | 9 | 10 | | Included |
| GB018 | GB018-S2 | 8/20/2013 | N | 2 | 3 | Included | Included |
| | GB018-S6 | 8/20/2013 | N | 6 | 7 | | Included |
| | GB018-S6-FD | 8/20/2013 | FD | 6 | 7 | | Included |
| | GB018-S9 | 8/20/2013 | N | 9 | 10 | | Included |
| GB019 | GB019-S1 | 8/19/2013 | N | 1 | 2 | Included | Included |
| | GB019-S3 | 8/19/2013 | N | 3 | 4 | | Included |
| | GB019-S6 | 8/19/2013 | N | 6 | 7 | | Included |
| | GB019-S9 | 8/19/2013 | N | 9 | 10 | | Included |
| GB020 | GB020-S1 | 8/19/2013 | N | 1 | 2 | Included | Included |
| | GB020-S3 | 8/19/2013 | N | 3 | 4 | | Included |
| | GB020-S6 | 8/19/2013 | N | 6 | 7 | | Included |
| | GB020-S6-FD | 8/19/2013 | FD | 6 | 7 | | Included |
| | GB020-S9 | 8/19/2013 | N | 9 | 10 | | Included |
| GB021 | GB021-S1 | 8/19/2013 | N | 1 | 2 | Included | Included |
| | GB021-S3 | 8/19/2013 | N | 3 | 4 | | Included |
| | GB021-S6 | 8/19/2013 | N | 6 | 7 | | Included |
| | GB021-S9 | 8/19/2013 | N | 9 | 10 | | Included |

**Table A-1. Human Health Risk Assessment Data Set**

*Human Health Risk Assessment, 744 and 758 High Street, Oakland, California*

| Sample Location | Sample Identifier | Sample Date | Sample Type Code | Start Depth (feet bgs) | End Depth (feet bgs) | Surface Soil Depth Group (0 to 2 feet bgs) | Total Soil Depth Group (0 to 10 feet bgs) |
|---|---|---|---|---|---|---|---|
| GB022 | GB022-S1 | 8/19/2013 | N | 1 | 2 | Included | Included |
| | GB022-S3 | 8/19/2013 | N | 3 | 4 | | Included |
| | GB022-S6 | 8/19/2013 | N | 6 | 7 | | Included |
| GB023 | GB023-S0 | 8/19/2013 | N | 0 | 1 | Included | Included |
| | GB023-S2 | 8/19/2013 | N | 2 | 3 | | Included |
| | GB023-S4 | 8/19/2013 | N | 4 | 5 | | Included |
| GB024 | GB024-S2 | 8/19/2013 | N | 2 | 3 | | Included |
| | GB024-S4 | 8/19/2013 | N | 4 | 5 | | Included |
| | GB024-S6 | 8/19/2013 | N | 6 | 7 | | Included |
| | GB024-S6-FD | 8/19/2013 | FD | 6 | 7 | | Included |
| GB025 | GB025-S1 | 8/20/2013 | N | 1 | 2 | Included | Included |
| | GB025-S1-FD | 8/20/2013 | FD | 1 | 2 | Included | Included |
| GB026 | GB026-S2 | 8/22/2013 | N | 2 | 3 | | Included |
| | GB026-S4 | 8/22/2013 | N | 4 | 5 | | Included |
| | GB026-S6 | 8/22/2013 | N | 6 | 7 | | Included |
| GB027 | GB027-S2 | 8/21/2013 | N | 2 | 3 | | Included |
| | GB027-S4 | 8/21/2013 | N | 4 | 5 | | Included |
| | GB027-S6 | 8/21/2013 | N | 6 | 7 | | Included |
| | GB027-S6-FD | 8/21/2013 | FD | 6 | 7 | | Included |
| GB028 | GB028-S2 | 8/22/2013 | N | 2 | 3 | | Included |
| | GB028-S4 | 8/22/2013 | N | 4 | 5 | | Included |
| | GB028-S6 | 8/22/2013 | N | 6 | 7 | | Included |
| | GB028-S6-FD | 8/22/2013 | FD | 6 | 7 | | Included |
| GB029 | GB029-S2 | 8/22/2013 | N | 2 | 3 | | Included |
| | GB029-S4 | 8/22/2013 | N | 4 | 5 | | Included |
| | GB029-S6 | 8/22/2013 | N | 6 | 7 | | Included |
| GB031 | GB031-01-021315 | 2/13/2015 | N | 1 | 1.5 | Included | Included |
| | GB031-04-021315 | 2/13/2015 | N | 4 | 4.5 | | Included |
| GB032 | GB032-01-021315 | 2/13/2015 | N | 1 | 1.5 | | Included |
| | GB032-04-021315 | 2/13/2015 | N | 4 | 4.5 | | Included |
| GB033 | GB033-01-021315 | 2/13/2015 | N | 1 | 1.5 | Included | Included |
| | GB033-03-021315 | 2/13/2015 | N | 3 | 3.5 | | Included |
| | GB033-06-021315 | 2/13/2015 | N | 6 | 6.5 | | Included |
| GB034 | GB034_04_021815 | 2/18/2015 | N | 4 | 4.5 | | Included |
| | GB034-01-021215 | 2/12/2015 | N | 1 | 1.5 | Included | Included |
| GB036 | GB036-01-021215 | 2/12/2015 | N | 1 | 1.5 | Included | Included |
| | GB036-04-021215 | 2/12/2015 | N | 4 | 4.5 | | Included |
| | GB036-06-021215 | 2/12/2015 | N | 6 | 6.5 | | Included |
| | GB036-09-021215 | 2/12/2015 | N | 9 | 9.5 | | Included |
| GB037 | GB037-01-021315 | 2/13/2015 | N | 1 | 1.5 | Included | Included |
| | GB037-04-021315 | 2/13/2015 | N | 4 | 4.5 | | Included |
| GB038 | GB038-01-021015 | 2/10/2015 | N | 1 | 1.5 | Included | Included |
| | GB038-05-021015 | 2/10/2015 | N | 5 | 5.5 | | Included |
| | GB038-09-021015 | 2/10/2015 | N | 9 | 9.5 | | Included |
| GB039 | GB039-01-021115 | 2/11/2015 | N | 1 | 1.5 | Included | Included |
| | GB039-05-021115 | 2/11/2015 | N | 5 | 5.5 | | Included |
| | GB039-09-021115 | 2/11/2015 | N | 9 | 9.5 | | Included |
| | GB039-09-021115-FD | 2/11/2015 | FD | 9 | 9.5 | | Included |
| GB040 | GB040-04-021215 | 2/12/2015 | N | 4 | 4.5 | | Included |
| | GB040-08-021215 | 2/12/2015 | N | 8 | 8.5 | | Included |
| GB041 | GB041-01-021115 | 2/11/2015 | N | 1 | 1.5 | Included | Included |
| | GB041-03-021115 | 2/11/2015 | N | 3 | 3.5 | | Included |
| | GB041-03-021115-FD | 2/11/2015 | FD | 3 | 3.5 | | Included |
| | GB041-05-021115 | 2/11/2015 | N | 5 | 5.5 | | Included |
| | GB041-09-021115 | 2/11/2015 | N | 9 | 9.5 | | Included |
| GB042 | GB042-01-021215 | 2/12/2015 | N | 1 | 1.5 | Included | Included |
| | GB042-05-021215 | 2/12/2015 | N | 5 | 5.5 | | Included |
| | GB042-09-021215 | 2/12/2015 | N | 9 | 9.5 | | Included |
| GB043 | GB043-01-020915 | 2/9/2015 | N | 1 | 1.5 | Included | Included |
| | GB043-05-020915 | 2/9/2015 | N | 5 | 5.5 | | Included |
| | GB043-09-020915 | 2/9/2015 | N | 9 | 9.5 | | Included |
| GB044 | GB044-01-021015 | 2/10/2015 | N | 1 | 1.5 | Included | Included |
| GB045 | GB045-01-021015 | 2/10/2015 | N | 1 | 1.5 | Included | Included |
| | GB045-04-021015 | 2/10/2015 | N | 4 | 4.5 | | Included |
| | GB045-04-021015-FD | 2/10/2015 | FD | 4 | 4.5 | | Included |
| GB046 | GB046-01-020915 | 2/9/2015 | N | 1 | 1.5 | Included | Included |
| | GB046-05-020915 | 2/9/2015 | N | 5 | 5.5 | | Included |
| | GB046-09-020915 | 2/9/2015 | N | 9 | 9.5 | | Included |
| GB047 | GB047-01-021015 | 2/10/2015 | N | 1 | 1.5 | Included | Included |
| | GB047-05-021015 | 2/10/2015 | N | 5 | 5.5 | | Included |
| GB048 | GB048-01-020915 | 2/9/2015 | N | 1 | 1.5 | Included | Included |
| | GB048-05-020915 | 2/9/2015 | N | 5 | 5.5 | | Included |
| | GB048-09-020915 | 2/9/2015 | N | 9 | 9.5 | | Included |
| GB049 | GB049-01-020915 | 2/9/2015 | N | 1 | 1.5 | Included | Included |

**Table A-1. Human Health Risk Assessment Data Set**

*Human Health Risk Assessment, 744 and 758 High Street, Oakland, California*

| Sample Location | Sample Identifier | Sample Date | Sample Type Code | Start Depth (feet bgs) | End Depth (feet bgs) | Surface Soil Depth Group (0 to 2 feet bgs) | Total Soil Depth Group (0 to 10 feet bgs) |
|---|---|---|---|---|---|---|---|
| | GB049-05-020915 | 2/9/2015 | N | 9 | 9.5 | | Included |
| | GB049-09-020915 | 2/9/2015 | N | 9 | 9.5 | | Included |
| | GB049-09-020915-FD | 2/9/2015 | FD | 9 | 9.5 | | Included |
| MW-01 | MW-01_01_021815 | 2/18/2015 | N | 1 | 1.5 | Included | Included |
| | MW-01_05_021815 | 2/18/2015 | N | 5 | 5.5 | | Included |
| | MW-01_09_021815 | 2/18/2015 | N | 9 | 9.5 | | Included |
| MW-02 | MW-02_06_021815 | 2/18/2015 | N | 6 | 6.5 | | Included |
| | MW-02_06_021815-FD | 2/18/2015 | FD | 6 | 6.5 | | Included |
| MW-04 | MW-04_01_021815 | 2/18/2015 | N | 1 | 1.5 | Included | Included |
| | MW-04_04_021815 | 2/18/2015 | N | 4 | 4.5 | | Included |
| | MW-04_04_021815-FD | 2/18/2015 | FD | 4 | 4.5 | | Included |
| | MW-04_08_021815 | 2/18/2015 | N | 8 | 8.5 | | Included |
| MW-A-1, A-2, A-3, A-4 | Comp A 1A-4A-5/25/1989 | 5/25/1989 | N | 1 | 3.5 | Included | Included |
| | Comp A 1B-4B -5/25/1989 | 5/25/1989 | N | 5.5 | 6 | | Included |
| MW-B-2 | B-2A-7/28/1989 | 7/28/1989 | N | 1.5 | 2 | Included | Included |
| MW-C-2 | C-21A-7/28/1989 | 7/28/1989 | FD | 2 | 2.5 | Included | Included |
| | C-2A-7/28/1989 | 7/28/1989 | N | 2 | 2.5 | Included | Included |
| No 1 | 1A-7/14/1988 | 7/14/1988 | N | 0 | 0.67 | Included | Included |
| | 1B-7/14/1988 | 7/14/1988 | N | 0 | 0.67 | Included | Included |
| | 1C-7/14/1988 | 7/14/1988 | N | 0 | 0.67 | Included | Included |
| No 2 | 2A-7/14/1988 | 7/14/1988 | N | 0 | 1 | Included | Included |
| | 2B-7/14/1988 | 7/14/1988 | N | 0 | 1 | Included | Included |
| | 2C-7/14/1988 | 7/14/1988 | N | 0 | 1 | Included | Included |
| No 3 | 3A-7/14/1988 | 7/14/1988 | N | 0 | 1 | Included | Included |
| | 3B-7/14/1988 | 7/14/1988 | N | 0 | 1 | Included | Included |
| | 3C-7/14/1988 | 7/14/1988 | N | 0 | 1 | Included | Included |
| No 4-1, No 4-2, No 4-3, No 4-4 | 4A-7/14/1988 | 7/14/1988 | N | 0 | 0.5 | Included | Included |
| | 4B-7/14/1988 | 7/14/1988 | N | 0 | 0.5 | Included | Included |
| | 4C-7/14/1988 | 7/14/1988 | N | 0 | 0.5 | Included | Included |

Notes:

bgs : below ground surface

N : normal sample

FD : field duplicate

# Appendix B
# ProUCL Output

| | A | B | C | D | E | F | G | H | I | J | K | L | M |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | **General Statistics for Surface Soil Data** | | | | | | | | | |
| 2 | | | Date/Time of Computation | 6/2/2015 9:25:32 PM | | | | | | | | | |
| 3 | | | **User Selected Options** | | | | | | | | | | |
| 4 | | | From File | Oakland_ProUCLInput.xls | | | | | | | | | |
| 5 | | | Full Precision | OFF | | | | | | | | | |
| 6 | | | | | | | | | | | | | |
| 7 | **From File: Oakland_ProUCLInput.xls** | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | |
| 9 | | | | | | | **General Statistics for Censored Data Set (with NDs) using Kaplan Meier Method** | | | | | | |
| 10 | | | | | | | | | | | | | |
| 11 | **Variable** | | **NumObs** | **# Missing** | **Num Ds** | **NumNDs** | **% NDs** | **Min ND** | **Max ND** | **KM Mean** | **KM Var** | **KM SD** | **KM CV** |
| 12 | 1,2-Dichloroethane | | 18 | 0 | 1 | 17 | 94.44% | 0.5 | 6.25 | 0.47 | 0 | 0 | N/A |
| 13 | 2-Methylnaphthalene | | 37 | 0 | 11 | 26 | 70.27% | 76 | 15000 | 255.9 | 618395 | 786.4 | 3.074 |
| 14 | Acenaphthene | | 37 | 0 | 4 | 33 | 89.19% | 76 | 15000 | 185.9 | 65478 | 255.9 | 1.377 |
| 15 | Acenaphthylene | | 37 | 0 | 12 | 25 | 67.57% | 77 | 6900 | 1661 | 52403952 | 7239 | 4.357 |
| 16 | Acetone | | 4 | 0 | 3 | 1 | 25.00% | 10000 | 10000 | 78 | 1368 | 36.99 | 0.474 |
| 17 | Anthracene | | 37 | 0 | 14 | 23 | 62.16% | 76 | 6900 | 1098 | 17639013 | 4200 | 3.825 |
| 18 | Antimony | | 25 | 0 | 19 | 6 | 24.00% | 0.45 | 7.4 | 1.554 | 3.054 | 1.748 | 1.125 |
| 19 | roclor-1242 (PCB-1242) | | 46 | 0 | 1 | 45 | 97.83% | 2.1000E-5 | 1.1 | 5.3250E-5 | 3.1202E-9 | 5.5859E-5 | 1.049 |
| 20 | roclor-1248 (PCB-1248) | | 46 | 0 | 5 | 41 | 89.13% | 2.1000E-5 | 0.28 | 0.146 | 0.415 | 0.644 | 4.406 |
| 21 | roclor-1254 (PCB-1254) | | 46 | 0 | 5 | 41 | 89.13% | 2.1000E-5 | 1.1 | 0.0161 | 0.00476 | 0.069 | 4.295 |
| 22 | roclor-1260 (PCB-1260) | | 52 | 0 | 23 | 29 | 55.77% | 2.1000E-5 | 0.29 | 0.0892 | 0.0767 | 0.277 | 3.104 |
| 23 | Arsenic | | 25 | 0 | 25 | 0 | 0.00% | N/A | N/A | 12.21 | 82.45 | 9.08 | 0.744 |
| 24 | Barium | | 27 | 0 | 27 | 0 | 0.00% | N/A | N/A | 241.9 | 81604 | 285.7 | 1.181 |
| 25 | Benzene | | 24 | 0 | 10 | 14 | 58.33% | 0.5 | 6.25 | 7.682 | 658.9 | 25.67 | 3.341 |
| 26 | Benzo(a)anthracene | | 37 | 0 | 22 | 15 | 40.54% | 380 | 34000 | 4378 | 1.288E+8 | 11350 | 2.593 |
| 27 | Benzo(a)pyrene | | 37 | 0 | 23 | 14 | 37.84% | 77 | 6900 | 7311 | 5.114E+8 | 22613 | 3.093 |
| 28 | Benzo(b)fluoranthene | | 37 | 0 | 22 | 15 | 40.54% | 77 | 6900 | 6388 | 3.548E+8 | 18836 | 2.949 |
| 29 | Benzo(g,h,i)perylene | | 37 | 0 | 21 | 16 | 43.24% | 77 | 6900 | 6105 | 3.235E+8 | 17985 | 2.946 |
| 30 | Benzo(k)fluoranthene | | 37 | 0 | 21 | 16 | 43.24% | 77 | 6900 | 4783 | 1.882E+8 | 13719 | 2.868 |
| 31 | Beryllium | | 25 | 0 | 18 | 7 | 28.00% | 0.071 | 0.25 | 0.226 | 0.043 | 0.207 | 0.917 |
| 32 | s(2-Ethylhexyl)phthalate | | 33 | 0 | 14 | 19 | 57.58% | 1800 | 34000 | 97436 | 3.008E+11 | 548461 | 5.629 |
| 33 | Butyl benzylphthalate | | 32 | 0 | 3 | 29 | 90.63% | 200 | 17000 | 223.3 | 14306 | 119.6 | 0.536 |
| 34 | Cadmium | | 26 | 0 | 24 | 2 | 7.69% | 0.11 | 0.18 | 0.869 | 0.78 | 0.883 | 1.016 |
| 35 | Carbon disulfide | | 6 | 0 | 2 | 4 | 66.67% | 6 | 5000 | 2.5 | 1.69 | 1.3 | 0.52 |
| 36 | form (Trichloromethane) | | 6 | 0 | 2 | 4 | 66.67% | 6 | 5000 | 0.8 | 0.01 | 0.1 | 0.125 |
| 37 | Chromium | | 25 | 0 | 25 | 0 | 0.00% | N/A | N/A | 61.88 | 1862 | 43.15 | 0.697 |
| 38 | Chromium VI | | 3 | 0 | 2 | 1 | 33.33% | 0.012 | 0.012 | 0.0227 | 8.0889E-5 | 0.00899 | 0.397 |
| 39 | Chrysene | | 37 | 0 | 21 | 16 | 43.24% | 77 | 6900 | 6287 | 3.050E+8 | 17466 | 2.778 |
| 40 | Cobalt | | 25 | 0 | 25 | 0 | 0.00% | N/A | N/A | 10.6 | 7.569 | 2.751 | 0.259 |
| 41 | Copper | | 26 | 0 | 26 | 0 | 0.00% | N/A | N/A | 117.1 | 19810 | 140.7 | 1.202 |
| 42 | Dibenz(a,h)anthracene | | 37 | 0 | 16 | 21 | 56.76% | 77 | 6900 | 1231 | 7133388 | 2671 | 2.17 |
| 43 | Dibenzofuran | | 37 | 0 | 2 | 35 | 94.59% | 76 | 15000 | 149.6 | 113585 | 337 | 2.253 |
| 44 | Dichlorofluoromethane | | 3 | 0 | 1 | 2 | 66.67% | 0.5 | 6.25 | 0.75 | 0.0625 | 0.25 | 0.333 |
| 45 | Diisopropyl ether | | 13 | 0 | 1 | 12 | 92.31% | 3.8 | 5.5 | 1.1 | 0 | 0 | N/A |
| 46 | Ethylbenzene | | 24 | 0 | 6 | 18 | 75.00% | 0.5 | 6.25 | 4.542 | 211.9 | 14.56 | 3.205 |
| 47 | Fluoranthene | | 37 | 0 | 24 | 13 | 35.14% | 77 | 6900 | 11306 | 1.542E+9 | 39273 | 3.474 |
| 48 | Fluorene | | 37 | 0 | 8 | 29 | 78.38% | 76 | 6900 | 599.4 | 7559854 | 2750 | 4.587 |
| 49 | Indeno(1,2,3-cd)pyrene | | 37 | 0 | 21 | 16 | 43.24% | 77 | 6900 | 4942 | 2.108E+8 | 14518 | 2.938 |
| 50 | Lead | | 27 | 0 | 27 | 0 | 0.00% | N/A | N/A | 141.8 | 21948 | 148.1 | 1.044 |
| 51 | Mercury | | 25 | 0 | 22 | 3 | 12.00% | 0.11 | 0.12 | 0.718 | 1.116 | 1.057 | 1.471 |

| | A | B | C | D | E | F | G | H | I | J | K | L | M |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 52 | Methylene chloride | | 6 | 0 | 2 | 4 | 66.67% | 6 | 5000 | 2.65 | 0.303 | 0.55 | 0.208 |
| 53 | Molybdenum | | 25 | 0 | 22 | 3 | 12.00% | 3.4 | 3.7 | 4.742 | 82.83 | 9.101 | 1.919 |
| 54 | Naphthalene | | 37 | 0 | 13 | 24 | 64.86% | 76 | 6900 | 2572 | 1.563E+8 | 12501 | 4.86 |
| 55 | Nickel | | 27 | 0 | 27 | 0 | 0.00% | N/A | N/A | 64.39 | 1313 | 36.23 | 0.563 |
| 56 | Phenanthrene | | 37 | 0 | 24 | 13 | 35.14% | 77 | 6900 | 10053 | 1.879E+9 | 43342 | 4.311 |
| 57 | Pyrene | | 38 | 0 | 25 | 13 | 34.21% | 77 | 330000 | 13682 | 2.111E+9 | 45948 | 3.358 |
| 58 | Selenium | | 25 | 0 | 4 | 21 | 84.00% | 0.6 | 2.3 | 0.485 | 0.0793 | 0.282 | 0.58 |
| 59 | Silver | | 25 | 0 | 18 | 7 | 28.00% | 0.22 | 1.2 | 0.459 | 0.26 | 0.51 | 1.112 |
| 60 | Thallium | | 20 | 0 | 8 | 12 | 60.00% | 0.42 | 0.71 | 0.478 | 0.206 | 0.454 | 0.948 |
| 61 | Toluene | | 24 | 0 | 8 | 16 | 66.67% | 0.5 | 6.25 | 2.692 | 15.6 | 3.95 | 1.467 |
| 62 | Vanadium | | 25 | 0 | 25 | 0 | 0.00% | N/A | N/A | 41.28 | 244.4 | 15.63 | 0.379 |
| 63 | Xylene (total) | | 24 | 0 | 8 | 16 | 66.67% | 0.5 | 12 | 4.664 | 61.12 | 7.818 | 1.676 |
| 64 | Zinc | | 26 | 0 | 26 | 0 | 0.00% | N/A | N/A | 341.1 | 273235 | 522.7 | 1.532 |
| 65 | | | | | | | | | | | | | |
| 66 | **General Statistics for Raw Data Sets using Detected Data Only** | | | | | | | | | | | | |
| 67 | | | | | | | | | | | | | |
| 68 | **Variable** | | **NumObs** | **# Missing** | **Minimum** | **Maximum** | **Mean** | **Median** | **Var** | **SD** | **MAD/0.675** | **Skewness** | **CV** |
| 69 | 1,2-Dichloroethane | | 1 | 0 | 0.47 | 0.47 | 0.47 | 0.47 | N/A | N/A | 0 | N/A | N/A |
| 70 | 2-Methylnaphthalene | | 11 | 0 | 13 | 4800 | 575.3 | 140 | 1975450 | 1406 | 148.3 | 3.28 | 2.443 |
| 71 | Acenaphthene | | 4 | 0 | 190 | 1200 | 470 | 245 | 237533 | 487.4 | 44.48 | 1.982 | 1.037 |
| 72 | Acenaphthylene | | 12 | 0 | 15 | 44000 | 4787 | 225 | 1.603E+8 | 12662 | 305.4 | 3.199 | 2.645 |
| 73 | Acetone | | 3 | 0 | 30 | 120 | 78 | 84 | 2052 | 45.3 | 53.37 | -0.586 | 0.581 |
| 74 | Anthracene | | 14 | 0 | 7.2 | 25000 | 2615 | 345 | 46137915 | 6792 | 375.8 | 3.219 | 2.597 |
| 75 | Antimony | | 19 | 0 | 0.14 | 6 | 1.762 | 1.1 | 3.396 | 1.843 | 1.29 | 1.325 | 1.046 |
| 76 | roclor-1242 (PCB-1242) | | 1 | 0 | 1.5000E-4 | 1.5000E-4 | 1.5000E-4 | 1.5000E-4 | N/A | N/A | 0 | N/A | N/A |
| 77 | roclor-1248 (PCB-1248) | | 5 | 0 | 0.22 | 4.2 | 1.344 | 0.56 | 2.761 | 1.662 | 0.504 | 1.851 | 1.236 |
| 78 | roclor-1254 (PCB-1254) | | 5 | 0 | 1.9000E-4 | 0.35 | 0.139 | 0.02 | 0.0321 | 0.179 | 0.0294 | 0.617 | 1.288 |
| 79 | roclor-1260 (PCB-1260) | | 23 | 0 | 9.0000E-4 | 1.9 | 0.193 | 0.07 | 0.16 | 0.4 | 0.089 | 3.909 | 2.078 |
| 80 | Arsenic | | 25 | 0 | 1.5 | 41 | 12.21 | 9.9 | 82.45 | 9.08 | 7.561 | 1.499 | 0.744 |
| 81 | Barium | | 27 | 0 | 48 | 1500 | 241.9 | 160 | 81604 | 285.7 | 60.79 | 3.686 | 1.181 |
| 82 | Benzene | | 10 | 0 | 0.49 | 130 | 16.37 | 3.45 | 1610 | 40.13 | 3.936 | 3.105 | 2.451 |
| 83 | Benzo(a)anthracene | | 22 | 0 | 24 | 51000 | 6492 | 965 | 2.119E+8 | 14558 | 1324 | 2.843 | 2.242 |
| 84 | Benzo(a)pyrene | | 23 | 0 | 42 | 110000 | 11441 | 1300 | 8.125E+8 | 28505 | 1631 | 3.099 | 2.492 |
| 85 | Benzo(b)fluoranthene | | 22 | 0 | 43 | 94000 | 10427 | 1350 | 5.826E+8 | 24137 | 1772 | 2.995 | 2.315 |
| 86 | Benzo(g,h,i)perylene | | 21 | 0 | 52 | 93000 | 10400 | 1200 | 5.533E+8 | 23522 | 1656 | 3.033 | 2.262 |
| 87 | Benzo(k)fluoranthene | | 21 | 0 | 34 | 68000 | 8121 | 1400 | 3.209E+8 | 17913 | 1868 | 2.88 | 2.206 |
| 88 | Beryllium | | 18 | 0 | 0.078 | 1.1 | 0.274 | 0.23 | 0.0536 | 0.232 | 0.126 | 2.908 | 0.845 |
| 89 | s(2-Ethylhexyl)phthalate | | 14 | 0 | 24 | 3200000 | 229043 | 270 | 7.312E+11 | 855101 | 341.7 | 3.742 | 3.733 |
| 90 | Butyl benzylphthalate | | 3 | 0 | 160 | 490 | 276.7 | 180 | 34233 | 185 | 29.65 | 1.709 | 0.669 |
| 91 | Cadmium | | 24 | 0 | 0.038 | 3.06 | 0.936 | 0.64 | 0.82 | 0.906 | 0.66 | 1.312 | 0.967 |
| 92 | Carbon disulfide | | 2 | 0 | 1.2 | 3.8 | 2.5 | 2.5 | 3.38 | 1.838 | 1.927 | N/A | 0.735 |
| 93 | form (Trichloromethane) | | 2 | 0 | 0.7 | 0.9 | 0.8 | 0.8 | 0.02 | 0.141 | 0.148 | N/A | 0.177 |
| 94 | Chromium | | 25 | 0 | 23 | 180 | 61.88 | 43.8 | 1862 | 43.15 | 13.05 | 1.647 | 0.697 |
| 95 | Chromium VI | | 2 | 0 | 0.022 | 0.034 | 0.028 | 0.028 | 7.2000E-5 | 0.00849 | 0.0089 | N/A | 0.303 |
| 96 | Chrysene | | 21 | 0 | 43 | 78000 | 10745 | 1800 | 5.157E+8 | 22710 | 2554 | 2.688 | 2.114 |
| 97 | Cobalt | | 25 | 0 | 6 | 15 | 10.6 | 11 | 7.569 | 2.751 | 4.151 | 0.151 | 0.259 |
| 98 | Copper | | 26 | 0 | 15 | 610 | 117.1 | 54.5 | 19810 | 140.7 | 45.22 | 2.233 | 1.202 |
| 99 | Dibenz(a,h)anthracene | | 16 | 0 | 20 | 13000 | 2438 | 745 | 14512475 | 3810 | 946.6 | 2.093 | 1.563 |
| 100 | Dibenzofuran | | 2 | 0 | 100 | 1800 | 950 | 950 | 1445000 | 1202 | 1260 | N/A | 1.265 |
| 101 | Dichlorofluoromethane | | 1 | 0 | 1 | 1 | 1 | 1 | N/A | N/A | 0 | N/A | N/A |
| 102 | Diisopropyl ether | | 1 | 0 | 1.1 | 1.1 | 1.1 | 1.1 | N/A | N/A | 0 | N/A | N/A |

| | A | B | C | D | E | F | G | H | I | J | K | L | M |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 103 | | Ethylbenzene | 6 | 0 | 0.84 | 74 | 14.89 | 3.3 | 843.1 | 29.04 | 3.084 | 2.42 | 1.95 |
| 104 | | Fluoranthene | 24 | 0 | 28 | 180000 | 17166 | 1095 | 2.379E+9 | 48774 | 1494 | 3.193 | 2.841 |
| 105 | | Fluorene | 8 | 0 | 14 | 17000 | 2394 | 89.5 | 35075033 | 5922 | 77.84 | 2.79 | 2.473 |
| 106 | | Indeno(1,2,3-cd)pyrene | 21 | 0 | 41 | 74000 | 8391 | 1100 | 3.607E+8 | 18993 | 1539 | 2.992 | 2.263 |
| 107 | | Lead | 27 | 0 | 3.2 | 538 | 141.8 | 97 | 21948 | 148.1 | 123.1 | 1.244 | 1.044 |
| 108 | | Mercury | 22 | 0 | 0.063 | 4.6 | 0.806 | 0.315 | 1.262 | 1.123 | 0.344 | 2.428 | 1.394 |
| 109 | | Methylene chloride | 2 | 0 | 2.1 | 3.2 | 2.65 | 2.65 | 0.605 | 0.778 | 0.815 | N/A | 0.294 |
| 110 | | Molybdenum | 22 | 0 | 0.12 | 30 | 5.268 | 0.835 | 96.11 | 9.804 | 0.815 | 1.949 | 1.861 |
| 111 | | Naphthalene | 13 | 0 | 21 | 77000 | 6970 | 360 | 4.494E+8 | 21199 | 266.9 | 3.518 | 3.041 |
| 112 | | Nickel | 27 | 0 | 24 | 160 | 64.39 | 52.5 | 1313 | 36.23 | 22.98 | 1.536 | 0.563 |
| 113 | | Phenanthrene | 24 | 0 | 5.2 | 260000 | 15240 | 645 | 2.942E+9 | 54238 | 876.9 | 4.401 | 3.559 |
| 114 | | Pyrene | 25 | 0 | 53 | 210000 | 19980 | 1400 | 3.127E+9 | 55922 | 1961 | 3.257 | 2.799 |
| 115 | | Selenium | 4 | 0 | 0.32 | 1.2 | 0.838 | 0.915 | 0.16 | 0.4 | 0.348 | -0.773 | 0.477 |
| 116 | | Silver | 18 | 0 | 0.075 | 2.2 | 0.556 | 0.275 | 0.34 | 0.583 | 0.193 | 1.662 | 1.049 |
| 117 | | Thallium | 8 | 0 | 0.13 | 1.7 | 0.818 | 0.735 | 0.341 | 0.584 | 0.726 | 0.296 | 0.714 |
| 118 | | Toluene | 8 | 0 | 0.83 | 20 | 5.266 | 2.75 | 39.82 | 6.31 | 2.498 | 2.257 | 1.198 |
| 119 | | Vanadium | 25 | 0 | 27 | 90 | 41.28 | 36 | 244.4 | 15.63 | 10.38 | 1.906 | 0.379 |
| 120 | | Xylene (total) | 8 | 0 | 1.6 | 37 | 9.675 | 4.4 | 158.7 | 12.6 | 3.855 | 1.871 | 1.302 |
| 121 | | Zinc | 26 | 0 | 23 | 2420 | 341.1 | 180 | 273235 | 522.7 | 192.7 | 3.128 | 1.532 |
| 122 | | | | | | | | | | | | | |
| 123 | **Percentiles using all Detects (Ds) and Non-Detects (NDs)** | | | | | | | | | | | | |
| 124 | | | | | | | | | | | | | |
| 125 | **Variable** | | **NumObs** | **# Missing** | **10%ile** | **20%ile** | **25%ile(Q1)** | **50%ile(Q2)** | **75%ile(Q3)** | **80%ile** | **90%ile** | **95%ile** | **99%ile** |
| 126 | | 1,2-Dichloroethane | 18 | 0 | 0.5 | 4.1 | 4.125 | 4.8 | 5.575 | 5.66 | 6 | 6.038 | 6.208 |
| 127 | | 2-Methylnaphthalene | 37 | 0 | 76.6 | 142 | 150 | 700 | 2800 | 3200 | 3580 | 5220 | 12084 |
| 128 | | Acenaphthene | 37 | 0 | 121.6 | 242 | 350 | 1400 | 2800 | 2800 | 3500 | 4340 | 12084 |
| 129 | | Acenaphthylene | 37 | 0 | 78.2 | 150 | 300 | 790 | 2800 | 3200 | 3580 | 7520 | 31760 |
| 130 | | Acetone | 4 | 0 | 46.2 | 62.4 | 70.5 | 102 | 2590 | 4072 | 7036 | 8518 | 9704 |
| 131 | | Anthracene | 37 | 0 | 74.8 | 134 | 310 | 870 | 2800 | 3200 | 3580 | 7180 | 18988 |
| 132 | | Antimony | 25 | 0 | 0.218 | 0.344 | 0.45 | 1.1 | 3.6 | 4.5 | 6.54 | 6.98 | 7.304 |
| 133 | | roclor-1242 (PCB-1242) | 46 | 0 | 0.005 | 0.005 | 0.005 | 0.051 | 0.0558 | 0.058 | 0.11 | 0.28 | 0.735 |
| 134 | | roclor-1248 (PCB-1248) | 46 | 0 | 0.005 | 0.005 | 0.005 | 0.051 | 0.0575 | 0.058 | 0.25 | 0.505 | 2.94 |
| 135 | | roclor-1254 (PCB-1254) | 46 | 0 | 0.005 | 0.005 | 0.005 | 0.051 | 0.0558 | 0.058 | 0.28 | 0.313 | 0.762 |
| 136 | | roclor-1260 (PCB-1260) | 52 | 0 | 0.005 | 0.005 | 0.005 | 0.034 | 0.11 | 0.138 | 0.255 | 0.285 | 1.283 |
| 137 | | Arsenic | 25 | 0 | 3.632 | 4.7 | 4.9 | 9.9 | 16 | 17.4 | 21.8 | 27 | 37.88 |
| 138 | | Barium | 27 | 0 | 106 | 111.8 | 119.5 | 160 | 200 | 218 | 429 | 634.6 | 1284 |
| 139 | | Benzene | 24 | 0 | 0.572 | 0.916 | 2.8 | 4.6 | 6 | 6 | 6.205 | 12.84 | 103.3 |
| 140 | | Benzo(a)anthracene | 37 | 0 | 160 | 400 | 520 | 3400 | 14000 | 15600 | 17400 | 37200 | 50640 |
| 141 | | Benzo(a)pyrene | 37 | 0 | 163.6 | 320 | 530 | 1800 | 3700 | 5920 | 9140 | 29400 | 103160 |
| 142 | | Benzo(b)fluoranthene | 37 | 0 | 162 | 368 | 500 | 1800 | 3700 | 5180 | 9340 | 28000 | 86080 |
| 143 | | Benzo(g,h,i)perylene | 37 | 0 | 166 | 360 | 540 | 2000 | 3700 | 5880 | 9000 | 22600 | 82920 |
| 144 | | Benzo(k)fluoranthene | 37 | 0 | 146 | 406 | 590 | 1800 | 3500 | 3780 | 8540 | 21000 | 62600 |
| 145 | | Beryllium | 25 | 0 | 0.097 | 0.108 | 0.12 | 0.23 | 0.25 | 0.284 | 0.384 | 0.448 | 0.946 |
| 146 | | s(2-Ethylhexyl)phthalate | 33 | 0 | 130 | 262 | 530 | 2900 | 14000 | 15200 | 17000 | 24400 | 2186880 |
| 147 | | Butyl benzylphthalate | 32 | 0 | 218 | 904 | 927.5 | 3600 | 7025 | 7180 | 8890 | 9135 | 14613 |
| 148 | | Cadmium | 26 | 0 | 0.115 | 0.19 | 0.215 | 0.56 | 1.17 | 1.4 | 2.3 | 2.875 | 3.045 |
| 149 | | Carbon disulfide | 6 | 0 | 2.5 | 3.8 | 4.35 | 6 | 6.188 | 6.25 | 2503 | 3752 | 4750 |
| 150 | | form (Trichloromethane) | 6 | 0 | 0.8 | 0.9 | 2.175 | 6 | 6.188 | 6.25 | 2503 | 3752 | 4750 |
| 151 | | Chromium | 25 | 0 | 32.8 | 34.8 | 35 | 43.8 | 67 | 84.2 | 136 | 149.6 | 173.3 |
| 152 | | Chromium VI | 3 | 0 | 0.014 | 0.016 | 0.017 | 0.022 | 0.028 | 0.0292 | 0.0316 | 0.0328 | 0.0338 |
| 153 | | Chrysene | 37 | 0 | 120.8 | 438 | 620 | 1800 | 3700 | 5280 | 11400 | 31200 | 77280 |

| | A | B | C | D | E | F | G | H | I | J | K | L | M |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 154 | | Cobalt | 25 | 0 | 7.64 | 7.98 | 8.1 | 11 | 13 | 13.84 | 14 | 14.8 | 15 |
| 155 | | Copper | 26 | 0 | 25.5 | 28 | 30.1 | 54.5 | 133 | 190 | 270 | 375 | 557.5 |
| 156 | | Dibenz(a,h)anthracene | 37 | 0 | 78.2 | 272 | 390 | 1400 | 3300 | 3480 | 4180 | 7500 | 11884 |
| 157 | | Dibenzofuran | 37 | 0 | 91.6 | 352 | 370 | 1400 | 2800 | 2800 | 3500 | 4340 | 12084 |
| 158 | | Dichlorofluoromethane | 3 | 0 | 0.6 | 0.7 | 0.75 | 1 | 3.625 | 4.15 | 5.2 | 5.725 | 6.145 |
| 159 | | Diisopropyl ether | 13 | 0 | 3.86 | 4.14 | 4.2 | 4.7 | 5.1 | 5.28 | 5.4 | 5.44 | 5.488 |
| 160 | | Ethylbenzene | 24 | 0 | 1.068 | 3.14 | 4.175 | 4.85 | 6 | 6 | 6.175 | 6.293 | 58.43 |
| 161 | | Fluoranthene | 37 | 0 | 111.6 | 336 | 400 | 1800 | 3500 | 6100 | 9860 | 43600 | 176400 |
| 162 | | Fluorene | 37 | 0 | 76.6 | 110 | 150 | 1400 | 2800 | 2800 | 3500 | 4340 | 13364 |
| 163 | | Indeno(1,2,3-cd)pyrene | 37 | 0 | 120.8 | 344 | 410 | 1800 | 3700 | 4820 | 7420 | 18800 | 66800 |
| 164 | | Lead | 27 | 0 | 10.52 | 14.8 | 25.45 | 97 | 204 | 258 | 364 | 414.8 | 511 |
| 165 | | Mercury | 25 | 0 | 0.104 | 0.12 | 0.13 | 0.31 | 0.76 | 0.834 | 1.94 | 2.82 | 4.192 |
| 166 | | Methylene chloride | 6 | 0 | 2.65 | 3.2 | 3.9 | 6 | 6.188 | 6.25 | 2503 | 3752 | 4750 |
| 167 | | Molybdenum | 25 | 0 | 0.27 | 0.43 | 0.51 | 1.1 | 3.4 | 3.54 | 21.2 | 28 | 29.76 |
| 168 | | Naphthalene | 37 | 0 | 76.6 | 208 | 360 | 1400 | 2800 | 3200 | 3580 | 7440 | 52736 |
| 169 | | Nickel | 27 | 0 | 34.6 | 38.4 | 44 | 52.5 | 72.5 | 79.8 | 122 | 145.6 | 156.9 |
| 170 | | Phenanthrene | 37 | 0 | 57.6 | 200 | 270 | 1400 | 3300 | 3380 | 6420 | 22480 | 193040 |
| 171 | | Pyrene | 38 | 0 | 121.1 | 382 | 535 | 2000 | 5525 | 8340 | 14600 | 201500 | 285600 |
| 172 | | Selenium | 25 | 0 | 0.6 | 0.818 | 0.9 | 1.1 | 1.2 | 1.4 | 1.58 | 1.94 | 2.228 |
| 173 | | Silver | 25 | 0 | 0.142 | 0.188 | 0.2 | 0.29 | 1.1 | 1.2 | 1.26 | 1.3 | 1.984 |
| 174 | | Thallium | 20 | 0 | 0.4 | 0.444 | 0.465 | 0.54 | 0.71 | 0.764 | 1.22 | 1.415 | 1.643 |
| 175 | | Toluene | 24 | 0 | 0.971 | 2.06 | 3.075 | 4.75 | 6 | 6 | 6.175 | 6.463 | 16.9 |
| 176 | | Vanadium | 25 | 0 | 29 | 29.92 | 31 | 36 | 46 | 47.4 | 57 | 75 | 87.36 |
| 177 | | Xylene (total) | 24 | 0 | 1.6 | 2.84 | 4.9 | 7.3 | 9.65 | 10.28 | 12 | 18.8 | 33.09 |
| 178 | | Zinc | 26 | 0 | 46.1 | 51 | 55 | 180 | 340 | 400 | 584 | 1283 | 2190 |

| | A | B | C | D | E | F | G | H | I | J | K | L | M |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | **General Statistics on Total Soil Data** | | | | | | | | | |
| 2 | | | Date/Time of Computation | 6/2/2015 9:34:12 PM | | | | | | | | | |
| 3 | | | **User Selected Options** | | | | | | | | | | |
| 4 | | | From File | Oakland_ProUCLInput_a.xls | | | | | | | | | |
| 5 | | | Full Precision | OFF | | | | | | | | | |
| 6 | | | | | | | | | | | | | |
| 7 | **From File: Oakland_ProUCLInput_a.xls** | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | |
| 9 | | | | | | **General Statistics for Censored Data Set (with NDs) using Kaplan Meier Method** | | | | | | | |
| 10 | | | | | | | | | | | | | |
| 11 | **Variable** | | **NumObs** | **# Missing** | **Num Ds** | **NumNDs** | **% NDs** | **Min ND** | **Max ND** | **KM Mean** | **KM Var** | **KM SD** | **KM CV** |
| 12 | 1,2,4-Trichlorobenzene | | 120 | 0 | 1 | 119 | 99.17% | 69 | 6900 | 22 | 0 | 0 | N/A |
| 13 | 1,2-Dichloroethane | | 81 | 0 | 4 | 77 | 95.06% | 0.5 | 6.25 | 0.483 | 0.389 | 0.624 | 1.291 |
| 14 | 2-Chloronaphthalene | | 120 | 0 | 1 | 119 | 99.17% | 69 | 6900 | 70.15 | 80 | 8.944 | 0.128 |
| 15 | 2-Methylnaphthalene | | 133 | 0 | 24 | 109 | 81.95% | 69 | 15000 | 106.4 | 194005 | 440.5 | 4.141 |
| 16 | Acenaphthene | | 135 | 0 | 12 | 123 | 91.11% | 5.8 | 15000 | 102.4 | 386642 | 621.8 | 6.075 |
| 17 | Acenaphthylene | | 135 | 0 | 20 | 115 | 85.19% | 5.8 | 6900 | 466.7 | 14892158 | 3859 | 8.269 |
| 18 | Acetone | | 9 | 0 | 8 | 1 | 11.11% | 10000 | 10000 | 65.5 | 885.3 | 29.75 | 0.454 |
| 19 | Anthracene | | 135 | 0 | 41 | 94 | 69.63% | 5.8 | 6900 | 438.7 | 6139197 | 2478 | 5.648 |
| 20 | Antimony | | 98 | 0 | 74 | 24 | 24.49% | 0.45 | 7.4 | 1.367 | 5.385 | 2.321 | 1.697 |
| 21 | roclor-1242 (PCB-1242) | | 147 | 0 | 3 | 144 | 97.96% | 2.1000E-5 | 5.4 | 3.0947E-4 | 4.4166E-7 | 6.6457E-4 | 2.147 |
| 22 | roclor-1248 (PCB-1248) | | 147 | 0 | 11 | 136 | 92.52% | 2.1000E-5 | 5.4 | 0.111 | 0.394 | 0.628 | 5.652 |
| 23 | roclor-1254 (PCB-1254) | | 146 | 0 | 12 | 134 | 91.78% | 2.1000E-5 | 5.4 | 0.0118 | 0.00334 | 0.0578 | 4.891 |
| 24 | roclor-1260 (PCB-1260) | | 159 | 0 | 66 | 93 | 58.49% | 2.1000E-5 | 0.57 | 0.519 | 11.19 | 3.345 | 6.44 |
| 25 | Arsenic | | 98 | 0 | 98 | 0 | 0.00% | N/A | N/A | 8.679 | 63.28 | 7.955 | 0.917 |
| 26 | Barium | | 104 | 0 | 104 | 0 | 0.00% | N/A | N/A | 226.6 | 47536 | 218 | 0.962 |
| 27 | Benzene | | 97 | 0 | 18 | 79 | 81.44% | 0.5 | 6.25 | 3.043 | 171.2 | 13.09 | 4.3 |
| 28 | Benzo(a)anthracene | | 135 | 0 | 57 | 78 | 57.78% | 5.8 | 34000 | 1568 | 41372187 | 6432 | 4.102 |
| 29 | Benzo(a)pyrene | | 135 | 0 | 73 | 62 | 45.93% | 5.8 | 6900 | 2420 | 1.528E+8 | 12362 | 5.108 |
| 30 | Benzo(b)fluoranthene | | 135 | 0 | 68 | 67 | 49.63% | 5.8 | 6900 | 2169 | 1.078E+8 | 10383 | 4.787 |
| 31 | Benzo(g,h,i)perylene | | 135 | 0 | 58 | 77 | 57.04% | 5.8 | 6900 | 1938 | 96253295 | 9811 | 5.061 |
| 32 | Benzo(k)fluoranthene | | 135 | 0 | 59 | 76 | 56.30% | 5.8 | 6900 | 1668 | 58086501 | 7621 | 4.569 |
| 33 | Beryllium | | 98 | 0 | 83 | 15 | 15.31% | 0.071 | 0.25 | 0.295 | 0.0323 | 0.18 | 0.609 |
| 34 | s(2-Ethylhexyl)phthalate | | 121 | 0 | 51 | 70 | 57.85% | 340 | 34000 | 26764 | 8.391E+10 | 289677 | 10.82 |
| 35 | Butyl benzylphthalate | | 120 | 0 | 10 | 110 | 91.67% | 180 | 17000 | 129.1 | 27891 | 167 | 1.294 |
| 36 | Cadmium | | 102 | 0 | 92 | 10 | 9.80% | 0.11 | 0.28 | 1.135 | 9.609 | 3.1 | 2.73 |
| 37 | Carbon disulfide | | 10 | 0 | 2 | 8 | 80.00% | 6 | 5000 | 2.5 | 1.69 | 1.3 | 0.52 |
| 38 | form (Trichloromethane) | | 10 | 0 | 2 | 8 | 80.00% | 6 | 5000 | 0.8 | 0.01 | 0.1 | 0.125 |
| 39 | Chromium | | 98 | 0 | 98 | 0 | 0.00% | N/A | N/A | 71.75 | 2853 | 53.41 | 0.744 |
| 40 | Chromium VI | | 8 | 0 | 4 | 4 | 50.00% | 0.011 | 0.012 | 0.0245 | 5.6525E-4 | 0.0238 | 0.97 |
| 41 | Chrysene | | 135 | 0 | 52 | 83 | 61.48% | 5.8 | 6900 | 2290 | 96923183 | 9845 | 4.299 |
| 42 | Cobalt | | 98 | 0 | 98 | 0 | 0.00% | N/A | N/A | 12.68 | 36.68 | 6.057 | 0.478 |
| 43 | Copper | | 99 | 0 | 99 | 0 | 0.00% | N/A | N/A | 78.51 | 15867 | 126 | 1.604 |
| 44 | Dibenz(a,h)anthracene | | 135 | 0 | 37 | 98 | 72.59% | 5.8 | 6900 | 439.5 | 2431510 | 1559 | 3.548 |
| 45 | Dibenzofuran | | 133 | 0 | 7 | 126 | 94.74% | 69 | 15000 | 60.57 | 79653 | 282.2 | 4.66 |
| 46 | Dichlorofluoromethane | | 3 | 0 | 1 | 2 | 66.67% | 0.5 | 6.25 | 0.75 | 0.0625 | 0.25 | 0.333 |
| 47 | Diethyl phthalate | | 120 | 0 | 1 | 119 | 99.17% | 180 | 17000 | 44 | 0 | 0 | N/A |
| 48 | Diisopropyl ether | | 72 | 0 | 1 | 71 | 98.61% | 3.8 | 6.2 | 1.1 | 0 | 0 | N/A |
| 49 | Di-n-butyl phthalate | | 120 | 0 | 4 | 116 | 96.67% | 180 | 17000 | 175.6 | 33130 | 182 | 1.036 |
| 50 | Di-n-octyl phthalate | | 133 | 0 | 7 | 126 | 94.74% | 180 | 37000 | 24.2 | 857.9 | 29.29 | 1.21 |
| 51 | Ethylbenzene | | 97 | 0 | 15 | 82 | 84.54% | 0.5 | 6.25 | 11.2 | 3695 | 60.78 | 5.425 |
| 52 | Fluoranthene | | 135 | 0 | 71 | 64 | 47.41% | 71 | 6900 | 3646 | 4.534E+8 | 21294 | 5.84 |

| | A | B | C | D | E | F | G | H | I | J | K | L | M |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 53 | | Fluorene | 135 | 0 | 17 | 118 | 87.41% | 5.8 | 6900 | 229.9 | 2339010 | 1529 | 6.652 |
| 54 | | Indeno(1,2,3-cd)pyrene | 135 | 0 | 59 | 76 | 56.30% | 5.8 | 6900 | 1603 | 63012635 | 7938 | 4.953 |
| 55 | | Lead | 108 | 0 | 108 | 0 | 0.00% | N/A | N/A | 122.9 | 75557 | 274.9 | 2.236 |
| 56 | | Mercury | 98 | 0 | 89 | 9 | 9.18% | 0.011 | 0.12 | 0.494 | 1.226 | 1.107 | 2.24 |
| 57 | | Methyl Tert Butyl Ether | 14 | 0 | 1 | 13 | 92.86% | 4.3 | 6.1 | 1.7 | 0 | 0 | N/A |
| 58 | | Methylene chloride | 10 | 0 | 4 | 6 | 60.00% | 6 | 5000 | 3.559 | 2.932 | 1.712 | 0.481 |
| 59 | | Molybdenum | 97 | 0 | 82 | 15 | 15.46% | 0.45 | 3.7 | 2.406 | 46.7 | 6.834 | 2.841 |
| 60 | | Naphthalene | 135 | 0 | 30 | 105 | 77.78% | 5.8 | 6900 | 750.9 | 44140173 | 6644 | 8.847 |
| 61 | | Nickel | 104 | 0 | 104 | 0 | 0.00% | N/A | N/A | 98.95 | 5022 | 70.87 | 0.716 |
| 62 | | Nitrobenzene | 13 | 0 | 1 | 12 | 92.31% | 75 | 15000 | 51 | 0 | 0 | N/A |
| 63 | | N-Nitrosodiphenylamine | 120 | 0 | 2 | 118 | 98.33% | 69 | 6900 | 39 | 196 | 14 | 0.359 |
| 64 | | Phenanthrene | 135 | 0 | 60 | 75 | 55.56% | 71 | 6900 | 3256 | 5.431E+8 | 23304 | 7.158 |
| 65 | | Phenol | 120 | 0 | 2 | 118 | 98.33% | 69 | 6900 | 40.5 | 552.3 | 23.5 | 0.58 |
| 66 | | Pyrene | 136 | 0 | 83 | 53 | 38.97% | 72 | 330000 | 4447 | 6.220E+8 | 24940 | 5.609 |
| 67 | | Selenium | 97 | 0 | 41 | 56 | 57.73% | 0.6 | 5 | 0.491 | 0.15 | 0.387 | 0.789 |
| 68 | | Silver | 98 | 0 | 49 | 49 | 50.00% | 0.22 | 1.2 | 0.278 | 0.115 | 0.339 | 1.217 |
| 69 | | Thallium | 83 | 0 | 36 | 47 | 56.63% | 0.4 | 1.1 | 0.708 | 1.072 | 1.035 | 1.462 |
| 70 | | Toluene | 97 | 0 | 17 | 80 | 82.47% | 0.5 | 6.25 | 2.334 | 14.54 | 3.814 | 1.634 |
| 71 | | Vanadium | 97 | 0 | 97 | 0 | 0.00% | N/A | N/A | 38.66 | 117 | 10.82 | 0.28 |
| 72 | | Xylene (total) | 97 | 0 | 25 | 72 | 74.23% | 0.5 | 12 | 53.9 | 165944 | 407.4 | 7.557 |
| 73 | | Zinc | 99 | 0 | 99 | 0 | 0.00% | N/A | N/A | 211.4 | 155318 | 394.1 | 1.864 |
| 74 | | | | | | | | | | | | | |
| 75 | | **General Statistics for Raw Data Sets using Detected Data Only** | | | | | | | | | | | |
| 76 | | | | | | | | | | | | | |
| 77 | | **Variable** | **NumObs** | **# Missing** | **Minimum** | **Maximum** | **Mean** | **Median** | **Var** | **SD** | **MAD/0.675** | **Skewness** | **CV** |
| 78 | | 1,2,4-Trichlorobenzene | 1 | 0 | 22 | 22 | 22 | 22 | N/A | N/A | 0 | N/A | N/A |
| 79 | | 1,2-Dichloroethane | 4 | 0 | 0.33 | 6 | 1.81 | 0.455 | 7.806 | 2.794 | 0.104 | 1.997 | 1.544 |
| 80 | | 2-Chloronaphthalene | 1 | 0 | 140 | 140 | 140 | 140 | N/A | N/A | 0 | N/A | N/A |
| 81 | | 2-Methylnaphthalene | 24 | 0 | 7.9 | 4800 | 379.1 | 100 | 989795 | 994.9 | 99.33 | 4.223 | 2.624 |
| 82 | | Acenaphthene | 12 | 0 | 6.8 | 6900 | 955.6 | 240 | 3757980 | 1939 | 340.8 | 3.08 | 2.029 |
| 83 | | Acenaphthylene | 20 | 0 | 10 | 44000 | 2923 | 135 | 98322304 | 9916 | 163.1 | 4.157 | 3.393 |
| 84 | | Acetone | 8 | 0 | 21 | 120 | 65.5 | 65.5 | 1012 | 31.81 | 26.69 | 0.234 | 0.486 |
| 85 | | Anthracene | 41 | 0 | 6.1 | 25000 | 1348 | 96 | 19483745 | 4414 | 124.5 | 4.499 | 3.275 |
| 86 | | Antimony | 74 | 0 | 0.1 | 13 | 1.646 | 0.77 | 6.713 | 2.591 | 0.771 | 2.948 | 1.574 |
| 87 | | roclor-1242 (PCB-1242) | 3 | 0 | 1.5000E-4 | 0.0023 | 0.00107 | 7.7000E-4 | 1.2246E-6 | 0.00111 | 9.1920E-4 | 1.141 | 1.031 |
| 88 | | roclor-1248 (PCB-1248) | 11 | 0 | 0.056 | 4.5 | 1.455 | 0.34 | 3.562 | 1.887 | 0.394 | 1.062 | 1.298 |
| 89 | | roclor-1254 (PCB-1254) | 12 | 0 | 1.9000E-4 | 0.48 | 0.116 | 0.019 | 0.0285 | 0.169 | 0.0254 | 1.377 | 1.459 |
| 90 | | roclor-1260 (PCB-1260) | 66 | 0 | 2.4000E-5 | 32 | 1.24 | 0.058 | 26.46 | 5.144 | 0.0768 | 5.394 | 4.147 |
| 91 | | Arsenic | 98 | 0 | 1.5 | 49 | 8.679 | 6.1 | 63.28 | 7.955 | 3.039 | 2.974 | 0.917 |
| 92 | | Barium | 104 | 0 | 36 | 1500 | 226.6 | 170 | 47536 | 218 | 44.48 | 3.551 | 0.962 |
| 93 | | Benzene | 18 | 0 | 0.3 | 130 | 9.929 | 1.95 | 908.6 | 30.14 | 2.128 | 4.162 | 3.036 |
| 94 | | Benzo(a)anthracene | 57 | 0 | 22 | 51000 | 3412 | 480 | 92823301 | 9634 | 646.4 | 4.362 | 2.824 |
| 95 | | Benzo(a)pyrene | 73 | 0 | 9.5 | 110000 | 4409 | 260 | 2.777E+8 | 16665 | 361.7 | 5.635 | 3.779 |
| 96 | | Benzo(b)fluoranthene | 68 | 0 | 11 | 94000 | 4227 | 310 | 2.085E+8 | 14440 | 429.2 | 5.301 | 3.416 |
| 97 | | Benzo(g,h,i)perylene | 58 | 0 | 27 | 93000 | 4396 | 520 | 2.171E+8 | 14735 | 687.2 | 5.204 | 3.352 |
| 98 | | Benzo(k)fluoranthene | 59 | 0 | 20 | 68000 | 3720 | 430 | 1.275E+8 | 11293 | 573.8 | 4.79 | 3.036 |
| 99 | | Beryllium | 83 | 0 | 0.047 | 1.1 | 0.332 | 0.34 | 0.0293 | 0.171 | 0.163 | 1.098 | 0.516 |
| 100 | | s(2-Ethylhexyl)phthalate | 51 | 0 | 8.3 | 3200000 | 63271 | 130 | 2.007E+11 | 448016 | 163.1 | 7.141 | 7.081 |
| 101 | | Butyl benzylphthalate | 10 | 0 | 41 | 1400 | 347.2 | 170 | 175734 | 419.2 | 174.2 | 2.073 | 1.207 |
| 102 | | Cadmium | 92 | 0 | 0.014 | 27 | 1.251 | 0.375 | 10.63 | 3.261 | 0.426 | 6.266 | 2.607 |
| 103 | | Carbon disulfide | 2 | 0 | 1.2 | 3.8 | 2.5 | 2.5 | 3.38 | 1.838 | 1.927 | N/A | 0.735 |
| 104 | | form (Trichloromethane) | 2 | 0 | 0.7 | 0.9 | 0.8 | 0.8 | 0.02 | 0.141 | 0.148 | N/A | 0.177 |

| | A | B | C | D | E | F | G | H | I | J | K | L | M |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 105 | | Chromium | 98 | 0 | 20.4 | 470 | 71.75 | 61.35 | 2853 | 53.41 | 21.5 | 4.805 | 0.744 |
| 106 | | Chromium VI | 4 | 0 | 0.012 | 0.084 | 0.038 | 0.028 | 0.00102 | 0.032 | 0.0163 | 1.544 | 0.841 |
| 107 | | Chrysene | 52 | 0 | 43 | 78000 | 5805 | 720 | 2.360E+8 | 15362 | 962.2 | 4.093 | 2.647 |
| 108 | | Cobalt | 98 | 0 | 3.64 | 37 | 12.68 | 12 | 36.68 | 6.057 | 4.374 | 1.724 | 0.478 |
| 109 | | Copper | 99 | 0 | 14 | 680 | 78.51 | 28 | 15867 | 126 | 14.83 | 3.181 | 1.604 |
| 110 | | Dibenz(a,h)anthracene | 37 | 0 | 18 | 13000 | 1423 | 270 | 7666259 | 2769 | 349.9 | 3.057 | 1.946 |
| 111 | | Dibenzofuran | 7 | 0 | 13 | 2500 | 767.1 | 350 | 964990 | 982.3 | 404.7 | 1.271 | 1.281 |
| 112 | | Dichlorofluoromethane | 1 | 0 | 1 | 1 | 1 | 1 | N/A | N/A | 0 | N/A | N/A |
| 113 | | Diethyl phthalate | 1 | 0 | 44 | 44 | 44 | 44 | N/A | N/A | 0 | N/A | N/A |
| 114 | | Diisopropyl ether | 1 | 0 | 1.1 | 1.1 | 1.1 | 1.1 | N/A | N/A | 0 | N/A | N/A |
| 115 | | Di-n-butyl phthalate | 4 | 0 | 140 | 1400 | 820 | 870 | 269600 | 519.2 | 429.9 | -0.563 | 0.633 |
| 116 | | Di-n-octyl phthalate | 7 | 0 | 5.5 | 95 | 24.2 | 16 | 1001 | 31.64 | 10.38 | 2.501 | 1.307 |
| 117 | | Ethylbenzene | 15 | 0 | 0.72 | 570 | 64.84 | 4.9 | 21946 | 148.1 | 5.189 | 3.247 | 2.285 |
| 118 | | Fluoranthene | 71 | 0 | 1.1 | 180000 | 6869 | 230 | 8.522E+8 | 29192 | 324.7 | 5.63 | 4.25 |
| 119 | | Fluorene | 17 | 0 | 10 | 17000 | 1546 | 100 | 17578153 | 4193 | 117.1 | 3.564 | 2.712 |
| 120 | | Indeno(1,2,3-cd)pyrene | 59 | 0 | 21 | 74000 | 3563 | 330 | 1.397E+8 | 11818 | 447.7 | 5.156 | 3.317 |
| 121 | | Lead | 108 | 0 | 3.2 | 2000 | 122.9 | 18.45 | 75557 | 274.9 | 19.94 | 5 | 2.236 |
| 122 | | Mercury | 89 | 0 | 0.04 | 9.5 | 0.538 | 0.21 | 1.345 | 1.16 | 0.148 | 6.011 | 2.156 |
| 123 | | Methyl Tert Butyl Ether | 1 | 0 | 1.7 | 1.7 | 1.7 | 1.7 | N/A | N/A | 0 | N/A | N/A |
| 124 | | Methylene chloride | 4 | 0 | 2.1 | 7 | 4.575 | 4.6 | 5.309 | 2.304 | 2.817 | -0.033 | 0.504 |
| 125 | | Molybdenum | 82 | 0 | 0.076 | 46 | 2.761 | 0.38 | 55.03 | 7.418 | 0.334 | 4.082 | 2.687 |
| 126 | | Naphthalene | 30 | 0 | 5.9 | 77000 | 3215 | 230 | 1.974E+8 | 14049 | 266.9 | 5.347 | 4.37 |
| 127 | | Nickel | 104 | 0 | 18.3 | 570 | 98.95 | 86 | 5022 | 70.87 | 50.41 | 3.377 | 0.716 |
| 128 | | Nitrobenzene | 1 | 0 | 51 | 51 | 51 | 51 | N/A | N/A | 0 | N/A | N/A |
| 129 | | N-Nitrosodiphenylamine | 2 | 0 | 25 | 53 | 39 | 39 | 392 | 19.8 | 20.76 | N/A | 0.508 |
| 130 | | Phenanthrene | 60 | 0 | 1.2 | 260000 | 7234 | 260 | 1.214E+9 | 34837 | 338 | 6.824 | 4.815 |
| 131 | | Phenol | 2 | 0 | 17 | 64 | 40.5 | 40.5 | 1105 | 33.23 | 34.84 | N/A | 0.821 |
| 132 | | Pyrene | 83 | 0 | 1.8 | 210000 | 7185 | 240 | 1.004E+9 | 31690 | 344.6 | 6.089 | 4.411 |
| 133 | | Selenium | 41 | 0 | 0.17 | 3.5 | 0.583 | 0.38 | 0.299 | 0.546 | 0.193 | 4.062 | 0.937 |
| 134 | | Silver | 49 | 0 | 0.06 | 2.2 | 0.395 | 0.22 | 0.198 | 0.445 | 0.181 | 2.229 | 1.127 |
| 135 | | Thallium | 36 | 0 | 0.13 | 8.6 | 1.24 | 0.945 | 2.011 | 1.418 | 0.801 | 4.197 | 1.144 |
| 136 | | Toluene | 17 | 0 | 0.82 | 33 | 5.462 | 2.1 | 70.91 | 8.421 | 1.883 | 2.766 | 1.542 |
| 137 | | Vanadium | 97 | 0 | 10.2 | 90 | 38.66 | 37 | 117 | 10.82 | 7.413 | 1.677 | 0.28 |
| 138 | | Xylene (total) | 25 | 0 | 1 | 4000 | 202.1 | 3.9 | 639859 | 799.9 | 3.706 | 4.837 | 3.958 |
| 139 | | Zinc | 99 | 0 | 23 | 2420 | 211.4 | 54 | 155318 | 394.1 | 37.06 | 4.021 | 1.864 |
| 140 | | | | | | | | | | | | | |
| 141 | | **Percentiles using all Detects (Ds) and Non-Detects (NDs)** | | | | | | | | | | | |
| 142 | | | | | | | | | | | | | |
| 143 | | **Variable** | **NumObs** | **# Missing** | **10%ile** | **20%ile** | **25%ile(Q1)** | **50%ile(Q2)** | **75%ile(Q3)** | **80%ile** | **90%ile** | **95%ile** | **99%ile** |
| 144 | | 1,2,4-Trichlorobenzene | 120 | 0 | 74.9 | 76.8 | 77 | 83 | 752.5 | 1400 | 1800 | 2825 | 3662 |
| 145 | | 1,2-Dichloroethane | 81 | 0 | 4.1 | 4.3 | 4.4 | 4.7 | 5.1 | 5.3 | 5.7 | 6 | 6.05 |
| 146 | | 2-Chloronaphthalene | 120 | 0 | 75 | 77 | 77.75 | 112 | 752.5 | 1400 | 1800 | 2825 | 3662 |
| 147 | | 2-Methylnaphthalene | 133 | 0 | 71.2 | 76 | 76 | 81 | 700 | 772 | 1800 | 3340 | 6228 |
| 148 | | Acenaphthene | 135 | 0 | 74 | 76 | 77 | 81 | 720 | 1240 | 1800 | 3330 | 6900 |
| 149 | | Acenaphthylene | 135 | 0 | 73 | 76 | 77 | 81 | 735 | 800 | 1680 | 3330 | 8946 |
| 150 | | Acetone | 9 | 0 | 28.2 | 45 | 55 | 73 | 84 | 98.4 | 2096 | 6048 | 9210 |
| 151 | | Anthracene | 135 | 0 | 35.2 | 73.8 | 75.5 | 80 | 460 | 738 | 2340 | 3500 | 10742 |
| 152 | | Antimony | 98 | 0 | 0.217 | 0.294 | 0.41 | 0.74 | 1.8 | 2.42 | 6.83 | 7.145 | 12.03 |
| 153 | | roclor-1242 (PCB-1242) | 147 | 0 | 0.005 | 0.005 | 0.005 | 0.055 | 0.0595 | 0.0608 | 0.26 | 0.486 | 3.514 |
| 154 | | roclor-1248 (PCB-1248) | 147 | 0 | 0.005 | 0.005 | 0.005 | 0.056 | 0.06 | 0.0618 | 0.26 | 0.941 | 4.986 |
| 155 | | roclor-1254 (PCB-1254) | 146 | 0 | 0.005 | 0.005 | 0.005 | 0.055 | 0.059 | 0.061 | 0.275 | 0.548 | 3.555 |
| 156 | | roclor-1260 (PCB-1260) | 159 | 0 | 0.005 | 0.005 | 0.0071 | 0.056 | 0.094 | 0.152 | 0.308 | 0.806 | 15.11 |

| | A | B | C | D | E | F | G | H | I | J | K | L | M |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 157 | | Arsenic | 98 | 0 | 3.3 | 4.3 | 4.4 | 6.1 | 9.475 | 9.96 | 16.3 | 23.15 | 41.24 |
| 158 | | Barium | 104 | 0 | 108.6 | 120 | 139.3 | 170 | 200 | 220 | 397.3 | 614 | 1210 |
| 159 | | Benzene | 97 | 0 | 1.44 | 4.1 | 4.2 | 4.6 | 5 | 5.28 | 6 | 6 | 18.64 |
| 160 | | Benzo(a)anthracene | 135 | 0 | 77 | 348 | 365 | 390 | 1800 | 3500 | 9460 | 16300 | 44560 |
| 161 | | Benzo(a)pyrene | 135 | 0 | 42.4 | 75 | 76 | 97 | 1150 | 1320 | 3620 | 7200 | 65840 |
| 162 | | Benzo(b)fluoranthene | 135 | 0 | 56.4 | 75 | 76 | 120 | 1050 | 1420 | 3620 | 7350 | 53980 |
| 163 | | Benzo(g,h,i)perylene | 135 | 0 | 73 | 76 | 77 | 140 | 1100 | 1400 | 3500 | 7260 | 46980 |
| 164 | | Benzo(k)fluoranthene | 135 | 0 | 71.4 | 76 | 77 | 120 | 1000 | 1400 | 3500 | 5920 | 40080 |
| 165 | | Beryllium | 98 | 0 | 0.0991 | 0.14 | 0.2 | 0.305 | 0.415 | 0.44 | 0.503 | 0.512 | 0.751 |
| 166 | | s(2-Ethylhexyl)phthalate | 121 | 0 | 30 | 120 | 190 | 380 | 1800 | 2900 | 8700 | 16000 | 30800 |
| 167 | | Butyl benzylphthalate | 120 | 0 | 189 | 190 | 197.5 | 205 | 1825 | 2040 | 3960 | 7265 | 9243 |
| 168 | | Cadmium | 102 | 0 | 0.0514 | 0.12 | 0.13 | 0.27 | 0.945 | 1.194 | 2.476 | 3.482 | 13.92 |
| 169 | | Carbon disulfide | 10 | 0 | 3.54 | 5.56 | 6 | 6 | 6 | 6.05 | 505.6 | 2753 | 4551 |
| 170 | | form (Trichloromethane) | 10 | 0 | 0.88 | 4.98 | 6 | 6 | 6 | 6.05 | 505.6 | 2753 | 4551 |
| 171 | | Chromium | 98 | 0 | 35.7 | 43.88 | 46.25 | 61.35 | 73.75 | 80.24 | 116 | 141.8 | 227.5 |
| 172 | | Chromium VI | 8 | 0 | 0.0117 | 0.012 | 0.012 | 0.012 | 0.025 | 0.0292 | 0.049 | 0.0665 | 0.0805 |
| 173 | | Chrysene | 135 | 0 | 73.4 | 76.8 | 77 | 150 | 1400 | 1640 | 3620 | 9500 | 57640 |
| 174 | | Cobalt | 98 | 0 | 7.15 | 8.14 | 8.673 | 12 | 14 | 15 | 19.3 | 23.75 | 33.12 |
| 175 | | Copper | 99 | 0 | 18 | 19.12 | 21 | 28 | 65.5 | 91.4 | 198 | 328 | 611.4 |
| 176 | | Dibenz(a,h)anthracene | 135 | 0 | 73 | 76 | 77 | 82 | 725 | 1320 | 2640 | 3500 | 8880 |
| 177 | | Dibenzofuran | 133 | 0 | 75 | 76 | 77 | 82 | 730 | 1196 | 1800 | 3000 | 5876 |
| 178 | | Dichlorofluoromethane | 3 | 0 | 0.6 | 0.7 | 0.75 | 1 | 3.625 | 4.15 | 5.2 | 5.725 | 6.145 |
| 179 | | Diethyl phthalate | 120 | 0 | 190 | 190 | 200 | 210 | 1900 | 3600 | 4500 | 7265 | 9243 |
| 180 | | Diisopropyl ether | 72 | 0 | 4.11 | 4.3 | 4.4 | 4.6 | 4.9 | 5 | 5.39 | 5.5 | 5.845 |
| 181 | | Di-n-butyl phthalate | 120 | 0 | 190 | 190 | 200 | 210 | 1900 | 2040 | 4500 | 7265 | 9243 |
| 182 | | Di-n-octyl phthalate | 133 | 0 | 190 | 190 | 190 | 210 | 1900 | 3600 | 4580 | 8620 | 18360 |
| 183 | | Ethylbenzene | 97 | 0 | 3.92 | 4.22 | 4.3 | 4.7 | 5.4 | 5.6 | 6 | 14.4 | 195.6 |
| 184 | | Fluoranthene | 135 | 0 | 59 | 75 | 76 | 97 | 1100 | 1560 | 3460 | 9370 | 122400 |
| 185 | | Fluorene | 135 | 0 | 73 | 76 | 76.5 | 81 | 720 | 932 | 1800 | 3330 | 6390 |
| 186 | | Indeno(1,2,3-cd)pyrene | 135 | 0 | 71.4 | 76 | 77 | 120 | 795 | 1400 | 3500 | 6130 | 39040 |
| 187 | | Lead | 108 | 0 | 5.7 | 6.48 | 6.9 | 18.45 | 120 | 160 | 299 | 501.6 | 1623 |
| 188 | | Mercury | 98 | 0 | 0.0744 | 0.114 | 0.12 | 0.2 | 0.383 | 0.506 | 0.925 | 1.315 | 4.747 |
| 189 | | Methyl Tert Butyl Ether | 14 | 0 | 4.3 | 4.36 | 4.425 | 4.6 | 5.35 | 5.66 | 5.97 | 6.035 | 6.087 |
| 190 | | Methylene chloride | 10 | 0 | 3.09 | 5.44 | 6 | 6 | 6.188 | 6.4 | 506.3 | 2753 | 4551 |
| 191 | | Molybdenum | 97 | 0 | 0.15 | 0.19 | 0.22 | 0.51 | 1.9 | 2.86 | 3.6 | 12.2 | 30.64 |
| 192 | | Naphthalene | 135 | 0 | 71.4 | 76 | 76 | 81 | 710 | 814 | 2340 | 3330 | 8682 |
| 193 | | Nickel | 104 | 0 | 42 | 50.6 | 52.88 | 86 | 120 | 130 | 160 | 230 | 307.6 |
| 194 | | Nitrobenzene | 13 | 0 | 75.2 | 76 | 76 | 78 | 86 | 1654 | 6460 | 10440 | 14088 |
| 195 | | N-Nitrosodiphenylamine | 120 | 0 | 74 | 76 | 77 | 82 | 752.5 | 1400 | 1800 | 2825 | 3662 |
| 196 | | Phenanthrene | 135 | 0 | 52.8 | 73.8 | 75.5 | 80 | 825 | 1420 | 3100 | 4420 | 61080 |
| 197 | | Phenol | 120 | 0 | 74 | 76 | 77 | 82 | 752.5 | 1400 | 1800 | 2825 | 3662 |
| 198 | | Pyrene | 136 | 0 | 17 | 74 | 75.75 | 150 | 1425 | 2100 | 5450 | 14250 | 206500 |
| 199 | | Selenium | 97 | 0 | 0.326 | 0.38 | 0.5 | 0.93 | 1.1 | 1.2 | 1.4 | 1.84 | 3.56 |
| 200 | | Silver | 98 | 0 | 0.117 | 0.184 | 0.22 | 0.27 | 0.383 | 0.52 | 1.13 | 1.2 | 1.521 |
| 201 | | Thallium | 83 | 0 | 0.42 | 0.49 | 0.53 | 0.58 | 0.845 | 0.992 | 1.5 | 1.89 | 3.762 |
| 202 | | Toluene | 97 | 0 | 2.06 | 4.2 | 4.3 | 4.6 | 5 | 5.38 | 6 | 6 | 20.52 |
| 203 | | Vanadium | 97 | 0 | 28.6 | 31.2 | 33 | 37 | 43 | 44 | 47.8 | 56.6 | 79.44 |
| 204 | | Xylene (total) | 97 | 0 | 2.28 | 6 | 6.4 | 9.2 | 9.9 | 10 | 12 | 27.4 | 668.8 |
| 205 | | Zinc | 99 | 0 | 30.8 | 39.6 | 41 | 54 | 190 | 290 | 436 | 677 | 2302 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | **UCL Statistics for Surface Soils** | | | | | | | | | | | |
| 2 | | | | | | | | | | | | |
| 3 | User Selected Options | | | | | | | | | | | |
| 4 | Date/Time of Computation | 6/2/2015 9:26:25 PM | | | | | | | | | | |
| 5 | From File | Oakland_ProUCLInput.xls | | | | | | | | | | |
| 6 | Full Precision | OFF | | | | | | | | | | |
| 7 | Confidence Coefficient | 95% | | | | | | | | | | |
| 8 | Number of Bootstrap Operations | 2000 | | | | | | | | | | |
| 9 | | | | | | | | | | | | |
| 10 | **1,2-Dichloroethane** | | | | | | | | | | | |
| 11 | | | | | | | | | | | | |
| 12 | **General Statistics** | | | | | | | | | | | |
| 13 | Total Number of Observations | 18 | | | | | Number of Distinct Observations | 14 | | | | |
| 14 | Number of Detects | 1 | | | | | Number of Non-Detects | 17 | | | | |
| 15 | Number of Distinct Detects | 1 | | | | | Number of Distinct Non-Detects | 13 | | | | |
| 16 | | | | | | | | | | | | |
| 17 | **Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!** | | | | | | | | | | | |
| 18 | **It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).** | | | | | | | | | | | |
| 19 | | | | | | | | | | | | |
| 20 | **The data set for variable 1,2-Dichloroethane was not processed!** | | | | | | | | | | | |
| 21 | | | | | | | | | | | | |
| 22 | | | | | | | | | | | | |
| 23 | **2-Methylnaphthalene** | | | | | | | | | | | |
| 24 | | | | | | | | | | | | |
| 25 | **General Statistics** | | | | | | | | | | | |
| 26 | Total Number of Observations | 37 | | | | | Number of Distinct Observations | 30 | | | | |
| 27 | Number of Detects | 11 | | | | | Number of Non-Detects | 26 | | | | |
| 28 | Number of Distinct Detects | 11 | | | | | Number of Distinct Non-Detects | 19 | | | | |
| 29 | Minimum Detect | 13 | | | | | Minimum Non-Detect | 76 | | | | |
| 30 | Maximum Detect | 4800 | | | | | Maximum Non-Detect | 15000 | | | | |
| 31 | Variance Detects | 1975450 | | | | | Percent Non-Detects | 70.27% | | | | |
| 32 | Mean Detects | 575.3 | | | | | SD Detects | 1406 | | | | |
| 33 | Median Detects | 140 | | | | | CV Detects | 2.443 | | | | |
| 34 | Skewness Detects | 3.28 | | | | | Kurtosis Detects | 10.82 | | | | |
| 35 | Mean of Logged Detects | 4.988 | | | | | SD of Logged Detects | 1.538 | | | | |
| 36 | | | | | | | | | | | | |
| 37 | **Normal GOF Test on Detects Only** | | | | | | | | | | | |
| 38 | Shapiro Wilk Test Statistic | 0.417 | | | | | **Shapiro Wilk GOF Test** | | | | | |
| 39 | 5% Shapiro Wilk Critical Value | 0.85 | | | | | Detected Data Not Normal at 5% Significance Level | | | | | |
| 40 | Lilliefors Test Statistic | 0.473 | | | | | **Lilliefors GOF Test** | | | | | |
| 41 | 5% Lilliefors Critical Value | 0.267 | | | | | Detected Data Not Normal at 5% Significance Level | | | | | |
| 42 | **Detected Data Not Normal at 5% Significance Level** | | | | | | | | | | | |
| 43 | | | | | | | | | | | | |
| 44 | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | | | | | |
| 45 | Mean | 255.9 | | | | | Standard Error of Mean | 141.3 | | | | |
| 46 | SD | 786.4 | | | | | 95% KM (BCA) UCL | 515.2 | | | | |
| 47 | 95% KM (t) UCL | 494.4 | | | | | 95% KM (Percentile Bootstrap) UCL | 523.1 | | | | |
| 48 | 95% KM (z) UCL | 488.3 | | | | | 95% KM Bootstrap t UCL | 1171 | | | | |
| 49 | 90% KM Chebyshev UCL | 679.7 | | | | | 95% KM Chebyshev UCL | 871.7 | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 50 | 97.5% KM Chebyshev UCL | | | | | 1138 | 99% KM Chebyshev UCL | | | | | 1662 |
| 51 | | | | | | | | | | | | |
| 52 | **Gamma GOF Tests on Detected Observations Only** | | | | | | | | | | | |
| 53 | A-D Test Statistic | | | | | 1.219 | **Anderson-Darling GOF Test** | | | | | |
| 54 | 5% A-D Critical Value | | | | | 0.787 | Detected Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 55 | K-S Test Statistic | | | | | 0.335 | **Kolmogrov-Smirnoff GOF** | | | | | |
| 56 | 5% K-S Critical Value | | | | | 0.27 | Detected Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 57 | **Detected Data Not Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 58 | | | | | | | | | | | | |
| 59 | **Gamma Statistics on Detected Data Only** | | | | | | | | | | | |
| 60 | k hat (MLE) | | | | | 0.469 | k star (bias corrected MLE) | | | | | 0.402 |
| 61 | Theta hat (MLE) | | | | | 1226 | Theta star (bias corrected MLE) | | | | | 1432 |
| 62 | nu hat (MLE) | | | | | 10.32 | nu star (bias corrected) | | | | | 8.841 |
| 63 | MLE Mean (bias corrected) | | | | | 575.3 | MLE Sd (bias corrected) | | | | | 907.5 |
| 64 | | | | | | | | | | | | |
| 65 | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | | | | | |
| 66 | k hat (KM) | | | | | 0.106 | nu hat (KM) | | | | | 7.833 |
| 67 | Approximate Chi Square Value (7.83, α) | | | | | 2.639 | Adjusted Chi Square Value (7.83, β) | | | | | 2.51 |
| 68 | 95% Gamma Approximate KM-UCL (use when n>=50) | | | | | 759.5 | 95% Gamma Adjusted KM-UCL (use when n<50) | | | | | 798.6 |
| 69 | | | | | | | | | | | | |
| 70 | **Gamma ROS Statistics using Imputed Non-Detects** | | | | | | | | | | | |
| 71 | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | | | | |
| 72 | GROS may not be used when kstar of detected data is small such as < 0.1 | | | | | | | | | | | |
| 73 | For such situations, GROS method tends to yield inflated values of UCLs and BTVs | | | | | | | | | | | |
| 74 | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | | | | |
| 75 | Minimum | | | | | 0.01 | Mean | | | | | 195 |
| 76 | Maximum | | | | | 4800 | Median | | | | | 0.01 |
| 77 | SD | | | | | 785.1 | CV | | | | | 4.025 |
| 78 | k hat (MLE) | | | | | 0.136 | k star (bias corrected MLE) | | | | | 0.143 |
| 79 | Theta hat (MLE) | | | | | 1431 | Theta star (bias corrected MLE) | | | | | 1362 |
| 80 | nu hat (MLE) | | | | | 10.08 | nu star (bias corrected) | | | | | 10.6 |
| 81 | MLE Mean (bias corrected) | | | | | 195 | MLE Sd (bias corrected) | | | | | 515.4 |
| 82 | | | | | | | Adjusted Level of Significance (β) | | | | | 0.0431 |
| 83 | Approximate Chi Square Value (10.60, α) | | | | | 4.32 | Adjusted Chi Square Value (10.60, β) | | | | | 4.146 |
| 84 | 95% Gamma Approximate UCL (use when n>=50) | | | | | 478.6 | 95% Gamma Adjusted UCL (use when n<50) | | | | | 498.6 |
| 85 | | | | | | | | | | | | |
| 86 | **Lognormal GOF Test on Detected Observations Only** | | | | | | | | | | | |
| 87 | Shapiro Wilk Test Statistic | | | | | 0.935 | **Shapiro Wilk GOF Test** | | | | | |
| 88 | 5% Shapiro Wilk Critical Value | | | | | 0.85 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 89 | Lilliefors Test Statistic | | | | | 0.195 | **Lilliefors GOF Test** | | | | | |
| 90 | 5% Lilliefors Critical Value | | | | | 0.267 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 91 | **Detected Data appear Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 92 | | | | | | | | | | | | |
| 93 | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | | | | | |
| 94 | Mean in Original Scale | | | | | 227.4 | Mean in Log Scale | | | | | 4.457 |
| 95 | SD in Original Scale | | | | | 776.4 | SD in Log Scale | | | | | 1.005 |
| 96 | 95% t UCL (assumes normality of ROS data) | | | | | 442.9 | 95% Percentile Bootstrap UCL | | | | | 477.8 |
| 97 | 95% BCA Bootstrap UCL | | | | | 618.6 | 95% Bootstrap t UCL | | | | | 1943 |
| 98 | 95% H-UCL (Log ROS) | | | | | 213.4 | | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 99 | | | | | | | | | | | | |
| 100 | **UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed** | | | | | | | | | | | |
| 101 | | | | | KM Mean (logged) | 4.445 | | | | 95% H-UCL (KM -Log) | 330.4 | |
| 102 | | | | | KM SD (logged) | 1.257 | | | | 95% Critical H Value (KM-Log) | 2.699 | |
| 103 | | | | | KM Standard Error of Mean (logged) | 0.339 | | | | | | |
| 104 | | | | | | | | | | | | |
| 105 | **DL/2 Statistics** | | | | | | | | | | | |
| 106 | **DL/2 Normal** | | | | | | **DL/2 Log-Transformed** | | | | | |
| 107 | | | | | Mean in Original Scale | 1034 | | | | Mean in Log Scale | 5.997 | |
| 108 | | | | | SD in Original Scale | 1492 | | | | SD in Log Scale | 1.557 | |
| 109 | | | | | 95% t UCL (Assumes normality) | 1448 | | | | 95% H-Stat UCL | 3017 | |
| 110 | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | | | | | |
| 111 | | | | | | | | | | | | |
| 112 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 113 | **Detected Data appear Lognormal Distributed at 5% Significance Level** | | | | | | | | | | | |
| 114 | | | | | | | | | | | | |
| 115 | **Suggested UCL to Use** | | | | | | | | | | | |
| 116 | | | | | 97.5% KM (Chebyshev) UCL | 1138 | | | | | | |
| 117 | | | | | | | | | | | | |
| 118 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 119 | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | | | | | |
| 120 | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | | | | | |
| 121 | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 122 | | | | | | | | | | | | |
| 123 | **Acenaphthene** | | | | | | | | | | | |
| 124 | | | | | | | | | | | | |
| 125 | **General Statistics** | | | | | | | | | | | |
| 126 | | | | | Total Number of Observations | 37 | | | | Number of Distinct Observations | 27 | |
| 127 | | | | | Number of Detects | 4 | | | | Number of Non-Detects | 33 | |
| 128 | | | | | Number of Distinct Detects | 4 | | | | Number of Distinct Non-Detects | 23 | |
| 129 | | | | | Minimum Detect | 190 | | | | Minimum Non-Detect | 76 | |
| 130 | | | | | Maximum Detect | 1200 | | | | Maximum Non-Detect | 15000 | |
| 131 | | | | | Variance Detects | 237533 | | | | Percent Non-Detects | 89.19% | |
| 132 | | | | | Mean Detects | 470 | | | | SD Detects | 487.4 | |
| 133 | | | | | Median Detects | 245 | | | | CV Detects | 1.037 | |
| 134 | | | | | Skewness Detects | 1.982 | | | | Kurtosis Detects | 3.944 | |
| 135 | | | | | Mean of Logged Detects | 5.835 | | | | SD of Logged Detects | 0.846 | |
| 136 | | | | | | | | | | | | |
| 137 | **Normal GOF Test on Detects Only** | | | | | | | | | | | |
| 138 | | | | | Shapiro Wilk Test Statistic | 0.679 | **Shapiro Wilk GOF Test** | | | | | |
| 139 | | | | | 5% Shapiro Wilk Critical Value | 0.748 | Detected Data Not Normal at 5% Significance Level | | | | | |
| 140 | | | | | Lilliefors Test Statistic | 0.424 | **Lilliefors GOF Test** | | | | | |
| 141 | | | | | 5% Lilliefors Critical Value | 0.443 | Detected Data appear Normal at 5% Significance Level | | | | | |
| 142 | **Detected Data appear Approximate Normal at 5% Significance Level** | | | | | | | | | | | |
| 143 | | | | | | | | | | | | |
| 144 | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | | | | | |
| 145 | | | | | Mean | 185.9 | | | | Standard Error of Mean | 71.96 | |
| 146 | | | | | SD | 255.9 | | | | 95% KM (BCA) UCL | N/A | |
| 147 | | | | | 95% KM (t) UCL | 307.4 | | | | 95% KM (Percentile Bootstrap) UCL | N/A | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 148 | | | | 95% KM (z) UCL | 304.2 | | | | | 95% KM Bootstrap t UCL | N/A | |
| 149 | | | | 90% KM Chebyshev UCL | 401.8 | | | | | 95% KM Chebyshev UCL | 499.5 | |
| 150 | | | | 97.5% KM Chebyshev UCL | 635.3 | | | | | 99% KM Chebyshev UCL | 901.9 | |
| 151 | | | | | | | | | | | | |
| 152 | **Gamma GOF Tests on Detected Observations Only** | | | | | | | | | | | |
| 153 | | | | A-D Test Statistic | 0.748 | **Anderson-Darling GOF Test** | | | | | | |
| 154 | | | | 5% A-D Critical Value | 0.662 | Detected Data Not Gamma Distributed at 5% Significance Level | | | | | | |
| 155 | | | | K-S Test Statistic | 0.435 | **Kolmogrov-Smirnoff GOF** | | | | | | |
| 156 | | | | 5% K-S Critical Value | 0.399 | Detected Data Not Gamma Distributed at 5% Significance Level | | | | | | |
| 157 | **Detected Data Not Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 158 | | | | | | | | | | | | |
| 159 | **Gamma Statistics on Detected Data Only** | | | | | | | | | | | |
| 160 | | | | k hat (MLE) | 1.72 | | | | | k star (bias corrected MLE) | 0.597 | |
| 161 | | | | Theta hat (MLE) | 273.2 | | | | | Theta star (bias corrected MLE) | 787.5 | |
| 162 | | | | nu hat (MLE) | 13.76 | | | | | nu star (bias corrected) | 4.774 | |
| 163 | | | | MLE Mean (bias corrected) | 470 | | | | | MLE Sd (bias corrected) | 608.4 | |
| 164 | | | | | | | | | | | | |
| 165 | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | | | | | |
| 166 | | | | k hat (KM) | 0.528 | | | | | nu hat (KM) | 39.05 | |
| 167 | | | | Approximate Chi Square Value (39.05, α) | 25.73 | | | | | Adjusted Chi Square Value (39.05, β) | 25.26 | |
| 168 | | | | 95% Gamma Approximate KM-UCL (use when n>=50) | 282 | | | | | 95% Gamma Adjusted KM-UCL (use when n<50) | 287.3 | |
| 169 | | | | | | | | | | | | |
| 170 | **Gamma ROS Statistics using Imputed Non-Detects** | | | | | | | | | | | |
| 171 | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | | | | |
| 172 | GROS may not be used when kstar of detected data is small such as < 0.1 | | | | | | | | | | | |
| 173 | For such situations, GROS method tends to yield inflated values of UCLs and BTVs | | | | | | | | | | | |
| 174 | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | | | | |
| 175 | | | | Minimum | 0.01 | | | | | Mean | 59.95 | |
| 176 | | | | Maximum | 1200 | | | | | Median | 0.01 | |
| 177 | | | | SD | 204.7 | | | | | CV | 3.415 | |
| 178 | | | | k hat (MLE) | 0.125 | | | | | k star (bias corrected MLE) | 0.133 | |
| 179 | | | | Theta hat (MLE) | 479.8 | | | | | Theta star (bias corrected MLE) | 451.3 | |
| 180 | | | | nu hat (MLE) | 9.246 | | | | | nu star (bias corrected) | 9.83 | |
| 181 | | | | MLE Mean (bias corrected) | 59.95 | | | | | MLE Sd (bias corrected) | 164.5 | |
| 182 | | | | | | | | | | Adjusted Level of Significance (β) | 0.0431 | |
| 183 | | | | Approximate Chi Square Value (9.83, α) | 3.836 | | | | | Adjusted Chi Square Value (9.83, β) | 3.674 | |
| 184 | | | | 95% Gamma Approximate UCL (use when n>=50) | 153.6 | | | | | 95% Gamma Adjusted UCL (use when n<50) | N/A | |
| 185 | | | | | | | | | | | | |
| 186 | **Lognormal GOF Test on Detected Observations Only** | | | | | | | | | | | |
| 187 | | | | Shapiro Wilk Test Statistic | 0.756 | **Shapiro Wilk GOF Test** | | | | | | |
| 188 | | | | 5% Shapiro Wilk Critical Value | 0.748 | Detected Data appear Lognormal at 5% Significance Level | | | | | | |
| 189 | | | | Lilliefors Test Statistic | 0.395 | **Lilliefors GOF Test** | | | | | | |
| 190 | | | | 5% Lilliefors Critical Value | 0.443 | Detected Data appear Lognormal at 5% Significance Level | | | | | | |
| 191 | **Detected Data appear Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 192 | | | | | | | | | | | | |
| 193 | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | | | | | |
| 194 | | | | Mean in Original Scale | 118.6 | | | | | Mean in Log Scale | 4.37 | |
| 195 | | | | SD in Original Scale | 192 | | | | | SD in Log Scale | 0.76 | |
| 196 | | | | 95% t UCL (assumes normality of ROS data) | 171.9 | | | | | 95% Percentile Bootstrap UCL | 177.2 | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 197 | | | | 95% BCA Bootstrap UCL | | 216.7 | | | | 95% Bootstrap t UCL | | 274.2 |
| 198 | | | | 95% H-UCL (Log ROS) | | 138.3 | | | | | | |
| 199 | | | | | | | | | | | | |
| 200 | **UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed** | | | | | | | | | | | |
| 201 | | | | KM Mean (logged) | | 4.826 | | | | 95% H-UCL (KM -Log) | | 213.9 |
| 202 | | | | KM SD (logged) | | 0.744 | | | | 95% Critical H Value (KM-Log) | | 2.121 |
| 203 | | | | KM Standard Error of Mean (logged) | | 0.24 | | | | | | |
| 204 | | | | | | | | | | | | |
| 205 | **DL/2 Statistics** | | | | | | | | | | | |
| 206 | **DL/2 Normal** | | | | | | **DL/2 Log-Transformed** | | | | | |
| 207 | | | | Mean in Original Scale | | 981.9 | | | | Mean in Log Scale | | 6.162 |
| 208 | | | | SD in Original Scale | | 1330 | | | | SD in Log Scale | | 1.354 |
| 209 | | | | 95% t UCL (Assumes normality) | | 1351 | | | | 95% H-Stat UCL | | 2242 |
| 210 | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | | | | | |
| 211 | | | | | | | | | | | | |
| 212 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 213 | **Detected Data appear Approximate Normal Distributed at 5% Significance Level** | | | | | | | | | | | |
| 214 | | | | | | | | | | | | |
| 215 | **Suggested UCL to Use** | | | | | | | | | | | |
| 216 | | | | 95% KM (t) UCL | | 307.4 | | | | 95% KM (Percentile Bootstrap) UCL | | N/A |
| 217 | **Warning: One or more Recommended UCL(s) not available!** | | | | | | | | | | | |
| 218 | | | | | | | | | | | | |
| 219 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 220 | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | | | | | |
| 221 | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | | | | | |
| 222 | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 223 | | | | | | | | | | | | |
| 224 | **Acenaphthylene** | | | | | | | | | | | |
| 225 | | | | | | | | | | | | |
| 226 | **General Statistics** | | | | | | | | | | | |
| 227 | | | | Total Number of Observations | | 37 | | | | Number of Distinct Observations | | 31 |
| 228 | | | | Number of Detects | | 12 | | | | Number of Non-Detects | | 25 |
| 229 | | | | Number of Distinct Detects | | 12 | | | | Number of Distinct Non-Detects | | 20 |
| 230 | | | | Minimum Detect | | 15 | | | | Minimum Non-Detect | | 77 |
| 231 | | | | Maximum Detect | | 44000 | | | | Maximum Non-Detect | | 6900 |
| 232 | | | | Variance Detects | | 1.603E+8 | | | | Percent Non-Detects | | 67.57% |
| 233 | | | | Mean Detects | | 4787 | | | | SD Detects | | 12662 |
| 234 | | | | Median Detects | | 225 | | | | CV Detects | | 2.645 |
| 235 | | | | Skewness Detects | | 3.199 | | | | Kurtosis Detects | | 10.49 |
| 236 | | | | Mean of Logged Detects | | 5.818 | | | | SD of Logged Detects | | 2.389 |
| 237 | | | | | | | | | | | | |
| 238 | **Normal GOF Test on Detects Only** | | | | | | | | | | | |
| 239 | | | | Shapiro Wilk Test Statistic | | 0.44 | **Shapiro Wilk GOF Test** | | | | | |
| 240 | | | | 5% Shapiro Wilk Critical Value | | 0.859 | Detected Data Not Normal at 5% Significance Level | | | | | |
| 241 | | | | Lilliefors Test Statistic | | 0.445 | **Lilliefors GOF Test** | | | | | |
| 242 | | | | 5% Lilliefors Critical Value | | 0.256 | Detected Data Not Normal at 5% Significance Level | | | | | |
| 243 | **Detected Data Not Normal at 5% Significance Level** | | | | | | | | | | | |
| 244 | | | | | | | | | | | | |
| 245 | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 246 | | | | | Mean | 1661 | | | | Standard Error of Mean | | 1244 |
| 247 | | | | | SD | 7239 | | | | 95% KM (BCA) UCL | | 4002 |
| 248 | | | | | 95% KM (t) UCL | 3762 | | | | 95% KM (Percentile Bootstrap) UCL | | 3969 |
| 249 | | | | | 95% KM (z) UCL | 3708 | | | | 95% KM Bootstrap t UCL | | 28911 |
| 250 | | | | | 90% KM Chebyshev UCL | 5394 | | | | 95% KM Chebyshev UCL | | 7084 |
| 251 | | | | | 97.5% KM Chebyshev UCL | 9430 | | | | 99% KM Chebyshev UCL | | 14039 |
| 252 | | | | | | | | | | | | |
| 253 | **Gamma GOF Tests on Detected Observations Only** | | | | | | | | | | | |
| 254 | | | | | A-D Test Statistic | 1.167 | **Anderson-Darling GOF Test** | | | | | |
| 255 | | | | | 5% A-D Critical Value | 0.841 | Detected Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 256 | | | | | K-S Test Statistic | 0.301 | **Kolmogrov-Smirnoff GOF** | | | | | |
| 257 | | | | | 5% K-S Critical Value | 0.268 | Detected Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 258 | **Detected Data Not Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 259 | | | | | | | | | | | | |
| 260 | **Gamma Statistics on Detected Data Only** | | | | | | | | | | | |
| 261 | | | | | k hat (MLE) | 0.265 | | | | k star (bias corrected MLE) | | 0.254 |
| 262 | | | | | Theta hat (MLE) | 18068 | | | | Theta star (bias corrected MLE) | | 18827 |
| 263 | | | | | nu hat (MLE) | 6.359 | | | | nu star (bias corrected) | | 6.102 |
| 264 | | | | | MLE Mean (bias corrected) | 4787 | | | | MLE Sd (bias corrected) | | 9494 |
| 265 | | | | | | | | | | | | |
| 266 | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | | | | | |
| 267 | | | | | k hat (KM) | 0.0527 | | | | nu hat (KM) | | 3.898 |
| 268 | | | | | Approximate Chi Square Value (3.90, α) | 0.682 | | | | Adjusted Chi Square Value (3.90, β) | | 0.628 |
| 269 | | | | | 95% Gamma Approximate KM-UCL (use when n>=50) | 9499 | | | | 95% Gamma Adjusted KM-UCL (use when n<50) | | 10305 |
| 270 | Gamma (KM) may not be used when k hat (KM) is < 0.1 | | | | | | | | | | | |
| 271 | | | | | | | | | | | | |
| 272 | **Gamma ROS Statistics using Imputed Non-Detects** | | | | | | | | | | | |
| 273 | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | | | | |
| 274 | GROS may not be used when kstar of detected data is small such as < 0.1 | | | | | | | | | | | |
| 275 | For such situations, GROS method tends to yield inflated values of UCLs and BTVs | | | | | | | | | | | |
| 276 | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | | | | |
| 277 | | | | | Minimum | 0.01 | | | | Mean | | 1554 |
| 278 | | | | | Maximum | 44000 | | | | Median | | 0.01 |
| 279 | | | | | SD | 7359 | | | | CV | | 4.736 |
| 280 | | | | | k hat (MLE) | 0.0976 | | | | k star (bias corrected MLE) | | 0.108 |
| 281 | | | | | Theta hat (MLE) | 15917 | | | | Theta star (bias corrected MLE) | | 14424 |
| 282 | | | | | nu hat (MLE) | 7.224 | | | | nu star (bias corrected) | | 7.972 |
| 283 | | | | | MLE Mean (bias corrected) | 1554 | | | | MLE Sd (bias corrected) | | 4734 |
| 284 | | | | | | | | | | Adjusted Level of Significance (β) | | 0.0431 |
| 285 | | | | | Approximate Chi Square Value (7.97, α) | 2.719 | | | | Adjusted Chi Square Value (7.97, β) | | 2.587 |
| 286 | | | | | 95% Gamma Approximate UCL (use when n>=50) | 4556 | | | | 95% Gamma Adjusted UCL (use when n<50) | | 4788 |
| 287 | | | | | | | | | | | | |
| 288 | **Lognormal GOF Test on Detected Observations Only** | | | | | | | | | | | |
| 289 | | | | | Shapiro Wilk Test Statistic | 0.946 | **Shapiro Wilk GOF Test** | | | | | |
| 290 | | | | | 5% Shapiro Wilk Critical Value | 0.859 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 291 | | | | | Lilliefors Test Statistic | 0.132 | **Lilliefors GOF Test** | | | | | |
| 292 | | | | | 5% Lilliefors Critical Value | 0.256 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 293 | **Detected Data appear Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 294 | | | | | | | | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 295 | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | | | | | |
| 296 | | | | | Mean in Original Scale | 1612 | | | | Mean in Log Scale | | 4.719 |
| 297 | | | | | SD in Original Scale | 7346 | | | | SD in Log Scale | | 1.652 |
| 298 | | | | | 95% t UCL (assumes normality of ROS data) | 3651 | | | | 95% Percentile Bootstrap UCL | | 3922 |
| 299 | | | | | 95% BCA Bootstrap UCL | 5651 | | | | 95% Bootstrap t UCL | | 50664 |
| 300 | | | | | 95% H-UCL (Log ROS) | 1066 | | | | | | |
| 301 | | | | | | | | | | | | |
| 302 | **UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed** | | | | | | | | | | | |
| 303 | | | | | KM Mean (logged) | 4.714 | | | | 95% H-UCL (KM -Log) | | 1738 |
| 304 | | | | | KM SD (logged) | 1.833 | | | | 95% Critical H Value (KM-Log) | | 3.487 |
| 305 | | | | | KM Standard Error of Mean (logged) | 0.424 | | | | | | |
| 306 | | | | | | | | | | | | |
| 307 | **DL/2 Statistics** | | | | | | | | | | | |
| 308 | | | | | **DL/2 Normal** | | | | | **DL/2 Log-Transformed** | | |
| 309 | | | | | Mean in Original Scale | 2177 | | | | Mean in Log Scale | | 6.162 |
| 310 | | | | | SD in Original Scale | 7266 | | | | SD in Log Scale | | 1.662 |
| 311 | | | | | 95% t UCL (Assumes normality) | 4193 | | | | 95% H-Stat UCL | | 4631 |
| 312 | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | | | | | |
| 313 | | | | | | | | | | | | |
| 314 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 315 | **Detected Data appear Lognormal Distributed at 5% Significance Level** | | | | | | | | | | | |
| 316 | | | | | | | | | | | | |
| 317 | **Suggested UCL to Use** | | | | | | | | | | | |
| 318 | | | | | 99% KM (Chebyshev) UCL | 14039 | | | | | | |
| 319 | | | | | | | | | | | | |
| 320 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 321 | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | | | | | |
| 322 | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | | | | | |
| 323 | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 324 | | | | | | | | | | | | |
| 325 | **Acetone** | | | | | | | | | | | |
| 326 | | | | | | | | | | | | |
| 327 | **General Statistics** | | | | | | | | | | | |
| 328 | | | | | Total Number of Observations | 4 | | | | Number of Distinct Observations | | 4 |
| 329 | | | | | Number of Detects | 3 | | | | Number of Non-Detects | | 1 |
| 330 | | | | | Number of Distinct Detects | 3 | | | | Number of Distinct Non-Detects | | 1 |
| 331 | | | | | Minimum Detect | 30 | | | | Minimum Non-Detect | | 10000 |
| 332 | | | | | Maximum Detect | 120 | | | | Maximum Non-Detect | | 10000 |
| 333 | | | | | Variance Detects | 2052 | | | | Percent Non-Detects | | 25% |
| 334 | | | | | Mean Detects | 78 | | | | SD Detects | | 45.3 |
| 335 | | | | | Median Detects | 84 | | | | CV Detects | | 0.581 |
| 336 | | | | | Skewness Detects | -0.586 | | | | Kurtosis Detects | | N/A |
| 337 | | | | | Mean of Logged Detects | 4.207 | | | | SD of Logged Detects | | 0.72 |
| 338 | | | | | | | | | | | | |
| 339 | **Warning: Data set has only 3 Detected Values.** | | | | | | | | | | | |
| 340 | **This is not enough to compute meaningful or reliable statistics and estimates.** | | | | | | | | | | | |
| 341 | | | | | | | | | | | | |
| 342 | | | | | | | | | | | | |
| 343 | **Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use** | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 344 | guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest. | | | | | | | | | | | |
| 345 | For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012). | | | | | | | | | | | |
| 346 | Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.0 | | | | | | | | | | | |
| 347 | | | | | | | | | | | | |
| 348 | Normal GOF Test on Detects Only | | | | | | | | | | | |
| 349 | | | | | Shapiro Wilk Test Statistic | 0.987 | Shapiro Wilk GOF Test | | | | | |
| 350 | | | | | 5% Shapiro Wilk Critical Value | 0.767 | Detected Data appear Normal at 5% Significance Level | | | | | |
| 351 | | | | | Lilliefors Test Statistic | 0.219 | Lilliefors GOF Test | | | | | |
| 352 | | | | | 5% Lilliefors Critical Value | 0.512 | Detected Data appear Normal at 5% Significance Level | | | | | |
| 353 | Detected Data appear Normal at 5% Significance Level | | | | | | | | | | | |
| 354 | | | | | | | | | | | | |
| 355 | Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs | | | | | | | | | | | |
| 356 | | | | | Mean | 78 | | | Standard Error of Mean | 26.15 | | |
| 357 | | | | | SD | 36.99 | | | 95% KM (BCA) UCL | N/A | | |
| 358 | | | | | 95% KM (t) UCL | 139.5 | | | 95% KM (Percentile Bootstrap) UCL | N/A | | |
| 359 | | | | | 95% KM (z) UCL | 121 | | | 95% KM Bootstrap t UCL | N/A | | |
| 360 | | | | | 90% KM Chebyshev UCL | 156.5 | | | 95% KM Chebyshev UCL | 192 | | |
| 361 | | | | | 97.5% KM Chebyshev UCL | 241.3 | | | 99% KM Chebyshev UCL | 338.2 | | |
| 362 | | | | | | | | | | | | |
| 363 | Gamma GOF Tests on Detected Observations Only | | | | | | | | | | | |
| 364 | Not Enough Data to Perform GOF Test | | | | | | | | | | | |
| 365 | | | | | | | | | | | | |
| 366 | Gamma Statistics on Detected Data Only | | | | | | | | | | | |
| 367 | | | | | k hat (MLE) | 3.487 | | | k star (bias corrected MLE) | N/A | | |
| 368 | | | | | Theta hat (MLE) | 22.37 | | | Theta star (bias corrected MLE) | N/A | | |
| 369 | | | | | nu hat (MLE) | 20.92 | | | nu star (bias corrected) | N/A | | |
| 370 | | | | | MLE Mean (bias corrected) | N/A | | | MLE Sd (bias corrected) | N/A | | |
| 371 | | | | | | | | | | | | |
| 372 | Gamma Kaplan-Meier (KM) Statistics | | | | | | | | | | | |
| 373 | | | | | k hat (KM) | 4.447 | | | nu hat (KM) | 35.58 | | |
| 374 | | | | | | | | | Adjusted Level of Significance (β) | 0.00498 | | |
| 375 | | | | | Approximate Chi Square Value (35.58, α) | 22.93 | | | Adjusted Chi Square Value (35.58, β) | 17.59 | | |
| 376 | | | | | 95% Gamma Approximate KM-UCL (use when n>=50) | 121 | | | 95% Gamma Adjusted KM-UCL (use when n<50) | 157.8 | | |
| 377 | | | | | | | | | | | | |
| 378 | Lognormal GOF Test on Detected Observations Only | | | | | | | | | | | |
| 379 | | | | | Shapiro Wilk Test Statistic | 0.927 | Shapiro Wilk GOF Test | | | | | |
| 380 | | | | | 5% Shapiro Wilk Critical Value | 0.767 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 381 | | | | | Lilliefors Test Statistic | 0.289 | Lilliefors GOF Test | | | | | |
| 382 | | | | | 5% Lilliefors Critical Value | 0.512 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 383 | Detected Data appear Lognormal at 5% Significance Level | | | | | | | | | | | |
| 384 | | | | | | | | | | | | |
| 385 | Lognormal ROS Statistics Using Imputed Non-Detects | | | | | | | | | | | |
| 386 | | | | | Mean in Original Scale | 75.28 | | | Mean in Log Scale | 4.207 | | |
| 387 | | | | | SD in Original Scale | 37.38 | | | SD in Log Scale | 0.588 | | |
| 388 | | | | | 95% t UCL (assumes normality of ROS data) | 119.3 | | | 95% Percentile Bootstrap UCL | N/A | | |
| 389 | | | | | 95% BCA Bootstrap UCL | N/A | | | 95% Bootstrap t UCL | N/A | | |
| 390 | | | | | 95% H-UCL (Log ROS) | 324.9 | | | | | | |
| 391 | | | | | | | | | | | | |
| 392 | UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed | | | | | | | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 393 | KM Mean (logged) | | | | | 4.207 | 95% H-UCL (KM -Log) | | | | | 324.9 |
| 394 | KM SD (logged) | | | | | 0.588 | 95% Critical H Value (KM-Log) | | | | | 4.138 |
| 395 | KM Standard Error of Mean (logged) | | | | | 0.416 | | | | | | |
| 396 | | | | | | | | | | | | |
| 397 | **DL/2 Statistics** | | | | | | | | | | | |
| 398 | **DL/2 Normal** | | | | | | **DL/2 Log-Transformed** | | | | | |
| 399 | Mean in Original Scale | | | | | 1309 | Mean in Log Scale | | | | | 5.284 |
| 400 | SD in Original Scale | | | | | 2461 | SD in Log Scale | | | | | 2.234 |
| 401 | 95% t UCL (Assumes normality) | | | | | 4205 | 95% H-Stat UCL | | | | | 3.733E+11 |
| 402 | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | | | | | |
| 403 | | | | | | | | | | | | |
| 404 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 405 | **Detected Data appear Normal Distributed at 5% Significance Level** | | | | | | | | | | | |
| 406 | | | | | | | | | | | | |
| 407 | **Suggested UCL to Use** | | | | | | | | | | | |
| 408 | 95% KM (t) UCL | | | | | 139.5 | 95% KM (Percentile Bootstrap) UCL | | | | | N/A |
| 409 | **Warning: One or more Recommended UCL(s) not available!** | | | | | | | | | | | |
| 410 | | | | | | | | | | | | |
| 411 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 412 | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | | | | | |
| 413 | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | | | | | |
| 414 | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 415 | | | | | | | | | | | | |
| 416 | **Anthracene** | | | | | | | | | | | |
| 417 | | | | | | | | | | | | |
| 418 | **General Statistics** | | | | | | | | | | | |
| 419 | Total Number of Observations | | | | | 37 | Number of Distinct Observations | | | | | 30 |
| 420 | Number of Detects | | | | | 14 | Number of Non-Detects | | | | | 23 |
| 421 | Number of Distinct Detects | | | | | 13 | Number of Distinct Non-Detects | | | | | 17 |
| 422 | Minimum Detect | | | | | 7.2 | Minimum Non-Detect | | | | | 76 |
| 423 | Maximum Detect | | | | | 25000 | Maximum Non-Detect | | | | | 6900 |
| 424 | Variance Detects | | | | | 46137915 | Percent Non-Detects | | | | | 62.16% |
| 425 | Mean Detects | | | | | 2615 | SD Detects | | | | | 6792 |
| 426 | Median Detects | | | | | 345 | CV Detects | | | | | 2.597 |
| 427 | Skewness Detects | | | | | 3.219 | Kurtosis Detects | | | | | 10.68 |
| 428 | Mean of Logged Detects | | | | | 5.613 | SD of Logged Detects | | | | | 2.163 |
| 429 | | | | | | | | | | | | |
| 430 | **Normal GOF Test on Detects Only** | | | | | | | | | | | |
| 431 | Shapiro Wilk Test Statistic | | | | | 0.438 | **Shapiro Wilk GOF Test** | | | | | |
| 432 | 5% Shapiro Wilk Critical Value | | | | | 0.874 | Detected Data Not Normal at 5% Significance Level | | | | | |
| 433 | Lilliefors Test Statistic | | | | | 0.459 | **Lilliefors GOF Test** | | | | | |
| 434 | 5% Lilliefors Critical Value | | | | | 0.237 | Detected Data Not Normal at 5% Significance Level | | | | | |
| 435 | **Detected Data Not Normal at 5% Significance Level** | | | | | | | | | | | |
| 436 | | | | | | | | | | | | |
| 437 | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | | | | | |
| 438 | Mean | | | | | 1098 | Standard Error of Mean | | | | | 717.6 |
| 439 | SD | | | | | 4200 | 95% KM (BCA) UCL | | | | | 2431 |
| 440 | 95% KM (t) UCL | | | | | 2310 | 95% KM (Percentile Bootstrap) UCL | | | | | 2325 |
| 441 | 95% KM (z) UCL | | | | | 2278 | 95% KM Bootstrap t UCL | | | | | 13991 |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 442 | | | | | 90% KM Chebyshev UCL | 3251 | | | | 95% KM Chebyshev UCL | | 4226 |
| 443 | | | | | 97.5% KM Chebyshev UCL | 5579 | | | | 99% KM Chebyshev UCL | | 8238 |
| 444 | | | | | | | | | | | | |
| 445 | | | | | **Gamma GOF Tests on Detected Observations Only** | | | | | | | |
| 446 | | | | | A-D Test Statistic | 1.394 | **Anderson-Darling GOF Test** | | | | | |
| 447 | | | | | 5% A-D Critical Value | 0.831 | Detected Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 448 | | | | | K-S Test Statistic | 0.331 | **Kolmogrov-Smirnoff GOF** | | | | | |
| 449 | | | | | 5% K-S Critical Value | 0.248 | Detected Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 450 | | | | | **Detected Data Not Gamma Distributed at 5% Significance Level** | | | | | | | |
| 451 | | | | | | | | | | | | |
| 452 | | | | | **Gamma Statistics on Detected Data Only** | | | | | | | |
| 453 | | | | | k hat (MLE) | 0.305 | k star (bias corrected MLE) | | | | | 0.287 |
| 454 | | | | | Theta hat (MLE) | 8580 | Theta star (bias corrected MLE) | | | | | 9109 |
| 455 | | | | | nu hat (MLE) | 8.535 | nu star (bias corrected) | | | | | 8.039 |
| 456 | | | | | MLE Mean (bias corrected) | 2615 | MLE Sd (bias corrected) | | | | | 4881 |
| 457 | | | | | | | | | | | | |
| 458 | | | | | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | |
| 459 | | | | | k hat (KM) | 0.0684 | nu hat (KM) | | | | | 5.058 |
| 460 | | | | | Approximate Chi Square Value (5.06, α) | 1.179 | Adjusted Chi Square Value (5.06, β) | | | | | 1.101 |
| 461 | | | | | 95% Gamma Approximate KM-UCL (use when n>=50) | 4710 | 95% Gamma Adjusted KM-UCL (use when n<50) | | | | | 5043 |
| 462 | | | | | Gamma (KM) may not be used when k hat (KM) is < 0.1 | | | | | | | |
| 463 | | | | | | | | | | | | |
| 464 | | | | | **Gamma ROS Statistics using Imputed Non-Detects** | | | | | | | |
| 465 | | | | | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | |
| 466 | | | | | GROS may not be used when kstar of detected data is small such as < 0.1 | | | | | | | |
| 467 | | | | | For such situations, GROS method tends to yield inflated values of UCLs and BTVs | | | | | | | |
| 468 | | | | | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | |
| 469 | | | | | Minimum | 0.01 | Mean | | | | | 1007 |
| 470 | | | | | Maximum | 25000 | Median | | | | | 0.01 |
| 471 | | | | | SD | 4277 | CV | | | | | 4.248 |
| 472 | | | | | k hat (MLE) | 0.109 | k star (bias corrected MLE) | | | | | 0.118 |
| 473 | | | | | Theta hat (MLE) | 9220 | Theta star (bias corrected MLE) | | | | | 8506 |
| 474 | | | | | nu hat (MLE) | 8.08 | nu star (bias corrected) | | | | | 8.758 |
| 475 | | | | | MLE Mean (bias corrected) | 1007 | MLE Sd (bias corrected) | | | | | 2926 |
| 476 | | | | | | | Adjusted Level of Significance (β) | | | | | 0.0431 |
| 477 | | | | | Approximate Chi Square Value (8.76, α) | 3.182 | Adjusted Chi Square Value (8.76, β) | | | | | 3.037 |
| 478 | | | | | 95% Gamma Approximate UCL (use when n>=50) | 2771 | 95% Gamma Adjusted UCL (use when n<50) | | | | | 2904 |
| 479 | | | | | | | | | | | | |
| 480 | | | | | **Lognormal GOF Test on Detected Observations Only** | | | | | | | |
| 481 | | | | | Shapiro Wilk Test Statistic | 0.955 | **Shapiro Wilk GOF Test** | | | | | |
| 482 | | | | | 5% Shapiro Wilk Critical Value | 0.874 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 483 | | | | | Lilliefors Test Statistic | 0.187 | **Lilliefors GOF Test** | | | | | |
| 484 | | | | | 5% Lilliefors Critical Value | 0.237 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 485 | | | | | **Detected Data appear Lognormal at 5% Significance Level** | | | | | | | |
| 486 | | | | | | | | | | | | |
| 487 | | | | | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | |
| 488 | | | | | Mean in Original Scale | 1056 | Mean in Log Scale | | | | | 4.842 |
| 489 | | | | | SD in Original Scale | 4265 | SD in Log Scale | | | | | 1.564 |
| 490 | | | | | 95% t UCL (assumes normality of ROS data) | 2240 | 95% Percentile Bootstrap UCL | | | | | 2391 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 491 | | | | 95% BCA Bootstrap UCL | | 3290 | | | | 95% Bootstrap t UCL | | 23975 |
| 492 | | | | 95% H-UCL (Log ROS) | | 967.3 | | | | | | |
| 493 | | | | | | | | | | | | |
| 494 | **UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed** | | | | | | | | | | | |
| 495 | | | | KM Mean (logged) | | 4.815 | | | | 95% H-UCL (KM -Log) | | 1812 |
| 496 | | | | KM SD (logged) | | 1.813 | | | | 95% Critical H Value (KM-Log) | | 3.457 |
| 497 | | | | KM Standard Error of Mean (logged) | | 0.432 | | | | | | |
| 498 | | | | | | | | | | | | |
| 499 | **DL/2 Statistics** | | | | | | | | | | | |
| 500 | **DL/2 Normal** | | | | | | **DL/2 Log-Transformed** | | | | | |
| 501 | | | | Mean in Original Scale | | 1628 | | | | Mean in Log Scale | | 6.127 |
| 502 | | | | SD in Original Scale | | 4204 | | | | SD in Log Scale | | 1.679 |
| 503 | | | | 95% t UCL (Assumes normality) | | 2795 | | | | 95% H-Stat UCL | | 4678 |
| 504 | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | | | | | |
| 505 | | | | | | | | | | | | |
| 506 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 507 | **Detected Data appear Lognormal Distributed at 5% Significance Level** | | | | | | | | | | | |
| 508 | | | | | | | | | | | | |
| 509 | **Suggested UCL to Use** | | | | | | | | | | | |
| 510 | | | | 99% KM (Chebyshev) UCL | | 8238 | | | | | | |
| 511 | | | | | | | | | | | | |
| 512 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 513 | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | | | | | |
| 514 | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | | | | | |
| 515 | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 516 | | | | | | | | | | | | |
| 517 | **Antimony** | | | | | | | | | | | |
| 518 | | | | | | | | | | | | |
| 519 | **General Statistics** | | | | | | | | | | | |
| 520 | | | | Total Number of Observations | | 25 | | | | Number of Distinct Observations | | 24 |
| 521 | | | | Number of Detects | | 19 | | | | Number of Non-Detects | | 6 |
| 522 | | | | Number of Distinct Detects | | 19 | | | | Number of Distinct Non-Detects | | 5 |
| 523 | | | | Minimum Detect | | 0.14 | | | | Minimum Non-Detect | | 0.45 |
| 524 | | | | Maximum Detect | | 6 | | | | Maximum Non-Detect | | 7.4 |
| 525 | | | | Variance Detects | | 3.396 | | | | Percent Non-Detects | | 24% |
| 526 | | | | Mean Detects | | 1.762 | | | | SD Detects | | 1.843 |
| 527 | | | | Median Detects | | 1.1 | | | | CV Detects | | 1.046 |
| 528 | | | | Skewness Detects | | 1.325 | | | | Kurtosis Detects | | 0.774 |
| 529 | | | | Mean of Logged Detects | | -0.0257 | | | | SD of Logged Detects | | 1.2 |
| 530 | | | | | | | | | | | | |
| 531 | **Normal GOF Test on Detects Only** | | | | | | | | | | | |
| 532 | | | | Shapiro Wilk Test Statistic | | 0.814 | **Shapiro Wilk GOF Test** | | | | | |
| 533 | | | | 5% Shapiro Wilk Critical Value | | 0.901 | Detected Data Not Normal at 5% Significance Level | | | | | |
| 534 | | | | Lilliefors Test Statistic | | 0.199 | **Lilliefors GOF Test** | | | | | |
| 535 | | | | 5% Lilliefors Critical Value | | 0.203 | Detected Data appear Normal at 5% Significance Level | | | | | |
| 536 | **Detected Data appear Approximate Normal at 5% Significance Level** | | | | | | | | | | | |
| 537 | | | | | | | | | | | | |
| 538 | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | | | | | |
| 539 | | | | Mean | | 1.554 | | | | Standard Error of Mean | | 0.383 |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 540 | | | | | SD | 1.748 | | | | 95% KM (BCA) UCL | | 2.166 |
| 541 | | | | | 95% KM (t) UCL | 2.209 | | | | 95% KM (Percentile Bootstrap) UCL | | 2.215 |
| 542 | | | | | 95% KM (z) UCL | 2.184 | | | | 95% KM Bootstrap t UCL | | 2.475 |
| 543 | | | | | 90% KM Chebyshev UCL | 2.702 | | | | 95% KM Chebyshev UCL | | 3.223 |
| 544 | | | | | 97.5% KM Chebyshev UCL | 3.945 | | | | 99% KM Chebyshev UCL | | 5.363 |
| 545 | | | | | | | | | | | | |
| 546 | **Gamma GOF Tests on Detected Observations Only** | | | | | | | | | | | |
| 547 | | | | | A-D Test Statistic | 0.354 | **Anderson-Darling GOF Test** | | | | | |
| 548 | | | | | 5% A-D Critical Value | 0.77 | Detected data appear Gamma Distributed at 5% Significance Level | | | | | |
| 549 | | | | | K-S Test Statistic | 0.126 | **Kolmogrov-Smirnoff GOF** | | | | | |
| 550 | | | | | 5% K-S Critical Value | 0.204 | Detected data appear Gamma Distributed at 5% Significance Level | | | | | |
| 551 | **Detected data appear Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 552 | | | | | | | | | | | | |
| 553 | **Gamma Statistics on Detected Data Only** | | | | | | | | | | | |
| 554 | | | | | k hat (MLE) | 0.977 | | | | k star (bias corrected MLE) | | 0.858 |
| 555 | | | | | Theta hat (MLE) | 1.803 | | | | Theta star (bias corrected MLE) | | 2.053 |
| 556 | | | | | nu hat (MLE) | 37.14 | | | | nu star (bias corrected) | | 32.61 |
| 557 | | | | | MLE Mean (bias corrected) | 1.762 | | | | MLE Sd (bias corrected) | | 1.902 |
| 558 | | | | | | | | | | | | |
| 559 | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | | | | | |
| 560 | | | | | k hat (KM) | 0.791 | | | | nu hat (KM) | | 39.53 |
| 561 | | | | | Approximate Chi Square Value (39.53, α) | 26.12 | | | | Adjusted Chi Square Value (39.53, β) | | 25.38 |
| 562 | | | | | 95% Gamma Approximate KM-UCL (use when n>=50) | 2.351 | | | | 95% Gamma Adjusted KM-UCL (use when n<50) | | 2.42 |
| 563 | | | | | | | | | | | | |
| 564 | **Gamma ROS Statistics using Imputed Non-Detects** | | | | | | | | | | | |
| 565 | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | | | | |
| 566 | GROS may not be used when kstar of detected data is small such as < 0.1 | | | | | | | | | | | |
| 567 | For such situations, GROS method tends to yield inflated values of UCLs and BTVs | | | | | | | | | | | |
| 568 | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | | | | |
| 569 | | | | | Minimum | 0.01 | | | | Mean | | 1.467 |
| 570 | | | | | Maximum | 6 | | | | Median | | 0.99 |
| 571 | | | | | SD | 1.7 | | | | CV | | 1.159 |
| 572 | | | | | k hat (MLE) | 0.723 | | | | k star (bias corrected MLE) | | 0.663 |
| 573 | | | | | Theta hat (MLE) | 2.028 | | | | Theta star (bias corrected MLE) | | 2.211 |
| 574 | | | | | nu hat (MLE) | 36.17 | | | | nu star (bias corrected) | | 33.16 |
| 575 | | | | | MLE Mean (bias corrected) | 1.467 | | | | MLE Sd (bias corrected) | | 1.801 |
| 576 | | | | | | | | | | Adjusted Level of Significance (β) | | 0.0395 |
| 577 | | | | | Approximate Chi Square Value (33.16, α) | 21 | | | | Adjusted Chi Square Value (33.16, β) | | 20.34 |
| 578 | | | | | 95% Gamma Approximate UCL (use when n>=50) | 2.317 | | | | 95% Gamma Adjusted UCL (use when n<50) | | 2.392 |
| 579 | | | | | | | | | | | | |
| 580 | **Lognormal GOF Test on Detected Observations Only** | | | | | | | | | | | |
| 581 | | | | | Shapiro Wilk Test Statistic | 0.947 | **Shapiro Wilk GOF Test** | | | | | |
| 582 | | | | | 5% Shapiro Wilk Critical Value | 0.901 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 583 | | | | | Lilliefors Test Statistic | 0.114 | **Lilliefors GOF Test** | | | | | |
| 584 | | | | | 5% Lilliefors Critical Value | 0.203 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 585 | **Detected Data appear Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 586 | | | | | | | | | | | | |
| 587 | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | | | | | |
| 588 | | | | | Mean in Original Scale | 1.468 | | | | Mean in Log Scale | | -0.207 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 589 | | | | | SD in Original Scale | 1.688 | | | | | SD in Log Scale | 1.13 |
| 590 | | | | 95% t UCL (assumes normality of ROS data) | | 2.046 | | | | | 95% Percentile Bootstrap UCL | 2.044 |
| 591 | | | | | 95% BCA Bootstrap UCL | 2.134 | | | | | 95% Bootstrap t UCL | 2.288 |
| 592 | | | | | 95% H-UCL (Log ROS) | 2.848 | | | | | | |
| 593 | | | | | | | | | | | | |
| 594 | **UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed** | | | | | | | | | | | |
| 595 | | | | | KM Mean (logged) | -0.226 | | | | | 95% H-UCL (KM -Log) | 3.235 |
| 596 | | | | | KM SD (logged) | 1.202 | | | | | 95% Critical H Value (KM-Log) | 2.762 |
| 597 | | | | | KM Standard Error of Mean (logged) | 0.265 | | | | | | |
| 598 | | | | | | | | | | | | |
| 599 | **DL/2 Statistics** | | | | | | | | | | | |
| 600 | **DL/2 Normal** | | | | | | **DL/2 Log-Transformed** | | | | | |
| 601 | | | | | Mean in Original Scale | 1.793 | | | | | Mean in Log Scale | -0.0448 |
| 602 | | | | | SD in Original Scale | 1.8 | | | | | SD in Log Scale | 1.246 |
| 603 | | | | | 95% t UCL (Assumes normality) | 2.409 | | | | | 95% H-Stat UCL | 4.262 |
| 604 | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | | | | | |
| 605 | | | | | | | | | | | | |
| 606 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 607 | **Detected Data appear Approximate Normal Distributed at 5% Significance Level** | | | | | | | | | | | |
| 608 | | | | | | | | | | | | |
| 609 | **Suggested UCL to Use** | | | | | | | | | | | |
| 610 | | | | | 95% KM (t) UCL | 2.209 | | | | | 95% KM (Percentile Bootstrap) UCL | 2.215 |
| 611 | | | | | | | | | | | | |
| 612 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 613 | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | | | | | |
| 614 | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | | | | | |
| 615 | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 616 | | | | | | | | | | | | |
| 617 | **Aroclor-1242 (PCB-1242)** | | | | | | | | | | | |
| 618 | | | | | | | | | | | | |
| 619 | **General Statistics** | | | | | | | | | | | |
| 620 | | | | | Total Number of Observations | 46 | | | | | Number of Distinct Observations | 17 |
| 621 | | | | | Number of Detects | 1 | | | | | Number of Non-Detects | 45 |
| 622 | | | | | Number of Distinct Detects | 1 | | | | | Number of Distinct Non-Detects | 16 |
| 623 | | | | | | | | | | | | |
| 624 | **Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!** | | | | | | | | | | | |
| 625 | **It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).** | | | | | | | | | | | |
| 626 | | | | | | | | | | | | |
| 627 | **The data set for variable Aroclor-1242 (PCB-1242) was not processed!** | | | | | | | | | | | |
| 628 | | | | | | | | | | | | |
| 629 | | | | | | | | | | | | |
| 630 | **Aroclor-1248 (PCB-1248)** | | | | | | | | | | | |
| 631 | | | | | | | | | | | | |
| 632 | **General Statistics** | | | | | | | | | | | |
| 633 | | | | | Total Number of Observations | 46 | | | | | Number of Distinct Observations | 19 |
| 634 | | | | | Number of Detects | 5 | | | | | Number of Non-Detects | 41 |
| 635 | | | | | Number of Distinct Detects | 5 | | | | | Number of Distinct Non-Detects | 14 |
| 636 | | | | | Minimum Detect | 0.22 | | | | | Minimum Non-Detect | 2.1000E-5 |
| 637 | | | | | Maximum Detect | 4.2 | | | | | Maximum Non-Detect | 0.28 |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 638 | | | | | Variance Detects | 2.761 | | | | Percent Non-Detects | | 89.13% |
| 639 | | | | | Mean Detects | 1.344 | | | | SD Detects | | 1.662 |
| 640 | | | | | Median Detects | 0.56 | | | | CV Detects | | 1.236 |
| 641 | | | | | Skewness Detects | 1.851 | | | | Kurtosis Detects | | 3.396 |
| 642 | | | | | Mean of Logged Detects | -0.28 | | | | SD of Logged Detects | | 1.18 |
| 643 | | | | | | | | | | | | |
| 644 | **Normal GOF Test on Detects Only** | | | | | | | | | | | |
| 645 | | | | | Shapiro Wilk Test Statistic | 0.762 | **Shapiro Wilk GOF Test** | | | | | |
| 646 | | | | | 5% Shapiro Wilk Critical Value | 0.762 | Detected Data Not Normal at 5% Significance Level | | | | | |
| 647 | | | | | Lilliefors Test Statistic | 0.287 | **Lilliefors GOF Test** | | | | | |
| 648 | | | | | 5% Lilliefors Critical Value | 0.396 | Detected Data appear Normal at 5% Significance Level | | | | | |
| 649 | **Detected Data appear Approximate Normal at 5% Significance Level** | | | | | | | | | | | |
| 650 | | | | | | | | | | | | |
| 651 | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | | | | | |
| 652 | | | | | Mean | 0.146 | | | | Standard Error of Mean | | 0.106 |
| 653 | | | | | SD | 0.644 | | | | 95% KM (BCA) UCL | | 0.341 |
| 654 | | | | | 95% KM (t) UCL | 0.325 | | | | 95% KM (Percentile Bootstrap) UCL | | 0.331 |
| 655 | | | | | 95% KM (z) UCL | 0.321 | | | | 95% KM Bootstrap t UCL | | 0.612 |
| 656 | | | | | 90% KM Chebyshev UCL | 0.465 | | | | 95% KM Chebyshev UCL | | 0.609 |
| 657 | | | | | 97.5% KM Chebyshev UCL | 0.81 | | | | 99% KM Chebyshev UCL | | 1.203 |
| 658 | | | | | | | | | | | | |
| 659 | **Gamma GOF Tests on Detected Observations Only** | | | | | | | | | | | |
| 660 | | | | | A-D Test Statistic | 0.36 | **Anderson-Darling GOF Test** | | | | | |
| 661 | | | | | 5% A-D Critical Value | 0.691 | Detected data appear Gamma Distributed at 5% Significance Level | | | | | |
| 662 | | | | | K-S Test Statistic | 0.26 | **Kolmogrov-Smirnoff GOF** | | | | | |
| 663 | | | | | 5% K-S Critical Value | 0.364 | Detected data appear Gamma Distributed at 5% Significance Level | | | | | |
| 664 | **Detected data appear Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 665 | | | | | | | | | | | | |
| 666 | **Gamma Statistics on Detected Data Only** | | | | | | | | | | | |
| 667 | | | | | k hat (MLE) | 1.002 | | | | k star (bias corrected MLE) | | 0.534 |
| 668 | | | | | Theta hat (MLE) | 1.341 | | | | Theta star (bias corrected MLE) | | 2.516 |
| 669 | | | | | nu hat (MLE) | 10.02 | | | | nu star (bias corrected) | | 5.342 |
| 670 | | | | | MLE Mean (bias corrected) | 1.344 | | | | MLE Sd (bias corrected) | | 1.839 |
| 671 | | | | | | | | | | | | |
| 672 | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | | | | | |
| 673 | | | | | k hat (KM) | 0.0515 | | | | nu hat (KM) | | 4.739 |
| 674 | | | | | Approximate Chi Square Value (4.74, α) | 1.033 | | | | Adjusted Chi Square Value (4.74, β) | | 0.98 |
| 675 | | | | | 95% Gamma Approximate KM-UCL (use when n>=50) | 0.671 | | | | 95% Gamma Adjusted KM-UCL (use when n<50) | | 0.707 |
| 676 | Gamma (KM) may not be used when k hat (KM) is < 0.1 | | | | | | | | | | | |
| 677 | | | | | | | | | | | | |
| 678 | **Gamma ROS Statistics using Imputed Non-Detects** | | | | | | | | | | | |
| 679 | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | | | | |
| 680 | GROS may not be used when kstar of detected data is small such as < 0.1 | | | | | | | | | | | |
| 681 | For such situations, GROS method tends to yield inflated values of UCLs and BTVs | | | | | | | | | | | |
| 682 | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | | | | |
| 683 | | | | | Minimum | 0.01 | | | | Mean | | 0.155 |
| 684 | | | | | Maximum | 4.2 | | | | Median | | 0.01 |
| 685 | | | | | SD | 0.649 | | | | CV | | 4.19 |
| 686 | | | | | k hat (MLE) | 0.303 | | | | k star (bias corrected MLE) | | 0.298 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 687 | Theta hat (MLE) | | | | | 0.511 | Theta star (bias corrected MLE) | | | | | 0.52 |
| 688 | nu hat (MLE) | | | | | 27.89 | nu star (bias corrected) | | | | | 27.4 |
| 689 | MLE Mean (bias corrected) | | | | | 0.155 | MLE Sd (bias corrected) | | | | | 0.284 |
| 690 | | | | | | | Adjusted Level of Significance (β) | | | | | 0.0448 |
| 691 | Approximate Chi Square Value (27.40, α) | | | | | 16.47 | Adjusted Chi Square Value (27.40, β) | | | | | 16.19 |
| 692 | 95% Gamma Approximate UCL (use when n>=50) | | | | | 0.258 | 95% Gamma Adjusted UCL (use when n<50) | | | | | 0.262 |
| 693 | | | | | | | | | | | | |
| 694 | **Lognormal GOF Test on Detected Observations Only** | | | | | | | | | | | |
| 695 | Shapiro Wilk Test Statistic | | | | | 0.951 | **Shapiro Wilk GOF Test** | | | | | |
| 696 | 5% Shapiro Wilk Critical Value | | | | | 0.762 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 697 | Lilliefors Test Statistic | | | | | 0.2 | **Lilliefors GOF Test** | | | | | |
| 698 | 5% Lilliefors Critical Value | | | | | 0.396 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 699 | **Detected Data appear Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 700 | | | | | | | | | | | | |
| 701 | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | | | | | |
| 702 | Mean in Original Scale | | | | | 0.15 | Mean in Log Scale | | | | | -6.356 |
| 703 | SD in Original Scale | | | | | 0.651 | SD in Log Scale | | | | | 2.954 |
| 704 | 95% t UCL (assumes normality of ROS data) | | | | | 0.311 | 95% Percentile Bootstrap UCL | | | | | 0.326 |
| 705 | 95% BCA Bootstrap UCL | | | | | 0.434 | 95% Bootstrap t UCL | | | | | 1.036 |
| 706 | 95% H-UCL (Log ROS) | | | | | 1.206 | | | | | | |
| 707 | | | | | | | | | | | | |
| 708 | **UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed** | | | | | | | | | | | |
| 709 | KM Mean (logged) | | | | | -9.626 | 95% H-UCL (KM -Log) | | | | | 0.214 |
| 710 | KM SD (logged) | | | | | 3.289 | 95% Critical H Value (KM-Log) | | | | | 5.454 |
| 711 | KM Standard Error of Mean (logged) | | | | | 0.543 | | | | | | |
| 712 | | | | | | | | | | | | |
| 713 | **DL/2 Statistics** | | | | | | | | | | | |
| 714 | **DL/2 Normal** | | | | | | **DL/2 Log-Transformed** | | | | | |
| 715 | Mean in Original Scale | | | | | 0.163 | Mean in Log Scale | | | | | -4.645 |
| 716 | SD in Original Scale | | | | | 0.648 | SD in Log Scale | | | | | 2.673 |
| 717 | 95% t UCL (Assumes normality) | | | | | 0.323 | 95% H-Stat UCL | | | | | 2.087 |
| 718 | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | | | | | |
| 719 | | | | | | | | | | | | |
| 720 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 721 | **Detected Data appear Approximate Normal Distributed at 5% Significance Level** | | | | | | | | | | | |
| 722 | | | | | | | | | | | | |
| 723 | **Suggested UCL to Use** | | | | | | | | | | | |
| 724 | 95% KM (t) UCL | | | | | 0.325 | 95% KM (Percentile Bootstrap) UCL | | | | | 0.331 |
| 725 | | | | | | | | | | | | |
| 726 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 727 | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | | | | | |
| 728 | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | | | | | |
| 729 | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 730 | | | | | | | | | | | | |
| 731 | **Aroclor-1254 (PCB-1254)** | | | | | | | | | | | |
| 732 | | | | | | | | | | | | |
| 733 | **General Statistics** | | | | | | | | | | | |
| 734 | Total Number of Observations | | | | | 46 | Number of Distinct Observations | | | | | 20 |
| 735 | Number of Detects | | | | | 5 | Number of Non-Detects | | | | | 41 |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 736 | | | | | Number of Distinct Detects | 5 | | | | Number of Distinct Non-Detects | | 15 |
| 737 | | | | | Minimum Detect | 1.9000E-4 | | | | Minimum Non-Detect | | 2.1000E-5 |
| 738 | | | | | Maximum Detect | 0.35 | | | | Maximum Non-Detect | | 1.1 |
| 739 | | | | | Variance Detects | 0.0321 | | | | Percent Non-Detects | | 89.13% |
| 740 | | | | | Mean Detects | 0.139 | | | | SD Detects | | 0.179 |
| 741 | | | | | Median Detects | 0.02 | | | | CV Detects | | 1.288 |
| 742 | | | | | Skewness Detects | 0.617 | | | | Kurtosis Detects | | -3.23 |
| 743 | | | | | Mean of Logged Detects | -3.967 | | | | SD of Logged Detects | | 3.127 |
| 744 | | | | | | | | | | | | |
| 745 | | | | | **Normal GOF Test on Detects Only** | | | | | | | |
| 746 | | | | | Shapiro Wilk Test Statistic | 0.74 | | | **Shapiro Wilk GOF Test** | | | |
| 747 | | | | | 5% Shapiro Wilk Critical Value | 0.762 | | | Detected Data Not Normal at 5% Significance Level | | | |
| 748 | | | | | Lilliefors Test Statistic | 0.347 | | | **Lilliefors GOF Test** | | | |
| 749 | | | | | 5% Lilliefors Critical Value | 0.396 | | | Detected Data appear Normal at 5% Significance Level | | | |
| 750 | | | | | **Detected Data appear Approximate Normal at 5% Significance Level** | | | | | | | |
| 751 | | | | | | | | | | | | |
| 752 | | | | | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | |
| 753 | | | | | Mean | 0.0161 | | | | Standard Error of Mean | | 0.0115 |
| 754 | | | | | SD | 0.069 | | | | 95% KM (BCA) UCL | | 0.0382 |
| 755 | | | | | 95% KM (t) UCL | 0.0354 | | | | 95% KM (Percentile Bootstrap) UCL | | 0.0371 |
| 756 | | | | | 95% KM (z) UCL | 0.035 | | | | 95% KM Bootstrap t UCL | | 0.123 |
| 757 | | | | | 90% KM Chebyshev UCL | 0.0506 | | | | 95% KM Chebyshev UCL | | 0.0663 |
| 758 | | | | | 97.5% KM Chebyshev UCL | 0.088 | | | | 99% KM Chebyshev UCL | | 0.131 |
| 759 | | | | | | | | | | | | |
| 760 | | | | | **Gamma GOF Tests on Detected Observations Only** | | | | | | | |
| 761 | | | | | A-D Test Statistic | 0.37 | | | **Anderson-Darling GOF Test** | | | |
| 762 | | | | | 5% A-D Critical Value | 0.734 | | | Detected data appear Gamma Distributed at 5% Significance Level | | | |
| 763 | | | | | K-S Test Statistic | 0.265 | | | **Kolmogrov-Smirnoff GOF** | | | |
| 764 | | | | | 5% K-S Critical Value | 0.378 | | | Detected data appear Gamma Distributed at 5% Significance Level | | | |
| 765 | | | | | **Detected data appear Gamma Distributed at 5% Significance Level** | | | | | | | |
| 766 | | | | | | | | | | | | |
| 767 | | | | | **Gamma Statistics on Detected Data Only** | | | | | | | |
| 768 | | | | | k hat (MLE) | 0.339 | | | | k star (bias corrected MLE) | | 0.269 |
| 769 | | | | | Theta hat (MLE) | 0.411 | | | | Theta star (bias corrected MLE) | | 0.518 |
| 770 | | | | | nu hat (MLE) | 3.388 | | | | nu star (bias corrected) | | 2.688 |
| 771 | | | | | MLE Mean (bias corrected) | 0.139 | | | | MLE Sd (bias corrected) | | 0.268 |
| 772 | | | | | | | | | | | | |
| 773 | | | | | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | |
| 774 | | | | | k hat (KM) | 0.0542 | | | | nu hat (KM) | | 4.987 |
| 775 | | | | | Approximate Chi Square Value (4.99, α) | 1.146 | | | | Adjusted Chi Square Value (4.99, β) | | 1.089 |
| 776 | | | | | 95% Gamma Approximate KM-UCL (use when n>=50) | 0.0699 | | | | 95% Gamma Adjusted KM-UCL (use when n<50) | | 0.0736 |
| 777 | | | | | Gamma (KM) may not be used when k hat (KM) is < 0.1 | | | | | | | |
| 778 | | | | | | | | | | | | |
| 779 | | | | | **Gamma ROS Statistics using Imputed Non-Detects** | | | | | | | |
| 780 | | | | | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | |
| 781 | | | | | GROS may not be used when kstar of detected data is small such as < 0.1 | | | | | | | |
| 782 | | | | | For such situations, GROS method tends to yield inflated values of UCLs and BTVs | | | | | | | |
| 783 | | | | | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | |
| 784 | | | | | Minimum | 1.9000E-4 | | | | Mean | | 0.024 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 785 | | | | | Maximum | 0.35 | | | | | Median | 0.01 |
| 786 | | | | | SD | 0.0671 | | | | | CV | 2.793 |
| 787 | | | | | k hat (MLE) | 0.742 | | | | | k star (bias corrected MLE) | 0.708 |
| 788 | | | | | Theta hat (MLE) | 0.0324 | | | | | Theta star (bias corrected MLE) | 0.0339 |
| 789 | | | | | nu hat (MLE) | 68.27 | | | | | nu star (bias corrected) | 65.15 |
| 790 | | | | | MLE Mean (bias corrected) | 0.024 | | | | | MLE Sd (bias corrected) | 0.0286 |
| 791 | | | | | | | | | | | Adjusted Level of Significance (β) | 0.0448 |
| 792 | | | | | Approximate Chi Square Value (65.15, α) | 47.58 | | | | | Adjusted Chi Square Value (65.15, β) | 47.09 |
| 793 | | | | | 95% Gamma Approximate UCL (use when n>=50) | 0.0329 | | | | | 95% Gamma Adjusted UCL (use when n<50) | 0.0333 |
| 794 | | | | | | | | | | | | |
| 795 | | | | | **Lognormal GOF Test on Detected Observations Only** | | | | | | | |
| 796 | | | | | Shapiro Wilk Test Statistic | 0.911 | | | | | **Shapiro Wilk GOF Test** | |
| 797 | | | | | 5% Shapiro Wilk Critical Value | 0.762 | | | | | Detected Data appear Lognormal at 5% Significance Level | |
| 798 | | | | | Lilliefors Test Statistic | 0.217 | | | | | **Lilliefors GOF Test** | |
| 799 | | | | | 5% Lilliefors Critical Value | 0.396 | | | | | Detected Data appear Lognormal at 5% Significance Level | |
| 800 | | | | | **Detected Data appear Lognormal at 5% Significance Level** | | | | | | | |
| 801 | | | | | | | | | | | | |
| 802 | | | | | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | |
| 803 | | | | | Mean in Original Scale | 0.0152 | | | | | Mean in Log Scale | -11.92 |
| 804 | | | | | SD in Original Scale | 0.0691 | | | | | SD in Log Scale | 4.181 |
| 805 | | | | | 95% t UCL (assumes normality of ROS data) | 0.0323 | | | | | 95% Percentile Bootstrap UCL | 0.0308 |
| 806 | | | | | 95% BCA Bootstrap UCL | 0.0442 | | | | | 95% Bootstrap t UCL | 0.36 |
| 807 | | | | | 95% H-UCL (Log ROS) | 2.874 | | | | | | |
| 808 | | | | | | | | | | | | |
| 809 | | | | | **UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed** | | | | | | | |
| 810 | | | | | KM Mean (logged) | -9.321 | | | | | 95% H-UCL (KM -Log) | 0.0123 |
| 811 | | | | | KM SD (logged) | 2.554 | | | | | 95% Critical H Value (KM-Log) | 4.367 |
| 812 | | | | | KM Standard Error of Mean (logged) | 0.665 | | | | | | |
| 813 | | | | | | | | | | | | |
| 814 | | | | | **DL/2 Statistics** | | | | | | | |
| 815 | | | | | **DL/2 Normal** | | | | | | **DL/2 Log-Transformed** | |
| 816 | | | | | Mean in Original Scale | 0.0485 | | | | | Mean in Log Scale | -4.773 |
| 817 | | | | | SD in Original Scale | 0.105 | | | | | SD in Log Scale | 2.381 |
| 818 | | | | | 95% t UCL (Assumes normality) | 0.0745 | | | | | 95% H-Stat UCL | 0.62 |
| 819 | | | | | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | |
| 820 | | | | | | | | | | | | |
| 821 | | | | | **Nonparametric Distribution Free UCL Statistics** | | | | | | | |
| 822 | | | | | **Detected Data appear Approximate Normal Distributed at 5% Significance Level** | | | | | | | |
| 823 | | | | | | | | | | | | |
| 824 | | | | | **Suggested UCL to Use** | | | | | | | |
| 825 | | | | | 95% KM (t) UCL | 0.0354 | | | | | 95% KM (Percentile Bootstrap) UCL | 0.0371 |
| 826 | | | | | | | | | | | | |
| 827 | | | | | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | |
| 828 | | | | | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | |
| 829 | | | | | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | |
| 830 | | | | | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | |
| 831 | | | | | | | | | | | | |
| 832 | **Aroclor-1260 (PCB-1260)** | | | | | | | | | | | |
| 833 | | | | | | | | | | | | |

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| 834 | **General Statistics** | | | | | | | | | | | |
| 835 | Total Number of Observations | | | | | 52 | Number of Distinct Observations | | | | | 33 |
| 836 | Number of Detects | | | | | 23 | Number of Non-Detects | | | | | 29 |
| 837 | Number of Distinct Detects | | | | | 21 | Number of Distinct Non-Detects | | | | | 13 |
| 838 | Minimum Detect | | | | | 9.0000E-4 | Minimum Non-Detect | | | | | 2.1000E-5 |
| 839 | Maximum Detect | | | | | 1.9 | Maximum Non-Detect | | | | | 0.29 |
| 840 | Variance Detects | | | | | 0.16 | Percent Non-Detects | | | | | 55.77% |
| 841 | Mean Detects | | | | | 0.193 | SD Detects | | | | | 0.4 |
| 842 | Median Detects | | | | | 0.07 | CV Detects | | | | | 2.078 |
| 843 | Skewness Detects | | | | | 3.909 | Kurtosis Detects | | | | | 16.46 |
| 844 | Mean of Logged Detects | | | | | -2.794 | SD of Logged Detects | | | | | 1.641 |
| 845 | | | | | | | | | | | | |
| 846 | **Normal GOF Test on Detects Only** | | | | | | | | | | | |
| 847 | Shapiro Wilk Test Statistic | | | | | 0.465 | **Shapiro Wilk GOF Test** | | | | | |
| 848 | 5% Shapiro Wilk Critical Value | | | | | 0.914 | Detected Data Not Normal at 5% Significance Level | | | | | |
| 849 | Lilliefors Test Statistic | | | | | 0.352 | **Lilliefors GOF Test** | | | | | |
| 850 | 5% Lilliefors Critical Value | | | | | 0.185 | Detected Data Not Normal at 5% Significance Level | | | | | |
| 851 | **Detected Data Not Normal at 5% Significance Level** | | | | | | | | | | | |
| 852 | | | | | | | | | | | | |
| 853 | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | | | | | |
| 854 | Mean | | | | | 0.0892 | Standard Error of Mean | | | | | 0.0394 |
| 855 | SD | | | | | 0.277 | 95% KM (BCA) UCL | | | | | 0.162 |
| 856 | 95% KM (t) UCL | | | | | 0.155 | 95% KM (Percentile Bootstrap) UCL | | | | | 0.157 |
| 857 | 95% KM (z) UCL | | | | | 0.154 | 95% KM Bootstrap t UCL | | | | | 0.306 |
| 858 | 90% KM Chebyshev UCL | | | | | 0.207 | 95% KM Chebyshev UCL | | | | | 0.261 |
| 859 | 97.5% KM Chebyshev UCL | | | | | 0.335 | 99% KM Chebyshev UCL | | | | | 0.481 |
| 860 | | | | | | | | | | | | |
| 861 | **Gamma GOF Tests on Detected Observations Only** | | | | | | | | | | | |
| 862 | A-D Test Statistic | | | | | 0.765 | **Anderson-Darling GOF Test** | | | | | |
| 863 | 5% A-D Critical Value | | | | | 0.801 | Detected data appear Gamma Distributed at 5% Significance Level | | | | | |
| 864 | K-S Test Statistic | | | | | 0.172 | **Kolmogrov-Smirnoff GOF** | | | | | |
| 865 | 5% K-S Critical Value | | | | | 0.191 | Detected data appear Gamma Distributed at 5% Significance Level | | | | | |
| 866 | **Detected data appear Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 867 | | | | | | | | | | | | |
| 868 | **Gamma Statistics on Detected Data Only** | | | | | | | | | | | |
| 869 | k hat (MLE) | | | | | 0.546 | k star (bias corrected MLE) | | | | | 0.504 |
| 870 | Theta hat (MLE) | | | | | 0.353 | Theta star (bias corrected MLE) | | | | | 0.382 |
| 871 | nu hat (MLE) | | | | | 25.12 | nu star (bias corrected) | | | | | 23.18 |
| 872 | MLE Mean (bias corrected) | | | | | 0.193 | MLE Sd (bias corrected) | | | | | 0.272 |
| 873 | | | | | | | | | | | | |
| 874 | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | | | | | |
| 875 | k hat (KM) | | | | | 0.104 | nu hat (KM) | | | | | 10.79 |
| 876 | Approximate Chi Square Value (10.79, α) | | | | | 4.443 | Adjusted Chi Square Value (10.79, β) | | | | | 4.327 |
| 877 | 95% Gamma Approximate KM-UCL (use when n>=50) | | | | | 0.217 | 95% Gamma Adjusted KM-UCL (use when n<50) | | | | | 0.223 |
| 878 | | | | | | | | | | | | |
| 879 | **Gamma ROS Statistics using Imputed Non-Detects** | | | | | | | | | | | |
| 880 | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | | | | |
| 881 | GROS may not be used when kstar of detected data is small such as < 0.1 | | | | | | | | | | | |
| 882 | For such situations, GROS method tends to yield inflated values of UCLs and BTVs | | | | | | | | | | | |

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| 883 | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | | | | |
| 884 | | | | | Minimum | 9.0000E-4 | | | | Mean | | 0.0908 |
| 885 | | | | | Maximum | 1.9 | | | | Median | | 0.01 |
| 886 | | | | | SD | 0.278 | | | | CV | | 3.066 |
| 887 | | | | | k hat (MLE) | 0.458 | | | | k star (bias corrected MLE) | | 0.445 |
| 888 | | | | | Theta hat (MLE) | 0.198 | | | | Theta star (bias corrected MLE) | | 0.204 |
| 889 | | | | | nu hat (MLE) | 47.66 | | | | nu star (bias corrected) | | 46.24 |
| 890 | | | | | MLE Mean (bias corrected) | 0.0908 | | | | MLE Sd (bias corrected) | | 0.136 |
| 891 | | | | | | | | | | Adjusted Level of Significance (β) | | 0.0454 |
| 892 | | | | | Approximate Chi Square Value (46.24, α) | 31.64 | | | | Adjusted Chi Square Value (46.24, β) | | 31.29 |
| 893 | | | | | 95% Gamma Approximate UCL (use when n>=50) | 0.133 | | | | 95% Gamma Adjusted UCL (use when n<50) | | 0.134 |
| 894 | | | | | | | | | | | | |
| 895 | **Lognormal GOF Test on Detected Observations Only** | | | | | | | | | | | |
| 896 | | | | | Shapiro Wilk Test Statistic | 0.975 | **Shapiro Wilk GOF Test** | | | | | |
| 897 | | | | | 5% Shapiro Wilk Critical Value | 0.914 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 898 | | | | | Lilliefors Test Statistic | 0.102 | **Lilliefors GOF Test** | | | | | |
| 899 | | | | | 5% Lilliefors Critical Value | 0.185 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 900 | **Detected Data appear Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 901 | | | | | | | | | | | | |
| 902 | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | | | | | |
| 903 | | | | | Mean in Original Scale | 0.0872 | | | | Mean in Log Scale | | -4.722 |
| 904 | | | | | SD in Original Scale | 0.28 | | | | SD in Log Scale | | 2.231 |
| 905 | | | | | 95% t UCL (assumes normality of ROS data) | 0.152 | | | | 95% Percentile Bootstrap UCL | | 0.159 |
| 906 | | | | | 95% BCA Bootstrap UCL | 0.198 | | | | 95% Bootstrap t UCL | | 0.321 |
| 907 | | | | | 95% H-UCL (Log ROS) | 0.362 | | | | | | |
| 908 | | | | | | | | | | | | |
| 909 | **UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed** | | | | | | | | | | | |
| 910 | | | | | KM Mean (logged) | -6.344 | | | | 95% H-UCL (KM -Log) | | 116 |
| 911 | | | | | KM SD (logged) | 3.903 | | | | 95% Critical H Value (KM-Log) | | 6.367 |
| 912 | | | | | KM Standard Error of Mean (logged) | 0.675 | | | | | | |
| 913 | | | | | | | | | | | | |
| 914 | **DL/2 Statistics** | | | | | | | | | | | |
| 915 | **DL/2 Normal** | | | | | | **DL/2 Log-Transformed** | | | | | |
| 916 | | | | | Mean in Original Scale | 0.0993 | | | | Mean in Log Scale | | -4.33 |
| 917 | | | | | SD in Original Scale | 0.278 | | | | SD in Log Scale | | 2.625 |
| 918 | | | | | 95% t UCL (Assumes normality) | 0.164 | | | | 95% H-Stat UCL | | 2.15 |
| 919 | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | | | | | |
| 920 | | | | | | | | | | | | |
| 921 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 922 | **Detected Data appear Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 923 | | | | | | | | | | | | |
| 924 | **Suggested UCL to Use** | | | | | | | | | | | |
| 925 | | | | | 95% KM (t) UCL | 0.155 | | | | 95% GROS Approximate Gamma UCL | | 0.133 |
| 926 | | | | | 95% Approximate Gamma KM-UCL | 0.217 | | | | | | |
| 927 | | | | | | | | | | | | |
| 928 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 929 | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | | | | | |
| 930 | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | | | | | |
| 931 | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | | | | | |

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| 932 | | | | | | | | | | | | |
| 933 | | | | | | | | | | | | |
| 934 | **Arsenic** | | | | | | | | | | | |
| 935 | | | | | | | | | | | | |
| 936 | **General Statistics** | | | | | | | | | | | |
| 937 | Total Number of Observations | | | | | 25 | Number of Distinct Observations | | | | | 25 |
| 938 | | | | | | | Number of Missing Observations | | | | | 0 |
| 939 | Minimum | | | | | 1.5 | Mean | | | | | 12.21 |
| 940 | Maximum | | | | | 41 | Median | | | | | 9.9 |
| 941 | SD | | | | | 9.08 | Std. Error of Mean | | | | | 1.816 |
| 942 | Coefficient of Variation | | | | | 0.744 | Skewness | | | | | 1.499 |
| 943 | | | | | | | | | | | | |
| 944 | **Normal GOF Test** | | | | | | | | | | | |
| 945 | Shapiro Wilk Test Statistic | | | | | 0.879 | **Shapiro Wilk GOF Test** | | | | | |
| 946 | 5% Shapiro Wilk Critical Value | | | | | 0.918 | Data Not Normal at 5% Significance Level | | | | | |
| 947 | Lilliefors Test Statistic | | | | | 0.156 | **Lilliefors GOF Test** | | | | | |
| 948 | 5% Lilliefors Critical Value | | | | | 0.177 | Data appear Normal at 5% Significance Level | | | | | |
| 949 | **Data appear Approximate Normal at 5% Significance Level** | | | | | | | | | | | |
| 950 | | | | | | | | | | | | |
| 951 | **Assuming Normal Distribution** | | | | | | | | | | | |
| 952 | **95% Normal UCL** | | | | | | **95% UCLs (Adjusted for Skewness)** | | | | | |
| 953 | 95% Student's-t UCL | | | | | 15.31 | 95% Adjusted-CLT UCL (Chen-1995) | | | | | 15.77 |
| 954 | | | | | | | 95% Modified-t UCL (Johnson-1978) | | | | | 15.4 |
| 955 | | | | | | | | | | | | |
| 956 | **Gamma GOF Test** | | | | | | | | | | | |
| 957 | A-D Test Statistic | | | | | 0.219 | **Anderson-Darling Gamma GOF Test** | | | | | |
| 958 | 5% A-D Critical Value | | | | | 0.757 | Detected data appear Gamma Distributed at 5% Significance Level | | | | | |
| 959 | K-S Test Statistic | | | | | 0.118 | **Kolmogrov-Smirnoff Gamma GOF Test** | | | | | |
| 960 | 5% K-S Critical Value | | | | | 0.177 | Detected data appear Gamma Distributed at 5% Significance Level | | | | | |
| 961 | **Detected data appear Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 962 | | | | | | | | | | | | |
| 963 | **Gamma Statistics** | | | | | | | | | | | |
| 964 | k hat (MLE) | | | | | 1.963 | k star (bias corrected MLE) | | | | | 1.754 |
| 965 | Theta hat (MLE) | | | | | 6.217 | Theta star (bias corrected MLE) | | | | | 6.957 |
| 966 | nu hat (MLE) | | | | | 98.17 | nu star (bias corrected) | | | | | 87.72 |
| 967 | MLE Mean (bias corrected) | | | | | 12.21 | MLE Sd (bias corrected) | | | | | 9.215 |
| 968 | | | | | | | Approximate Chi Square Value (0.05) | | | | | 67.13 |
| 969 | Adjusted Level of Significance | | | | | 0.0395 | Adjusted Chi Square Value | | | | | 65.9 |
| 970 | | | | | | | | | | | | |
| 971 | **Assuming Gamma Distribution** | | | | | | | | | | | |
| 972 | 95% Approximate Gamma UCL (use when n>=50)) | | | | | 15.95 | 95% Adjusted Gamma UCL (use when n<50) | | | | | 16.25 |
| 973 | | | | | | | | | | | | |
| 974 | **Lognormal GOF Test** | | | | | | | | | | | |
| 975 | Shapiro Wilk Test Statistic | | | | | 0.971 | **Shapiro Wilk Lognormal GOF Test** | | | | | |
| 976 | 5% Shapiro Wilk Critical Value | | | | | 0.918 | Data appear Lognormal at 5% Significance Level | | | | | |
| 977 | Lilliefors Test Statistic | | | | | 0.154 | **Lilliefors Lognormal GOF Test** | | | | | |
| 978 | 5% Lilliefors Critical Value | | | | | 0.177 | Data appear Lognormal at 5% Significance Level | | | | | |
| 979 | **Data appear Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 980 | | | | | | | | | | | | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 981 | **Lognormal Statistics** | | | | | | | | | | | |
| 982 | | | | | Minimum of Logged Data | 0.405 | | | Mean of logged Data | 2.226 | | |
| 983 | | | | | Maximum of Logged Data | 3.714 | | | SD of logged Data | 0.805 | | |
| 984 | | | | | | | | | | | | |
| 985 | **Assuming Lognormal Distribution** | | | | | | | | | | | |
| 986 | | | | | 95% H-UCL | 18.57 | | | 90% Chebyshev (MVUE) UCL | 19.27 | | |
| 987 | | | | | 95% Chebyshev (MVUE) UCL | 22.29 | | | 97.5% Chebyshev (MVUE) UCL | 26.49 | | |
| 988 | | | | | 99% Chebyshev (MVUE) UCL | 34.73 | | | | | | |
| 989 | | | | | | | | | | | | |
| 990 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 991 | **Data appear to follow a Discernible Distribution at 5% Significance Level** | | | | | | | | | | | |
| 992 | | | | | | | | | | | | |
| 993 | **Nonparametric Distribution Free UCLs** | | | | | | | | | | | |
| 994 | | | | | 95% CLT UCL | 15.19 | | | 95% Jackknife UCL | 15.31 | | |
| 995 | | | | | 95% Standard Bootstrap UCL | 15.13 | | | 95% Bootstrap-t UCL | 16.28 | | |
| 996 | | | | | 95% Hall's Bootstrap UCL | 16.74 | | | 95% Percentile Bootstrap UCL | 15.25 | | |
| 997 | | | | | 95% BCA Bootstrap UCL | 15.85 | | | | | | |
| 998 | | | | | 90% Chebyshev(Mean, Sd) UCL | 17.65 | | | 95% Chebyshev(Mean, Sd) UCL | 20.12 | | |
| 999 | | | | | 97.5% Chebyshev(Mean, Sd) UCL | 23.55 | | | 99% Chebyshev(Mean, Sd) UCL | 30.27 | | |
| 1000 | | | | | | | | | | | | |
| 1001 | **Suggested UCL to Use** | | | | | | | | | | | |
| 1002 | | | | | 95% Student's-t UCL | 15.31 | | | | | | |
| 1003 | | | | | | | | | | | | |
| 1004 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 1005 | These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) | | | | | | | | | | | |
| 1006 | and Singh and Singh (2003). However, simulations results will not cover all Real World data sets. | | | | | | | | | | | |
| 1007 | For additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 1008 | | | | | | | | | | | | |
| 1009 | | | | | | | | | | | | |
| 1010 | **Barium** | | | | | | | | | | | |
| 1011 | | | | | | | | | | | | |
| 1012 | **General Statistics** | | | | | | | | | | | |
| 1013 | | | | | Total Number of Observations | 27 | | | Number of Distinct Observations | 21 | | |
| 1014 | | | | | | | | | Number of Missing Observations | 0 | | |
| 1015 | | | | | Minimum | 48 | | | Mean | 241.9 | | |
| 1016 | | | | | Maximum | 1500 | | | Median | 160 | | |
| 1017 | | | | | SD | 285.7 | | | Std. Error of Mean | 54.98 | | |
| 1018 | | | | | Coefficient of Variation | 1.181 | | | Skewness | 3.686 | | |
| 1019 | | | | | | | | | | | | |
| 1020 | **Normal GOF Test** | | | | | | | | | | | |
| 1021 | | | | | Shapiro Wilk Test Statistic | 0.527 | | | **Shapiro Wilk GOF Test** | | | |
| 1022 | | | | | 5% Shapiro Wilk Critical Value | 0.923 | | | Data Not Normal at 5% Significance Level | | | |
| 1023 | | | | | Lilliefors Test Statistic | 0.345 | | | **Lilliefors GOF Test** | | | |
| 1024 | | | | | 5% Lilliefors Critical Value | 0.171 | | | Data Not Normal at 5% Significance Level | | | |
| 1025 | **Data Not Normal at 5% Significance Level** | | | | | | | | | | | |
| 1026 | | | | | | | | | | | | |
| 1027 | **Assuming Normal Distribution** | | | | | | | | | | | |
| 1028 | **95% Normal UCL** | | | | | | | | **95% UCLs (Adjusted for Skewness)** | | | |
| 1029 | | | | | 95% Student's-t UCL | 335.7 | | | 95% Adjusted-CLT UCL (Chen-1995) | 374 | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1030 | | | | | | | | | | | 95% Modified-t UCL (Johnson-1978) | 342.2 |
| 1031 | | | | | | | | | | | | |
| 1032 | **Gamma GOF Test** | | | | | | | | | | | |
| 1033 | | | | | A-D Test Statistic | 2.243 | **Anderson-Darling Gamma GOF Test** | | | | | |
| 1034 | | | | | 5% A-D Critical Value | 0.759 | Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 1035 | | | | | K-S Test Statistic | 0.263 | **Kolmogrov-Smirnoff Gamma GOF Test** | | | | | |
| 1036 | | | | | 5% K-S Critical Value | 0.171 | Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 1037 | **Data Not Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 1038 | | | | | | | | | | | | |
| 1039 | **Gamma Statistics** | | | | | | | | | | | |
| 1040 | | | | | k hat (MLE) | 1.78 | | | | | k star (bias corrected MLE) | 1.607 |
| 1041 | | | | | Theta hat (MLE) | 135.9 | | | | | Theta star (bias corrected MLE) | 150.5 |
| 1042 | | | | | nu hat (MLE) | 96.14 | | | | | nu star (bias corrected) | 86.79 |
| 1043 | | | | | MLE Mean (bias corrected) | 241.9 | | | | | MLE Sd (bias corrected) | 190.8 |
| 1044 | | | | | | | | | | | Approximate Chi Square Value (0.05) | 66.31 |
| 1045 | | | | | Adjusted Level of Significance | 0.0401 | | | | | Adjusted Chi Square Value | 65.17 |
| 1046 | | | | | | | | | | | | |
| 1047 | **Assuming Gamma Distribution** | | | | | | | | | | | |
| 1048 | | | | | 95% Approximate Gamma UCL (use when n>=50)) | 316.6 | | | | | 95% Adjusted Gamma UCL (use when n<50) | 322.2 |
| 1049 | | | | | | | | | | | | |
| 1050 | **Lognormal GOF Test** | | | | | | | | | | | |
| 1051 | | | | | Shapiro Wilk Test Statistic | 0.889 | **Shapiro Wilk Lognormal GOF Test** | | | | | |
| 1052 | | | | | 5% Shapiro Wilk Critical Value | 0.923 | Data Not Lognormal at 5% Significance Level | | | | | |
| 1053 | | | | | Lilliefors Test Statistic | 0.203 | **Lilliefors Lognormal GOF Test** | | | | | |
| 1054 | | | | | 5% Lilliefors Critical Value | 0.171 | Data Not Lognormal at 5% Significance Level | | | | | |
| 1055 | **Data Not Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 1056 | | | | | | | | | | | | |
| 1057 | **Lognormal Statistics** | | | | | | | | | | | |
| 1058 | | | | | Minimum of Logged Data | 3.871 | | | | | Mean of logged Data | 5.182 |
| 1059 | | | | | Maximum of Logged Data | 7.313 | | | | | SD of logged Data | 0.688 |
| 1060 | | | | | | | | | | | | |
| 1061 | **Assuming Lognormal Distribution** | | | | | | | | | | | |
| 1062 | | | | | 95% H-UCL | 301.4 | | | | | 90% Chebyshev (MVUE) UCL | 318.6 |
| 1063 | | | | | 95% Chebyshev (MVUE) UCL | 361.8 | | | | | 97.5% Chebyshev (MVUE) UCL | 421.7 |
| 1064 | | | | | 99% Chebyshev (MVUE) UCL | 539.5 | | | | | | |
| 1065 | | | | | | | | | | | | |
| 1066 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 1067 | **Data do not follow a Discernible Distribution (0.05)** | | | | | | | | | | | |
| 1068 | | | | | | | | | | | | |
| 1069 | **Nonparametric Distribution Free UCLs** | | | | | | | | | | | |
| 1070 | | | | | 95% CLT UCL | 332.4 | | | | | 95% Jackknife UCL | 335.7 |
| 1071 | | | | | 95% Standard Bootstrap UCL | 331.5 | | | | | 95% Bootstrap-t UCL | 491.9 |
| 1072 | | | | | 95% Hall's Bootstrap UCL | 655.3 | | | | | 95% Percentile Bootstrap UCL | 337.1 |
| 1073 | | | | | 95% BCA Bootstrap UCL | 375.6 | | | | | | |
| 1074 | | | | | 90% Chebyshev(Mean, Sd) UCL | 406.9 | | | | | 95% Chebyshev(Mean, Sd) UCL | 481.6 |
| 1075 | | | | | 97.5% Chebyshev(Mean, Sd) UCL | 585.3 | | | | | 99% Chebyshev(Mean, Sd) UCL | 788.9 |
| 1076 | | | | | | | | | | | | |
| 1077 | **Suggested UCL to Use** | | | | | | | | | | | |
| 1078 | | | | | 95% Chebyshev (Mean, Sd) UCL | 481.6 | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1079 | | | | | | | | | | | | |
| 1080 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 1081 | These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) | | | | | | | | | | | |
| 1082 | and Singh and Singh (2003). However, simulations results will not cover all Real World data sets. | | | | | | | | | | | |
| 1083 | For additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 1084 | | | | | | | | | | | | |
| 1085 | **Benzene** | | | | | | | | | | | |
| 1086 | | | | | | | | | | | | |
| 1087 | **General Statistics** | | | | | | | | | | | |
| 1088 | Total Number of Observations | | | | | 24 | Number of Distinct Observations | | | | | 19 |
| 1089 | Number of Detects | | | | | 10 | Number of Non-Detects | | | | | 14 |
| 1090 | Number of Distinct Detects | | | | | 10 | Number of Distinct Non-Detects | | | | | 9 |
| 1091 | Minimum Detect | | | | | 0.49 | Minimum Non-Detect | | | | | 0.5 |
| 1092 | Maximum Detect | | | | | 130 | Maximum Non-Detect | | | | | 6.25 |
| 1093 | Variance Detects | | | | | 1610 | Percent Non-Detects | | | | | 58.33% |
| 1094 | Mean Detects | | | | | 16.37 | SD Detects | | | | | 40.13 |
| 1095 | Median Detects | | | | | 3.45 | CV Detects | | | | | 2.451 |
| 1096 | Skewness Detects | | | | | 3.105 | Kurtosis Detects | | | | | 9.72 |
| 1097 | Mean of Logged Detects | | | | | 1.185 | SD of Logged Detects | | | | | 1.677 |
| 1098 | | | | | | | | | | | | |
| 1099 | **Normal GOF Test on Detects Only** | | | | | | | | | | | |
| 1100 | Shapiro Wilk Test Statistic | | | | | 0.443 | **Shapiro Wilk GOF Test** | | | | | |
| 1101 | 5% Shapiro Wilk Critical Value | | | | | 0.842 | Detected Data Not Normal at 5% Significance Level | | | | | |
| 1102 | Lilliefors Test Statistic | | | | | 0.424 | **Lilliefors GOF Test** | | | | | |
| 1103 | 5% Lilliefors Critical Value | | | | | 0.28 | Detected Data Not Normal at 5% Significance Level | | | | | |
| 1104 | **Detected Data Not Normal at 5% Significance Level** | | | | | | | | | | | |
| 1105 | | | | | | | | | | | | |
| 1106 | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | | | | | |
| 1107 | Mean | | | | | 7.682 | Standard Error of Mean | | | | | 5.532 |
| 1108 | SD | | | | | 25.67 | 95% KM (BCA) UCL | | | | | 18.6 |
| 1109 | 95% KM (t) UCL | | | | | 17.16 | 95% KM (Percentile Bootstrap) UCL | | | | | 18.23 |
| 1110 | 95% KM (z) UCL | | | | | 16.78 | 95% KM Bootstrap t UCL | | | | | 75.97 |
| 1111 | 90% KM Chebyshev UCL | | | | | 24.28 | 95% KM Chebyshev UCL | | | | | 31.8 |
| 1112 | 97.5% KM Chebyshev UCL | | | | | 42.23 | 99% KM Chebyshev UCL | | | | | 62.73 |
| 1113 | | | | | | | | | | | | |
| 1114 | **Gamma GOF Tests on Detected Observations Only** | | | | | | | | | | | |
| 1115 | A-D Test Statistic | | | | | 1.176 | **Anderson-Darling GOF Test** | | | | | |
| 1116 | 5% A-D Critical Value | | | | | 0.794 | Detected Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 1117 | K-S Test Statistic | | | | | 0.299 | **Kolmogrov-Smirnoff GOF** | | | | | |
| 1118 | 5% K-S Critical Value | | | | | 0.284 | Detected Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 1119 | **Detected Data Not Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 1120 | | | | | | | | | | | | |
| 1121 | **Gamma Statistics on Detected Data Only** | | | | | | | | | | | |
| 1122 | k hat (MLE) | | | | | 0.407 | k star (bias corrected MLE) | | | | | 0.352 |
| 1123 | Theta hat (MLE) | | | | | 40.19 | Theta star (bias corrected MLE) | | | | | 46.53 |
| 1124 | nu hat (MLE) | | | | | 8.147 | nu star (bias corrected) | | | | | 7.036 |
| 1125 | MLE Mean (bias corrected) | | | | | 16.37 | MLE Sd (bias corrected) | | | | | 27.6 |
| 1126 | | | | | | | | | | | | |
| 1127 | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1128 | | | | | k hat (KM) | 0.0896 | | | | | nu hat (KM) | 4.3 |
| 1129 | | | | | Approximate Chi Square Value (4.30, α) | 0.844 | | | | | Adjusted Chi Square Value (4.30, β) | 0.745 |
| 1130 | | | | | 95% Gamma Approximate KM-UCL (use when n>=50) | 39.16 | | | | | 95% Gamma Adjusted KM-UCL (use when n<50) | 44.35 |
| 1131 | | | | | Gamma (KM) may not be used when k hat (KM) is < 0.1 | | | | | | | |
| 1132 | | | | | | | | | | | | |
| 1133 | | | | | **Gamma ROS Statistics using Imputed Non-Detects** | | | | | | | |
| 1134 | | | | | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | |
| 1135 | | | | | GROS may not be used when kstar of detected data is small such as < 0.1 | | | | | | | |
| 1136 | | | | | For such situations, GROS method tends to yield inflated values of UCLs and BTVs | | | | | | | |
| 1137 | | | | | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | |
| 1138 | | | | | Minimum | 0.01 | | | | | Mean | 6.92 |
| 1139 | | | | | Maximum | 130 | | | | | Median | 0.01 |
| 1140 | | | | | SD | 26.4 | | | | | CV | 3.815 |
| 1141 | | | | | k hat (MLE) | 0.19 | | | | | k star (bias corrected MLE) | 0.194 |
| 1142 | | | | | Theta hat (MLE) | 36.4 | | | | | Theta star (bias corrected MLE) | 35.65 |
| 1143 | | | | | nu hat (MLE) | 9.125 | | | | | nu star (bias corrected) | 9.318 |
| 1144 | | | | | MLE Mean (bias corrected) | 6.92 | | | | | MLE Sd (bias corrected) | 15.71 |
| 1145 | | | | | | | | | | | Adjusted Level of Significance (β) | 0.0392 |
| 1146 | | | | | Approximate Chi Square Value (9.32, α) | 3.52 | | | | | Adjusted Chi Square Value (9.32, β) | 3.273 |
| 1147 | | | | | 95% Gamma Approximate UCL (use when n>=50) | 18.32 | | | | | 95% Gamma Adjusted UCL (use when n<50) | 19.7 |
| 1148 | | | | | | | | | | | | |
| 1149 | | | | | **Lognormal GOF Test on Detected Observations Only** | | | | | | | |
| 1150 | | | | | Shapiro Wilk Test Statistic | 0.898 | | | | | **Shapiro Wilk GOF Test** | |
| 1151 | | | | | 5% Shapiro Wilk Critical Value | 0.842 | | | | | Detected Data appear Lognormal at 5% Significance Level | |
| 1152 | | | | | Lilliefors Test Statistic | 0.171 | | | | | **Lilliefors GOF Test** | |
| 1153 | | | | | 5% Lilliefors Critical Value | 0.28 | | | | | Detected Data appear Lognormal at 5% Significance Level | |
| 1154 | | | | | **Detected Data appear Lognormal at 5% Significance Level** | | | | | | | |
| 1155 | | | | | | | | | | | | |
| 1156 | | | | | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | |
| 1157 | | | | | Mean in Original Scale | 7.448 | | | | | Mean in Log Scale | 0.39 |
| 1158 | | | | | SD in Original Scale | 26.26 | | | | | SD in Log Scale | 1.388 |
| 1159 | | | | | 95% t UCL (assumes normality of ROS data) | 16.64 | | | | | 95% Percentile Bootstrap UCL | 18.06 |
| 1160 | | | | | 95% BCA Bootstrap UCL | 23.76 | | | | | 95% Bootstrap t UCL | 125.8 |
| 1161 | | | | | 95% H-UCL (Log ROS) | 9.494 | | | | | | |
| 1162 | | | | | | | | | | | | |
| 1163 | | | | | **UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed** | | | | | | | |
| 1164 | | | | | KM Mean (logged) | 0.499 | | | | | 95% H-UCL (KM -Log) | 9.432 |
| 1165 | | | | | KM SD (logged) | 1.34 | | | | | 95% Critical H Value (KM-Log) | 3.029 |
| 1166 | | | | | KM Standard Error of Mean (logged) | 0.348 | | | | | | |
| 1167 | | | | | | | | | | | | |
| 1168 | | | | | **DL/2 Statistics** | | | | | | | |
| 1169 | | | | | **DL/2 Normal** | | | | | | **DL/2 Log-Transformed** | |
| 1170 | | | | | Mean in Original Scale | 8.123 | | | | | Mean in Log Scale | 0.843 |
| 1171 | | | | | SD in Original Scale | 26.1 | | | | | SD in Log Scale | 1.264 |
| 1172 | | | | | 95% t UCL (Assumes normality) | 17.25 | | | | | 95% H-Stat UCL | 11.14 |
| 1173 | | | | | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | |
| 1174 | | | | | | | | | | | | |
| 1175 | | | | | **Nonparametric Distribution Free UCL Statistics** | | | | | | | |
| 1176 | | | | | **Detected Data appear Lognormal Distributed at 5% Significance Level** | | | | | | | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1177 | | | | | | | | | | | | |
| 1178 | **Suggested UCL to Use** | | | | | | | | | | | |
| 1179 | 97.5% KM (Chebyshev) UCL | | | | 42.23 | | | | | | | |
| 1180 | | | | | | | | | | | | |
| 1181 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 1182 | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | | | | | |
| 1183 | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | | | | | |
| 1184 | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 1185 | | | | | | | | | | | | |
| 1186 | **Benzo(a)anthracene** | | | | | | | | | | | |
| 1187 | | | | | | | | | | | | |
| 1188 | **General Statistics** | | | | | | | | | | | |
| 1189 | Total Number of Observations | | | | 37 | | | Number of Distinct Observations | | | | 32 |
| 1190 | Number of Detects | | | | 22 | | | Number of Non-Detects | | | | 15 |
| 1191 | Number of Distinct Detects | | | | 21 | | | Number of Distinct Non-Detects | | | | 12 |
| 1192 | Minimum Detect | | | | 24 | | | Minimum Non-Detect | | | | 380 |
| 1193 | Maximum Detect | | | | 51000 | | | Maximum Non-Detect | | | | 34000 |
| 1194 | Variance Detects | | | | 2.119E+8 | | | Percent Non-Detects | | | | 40.54% |
| 1195 | Mean Detects | | | | 6492 | | | SD Detects | | | | 14558 |
| 1196 | Median Detects | | | | 965 | | | CV Detects | | | | 2.242 |
| 1197 | Skewness Detects | | | | 2.843 | | | Kurtosis Detects | | | | 7.145 |
| 1198 | Mean of Logged Detects | | | | 6.852 | | | SD of Logged Detects | | | | 2.148 |
| 1199 | | | | | | | | | | | | |
| 1200 | **Normal GOF Test on Detects Only** | | | | | | | | | | | |
| 1201 | Shapiro Wilk Test Statistic | | | | 0.474 | | | **Shapiro Wilk GOF Test** | | | | |
| 1202 | 5% Shapiro Wilk Critical Value | | | | 0.911 | | | Detected Data Not Normal at 5% Significance Level | | | | |
| 1203 | Lilliefors Test Statistic | | | | 0.383 | | | **Lilliefors GOF Test** | | | | |
| 1204 | 5% Lilliefors Critical Value | | | | 0.189 | | | Detected Data Not Normal at 5% Significance Level | | | | |
| 1205 | **Detected Data Not Normal at 5% Significance Level** | | | | | | | | | | | |
| 1206 | | | | | | | | | | | | |
| 1207 | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | | | | | |
| 1208 | Mean | | | | 4378 | | | Standard Error of Mean | | | | 1928 |
| 1209 | SD | | | | 11350 | | | 95% KM (BCA) UCL | | | | 7689 |
| 1210 | 95% KM (t) UCL | | | | 7634 | | | 95% KM (Percentile Bootstrap) UCL | | | | 7972 |
| 1211 | 95% KM (z) UCL | | | | 7550 | | | 95% KM Bootstrap t UCL | | | | 15750 |
| 1212 | 90% KM Chebyshev UCL | | | | 10163 | | | 95% KM Chebyshev UCL | | | | 12784 |
| 1213 | 97.5% KM Chebyshev UCL | | | | 16421 | | | 99% KM Chebyshev UCL | | | | 23566 |
| 1214 | | | | | | | | | | | | |
| 1215 | **Gamma GOF Tests on Detected Observations Only** | | | | | | | | | | | |
| 1216 | A-D Test Statistic | | | | 1.145 | | | **Anderson-Darling GOF Test** | | | | |
| 1217 | 5% A-D Critical Value | | | | 0.837 | | | Detected Data Not Gamma Distributed at 5% Significance Level | | | | |
| 1218 | K-S Test Statistic | | | | 0.225 | | | **Kolmogrov-Smirnoff GOF** | | | | |
| 1219 | 5% K-S Critical Value | | | | 0.2 | | | Detected Data Not Gamma Distributed at 5% Significance Level | | | | |
| 1220 | **Detected Data Not Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 1221 | | | | | | | | | | | | |
| 1222 | **Gamma Statistics on Detected Data Only** | | | | | | | | | | | |
| 1223 | k hat (MLE) | | | | 0.349 | | | k star (bias corrected MLE) | | | | 0.332 |
| 1224 | Theta hat (MLE) | | | | 18591 | | | Theta star (bias corrected MLE) | | | | 19561 |
| 1225 | nu hat (MLE) | | | | 15.37 | | | nu star (bias corrected) | | | | 14.6 |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1226 | MLE Mean (bias corrected) | | | | | 6492 | MLE Sd (bias corrected) | | | | | 11269 |
| 1227 | | | | | | | | | | | | |
| 1228 | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | | | | | |
| 1229 | k hat (KM) | | | | | 0.149 | nu hat (KM) | | | | | 11.01 |
| 1230 | Approximate Chi Square Value (11.01, α) | | | | | 4.582 | Adjusted Chi Square Value (11.01, β) | | | | | 4.402 |
| 1231 | 95% Gamma Approximate KM-UCL (use when n>=50) | | | | | 10519 | 95% Gamma Adjusted KM-UCL (use when n<50) | | | | | 10948 |
| 1232 | | | | | | | | | | | | |
| 1233 | **Gamma ROS Statistics using Imputed Non-Detects** | | | | | | | | | | | |
| 1234 | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | | | | |
| 1235 | GROS may not be used when kstar of detected data is small such as < 0.1 | | | | | | | | | | | |
| 1236 | For such situations, GROS method tends to yield inflated values of UCLs and BTVs | | | | | | | | | | | |
| 1237 | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | | | | |
| 1238 | Minimum | | | | | 0.01 | Mean | | | | | 4033 |
| 1239 | Maximum | | | | | 51000 | Median | | | | | 210 |
| 1240 | SD | | | | | 11547 | CV | | | | | 2.863 |
| 1241 | k hat (MLE) | | | | | 0.143 | k star (bias corrected MLE) | | | | | 0.149 |
| 1242 | Theta hat (MLE) | | | | | 28216 | Theta star (bias corrected MLE) | | | | | 27002 |
| 1243 | nu hat (MLE) | | | | | 10.58 | nu star (bias corrected) | | | | | 11.05 |
| 1244 | MLE Mean (bias corrected) | | | | | 4033 | MLE Sd (bias corrected) | | | | | 10436 |
| 1245 | | | | | | | Adjusted Level of Significance (β) | | | | | 0.0431 |
| 1246 | Approximate Chi Square Value (11.05, α) | | | | | 4.61 | Adjusted Chi Square Value (11.05, β) | | | | | 4.43 |
| 1247 | 95% Gamma Approximate UCL (use when n>=50) | | | | | 9670 | 95% Gamma Adjusted UCL (use when n<50) | | | | | 10063 |
| 1248 | | | | | | | | | | | | |
| 1249 | **Lognormal GOF Test on Detected Observations Only** | | | | | | | | | | | |
| 1250 | Shapiro Wilk Test Statistic | | | | | 0.97 | **Shapiro Wilk GOF Test** | | | | | |
| 1251 | 5% Shapiro Wilk Critical Value | | | | | 0.911 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 1252 | Lilliefors Test Statistic | | | | | 0.108 | **Lilliefors GOF Test** | | | | | |
| 1253 | 5% Lilliefors Critical Value | | | | | 0.189 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 1254 | **Detected Data appear Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 1255 | | | | | | | | | | | | |
| 1256 | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | | | | | |
| 1257 | Mean in Original Scale | | | | | 4090 | Mean in Log Scale | | | | | 6.533 |
| 1258 | SD in Original Scale | | | | | 11508 | SD in Log Scale | | | | | 1.752 |
| 1259 | 95% t UCL (assumes normality of ROS data) | | | | | 7284 | 95% Percentile Bootstrap UCL | | | | | 7192 |
| 1260 | 95% BCA Bootstrap UCL | | | | | 8958 | 95% Bootstrap t UCL | | | | | 18475 |
| 1261 | 95% H-UCL (Log ROS) | | | | | 8544 | | | | | | |
| 1262 | | | | | | | | | | | | |
| 1263 | **UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed** | | | | | | | | | | | |
| 1264 | KM Mean (logged) | | | | | 6.492 | 95% H-UCL (KM -Log) | | | | | 16099 |
| 1265 | KM SD (logged) | | | | | 1.984 | 95% Critical H Value (KM-Log) | | | | | 3.707 |
| 1266 | KM Standard Error of Mean (logged) | | | | | 0.4 | | | | | | |
| 1267 | | | | | | | | | | | | |
| 1268 | **DL/2 Statistics** | | | | | | | | | | | |
| 1269 | **DL/2 Normal** | | | | | | **DL/2 Log-Transformed** | | | | | |
| 1270 | Mean in Original Scale | | | | | 6344 | Mean in Log Scale | | | | | 7.458 |
| 1271 | SD in Original Scale | | | | | 11430 | SD in Log Scale | | | | | 1.934 |
| 1272 | 95% t UCL (Assumes normality) | | | | | 9516 | 95% H-Stat UCL | | | | | 36310 |
| 1273 | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | | | | | |
| 1274 | | | | | | | | | | | | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1275 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 1276 | **Detected Data appear Lognormal Distributed at 5% Significance Level** | | | | | | | | | | | |
| 1277 | | | | | | | | | | | | |
| 1278 | **Suggested UCL to Use** | | | | | | | | | | | |
| 1279 | | | | 99% KM (Chebyshev) UCL | | 23566 | | | | | | |
| 1280 | | | | | | | | | | | | |
| 1281 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 1282 | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | | | | | |
| 1283 | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | | | | | |
| 1284 | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 1285 | | | | | | | | | | | | |
| 1286 | **Benzo(a)pyrene** | | | | | | | | | | | |
| 1287 | | | | | | | | | | | | |
| 1288 | **General Statistics** | | | | | | | | | | | |
| 1289 | | | | Total Number of Observations | | 37 | | | Number of Distinct Observations | | | 32 |
| 1290 | | | | Number of Detects | | 23 | | | Number of Non-Detects | | | 14 |
| 1291 | | | | Number of Distinct Detects | | 22 | | | Number of Distinct Non-Detects | | | 11 |
| 1292 | | | | Minimum Detect | | 42 | | | Minimum Non-Detect | | | 77 |
| 1293 | | | | Maximum Detect | | 110000 | | | Maximum Non-Detect | | | 6900 |
| 1294 | | | | Variance Detects | | 8.125E+8 | | | Percent Non-Detects | | | 37.84% |
| 1295 | | | | Mean Detects | | 11441 | | | SD Detects | | | 28505 |
| 1296 | | | | Median Detects | | 1300 | | | CV Detects | | | 2.492 |
| 1297 | | | | Skewness Detects | | 3.099 | | | Kurtosis Detects | | | 8.725 |
| 1298 | | | | Mean of Logged Detects | | 7.271 | | | SD of Logged Detects | | | 2.139 |
| 1299 | | | | | | | | | | | | |
| 1300 | **Normal GOF Test on Detects Only** | | | | | | | | | | | |
| 1301 | | | | Shapiro Wilk Test Statistic | | 0.432 | | | **Shapiro Wilk GOF Test** | | | |
| 1302 | | | | 5% Shapiro Wilk Critical Value | | 0.914 | | | Detected Data Not Normal at 5% Significance Level | | | |
| 1303 | | | | Lilliefors Test Statistic | | 0.377 | | | **Lilliefors GOF Test** | | | |
| 1304 | | | | 5% Lilliefors Critical Value | | 0.185 | | | Detected Data Not Normal at 5% Significance Level | | | |
| 1305 | **Detected Data Not Normal at 5% Significance Level** | | | | | | | | | | | |
| 1306 | | | | | | | | | | | | |
| 1307 | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | | | | | |
| 1308 | | | | Mean | | 7311 | | | Standard Error of Mean | | | 3802 |
| 1309 | | | | SD | | 22613 | | | 95% KM (BCA) UCL | | | 15214 |
| 1310 | | | | 95% KM (t) UCL | | 13730 | | | 95% KM (Percentile Bootstrap) UCL | | | 14478 |
| 1311 | | | | 95% KM (z) UCL | | 13565 | | | 95% KM Bootstrap t UCL | | | 47020 |
| 1312 | | | | 90% KM Chebyshev UCL | | 18717 | | | 95% KM Chebyshev UCL | | | 23883 |
| 1313 | | | | 97.5% KM Chebyshev UCL | | 31054 | | | 99% KM Chebyshev UCL | | | 45140 |
| 1314 | | | | | | | | | | | | |
| 1315 | **Gamma GOF Tests on Detected Observations Only** | | | | | | | | | | | |
| 1316 | | | | A-D Test Statistic | | 1.46 | | | **Anderson-Darling GOF Test** | | | |
| 1317 | | | | 5% A-D Critical Value | | 0.843 | | | Detected Data Not Gamma Distributed at 5% Significance Level | | | |
| 1318 | | | | K-S Test Statistic | | 0.198 | | | **Kolmogrov-Smirnoff GOF** | | | |
| 1319 | | | | 5% K-S Critical Value | | 0.196 | | | Detected Data Not Gamma Distributed at 5% Significance Level | | | |
| 1320 | **Detected Data Not Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 1321 | | | | | | | | | | | | |
| 1322 | **Gamma Statistics on Detected Data Only** | | | | | | | | | | | |
| 1323 | | | | k hat (MLE) | | 0.328 | | | k star (bias corrected MLE) | | | 0.314 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1324 | Theta hat (MLE) | | | | | 34903 | Theta star (bias corrected MLE) | | | | | 36434 |
| 1325 | nu hat (MLE) | | | | | 15.08 | nu star (bias corrected) | | | | | 14.44 |
| 1326 | MLE Mean (bias corrected) | | | | | 11441 | MLE Sd (bias corrected) | | | | | 20416 |
| 1327 | | | | | | | | | | | | |
| 1328 | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | | | | | |
| 1329 | k hat (KM) | | | | | 0.105 | nu hat (KM) | | | | | 7.735 |
| 1330 | Approximate Chi Square Value (7.73, α) | | | | | 2.582 | Adjusted Chi Square Value (7.73, β) | | | | | 2.455 |
| 1331 | 95% Gamma Approximate KM-UCL (use when n>=50) | | | | | 21897 | 95% Gamma Adjusted KM-UCL (use when n<50) | | | | | 23036 |
| 1332 | | | | | | | | | | | | |
| 1333 | **Gamma ROS Statistics using Imputed Non-Detects** | | | | | | | | | | | |
| 1334 | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | | | | |
| 1335 | GROS may not be used when kstar of detected data is small such as < 0.1 | | | | | | | | | | | |
| 1336 | For such situations, GROS method tends to yield inflated values of UCLs and BTVs | | | | | | | | | | | |
| 1337 | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | | | | |
| 1338 | Minimum | | | | | 0.01 | Mean | | | | | 7112 |
| 1339 | Maximum | | | | | 110000 | Median | | | | | 230 |
| 1340 | SD | | | | | 22982 | CV | | | | | 3.232 |
| 1341 | k hat (MLE) | | | | | 0.129 | k star (bias corrected MLE) | | | | | 0.136 |
| 1342 | Theta hat (MLE) | | | | | 55170 | Theta star (bias corrected MLE) | | | | | 52111 |
| 1343 | nu hat (MLE) | | | | | 9.539 | nu star (bias corrected) | | | | | 10.1 |
| 1344 | MLE Mean (bias corrected) | | | | | 7112 | MLE Sd (bias corrected) | | | | | 19251 |
| 1345 | | | | | | | Adjusted Level of Significance (β) | | | | | 0.0431 |
| 1346 | Approximate Chi Square Value (10.10, α) | | | | | 4.004 | Adjusted Chi Square Value (10.10, β) | | | | | 3.838 |
| 1347 | 95% Gamma Approximate UCL (use when n>=50) | | | | | 17939 | 95% Gamma Adjusted UCL (use when n<50) | | | | | 18714 |
| 1348 | | | | | | | | | | | | |
| 1349 | **Lognormal GOF Test on Detected Observations Only** | | | | | | | | | | | |
| 1350 | Shapiro Wilk Test Statistic | | | | | 0.969 | **Shapiro Wilk GOF Test** | | | | | |
| 1351 | 5% Shapiro Wilk Critical Value | | | | | 0.914 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 1352 | Lilliefors Test Statistic | | | | | 0.0853 | **Lilliefors GOF Test** | | | | | |
| 1353 | 5% Lilliefors Critical Value | | | | | 0.185 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 1354 | **Detected Data appear Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 1355 | | | | | | | | | | | | |
| 1356 | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | | | | | |
| 1357 | Mean in Original Scale | | | | | 7246 | Mean in Log Scale | | | | | 6.63 |
| 1358 | SD in Original Scale | | | | | 22941 | SD in Log Scale | | | | | 1.943 |
| 1359 | 95% t UCL (assumes normality of ROS data) | | | | | 13613 | 95% Percentile Bootstrap UCL | | | | | 14102 |
| 1360 | 95% BCA Bootstrap UCL | | | | | 16778 | 95% Bootstrap t UCL | | | | | 47761 |
| 1361 | 95% H-UCL (Log ROS) | | | | | 16283 | | | | | | |
| 1362 | | | | | | | | | | | | |
| 1363 | **UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed** | | | | | | | | | | | |
| 1364 | KM Mean (logged) | | | | | 6.591 | 95% H-UCL (KM -Log) | | | | | 20643 |
| 1365 | KM SD (logged) | | | | | 2.032 | 95% Critical H Value (KM-Log) | | | | | 3.777 |
| 1366 | KM Standard Error of Mean (logged) | | | | | 0.377 | | | | | | |
| 1367 | | | | | | | | | | | | |
| 1368 | **DL/2 Statistics** | | | | | | | | | | | |
| 1369 | **DL/2 Normal** | | | | | | **DL/2 Log-Transformed** | | | | | |
| 1370 | Mean in Original Scale | | | | | 7598 | Mean in Log Scale | | | | | 7.08 |
| 1371 | SD in Original Scale | | | | | 22842 | SD in Log Scale | | | | | 1.831 |
| 1372 | 95% t UCL (Assumes normality) | | | | | 13938 | 95% H-Stat UCL | | | | | 18398 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1373 | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | | | | | |
| 1374 | | | | | | | | | | | | |
| 1375 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 1376 | **Detected Data appear Lognormal Distributed at 5% Significance Level** | | | | | | | | | | | |
| 1377 | | | | | | | | | | | | |
| 1378 | **Suggested UCL to Use** | | | | | | | | | | | |
| 1379 | 99% KM (Chebyshev) UCL | 45140 | | | | | | | | | | |
| 1380 | | | | | | | | | | | | |
| 1381 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 1382 | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | | | | | |
| 1383 | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | | | | | |
| 1384 | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 1385 | | | | | | | | | | | | |
| 1386 | **Benzo(b)fluoranthene** | | | | | | | | | | | |
| 1387 | | | | | | | | | | | | |
| 1388 | **General Statistics** | | | | | | | | | | | |
| 1389 | Total Number of Observations | 37 | | | Number of Distinct Observations | 34 | | | | | | |
| 1390 | Number of Detects | 22 | | | Number of Non-Detects | 15 | | | | | | |
| 1391 | Number of Distinct Detects | 22 | | | Number of Distinct Non-Detects | 12 | | | | | | |
| 1392 | Minimum Detect | 43 | | | Minimum Non-Detect | 77 | | | | | | |
| 1393 | Maximum Detect | 94000 | | | Maximum Non-Detect | 6900 | | | | | | |
| 1394 | Variance Detects | 5.826E+8 | | | Percent Non-Detects | 40.54% | | | | | | |
| 1395 | Mean Detects | 10427 | | | SD Detects | 24137 | | | | | | |
| 1396 | Median Detects | 1350 | | | CV Detects | 2.315 | | | | | | |
| 1397 | Skewness Detects | 2.995 | | | Kurtosis Detects | 8.342 | | | | | | |
| 1398 | Mean of Logged Detects | 7.299 | | | SD of Logged Detects | 2.124 | | | | | | |
| 1399 | | | | | | | | | | | | |
| 1400 | **Normal GOF Test on Detects Only** | | | | | | | | | | | |
| 1401 | Shapiro Wilk Test Statistic | 0.472 | | | **Shapiro Wilk GOF Test** | | | | | | | |
| 1402 | 5% Shapiro Wilk Critical Value | 0.911 | | | Detected Data Not Normal at 5% Significance Level | | | | | | | |
| 1403 | Lilliefors Test Statistic | 0.38 | | | **Lilliefors GOF Test** | | | | | | | |
| 1404 | 5% Lilliefors Critical Value | 0.189 | | | Detected Data Not Normal at 5% Significance Level | | | | | | | |
| 1405 | **Detected Data Not Normal at 5% Significance Level** | | | | | | | | | | | |
| 1406 | | | | | | | | | | | | |
| 1407 | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | | | | | |
| 1408 | Mean | 6388 | | | Standard Error of Mean | 3171 | | | | | | |
| 1409 | SD | 18836 | | | 95% KM (BCA) UCL | 12452 | | | | | | |
| 1410 | 95% KM (t) UCL | 11741 | | | 95% KM (Percentile Bootstrap) UCL | 11685 | | | | | | |
| 1411 | 95% KM (z) UCL | 11604 | | | 95% KM Bootstrap t UCL | 30815 | | | | | | |
| 1412 | 90% KM Chebyshev UCL | 15900 | | | 95% KM Chebyshev UCL | 20209 | | | | | | |
| 1413 | 97.5% KM Chebyshev UCL | 26189 | | | 99% KM Chebyshev UCL | 37936 | | | | | | |
| 1414 | | | | | | | | | | | | |
| 1415 | **Gamma GOF Tests on Detected Observations Only** | | | | | | | | | | | |
| 1416 | A-D Test Statistic | 1.146 | | | **Anderson-Darling GOF Test** | | | | | | | |
| 1417 | 5% A-D Critical Value | 0.838 | | | Detected Data Not Gamma Distributed at 5% Significance Level | | | | | | | |
| 1418 | K-S Test Statistic | 0.187 | | | **Kolmogrov-Smirnoff GOF** | | | | | | | |
| 1419 | 5% K-S Critical Value | 0.2 | | | Detected data appear Gamma Distributed at 5% Significance Level | | | | | | | |
| 1420 | **Detected data follow Appr. Gamma Distribution at 5% Significance Level** | | | | | | | | | | | |
| 1421 | | | | | | | | | | | | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1422 | **Gamma Statistics on Detected Data Only** | | | | | | | | | | | |
| 1423 | | | | | k hat (MLE) | 0.345 | | | k star (bias corrected MLE) | | | 0.328 |
| 1424 | | | | | Theta hat (MLE) | 30224 | | | Theta star (bias corrected MLE) | | | 31765 |
| 1425 | | | | | nu hat (MLE) | 15.18 | | | nu star (bias corrected) | | | 14.44 |
| 1426 | | | | | MLE Mean (bias corrected) | 10427 | | | MLE Sd (bias corrected) | | | 18200 |
| 1427 | | | | | | | | | | | | |
| 1428 | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | | | | | |
| 1429 | | | | | k hat (KM) | 0.115 | | | nu hat (KM) | | | 8.511 |
| 1430 | | | | | Approximate Chi Square Value (8.51, α) | 3.035 | | | Adjusted Chi Square Value (8.51, β) | | | 2.894 |
| 1431 | | | | | 95% Gamma Approximate KM-UCL (use when n>=50) | 17917 | | | 95% Gamma Adjusted KM-UCL (use when n<50) | | | 18789 |
| 1432 | | | | | | | | | | | | |
| 1433 | **Gamma ROS Statistics using Imputed Non-Detects** | | | | | | | | | | | |
| 1434 | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | | | | |
| 1435 | GROS may not be used when kstar of detected data is small such as < 0.1 | | | | | | | | | | | |
| 1436 | For such situations, GROS method tends to yield inflated values of UCLs and BTVs | | | | | | | | | | | |
| 1437 | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | | | | |
| 1438 | | | | | Minimum | 0.01 | | | Mean | | | 6200 |
| 1439 | | | | | Maximum | 94000 | | | Median | | | 190 |
| 1440 | | | | | SD | 19151 | | | CV | | | 3.089 |
| 1441 | | | | | k hat (MLE) | 0.126 | | | k star (bias corrected MLE) | | | 0.134 |
| 1442 | | | | | Theta hat (MLE) | 49258 | | | Theta star (bias corrected MLE) | | | 46379 |
| 1443 | | | | | nu hat (MLE) | 9.314 | | | nu star (bias corrected) | | | 9.892 |
| 1444 | | | | | MLE Mean (bias corrected) | 6200 | | | MLE Sd (bias corrected) | | | 16957 |
| 1445 | | | | | | | | | Adjusted Level of Significance (β) | | | 0.0431 |
| 1446 | | | | | Approximate Chi Square Value (9.89, α) | 3.875 | | | Adjusted Chi Square Value (9.89, β) | | | 3.712 |
| 1447 | | | | | 95% Gamma Approximate UCL (use when n>=50) | 15829 | | | 95% Gamma Adjusted UCL (use when n<50) | | | 16523 |
| 1448 | | | | | | | | | | | | |
| 1449 | **Lognormal GOF Test on Detected Observations Only** | | | | | | | | | | | |
| 1450 | | | | | Shapiro Wilk Test Statistic | 0.977 | | | **Shapiro Wilk GOF Test** | | | |
| 1451 | | | | | 5% Shapiro Wilk Critical Value | 0.911 | | | Detected Data appear Lognormal at 5% Significance Level | | | |
| 1452 | | | | | Lilliefors Test Statistic | 0.0775 | | | **Lilliefors GOF Test** | | | |
| 1453 | | | | | 5% Lilliefors Critical Value | 0.189 | | | Detected Data appear Lognormal at 5% Significance Level | | | |
| 1454 | **Detected Data appear Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 1455 | | | | | | | | | | | | |
| 1456 | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | | | | | |
| 1457 | | | | | Mean in Original Scale | 6320 | | | Mean in Log Scale | | | 6.53 |
| 1458 | | | | | SD in Original Scale | 19112 | | | SD in Log Scale | | | 1.951 |
| 1459 | | | | | 95% t UCL (assumes normality of ROS data) | 11625 | | | 95% Percentile Bootstrap UCL | | | 12141 |
| 1460 | | | | | 95% BCA Bootstrap UCL | 14043 | | | 95% Bootstrap t UCL | | | 30564 |
| 1461 | | | | | 95% H-UCL (Log ROS) | 15101 | | | | | | |
| 1462 | | | | | | | | | | | | |
| 1463 | **UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed** | | | | | | | | | | | |
| 1464 | | | | | KM Mean (logged) | 6.497 | | | 95% H-UCL (KM -Log) | | | 19008 |
| 1465 | | | | | KM SD (logged) | 2.036 | | | 95% Critical H Value (KM-Log) | | | 3.783 |
| 1466 | | | | | KM Standard Error of Mean (logged) | 0.378 | | | | | | |
| 1467 | | | | | | | | | | | | |
| 1468 | **DL/2 Statistics** | | | | | | | | | | | |
| 1469 | **DL/2 Normal** | | | | | | | | **DL/2 Log-Transformed** | | | |
| 1470 | | | | | Mean in Original Scale | 6691 | | | Mean in Log Scale | | | 7.04 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1471 | | | | | SD in Original Scale | 19005 | | | | | SD in Log Scale | 1.815 |
| 1472 | | | | | 95% t UCL (Assumes normality) | 11966 | | | | | 95% H-Stat UCL | 16872 |
| 1473 | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | | | | | |
| 1474 | | | | | | | | | | | | |
| 1475 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 1476 | **Detected Data appear Approximate Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 1477 | | | | | | | | | | | | |
| 1478 | **Suggested UCL to Use** | | | | | | | | | | | |
| 1479 | | | | | 95% KM (BCA) UCL | 12452 | | | | | 95% GROS Adjusted Gamma UCL | 16523 |
| 1480 | | | | | 95% Adjusted Gamma KM-UCL | 18789 | | | | | | |
| 1481 | | | | | | | | | | | | |
| 1482 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 1483 | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | | | | | |
| 1484 | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | | | | | |
| 1485 | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 1486 | | | | | | | | | | | | |
| 1487 | **Benzo(g,h,i)perylene** | | | | | | | | | | | |
| 1488 | | | | | | | | | | | | |
| 1489 | **General Statistics** | | | | | | | | | | | |
| 1490 | | | | | Total Number of Observations | 37 | | | | | Number of Distinct Observations | 32 |
| 1491 | | | | | Number of Detects | 21 | | | | | Number of Non-Detects | 16 |
| 1492 | | | | | Number of Distinct Detects | 21 | | | | | Number of Distinct Non-Detects | 11 |
| 1493 | | | | | Minimum Detect | 52 | | | | | Minimum Non-Detect | 77 |
| 1494 | | | | | Maximum Detect | 93000 | | | | | Maximum Non-Detect | 6900 |
| 1495 | | | | | Variance Detects | 5.533E+8 | | | | | Percent Non-Detects | 43.24% |
| 1496 | | | | | Mean Detects | 10400 | | | | | SD Detects | 23522 |
| 1497 | | | | | Median Detects | 1200 | | | | | CV Detects | 2.262 |
| 1498 | | | | | Skewness Detects | 3.033 | | | | | Kurtosis Detects | 8.749 |
| 1499 | | | | | Mean of Logged Detects | 7.376 | | | | | SD of Logged Detects | 2.112 |
| 1500 | | | | | | | | | | | | |
| 1501 | **Normal GOF Test on Detects Only** | | | | | | | | | | | |
| 1502 | | | | | Shapiro Wilk Test Statistic | 0.476 | | | | | **Shapiro Wilk GOF Test** | |
| 1503 | | | | | 5% Shapiro Wilk Critical Value | 0.908 | | | | | Detected Data Not Normal at 5% Significance Level | |
| 1504 | | | | | Lilliefors Test Statistic | 0.378 | | | | | **Lilliefors GOF Test** | |
| 1505 | | | | | 5% Lilliefors Critical Value | 0.193 | | | | | Detected Data Not Normal at 5% Significance Level | |
| 1506 | **Detected Data Not Normal at 5% Significance Level** | | | | | | | | | | | |
| 1507 | | | | | | | | | | | | |
| 1508 | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | | | | | |
| 1509 | | | | | Mean | 6105 | | | | | Standard Error of Mean | 3031 |
| 1510 | | | | | SD | 17985 | | | | | 95% KM (BCA) UCL | 12318 |
| 1511 | | | | | 95% KM (t) UCL | 11222 | | | | | 95% KM (Percentile Bootstrap) UCL | 11645 |
| 1512 | | | | | 95% KM (z) UCL | 11090 | | | | | 95% KM Bootstrap t UCL | 31702 |
| 1513 | | | | | 90% KM Chebyshev UCL | 15198 | | | | | 95% KM Chebyshev UCL | 19317 |
| 1514 | | | | | 97.5% KM Chebyshev UCL | 25033 | | | | | 99% KM Chebyshev UCL | 36263 |
| 1515 | | | | | | | | | | | | |
| 1516 | **Gamma GOF Tests on Detected Observations Only** | | | | | | | | | | | |
| 1517 | | | | | A-D Test Statistic | 1.013 | | | | | **Anderson-Darling GOF Test** | |
| 1518 | | | | | 5% A-D Critical Value | 0.834 | | | | | Detected Data Not Gamma Distributed at 5% Significance Level | |
| 1519 | | | | | K-S Test Statistic | 0.169 | | | | | **Kolmogrov-Smirnoff GOF** | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1520 | 5% K-S Critical Value | | | | | 0.204 | Detected data appear Gamma Distributed at 5% Significance Level | | | | | |
| 1521 | **Detected data follow Appr. Gamma Distribution at 5% Significance Level** | | | | | | | | | | | |
| 1522 | | | | | | | | | | | | |
| 1523 | **Gamma Statistics on Detected Data Only** | | | | | | | | | | | |
| 1524 | k hat (MLE) | | | | | 0.358 | k star (bias corrected MLE) | | | | | 0.338 |
| 1525 | Theta hat (MLE) | | | | | 29079 | Theta star (bias corrected MLE) | | | | | 30742 |
| 1526 | nu hat (MLE) | | | | | 15.02 | nu star (bias corrected) | | | | | 14.21 |
| 1527 | MLE Mean (bias corrected) | | | | | 10400 | MLE Sd (bias corrected) | | | | | 17880 |
| 1528 | | | | | | | | | | | | |
| 1529 | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | | | | | |
| 1530 | k hat (KM) | | | | | 0.115 | nu hat (KM) | | | | | 8.526 |
| 1531 | Approximate Chi Square Value (8.53, α) | | | | | 3.043 | Adjusted Chi Square Value (8.53, β) | | | | | 2.902 |
| 1532 | 95% Gamma Approximate KM-UCL (use when n>=50) | | | | | 17103 | 95% Gamma Adjusted KM-UCL (use when n<50) | | | | | 17934 |
| 1533 | | | | | | | | | | | | |
| 1534 | **Gamma ROS Statistics using Imputed Non-Detects** | | | | | | | | | | | |
| 1535 | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | | | | |
| 1536 | GROS may not be used when kstar of detected data is small such as < 0.1 | | | | | | | | | | | |
| 1537 | For such situations, GROS method tends to yield inflated values of UCLs and BTVs | | | | | | | | | | | |
| 1538 | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | | | | |
| 1539 | Minimum | | | | | 0.01 | Mean | | | | | 5903 |
| 1540 | Maximum | | | | | 93000 | Median | | | | | 100 |
| 1541 | SD | | | | | 18294 | CV | | | | | 3.099 |
| 1542 | k hat (MLE) | | | | | 0.122 | k star (bias corrected MLE) | | | | | 0.13 |
| 1543 | Theta hat (MLE) | | | | | 48399 | Theta star (bias corrected MLE) | | | | | 45374 |
| 1544 | nu hat (MLE) | | | | | 9.025 | nu star (bias corrected) | | | | | 9.626 |
| 1545 | MLE Mean (bias corrected) | | | | | 5903 | MLE Sd (bias corrected) | | | | | 16365 |
| 1546 | | | | | | | Adjusted Level of Significance (β) | | | | | 0.0431 |
| 1547 | Approximate Chi Square Value (9.63, α) | | | | | 3.71 | Adjusted Chi Square Value (9.63, β) | | | | | 3.551 |
| 1548 | 95% Gamma Approximate UCL (use when n>=50) | | | | | 15317 | 95% Gamma Adjusted UCL (use when n<50) | | | | | 16001 |
| 1549 | | | | | | | | | | | | |
| 1550 | **Lognormal GOF Test on Detected Observations Only** | | | | | | | | | | | |
| 1551 | Shapiro Wilk Test Statistic | | | | | 0.967 | **Shapiro Wilk GOF Test** | | | | | |
| 1552 | 5% Shapiro Wilk Critical Value | | | | | 0.908 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 1553 | Lilliefors Test Statistic | | | | | 0.11 | **Lilliefors GOF Test** | | | | | |
| 1554 | 5% Lilliefors Critical Value | | | | | 0.193 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 1555 | **Detected Data appear Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 1556 | | | | | | | | | | | | |
| 1557 | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | | | | | |
| 1558 | Mean in Original Scale | | | | | 6048 | Mean in Log Scale | | | | | 6.56 |
| 1559 | SD in Original Scale | | | | | 18247 | SD in Log Scale | | | | | 1.937 |
| 1560 | 95% t UCL (assumes normality of ROS data) | | | | | 11113 | 95% Percentile Bootstrap UCL | | | | | 11167 |
| 1561 | 95% BCA Bootstrap UCL | | | | | 13956 | 95% Bootstrap t UCL | | | | | 33249 |
| 1562 | 95% H-UCL (Log ROS) | | | | | 14939 | | | | | | |
| 1563 | | | | | | | | | | | | |
| 1564 | **UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed** | | | | | | | | | | | |
| 1565 | KM Mean (logged) | | | | | 6.537 | 95% H-UCL (KM -Log) | | | | | 16915 |
| 1566 | KM SD (logged) | | | | | 1.986 | 95% Critical H Value (KM-Log) | | | | | 3.709 |
| 1567 | KM Standard Error of Mean (logged) | | | | | 0.374 | | | | | | |
| 1568 | | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1569 | **DL/2 Statistics** | | | | | | | | | | | |
| 1570 | **DL/2 Normal** | | | | | | **DL/2 Log-Transformed** | | | | | |
| 1571 | Mean in Original Scale | | | | | 6445 | Mean in Log Scale | | | | | 7.119 |
| 1572 | SD in Original Scale | | | | | 18132 | SD in Log Scale | | | | | 1.752 |
| 1573 | 95% t UCL (Assumes normality) | | | | | 11478 | 95% H-Stat UCL | | | | | 15358 |
| 1574 | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | | | | | |
| 1575 | | | | | | | | | | | | |
| 1576 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 1577 | **Detected Data appear Approximate Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 1578 | | | | | | | | | | | | |
| 1579 | **Suggested UCL to Use** | | | | | | | | | | | |
| 1580 | 95% KM (BCA) UCL | | | | | 12318 | 95% GROS Adjusted Gamma UCL | | | | | 16001 |
| 1581 | 95% Adjusted Gamma KM-UCL | | | | | 17934 | | | | | | |
| 1582 | | | | | | | | | | | | |
| 1583 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 1584 | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | | | | | |
| 1585 | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | | | | | |
| 1586 | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 1587 | | | | | | | | | | | | |
| 1588 | **Benzo(k)fluoranthene** | | | | | | | | | | | |
| 1589 | | | | | | | | | | | | |
| 1590 | **General Statistics** | | | | | | | | | | | |
| 1591 | Total Number of Observations | | | | | 37 | Number of Distinct Observations | | | | | 29 |
| 1592 | Number of Detects | | | | | 21 | Number of Non-Detects | | | | | 16 |
| 1593 | Number of Distinct Detects | | | | | 21 | Number of Distinct Non-Detects | | | | | 12 |
| 1594 | Minimum Detect | | | | | 34 | Minimum Non-Detect | | | | | 77 |
| 1595 | Maximum Detect | | | | | 68000 | Maximum Non-Detect | | | | | 6900 |
| 1596 | Variance Detects | | | | | 3.209E+8 | Percent Non-Detects | | | | | 43.24% |
| 1597 | Mean Detects | | | | | 8121 | SD Detects | | | | | 17913 |
| 1598 | Median Detects | | | | | 1400 | CV Detects | | | | | 2.206 |
| 1599 | Skewness Detects | | | | | 2.88 | Kurtosis Detects | | | | | 7.614 |
| 1600 | Mean of Logged Detects | | | | | 7.222 | SD of Logged Detects | | | | | 2.054 |
| 1601 | | | | | | | | | | | | |
| 1602 | **Normal GOF Test on Detects Only** | | | | | | | | | | | |
| 1603 | Shapiro Wilk Test Statistic | | | | | 0.489 | **Shapiro Wilk GOF Test** | | | | | |
| 1604 | 5% Shapiro Wilk Critical Value | | | | | 0.908 | Detected Data Not Normal at 5% Significance Level | | | | | |
| 1605 | Lilliefors Test Statistic | | | | | 0.387 | **Lilliefors GOF Test** | | | | | |
| 1606 | 5% Lilliefors Critical Value | | | | | 0.193 | Detected Data Not Normal at 5% Significance Level | | | | | |
| 1607 | **Detected Data Not Normal at 5% Significance Level** | | | | | | | | | | | |
| 1608 | | | | | | | | | | | | |
| 1609 | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | | | | | |
| 1610 | Mean | | | | | 4783 | Standard Error of Mean | | | | | 2312 |
| 1611 | SD | | | | | 13719 | 95% KM (BCA) UCL | | | | | 9316 |
| 1612 | 95% KM (t) UCL | | | | | 8687 | 95% KM (Percentile Bootstrap) UCL | | | | | 8858 |
| 1613 | 95% KM (z) UCL | | | | | 8586 | 95% KM Bootstrap t UCL | | | | | 22010 |
| 1614 | 90% KM Chebyshev UCL | | | | | 11720 | 95% KM Chebyshev UCL | | | | | 14862 |
| 1615 | 97.5% KM Chebyshev UCL | | | | | 19223 | 99% KM Chebyshev UCL | | | | | 27789 |
| 1616 | | | | | | | | | | | | |
| 1617 | **Gamma GOF Tests on Detected Observations Only** | | | | | | | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1618 | A-D Test Statistic | | | | | 1.027 | **Anderson-Darling GOF Test** | | | | | |
| 1619 | 5% A-D Critical Value | | | | | 0.831 | Detected Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 1620 | K-S Test Statistic | | | | | 0.214 | **Kolmogrov-Smirnoff GOF** | | | | | |
| 1621 | 5% K-S Critical Value | | | | | 0.204 | Detected Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 1622 | **Detected Data Not Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 1623 | | | | | | | | | | | | |
| 1624 | **Gamma Statistics on Detected Data Only** | | | | | | | | | | | |
| 1625 | k hat (MLE) | | | | | 0.374 | k star (bias corrected MLE) | | | | | 0.352 |
| 1626 | Theta hat (MLE) | | | | | 21727 | Theta star (bias corrected MLE) | | | | | 23063 |
| 1627 | nu hat (MLE) | | | | | 15.7 | nu star (bias corrected) | | | | | 14.79 |
| 1628 | MLE Mean (bias corrected) | | | | | 8121 | MLE Sd (bias corrected) | | | | | 13685 |
| 1629 | | | | | | | | | | | | |
| 1630 | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | | | | | |
| 1631 | k hat (KM) | | | | | 0.122 | nu hat (KM) | | | | | 8.993 |
| 1632 | Approximate Chi Square Value (8.99, α) | | | | | 3.323 | Adjusted Chi Square Value (8.99, β) | | | | | 3.174 |
| 1633 | 95% Gamma Approximate KM-UCL (use when n>=50) | | | | | 12944 | 95% Gamma Adjusted KM-UCL (use when n<50) | | | | | 13550 |
| 1634 | | | | | | | | | | | | |
| 1635 | **Gamma ROS Statistics using Imputed Non-Detects** | | | | | | | | | | | |
| 1636 | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | | | | |
| 1637 | GROS may not be used when kstar of detected data is small such as < 0.1 | | | | | | | | | | | |
| 1638 | For such situations, GROS method tends to yield inflated values of UCLs and BTVs | | | | | | | | | | | |
| 1639 | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | | | | |
| 1640 | Minimum | | | | | 0.01 | Mean | | | | | 4609 |
| 1641 | Maximum | | | | | 68000 | Median | | | | | 140 |
| 1642 | SD | | | | | 13961 | CV | | | | | 3.029 |
| 1643 | k hat (MLE) | | | | | 0.125 | k star (bias corrected MLE) | | | | | 0.133 |
| 1644 | Theta hat (MLE) | | | | | 36970 | Theta star (bias corrected MLE) | | | | | 34764 |
| 1645 | nu hat (MLE) | | | | | 9.225 | nu star (bias corrected) | | | | | 9.811 |
| 1646 | MLE Mean (bias corrected) | | | | | 4609 | MLE Sd (bias corrected) | | | | | 12658 |
| 1647 | | | | | | | Adjusted Level of Significance (β) | | | | | 0.0431 |
| 1648 | Approximate Chi Square Value (9.81, α) | | | | | 3.824 | Adjusted Chi Square Value (9.81, β) | | | | | 3.662 |
| 1649 | 95% Gamma Approximate UCL (use when n>=50) | | | | | 11825 | 95% Gamma Adjusted UCL (use when n<50) | | | | | 12347 |
| 1650 | | | | | | | | | | | | |
| 1651 | **Lognormal GOF Test on Detected Observations Only** | | | | | | | | | | | |
| 1652 | Shapiro Wilk Test Statistic | | | | | 0.978 | **Shapiro Wilk GOF Test** | | | | | |
| 1653 | 5% Shapiro Wilk Critical Value | | | | | 0.908 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 1654 | Lilliefors Test Statistic | | | | | 0.0871 | **Lilliefors GOF Test** | | | | | |
| 1655 | 5% Lilliefors Critical Value | | | | | 0.193 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 1656 | **Detected Data appear Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 1657 | | | | | | | | | | | | |
| 1658 | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | | | | | |
| 1659 | Mean in Original Scale | | | | | 4714 | Mean in Log Scale | | | | | 6.335 |
| 1660 | SD in Original Scale | | | | | 13926 | SD in Log Scale | | | | | 1.931 |
| 1661 | 95% t UCL (assumes normality of ROS data) | | | | | 8579 | 95% Percentile Bootstrap UCL | | | | | 8986 |
| 1662 | 95% BCA Bootstrap UCL | | | | | 10341 | 95% Bootstrap t UCL | | | | | 21266 |
| 1663 | 95% H-UCL (Log ROS) | | | | | 11696 | | | | | | |
| 1664 | | | | | | | | | | | | |
| 1665 | **UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed** | | | | | | | | | | | |
| 1666 | KM Mean (logged) | | | | | 6.296 | 95% H-UCL (KM -Log) | | | | | 16883 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1667 | | | | | KM SD (logged) | 2.062 | | | | 95% Critical H Value (KM-Log) | | 3.821 |
| 1668 | | | | | KM Standard Error of Mean (logged) | 0.395 | | | | | | |
| 1669 | | | | | | | | | | | | |
| 1670 | **DL/2 Statistics** | | | | | | | | | | | |
| 1671 | **DL/2 Normal** | | | | | | **DL/2 Log-Transformed** | | | | | |
| 1672 | | | | | Mean in Original Scale | 5116 | | | | Mean in Log Scale | | 6.953 |
| 1673 | | | | | SD in Original Scale | 13812 | | | | SD in Log Scale | | 1.758 |
| 1674 | | | | | 95% t UCL (Assumes normality) | 8950 | | | | 95% H-Stat UCL | | 13221 |
| 1675 | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | | | | | |
| 1676 | | | | | | | | | | | | |
| 1677 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 1678 | **Detected Data appear Lognormal Distributed at 5% Significance Level** | | | | | | | | | | | |
| 1679 | | | | | | | | | | | | |
| 1680 | **Suggested UCL to Use** | | | | | | | | | | | |
| 1681 | | | | | 99% KM (Chebyshev) UCL | 27789 | | | | | | |
| 1682 | | | | | | | | | | | | |
| 1683 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 1684 | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | | | | | |
| 1685 | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | | | | | |
| 1686 | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 1687 | | | | | | | | | | | | |
| 1688 | **Beryllium** | | | | | | | | | | | |
| 1689 | | | | | | | | | | | | |
| 1690 | **General Statistics** | | | | | | | | | | | |
| 1691 | | | | | Total Number of Observations | 25 | | | | Number of Distinct Observations | | 20 |
| 1692 | | | | | Number of Detects | 18 | | | | Number of Non-Detects | | 7 |
| 1693 | | | | | Number of Distinct Detects | 16 | | | | Number of Distinct Non-Detects | | 7 |
| 1694 | | | | | Minimum Detect | 0.078 | | | | Minimum Non-Detect | | 0.071 |
| 1695 | | | | | Maximum Detect | 1.1 | | | | Maximum Non-Detect | | 0.25 |
| 1696 | | | | | Variance Detects | 0.0536 | | | | Percent Non-Detects | | 28% |
| 1697 | | | | | Mean Detects | 0.274 | | | | SD Detects | | 0.232 |
| 1698 | | | | | Median Detects | 0.23 | | | | CV Detects | | 0.845 |
| 1699 | | | | | Skewness Detects | 2.908 | | | | Kurtosis Detects | | 10.12 |
| 1700 | | | | | Mean of Logged Detects | -1.51 | | | | SD of Logged Detects | | 0.636 |
| 1701 | | | | | | | | | | | | |
| 1702 | **Normal GOF Test on Detects Only** | | | | | | | | | | | |
| 1703 | | | | | Shapiro Wilk Test Statistic | 0.679 | **Shapiro Wilk GOF Test** | | | | | |
| 1704 | | | | | 5% Shapiro Wilk Critical Value | 0.897 | Detected Data Not Normal at 5% Significance Level | | | | | |
| 1705 | | | | | Lilliefors Test Statistic | 0.233 | **Lilliefors GOF Test** | | | | | |
| 1706 | | | | | 5% Lilliefors Critical Value | 0.209 | Detected Data Not Normal at 5% Significance Level | | | | | |
| 1707 | **Detected Data Not Normal at 5% Significance Level** | | | | | | | | | | | |
| 1708 | | | | | | | | | | | | |
| 1709 | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | | | | | |
| 1710 | | | | | Mean | 0.226 | | | | Standard Error of Mean | | 0.0429 |
| 1711 | | | | | SD | 0.207 | | | | 95% KM (BCA) UCL | | 0.317 |
| 1712 | | | | | 95% KM (t) UCL | 0.299 | | | | 95% KM (Percentile Bootstrap) UCL | | 0.301 |
| 1713 | | | | | 95% KM (z) UCL | 0.297 | | | | 95% KM Bootstrap t UCL | | 0.355 |
| 1714 | | | | | 90% KM Chebyshev UCL | 0.355 | | | | 95% KM Chebyshev UCL | | 0.413 |
| 1715 | | | | | 97.5% KM Chebyshev UCL | 0.494 | | | | 99% KM Chebyshev UCL | | 0.653 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1716 | | | | | | | | | | | | |
| 1717 | **Gamma GOF Tests on Detected Observations Only** | | | | | | | | | | | |
| 1718 | | | | A-D Test Statistic | | 0.52 | **Anderson-Darling GOF Test** | | | | | |
| 1719 | | | | 5% A-D Critical Value | | 0.749 | Detected data appear Gamma Distributed at 5% Significance Level | | | | | |
| 1720 | | | | K-S Test Statistic | | 0.139 | **Kolmogrov-Smirnoff GOF** | | | | | |
| 1721 | | | | 5% K-S Critical Value | | 0.206 | Detected data appear Gamma Distributed at 5% Significance Level | | | | | |
| 1722 | **Detected data appear Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 1723 | | | | | | | | | | | | |
| 1724 | **Gamma Statistics on Detected Data Only** | | | | | | | | | | | |
| 1725 | | | | k hat (MLE) | | 2.466 | k star (bias corrected MLE) | | | | | 2.092 |
| 1726 | | | | Theta hat (MLE) | | 0.111 | Theta star (bias corrected MLE) | | | | | 0.131 |
| 1727 | | | | nu hat (MLE) | | 88.76 | nu star (bias corrected) | | | | | 75.3 |
| 1728 | | | | MLE Mean (bias corrected) | | 0.274 | MLE Sd (bias corrected) | | | | | 0.19 |
| 1729 | | | | | | | | | | | | |
| 1730 | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | | | | | |
| 1731 | | | | k hat (KM) | | 1.188 | nu hat (KM) | | | | | 59.41 |
| 1732 | | | | Approximate Chi Square Value (59.41, α) | | 42.69 | Adjusted Chi Square Value (59.41, β) | | | | | 41.72 |
| 1733 | | | | 95% Gamma Approximate KM-UCL (use when n>=50) | | 0.315 | 95% Gamma Adjusted KM-UCL (use when n<50) | | | | | 0.322 |
| 1734 | | | | | | | | | | | | |
| 1735 | **Gamma ROS Statistics using Imputed Non-Detects** | | | | | | | | | | | |
| 1736 | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | | | | |
| 1737 | GROS may not be used when kstar of detected data is small such as < 0.1 | | | | | | | | | | | |
| 1738 | For such situations, GROS method tends to yield inflated values of UCLs and BTVs | | | | | | | | | | | |
| 1739 | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | | | | |
| 1740 | | | | Minimum | | 0.01 | Mean | | | | | 0.209 |
| 1741 | | | | Maximum | | 1.1 | Median | | | | | 0.17 |
| 1742 | | | | SD | | 0.223 | CV | | | | | 1.064 |
| 1743 | | | | k hat (MLE) | | 1.085 | k star (bias corrected MLE) | | | | | 0.981 |
| 1744 | | | | Theta hat (MLE) | | 0.193 | Theta star (bias corrected MLE) | | | | | 0.213 |
| 1745 | | | | nu hat (MLE) | | 54.24 | nu star (bias corrected) | | | | | 49.07 |
| 1746 | | | | MLE Mean (bias corrected) | | 0.209 | MLE Sd (bias corrected) | | | | | 0.211 |
| 1747 | | | | | | | Adjusted Level of Significance (β) | | | | | 0.0395 |
| 1748 | | | | Approximate Chi Square Value (49.07, α) | | 33.99 | Adjusted Chi Square Value (49.07, β) | | | | | 33.13 |
| 1749 | | | | 95% Gamma Approximate UCL (use when n>=50) | | 0.302 | 95% Gamma Adjusted UCL (use when n<50) | | | | | 0.31 |
| 1750 | | | | | | | | | | | | |
| 1751 | **Lognormal GOF Test on Detected Observations Only** | | | | | | | | | | | |
| 1752 | | | | Shapiro Wilk Test Statistic | | 0.963 | **Shapiro Wilk GOF Test** | | | | | |
| 1753 | | | | 5% Shapiro Wilk Critical Value | | 0.897 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 1754 | | | | Lilliefors Test Statistic | | 0.0928 | **Lilliefors GOF Test** | | | | | |
| 1755 | | | | 5% Lilliefors Critical Value | | 0.209 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 1756 | **Detected Data appear Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 1757 | | | | | | | | | | | | |
| 1758 | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | | | | | |
| 1759 | | | | Mean in Original Scale | | 0.222 | Mean in Log Scale | | | | | -1.782 |
| 1760 | | | | SD in Original Scale | | 0.213 | SD in Log Scale | | | | | 0.723 |
| 1761 | | | | 95% t UCL (assumes normality of ROS data) | | 0.295 | 95% Percentile Bootstrap UCL | | | | | 0.296 |
| 1762 | | | | 95% BCA Bootstrap UCL | | 0.328 | 95% Bootstrap t UCL | | | | | 0.354 |
| 1763 | | | | 95% H-UCL (Log ROS) | | 0.301 | | | | | | |
| 1764 | | | | | | | | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1765 | **UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed** | | | | | | | | | | | |
| 1766 | | | | | KM Mean (logged) | -1.747 | | | | 95% H-UCL (KM -Log) | | 0.293 |
| 1767 | | | | | KM SD (logged) | 0.676 | | | | 95% Critical H Value (KM-Log) | | 2.121 |
| 1768 | | | | | KM Standard Error of Mean (logged) | 0.143 | | | | | | |
| 1769 | | | | | | | | | | | | |
| 1770 | **DL/2 Statistics** | | | | | | | | | | | |
| 1771 | | | | **DL/2 Normal** | | | | | **DL/2 Log-Transformed** | | | |
| 1772 | | | | | Mean in Original Scale | 0.22 | | | | Mean in Log Scale | | -1.823 |
| 1773 | | | | | SD in Original Scale | 0.215 | | | | SD in Log Scale | | 0.783 |
| 1774 | | | | | 95% t UCL (Assumes normality) | 0.294 | | | | 95% H-Stat UCL | | 0.314 |
| 1775 | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | | | | | |
| 1776 | | | | | | | | | | | | |
| 1777 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 1778 | **Detected Data appear Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 1779 | | | | | | | | | | | | |
| 1780 | **Suggested UCL to Use** | | | | | | | | | | | |
| 1781 | | | | | 95% KM (Percentile Bootstrap) UCL | 0.301 | | | | 95% GROS Adjusted Gamma UCL | | 0.31 |
| 1782 | | | | | 95% Adjusted Gamma KM-UCL | 0.322 | | | | | | |
| 1783 | | | | | | | | | | | | |
| 1784 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 1785 | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | | | | | |
| 1786 | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | | | | | |
| 1787 | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 1788 | | | | | | | | | | | | |
| 1789 | **bis(2-Ethylhexyl)phthalate** | | | | | | | | | | | |
| 1790 | | | | | | | | | | | | |
| 1791 | **General Statistics** | | | | | | | | | | | |
| 1792 | | | | | Total Number of Observations | 33 | | | | Number of Distinct Observations | | 26 |
| 1793 | | | | | Number of Detects | 14 | | | | Number of Non-Detects | | 19 |
| 1794 | | | | | Number of Distinct Detects | 13 | | | | Number of Distinct Non-Detects | | 13 |
| 1795 | | | | | Minimum Detect | 24 | | | | Minimum Non-Detect | | 1800 |
| 1796 | | | | | Maximum Detect | 3200000 | | | | Maximum Non-Detect | | 34000 |
| 1797 | | | | | Variance Detects | 7.312E+11 | | | | Percent Non-Detects | | 57.58% |
| 1798 | | | | | Mean Detects | 229043 | | | | SD Detects | | 855101 |
| 1799 | | | | | Median Detects | 270 | | | | CV Detects | | 3.733 |
| 1800 | | | | | Skewness Detects | 3.742 | | | | Kurtosis Detects | | 14 |
| 1801 | | | | | Mean of Logged Detects | 6.207 | | | | SD of Logged Detects | | 2.827 |
| 1802 | | | | | | | | | | | | |
| 1803 | **Normal GOF Test on Detects Only** | | | | | | | | | | | |
| 1804 | | | | | Shapiro Wilk Test Statistic | 0.297 | | | | **Shapiro Wilk GOF Test** | | |
| 1805 | | | | | 5% Shapiro Wilk Critical Value | 0.874 | | | | Detected Data Not Normal at 5% Significance Level | | |
| 1806 | | | | | Lilliefors Test Statistic | 0.533 | | | | **Lilliefors GOF Test** | | |
| 1807 | | | | | 5% Lilliefors Critical Value | 0.237 | | | | Detected Data Not Normal at 5% Significance Level | | |
| 1808 | **Detected Data Not Normal at 5% Significance Level** | | | | | | | | | | | |
| 1809 | | | | | | | | | | | | |
| 1810 | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | | | | | |
| 1811 | | | | | Mean | 97436 | | | | Standard Error of Mean | | 99079 |
| 1812 | | | | | SD | 548461 | | | | 95% KM (BCA) UCL | | 291460 |
| 1813 | | | | | 95% KM (t) UCL | 265265 | | | | 95% KM (Percentile Bootstrap) UCL | | 291294 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1814 | | | | 95% KM (z) UCL | 260407 | | | | 95% KM Bootstrap t UCL | | 1.094E+8 | |
| 1815 | | | | 90% KM Chebyshev UCL | 394673 | | | | 95% KM Chebyshev UCL | | 529312 | |
| 1816 | | | | 97.5% KM Chebyshev UCL | 716184 | | | | 99% KM Chebyshev UCL | | 1083260 | |
| 1817 | | | | | | | | | | | | |
| 1818 | **Gamma GOF Tests on Detected Observations Only** | | | | | | | | | | | |
| 1819 | | | | A-D Test Statistic | 3.574 | **Anderson-Darling GOF Test** | | | | | | |
| 1820 | | | | 5% A-D Critical Value | 0.943 | Detected Data Not Gamma Distributed at 5% Significance Level | | | | | | |
| 1821 | | | | K-S Test Statistic | 0.478 | **Kolmogrov-Smirnoff GOF** | | | | | | |
| 1822 | | | | 5% K-S Critical Value | 0.259 | Detected Data Not Gamma Distributed at 5% Significance Level | | | | | | |
| 1823 | **Detected Data Not Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 1824 | | | | | | | | | | | | |
| 1825 | **Gamma Statistics on Detected Data Only** | | | | | | | | | | | |
| 1826 | | | | k hat (MLE) | 0.128 | k star (bias corrected MLE) | 0.148 | | | | | |
| 1827 | | | | Theta hat (MLE) | 1787795 | Theta star (bias corrected MLE) | 1544658 | | | | | |
| 1828 | | | | nu hat (MLE) | 3.587 | nu star (bias corrected) | 4.152 | | | | | |
| 1829 | | | | MLE Mean (bias corrected) | 229043 | MLE Sd (bias corrected) | 594805 | | | | | |
| 1830 | | | | | | | | | | | | |
| 1831 | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | | | | | |
| 1832 | | | | k hat (KM) | 0.0316 | nu hat (KM) | 2.083 | | | | | |
| 1833 | | | | Approximate Chi Square Value (2.08, α) | 0.162 | Adjusted Chi Square Value (2.08, β) | 0.148 | | | | | |
| 1834 | | | | 95% Gamma Approximate KM-UCL (use when n>=50) | 1250150 | 95% Gamma Adjusted KM-UCL (use when n<50) | 1371617 | | | | | |
| 1835 | Gamma (KM) may not be used when k hat (KM) is < 0.1 | | | | | | | | | | | |
| 1836 | | | | | | | | | | | | |
| 1837 | **Gamma ROS Statistics using Imputed Non-Detects** | | | | | | | | | | | |
| 1838 | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | | | | |
| 1839 | GROS may not be used when kstar of detected data is small such as < 0.1 | | | | | | | | | | | |
| 1840 | For such situations, GROS method tends to yield inflated values of UCLs and BTVs | | | | | | | | | | | |
| 1841 | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | | | | |
| 1842 | | | | Minimum | 0.01 | Mean | 99395 | | | | | |
| 1843 | | | | Maximum | 3200000 | Median | 0.01 | | | | | |
| 1844 | | | | SD | 556758 | CV | 5.601 | | | | | |
| 1845 | | | | k hat (MLE) | 0.0779 | k star (bias corrected MLE) | 0.091 | | | | | |
| 1846 | | | | Theta hat (MLE) | 1275486 | Theta star (bias corrected MLE) | 1091715 | | | | | |
| 1847 | | | | nu hat (MLE) | 5.143 | nu star (bias corrected) | 6.009 | | | | | |
| 1848 | | | | MLE Mean (bias corrected) | 99395 | MLE Sd (bias corrected) | 329411 | | | | | |
| 1849 | | | | | | Adjusted Level of Significance (β) | 0.0419 | | | | | |
| 1850 | | | | Approximate Chi Square Value (6.01, α) | 1.644 | Adjusted Chi Square Value (6.01, β) | 1.53 | | | | | |
| 1851 | | | | 95% Gamma Approximate UCL (use when n>=50) | 363199 | 95% Gamma Adjusted UCL (use when n<50) | 390263 | | | | | |
| 1852 | | | | | | | | | | | | |
| 1853 | **Lognormal GOF Test on Detected Observations Only** | | | | | | | | | | | |
| 1854 | | | | Shapiro Wilk Test Statistic | 0.74 | **Shapiro Wilk GOF Test** | | | | | | |
| 1855 | | | | 5% Shapiro Wilk Critical Value | 0.874 | Detected Data Not Lognormal at 5% Significance Level | | | | | | |
| 1856 | | | | Lilliefors Test Statistic | 0.261 | **Lilliefors GOF Test** | | | | | | |
| 1857 | | | | 5% Lilliefors Critical Value | 0.237 | Detected Data Not Lognormal at 5% Significance Level | | | | | | |
| 1858 | **Detected Data Not Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 1859 | | | | | | | | | | | | |
| 1860 | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | | | | | |
| 1861 | | | | Mean in Original Scale | 97444 | Mean in Log Scale | 5.941 | | | | | |
| 1862 | | | | SD in Original Scale | 556964 | SD in Log Scale | 1.948 | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1863 | 95% t UCL (assumes normality of ROS data) | | | | | 261675 | 95% Percentile Bootstrap UCL | | | | | 291333 |
| 1864 | 95% BCA Bootstrap UCL | | | | | 485106 | 95% Bootstrap t UCL | | | | | 1.333E+8 |
| 1865 | 95% H-UCL (Log ROS) | | | | | 9276 | | | | | | |
| 1866 | | | | | | | | | | | | |
| 1867 | **DL/2 Statistics** | | | | | | | | | | | |
| 1868 | **DL/2 Normal** | | | | | | **DL/2 Log-Transformed** | | | | | |
| 1869 | Mean in Original Scale | | | | | 100494 | Mean in Log Scale | | | | | 7.45 |
| 1870 | SD in Original Scale | | | | | 556430 | SD in Log Scale | | | | | 2.204 |
| 1871 | 95% t UCL (Assumes normality) | | | | | 264567 | 95% H-Stat UCL | | | | | 98887 |
| 1872 | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | | | | | |
| 1873 | | | | | | | | | | | | |
| 1874 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 1875 | **Data do not follow a Discernible Distribution at 5% Significance Level** | | | | | | | | | | | |
| 1876 | | | | | | | | | | | | |
| 1877 | **Suggested UCL to Use** | | | | | | | | | | | |
| 1878 | 99% KM (Chebyshev) UCL | | | | | 1083260 | | | | | | |
| 1879 | | | | | | | | | | | | |
| 1880 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 1881 | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | | | | | |
| 1882 | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | | | | | |
| 1883 | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 1884 | | | | | | | | | | | | |
| 1885 | **Butyl benzylphthalate** | | | | | | | | | | | |
| 1886 | | | | | | | | | | | | |
| 1887 | **General Statistics** | | | | | | | | | | | |
| 1888 | Total Number of Observations | | | | | 32 | Number of Distinct Observations | | | | | 25 |
| 1889 | Number of Detects | | | | | 3 | Number of Non-Detects | | | | | 29 |
| 1890 | Number of Distinct Detects | | | | | 3 | Number of Distinct Non-Detects | | | | | 22 |
| 1891 | Minimum Detect | | | | | 160 | Minimum Non-Detect | | | | | 200 |
| 1892 | Maximum Detect | | | | | 490 | Maximum Non-Detect | | | | | 17000 |
| 1893 | Variance Detects | | | | | 34233 | Percent Non-Detects | | | | | 90.63% |
| 1894 | Mean Detects | | | | | 276.7 | SD Detects | | | | | 185 |
| 1895 | Median Detects | | | | | 180 | CV Detects | | | | | 0.669 |
| 1896 | Skewness Detects | | | | | 1.709 | Kurtosis Detects | | | | | N/A |
| 1897 | Mean of Logged Detects | | | | | 5.488 | SD of Logged Detects | | | | | 0.615 |
| 1898 | | | | | | | | | | | | |
| 1899 | **Warning: Data set has only 3 Detected Values.** | | | | | | | | | | | |
| 1900 | **This is not enough to compute meaningful or reliable statistics and estimates.** | | | | | | | | | | | |
| 1901 | | | | | | | | | | | | |
| 1902 | | | | | | | | | | | | |
| 1903 | **Normal GOF Test on Detects Only** | | | | | | | | | | | |
| 1904 | Shapiro Wilk Test Statistic | | | | | 0.795 | **Shapiro Wilk GOF Test** | | | | | |
| 1905 | 5% Shapiro Wilk Critical Value | | | | | 0.767 | Detected Data appear Normal at 5% Significance Level | | | | | |
| 1906 | Lilliefors Test Statistic | | | | | 0.366 | **Lilliefors GOF Test** | | | | | |
| 1907 | 5% Lilliefors Critical Value | | | | | 0.512 | Detected Data appear Normal at 5% Significance Level | | | | | |
| 1908 | **Detected Data appear Normal at 5% Significance Level** | | | | | | | | | | | |
| 1909 | | | | | | | | | | | | |
| 1910 | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | | | | | |
| 1911 | Mean | | | | | 223.3 | Standard Error of Mean | | | | | 60.06 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1912 | | | | | SD | 119.6 | | | | 95% KM (BCA) UCL | | N/A |
| 1913 | | | | | 95% KM (t) UCL | 325.2 | | | | 95% KM (Percentile Bootstrap) UCL | | N/A |
| 1914 | | | | | 95% KM (z) UCL | 322.1 | | | | 95% KM Bootstrap t UCL | | N/A |
| 1915 | | | | | 90% KM Chebyshev UCL | 403.5 | | | | 95% KM Chebyshev UCL | | 485.1 |
| 1916 | | | | | 97.5% KM Chebyshev UCL | 598.4 | | | | 99% KM Chebyshev UCL | | 821 |
| 1917 | | | | | | | | | | | | |
| 1918 | | | | | **Gamma GOF Tests on Detected Observations Only** | | | | | | | |
| 1919 | | | | | **Not Enough Data to Perform GOF Test** | | | | | | | |
| 1920 | | | | | | | | | | | | |
| 1921 | | | | | **Gamma Statistics on Detected Data Only** | | | | | | | |
| 1922 | | | | | k hat (MLE) | 3.854 | | | | k star (bias corrected MLE) | | N/A |
| 1923 | | | | | Theta hat (MLE) | 71.78 | | | | Theta star (bias corrected MLE) | | N/A |
| 1924 | | | | | nu hat (MLE) | 23.13 | | | | nu star (bias corrected) | | N/A |
| 1925 | | | | | MLE Mean (bias corrected) | N/A | | | | MLE Sd (bias corrected) | | N/A |
| 1926 | | | | | | | | | | | | |
| 1927 | | | | | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | |
| 1928 | | | | | k hat (KM) | 3.487 | | | | nu hat (KM) | | 223.1 |
| 1929 | | | | | | | | | | Adjusted Level of Significance (β) | | 0.0416 |
| 1930 | | | | | Approximate Chi Square Value (223.14, α) | 189.6 | | | | Adjusted Chi Square Value (223.14, β) | | 187.9 |
| 1931 | | | | | 95% Gamma Approximate KM-UCL (use when n>=50) | 262.9 | | | | 95% Gamma Adjusted KM-UCL (use when n<50) | | 265.2 |
| 1932 | | | | | | | | | | | | |
| 1933 | | | | | **Lognormal GOF Test on Detected Observations Only** | | | | | | | |
| 1934 | | | | | Shapiro Wilk Test Statistic | 0.828 | | | | **Shapiro Wilk GOF Test** | | |
| 1935 | | | | | 5% Shapiro Wilk Critical Value | 0.767 | | | | Detected Data appear Lognormal at 5% Significance Level | | |
| 1936 | | | | | Lilliefors Test Statistic | 0.351 | | | | **Lilliefors GOF Test** | | |
| 1937 | | | | | 5% Lilliefors Critical Value | 0.512 | | | | Detected Data appear Lognormal at 5% Significance Level | | |
| 1938 | | | | | **Detected Data appear Lognormal at 5% Significance Level** | | | | | | | |
| 1939 | | | | | | | | | | | | |
| 1940 | | | | | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | |
| 1941 | | | | | Mean in Original Scale | 208.7 | | | | Mean in Log Scale | | 5.308 |
| 1942 | | | | | SD in Original Scale | 63.29 | | | | SD in Log Scale | | 0.244 |
| 1943 | | | | | 95% t UCL (assumes normality of ROS data) | 227.6 | | | | 95% Percentile Bootstrap UCL | | 229.2 |
| 1944 | | | | | 95% BCA Bootstrap UCL | 234.8 | | | | 95% Bootstrap t UCL | | 240 |
| 1945 | | | | | 95% H-UCL (Log ROS) | 224.8 | | | | | | |
| 1946 | | | | | | | | | | | | |
| 1947 | | | | | **UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed** | | | | | | | |
| 1948 | | | | | KM Mean (logged) | 5.311 | | | | 95% H-UCL (KM -Log) | | 250.5 |
| 1949 | | | | | KM SD (logged) | 0.399 | | | | 95% Critical H Value (KM-Log) | | 1.858 |
| 1950 | | | | | KM Standard Error of Mean (logged) | 0.202 | | | | | | |
| 1951 | | | | | | | | | | | | |
| 1952 | | | | | **DL/2 Statistics** | | | | | | | |
| 1953 | | | | | **DL/2 Normal** | | | | | **DL/2 Log-Transformed** | | |
| 1954 | | | | | Mean in Original Scale | 2072 | | | | Mean in Log Scale | | 7.075 |
| 1955 | | | | | SD in Original Scale | 1939 | | | | SD in Log Scale | | 1.231 |
| 1956 | | | | | 95% t UCL (Assumes normality) | 2653 | | | | 95% H-Stat UCL | | 4597 |
| 1957 | | | | | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | |
| 1958 | | | | | | | | | | | | |
| 1959 | | | | | **Nonparametric Distribution Free UCL Statistics** | | | | | | | |
| 1960 | | | | | **Detected Data appear Normal Distributed at 5% Significance Level** | | | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1961 | | | | | | | | | | | | |
| 1962 | **Suggested UCL to Use** | | | | | | | | | | | |
| 1963 | | | | 95% KM (t) UCL | | 325.2 | | | 95% KM (Percentile Bootstrap) UCL | | | N/A |
| 1964 | **Warning: One or more Recommended UCL(s) not available!** | | | | | | | | | | | |
| 1965 | | | | | | | | | | | | |
| 1966 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 1967 | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | | | | | |
| 1968 | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | | | | | |
| 1969 | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 1970 | | | | | | | | | | | | |
| 1971 | **Cadmium** | | | | | | | | | | | |
| 1972 | | | | | | | | | | | | |
| 1973 | **General Statistics** | | | | | | | | | | | |
| 1974 | | | | Total Number of Observations | | 26 | | | Number of Distinct Observations | | | 22 |
| 1975 | | | | Number of Detects | | 24 | | | Number of Non-Detects | | | 2 |
| 1976 | | | | Number of Distinct Detects | | 20 | | | Number of Distinct Non-Detects | | | 2 |
| 1977 | | | | Minimum Detect | | 0.038 | | | Minimum Non-Detect | | | 0.11 |
| 1978 | | | | Maximum Detect | | 3.06 | | | Maximum Non-Detect | | | 0.18 |
| 1979 | | | | Variance Detects | | 0.82 | | | Percent Non-Detects | | | 7.692% |
| 1980 | | | | Mean Detects | | 0.936 | | | SD Detects | | | 0.906 |
| 1981 | | | | Median Detects | | 0.64 | | | CV Detects | | | 0.967 |
| 1982 | | | | Skewness Detects | | 1.312 | | | Kurtosis Detects | | | 0.721 |
| 1983 | | | | Mean of Logged Detects | | -0.576 | | | SD of Logged Detects | | | 1.143 |
| 1984 | | | | | | | | | | | | |
| 1985 | **Normal GOF Test on Detects Only** | | | | | | | | | | | |
| 1986 | | | | Shapiro Wilk Test Statistic | | 0.823 | | | **Shapiro Wilk GOF Test** | | | |
| 1987 | | | | 5% Shapiro Wilk Critical Value | | 0.916 | | | Detected Data Not Normal at 5% Significance Level | | | |
| 1988 | | | | Lilliefors Test Statistic | | 0.235 | | | **Lilliefors GOF Test** | | | |
| 1989 | | | | 5% Lilliefors Critical Value | | 0.181 | | | Detected Data Not Normal at 5% Significance Level | | | |
| 1990 | **Detected Data Not Normal at 5% Significance Level** | | | | | | | | | | | |
| 1991 | | | | | | | | | | | | |
| 1992 | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | | | | | |
| 1993 | | | | Mean | | 0.869 | | | Standard Error of Mean | | | 0.177 |
| 1994 | | | | SD | | 0.883 | | | 95% KM (BCA) UCL | | | 1.154 |
| 1995 | | | | 95% KM (t) UCL | | 1.171 | | | 95% KM (Percentile Bootstrap) UCL | | | 1.158 |
| 1996 | | | | 95% KM (z) UCL | | 1.16 | | | 95% KM Bootstrap t UCL | | | 1.241 |
| 1997 | | | | 90% KM Chebyshev UCL | | 1.4 | | | 95% KM Chebyshev UCL | | | 1.64 |
| 1998 | | | | 97.5% KM Chebyshev UCL | | 1.974 | | | 99% KM Chebyshev UCL | | | 2.629 |
| 1999 | | | | | | | | | | | | |
| 2000 | **Gamma GOF Tests on Detected Observations Only** | | | | | | | | | | | |
| 2001 | | | | A-D Test Statistic | | 0.252 | | | **Anderson-Darling GOF Test** | | | |
| 2002 | | | | 5% A-D Critical Value | | 0.769 | | | Detected data appear Gamma Distributed at 5% Significance Level | | | |
| 2003 | | | | K-S Test Statistic | | 0.117 | | | **Kolmogrov-Smirnoff GOF** | | | |
| 2004 | | | | 5% K-S Critical Value | | 0.183 | | | Detected data appear Gamma Distributed at 5% Significance Level | | | |
| 2005 | **Detected data appear Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 2006 | | | | | | | | | | | | |
| 2007 | **Gamma Statistics on Detected Data Only** | | | | | | | | | | | |
| 2008 | | | | k hat (MLE) | | 1.117 | | | k star (bias corrected MLE) | | | 1.005 |
| 2009 | | | | Theta hat (MLE) | | 0.838 | | | Theta star (bias corrected MLE) | | | 0.932 |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2010 | | | | | nu hat (MLE) | 53.61 | | | | nu star (bias corrected) | | 48.24 |
| 2011 | | | | | MLE Mean (bias corrected) | 0.936 | | | | MLE Sd (bias corrected) | | 0.934 |
| 2012 | | | | | | | | | | | | |
| 2013 | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | | | | | |
| 2014 | | | | | k hat (KM) | 0.968 | | | | nu hat (KM) | | 50.36 |
| 2015 | | | | | Approximate Chi Square Value (50.36, α) | 35.06 | | | | Adjusted Chi Square Value (50.36, β) | | 34.22 |
| 2016 | | | | | 95% Gamma Approximate KM-UCL (use when n>=50) | 1.248 | | | | 95% Gamma Adjusted KM-UCL (use when n<50) | | 1.279 |
| 2017 | | | | | | | | | | | | |
| 2018 | **Gamma ROS Statistics using Imputed Non-Detects** | | | | | | | | | | | |
| 2019 | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | | | | |
| 2020 | GROS may not be used when kstar of detected data is small such as < 0.1 | | | | | | | | | | | |
| 2021 | For such situations, GROS method tends to yield inflated values of UCLs and BTVs | | | | | | | | | | | |
| 2022 | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | | | | |
| 2023 | | | | | Minimum | 0.01 | | | | Mean | | 0.865 |
| 2024 | | | | | Maximum | 3.06 | | | | Median | | 0.56 |
| 2025 | | | | | SD | 0.904 | | | | CV | | 1.046 |
| 2026 | | | | | k hat (MLE) | 0.801 | | | | k star (bias corrected MLE) | | 0.734 |
| 2027 | | | | | Theta hat (MLE) | 1.08 | | | | Theta star (bias corrected MLE) | | 1.178 |
| 2028 | | | | | nu hat (MLE) | 41.64 | | | | nu star (bias corrected) | | 38.17 |
| 2029 | | | | | MLE Mean (bias corrected) | 0.865 | | | | MLE Sd (bias corrected) | | 1.01 |
| 2030 | | | | | | | | | | Adjusted Level of Significance (β) | | 0.0398 |
| 2031 | | | | | Approximate Chi Square Value (38.17, α) | 25.02 | | | | Adjusted Chi Square Value (38.17, β) | | 24.31 |
| 2032 | | | | | 95% Gamma Approximate UCL (use when n>=50) | 1.32 | | | | 95% Gamma Adjusted UCL (use when n<50) | | 1.358 |
| 2033 | | | | | | | | | | | | |
| 2034 | **Lognormal GOF Test on Detected Observations Only** | | | | | | | | | | | |
| 2035 | | | | | Shapiro Wilk Test Statistic | 0.963 | | | | **Shapiro Wilk GOF Test** | | |
| 2036 | | | | | 5% Shapiro Wilk Critical Value | 0.916 | | | | Detected Data appear Lognormal at 5% Significance Level | | |
| 2037 | | | | | Lilliefors Test Statistic | 0.107 | | | | **Lilliefors GOF Test** | | |
| 2038 | | | | | 5% Lilliefors Critical Value | 0.181 | | | | Detected Data appear Lognormal at 5% Significance Level | | |
| 2039 | **Detected Data appear Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 2040 | | | | | | | | | | | | |
| 2041 | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | | | | | |
| 2042 | | | | | Mean in Original Scale | 0.87 | | | | Mean in Log Scale | | -0.727 |
| 2043 | | | | | SD in Original Scale | 0.899 | | | | SD in Log Scale | | 1.219 |
| 2044 | | | | | 95% t UCL (assumes normality of ROS data) | 1.172 | | | | 95% Percentile Bootstrap UCL | | 1.164 |
| 2045 | | | | | 95% BCA Bootstrap UCL | 1.174 | | | | 95% Bootstrap t UCL | | 1.243 |
| 2046 | | | | | 95% H-UCL (Log ROS) | 2.014 | | | | | | |
| 2047 | | | | | | | | | | | | |
| 2048 | **UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed** | | | | | | | | | | | |
| 2049 | | | | | KM Mean (logged) | -0.751 | | | | 95% H-UCL (KM -Log) | | 2.054 |
| 2050 | | | | | KM SD (logged) | 1.24 | | | | 95% Critical H Value (KM-Log) | | 2.833 |
| 2051 | | | | | KM Standard Error of Mean (logged) | 0.25 | | | | | | |
| 2052 | | | | | | | | | | | | |
| 2053 | **DL/2 Statistics** | | | | | | | | | | | |
| 2054 | **DL/2 Normal** | | | | | | **DL/2 Log-Transformed** | | | | | |
| 2055 | | | | | Mean in Original Scale | 0.87 | | | | Mean in Log Scale | | -0.736 |
| 2056 | | | | | SD in Original Scale | 0.9 | | | | SD in Log Scale | | 1.236 |
| 2057 | | | | | 95% t UCL (Assumes normality) | 1.171 | | | | 95% H-Stat UCL | | 2.066 |
| 2058 | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2059 | | | | | | | | | | | | |
| 2060 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 2061 | **Detected Data appear Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 2062 | | | | | | | | | | | | |
| 2063 | **Suggested UCL to Use** | | | | | | | | | | | |
| 2064 | 95% KM (Chebyshev) UCL | | | | | 1.64 | 95% GROS Adjusted Gamma UCL | | | | | 1.358 |
| 2065 | 95% Adjusted Gamma KM-UCL | | | | | 1.279 | | | | | | |
| 2066 | | | | | | | | | | | | |
| 2067 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 2068 | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | | | | | |
| 2069 | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | | | | | |
| 2070 | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 2071 | | | | | | | | | | | | |
| 2072 | **Carbon disulfide** | | | | | | | | | | | |
| 2073 | | | | | | | | | | | | |
| 2074 | **General Statistics** | | | | | | | | | | | |
| 2075 | Total Number of Observations | | | | | 6 | Number of Distinct Observations | | | | | 5 |
| 2076 | Number of Detects | | | | | 2 | Number of Non-Detects | | | | | 4 |
| 2077 | Number of Distinct Detects | | | | | 2 | Number of Distinct Non-Detects | | | | | 3 |
| 2078 | Minimum Detect | | | | | 1.2 | Minimum Non-Detect | | | | | 6 |
| 2079 | Maximum Detect | | | | | 3.8 | Maximum Non-Detect | | | | | 5000 |
| 2080 | Variance Detects | | | | | 3.38 | Percent Non-Detects | | | | | 66.67% |
| 2081 | Mean Detects | | | | | 2.5 | SD Detects | | | | | 1.838 |
| 2082 | Median Detects | | | | | 2.5 | CV Detects | | | | | 0.735 |
| 2083 | Skewness Detects | | | | | N/A | Kurtosis Detects | | | | | N/A |
| 2084 | Mean of Logged Detects | | | | | 0.759 | SD of Logged Detects | | | | | 0.815 |
| 2085 | | | | | | | | | | | | |
| 2086 | **Warning: Data set has only 2 Detected Values.** | | | | | | | | | | | |
| 2087 | **This is not enough to compute meaningful or reliable statistics and estimates.** | | | | | | | | | | | |
| 2088 | | | | | | | | | | | | |
| 2089 | | | | | | | | | | | | |
| 2090 | **Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use** | | | | | | | | | | | |
| 2091 | **guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.** | | | | | | | | | | | |
| 2092 | **For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).** | | | | | | | | | | | |
| 2093 | **Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.0** | | | | | | | | | | | |
| 2094 | | | | | | | | | | | | |
| 2095 | **Normal GOF Test on Detects Only** | | | | | | | | | | | |
| 2096 | **Not Enough Data to Perform GOF Test** | | | | | | | | | | | |
| 2097 | | | | | | | | | | | | |
| 2098 | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | | | | | |
| 2099 | Mean | | | | | 2.5 | Standard Error of Mean | | | | | 1.3 |
| 2100 | SD | | | | | 1.3 | 95% KM (BCA) UCL | | | | | N/A |
| 2101 | 95% KM (t) UCL | | | | | 5.12 | 95% KM (Percentile Bootstrap) UCL | | | | | N/A |
| 2102 | 95% KM (z) UCL | | | | | 4.638 | 95% KM Bootstrap t UCL | | | | | N/A |
| 2103 | 90% KM Chebyshev UCL | | | | | 6.4 | 95% KM Chebyshev UCL | | | | | 8.167 |
| 2104 | 97.5% KM Chebyshev UCL | | | | | 10.62 | 99% KM Chebyshev UCL | | | | | 15.43 |
| 2105 | | | | | | | | | | | | |
| 2106 | **Gamma GOF Tests on Detected Observations Only** | | | | | | | | | | | |
| 2107 | **Not Enough Data to Perform GOF Test** | | | | | | | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2108 | | | | | | | | | | | | |
| 2109 | **Gamma Statistics on Detected Data Only** | | | | | | | | | | | |
| 2110 | | | | | k hat (MLE) | 3.329 | | | k star (bias corrected MLE) | | | N/A |
| 2111 | | | | | Theta hat (MLE) | 0.751 | | | Theta star (bias corrected MLE) | | | N/A |
| 2112 | | | | | nu hat (MLE) | 13.32 | | | nu star (bias corrected) | | | N/A |
| 2113 | | | | | MLE Mean (bias corrected) | N/A | | | MLE Sd (bias corrected) | | | N/A |
| 2114 | | | | | | | | | | | | |
| 2115 | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | | | | | |
| 2116 | | | | | k hat (KM) | 3.698 | | | nu hat (KM) | | | 44.38 |
| 2117 | | | | | | | | | Adjusted Level of Significance (β) | | | 0.0122 |
| 2118 | | | | | Approximate Chi Square Value (44.38, α) | 30.1 | | | Adjusted Chi Square Value (44.38, β) | | | 25.93 |
| 2119 | | | | | 95% Gamma Approximate KM-UCL (use when n>=50) | 3.686 | | | 95% Gamma Adjusted KM-UCL (use when n<50) | | | 4.279 |
| 2120 | | | | | | | | | | | | |
| 2121 | **Lognormal GOF Test on Detected Observations Only** | | | | | | | | | | | |
| 2122 | **Not Enough Data to Perform GOF Test** | | | | | | | | | | | |
| 2123 | | | | | | | | | | | | |
| 2124 | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | | | | | |
| 2125 | | | | | Mean in Original Scale | 2.378 | | | Mean in Log Scale | | | 0.759 |
| 2126 | | | | | SD in Original Scale | 1.178 | | | SD in Log Scale | | | 0.515 |
| 2127 | | | | | 95% t UCL (assumes normality of ROS data) | 3.347 | | | 95% Percentile Bootstrap UCL | | | N/A |
| 2128 | | | | | 95% BCA Bootstrap UCL | N/A | | | 95% Bootstrap t UCL | | | N/A |
| 2129 | | | | | 95% H-UCL (Log ROS) | 4.519 | | | | | | |
| 2130 | | | | | | | | | | | | |
| 2131 | **DL/2 Statistics** | | | | | | | | | | | |
| 2132 | **DL/2 Normal** | | | | | | | | **DL/2 Log-Transformed** | | | |
| 2133 | | | | | Mean in Original Scale | 419 | | | Mean in Log Scale | | | 2.113 |
| 2134 | | | | | SD in Original Scale | 1019 | | | SD in Log Scale | | | 2.827 |
| 2135 | | | | | 95% t UCL (Assumes normality) | 1258 | | | 95% H-Stat UCL | | | 3.620E+8 |
| 2136 | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | | | | | |
| 2137 | | | | | | | | | | | | |
| 2138 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 2139 | **Data do not follow a Discernible Distribution at 5% Significance Level** | | | | | | | | | | | |
| 2140 | | | | | | | | | | | | |
| 2141 | **Suggested UCL to Use** | | | | | | | | | | | |
| 2142 | | | | | 95% KM (t) UCL | 5.12 | | | 95% KM (% Bootstrap) UCL | | | N/A |
| 2143 | **Warning: One or more Recommended UCL(s) not available!** | | | | | | | | | | | |
| 2144 | **Warning: Recommended UCL exceeds the maximum observation** | | | | | | | | | | | |
| 2145 | | | | | | | | | | | | |
| 2146 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 2147 | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | | | | | |
| 2148 | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | | | | | |
| 2149 | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 2150 | | | | | | | | | | | | |
| 2151 | **Chloroform (Trichloromethane)** | | | | | | | | | | | |
| 2152 | | | | | | | | | | | | |
| 2153 | **General Statistics** | | | | | | | | | | | |
| 2154 | | | | | Total Number of Observations | 6 | | | Number of Distinct Observations | | | 5 |
| 2155 | | | | | Number of Detects | 2 | | | Number of Non-Detects | | | 4 |
| 2156 | | | | | Number of Distinct Detects | 2 | | | Number of Distinct Non-Detects | | | 3 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2157 | | | | | Minimum Detect | 0.7 | | | | | Minimum Non-Detect | 6 |
| 2158 | | | | | Maximum Detect | 0.9 | | | | | Maximum Non-Detect | 5000 |
| 2159 | | | | | Variance Detects | 0.02 | | | | | Percent Non-Detects | 66.67% |
| 2160 | | | | | Mean Detects | 0.8 | | | | | SD Detects | 0.141 |
| 2161 | | | | | Median Detects | 0.8 | | | | | CV Detects | 0.177 |
| 2162 | | | | | Skewness Detects | N/A | | | | | Kurtosis Detects | N/A |
| 2163 | | | | | Mean of Logged Detects | -0.231 | | | | | SD of Logged Detects | 0.178 |
| 2164 | | | | | | | | | | | | |
| 2165 | | | | | | **Warning: Data set has only 2 Detected Values.** | | | | | | | |
| 2166 | | | | | | **This is not enough to compute meaningful or reliable statistics and estimates.** | | | | | | |
| 2167 | | | | | | | | | | | | |
| 2168 | | | | | | | | | | | | |
| 2169 | | | | | | **Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use** | | | | | | |
| 2170 | | | | | | **guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.** | | | | | | |
| 2171 | | | | | | **For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).** | | | | | | |
| 2172 | | | | | | **Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.0** | | | | | | |
| 2173 | | | | | | | | | | | | |
| 2174 | | | | | | **Normal GOF Test on Detects Only** | | | | | | |
| 2175 | | | | | | **Not Enough Data to Perform GOF Test** | | | | | | |
| 2176 | | | | | | | | | | | | |
| 2177 | | | | | | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | |
| 2178 | | | | | Mean | 0.8 | | | | | Standard Error of Mean | 0.1 |
| 2179 | | | | | SD | 0.1 | | | | | 95% KM (BCA) UCL | N/A |
| 2180 | | | | | 95% KM (t) UCL | 1.002 | | | | | 95% KM (Percentile Bootstrap) UCL | N/A |
| 2181 | | | | | 95% KM (z) UCL | 0.964 | | | | | 95% KM Bootstrap t UCL | N/A |
| 2182 | | | | | 90% KM Chebyshev UCL | 1.1 | | | | | 95% KM Chebyshev UCL | 1.236 |
| 2183 | | | | | 97.5% KM Chebyshev UCL | 1.424 | | | | | 99% KM Chebyshev UCL | 1.795 |
| 2184 | | | | | | | | | | | | |
| 2185 | | | | | | **Gamma GOF Tests on Detected Observations Only** | | | | | | |
| 2186 | | | | | | **Not Enough Data to Perform GOF Test** | | | | | | |
| 2187 | | | | | | | | | | | | |
| 2188 | | | | | | **Gamma Statistics on Detected Data Only** | | | | | | |
| 2189 | | | | | k hat (MLE) | 63.66 | | | | | k star (bias corrected MLE) | N/A |
| 2190 | | | | | Theta hat (MLE) | 0.0126 | | | | | Theta star (bias corrected MLE) | N/A |
| 2191 | | | | | nu hat (MLE) | 254.7 | | | | | nu star (bias corrected) | N/A |
| 2192 | | | | | MLE Mean (bias corrected) | N/A | | | | | MLE Sd (bias corrected) | N/A |
| 2193 | | | | | | | | | | | | |
| 2194 | | | | | | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | |
| 2195 | | | | | k hat (KM) | 64 | | | | | nu hat (KM) | 768 |
| 2196 | | | | | | | | | | | Adjusted Level of Significance (β) | 0.0122 |
| 2197 | | | | | Approximate Chi Square Value (768.00, α) | 704.7 | | | | | Adjusted Chi Square Value (768.00, β) | 682.5 |
| 2198 | | | | | 95% Gamma Approximate KM-UCL (use when n>=50) | 0.872 | | | | | 95% Gamma Adjusted KM-UCL (use when n<50) | 0.9 |
| 2199 | | | | | | | | | | | | |
| 2200 | | | | | | **Lognormal GOF Test on Detected Observations Only** | | | | | | |
| 2201 | | | | | | **Not Enough Data to Perform GOF Test** | | | | | | |
| 2202 | | | | | | | | | | | | |
| 2203 | | | | | | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | |
| 2204 | | | | | Mean in Original Scale | 0.798 | | | | | Mean in Log Scale | -0.231 |
| 2205 | | | | | SD in Original Scale | 0.0895 | | | | | SD in Log Scale | 0.112 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2206 | | | | 95% t UCL (assumes normality of ROS data) | | 0.872 | | | | 95% Percentile Bootstrap UCL | | N/A |
| 2207 | | | | 95% BCA Bootstrap UCL | | N/A | | | | 95% Bootstrap t UCL | | N/A |
| 2208 | | | | 95% H-UCL (Log ROS) | | 0.881 | | | | | | |
| 2209 | | | | | | | | | | | | |
| 2210 | | | | | | **DL/2 Statistics** | | | | | | |
| 2211 | | | | **DL/2 Normal** | | | | | | **DL/2 Log-Transformed** | | |
| 2212 | | | | Mean in Original Scale | | 418.5 | | | | Mean in Log Scale | | 1.783 |
| 2213 | | | | SD in Original Scale | | 1020 | | | | SD in Log Scale | | 3.033 |
| 2214 | | | | 95% t UCL (Assumes normality) | | 1257 | | | | 95% H-Stat UCL | | 3.620E+9 |
| 2215 | | | | | | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | |
| 2216 | | | | | | | | | | | | |
| 2217 | | | | | | **Nonparametric Distribution Free UCL Statistics** | | | | | | |
| 2218 | | | | | | **Data do not follow a Discernible Distribution at 5% Significance Level** | | | | | | |
| 2219 | | | | | | | | | | | | |
| 2220 | | | | | | **Suggested UCL to Use** | | | | | | |
| 2221 | | | | 95% KM (t) UCL | | 1.002 | | | | 95% KM (% Bootstrap) UCL | | N/A |
| 2222 | | | | | | **Warning: One or more Recommended UCL(s) not available!** | | | | | | |
| 2223 | | | | | | **Warning: Recommended UCL exceeds the maximum observation** | | | | | | |
| 2224 | | | | | | | | | | | | |
| 2225 | | | | | | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | |
| 2226 | | | | | | Recommendations are based upon data size, data distribution, and skewness. | | | | | | |
| 2227 | | | | | | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | |
| 2228 | | | | | | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | |
| 2229 | | | | | | | | | | | | |
| 2230 | | | | | | | | | | | | |
| 2231 | **Chromium** | | | | | | | | | | | |
| 2232 | | | | | | | | | | | | |
| 2233 | | | | | | **General Statistics** | | | | | | |
| 2234 | | | | Total Number of Observations | | 25 | | | | Number of Distinct Observations | | 21 |
| 2235 | | | | | | | | | | Number of Missing Observations | | 0 |
| 2236 | | | | Minimum | | 23 | | | | Mean | | 61.88 |
| 2237 | | | | Maximum | | 180 | | | | Median | | 43.8 |
| 2238 | | | | SD | | 43.15 | | | | Std. Error of Mean | | 8.629 |
| 2239 | | | | Coefficient of Variation | | 0.697 | | | | Skewness | | 1.647 |
| 2240 | | | | | | | | | | | | |
| 2241 | | | | | | **Normal GOF Test** | | | | | | |
| 2242 | | | | Shapiro Wilk Test Statistic | | 0.741 | | | | **Shapiro Wilk GOF Test** | | |
| 2243 | | | | 5% Shapiro Wilk Critical Value | | 0.918 | | | | Data Not Normal at 5% Significance Level | | |
| 2244 | | | | Lilliefors Test Statistic | | 0.311 | | | | **Lilliefors GOF Test** | | |
| 2245 | | | | 5% Lilliefors Critical Value | | 0.177 | | | | Data Not Normal at 5% Significance Level | | |
| 2246 | | | | | | **Data Not Normal at 5% Significance Level** | | | | | | |
| 2247 | | | | | | | | | | | | |
| 2248 | | | | | | **Assuming Normal Distribution** | | | | | | |
| 2249 | | | | **95% Normal UCL** | | | | | | **95% UCLs (Adjusted for Skewness)** | | |
| 2250 | | | | 95% Student's-t UCL | | 76.64 | | | | 95% Adjusted-CLT UCL (Chen-1995) | | 79.11 |
| 2251 | | | | | | | | | | 95% Modified-t UCL (Johnson-1978) | | 77.11 |
| 2252 | | | | | | | | | | | | |
| 2253 | | | | | | **Gamma GOF Test** | | | | | | |
| 2254 | | | | A-D Test Statistic | | 1.795 | | | | **Anderson-Darling Gamma GOF Test** | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2255 | 5% A-D Critical Value | | | | | 0.751 | Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 2256 | K-S Test Statistic | | | | | 0.259 | **Kolmogrov-Smirnoff Gamma GOF Test** | | | | | |
| 2257 | 5% K-S Critical Value | | | | | 0.176 | Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 2258 | **Data Not Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 2259 | | | | | | | | | | | | |
| 2260 | **Gamma Statistics** | | | | | | | | | | | |
| 2261 | k hat (MLE) | | | | | 3.011 | k star (bias corrected MLE) | | | | | 2.677 |
| 2262 | Theta hat (MLE) | | | | | 20.55 | Theta star (bias corrected MLE) | | | | | 23.12 |
| 2263 | nu hat (MLE) | | | | | 150.6 | nu star (bias corrected) | | | | | 133.8 |
| 2264 | MLE Mean (bias corrected) | | | | | 61.88 | MLE Sd (bias corrected) | | | | | 37.82 |
| 2265 | | | | | | | Approximate Chi Square Value (0.05) | | | | | 108.1 |
| 2266 | Adjusted Level of Significance | | | | | 0.0395 | Adjusted Chi Square Value | | | | | 106.5 |
| 2267 | | | | | | | | | | | | |
| 2268 | **Assuming Gamma Distribution** | | | | | | | | | | | |
| 2269 | 95% Approximate Gamma UCL (use when n>=50)) | | | | | 76.6 | 95% Adjusted Gamma UCL (use when n<50) | | | | | 77.73 |
| 2270 | | | | | | | | | | | | |
| 2271 | **Lognormal GOF Test** | | | | | | | | | | | |
| 2272 | Shapiro Wilk Test Statistic | | | | | 0.881 | **Shapiro Wilk Lognormal GOF Test** | | | | | |
| 2273 | 5% Shapiro Wilk Critical Value | | | | | 0.918 | Data Not Lognormal at 5% Significance Level | | | | | |
| 2274 | Lilliefors Test Statistic | | | | | 0.219 | **Lilliefors Lognormal GOF Test** | | | | | |
| 2275 | 5% Lilliefors Critical Value | | | | | 0.177 | Data Not Lognormal at 5% Significance Level | | | | | |
| 2276 | **Data Not Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 2277 | | | | | | | | | | | | |
| 2278 | **Lognormal Statistics** | | | | | | | | | | | |
| 2279 | Minimum of Logged Data | | | | | 3.135 | Mean of logged Data | | | | | 3.95 |
| 2280 | Maximum of Logged Data | | | | | 5.193 | SD of logged Data | | | | | 0.564 |
| 2281 | | | | | | | | | | | | |
| 2282 | **Assuming Lognormal Distribution** | | | | | | | | | | | |
| 2283 | 95% H-UCL | | | | | 76.81 | 90% Chebyshev (MVUE) UCL | | | | | 81.98 |
| 2284 | 95% Chebyshev (MVUE) UCL | | | | | 91.73 | 97.5% Chebyshev (MVUE) UCL | | | | | 105.3 |
| 2285 | 99% Chebyshev (MVUE) UCL | | | | | 131.8 | | | | | | |
| 2286 | | | | | | | | | | | | |
| 2287 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 2288 | **Data do not follow a Discernible Distribution (0.05)** | | | | | | | | | | | |
| 2289 | | | | | | | | | | | | |
| 2290 | **Nonparametric Distribution Free UCLs** | | | | | | | | | | | |
| 2291 | 95% CLT UCL | | | | | 76.07 | 95% Jackknife UCL | | | | | 76.64 |
| 2292 | 95% Standard Bootstrap UCL | | | | | 75.78 | 95% Bootstrap-t UCL | | | | | 81.49 |
| 2293 | 95% Hall's Bootstrap UCL | | | | | 76.94 | 95% Percentile Bootstrap UCL | | | | | 75.84 |
| 2294 | 95% BCA Bootstrap UCL | | | | | 79.59 | | | | | | |
| 2295 | 90% Chebyshev(Mean, Sd) UCL | | | | | 87.76 | 95% Chebyshev(Mean, Sd) UCL | | | | | 99.49 |
| 2296 | 97.5% Chebyshev(Mean, Sd) UCL | | | | | 115.8 | 99% Chebyshev(Mean, Sd) UCL | | | | | 147.7 |
| 2297 | | | | | | | | | | | | |
| 2298 | **Suggested UCL to Use** | | | | | | | | | | | |
| 2299 | 95% Chebyshev (Mean, Sd) UCL | | | | | 99.49 | | | | | | |
| 2300 | | | | | | | | | | | | |
| 2301 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 2302 | These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) | | | | | | | | | | | |
| 2303 | and Singh and Singh (2003). However, simulations results will not cover all Real World data sets. | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2304 | For additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 2305 | | | | | | | | | | | | |
| 2306 | **Chromium VI** | | | | | | | | | | | |
| 2307 | | | | | | | | | | | | |
| 2308 | **General Statistics** | | | | | | | | | | | |
| 2309 | Total Number of Observations | | | | | 3 | Number of Distinct Observations | | | | | 3 |
| 2310 | Number of Detects | | | | | 2 | Number of Non-Detects | | | | | 1 |
| 2311 | Number of Distinct Detects | | | | | 2 | Number of Distinct Non-Detects | | | | | 1 |
| 2312 | Minimum Detect | | | | | 0.022 | Minimum Non-Detect | | | | | 0.012 |
| 2313 | Maximum Detect | | | | | 0.034 | Maximum Non-Detect | | | | | 0.012 |
| 2314 | Variance Detects | | | | | 7.2000E-5 | Percent Non-Detects | | | | | 33.33% |
| 2315 | Mean Detects | | | | | 0.028 | SD Detects | | | | | 0.00849 |
| 2316 | Median Detects | | | | | 0.028 | CV Detects | | | | | 0.303 |
| 2317 | Skewness Detects | | | | | N/A | Kurtosis Detects | | | | | N/A |
| 2318 | Mean of Logged Detects | | | | | -3.599 | SD of Logged Detects | | | | | 0.308 |
| 2319 | | | | | | | | | | | | |
| 2320 | **Warning: Data set has only 2 Detected Values.** | | | | | | | | | | | |
| 2321 | **This is not enough to compute meaningful or reliable statistics and estimates.** | | | | | | | | | | | |
| 2322 | | | | | | | | | | | | |
| 2323 | | | | | | | | | | | | |
| 2324 | **Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use** | | | | | | | | | | | |
| 2325 | **guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.** | | | | | | | | | | | |
| 2326 | **For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).** | | | | | | | | | | | |
| 2327 | **Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.0** | | | | | | | | | | | |
| 2328 | | | | | | | | | | | | |
| 2329 | **Normal GOF Test on Detects Only** | | | | | | | | | | | |
| 2330 | **Not Enough Data to Perform GOF Test** | | | | | | | | | | | |
| 2331 | | | | | | | | | | | | |
| 2332 | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | | | | | |
| 2333 | Mean | | | | | 0.0227 | Standard Error of Mean | | | | | 0.00734 |
| 2334 | SD | | | | | 0.00899 | 95% KM (BCA) UCL | | | | | N/A |
| 2335 | 95% KM (t) UCL | | | | | 0.0441 | 95% KM (Percentile Bootstrap) UCL | | | | | N/A |
| 2336 | 95% KM (z) UCL | | | | | 0.0347 | 95% KM Bootstrap t UCL | | | | | N/A |
| 2337 | 90% KM Chebyshev UCL | | | | | 0.0447 | 95% KM Chebyshev UCL | | | | | 0.0547 |
| 2338 | 97.5% KM Chebyshev UCL | | | | | 0.0685 | 99% KM Chebyshev UCL | | | | | 0.0957 |
| 2339 | | | | | | | | | | | | |
| 2340 | **Gamma GOF Tests on Detected Observations Only** | | | | | | | | | | | |
| 2341 | **Not Enough Data to Perform GOF Test** | | | | | | | | | | | |
| 2342 | | | | | | | | | | | | |
| 2343 | **Gamma Statistics on Detected Data Only** | | | | | | | | | | | |
| 2344 | k hat (MLE) | | | | | 21.44 | k star (bias corrected MLE) | | | | | N/A |
| 2345 | Theta hat (MLE) | | | | | 0.00131 | Theta star (bias corrected MLE) | | | | | N/A |
| 2346 | nu hat (MLE) | | | | | 85.76 | nu star (bias corrected) | | | | | N/A |
| 2347 | MLE Mean (bias corrected) | | | | | N/A | MLE Sd (bias corrected) | | | | | N/A |
| 2348 | | | | | | | | | | | | |
| 2349 | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | | | | | |
| 2350 | k hat (KM) | | | | | 6.352 | nu hat (KM) | | | | | 38.11 |
| 2351 | | | | | | | Adjusted Level of Significance (β) | | | | | 0.00136 |
| 2352 | Approximate Chi Square Value (38.11, α) | | | | | 24.97 | Adjusted Chi Square Value (38.11, β) | | | | | 17.14 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2353 | 95% Gamma Approximate KM-UCL (use when n>=50) | | | | | 0.0346 | 95% Gamma Adjusted KM-UCL (use when n<50) | | | | | 0.0504 |
| 2354 | | | | | | | | | | | | |
| 2355 | **Lognormal GOF Test on Detected Observations Only** | | | | | | | | | | | |
| 2356 | **Not Enough Data to Perform GOF Test** | | | | | | | | | | | |
| 2357 | | | | | | | | | | | | |
| 2358 | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | | | | | |
| 2359 | Mean in Original Scale | | | | | 0.0221 | Mean in Log Scale | | | | | -3.929 |
| 2360 | SD in Original Scale | | | | | 0.0119 | SD in Log Scale | | | | | 0.611 |
| 2361 | 95% t UCL (assumes normality of ROS data) | | | | | 0.0421 | 95% Percentile Bootstrap UCL | | | | | N/A |
| 2362 | 95% BCA Bootstrap UCL | | | | | N/A | 95% Bootstrap t UCL | | | | | N/A |
| 2363 | 95% H-UCL (Log ROS) | | | | | 0.736 | | | | | | |
| 2364 | | | | | | | | | | | | |
| 2365 | **DL/2 Statistics** | | | | | | | | | | | |
| 2366 | **DL/2 Normal** | | | | | | **DL/2 Log-Transformed** | | | | | |
| 2367 | Mean in Original Scale | | | | | 0.0207 | Mean in Log Scale | | | | | -4.105 |
| 2368 | SD in Original Scale | | | | | 0.014 | SD in Log Scale | | | | | 0.902 |
| 2369 | 95% t UCL (Assumes normality) | | | | | 0.0443 | 95% H-Stat UCL | | | | | 45.36 |
| 2370 | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | | | | | |
| 2371 | | | | | | | | | | | | |
| 2372 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 2373 | **Data do not follow a Discernible Distribution at 5% Significance Level** | | | | | | | | | | | |
| 2374 | | | | | | | | | | | | |
| 2375 | **Suggested UCL to Use** | | | | | | | | | | | |
| 2376 | 95% KM (BCA) UCL | | | | | N/A | | | | | | |
| 2377 | **Warning: One or more Recommended UCL(s) not available!** | | | | | | | | | | | |
| 2378 | | | | | | | | | | | | |
| 2379 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 2380 | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | | | | | |
| 2381 | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | | | | | |
| 2382 | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 2383 | | | | | | | | | | | | |
| 2384 | **Chrysene** | | | | | | | | | | | |
| 2385 | | | | | | | | | | | | |
| 2386 | **General Statistics** | | | | | | | | | | | |
| 2387 | Total Number of Observations | | | | | 37 | Number of Distinct Observations | | | | | 30 |
| 2388 | Number of Detects | | | | | 21 | Number of Non-Detects | | | | | 16 |
| 2389 | Number of Distinct Detects | | | | | 20 | Number of Distinct Non-Detects | | | | | 12 |
| 2390 | Minimum Detect | | | | | 43 | Minimum Non-Detect | | | | | 77 |
| 2391 | Maximum Detect | | | | | 78000 | Maximum Non-Detect | | | | | 6900 |
| 2392 | Variance Detects | | | | | 5.157E+8 | Percent Non-Detects | | | | | 43.24% |
| 2393 | Mean Detects | | | | | 10745 | SD Detects | | | | | 22710 |
| 2394 | Median Detects | | | | | 1800 | CV Detects | | | | | 2.114 |
| 2395 | Skewness Detects | | | | | 2.688 | Kurtosis Detects | | | | | 6.328 |
| 2396 | Mean of Logged Detects | | | | | 7.382 | SD of Logged Detects | | | | | 2.184 |
| 2397 | | | | | | | | | | | | |
| 2398 | **Normal GOF Test on Detects Only** | | | | | | | | | | | |
| 2399 | Shapiro Wilk Test Statistic | | | | | 0.506 | **Shapiro Wilk GOF Test** | | | | | |
| 2400 | 5% Shapiro Wilk Critical Value | | | | | 0.908 | Detected Data Not Normal at 5% Significance Level | | | | | |
| 2401 | Lilliefors Test Statistic | | | | | 0.375 | **Lilliefors GOF Test** | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2402 | | | | | 5% Lilliefors Critical Value | 0.193 | Detected Data Not Normal at 5% Significance Level | | | | | |
| 2403 | **Detected Data Not Normal at 5% Significance Level** | | | | | | | | | | | |
| 2404 | | | | | | | | | | | | |
| 2405 | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | | | | | |
| 2406 | | | | | Mean | 6287 | | | | Standard Error of Mean | | 2943 |
| 2407 | | | | | SD | 17466 | | | | 95% KM (BCA) UCL | | 12236 |
| 2408 | | | | | 95% KM (t) UCL | 11256 | | | | 95% KM (Percentile Bootstrap) UCL | | 11684 |
| 2409 | | | | | 95% KM (z) UCL | 11128 | | | | 95% KM Bootstrap t UCL | | 25203 |
| 2410 | | | | | 90% KM Chebyshev UCL | 15117 | | | | 95% KM Chebyshev UCL | | 19117 |
| 2411 | | | | | 97.5% KM Chebyshev UCL | 24668 | | | | 99% KM Chebyshev UCL | | 35573 |
| 2412 | | | | | | | | | | | | |
| 2413 | **Gamma GOF Tests on Detected Observations Only** | | | | | | | | | | | |
| 2414 | | | | | A-D Test Statistic | 0.912 | **Anderson-Darling GOF Test** | | | | | |
| 2415 | | | | | 5% A-D Critical Value | 0.835 | Detected Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 2416 | | | | | K-S Test Statistic | 0.183 | **Kolmogrov-Smirnoff GOF** | | | | | |
| 2417 | | | | | 5% K-S Critical Value | 0.204 | Detected data appear Gamma Distributed at 5% Significance Level | | | | | |
| 2418 | **Detected data follow Appr. Gamma Distribution at 5% Significance Level** | | | | | | | | | | | |
| 2419 | | | | | | | | | | | | |
| 2420 | **Gamma Statistics on Detected Data Only** | | | | | | | | | | | |
| 2421 | | | | | k hat (MLE) | 0.353 | | | | k star (bias corrected MLE) | | 0.335 |
| 2422 | | | | | Theta hat (MLE) | 30407 | | | | Theta star (bias corrected MLE) | | 32109 |
| 2423 | | | | | nu hat (MLE) | 14.84 | | | | nu star (bias corrected) | | 14.05 |
| 2424 | | | | | MLE Mean (bias corrected) | 10745 | | | | MLE Sd (bias corrected) | | 18575 |
| 2425 | | | | | | | | | | | | |
| 2426 | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | | | | | |
| 2427 | | | | | k hat (KM) | 0.13 | | | | nu hat (KM) | | 9.589 |
| 2428 | | | | | Approximate Chi Square Value (9.59, α) | 3.686 | | | | Adjusted Chi Square Value (9.59, β) | | 3.528 |
| 2429 | | | | | 95% Gamma Approximate KM-UCL (use when n>=50) | 16353 | | | | 95% Gamma Adjusted KM-UCL (use when n<50) | | 17086 |
| 2430 | | | | | | | | | | | | |
| 2431 | **Gamma ROS Statistics using Imputed Non-Detects** | | | | | | | | | | | |
| 2432 | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | | | | |
| 2433 | GROS may not be used when kstar of detected data is small such as < 0.1 | | | | | | | | | | | |
| 2434 | For such situations, GROS method tends to yield inflated values of UCLs and BTVs | | | | | | | | | | | |
| 2435 | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | | | | |
| 2436 | | | | | Minimum | 0.01 | | | | Mean | | 6099 |
| 2437 | | | | | Maximum | 78000 | | | | Median | | 77 |
| 2438 | | | | | SD | 17766 | | | | CV | | 2.913 |
| 2439 | | | | | k hat (MLE) | 0.121 | | | | k star (bias corrected MLE) | | 0.13 |
| 2440 | | | | | Theta hat (MLE) | 50203 | | | | Theta star (bias corrected MLE) | | 47039 |
| 2441 | | | | | nu hat (MLE) | 8.989 | | | | nu star (bias corrected) | | 9.594 |
| 2442 | | | | | MLE Mean (bias corrected) | 6099 | | | | MLE Sd (bias corrected) | | 16937 |
| 2443 | | | | | | | | | | Adjusted Level of Significance (β) | | 0.0431 |
| 2444 | | | | | Approximate Chi Square Value (9.59, α) | 3.69 | | | | Adjusted Chi Square Value (9.59, β) | | 3.531 |
| 2445 | | | | | 95% Gamma Approximate UCL (use when n>=50) | 15858 | | | | 95% Gamma Adjusted UCL (use when n<50) | | 16568 |
| 2446 | | | | | | | | | | | | |
| 2447 | **Lognormal GOF Test on Detected Observations Only** | | | | | | | | | | | |
| 2448 | | | | | Shapiro Wilk Test Statistic | 0.971 | **Shapiro Wilk GOF Test** | | | | | |
| 2449 | | | | | 5% Shapiro Wilk Critical Value | 0.908 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 2450 | | | | | Lilliefors Test Statistic | 0.0706 | **Lilliefors GOF Test** | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2451 | 5% Lilliefors Critical Value | | | | | 0.193 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 2452 | **Detected Data appear Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 2453 | | | | | | | | | | | | |
| 2454 | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | | | | | |
| 2455 | Mean in Original Scale | | | | | 6219 | Mean in Log Scale | | | | | 6.497 |
| 2456 | SD in Original Scale | | | | | 17725 | SD in Log Scale | | | | | 2.001 |
| 2457 | 95% t UCL (assumes normality of ROS data) | | | | | 11138 | 95% Percentile Bootstrap UCL | | | | | 11450 |
| 2458 | 95% BCA Bootstrap UCL | | | | | 13850 | 95% Bootstrap t UCL | | | | | 24982 |
| 2459 | 95% H-UCL (Log ROS) | | | | | 17073 | | | | | | |
| 2460 | | | | | | | | | | | | |
| 2461 | **UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed** | | | | | | | | | | | |
| 2462 | KM Mean (logged) | | | | | 6.464 | 95% H-UCL (KM -Log) | | | | | 21869 |
| 2463 | KM SD (logged) | | | | | 2.09 | 95% Critical H Value (KM-Log) | | | | | 3.863 |
| 2464 | KM Standard Error of Mean (logged) | | | | | 0.394 | | | | | | |
| 2465 | | | | | | | | | | | | |
| 2466 | **DL/2 Statistics** | | | | | | | | | | | |
| 2467 | **DL/2 Normal** | | | | | | **DL/2 Log-Transformed** | | | | | |
| 2468 | Mean in Original Scale | | | | | 6624 | Mean in Log Scale | | | | | 7.106 |
| 2469 | SD in Original Scale | | | | | 17599 | SD in Log Scale | | | | | 1.803 |
| 2470 | 95% t UCL (Assumes normality) | | | | | 11508 | 95% H-Stat UCL | | | | | 17446 |
| 2471 | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | | | | | |
| 2472 | | | | | | | | | | | | |
| 2473 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 2474 | **Detected Data appear Approximate Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 2475 | | | | | | | | | | | | |
| 2476 | **Suggested UCL to Use** | | | | | | | | | | | |
| 2477 | 95% KM (BCA) UCL | | | | | 12236 | 95% GROS Adjusted Gamma UCL | | | | | 16568 |
| 2478 | 95% Adjusted Gamma KM-UCL | | | | | 17086 | | | | | | |
| 2479 | | | | | | | | | | | | |
| 2480 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 2481 | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | | | | | |
| 2482 | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | | | | | |
| 2483 | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 2484 | | | | | | | | | | | | |
| 2485 | | | | | | | | | | | | |
| 2486 | **Cobalt** | | | | | | | | | | | |
| 2487 | | | | | | | | | | | | |
| 2488 | **General Statistics** | | | | | | | | | | | |
| 2489 | Total Number of Observations | | | | | 25 | Number of Distinct Observations | | | | | 17 |
| 2490 | | | | | | | Number of Missing Observations | | | | | 0 |
| 2491 | Minimum | | | | | 6 | Mean | | | | | 10.6 |
| 2492 | Maximum | | | | | 15 | Median | | | | | 11 |
| 2493 | SD | | | | | 2.751 | Std. Error of Mean | | | | | 0.55 |
| 2494 | Coefficient of Variation | | | | | 0.259 | Skewness | | | | | 0.151 |
| 2495 | | | | | | | | | | | | |
| 2496 | **Normal GOF Test** | | | | | | | | | | | |
| 2497 | Shapiro Wilk Test Statistic | | | | | 0.925 | **Shapiro Wilk GOF Test** | | | | | |
| 2498 | 5% Shapiro Wilk Critical Value | | | | | 0.918 | Data appear Normal at 5% Significance Level | | | | | |
| 2499 | Lilliefors Test Statistic | | | | | 0.169 | **Lilliefors GOF Test** | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2500 | 5% Lilliefors Critical Value | | | | | 0.177 | Data appear Normal at 5% Significance Level | | | | | |
| 2501 | **Data appear Normal at 5% Significance Level** | | | | | | | | | | | |
| 2502 | | | | | | | | | | | | |
| 2503 | **Assuming Normal Distribution** | | | | | | | | | | | |
| 2504 | **95% Normal UCL** | | | | | | **95% UCLs (Adjusted for Skewness)** | | | | | |
| 2505 | 95% Student's-t UCL | | | | | 11.55 | 95% Adjusted-CLT UCL (Chen-1995) | | | | | 11.53 |
| 2506 | | | | | | | 95% Modified-t UCL (Johnson-1978) | | | | | 11.55 |
| 2507 | | | | | | | | | | | | |
| 2508 | **Gamma GOF Test** | | | | | | | | | | | |
| 2509 | A-D Test Statistic | | | | | 0.686 | **Anderson-Darling Gamma GOF Test** | | | | | |
| 2510 | 5% A-D Critical Value | | | | | 0.744 | Detected data appear Gamma Distributed at 5% Significance Level | | | | | |
| 2511 | K-S Test Statistic | | | | | 0.168 | **Kolmogrov-Smirnoff Gamma GOF Test** | | | | | |
| 2512 | 5% K-S Critical Value | | | | | 0.174 | Detected data appear Gamma Distributed at 5% Significance Level | | | | | |
| 2513 | **Detected data appear Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 2514 | | | | | | | | | | | | |
| 2515 | **Gamma Statistics** | | | | | | | | | | | |
| 2516 | k hat (MLE) | | | | | 15.15 | k star (bias corrected MLE) | | | | | 13.36 |
| 2517 | Theta hat (MLE) | | | | | 0.7 | Theta star (bias corrected MLE) | | | | | 0.794 |
| 2518 | nu hat (MLE) | | | | | 757.3 | nu star (bias corrected) | | | | | 667.8 |
| 2519 | MLE Mean (bias corrected) | | | | | 10.6 | MLE Sd (bias corrected) | | | | | 2.901 |
| 2520 | | | | | | | Approximate Chi Square Value (0.05) | | | | | 608.8 |
| 2521 | Adjusted Level of Significance | | | | | 0.0395 | Adjusted Chi Square Value | | | | | 605 |
| 2522 | | | | | | | | | | | | |
| 2523 | **Assuming Gamma Distribution** | | | | | | | | | | | |
| 2524 | 95% Approximate Gamma UCL (use when n>=50)) | | | | | 11.63 | 95% Adjusted Gamma UCL (use when n<50) | | | | | 11.7 |
| 2525 | | | | | | | | | | | | |
| 2526 | **Lognormal GOF Test** | | | | | | | | | | | |
| 2527 | Shapiro Wilk Test Statistic | | | | | 0.932 | **Shapiro Wilk Lognormal GOF Test** | | | | | |
| 2528 | 5% Shapiro Wilk Critical Value | | | | | 0.918 | Data appear Lognormal at 5% Significance Level | | | | | |
| 2529 | Lilliefors Test Statistic | | | | | 0.16 | **Lilliefors Lognormal GOF Test** | | | | | |
| 2530 | 5% Lilliefors Critical Value | | | | | 0.177 | Data appear Lognormal at 5% Significance Level | | | | | |
| 2531 | **Data appear Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 2532 | | | | | | | | | | | | |
| 2533 | **Lognormal Statistics** | | | | | | | | | | | |
| 2534 | Minimum of Logged Data | | | | | 1.792 | Mean of logged Data | | | | | 2.328 |
| 2535 | Maximum of Logged Data | | | | | 2.708 | SD of logged Data | | | | | 0.266 |
| 2536 | | | | | | | | | | | | |
| 2537 | **Assuming Lognormal Distribution** | | | | | | | | | | | |
| 2538 | 95% H-UCL | | | | | 11.71 | 90% Chebyshev (MVUE) UCL | | | | | 12.33 |
| 2539 | 95% Chebyshev (MVUE) UCL | | | | | 13.1 | 97.5% Chebyshev (MVUE) UCL | | | | | 14.18 |
| 2540 | 99% Chebyshev (MVUE) UCL | | | | | 16.3 | | | | | | |
| 2541 | | | | | | | | | | | | |
| 2542 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 2543 | **Data appear to follow a Discernible Distribution at 5% Significance Level** | | | | | | | | | | | |
| 2544 | | | | | | | | | | | | |
| 2545 | **Nonparametric Distribution Free UCLs** | | | | | | | | | | | |
| 2546 | 95% CLT UCL | | | | | 11.51 | 95% Jackknife UCL | | | | | 11.55 |
| 2547 | 95% Standard Bootstrap UCL | | | | | 11.5 | 95% Bootstrap-t UCL | | | | | 11.56 |
| 2548 | 95% Hall's Bootstrap UCL | | | | | 11.54 | 95% Percentile Bootstrap UCL | | | | | 11.5 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2549 | | | | 95% BCA Bootstrap UCL | | 11.48 | | | | | | |
| 2550 | | | | 90% Chebyshev(Mean, Sd) UCL | | 12.25 | | | | 95% Chebyshev(Mean, Sd) UCL | | 13 |
| 2551 | | | | 97.5% Chebyshev(Mean, Sd) UCL | | 14.04 | | | | 99% Chebyshev(Mean, Sd) UCL | | 16.08 |
| 2552 | | | | | | | | | | | | |
| 2553 | | | | | **Suggested UCL to Use** | | | | | | | |
| 2554 | | | | 95% Student's-t UCL | | 11.55 | | | | | | |
| 2555 | | | | | | | | | | | | |
| 2556 | | | | | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | |
| 2557 | | | | | These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) | | | | | | | |
| 2558 | | | | | and Singh and Singh (2003). However, simulations results will not cover all Real World data sets. | | | | | | | |
| 2559 | | | | | For additional insight the user may want to consult a statistician. | | | | | | | |
| 2560 | | | | | | | | | | | | |
| 2561 | | | | | | | | | | | | |
| 2562 | **Copper** | | | | | | | | | | | |
| 2563 | | | | | | | | | | | | |
| 2564 | | | | | **General Statistics** | | | | | | | |
| 2565 | | | | Total Number of Observations | | 26 | | | | Number of Distinct Observations | | 25 |
| 2566 | | | | | | | | | | Number of Missing Observations | | 0 |
| 2567 | | | | Minimum | | 15 | | | | Mean | | 117.1 |
| 2568 | | | | Maximum | | 610 | | | | Median | | 54.5 |
| 2569 | | | | SD | | 140.7 | | | | Std. Error of Mean | | 27.6 |
| 2570 | | | | Coefficient of Variation | | 1.202 | | | | Skewness | | 2.233 |
| 2571 | | | | | | | | | | | | |
| 2572 | | | | | **Normal GOF Test** | | | | | | | |
| 2573 | | | | Shapiro Wilk Test Statistic | | 0.707 | | | | **Shapiro Wilk GOF Test** | | |
| 2574 | | | | 5% Shapiro Wilk Critical Value | | 0.92 | | | | Data Not Normal at 5% Significance Level | | |
| 2575 | | | | Lilliefors Test Statistic | | 0.245 | | | | **Lilliefors GOF Test** | | |
| 2576 | | | | 5% Lilliefors Critical Value | | 0.174 | | | | Data Not Normal at 5% Significance Level | | |
| 2577 | | | | | **Data Not Normal at 5% Significance Level** | | | | | | | |
| 2578 | | | | | | | | | | | | |
| 2579 | | | | | **Assuming Normal Distribution** | | | | | | | |
| 2580 | | | | **95% Normal UCL** | | | | | | **95% UCLs (Adjusted for Skewness)** | | |
| 2581 | | | | 95% Student's-t UCL | | 164.2 | | | | 95% Adjusted-CLT UCL (Chen-1995) | | 175.4 |
| 2582 | | | | | | | | | | 95% Modified-t UCL (Johnson-1978) | | 166.2 |
| 2583 | | | | | | | | | | | | |
| 2584 | | | | | **Gamma GOF Test** | | | | | | | |
| 2585 | | | | A-D Test Statistic | | 1.155 | | | | **Anderson-Darling Gamma GOF Test** | | |
| 2586 | | | | 5% A-D Critical Value | | 0.771 | | | | Data Not Gamma Distributed at 5% Significance Level | | |
| 2587 | | | | K-S Test Statistic | | 0.181 | | | | **Kolmogrov-Smirnoff Gamma GOF Test** | | |
| 2588 | | | | 5% K-S Critical Value | | 0.176 | | | | Data Not Gamma Distributed at 5% Significance Level | | |
| 2589 | | | | | **Data Not Gamma Distributed at 5% Significance Level** | | | | | | | |
| 2590 | | | | | | | | | | | | |
| 2591 | | | | | **Gamma Statistics** | | | | | | | |
| 2592 | | | | k hat (MLE) | | 1.087 | | | | k star (bias corrected MLE) | | 0.987 |
| 2593 | | | | Theta hat (MLE) | | 107.7 | | | | Theta star (bias corrected MLE) | | 118.5 |
| 2594 | | | | nu hat (MLE) | | 56.53 | | | | nu star (bias corrected) | | 51.34 |
| 2595 | | | | MLE Mean (bias corrected) | | 117.1 | | | | MLE Sd (bias corrected) | | 117.8 |
| 2596 | | | | | | | | | | Approximate Chi Square Value (0.05) | | 35.89 |
| 2597 | | | | Adjusted Level of Significance | | 0.0398 | | | | Adjusted Chi Square Value | | 35.03 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2598 | | | | | | | | | | | | |
| 2599 | **Assuming Gamma Distribution** | | | | | | | | | | | |
| 2600 | 95% Approximate Gamma UCL (use when n>=50)) | | | | | 167.5 | 95% Adjusted Gamma UCL (use when n<50) | | | | | 171.5 |
| 2601 | | | | | | | | | | | | |
| 2602 | **Lognormal GOF Test** | | | | | | | | | | | |
| 2603 | Shapiro Wilk Test Statistic | | | | | 0.936 | **Shapiro Wilk Lognormal GOF Test** | | | | | |
| 2604 | 5% Shapiro Wilk Critical Value | | | | | 0.92 | Data appear Lognormal at 5% Significance Level | | | | | |
| 2605 | Lilliefors Test Statistic | | | | | 0.139 | **Lilliefors Lognormal GOF Test** | | | | | |
| 2606 | 5% Lilliefors Critical Value | | | | | 0.174 | Data appear Lognormal at 5% Significance Level | | | | | |
| 2607 | **Data appear Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 2608 | | | | | | | | | | | | |
| 2609 | **Lognormal Statistics** | | | | | | | | | | | |
| 2610 | Minimum of Logged Data | | | | | 2.708 | Mean of logged Data | | | | | 4.237 |
| 2611 | Maximum of Logged Data | | | | | 6.413 | SD of logged Data | | | | | 1.003 |
| 2612 | | | | | | | | | | | | |
| 2613 | **Assuming Lognormal Distribution** | | | | | | | | | | | |
| 2614 | 95% H-UCL | | | | | 189.3 | 90% Chebyshev (MVUE) UCL | | | | | 186.1 |
| 2615 | 95% Chebyshev (MVUE) UCL | | | | | 220 | 97.5% Chebyshev (MVUE) UCL | | | | | 267 |
| 2616 | 99% Chebyshev (MVUE) UCL | | | | | 359.4 | | | | | | |
| 2617 | | | | | | | | | | | | |
| 2618 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 2619 | **Data appear to follow a Discernible Distribution at 5% Significance Level** | | | | | | | | | | | |
| 2620 | | | | | | | | | | | | |
| 2621 | **Nonparametric Distribution Free UCLs** | | | | | | | | | | | |
| 2622 | 95% CLT UCL | | | | | 162.5 | 95% Jackknife UCL | | | | | 164.2 |
| 2623 | 95% Standard Bootstrap UCL | | | | | 162 | 95% Bootstrap-t UCL | | | | | 189.9 |
| 2624 | 95% Hall's Bootstrap UCL | | | | | 196.4 | 95% Percentile Bootstrap UCL | | | | | 164.7 |
| 2625 | 95% BCA Bootstrap UCL | | | | | 174.9 | | | | | | |
| 2626 | 90% Chebyshev(Mean, Sd) UCL | | | | | 199.9 | 95% Chebyshev(Mean, Sd) UCL | | | | | 237.4 |
| 2627 | 97.5% Chebyshev(Mean, Sd) UCL | | | | | 289.4 | 99% Chebyshev(Mean, Sd) UCL | | | | | 391.7 |
| 2628 | | | | | | | | | | | | |
| 2629 | **Suggested UCL to Use** | | | | | | | | | | | |
| 2630 | 95% H-UCL | | | | | 189.3 | | | | | | |
| 2631 | | | | | | | | | | | | |
| 2632 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 2633 | These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) | | | | | | | | | | | |
| 2634 | and Singh and Singh (2003). However, simulations results will not cover all Real World data sets. | | | | | | | | | | | |
| 2635 | For additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 2636 | | | | | | | | | | | | |
| 2637 | **ProUCL computes and outputs H-statistic based UCLs for historical reasons only.** | | | | | | | | | | | |
| 2638 | **H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.** | | | | | | | | | | | |
| 2639 | **It is therefore recommended to avoid the use of H-statistic based 95% UCLs.** | | | | | | | | | | | |
| 2640 | **Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.** | | | | | | | | | | | |
| 2641 | | | | | | | | | | | | |
| 2642 | **Dibenz(a,h)anthracene** | | | | | | | | | | | |
| 2643 | | | | | | | | | | | | |
| 2644 | **General Statistics** | | | | | | | | | | | |
| 2645 | Total Number of Observations | | | | | 37 | Number of Distinct Observations | | | | | 29 |
| 2646 | Number of Detects | | | | | 16 | Number of Non-Detects | | | | | 21 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2647 | | | | | Number of Distinct Detects | 15 | | | | | Number of Distinct Non-Detects | 16 |
| 2648 | | | | | Minimum Detect | 20 | | | | | Minimum Non-Detect | 77 |
| 2649 | | | | | Maximum Detect | 13000 | | | | | Maximum Non-Detect | 6900 |
| 2650 | | | | | Variance Detects | 14512475 | | | | | Percent Non-Detects | 56.76% |
| 2651 | | | | | Mean Detects | 2438 | | | | | SD Detects | 3810 |
| 2652 | | | | | Median Detects | 745 | | | | | CV Detects | 1.563 |
| 2653 | | | | | Skewness Detects | 2.093 | | | | | Kurtosis Detects | 3.757 |
| 2654 | | | | | Mean of Logged Detects | 6.535 | | | | | SD of Logged Detects | 1.872 |
| 2655 | | | | | | | | | | | | |
| 2656 | | | | | **Normal GOF Test on Detects Only** | | | | | | | |
| 2657 | | | | | Shapiro Wilk Test Statistic | 0.67 | | | | | **Shapiro Wilk GOF Test** | |
| 2658 | | | | | 5% Shapiro Wilk Critical Value | 0.887 | | | | | Detected Data Not Normal at 5% Significance Level | |
| 2659 | | | | | Lilliefors Test Statistic | 0.305 | | | | | **Lilliefors GOF Test** | |
| 2660 | | | | | 5% Lilliefors Critical Value | 0.222 | | | | | Detected Data Not Normal at 5% Significance Level | |
| 2661 | | | | | **Detected Data Not Normal at 5% Significance Level** | | | | | | | |
| 2662 | | | | | | | | | | | | |
| 2663 | | | | | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | |
| 2664 | | | | | Mean | 1231 | | | | | Standard Error of Mean | 459.5 |
| 2665 | | | | | SD | 2671 | | | | | 95% KM (BCA) UCL | 2111 |
| 2666 | | | | | 95% KM (t) UCL | 2006 | | | | | 95% KM (Percentile Bootstrap) UCL | 1997 |
| 2667 | | | | | 95% KM (z) UCL | 1986 | | | | | 95% KM Bootstrap t UCL | 2940 |
| 2668 | | | | | 90% KM Chebyshev UCL | 2609 | | | | | 95% KM Chebyshev UCL | 3233 |
| 2669 | | | | | 97.5% KM Chebyshev UCL | 4100 | | | | | 99% KM Chebyshev UCL | 5802 |
| 2670 | | | | | | | | | | | | |
| 2671 | | | | | **Gamma GOF Tests on Detected Observations Only** | | | | | | | |
| 2672 | | | | | A-D Test Statistic | 0.318 | | | | | **Anderson-Darling GOF Test** | |
| 2673 | | | | | 5% A-D Critical Value | 0.796 | | | | | Detected data appear Gamma Distributed at 5% Significance Level | |
| 2674 | | | | | K-S Test Statistic | 0.154 | | | | | **Kolmogrov-Smirnoff GOF** | |
| 2675 | | | | | 5% K-S Critical Value | 0.227 | | | | | Detected data appear Gamma Distributed at 5% Significance Level | |
| 2676 | | | | | **Detected data appear Gamma Distributed at 5% Significance Level** | | | | | | | |
| 2677 | | | | | | | | | | | | |
| 2678 | | | | | **Gamma Statistics on Detected Data Only** | | | | | | | |
| 2679 | | | | | k hat (MLE) | 0.502 | | | | | k star (bias corrected MLE) | 0.45 |
| 2680 | | | | | Theta hat (MLE) | 4852 | | | | | Theta star (bias corrected MLE) | 5419 |
| 2681 | | | | | nu hat (MLE) | 16.08 | | | | | nu star (bias corrected) | 14.4 |
| 2682 | | | | | MLE Mean (bias corrected) | 2438 | | | | | MLE Sd (bias corrected) | 3635 |
| 2683 | | | | | | | | | | | | |
| 2684 | | | | | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | |
| 2685 | | | | | k hat (KM) | 0.212 | | | | | nu hat (KM) | 15.71 |
| 2686 | | | | | Approximate Chi Square Value (15.71, α) | 7.759 | | | | | Adjusted Chi Square Value (15.71, β) | 7.516 |
| 2687 | | | | | 95% Gamma Approximate KM-UCL (use when n>=50) | 2492 | | | | | 95% Gamma Adjusted KM-UCL (use when n<50) | 2573 |
| 2688 | | | | | | | | | | | | |
| 2689 | | | | | **Gamma ROS Statistics using Imputed Non-Detects** | | | | | | | |
| 2690 | | | | | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | |
| 2691 | | | | | GROS may not be used when kstar of detected data is small such as < 0.1 | | | | | | | |
| 2692 | | | | | For such situations, GROS method tends to yield inflated values of UCLs and BTVs | | | | | | | |
| 2693 | | | | | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | |
| 2694 | | | | | Minimum | 0.01 | | | | | Mean | 1093 |
| 2695 | | | | | Maximum | 13000 | | | | | Median | 51 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2696 | | | | | SD | 2736 | | | | | CV | 2.504 |
| 2697 | | | | | k hat (MLE) | 0.137 | | | | | k star (bias corrected MLE) | 0.144 |
| 2698 | | | | | Theta hat (MLE) | 7975 | | | | | Theta star (bias corrected MLE) | 7592 |
| 2699 | | | | | nu hat (MLE) | 10.14 | | | | | nu star (bias corrected) | 10.65 |
| 2700 | | | | | MLE Mean (bias corrected) | 1093 | | | | | MLE Sd (bias corrected) | 2880 |
| 2701 | | | | | | | | | | | Adjusted Level of Significance (β) | 0.0431 |
| 2702 | | | | | Approximate Chi Square Value (10.65, α) | 4.352 | | | | | Adjusted Chi Square Value (10.65, β) | 4.178 |
| 2703 | | | | | 95% Gamma Approximate UCL (use when n>=50) | 2674 | | | | | 95% Gamma Adjusted UCL (use when n<50) | 2785 |
| 2704 | | | | | | | | | | | | |
| 2705 | | | | | **Lognormal GOF Test on Detected Observations Only** | | | | | | | |
| 2706 | | | | | Shapiro Wilk Test Statistic | 0.979 | | | | | **Shapiro Wilk GOF Test** | |
| 2707 | | | | | 5% Shapiro Wilk Critical Value | 0.887 | | | | | Detected Data appear Lognormal at 5% Significance Level | |
| 2708 | | | | | Lilliefors Test Statistic | 0.0919 | | | | | **Lilliefors GOF Test** | |
| 2709 | | | | | 5% Lilliefors Critical Value | 0.222 | | | | | Detected Data appear Lognormal at 5% Significance Level | |
| 2710 | | | | | **Detected Data appear Lognormal at 5% Significance Level** | | | | | | | |
| 2711 | | | | | | | | | | | | |
| 2712 | | | | | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | |
| 2713 | | | | | Mean in Original Scale | 1151 | | | | | Mean in Log Scale | 5.59 |
| 2714 | | | | | SD in Original Scale | 2712 | | | | | SD in Log Scale | 1.57 |
| 2715 | | | | | 95% t UCL (assumes normality of ROS data) | 1904 | | | | | 95% Percentile Bootstrap UCL | 1971 |
| 2716 | | | | | 95% BCA Bootstrap UCL | 2312 | | | | | 95% Bootstrap t UCL | 3098 |
| 2717 | | | | | 95% H-UCL (Log ROS) | 2076 | | | | | | |
| 2718 | | | | | | | | | | | | |
| 2719 | | | | | **UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed** | | | | | | | |
| 2720 | | | | | KM Mean (logged) | 5.54 | | | | | 95% H-UCL (KM -Log) | 3609 |
| 2721 | | | | | KM SD (logged) | 1.8 | | | | | 95% Critical H Value (KM-Log) | 3.439 |
| 2722 | | | | | KM Standard Error of Mean (logged) | 0.392 | | | | | | |
| 2723 | | | | | | | | | | | | |
| 2724 | | | | | **DL/2 Statistics** | | | | | | | |
| 2725 | | | | | **DL/2 Normal** | | | | | | **DL/2 Log-Transformed** | |
| 2726 | | | | | Mean in Original Scale | 1635 | | | | | Mean in Log Scale | 6.455 |
| 2727 | | | | | SD in Original Scale | 2636 | | | | | SD in Log Scale | 1.552 |
| 2728 | | | | | 95% t UCL (Assumes normality) | 2367 | | | | | 95% H-Stat UCL | 4712 |
| 2729 | | | | | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | |
| 2730 | | | | | | | | | | | | |
| 2731 | | | | | **Nonparametric Distribution Free UCL Statistics** | | | | | | | |
| 2732 | | | | | **Detected Data appear Gamma Distributed at 5% Significance Level** | | | | | | | |
| 2733 | | | | | | | | | | | | |
| 2734 | | | | | **Suggested UCL to Use** | | | | | | | |
| 2735 | | | | | 95% KM (t) UCL | 2006 | | | | | 95% GROS Adjusted Gamma UCL | 2785 |
| 2736 | | | | | 95% Adjusted Gamma KM-UCL | 2573 | | | | | | |
| 2737 | | | | | | | | | | | | |
| 2738 | | | | | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | |
| 2739 | | | | | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | |
| 2740 | | | | | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | |
| 2741 | | | | | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | |
| 2742 | | | | | | | | | | | | |
| 2743 | **Dibenzofuran** | | | | | | | | | | | |
| 2744 | | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2745 | **General Statistics** | | | | | | | | | | | |
| 2746 | | | | | Total Number of Observations | 37 | | | | Number of Distinct Observations | | 26 |
| 2747 | | | | | Number of Detects | 2 | | | | Number of Non-Detects | | 35 |
| 2748 | | | | | Number of Distinct Detects | 2 | | | | Number of Distinct Non-Detects | | 25 |
| 2749 | | | | | Minimum Detect | 100 | | | | Minimum Non-Detect | | 76 |
| 2750 | | | | | Maximum Detect | 1800 | | | | Maximum Non-Detect | | 15000 |
| 2751 | | | | | Variance Detects | 1445000 | | | | Percent Non-Detects | | 94.59% |
| 2752 | | | | | Mean Detects | 950 | | | | SD Detects | | 1202 |
| 2753 | | | | | Median Detects | 950 | | | | CV Detects | | 1.265 |
| 2754 | | | | | Skewness Detects | N/A | | | | Kurtosis Detects | | N/A |
| 2755 | | | | | Mean of Logged Detects | 6.05 | | | | SD of Logged Detects | | 2.044 |
| 2756 | | | | | | | | | | | | |
| 2757 | **Warning: Data set has only 2 Detected Values.** | | | | | | | | | | | |
| 2758 | **This is not enough to compute meaningful or reliable statistics and estimates.** | | | | | | | | | | | |
| 2759 | | | | | | | | | | | | |
| 2760 | | | | | | | | | | | | |
| 2761 | **Normal GOF Test on Detects Only** | | | | | | | | | | | |
| 2762 | **Not Enough Data to Perform GOF Test** | | | | | | | | | | | |
| 2763 | | | | | | | | | | | | |
| 2764 | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | | | | | |
| 2765 | | | | | Mean | 149.6 | | | | Standard Error of Mean | | 95.47 |
| 2766 | | | | | SD | 337 | | | | 95% KM (BCA) UCL | | N/A |
| 2767 | | | | | 95% KM (t) UCL | 310.7 | | | | 95% KM (Percentile Bootstrap) UCL | | N/A |
| 2768 | | | | | 95% KM (z) UCL | 306.6 | | | | 95% KM Bootstrap t UCL | | N/A |
| 2769 | | | | | 90% KM Chebyshev UCL | 436 | | | | 95% KM Chebyshev UCL | | 565.7 |
| 2770 | | | | | 97.5% KM Chebyshev UCL | 745.8 | | | | 99% KM Chebyshev UCL | | 1099 |
| 2771 | | | | | | | | | | | | |
| 2772 | **Gamma GOF Tests on Detected Observations Only** | | | | | | | | | | | |
| 2773 | **Not Enough Data to Perform GOF Test** | | | | | | | | | | | |
| 2774 | | | | | | | | | | | | |
| 2775 | **Gamma Statistics on Detected Data Only** | | | | | | | | | | | |
| 2776 | | | | | k hat (MLE) | 0.744 | | | | k star (bias corrected MLE) | | N/A |
| 2777 | | | | | Theta hat (MLE) | 1278 | | | | Theta star (bias corrected MLE) | | N/A |
| 2778 | | | | | nu hat (MLE) | 2.974 | | | | nu star (bias corrected) | | N/A |
| 2779 | | | | | MLE Mean (bias corrected) | N/A | | | | MLE Sd (bias corrected) | | N/A |
| 2780 | | | | | | | | | | | | |
| 2781 | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | | | | | |
| 2782 | | | | | k hat (KM) | 0.197 | | | | nu hat (KM) | | 14.57 |
| 2783 | | | | | | | | | | Adjusted Level of Significance (β) | | 0.0431 |
| 2784 | | | | | Approximate Chi Square Value (14.57, α) | 6.966 | | | | Adjusted Chi Square Value (14.57, β) | | 6.738 |
| 2785 | | | | | 95% Gamma Approximate KM-UCL (use when n>=50) | 312.9 | | | | 95% Gamma Adjusted KM-UCL (use when n<50) | | 323.5 |
| 2786 | | | | | | | | | | | | |
| 2787 | **Lognormal GOF Test on Detected Observations Only** | | | | | | | | | | | |
| 2788 | **Not Enough Data to Perform GOF Test** | | | | | | | | | | | |
| 2789 | | | | | | | | | | | | |
| 2790 | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | | | | | |
| 2791 | | | | | Mean in Original Scale | 56.1 | | | | Mean in Log Scale | | 1.358 |
| 2792 | | | | | SD in Original Scale | 295.1 | | | | SD in Log Scale | | 1.56 |
| 2793 | | | | | 95% t UCL (assumes normality of ROS data) | 138 | | | | 95% Percentile Bootstrap UCL | | 152.2 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2794 | | | | 95% BCA Bootstrap UCL | | 206.6 | | | | 95% Bootstrap t UCL | | 2856 |
| 2795 | | | | 95% H-UCL (Log ROS) | | 29.37 | | | | | | |
| 2796 | | | | | | | | | | | | |
| 2797 | | | | | | DL/2 Statistics | | | | | | |
| 2798 | | | | DL/2 Normal | | | | | | DL/2 Log-Transformed | | |
| 2799 | | | | Mean in Original Scale | | 1005 | | | | Mean in Log Scale | | 6.183 |
| 2800 | | | | SD in Original Scale | | 1334 | | | | SD in Log Scale | | 1.371 |
| 2801 | | | | 95% t UCL (Assumes normality) | | 1375 | | | | 95% H-Stat UCL | | 2375 |
| 2802 | | | | | | DL/2 is not a recommended method, provided for comparisons and historical reasons | | | | | | |
| 2803 | | | | | | | | | | | | |
| 2804 | | | | | | Nonparametric Distribution Free UCL Statistics | | | | | | |
| 2805 | | | | | | Data do not follow a Discernible Distribution at 5% Significance Level | | | | | | |
| 2806 | | | | | | | | | | | | |
| 2807 | | | | | | Suggested UCL to Use | | | | | | |
| 2808 | | | | 99% KM (Chebyshev) UCL | | 1099 | | | | | | |
| 2809 | | | | | | | | | | | | |
| 2810 | | | | | | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | |
| 2811 | | | | | | Recommendations are based upon data size, data distribution, and skewness. | | | | | | |
| 2812 | | | | | | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | |
| 2813 | | | | | | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | |
| 2814 | | | | | | | | | | | | |
| 2815 | Dichlorofluoromethane | | | | | | | | | | | |
| 2816 | | | | | | | | | | | | |
| 2817 | | | | | | General Statistics | | | | | | |
| 2818 | | | | Total Number of Observations | | 3 | | | | Number of Distinct Observations | | 3 |
| 2819 | | | | Number of Detects | | 1 | | | | Number of Non-Detects | | 2 |
| 2820 | | | | Number of Distinct Detects | | 1 | | | | Number of Distinct Non-Detects | | 2 |
| 2821 | | | | | | | | | | | | |
| 2822 | | | | | | Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set! | | | | | | |
| 2823 | | | | | | It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV). | | | | | | |
| 2824 | | | | | | | | | | | | |
| 2825 | | | | | | The data set for variable Dichlorofluoromethane was not processed! | | | | | | |
| 2826 | | | | | | | | | | | | |
| 2827 | | | | | | | | | | | | |
| 2828 | Diisopropyl ether | | | | | | | | | | | |
| 2829 | | | | | | | | | | | | |
| 2830 | | | | | | General Statistics | | | | | | |
| 2831 | | | | Total Number of Observations | | 13 | | | | Number of Distinct Observations | | 11 |
| 2832 | | | | Number of Detects | | 1 | | | | Number of Non-Detects | | 12 |
| 2833 | | | | Number of Distinct Detects | | 1 | | | | Number of Distinct Non-Detects | | 10 |
| 2834 | | | | | | | | | | | | |
| 2835 | | | | | | Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set! | | | | | | |
| 2836 | | | | | | It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV). | | | | | | |
| 2837 | | | | | | | | | | | | |
| 2838 | | | | | | The data set for variable Diisopropyl ether was not processed! | | | | | | |
| 2839 | | | | | | | | | | | | |
| 2840 | | | | | | | | | | | | |
| 2841 | Ethylbenzene | | | | | | | | | | | |
| 2842 | | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
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| 2843 | **General Statistics** | | | | | | | | | | | |
| 2844 | Total Number of Observations | | | | | 24 | Number of Distinct Observations | | | | | 18 |
| 2845 | Number of Detects | | | | | 6 | Number of Non-Detects | | | | | 18 |
| 2846 | Number of Distinct Detects | | | | | 6 | Number of Distinct Non-Detects | | | | | 13 |
| 2847 | Minimum Detect | | | | | 0.84 | Minimum Non-Detect | | | | | 0.5 |
| 2848 | Maximum Detect | | | | | 74 | Maximum Non-Detect | | | | | 6.25 |
| 2849 | Variance Detects | | | | | 843.1 | Percent Non-Detects | | | | | 75% |
| 2850 | Mean Detects | | | | | 14.89 | SD Detects | | | | | 29.04 |
| 2851 | Median Detects | | | | | 3.3 | CV Detects | | | | | 1.95 |
| 2852 | Skewness Detects | | | | | 2.42 | Kurtosis Detects | | | | | 5.886 |
| 2853 | Mean of Logged Detects | | | | | 1.427 | SD of Logged Detects | | | | | 1.597 |
| 2854 | | | | | | | | | | | | |
| 2855 | **Normal GOF Test on Detects Only** | | | | | | | | | | | |
| 2856 | Shapiro Wilk Test Statistic | | | | | 0.561 | **Shapiro Wilk GOF Test** | | | | | |
| 2857 | 5% Shapiro Wilk Critical Value | | | | | 0.788 | Detected Data Not Normal at 5% Significance Level | | | | | |
| 2858 | Lilliefors Test Statistic | | | | | 0.45 | **Lilliefors GOF Test** | | | | | |
| 2859 | 5% Lilliefors Critical Value | | | | | 0.362 | Detected Data Not Normal at 5% Significance Level | | | | | |
| 2860 | **Detected Data Not Normal at 5% Significance Level** | | | | | | | | | | | |
| 2861 | | | | | | | | | | | | |
| 2862 | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | | | | | |
| 2863 | Mean | | | | | 4.542 | Standard Error of Mean | | | | | 3.265 |
| 2864 | SD | | | | | 14.56 | 95% KM (BCA) UCL | | | | | 10.73 |
| 2865 | 95% KM (t) UCL | | | | | 10.14 | 95% KM (Percentile Bootstrap) UCL | | | | | 10.51 |
| 2866 | 95% KM (z) UCL | | | | | 9.911 | 95% KM Bootstrap t UCL | | | | | 37.92 |
| 2867 | 90% KM Chebyshev UCL | | | | | 14.34 | 95% KM Chebyshev UCL | | | | | 18.77 |
| 2868 | 97.5% KM Chebyshev UCL | | | | | 24.93 | 99% KM Chebyshev UCL | | | | | 37.02 |
| 2869 | | | | | | | | | | | | |
| 2870 | **Gamma GOF Tests on Detected Observations Only** | | | | | | | | | | | |
| 2871 | A-D Test Statistic | | | | | 0.773 | **Anderson-Darling GOF Test** | | | | | |
| 2872 | 5% A-D Critical Value | | | | | 0.736 | Detected Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 2873 | K-S Test Statistic | | | | | 0.348 | **Kolmogrov-Smirnoff GOF** | | | | | |
| 2874 | 5% K-S Critical Value | | | | | 0.349 | Detected data appear Gamma Distributed at 5% Significance Level | | | | | |
| 2875 | **Detected data follow Appr. Gamma Distribution at 5% Significance Level** | | | | | | | | | | | |
| 2876 | | | | | | | | | | | | |
| 2877 | **Gamma Statistics on Detected Data Only** | | | | | | | | | | | |
| 2878 | k hat (MLE) | | | | | 0.499 | k star (bias corrected MLE) | | | | | 0.36 |
| 2879 | Theta hat (MLE) | | | | | 29.85 | Theta star (bias corrected MLE) | | | | | 41.3 |
| 2880 | nu hat (MLE) | | | | | 5.985 | nu star (bias corrected) | | | | | 4.326 |
| 2881 | MLE Mean (bias corrected) | | | | | 14.89 | MLE Sd (bias corrected) | | | | | 24.8 |
| 2882 | | | | | | | | | | | | |
| 2883 | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | | | | | |
| 2884 | k hat (KM) | | | | | 0.0973 | nu hat (KM) | | | | | 4.672 |
| 2885 | Approximate Chi Square Value (4.67, α) | | | | | 1.004 | Adjusted Chi Square Value (4.67, β) | | | | | 0.892 |
| 2886 | 95% Gamma Approximate KM-UCL (use when n>=50) | | | | | 21.14 | 95% Gamma Adjusted KM-UCL (use when n<50) | | | | | 23.78 |
| 2887 | Gamma (KM) may not be used when k hat (KM) is < 0.1 | | | | | | | | | | | |
| 2888 | | | | | | | | | | | | |
| 2889 | **Gamma ROS Statistics using Imputed Non-Detects** | | | | | | | | | | | |
| 2890 | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | | | | |
| 2891 | GROS may not be used when kstar of detected data is small such as < 0.1 | | | | | | | | | | | |

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| 2892 | For such situations, GROS method tends to yield inflated values of UCLs and BTVs | | | | | | | | | | | |
| 2893 | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | | | | |
| 2894 | | | | | Minimum | 0.01 | | | | Mean | | 3.836 |
| 2895 | | | | | Maximum | 74 | | | | Median | | 0.01 |
| 2896 | | | | | SD | 15.04 | | | | CV | | 3.92 |
| 2897 | | | | | k hat (MLE) | 0.178 | | | | k star (bias corrected MLE) | | 0.183 |
| 2898 | | | | | Theta hat (MLE) | 21.56 | | | | Theta star (bias corrected MLE) | | 20.9 |
| 2899 | | | | | nu hat (MLE) | 8.541 | | | | nu star (bias corrected) | | 8.807 |
| 2900 | | | | | MLE Mean (bias corrected) | 3.836 | | | | MLE Sd (bias corrected) | | 8.955 |
| 2901 | | | | | | | | | | Adjusted Level of Significance (β) | | 0.0392 |
| 2902 | | | | | Approximate Chi Square Value (8.81, α) | 3.211 | | | | Adjusted Chi Square Value (8.81, β) | | 2.977 |
| 2903 | | | | | 95% Gamma Approximate UCL (use when n>=50) | 10.52 | | | | 95% Gamma Adjusted UCL (use when n<50) | | 11.35 |
| 2904 | | | | | | | | | | | | |
| 2905 | **Lognormal GOF Test on Detected Observations Only** | | | | | | | | | | | |
| 2906 | | | | | Shapiro Wilk Test Statistic | 0.883 | **Shapiro Wilk GOF Test** | | | | | |
| 2907 | | | | | 5% Shapiro Wilk Critical Value | 0.788 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 2908 | | | | | Lilliefors Test Statistic | 0.231 | **Lilliefors GOF Test** | | | | | |
| 2909 | | | | | 5% Lilliefors Critical Value | 0.362 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 2910 | **Detected Data appear Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 2911 | | | | | | | | | | | | |
| 2912 | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | | | | | |
| 2913 | | | | | Mean in Original Scale | 4.195 | | | | Mean in Log Scale | | -0.181 |
| 2914 | | | | | SD in Original Scale | 14.94 | | | | SD in Log Scale | | 1.374 |
| 2915 | | | | | 95% t UCL (assumes normality of ROS data) | 9.423 | | | | 95% Percentile Bootstrap UCL | | 10.2 |
| 2916 | | | | | 95% BCA Bootstrap UCL | 13.49 | | | | 95% Bootstrap t UCL | | 55.79 |
| 2917 | | | | | 95% H-UCL (Log ROS) | 5.181 | | | | | | |
| 2918 | | | | | | | | | | | | |
| 2919 | **UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed** | | | | | | | | | | | |
| 2920 | | | | | KM Mean (logged) | 0.265 | | | | 95% H-UCL (KM -Log) | | 4.623 |
| 2921 | | | | | KM SD (logged) | 1.124 | | | | 95% Critical H Value (KM-Log) | | 2.71 |
| 2922 | | | | | KM Standard Error of Mean (logged) | 0.325 | | | | | | |
| 2923 | | | | | | | | | | | | |
| 2924 | **DL/2 Statistics** | | | | | | | | | | | |
| 2925 | | | | **DL/2 Normal** | | | **DL/2 Log-Transformed** | | | | | |
| 2926 | | | | | Mean in Original Scale | 5.484 | | | | Mean in Log Scale | | 0.875 |
| 2927 | | | | | SD in Original Scale | 14.65 | | | | SD in Log Scale | | 1.047 |
| 2928 | | | | | 95% t UCL (Assumes normality) | 10.61 | | | | 95% H-Stat UCL | | 7.324 |
| 2929 | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | | | | | |
| 2930 | | | | | | | | | | | | |
| 2931 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 2932 | **Detected Data appear Approximate Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 2933 | | | | | | | | | | | | |
| 2934 | **Suggested UCL to Use** | | | | | | | | | | | |
| 2935 | | | | | 95% KM (t) UCL | 10.14 | | | | 95% GROS Adjusted Gamma UCL | | 11.35 |
| 2936 | | | | | 95% Adjusted Gamma KM-UCL | 23.78 | | | | | | |
| 2937 | | | | | | | | | | | | |
| 2938 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 2939 | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | | | | | |
| 2940 | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | | | | | |

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| 2941 | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 2942 | | | | | | | | | | | | |
| 2943 | **Fluoranthene** | | | | | | | | | | | |
| 2944 | | | | | | | | | | | | |
| 2945 | **General Statistics** | | | | | | | | | | | |
| 2946 | Total Number of Observations | | | | | 37 | Number of Distinct Observations | | | | | 33 |
| 2947 | Number of Detects | | | | | 24 | Number of Non-Detects | | | | | 13 |
| 2948 | Number of Distinct Detects | | | | | 24 | Number of Distinct Non-Detects | | | | | 11 |
| 2949 | Minimum Detect | | | | | 28 | Minimum Non-Detect | | | | | 77 |
| 2950 | Maximum Detect | | | | | 180000 | Maximum Non-Detect | | | | | 6900 |
| 2951 | Variance Detects | | | | | 2.379E+9 | Percent Non-Detects | | | | | 35.14% |
| 2952 | Mean Detects | | | | | 17166 | SD Detects | | | | | 48774 |
| 2953 | Median Detects | | | | | 1095 | CV Detects | | | | | 2.841 |
| 2954 | Skewness Detects | | | | | 3.193 | Kurtosis Detects | | | | | 9.036 |
| 2955 | Mean of Logged Detects | | | | | 7.22 | SD of Logged Detects | | | | | 2.26 |
| 2956 | | | | | | | | | | | | |
| 2957 | **Normal GOF Test on Detects Only** | | | | | | | | | | | |
| 2958 | Shapiro Wilk Test Statistic | | | | | 0.374 | **Shapiro Wilk GOF Test** | | | | | |
| 2959 | 5% Shapiro Wilk Critical Value | | | | | 0.916 | Detected Data Not Normal at 5% Significance Level | | | | | |
| 2960 | Lilliefors Test Statistic | | | | | 0.459 | **Lilliefors GOF Test** | | | | | |
| 2961 | 5% Lilliefors Critical Value | | | | | 0.181 | Detected Data Not Normal at 5% Significance Level | | | | | |
| 2962 | **Detected Data Not Normal at 5% Significance Level** | | | | | | | | | | | |
| 2963 | | | | | | | | | | | | |
| 2964 | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | | | | | |
| 2965 | Mean | | | | | 11306 | Standard Error of Mean | | | | | 6596 |
| 2966 | SD | | | | | 39273 | 95% KM (BCA) UCL | | | | | 25465 |
| 2967 | 95% KM (t) UCL | | | | | 22442 | 95% KM (Percentile Bootstrap) UCL | | | | | 21916 |
| 2968 | 95% KM (z) UCL | | | | | 22155 | 95% KM Bootstrap t UCL | | | | | 132140 |
| 2969 | 90% KM Chebyshev UCL | | | | | 31093 | 95% KM Chebyshev UCL | | | | | 40056 |
| 2970 | 97.5% KM Chebyshev UCL | | | | | 52496 | 99% KM Chebyshev UCL | | | | | 76933 |
| 2971 | | | | | | | | | | | | |
| 2972 | **Gamma GOF Tests on Detected Observations Only** | | | | | | | | | | | |
| 2973 | A-D Test Statistic | | | | | 2.154 | **Anderson-Darling GOF Test** | | | | | |
| 2974 | 5% A-D Critical Value | | | | | 0.863 | Detected Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 2975 | K-S Test Statistic | | | | | 0.24 | **Kolmogrov-Smirnoff GOF** | | | | | |
| 2976 | 5% K-S Critical Value | | | | | 0.194 | Detected Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 2977 | **Detected Data Not Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 2978 | | | | | | | | | | | | |
| 2979 | **Gamma Statistics on Detected Data Only** | | | | | | | | | | | |
| 2980 | k hat (MLE) | | | | | 0.276 | k star (bias corrected MLE) | | | | | 0.269 |
| 2981 | Theta hat (MLE) | | | | | 62149 | Theta star (bias corrected MLE) | | | | | 63706 |
| 2982 | nu hat (MLE) | | | | | 13.26 | nu star (bias corrected) | | | | | 12.93 |
| 2983 | MLE Mean (bias corrected) | | | | | 17166 | MLE Sd (bias corrected) | | | | | 33069 |
| 2984 | | | | | | | | | | | | |
| 2985 | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | | | | | |
| 2986 | k hat (KM) | | | | | 0.0829 | nu hat (KM) | | | | | 6.133 |
| 2987 | Approximate Chi Square Value (6.13, α) | | | | | 1.708 | Adjusted Chi Square Value (6.13, β) | | | | | 1.609 |
| 2988 | 95% Gamma Approximate KM-UCL (use when n>=50) | | | | | 40592 | 95% Gamma Adjusted KM-UCL (use when n<50) | | | | | 43085 |
| 2989 | Gamma (KM) may not be used when k hat (KM) is < 0.1 | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2990 | | | | | | | | | | | | |
| 2991 | **Gamma ROS Statistics using Imputed Non-Detects** | | | | | | | | | | | |
| 2992 | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | | | | |
| 2993 | GROS may not be used when kstar of detected data is small such as < 0.1 | | | | | | | | | | | |
| 2994 | For such situations, GROS method tends to yield inflated values of UCLs and BTVs | | | | | | | | | | | |
| 2995 | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | | | | |
| 2996 | | | | | Minimum | 0.01 | | | | Mean | 11135 | |
| 2997 | | | | | Maximum | 180000 | | | | Median | 230 | |
| 2998 | | | | | SD | 39861 | | | | CV | 3.58 | |
| 2999 | | | | | k hat (MLE) | 0.126 | | | | k star (bias corrected MLE) | 0.134 | |
| 3000 | | | | | Theta hat (MLE) | 88374 | | | | Theta star (bias corrected MLE) | 83220 | |
| 3001 | | | | | nu hat (MLE) | 9.324 | | | | nu star (bias corrected) | 9.901 | |
| 3002 | | | | | MLE Mean (bias corrected) | 11135 | | | | MLE Sd (bias corrected) | 30441 | |
| 3003 | | | | | | | | | | Adjusted Level of Significance (β) | 0.0431 | |
| 3004 | | | | | Approximate Chi Square Value (9.90, α) | 3.88 | | | | Adjusted Chi Square Value (9.90, β) | 3.717 | |
| 3005 | | | | | 95% Gamma Approximate UCL (use when n>=50) | 28414 | | | | 95% Gamma Adjusted UCL (use when n<50) | 29659 | |
| 3006 | | | | | | | | | | | | |
| 3007 | **Lognormal GOF Test on Detected Observations Only** | | | | | | | | | | | |
| 3008 | | | | | Shapiro Wilk Test Statistic | 0.965 | | | | **Shapiro Wilk GOF Test** | | |
| 3009 | | | | | 5% Shapiro Wilk Critical Value | 0.916 | | | | Detected Data appear Lognormal at 5% Significance Level | | |
| 3010 | | | | | Lilliefors Test Statistic | 0.0849 | | | | **Lilliefors GOF Test** | | |
| 3011 | | | | | 5% Lilliefors Critical Value | 0.181 | | | | Detected Data appear Lognormal at 5% Significance Level | | |
| 3012 | **Detected Data appear Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 3013 | | | | | | | | | | | | |
| 3014 | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | | | | | |
| 3015 | | | | | Mean in Original Scale | 11243 | | | | Mean in Log Scale | 6.594 | |
| 3016 | | | | | SD in Original Scale | 39830 | | | | SD in Log Scale | 2.071 | |
| 3017 | | | | | 95% t UCL (assumes normality of ROS data) | 22298 | | | | 95% Percentile Bootstrap UCL | 21673 | |
| 3018 | | | | | 95% BCA Bootstrap UCL | 25945 | | | | 95% Bootstrap t UCL | 135292 | |
| 3019 | | | | | 95% H-UCL (Log ROS) | 23465 | | | | | | |
| 3020 | | | | | | | | | | | | |
| 3021 | **UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed** | | | | | | | | | | | |
| 3022 | | | | | KM Mean (logged) | 6.565 | | | | 95% H-UCL (KM -Log) | 29166 | |
| 3023 | | | | | KM SD (logged) | 2.146 | | | | 95% Critical H Value (KM-Log) | 3.946 | |
| 3024 | | | | | KM Standard Error of Mean (logged) | 0.392 | | | | | | |
| 3025 | | | | | | | | | | | | |
| 3026 | **DL/2 Statistics** | | | | | | | | | | | |
| 3027 | **DL/2 Normal** | | | | | | | | | **DL/2 Log-Transformed** | | |
| 3028 | | | | | Mean in Original Scale | 11573 | | | | Mean in Log Scale | 7.042 | |
| 3029 | | | | | SD in Original Scale | 39743 | | | | SD in Log Scale | 1.95 | |
| 3030 | | | | | 95% t UCL (Assumes normality) | 22604 | | | | 95% H-Stat UCL | 25158 | |
| 3031 | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | | | | | |
| 3032 | | | | | | | | | | | | |
| 3033 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 3034 | **Detected Data appear Lognormal Distributed at 5% Significance Level** | | | | | | | | | | | |
| 3035 | | | | | | | | | | | | |
| 3036 | **Suggested UCL to Use** | | | | | | | | | | | |
| 3037 | | | | | 99% KM (Chebyshev) UCL | 76933 | | | | | | |
| 3038 | | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3039 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 3040 | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | | | | | |
| 3041 | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | | | | | |
| 3042 | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 3043 | | | | | | | | | | | | |
| 3044 | **Fluorene** | | | | | | | | | | | |
| 3045 | | | | | | | | | | | | |
| 3046 | **General Statistics** | | | | | | | | | | | |
| 3047 | | | | | | Total Number of Observations | 37 | | | | Number of Distinct Observations | 27 | |
| 3048 | | | | | | Number of Detects | 8 | | | | Number of Non-Detects | 29 | |
| 3049 | | | | | | Number of Distinct Detects | 8 | | | | Number of Distinct Non-Detects | 21 | |
| 3050 | | | | | | Minimum Detect | 14 | | | | Minimum Non-Detect | 76 | |
| 3051 | | | | | | Maximum Detect | 17000 | | | | Maximum Non-Detect | 6900 | |
| 3052 | | | | | | Variance Detects | 35075033 | | | | Percent Non-Detects | 78.38% | |
| 3053 | | | | | | Mean Detects | 2394 | | | | SD Detects | 5922 | |
| 3054 | | | | | | Median Detects | 89.5 | | | | CV Detects | 2.473 | |
| 3055 | | | | | | Skewness Detects | 2.79 | | | | Kurtosis Detects | 7.829 | |
| 3056 | | | | | | Mean of Logged Detects | 5.34 | | | | SD of Logged Detects | 2.246 | |
| 3057 | | | | | | | | | | | | | |
| 3058 | **Normal GOF Test on Detects Only** | | | | | | | | | | | |
| 3059 | | | | | | Shapiro Wilk Test Statistic | 0.474 | | | **Shapiro Wilk GOF Test** | | | |
| 3060 | | | | | | 5% Shapiro Wilk Critical Value | 0.818 | | | Detected Data Not Normal at 5% Significance Level | | | |
| 3061 | | | | | | Lilliefors Test Statistic | 0.435 | | | **Lilliefors GOF Test** | | | |
| 3062 | | | | | | 5% Lilliefors Critical Value | 0.313 | | | Detected Data Not Normal at 5% Significance Level | | | |
| 3063 | **Detected Data Not Normal at 5% Significance Level** | | | | | | | | | | | |
| 3064 | | | | | | | | | | | | | |
| 3065 | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | | | | | |
| 3066 | | | | | | Mean | 599.4 | | | | Standard Error of Mean | 485.2 | |
| 3067 | | | | | | SD | 2750 | | | | 95% KM (BCA) UCL | 1555 | |
| 3068 | | | | | | 95% KM (t) UCL | 1419 | | | | 95% KM (Percentile Bootstrap) UCL | 1511 | |
| 3069 | | | | | | 95% KM (z) UCL | 1397 | | | | 95% KM Bootstrap t UCL | 10695 | |
| 3070 | | | | | | 90% KM Chebyshev UCL | 2055 | | | | 95% KM Chebyshev UCL | 2714 | |
| 3071 | | | | | | 97.5% KM Chebyshev UCL | 3630 | | | | 99% KM Chebyshev UCL | 5427 | |
| 3072 | | | | | | | | | | | | | |
| 3073 | **Gamma GOF Tests on Detected Observations Only** | | | | | | | | | | | |
| 3074 | | | | | | A-D Test Statistic | 1.038 | | | **Anderson-Darling GOF Test** | | | |
| 3075 | | | | | | 5% A-D Critical Value | 0.803 | | | Detected Data Not Gamma Distributed at 5% Significance Level | | | |
| 3076 | | | | | | K-S Test Statistic | 0.311 | | | **Kolmogrov-Smirnoff GOF** | | | |
| 3077 | | | | | | 5% K-S Critical Value | 0.318 | | | Detected data appear Gamma Distributed at 5% Significance Level | | | |
| 3078 | **Detected data follow Appr. Gamma Distribution at 5% Significance Level** | | | | | | | | | | | |
| 3079 | | | | | | | | | | | | | |
| 3080 | **Gamma Statistics on Detected Data Only** | | | | | | | | | | | |
| 3081 | | | | | | k hat (MLE) | 0.285 | | | | k star (bias corrected MLE) | 0.261 | |
| 3082 | | | | | | Theta hat (MLE) | 8405 | | | | Theta star (bias corrected MLE) | 9161 | |
| 3083 | | | | | | nu hat (MLE) | 4.558 | | | | nu star (bias corrected) | 4.182 | |
| 3084 | | | | | | MLE Mean (bias corrected) | 2394 | | | | MLE Sd (bias corrected) | 4683 | |
| 3085 | | | | | | | | | | | | | |
| 3086 | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | | | | | |
| 3087 | | | | | | k hat (KM) | 0.0475 | | | | nu hat (KM) | 3.517 | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3088 | Approximate Chi Square Value (3.52, α) | | | | | 0.541 | Adjusted Chi Square Value (3.52, β) | | | | | 0.496 |
| 3089 | 95% Gamma Approximate KM-UCL (use when n>=50) | | | | | 3899 | 95% Gamma Adjusted KM-UCL (use when n<50) | | | | | 4252 |
| 3090 | Gamma (KM) may not be used when k hat (KM) is < 0.1 | | | | | | | | | | | |
| 3091 | | | | | | | | | | | | |
| 3092 | **Gamma ROS Statistics using Imputed Non-Detects** | | | | | | | | | | | |
| 3093 | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | | | | |
| 3094 | GROS may not be used when kstar of detected data is small such as < 0.1 | | | | | | | | | | | |
| 3095 | For such situations, GROS method tends to yield inflated values of UCLs and BTVs | | | | | | | | | | | |
| 3096 | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | | | | |
| 3097 | Minimum | | | | | 0.01 | Mean | | | | | 521.6 |
| 3098 | Maximum | | | | | 17000 | Median | | | | | 0.01 |
| 3099 | SD | | | | | 2796 | CV | | | | | 5.359 |
| 3100 | k hat (MLE) | | | | | 0.0965 | k star (bias corrected MLE) | | | | | 0.107 |
| 3101 | Theta hat (MLE) | | | | | 5405 | Theta star (bias corrected MLE) | | | | | 4889 |
| 3102 | nu hat (MLE) | | | | | 7.141 | nu star (bias corrected) | | | | | 7.896 |
| 3103 | MLE Mean (bias corrected) | | | | | 521.6 | MLE Sd (bias corrected) | | | | | 1597 |
| 3104 | | | | | | | Adjusted Level of Significance (β) | | | | | 0.0431 |
| 3105 | Approximate Chi Square Value (7.90, α) | | | | | 2.675 | Adjusted Chi Square Value (7.90, β) | | | | | 2.544 |
| 3106 | 95% Gamma Approximate UCL (use when n>=50) | | | | | 1540 | 95% Gamma Adjusted UCL (use when n<50) | | | | | 1619 |
| 3107 | | | | | | | | | | | | |
| 3108 | **Lognormal GOF Test on Detected Observations Only** | | | | | | | | | | | |
| 3109 | Shapiro Wilk Test Statistic | | | | | 0.897 | **Shapiro Wilk GOF Test** | | | | | |
| 3110 | 5% Shapiro Wilk Critical Value | | | | | 0.818 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 3111 | Lilliefors Test Statistic | | | | | 0.253 | **Lilliefors GOF Test** | | | | | |
| 3112 | 5% Lilliefors Critical Value | | | | | 0.313 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 3113 | **Detected Data appear Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 3114 | | | | | | | | | | | | |
| 3115 | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | | | | | |
| 3116 | Mean in Original Scale | | | | | 568.5 | Mean in Log Scale | | | | | 4.257 |
| 3117 | SD in Original Scale | | | | | 2787 | SD in Log Scale | | | | | 1.285 |
| 3118 | 95% t UCL (assumes normality of ROS data) | | | | | 1342 | 95% Percentile Bootstrap UCL | | | | | 1481 |
| 3119 | 95% BCA Bootstrap UCL | | | | | 2356 | 95% Bootstrap t UCL | | | | | 24929 |
| 3120 | 95% H-UCL (Log ROS) | | | | | 289.6 | | | | | | |
| 3121 | | | | | | | | | | | | |
| 3122 | **UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed** | | | | | | | | | | | |
| 3123 | KM Mean (logged) | | | | | 4.312 | 95% H-UCL (KM -Log) | | | | | 399.1 |
| 3124 | KM SD (logged) | | | | | 1.411 | 95% Critical H Value (KM-Log) | | | | | 2.898 |
| 3125 | KM Standard Error of Mean (logged) | | | | | 0.406 | | | | | | |
| 3126 | | | | | | | | | | | | |
| 3127 | **DL/2 Statistics** | | | | | | | | | | | |
| 3128 | **DL/2 Normal** | | | | | | **DL/2 Log-Transformed** | | | | | |
| 3129 | Mean in Original Scale | | | | | 1222 | Mean in Log Scale | | | | | 6.032 |
| 3130 | SD in Original Scale | | | | | 2775 | SD in Log Scale | | | | | 1.566 |
| 3131 | 95% t UCL (Assumes normality) | | | | | 1992 | 95% H-Stat UCL | | | | | 3196 |
| 3132 | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | | | | | |
| 3133 | | | | | | | | | | | | |
| 3134 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 3135 | **Detected Data appear Approximate Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 3136 | | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3137 | **Suggested UCL to Use** | | | | | | | | | | | |
| 3138 | | | | | 95% KM (t) UCL | 1419 | | | | 95% GROS Adjusted Gamma UCL | | 1619 |
| 3139 | | | | | 95% Adjusted Gamma KM-UCL | 4252 | | | | | | |
| 3140 | | | | | | | | | | | | |
| 3141 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 3142 | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | | | | | |
| 3143 | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | | | | | |
| 3144 | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 3145 | | | | | | | | | | | | |
| 3146 | **Indeno(1,2,3-cd)pyrene** | | | | | | | | | | | |
| 3147 | | | | | | | | | | | | |
| 3148 | **General Statistics** | | | | | | | | | | | |
| 3149 | | | | | Total Number of Observations | 37 | | | | Number of Distinct Observations | | 32 |
| 3150 | | | | | Number of Detects | 21 | | | | Number of Non-Detects | | 16 |
| 3151 | | | | | Number of Distinct Detects | 21 | | | | Number of Distinct Non-Detects | | 11 |
| 3152 | | | | | Minimum Detect | 41 | | | | Minimum Non-Detect | | 77 |
| 3153 | | | | | Maximum Detect | 74000 | | | | Maximum Non-Detect | | 6900 |
| 3154 | | | | | Variance Detects | 3.607E+8 | | | | Percent Non-Detects | | 43.24% |
| 3155 | | | | | Mean Detects | 8391 | | | | SD Detects | | 18993 |
| 3156 | | | | | Median Detects | 1100 | | | | CV Detects | | 2.263 |
| 3157 | | | | | Skewness Detects | 2.992 | | | | Kurtosis Detects | | 8.38 |
| 3158 | | | | | Mean of Logged Detects | 7.127 | | | | SD of Logged Detects | | 2.139 |
| 3159 | | | | | | | | | | | | |
| 3160 | **Normal GOF Test on Detects Only** | | | | | | | | | | | |
| 3161 | | | | | Shapiro Wilk Test Statistic | 0.477 | | | | **Shapiro Wilk GOF Test** | | |
| 3162 | | | | | 5% Shapiro Wilk Critical Value | 0.908 | | | | Detected Data Not Normal at 5% Significance Level | | |
| 3163 | | | | | Lilliefors Test Statistic | 0.371 | | | | **Lilliefors GOF Test** | | |
| 3164 | | | | | 5% Lilliefors Critical Value | 0.193 | | | | Detected Data Not Normal at 5% Significance Level | | |
| 3165 | **Detected Data Not Normal at 5% Significance Level** | | | | | | | | | | | |
| 3166 | | | | | | | | | | | | |
| 3167 | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | | | | | |
| 3168 | | | | | Mean | 4942 | | | | Standard Error of Mean | | 2447 |
| 3169 | | | | | SD | 14518 | | | | 95% KM (BCA) UCL | | 9538 |
| 3170 | | | | | 95% KM (t) UCL | 9073 | | | | 95% KM (Percentile Bootstrap) UCL | | 9339 |
| 3171 | | | | | 95% KM (z) UCL | 8967 | | | | 95% KM Bootstrap t UCL | | 26655 |
| 3172 | | | | | 90% KM Chebyshev UCL | 12283 | | | | 95% KM Chebyshev UCL | | 15608 |
| 3173 | | | | | 97.5% KM Chebyshev UCL | 20223 | | | | 99% KM Chebyshev UCL | | 29289 |
| 3174 | | | | | | | | | | | | |
| 3175 | **Gamma GOF Tests on Detected Observations Only** | | | | | | | | | | | |
| 3176 | | | | | A-D Test Statistic | 1.001 | | | | **Anderson-Darling GOF Test** | | |
| 3177 | | | | | 5% A-D Critical Value | 0.835 | | | | Detected Data Not Gamma Distributed at 5% Significance Level | | |
| 3178 | | | | | K-S Test Statistic | 0.158 | | | | **Kolmogrov-Smirnoff GOF** | | |
| 3179 | | | | | 5% K-S Critical Value | 0.204 | | | | Detected data appear Gamma Distributed at 5% Significance Level | | |
| 3180 | **Detected data follow Appr. Gamma Distribution at 5% Significance Level** | | | | | | | | | | | |
| 3181 | | | | | | | | | | | | |
| 3182 | **Gamma Statistics on Detected Data Only** | | | | | | | | | | | |
| 3183 | | | | | k hat (MLE) | 0.352 | | | | k star (bias corrected MLE) | | 0.334 |
| 3184 | | | | | Theta hat (MLE) | 23833 | | | | Theta star (bias corrected MLE) | | 25159 |
| 3185 | | | | | nu hat (MLE) | 14.79 | | | | nu star (bias corrected) | | 14.01 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3186 | MLE Mean (bias corrected) | | | | | 8391 | MLE Sd (bias corrected) | | | | | 14530 |
| 3187 | | | | | | | | | | | | |
| 3188 | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | | | | | |
| 3189 | k hat (KM) | | | | | 0.116 | nu hat (KM) | | | | | 8.574 |
| 3190 | Approximate Chi Square Value (8.57, α) | | | | | 3.072 | Adjusted Chi Square Value (8.57, β) | | | | | 2.93 |
| 3191 | 95% Gamma Approximate KM-UCL (use when n>=50) | | | | | 13794 | 95% Gamma Adjusted KM-UCL (use when n<50) | | | | | 14462 |
| 3192 | | | | | | | | | | | | |
| 3193 | **Gamma ROS Statistics using Imputed Non-Detects** | | | | | | | | | | | |
| 3194 | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | | | | |
| 3195 | GROS may not be used when kstar of detected data is small such as < 0.1 | | | | | | | | | | | |
| 3196 | For such situations, GROS method tends to yield inflated values of UCLs and BTVs | | | | | | | | | | | |
| 3197 | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | | | | |
| 3198 | Minimum | | | | | 0.01 | Mean | | | | | 4763 |
| 3199 | Maximum | | | | | 74000 | Median | | | | | 71 |
| 3200 | SD | | | | | 14771 | CV | | | | | 3.101 |
| 3201 | k hat (MLE) | | | | | 0.123 | k star (bias corrected MLE) | | | | | 0.131 |
| 3202 | Theta hat (MLE) | | | | | 38663 | Theta star (bias corrected MLE) | | | | | 36296 |
| 3203 | nu hat (MLE) | | | | | 9.115 | nu star (bias corrected) | | | | | 9.71 |
| 3204 | MLE Mean (bias corrected) | | | | | 4763 | MLE Sd (bias corrected) | | | | | 13148 |
| 3205 | | | | | | | Adjusted Level of Significance (β) | | | | | 0.0431 |
| 3206 | Approximate Chi Square Value (9.71, α) | | | | | 3.761 | Adjusted Chi Square Value (9.71, β) | | | | | 3.601 |
| 3207 | 95% Gamma Approximate UCL (use when n>=50) | | | | | 12295 | 95% Gamma Adjusted UCL (use when n<50) | | | | | 12841 |
| 3208 | | | | | | | | | | | | |
| 3209 | **Lognormal GOF Test on Detected Observations Only** | | | | | | | | | | | |
| 3210 | Shapiro Wilk Test Statistic | | | | | 0.967 | **Shapiro Wilk GOF Test** | | | | | |
| 3211 | 5% Shapiro Wilk Critical Value | | | | | 0.908 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 3212 | Lilliefors Test Statistic | | | | | 0.107 | **Lilliefors GOF Test** | | | | | |
| 3213 | 5% Lilliefors Critical Value | | | | | 0.193 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 3214 | **Detected Data appear Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 3215 | | | | | | | | | | | | |
| 3216 | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | | | | | |
| 3217 | Mean in Original Scale | | | | | 4891 | Mean in Log Scale | | | | | 6.382 |
| 3218 | SD in Original Scale | | | | | 14730 | SD in Log Scale | | | | | 1.891 |
| 3219 | 95% t UCL (assumes normality of ROS data) | | | | | 8979 | 95% Percentile Bootstrap UCL | | | | | 9355 |
| 3220 | 95% BCA Bootstrap UCL | | | | | 11464 | 95% Bootstrap t UCL | | | | | 26459 |
| 3221 | 95% H-UCL (Log ROS) | | | | | 10875 | | | | | | |
| 3222 | | | | | | | | | | | | |
| 3223 | **UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed** | | | | | | | | | | | |
| 3224 | KM Mean (logged) | | | | | 6.327 | 95% H-UCL (KM -Log) | | | | | 13610 |
| 3225 | KM SD (logged) | | | | | 1.983 | 95% Critical H Value (KM-Log) | | | | | 3.706 |
| 3226 | KM Standard Error of Mean (logged) | | | | | 0.375 | | | | | | |
| 3227 | | | | | | | | | | | | |
| 3228 | **DL/2 Statistics** | | | | | | | | | | | |
| 3229 | **DL/2 Normal** | | | | | | **DL/2 Log-Transformed** | | | | | |
| 3230 | Mean in Original Scale | | | | | 5305 | Mean in Log Scale | | | | | 6.978 |
| 3231 | SD in Original Scale | | | | | 14613 | SD in Log Scale | | | | | 1.754 |
| 3232 | 95% t UCL (Assumes normality) | | | | | 9361 | 95% H-Stat UCL | | | | | 13390 |
| 3233 | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | | | | | |
| 3234 | | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3235 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 3236 | **Detected Data appear Approximate Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 3237 | | | | | | | | | | | | |
| 3238 | **Suggested UCL to Use** | | | | | | | | | | | |
| 3239 | | | | | 95% KM (BCA) UCL | 9538 | | | 95% GROS Adjusted Gamma UCL | | | 12841 |
| 3240 | | | | | 95% Adjusted Gamma KM-UCL | 14462 | | | | | | |
| 3241 | | | | | | | | | | | | |
| 3242 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 3243 | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | | | | | |
| 3244 | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | | | | | |
| 3245 | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 3246 | | | | | | | | | | | | |
| 3247 | | | | | | | | | | | | |
| 3248 | **Lead** | | | | | | | | | | | |
| 3249 | | | | | | | | | | | | |
| 3250 | **General Statistics** | | | | | | | | | | | |
| 3251 | | | | | Total Number of Observations | 27 | | | Number of Distinct Observations | | | 26 |
| 3252 | | | | | | | | | Number of Missing Observations | | | 0 |
| 3253 | | | | | Minimum | 3.2 | | | Mean | | | 141.8 |
| 3254 | | | | | Maximum | 538 | | | Median | | | 97 |
| 3255 | | | | | SD | 148.1 | | | Std. Error of Mean | | | 28.51 |
| 3256 | | | | | Coefficient of Variation | 1.044 | | | Skewness | | | 1.244 |
| 3257 | | | | | | | | | | | | |
| 3258 | **Normal GOF Test** | | | | | | | | | | | |
| 3259 | | | | | Shapiro Wilk Test Statistic | 0.84 | | | **Shapiro Wilk GOF Test** | | | |
| 3260 | | | | | 5% Shapiro Wilk Critical Value | 0.923 | | | Data Not Normal at 5% Significance Level | | | |
| 3261 | | | | | Lilliefors Test Statistic | 0.225 | | | **Lilliefors GOF Test** | | | |
| 3262 | | | | | 5% Lilliefors Critical Value | 0.171 | | | Data Not Normal at 5% Significance Level | | | |
| 3263 | **Data Not Normal at 5% Significance Level** | | | | | | | | | | | |
| 3264 | | | | | | | | | | | | |
| 3265 | **Assuming Normal Distribution** | | | | | | | | | | | |
| 3266 | | | | | **95% Normal UCL** | | | | **95% UCLs (Adjusted for Skewness)** | | | |
| 3267 | | | | | 95% Student's-t UCL | 190.5 | | | 95% Adjusted-CLT UCL (Chen-1995) | | | 196 |
| 3268 | | | | | | | | | 95% Modified-t UCL (Johnson-1978) | | | 191.6 |
| 3269 | | | | | | | | | | | | |
| 3270 | **Gamma GOF Test** | | | | | | | | | | | |
| 3271 | | | | | A-D Test Statistic | 0.262 | | | **Anderson-Darling Gamma GOF Test** | | | |
| 3272 | | | | | 5% A-D Critical Value | 0.781 | | | Detected data appear Gamma Distributed at 5% Significance Level | | | |
| 3273 | | | | | K-S Test Statistic | 0.1 | | | **Kolmogrov-Smirnoff Gamma GOF Test** | | | |
| 3274 | | | | | 5% K-S Critical Value | 0.174 | | | Detected data appear Gamma Distributed at 5% Significance Level | | | |
| 3275 | **Detected data appear Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 3276 | | | | | | | | | | | | |
| 3277 | **Gamma Statistics** | | | | | | | | | | | |
| 3278 | | | | | k hat (MLE) | 0.821 | | | k star (bias corrected MLE) | | | 0.754 |
| 3279 | | | | | Theta hat (MLE) | 172.8 | | | Theta star (bias corrected MLE) | | | 188 |
| 3280 | | | | | nu hat (MLE) | 44.33 | | | nu star (bias corrected) | | | 40.74 |
| 3281 | | | | | MLE Mean (bias corrected) | 141.8 | | | MLE Sd (bias corrected) | | | 163.3 |
| 3282 | | | | | | | | | Approximate Chi Square Value (0.05) | | | 27.11 |
| 3283 | | | | | Adjusted Level of Significance | 0.0401 | | | Adjusted Chi Square Value | | | 26.4 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3284 | | | | | | | | | | | | |
| 3285 | **Assuming Gamma Distribution** | | | | | | | | | | | |
| 3286 | 95% Approximate Gamma UCL (use when n>=50) | | | | | 213.1 | 95% Adjusted Gamma UCL (use when n<50) | | | | | 218.9 |
| 3287 | | | | | | | | | | | | |
| 3288 | **Lognormal GOF Test** | | | | | | | | | | | |
| 3289 | Shapiro Wilk Test Statistic | | | | | 0.947 | **Shapiro Wilk Lognormal GOF Test** | | | | | |
| 3290 | 5% Shapiro Wilk Critical Value | | | | | 0.923 | Data appear Lognormal at 5% Significance Level | | | | | |
| 3291 | Lilliefors Test Statistic | | | | | 0.121 | **Lilliefors Lognormal GOF Test** | | | | | |
| 3292 | 5% Lilliefors Critical Value | | | | | 0.171 | Data appear Lognormal at 5% Significance Level | | | | | |
| 3293 | **Data appear Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 3294 | | | | | | | | | | | | |
| 3295 | **Lognormal Statistics** | | | | | | | | | | | |
| 3296 | Minimum of Logged Data | | | | | 1.163 | Mean of logged Data | | | | | 4.234 |
| 3297 | Maximum of Logged Data | | | | | 6.288 | SD of logged Data | | | | | 1.422 |
| 3298 | | | | | | | | | | | | |
| 3299 | **Assuming Lognormal Distribution** | | | | | | | | | | | |
| 3300 | 95% H-UCL | | | | | 452.4 | 90% Chebyshev (MVUE) UCL | | | | | 356 |
| 3301 | 95% Chebyshev (MVUE) UCL | | | | | 437.1 | 97.5% Chebyshev (MVUE) UCL | | | | | 549.6 |
| 3302 | 99% Chebyshev (MVUE) UCL | | | | | 770.6 | | | | | | |
| 3303 | | | | | | | | | | | | |
| 3304 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 3305 | **Data appear to follow a Discernible Distribution at 5% Significance Level** | | | | | | | | | | | |
| 3306 | | | | | | | | | | | | |
| 3307 | **Nonparametric Distribution Free UCLs** | | | | | | | | | | | |
| 3308 | 95% CLT UCL | | | | | 188.7 | 95% Jackknife UCL | | | | | 190.5 |
| 3309 | 95% Standard Bootstrap UCL | | | | | 188.3 | 95% Bootstrap-t UCL | | | | | 202.7 |
| 3310 | 95% Hall's Bootstrap UCL | | | | | 194.6 | 95% Percentile Bootstrap UCL | | | | | 191.8 |
| 3311 | 95% BCA Bootstrap UCL | | | | | 194.3 | | | | | | |
| 3312 | 90% Chebyshev(Mean, Sd) UCL | | | | | 227.4 | 95% Chebyshev(Mean, Sd) UCL | | | | | 266.1 |
| 3313 | 97.5% Chebyshev(Mean, Sd) UCL | | | | | 319.9 | 99% Chebyshev(Mean, Sd) UCL | | | | | 425.5 |
| 3314 | | | | | | | | | | | | |
| 3315 | **Suggested UCL to Use** | | | | | | | | | | | |
| 3316 | 95% Adjusted Gamma UCL | | | | | 218.9 | | | | | | |
| 3317 | | | | | | | | | | | | |
| 3318 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 3319 | These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) | | | | | | | | | | | |
| 3320 | and Singh and Singh (2003). However, simulations results will not cover all Real World data sets. | | | | | | | | | | | |
| 3321 | For additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 3322 | | | | | | | | | | | | |
| 3323 | **Mercury** | | | | | | | | | | | |
| 3324 | | | | | | | | | | | | |
| 3325 | **General Statistics** | | | | | | | | | | | |
| 3326 | Total Number of Observations | | | | | 25 | Number of Distinct Observations | | | | | 22 |
| 3327 | Number of Detects | | | | | 22 | Number of Non-Detects | | | | | 3 |
| 3328 | Number of Distinct Detects | | | | | 20 | Number of Distinct Non-Detects | | | | | 2 |
| 3329 | Minimum Detect | | | | | 0.063 | Minimum Non-Detect | | | | | 0.11 |
| 3330 | Maximum Detect | | | | | 4.6 | Maximum Non-Detect | | | | | 0.12 |
| 3331 | Variance Detects | | | | | 1.262 | Percent Non-Detects | | | | | 12% |
| 3332 | Mean Detects | | | | | 0.806 | SD Detects | | | | | 1.123 |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3333 | | | | | Median Detects | 0.315 | | | | | CV Detects | 1.394 |
| 3334 | | | | | Skewness Detects | 2.428 | | | | | Kurtosis Detects | 5.94 |
| 3335 | | | | | Mean of Logged Detects | -0.899 | | | | | SD of Logged Detects | 1.171 |
| 3336 | | | | | | | | | | | | |
| 3337 | **Normal GOF Test on Detects Only** | | | | | | | | | | | |
| 3338 | | | | | Shapiro Wilk Test Statistic | 0.65 | **Shapiro Wilk GOF Test** | | | | | |
| 3339 | | | | | 5% Shapiro Wilk Critical Value | 0.911 | Detected Data Not Normal at 5% Significance Level | | | | | |
| 3340 | | | | | Lilliefors Test Statistic | 0.303 | **Lilliefors GOF Test** | | | | | |
| 3341 | | | | | 5% Lilliefors Critical Value | 0.189 | Detected Data Not Normal at 5% Significance Level | | | | | |
| 3342 | **Detected Data Not Normal at 5% Significance Level** | | | | | | | | | | | |
| 3343 | | | | | | | | | | | | |
| 3344 | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | | | | | |
| 3345 | | | | | Mean | 0.718 | | | | | Standard Error of Mean | 0.216 |
| 3346 | | | | | SD | 1.057 | | | | | 95% KM (BCA) UCL | 1.111 |
| 3347 | | | | | 95% KM (t) UCL | 1.088 | | | | | 95% KM (Percentile Bootstrap) UCL | 1.094 |
| 3348 | | | | | 95% KM (z) UCL | 1.074 | | | | | 95% KM Bootstrap t UCL | 1.41 |
| 3349 | | | | | 90% KM Chebyshev UCL | 1.367 | | | | | 95% KM Chebyshev UCL | 1.661 |
| 3350 | | | | | 97.5% KM Chebyshev UCL | 2.069 | | | | | 99% KM Chebyshev UCL | 2.87 |
| 3351 | | | | | | | | | | | | |
| 3352 | **Gamma GOF Tests on Detected Observations Only** | | | | | | | | | | | |
| 3353 | | | | | A-D Test Statistic | 0.902 | **Anderson-Darling GOF Test** | | | | | |
| 3354 | | | | | 5% A-D Critical Value | 0.778 | Detected Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 3355 | | | | | K-S Test Statistic | 0.216 | **Kolmogrov-Smirnoff GOF** | | | | | |
| 3356 | | | | | 5% K-S Critical Value | 0.192 | Detected Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 3357 | **Detected Data Not Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 3358 | | | | | | | | | | | | |
| 3359 | **Gamma Statistics on Detected Data Only** | | | | | | | | | | | |
| 3360 | | | | | k hat (MLE) | 0.86 | | | | | k star (bias corrected MLE) | 0.773 |
| 3361 | | | | | Theta hat (MLE) | 0.937 | | | | | Theta star (bias corrected MLE) | 1.042 |
| 3362 | | | | | nu hat (MLE) | 37.86 | | | | | nu star (bias corrected) | 34.03 |
| 3363 | | | | | MLE Mean (bias corrected) | 0.806 | | | | | MLE Sd (bias corrected) | 0.916 |
| 3364 | | | | | | | | | | | | |
| 3365 | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | | | | | |
| 3366 | | | | | k hat (KM) | 0.462 | | | | | nu hat (KM) | 23.11 |
| 3367 | | | | | Approximate Chi Square Value (23.11, α) | 13.18 | | | | | Adjusted Chi Square Value (23.11, β) | 12.66 |
| 3368 | | | | | 95% Gamma Approximate KM-UCL (use when n>=50) | 1.26 | | | | | 95% Gamma Adjusted KM-UCL (use when n<50) | 1.311 |
| 3369 | | | | | | | | | | | | |
| 3370 | **Gamma ROS Statistics using Imputed Non-Detects** | | | | | | | | | | | |
| 3371 | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | | | | |
| 3372 | GROS may not be used when kstar of detected data is small such as < 0.1 | | | | | | | | | | | |
| 3373 | For such situations, GROS method tends to yield inflated values of UCLs and BTVs | | | | | | | | | | | |
| 3374 | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | | | | |
| 3375 | | | | | Minimum | 0.01 | | | | | Mean | 0.71 |
| 3376 | | | | | Maximum | 4.6 | | | | | Median | 0.31 |
| 3377 | | | | | SD | 1.083 | | | | | CV | 1.525 |
| 3378 | | | | | k hat (MLE) | 0.615 | | | | | k star (bias corrected MLE) | 0.567 |
| 3379 | | | | | Theta hat (MLE) | 1.156 | | | | | Theta star (bias corrected MLE) | 1.252 |
| 3380 | | | | | nu hat (MLE) | 30.73 | | | | | nu star (bias corrected) | 28.37 |
| 3381 | | | | | MLE Mean (bias corrected) | 0.71 | | | | | MLE Sd (bias corrected) | 0.943 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3382 | | | | | | | | | | | Adjusted Level of Significance (β) | 0.0395 |
| 3383 | | | | Approximate Chi Square Value (28.37, α) | | 17.22 | | | | | Adjusted Chi Square Value (28.37, β) | 16.63 |
| 3384 | | | | 95% Gamma Approximate UCL (use when n>=50) | | 1.171 | | | | | 95% Gamma Adjusted UCL (use when n<50) | 1.212 |
| 3385 | | | | | | | | | | | | |
| 3386 | | | | | | **Lognormal GOF Test on Detected Observations Only** | | | | | | | |
| 3387 | | | | | Shapiro Wilk Test Statistic | 0.962 | | | | | **Shapiro Wilk GOF Test** | |
| 3388 | | | | | 5% Shapiro Wilk Critical Value | 0.911 | | | | | Detected Data appear Lognormal at 5% Significance Level | |
| 3389 | | | | | Lilliefors Test Statistic | 0.152 | | | | | **Lilliefors GOF Test** | |
| 3390 | | | | | 5% Lilliefors Critical Value | 0.189 | | | | | Detected Data appear Lognormal at 5% Significance Level | |
| 3391 | | | | | | **Detected Data appear Lognormal at 5% Significance Level** | | | | | | |
| 3392 | | | | | | | | | | | | |
| 3393 | | | | | | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | |
| 3394 | | | | | Mean in Original Scale | 0.717 | | | | | Mean in Log Scale | -1.122 |
| 3395 | | | | | SD in Original Scale | 1.079 | | | | | SD in Log Scale | 1.259 |
| 3396 | | | | | 95% t UCL (assumes normality of ROS data) | 1.086 | | | | | 95% Percentile Bootstrap UCL | 1.098 |
| 3397 | | | | | 95% BCA Bootstrap UCL | 1.242 | | | | | 95% Bootstrap t UCL | 1.388 |
| 3398 | | | | | 95% H-UCL (Log ROS) | 1.493 | | | | | | |
| 3399 | | | | | | | | | | | | |
| 3400 | | | | | | **UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed** | | | | | | |
| 3401 | | | | | KM Mean (logged) | -1.103 | | | | | 95% H-UCL (KM -Log) | 1.365 |
| 3402 | | | | | KM SD (logged) | 1.208 | | | | | 95% Critical H Value (KM-Log) | 2.772 |
| 3403 | | | | | KM Standard Error of Mean (logged) | 0.248 | | | | | | |
| 3404 | | | | | | | | | | | | |
| 3405 | | | | | | **DL/2 Statistics** | | | | | | |
| 3406 | | | | | **DL/2 Normal** | | | | | | **DL/2 Log-Transformed** | |
| 3407 | | | | | Mean in Original Scale | 0.716 | | | | | Mean in Log Scale | -1.132 |
| 3408 | | | | | SD in Original Scale | 1.08 | | | | | SD in Log Scale | 1.271 |
| 3409 | | | | | 95% t UCL (Assumes normality) | 1.086 | | | | | 95% H-Stat UCL | 1.517 |
| 3410 | | | | | | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | |
| 3411 | | | | | | | | | | | | |
| 3412 | | | | | | **Nonparametric Distribution Free UCL Statistics** | | | | | | |
| 3413 | | | | | | **Detected Data appear Lognormal Distributed at 5% Significance Level** | | | | | | |
| 3414 | | | | | | | | | | | | |
| 3415 | | | | | | **Suggested UCL to Use** | | | | | | |
| 3416 | | | | | 97.5% KM (Chebyshev) UCL | 2.069 | | | | | | |
| 3417 | | | | | | | | | | | | |
| 3418 | | | | | | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | |
| 3419 | | | | | | Recommendations are based upon data size, data distribution, and skewness. | | | | | | |
| 3420 | | | | | | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | |
| 3421 | | | | | | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | |
| 3422 | | | | | | | | | | | | |
| 3423 | **Methylene chloride** | | | | | | | | | | | |
| 3424 | | | | | | | | | | | | |
| 3425 | | | | | | **General Statistics** | | | | | | |
| 3426 | | | | | Total Number of Observations | 6 | | | | | Number of Distinct Observations | 5 |
| 3427 | | | | | Number of Detects | 2 | | | | | Number of Non-Detects | 4 |
| 3428 | | | | | Number of Distinct Detects | 2 | | | | | Number of Distinct Non-Detects | 3 |
| 3429 | | | | | Minimum Detect | 2.1 | | | | | Minimum Non-Detect | 6 |
| 3430 | | | | | Maximum Detect | 3.2 | | | | | Maximum Non-Detect | 5000 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3431 | | | | | Variance Detects | 0.605 | | | | | Percent Non-Detects | 66.67% |
| 3432 | | | | | Mean Detects | 2.65 | | | | | SD Detects | 0.778 |
| 3433 | | | | | Median Detects | 2.65 | | | | | CV Detects | 0.294 |
| 3434 | | | | | Skewness Detects | N/A | | | | | Kurtosis Detects | N/A |
| 3435 | | | | | Mean of Logged Detects | 0.953 | | | | | SD of Logged Detects | 0.298 |
| 3436 | | | | | | | | | | | | |
| 3437 | | | | | **Warning: Data set has only 2 Detected Values.** | | | | | | | |
| 3438 | | | | | **This is not enough to compute meaningful or reliable statistics and estimates.** | | | | | | | |
| 3439 | | | | | | | | | | | | |
| 3440 | | | | | | | | | | | | |
| 3441 | | | | | **Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use** | | | | | | | |
| 3442 | | | | | **guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.** | | | | | | | |
| 3443 | | | | | **For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).** | | | | | | | |
| 3444 | | | | | **Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.0** | | | | | | | |
| 3445 | | | | | | | | | | | | |
| 3446 | | | | | **Normal GOF Test on Detects Only** | | | | | | | |
| 3447 | | | | | **Not Enough Data to Perform GOF Test** | | | | | | | |
| 3448 | | | | | | | | | | | | |
| 3449 | | | | | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | |
| 3450 | | | | | Mean | 2.65 | | | | | Standard Error of Mean | 0.55 |
| 3451 | | | | | SD | 0.55 | | | | | 95% KM (BCA) UCL | N/A |
| 3452 | | | | | 95% KM (t) UCL | 3.758 | | | | | 95% KM (Percentile Bootstrap) UCL | N/A |
| 3453 | | | | | 95% KM (z) UCL | 3.555 | | | | | 95% KM Bootstrap t UCL | N/A |
| 3454 | | | | | 90% KM Chebyshev UCL | 4.3 | | | | | 95% KM Chebyshev UCL | 5.047 |
| 3455 | | | | | 97.5% KM Chebyshev UCL | 6.085 | | | | | 99% KM Chebyshev UCL | 8.122 |
| 3456 | | | | | | | | | | | | |
| 3457 | | | | | **Gamma GOF Tests on Detected Observations Only** | | | | | | | |
| 3458 | | | | | **Not Enough Data to Perform GOF Test** | | | | | | | |
| 3459 | | | | | | | | | | | | |
| 3460 | | | | | **Gamma Statistics on Detected Data Only** | | | | | | | |
| 3461 | | | | | k hat (MLE) | 22.88 | | | | | k star (bias corrected MLE) | N/A |
| 3462 | | | | | Theta hat (MLE) | 0.116 | | | | | Theta star (bias corrected MLE) | N/A |
| 3463 | | | | | nu hat (MLE) | 91.51 | | | | | nu star (bias corrected) | N/A |
| 3464 | | | | | MLE Mean (bias corrected) | N/A | | | | | MLE Sd (bias corrected) | N/A |
| 3465 | | | | | | | | | | | | |
| 3466 | | | | | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | |
| 3467 | | | | | k hat (KM) | 23.21 | | | | | nu hat (KM) | 278.6 |
| 3468 | | | | | | | | | | | Adjusted Level of Significance (β) | 0.0122 |
| 3469 | | | | | Approximate Chi Square Value (278.58, α) | 240.9 | | | | | Adjusted Chi Square Value (278.58, β) | 228.2 |
| 3470 | | | | | 95% Gamma Approximate KM-UCL (use when n>=50) | 3.064 | | | | | 95% Gamma Adjusted KM-UCL (use when n<50) | 3.235 |
| 3471 | | | | | | | | | | | | |
| 3472 | | | | | **Lognormal GOF Test on Detected Observations Only** | | | | | | | |
| 3473 | | | | | **Not Enough Data to Perform GOF Test** | | | | | | | |
| 3474 | | | | | | | | | | | | |
| 3475 | | | | | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | |
| 3476 | | | | | Mean in Original Scale | 2.631 | | | | | Mean in Log Scale | 0.953 |
| 3477 | | | | | SD in Original Scale | 0.493 | | | | | SD in Log Scale | 0.188 |
| 3478 | | | | | 95% t UCL (assumes normality of ROS data) | 3.036 | | | | | 95% Percentile Bootstrap UCL | N/A |
| 3479 | | | | | 95% BCA Bootstrap UCL | N/A | | | | | 95% Bootstrap t UCL | N/A |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3480 | | | | 95% H-UCL (Log ROS) | | 3.137 | | | | | | |
| 3481 | | | | | | | | | | | | |
| 3482 | | | | | | **DL/2 Statistics** | | | | | | |
| 3483 | | | | **DL/2 Normal** | | | | | **DL/2 Log-Transformed** | | | |
| 3484 | | | | Mean in Original Scale | | 419.1 | | | Mean in Log Scale | | | 2.178 |
| 3485 | | | | SD in Original Scale | | 1019 | | | SD in Log Scale | | | 2.771 |
| 3486 | | | | 95% t UCL (Assumes normality) | | 1258 | | | 95% H-Stat UCL | | | 1.942E+8 |
| 3487 | | | | | | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | |
| 3488 | | | | | | | | | | | | |
| 3489 | | | | | | **Nonparametric Distribution Free UCL Statistics** | | | | | | |
| 3490 | | | | | | **Data do not follow a Discernible Distribution at 5% Significance Level** | | | | | | |
| 3491 | | | | | | | | | | | | |
| 3492 | | | | | | **Suggested UCL to Use** | | | | | | |
| 3493 | | | | 95% KM (t) UCL | | 3.758 | | | 95% KM (% Bootstrap) UCL | | | N/A |
| 3494 | | | | | | **Warning: One or more Recommended UCL(s) not available!** | | | | | | |
| 3495 | | | | | | **Warning: Recommended UCL exceeds the maximum observation** | | | | | | |
| 3496 | | | | | | | | | | | | |
| 3497 | | | | | | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | |
| 3498 | | | | | | Recommendations are based upon data size, data distribution, and skewness. | | | | | | |
| 3499 | | | | | | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | |
| 3500 | | | | | | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | |
| 3501 | | | | | | | | | | | | |
| 3502 | **Molybdenum** | | | | | | | | | | | |
| 3503 | | | | | | | | | | | | |
| 3504 | | | | | | **General Statistics** | | | | | | |
| 3505 | | | | Total Number of Observations | | 25 | | | Number of Distinct Observations | | | 25 |
| 3506 | | | | Number of Detects | | 22 | | | Number of Non-Detects | | | 3 |
| 3507 | | | | Number of Distinct Detects | | 22 | | | Number of Distinct Non-Detects | | | 3 |
| 3508 | | | | Minimum Detect | | 0.12 | | | Minimum Non-Detect | | | 3.4 |
| 3509 | | | | Maximum Detect | | 30 | | | Maximum Non-Detect | | | 3.7 |
| 3510 | | | | Variance Detects | | 96.11 | | | Percent Non-Detects | | | 12% |
| 3511 | | | | Mean Detects | | 5.268 | | | SD Detects | | | 9.804 |
| 3512 | | | | Median Detects | | 0.835 | | | CV Detects | | | 1.861 |
| 3513 | | | | Skewness Detects | | 1.949 | | | Kurtosis Detects | | | 2.291 |
| 3514 | | | | Mean of Logged Detects | | 0.23 | | | SD of Logged Detects | | | 1.616 |
| 3515 | | | | | | | | | | | | |
| 3516 | | | | | | **Normal GOF Test on Detects Only** | | | | | | |
| 3517 | | | | Shapiro Wilk Test Statistic | | 0.552 | | | **Shapiro Wilk GOF Test** | | | |
| 3518 | | | | 5% Shapiro Wilk Critical Value | | 0.911 | | | Detected Data Not Normal at 5% Significance Level | | | |
| 3519 | | | | Lilliefors Test Statistic | | 0.414 | | | **Lilliefors GOF Test** | | | |
| 3520 | | | | 5% Lilliefors Critical Value | | 0.189 | | | Detected Data Not Normal at 5% Significance Level | | | |
| 3521 | | | | | | **Detected Data Not Normal at 5% Significance Level** | | | | | | |
| 3522 | | | | | | | | | | | | |
| 3523 | | | | | | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | |
| 3524 | | | | Mean | | 4.742 | | | Standard Error of Mean | | | 1.864 |
| 3525 | | | | SD | | 9.101 | | | 95% KM (BCA) UCL | | | 8.41 |
| 3526 | | | | 95% KM (t) UCL | | 7.931 | | | 95% KM (Percentile Bootstrap) UCL | | | 7.811 |
| 3527 | | | | 95% KM (z) UCL | | 7.808 | | | 95% KM Bootstrap t UCL | | | 9.494 |
| 3528 | | | | 90% KM Chebyshev UCL | | 10.33 | | | 95% KM Chebyshev UCL | | | 12.87 |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3529 | | | | | 97.5% KM Chebyshev UCL | 16.38 | | | | | 99% KM Chebyshev UCL | 23.29 |
| 3530 | | | | | | | | | | | | |
| 3531 | | | | | Gamma GOF Tests on Detected Observations Only | | | | | | | |
| 3532 | | | | | A-D Test Statistic | 2.446 | Anderson-Darling GOF Test | | | | | |
| 3533 | | | | | 5% A-D Critical Value | 0.815 | Detected Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 3534 | | | | | K-S Test Statistic | 0.297 | Kolmogrov-Smirnoff GOF | | | | | |
| 3535 | | | | | 5% K-S Critical Value | 0.197 | Detected Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 3536 | | | | | Detected Data Not Gamma Distributed at 5% Significance Level | | | | | | | |
| 3537 | | | | | | | | | | | | |
| 3538 | | | | | Gamma Statistics on Detected Data Only | | | | | | | |
| 3539 | | | | | k hat (MLE) | 0.451 | k star (bias corrected MLE) | | | | | 0.42 |
| 3540 | | | | | Theta hat (MLE) | 11.68 | Theta star (bias corrected MLE) | | | | | 12.55 |
| 3541 | | | | | nu hat (MLE) | 19.84 | nu star (bias corrected) | | | | | 18.47 |
| 3542 | | | | | MLE Mean (bias corrected) | 5.268 | MLE Sd (bias corrected) | | | | | 8.131 |
| 3543 | | | | | | | | | | | | |
| 3544 | | | | | Gamma Kaplan-Meier (KM) Statistics | | | | | | | |
| 3545 | | | | | k hat (KM) | 0.271 | nu hat (KM) | | | | | 13.57 |
| 3546 | | | | | Approximate Chi Square Value (13.57, α) | 6.281 | Adjusted Chi Square Value (13.57, β) | | | | | 5.944 |
| 3547 | | | | | 95% Gamma Approximate KM-UCL (use when n>=50) | 10.25 | 95% Gamma Adjusted KM-UCL (use when n<50) | | | | | 10.83 |
| 3548 | | | | | | | | | | | | |
| 3549 | | | | | Gamma ROS Statistics using Imputed Non-Detects | | | | | | | |
| 3550 | | | | | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | |
| 3551 | | | | | GROS may not be used when kstar of detected data is small such as < 0.1 | | | | | | | |
| 3552 | | | | | For such situations, GROS method tends to yield inflated values of UCLs and BTVs | | | | | | | |
| 3553 | | | | | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | |
| 3554 | | | | | Minimum | 0.12 | Mean | | | | | 4.655 |
| 3555 | | | | | Maximum | 30 | Median | | | | | 0.64 |
| 3556 | | | | | SD | 9.326 | CV | | | | | 2.003 |
| 3557 | | | | | k hat (MLE) | 0.42 | k star (bias corrected MLE) | | | | | 0.396 |
| 3558 | | | | | Theta hat (MLE) | 11.08 | Theta star (bias corrected MLE) | | | | | 11.74 |
| 3559 | | | | | nu hat (MLE) | 21.01 | nu star (bias corrected) | | | | | 19.82 |
| 3560 | | | | | MLE Mean (bias corrected) | 4.655 | MLE Sd (bias corrected) | | | | | 7.394 |
| 3561 | | | | | | | Adjusted Level of Significance (β) | | | | | 0.0395 |
| 3562 | | | | | Approximate Chi Square Value (19.82, α) | 10.72 | Adjusted Chi Square Value (19.82, β) | | | | | 10.27 |
| 3563 | | | | | 95% Gamma Approximate UCL (use when n>=50) | 8.608 | 95% Gamma Adjusted UCL (use when n<50) | | | | | 8.99 |
| 3564 | | | | | | | | | | | | |
| 3565 | | | | | Lognormal GOF Test on Detected Observations Only | | | | | | | |
| 3566 | | | | | Shapiro Wilk Test Statistic | 0.88 | Shapiro Wilk GOF Test | | | | | |
| 3567 | | | | | 5% Shapiro Wilk Critical Value | 0.911 | Detected Data Not Lognormal at 5% Significance Level | | | | | |
| 3568 | | | | | Lilliefors Test Statistic | 0.184 | Lilliefors GOF Test | | | | | |
| 3569 | | | | | 5% Lilliefors Critical Value | 0.189 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 3570 | | | | | Detected Data appear Approximate Lognormal at 5% Significance Level | | | | | | | |
| 3571 | | | | | | | | | | | | |
| 3572 | | | | | Lognormal ROS Statistics Using Imputed Non-Detects | | | | | | | |
| 3573 | | | | | Mean in Original Scale | 4.736 | Mean in Log Scale | | | | | 0.181 |
| 3574 | | | | | SD in Original Scale | 9.288 | SD in Log Scale | | | | | 1.517 |
| 3575 | | | | | 95% t UCL (assumes normality of ROS data) | 7.914 | 95% Percentile Bootstrap UCL | | | | | 8.093 |
| 3576 | | | | | 95% BCA Bootstrap UCL | 8.435 | 95% Bootstrap t UCL | | | | | 10.27 |
| 3577 | | | | | 95% H-UCL (Log ROS) | 10.28 | | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3578 | | | | | | | | | | | | |
| 3579 | **UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed** | | | | | | | | | | | |
| 3580 | | | | | KM Mean (logged) | 0.151 | | | | 95% H-UCL (KM -Log) | 10.09 | |
| 3581 | | | | | KM SD (logged) | 1.522 | | | | 95% Critical H Value (KM-Log) | 3.228 | |
| 3582 | | | | | KM Standard Error of Mean (logged) | 0.318 | | | | | | |
| 3583 | | | | | | | | | | | | |
| 3584 | **DL/2 Statistics** | | | | | | | | | | | |
| 3585 | | | | **DL/2 Normal** | | | | | **DL/2 Log-Transformed** | | | |
| 3586 | | | | | Mean in Original Scale | 4.848 | | | | Mean in Log Scale | 0.271 | |
| 3587 | | | | | SD in Original Scale | 9.244 | | | | SD in Log Scale | 1.515 | |
| 3588 | | | | | 95% t UCL (Assumes normality) | 8.011 | | | | 95% H-Stat UCL | 11.19 | |
| 3589 | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | | | | | |
| 3590 | | | | | | | | | | | | |
| 3591 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 3592 | **Detected Data appear Approximate Lognormal Distributed at 5% Significance Level** | | | | | | | | | | | |
| 3593 | | | | | | | | | | | | |
| 3594 | **Suggested UCL to Use** | | | | | | | | | | | |
| 3595 | | | | | 99% KM (Chebyshev) UCL | 23.29 | | | | | | |
| 3596 | | | | | | | | | | | | |
| 3597 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 3598 | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | | | | | |
| 3599 | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | | | | | |
| 3600 | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 3601 | | | | | | | | | | | | |
| 3602 | **Naphthalene** | | | | | | | | | | | |
| 3603 | | | | | | | | | | | | |
| 3604 | **General Statistics** | | | | | | | | | | | |
| 3605 | | | | | Total Number of Observations | 37 | | | | Number of Distinct Observations | 26 | |
| 3606 | | | | | Number of Detects | 13 | | | | Number of Non-Detects | 24 | |
| 3607 | | | | | Number of Distinct Detects | 10 | | | | Number of Distinct Non-Detects | 17 | |
| 3608 | | | | | Minimum Detect | 21 | | | | Minimum Non-Detect | 76 | |
| 3609 | | | | | Maximum Detect | 77000 | | | | Maximum Non-Detect | 6900 | |
| 3610 | | | | | Variance Detects | 4.494E+8 | | | | Percent Non-Detects | 64.86% | |
| 3611 | | | | | Mean Detects | 6970 | | | | SD Detects | 21199 | |
| 3612 | | | | | Median Detects | 360 | | | | CV Detects | 3.041 | |
| 3613 | | | | | Skewness Detects | 3.518 | | | | Kurtosis Detects | 12.51 | |
| 3614 | | | | | Mean of Logged Detects | 6.074 | | | | SD of Logged Detects | 2.214 | |
| 3615 | | | | | | | | | | | | |
| 3616 | **Normal GOF Test on Detects Only** | | | | | | | | | | | |
| 3617 | | | | | Shapiro Wilk Test Statistic | 0.373 | | | | **Shapiro Wilk GOF Test** | | |
| 3618 | | | | | 5% Shapiro Wilk Critical Value | 0.866 | | | | Detected Data Not Normal at 5% Significance Level | | |
| 3619 | | | | | Lilliefors Test Statistic | 0.448 | | | | **Lilliefors GOF Test** | | |
| 3620 | | | | | 5% Lilliefors Critical Value | 0.246 | | | | Detected Data Not Normal at 5% Significance Level | | |
| 3621 | **Detected Data Not Normal at 5% Significance Level** | | | | | | | | | | | |
| 3622 | | | | | | | | | | | | |
| 3623 | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | | | | | |
| 3624 | | | | | Mean | 2572 | | | | Standard Error of Mean | 2140 | |
| 3625 | | | | | SD | 12501 | | | | 95% KM (BCA) UCL | 6732 | |
| 3626 | | | | | 95% KM (t) UCL | 6184 | | | | 95% KM (Percentile Bootstrap) UCL | 6699 | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3627 | | | | | 95% KM (z) UCL | 6091 | | | | 95% KM Bootstrap t UCL | | 79981 |
| 3628 | | | | | 90% KM Chebyshev UCL | 8991 | | | | 95% KM Chebyshev UCL | | 11898 |
| 3629 | | | | | 97.5% KM Chebyshev UCL | 15934 | | | | 99% KM Chebyshev UCL | | 23860 |
| 3630 | | | | | | | | | | | | |
| 3631 | | | | | | **Gamma GOF Tests on Detected Observations Only** | | | | | | | |
| 3632 | | | | | A-D Test Statistic | 1.905 | **Anderson-Darling GOF Test** | | | | | |
| 3633 | | | | | 5% A-D Critical Value | 0.849 | Detected Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 3634 | | | | | K-S Test Statistic | 0.392 | **Kolmogrov-Smirnoff GOF** | | | | | |
| 3635 | | | | | 5% K-S Critical Value | 0.259 | Detected Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 3636 | | | | | | **Detected Data Not Gamma Distributed at 5% Significance Level** | | | | | | |
| 3637 | | | | | | | | | | | | |
| 3638 | | | | | | **Gamma Statistics on Detected Data Only** | | | | | | |
| 3639 | | | | | k hat (MLE) | 0.255 | | | | k star (bias corrected MLE) | | 0.248 |
| 3640 | | | | | Theta hat (MLE) | 27322 | | | | Theta star (bias corrected MLE) | | 28159 |
| 3641 | | | | | nu hat (MLE) | 6.633 | | | | nu star (bias corrected) | | 6.436 |
| 3642 | | | | | MLE Mean (bias corrected) | 6970 | | | | MLE Sd (bias corrected) | | 14010 |
| 3643 | | | | | | | | | | | | |
| 3644 | | | | | | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | |
| 3645 | | | | | k hat (KM) | 0.0423 | | | | nu hat (KM) | | 3.133 |
| 3646 | | | | | Approximate Chi Square Value (3.13, α) | 0.413 | | | | Adjusted Chi Square Value (3.13, β) | | 0.377 |
| 3647 | | | | | 95% Gamma Approximate KM-UCL (use when n>=50) | 19517 | | | | 95% Gamma Adjusted KM-UCL (use when n<50) | | 21391 |
| 3648 | | | | | | Gamma (KM) may not be used when k hat (KM) is < 0.1 | | | | | | |
| 3649 | | | | | | | | | | | | |
| 3650 | | | | | | **Gamma ROS Statistics using Imputed Non-Detects** | | | | | | | |
| 3651 | | | | | | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | |
| 3652 | | | | | | GROS may not be used when kstar of detected data is small such as < 0.1 | | | | | | |
| 3653 | | | | | | For such situations, GROS method tends to yield inflated values of UCLs and BTVs | | | | | | |
| 3654 | | | | | | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | |
| 3655 | | | | | Minimum | 0.01 | | | | Mean | | 2449 |
| 3656 | | | | | Maximum | 77000 | | | | Median | | 0.01 |
| 3657 | | | | | SD | 12696 | | | | CV | | 5.184 |
| 3658 | | | | | k hat (MLE) | 0.0945 | | | | k star (bias corrected MLE) | | 0.105 |
| 3659 | | | | | Theta hat (MLE) | 25919 | | | | Theta star (bias corrected MLE) | | 23359 |
| 3660 | | | | | nu hat (MLE) | 6.992 | | | | nu star (bias corrected) | | 7.758 |
| 3661 | | | | | MLE Mean (bias corrected) | 2449 | | | | MLE Sd (bias corrected) | | 7563 |
| 3662 | | | | | | | | | | Adjusted Level of Significance (β) | | 0.0431 |
| 3663 | | | | | Approximate Chi Square Value (7.76, α) | 2.596 | | | | Adjusted Chi Square Value (7.76, β) | | 2.468 |
| 3664 | | | | | 95% Gamma Approximate UCL (use when n>=50) | 7319 | | | | 95% Gamma Adjusted UCL (use when n<50) | | 7699 |
| 3665 | | | | | | | | | | | | |
| 3666 | | | | | | **Lognormal GOF Test on Detected Observations Only** | | | | | | | |
| 3667 | | | | | Shapiro Wilk Test Statistic | 0.891 | **Shapiro Wilk GOF Test** | | | | | |
| 3668 | | | | | 5% Shapiro Wilk Critical Value | 0.866 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 3669 | | | | | Lilliefors Test Statistic | 0.28 | **Lilliefors GOF Test** | | | | | |
| 3670 | | | | | 5% Lilliefors Critical Value | 0.246 | Detected Data Not Lognormal at 5% Significance Level | | | | | |
| 3671 | | | | | | **Detected Data appear Approximate Lognormal at 5% Significance Level** | | | | | | |
| 3672 | | | | | | | | | | | | |
| 3673 | | | | | | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | |
| 3674 | | | | | Mean in Original Scale | 2533 | | | | Mean in Log Scale | | 5.067 |
| 3675 | | | | | SD in Original Scale | 12679 | | | | SD in Log Scale | | 1.633 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3676 | 95% t UCL (assumes normality of ROS data) | | | | | 6052 | 95% Percentile Bootstrap UCL | | | | | 6484 |
| 3677 | 95% BCA Bootstrap UCL | | | | | 9041 | 95% Bootstrap t UCL | | | | | 198634 |
| 3678 | 95% H-UCL (Log ROS) | | | | | 1440 | | | | | | |
| 3679 | | | | | | | | | | | | |
| 3680 | **UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed** | | | | | | | | | | | |
| 3681 | KM Mean (logged) | | | | | 5.055 | 95% H-UCL (KM -Log) | | | | | 2054 |
| 3682 | KM SD (logged) | | | | | 1.772 | 95% Critical H Value (KM-Log) | | | | | 3.398 |
| 3683 | KM Standard Error of Mean (logged) | | | | | 0.393 | | | | | | |
| 3684 | | | | | | | | | | | | |
| 3685 | **DL/2 Statistics** | | | | | | | | | | | |
| 3686 | **DL/2 Normal** | | | | | | **DL/2 Log-Transformed** | | | | | |
| 3687 | Mean in Original Scale | | | | | 3105 | Mean in Log Scale | | | | | 6.269 |
| 3688 | SD in Original Scale | | | | | 12591 | SD in Log Scale | | | | | 1.661 |
| 3689 | 95% t UCL (Assumes normality) | | | | | 6600 | 95% H-Stat UCL | | | | | 5145 |
| 3690 | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | | | | | |
| 3691 | | | | | | | | | | | | |
| 3692 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 3693 | **Detected Data appear Approximate Lognormal Distributed at 5% Significance Level** | | | | | | | | | | | |
| 3694 | | | | | | | | | | | | |
| 3695 | **Suggested UCL to Use** | | | | | | | | | | | |
| 3696 | 99% KM (Chebyshev) UCL | | | | | 23860 | | | | | | |
| 3697 | | | | | | | | | | | | |
| 3698 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 3699 | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | | | | | |
| 3700 | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | | | | | |
| 3701 | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 3702 | | | | | | | | | | | | |
| 3703 | | | | | | | | | | | | |
| 3704 | **Nickel** | | | | | | | | | | | |
| 3705 | | | | | | | | | | | | |
| 3706 | **General Statistics** | | | | | | | | | | | |
| 3707 | Total Number of Observations | | | | | 27 | Number of Distinct Observations | | | | | 23 |
| 3708 | | | | | | | Number of Missing Observations | | | | | 0 |
| 3709 | Minimum | | | | | 24 | Mean | | | | | 64.39 |
| 3710 | Maximum | | | | | 160 | Median | | | | | 52.5 |
| 3711 | SD | | | | | 36.23 | Std. Error of Mean | | | | | 6.973 |
| 3712 | Coefficient of Variation | | | | | 0.563 | Skewness | | | | | 1.536 |
| 3713 | | | | | | | | | | | | |
| 3714 | **Normal GOF Test** | | | | | | | | | | | |
| 3715 | Shapiro Wilk Test Statistic | | | | | 0.811 | **Shapiro Wilk GOF Test** | | | | | |
| 3716 | 5% Shapiro Wilk Critical Value | | | | | 0.923 | Data Not Normal at 5% Significance Level | | | | | |
| 3717 | Lilliefors Test Statistic | | | | | 0.205 | **Lilliefors GOF Test** | | | | | |
| 3718 | 5% Lilliefors Critical Value | | | | | 0.171 | Data Not Normal at 5% Significance Level | | | | | |
| 3719 | **Data Not Normal at 5% Significance Level** | | | | | | | | | | | |
| 3720 | | | | | | | | | | | | |
| 3721 | **Assuming Normal Distribution** | | | | | | | | | | | |
| 3722 | **95% Normal UCL** | | | | | | **95% UCLs (Adjusted for Skewness)** | | | | | |
| 3723 | 95% Student's-t UCL | | | | | 76.28 | 95% Adjusted-CLT UCL (Chen-1995) | | | | | 78.06 |
| 3724 | | | | | | | 95% Modified-t UCL (Johnson-1978) | | | | | 76.63 |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3725 | | | | | | | | | | | | |
| 3726 | **Gamma GOF Test** | | | | | | | | | | | |
| 3727 | A-D Test Statistic | | | | | 0.923 | **Anderson-Darling Gamma GOF Test** | | | | | |
| 3728 | 5% A-D Critical Value | | | | | 0.749 | Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 3729 | K-S Test Statistic | | | | | 0.166 | **Kolmogrov-Smirnoff Gamma GOF Test** | | | | | |
| 3730 | 5% K-S Critical Value | | | | | 0.169 | Detected data appear Gamma Distributed at 5% Significance Level | | | | | |
| 3731 | **Detected data follow Appr. Gamma Distribution at 5% Significance Level** | | | | | | | | | | | |
| 3732 | | | | | | | | | | | | |
| 3733 | **Gamma Statistics** | | | | | | | | | | | |
| 3734 | k hat (MLE) | | | | | 4.213 | k star (bias corrected MLE) | | | | | 3.769 |
| 3735 | Theta hat (MLE) | | | | | 15.28 | Theta star (bias corrected MLE) | | | | | 17.08 |
| 3736 | nu hat (MLE) | | | | | 227.5 | nu star (bias corrected) | | | | | 203.6 |
| 3737 | MLE Mean (bias corrected) | | | | | 64.39 | MLE Sd (bias corrected) | | | | | 33.16 |
| 3738 | | | | | | | Approximate Chi Square Value (0.05) | | | | | 171.5 |
| 3739 | Adjusted Level of Significance | | | | | 0.0401 | Adjusted Chi Square Value | | | | | 169.7 |
| 3740 | | | | | | | | | | | | |
| 3741 | **Assuming Gamma Distribution** | | | | | | | | | | | |
| 3742 | 95% Approximate Gamma UCL (use when n>=50) | | | | | 76.41 | 95% Adjusted Gamma UCL (use when n<50) | | | | | 77.25 |
| 3743 | | | | | | | | | | | | |
| 3744 | **Lognormal GOF Test** | | | | | | | | | | | |
| 3745 | Shapiro Wilk Test Statistic | | | | | 0.947 | **Shapiro Wilk Lognormal GOF Test** | | | | | |
| 3746 | 5% Shapiro Wilk Critical Value | | | | | 0.923 | Data appear Lognormal at 5% Significance Level | | | | | |
| 3747 | Lilliefors Test Statistic | | | | | 0.136 | **Lilliefors Lognormal GOF Test** | | | | | |
| 3748 | 5% Lilliefors Critical Value | | | | | 0.171 | Data appear Lognormal at 5% Significance Level | | | | | |
| 3749 | **Data appear Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 3750 | | | | | | | | | | | | |
| 3751 | **Lognormal Statistics** | | | | | | | | | | | |
| 3752 | Minimum of Logged Data | | | | | 3.178 | Mean of logged Data | | | | | 4.042 |
| 3753 | Maximum of Logged Data | | | | | 5.075 | SD of logged Data | | | | | 0.486 |
| 3754 | | | | | | | | | | | | |
| 3755 | **Assuming Lognormal Distribution** | | | | | | | | | | | |
| 3756 | 95% H-UCL | | | | | 77.18 | 90% Chebyshev (MVUE) UCL | | | | | 82.32 |
| 3757 | 95% Chebyshev (MVUE) UCL | | | | | 90.74 | 97.5% Chebyshev (MVUE) UCL | | | | | 102.4 |
| 3758 | 99% Chebyshev (MVUE) UCL | | | | | 125.4 | | | | | | |
| 3759 | | | | | | | | | | | | |
| 3760 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 3761 | **Data appear to follow a Discernible Distribution at 5% Significance Level** | | | | | | | | | | | |
| 3762 | | | | | | | | | | | | |
| 3763 | **Nonparametric Distribution Free UCLs** | | | | | | | | | | | |
| 3764 | 95% CLT UCL | | | | | 75.86 | 95% Jackknife UCL | | | | | 76.28 |
| 3765 | 95% Standard Bootstrap UCL | | | | | 75.31 | 95% Bootstrap-t UCL | | | | | 80.31 |
| 3766 | 95% Hall's Bootstrap UCL | | | | | 78.45 | 95% Percentile Bootstrap UCL | | | | | 75.93 |
| 3767 | 95% BCA Bootstrap UCL | | | | | 78.13 | | | | | | |
| 3768 | 90% Chebyshev(Mean, Sd) UCL | | | | | 85.31 | 95% Chebyshev(Mean, Sd) UCL | | | | | 94.78 |
| 3769 | 97.5% Chebyshev(Mean, Sd) UCL | | | | | 107.9 | 99% Chebyshev(Mean, Sd) UCL | | | | | 133.8 |
| 3770 | | | | | | | | | | | | |
| 3771 | **Suggested UCL to Use** | | | | | | | | | | | |
| 3772 | 95% Adjusted Gamma UCL | | | | | 77.25 | | | | | | |
| 3773 | | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3774 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 3775 | These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) | | | | | | | | | | | |
| 3776 | and Singh and Singh (2003). However, simulations results will not cover all Real World data sets. | | | | | | | | | | | |
| 3777 | For additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 3778 | | | | | | | | | | | | |
| 3779 | **Phenanthrene** | | | | | | | | | | | |
| 3780 | | | | | | | | | | | | |
| 3781 | **General Statistics** | | | | | | | | | | | |
| 3782 | Total Number of Observations | | | | | 37 | Number of Distinct Observations | | | | | 31 |
| 3783 | Number of Detects | | | | | 24 | Number of Non-Detects | | | | | 13 |
| 3784 | Number of Distinct Detects | | | | | 22 | Number of Distinct Non-Detects | | | | | 10 |
| 3785 | Minimum Detect | | | | | 5.2 | Minimum Non-Detect | | | | | 77 |
| 3786 | Maximum Detect | | | | | 260000 | Maximum Non-Detect | | | | | 6900 |
| 3787 | Variance Detects | | | | | 2.942E+9 | Percent Non-Detects | | | | | 35.14% |
| 3788 | Mean Detects | | | | | 15240 | SD Detects | | | | | 54238 |
| 3789 | Median Detects | | | | | 645 | CV Detects | | | | | 3.559 |
| 3790 | Skewness Detects | | | | | 4.401 | Kurtosis Detects | | | | | 20.07 |
| 3791 | Mean of Logged Detects | | | | | 6.528 | SD of Logged Detects | | | | | 2.427 |
| 3792 | | | | | | | | | | | | |
| 3793 | **Normal GOF Test on Detects Only** | | | | | | | | | | | |
| 3794 | Shapiro Wilk Test Statistic | | | | | 0.31 | **Shapiro Wilk GOF Test** | | | | | |
| 3795 | 5% Shapiro Wilk Critical Value | | | | | 0.916 | Detected Data Not Normal at 5% Significance Level | | | | | |
| 3796 | Lilliefors Test Statistic | | | | | 0.458 | **Lilliefors GOF Test** | | | | | |
| 3797 | 5% Lilliefors Critical Value | | | | | 0.181 | Detected Data Not Normal at 5% Significance Level | | | | | |
| 3798 | **Detected Data Not Normal at 5% Significance Level** | | | | | | | | | | | |
| 3799 | | | | | | | | | | | | |
| 3800 | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | | | | | |
| 3801 | Mean | | | | | 10053 | Standard Error of Mean | | | | | 7279 |
| 3802 | SD | | | | | 43342 | 95% KM (BCA) UCL | | | | | 24180 |
| 3803 | 95% KM (t) UCL | | | | | 22342 | 95% KM (Percentile Bootstrap) UCL | | | | | 23750 |
| 3804 | 95% KM (z) UCL | | | | | 22026 | 95% KM Bootstrap t UCL | | | | | 240837 |
| 3805 | 90% KM Chebyshev UCL | | | | | 31890 | 95% KM Chebyshev UCL | | | | | 41781 |
| 3806 | 97.5% KM Chebyshev UCL | | | | | 55510 | 99% KM Chebyshev UCL | | | | | 82478 |
| 3807 | | | | | | | | | | | | |
| 3808 | **Gamma GOF Tests on Detected Observations Only** | | | | | | | | | | | |
| 3809 | A-D Test Statistic | | | | | 2.651 | **Anderson-Darling GOF Test** | | | | | |
| 3810 | 5% A-D Critical Value | | | | | 0.884 | Detected Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 3811 | K-S Test Statistic | | | | | 0.289 | **Kolmogrov-Smirnoff GOF** | | | | | |
| 3812 | 5% K-S Critical Value | | | | | 0.196 | Detected Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 3813 | **Detected Data Not Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 3814 | | | | | | | | | | | | |
| 3815 | **Gamma Statistics on Detected Data Only** | | | | | | | | | | | |
| 3816 | k hat (MLE) | | | | | 0.232 | k star (bias corrected MLE) | | | | | 0.23 |
| 3817 | Theta hat (MLE) | | | | | 65781 | Theta star (bias corrected MLE) | | | | | 66119 |
| 3818 | nu hat (MLE) | | | | | 11.12 | nu star (bias corrected) | | | | | 11.06 |
| 3819 | MLE Mean (bias corrected) | | | | | 15240 | MLE Sd (bias corrected) | | | | | 31744 |
| 3820 | | | | | | | | | | | | |
| 3821 | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | | | | | |
| 3822 | k hat (KM) | | | | | 0.0538 | nu hat (KM) | | | | | 3.981 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3823 | Approximate Chi Square Value (3.98, α) | | | | | 0.714 | Adjusted Chi Square Value (3.98, β) | | | | | 0.659 |
| 3824 | 95% Gamma Approximate KM-UCL (use when n>=50) | | | | | 56035 | 95% Gamma Adjusted KM-UCL (use when n<50) | | | | | 60724 |
| 3825 | Gamma (KM) may not be used when k hat (KM) is < 0.1 | | | | | | | | | | | |
| 3826 | | | | | | | | | | | | |
| 3827 | **Gamma ROS Statistics using Imputed Non-Detects** | | | | | | | | | | | |
| 3828 | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | | | | |
| 3829 | GROS may not be used when kstar of detected data is small such as < 0.1 | | | | | | | | | | | |
| 3830 | For such situations, GROS method tends to yield inflated values of UCLs and BTVs | | | | | | | | | | | |
| 3831 | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | | | | |
| 3832 | Minimum | | | | | 0.01 | Mean | | | | | 9886 |
| 3833 | Maximum | | | | | 260000 | Median | | | | | 120 |
| 3834 | SD | | | | | 43976 | CV | | | | | 4.449 |
| 3835 | k hat (MLE) | | | | | 0.12 | k star (bias corrected MLE) | | | | | 0.129 |
| 3836 | Theta hat (MLE) | | | | | 82092 | Theta star (bias corrected MLE) | | | | | 76826 |
| 3837 | nu hat (MLE) | | | | | 8.911 | nu star (bias corrected) | | | | | 9.522 |
| 3838 | MLE Mean (bias corrected) | | | | | 9886 | MLE Sd (bias corrected) | | | | | 27558 |
| 3839 | | | | | | | Adjusted Level of Significance (β) | | | | | 0.0431 |
| 3840 | Approximate Chi Square Value (9.52, α) | | | | | 3.645 | Adjusted Chi Square Value (9.52, β) | | | | | 3.488 |
| 3841 | 95% Gamma Approximate UCL (use when n>=50) | | | | | 25823 | 95% Gamma Adjusted UCL (use when n<50) | | | | | 26985 |
| 3842 | | | | | | | | | | | | |
| 3843 | **Lognormal GOF Test on Detected Observations Only** | | | | | | | | | | | |
| 3844 | Shapiro Wilk Test Statistic | | | | | 0.974 | **Shapiro Wilk GOF Test** | | | | | |
| 3845 | 5% Shapiro Wilk Critical Value | | | | | 0.916 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 3846 | Lilliefors Test Statistic | | | | | 0.0917 | **Lilliefors GOF Test** | | | | | |
| 3847 | 5% Lilliefors Critical Value | | | | | 0.181 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 3848 | **Detected Data appear Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 3849 | | | | | | | | | | | | |
| 3850 | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | | | | | |
| 3851 | Mean in Original Scale | | | | | 9974 | Mean in Log Scale | | | | | 6.071 |
| 3852 | SD in Original Scale | | | | | 43956 | SD in Log Scale | | | | | 2.104 |
| 3853 | 95% t UCL (assumes normality of ROS data) | | | | | 22174 | 95% Percentile Bootstrap UCL | | | | | 22538 |
| 3854 | 95% BCA Bootstrap UCL | | | | | 32823 | 95% Bootstrap t UCL | | | | | 254630 |
| 3855 | 95% H-UCL (Log ROS) | | | | | 15479 | | | | | | |
| 3856 | | | | | | | | | | | | |
| 3857 | **UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed** | | | | | | | | | | | |
| 3858 | KM Mean (logged) | | | | | 6.029 | 95% H-UCL (KM -Log) | | | | | 24419 |
| 3859 | KM SD (logged) | | | | | 2.251 | 95% Critical H Value (KM-Log) | | | | | 4.103 |
| 3860 | KM Standard Error of Mean (logged) | | | | | 0.424 | | | | | | |
| 3861 | | | | | | | | | | | | |
| 3862 | **DL/2 Statistics** | | | | | | | | | | | |
| 3863 | **DL/2 Normal** | | | | | | **DL/2 Log-Transformed** | | | | | |
| 3864 | Mean in Original Scale | | | | | 10335 | Mean in Log Scale | | | | | 6.616 |
| 3865 | SD in Original Scale | | | | | 43879 | SD in Log Scale | | | | | 2.057 |
| 3866 | 95% t UCL (Assumes normality) | | | | | 22514 | 95% H-Stat UCL | | | | | 22887 |
| 3867 | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | | | | | |
| 3868 | | | | | | | | | | | | |
| 3869 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 3870 | **Detected Data appear Lognormal Distributed at 5% Significance Level** | | | | | | | | | | | |
| 3871 | | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3872 | **Suggested UCL to Use** | | | | | | | | | | | |
| 3873 | 99% KM (Chebyshev) UCL | | | | | 82478 | | | | | | |
| 3874 | | | | | | | | | | | | |
| 3875 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 3876 | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | | | | | |
| 3877 | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | | | | | |
| 3878 | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 3879 | | | | | | | | | | | | |
| 3880 | **Pyrene** | | | | | | | | | | | |
| 3881 | | | | | | | | | | | | |
| 3882 | **General Statistics** | | | | | | | | | | | |
| 3883 | Total Number of Observations | | | | | 38 | Number of Distinct Observations | | | | | 34 |
| 3884 | Number of Detects | | | | | 25 | Number of Non-Detects | | | | | 13 |
| 3885 | Number of Distinct Detects | | | | | 25 | Number of Distinct Non-Detects | | | | | 11 |
| 3886 | Minimum Detect | | | | | 53 | Minimum Non-Detect | | | | | 77 |
| 3887 | Maximum Detect | | | | | 210000 | Maximum Non-Detect | | | | | 330000 |
| 3888 | Variance Detects | | | | | 3.127E+9 | Percent Non-Detects | | | | | 34.21% |
| 3889 | Mean Detects | | | | | 19980 | SD Detects | | | | | 55922 |
| 3890 | Median Detects | | | | | 1400 | CV Detects | | | | | 2.799 |
| 3891 | Skewness Detects | | | | | 3.257 | Kurtosis Detects | | | | | 9.481 |
| 3892 | Mean of Logged Detects | | | | | 7.529 | SD of Logged Detects | | | | | 2.213 |
| 3893 | | | | | | | | | | | | |
| 3894 | **Normal GOF Test on Detects Only** | | | | | | | | | | | |
| 3895 | Shapiro Wilk Test Statistic | | | | | 0.377 | **Shapiro Wilk GOF Test** | | | | | |
| 3896 | 5% Shapiro Wilk Critical Value | | | | | 0.918 | Detected Data Not Normal at 5% Significance Level | | | | | |
| 3897 | Lilliefors Test Statistic | | | | | 0.448 | **Lilliefors GOF Test** | | | | | |
| 3898 | 5% Lilliefors Critical Value | | | | | 0.177 | Detected Data Not Normal at 5% Significance Level | | | | | |
| 3899 | **Detected Data Not Normal at 5% Significance Level** | | | | | | | | | | | |
| 3900 | | | | | | | | | | | | |
| 3901 | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | | | | | |
| 3902 | Mean | | | | | 13682 | Standard Error of Mean | | | | | 7710 |
| 3903 | SD | | | | | 45948 | 95% KM (BCA) UCL | | | | | 29128 |
| 3904 | 95% KM (t) UCL | | | | | 26690 | 95% KM (Percentile Bootstrap) UCL | | | | | 28220 |
| 3905 | 95% KM (z) UCL | | | | | 26364 | 95% KM Bootstrap t UCL | | | | | 139011 |
| 3906 | 90% KM Chebyshev UCL | | | | | 36812 | 95% KM Chebyshev UCL | | | | | 47289 |
| 3907 | 97.5% KM Chebyshev UCL | | | | | 61831 | 99% KM Chebyshev UCL | | | | | 90396 |
| 3908 | | | | | | | | | | | | |
| 3909 | **Gamma GOF Tests on Detected Observations Only** | | | | | | | | | | | |
| 3910 | A-D Test Statistic | | | | | 2.029 | **Anderson-Darling GOF Test** | | | | | |
| 3911 | 5% A-D Critical Value | | | | | 0.856 | Detected Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 3912 | K-S Test Statistic | | | | | 0.228 | **Kolmogrov-Smirnoff GOF** | | | | | |
| 3913 | 5% K-S Critical Value | | | | | 0.19 | Detected Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 3914 | **Detected Data Not Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 3915 | | | | | | | | | | | | |
| 3916 | **Gamma Statistics on Detected Data Only** | | | | | | | | | | | |
| 3917 | k hat (MLE) | | | | | 0.292 | k star (bias corrected MLE) | | | | | 0.283 |
| 3918 | Theta hat (MLE) | | | | | 68461 | Theta star (bias corrected MLE) | | | | | 70479 |
| 3919 | nu hat (MLE) | | | | | 14.59 | nu star (bias corrected) | | | | | 14.17 |
| 3920 | MLE Mean (bias corrected) | | | | | 19980 | MLE Sd (bias corrected) | | | | | 37525 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3921 | | | | | | | | | | | | |
| 3922 | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | | | | | |
| 3923 | | | | | k hat (KM) | 0.0887 | | | nu hat (KM) | | | 6.739 |
| 3924 | | | | | Approximate Chi Square Value (6.74, α) | 2.028 | | | Adjusted Chi Square Value (6.74, β) | | | 1.923 |
| 3925 | | | | | 95% Gamma Approximate KM-UCL (use when n>=50) | 45456 | | | 95% Gamma Adjusted KM-UCL (use when n<50) | | | 47940 |
| 3926 | | | | | Gamma (KM) may not be used when k hat (KM) is < 0.1 | | | | | | | |
| 3927 | | | | | | | | | | | | |
| 3928 | **Gamma ROS Statistics using Imputed Non-Detects** | | | | | | | | | | | |
| 3929 | | | | | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | |
| 3930 | | | | | GROS may not be used when kstar of detected data is small such as < 0.1 | | | | | | | |
| 3931 | | | | | For such situations, GROS method tends to yield inflated values of UCLs and BTVs | | | | | | | |
| 3932 | | | | | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | |
| 3933 | | | | | Minimum | 0.01 | | | Mean | | | 13145 |
| 3934 | | | | | Maximum | 210000 | | | Median | | | 365 |
| 3935 | | | | | SD | 46052 | | | CV | | | 3.503 |
| 3936 | | | | | k hat (MLE) | 0.129 | | | k star (bias corrected MLE) | | | 0.136 |
| 3937 | | | | | Theta hat (MLE) | 102175 | | | Theta star (bias corrected MLE) | | | 96626 |
| 3938 | | | | | nu hat (MLE) | 9.777 | | | nu star (bias corrected) | | | 10.34 |
| 3939 | | | | | MLE Mean (bias corrected) | 13145 | | | MLE Sd (bias corrected) | | | 35638 |
| 3940 | | | | | | | | | Adjusted Level of Significance (β) | | | 0.0434 |
| 3941 | | | | | Approximate Chi Square Value (10.34, α) | 4.155 | | | Adjusted Chi Square Value (10.34, β) | | | 3.993 |
| 3942 | | | | | 95% Gamma Approximate UCL (use when n>=50) | 32711 | | | 95% Gamma Adjusted UCL (use when n<50) | | | 34037 |
| 3943 | | | | | | | | | | | | |
| 3944 | **Lognormal GOF Test on Detected Observations Only** | | | | | | | | | | | |
| 3945 | | | | | Shapiro Wilk Test Statistic | 0.96 | | | **Shapiro Wilk GOF Test** | | | |
| 3946 | | | | | 5% Shapiro Wilk Critical Value | 0.918 | | | Detected Data appear Lognormal at 5% Significance Level | | | |
| 3947 | | | | | Lilliefors Test Statistic | 0.0854 | | | **Lilliefors GOF Test** | | | |
| 3948 | | | | | 5% Lilliefors Critical Value | 0.177 | | | Detected Data appear Lognormal at 5% Significance Level | | | |
| 3949 | **Detected Data appear Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 3950 | | | | | | | | | | | | |
| 3951 | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | | | | | |
| 3952 | | | | | Mean in Original Scale | 13291 | | | Mean in Log Scale | | | 6.929 |
| 3953 | | | | | SD in Original Scale | 46009 | | | SD in Log Scale | | | 2.039 |
| 3954 | | | | | 95% t UCL (assumes normality of ROS data) | 25883 | | | 95% Percentile Bootstrap UCL | | | 28488 |
| 3955 | | | | | 95% BCA Bootstrap UCL | 33971 | | | 95% Bootstrap t UCL | | | 136482 |
| 3956 | | | | | 95% H-UCL (Log ROS) | 29235 | | | | | | |
| 3957 | | | | | | | | | | | | |
| 3958 | **UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed** | | | | | | | | | | | |
| 3959 | | | | | KM Mean (logged) | 6.906 | | | 95% H-UCL (KM -Log) | | | 37220 |
| 3960 | | | | | KM SD (logged) | 2.121 | | | 95% Critical H Value (KM-Log) | | | 3.925 |
| 3961 | | | | | KM Standard Error of Mean (logged) | 0.382 | | | | | | |
| 3962 | | | | | | | | | | | | |
| 3963 | **DL/2 Statistics** | | | | | | | | | | | |
| 3964 | **DL/2 Normal** | | | | | | | | **DL/2 Log-Transformed** | | | |
| 3965 | | | | | Mean in Original Scale | 17906 | | | Mean in Log Scale | | | 7.416 |
| 3966 | | | | | SD in Original Scale | 52015 | | | SD in Log Scale | | | 2.078 |
| 3967 | | | | | 95% t UCL (Assumes normality) | 32142 | | | 95% H-Stat UCL | | | 53795 |
| 3968 | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | | | | | |
| 3969 | | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3970 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 3971 | **Detected Data appear Lognormal Distributed at 5% Significance Level** | | | | | | | | | | | |
| 3972 | | | | | | | | | | | | |
| 3973 | **Suggested UCL to Use** | | | | | | | | | | | |
| 3974 | 99% KM (Chebyshev) UCL | | | | | 90396 | | | | | | |
| 3975 | | | | | | | | | | | | |
| 3976 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 3977 | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | | | | | |
| 3978 | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | | | | | |
| 3979 | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 3980 | | | | | | | | | | | | |
| 3981 | **Selenium** | | | | | | | | | | | |
| 3982 | | | | | | | | | | | | |
| 3983 | **General Statistics** | | | | | | | | | | | |
| 3984 | Total Number of Observations | | | | | 25 | | | Number of Distinct Observations | | | 14 |
| 3985 | Number of Detects | | | | | 4 | | | Number of Non-Detects | | | 21 |
| 3986 | Number of Distinct Detects | | | | | 4 | | | Number of Distinct Non-Detects | | | 12 |
| 3987 | Minimum Detect | | | | | 0.32 | | | Minimum Non-Detect | | | 0.6 |
| 3988 | Maximum Detect | | | | | 1.2 | | | Maximum Non-Detect | | | 2.3 |
| 3989 | Variance Detects | | | | | 0.16 | | | Percent Non-Detects | | | 84% |
| 3990 | Mean Detects | | | | | 0.838 | | | SD Detects | | | 0.4 |
| 3991 | Median Detects | | | | | 0.915 | | | CV Detects | | | 0.477 |
| 3992 | Skewness Detects | | | | | -0.773 | | | Kurtosis Detects | | | -1.261 |
| 3993 | Mean of Logged Detects | | | | | -0.294 | | | SD of Logged Detects | | | 0.604 |
| 3994 | | | | | | | | | | | | |
| 3995 | **Normal GOF Test on Detects Only** | | | | | | | | | | | |
| 3996 | Shapiro Wilk Test Statistic | | | | | 0.927 | | | **Shapiro Wilk GOF Test** | | | |
| 3997 | 5% Shapiro Wilk Critical Value | | | | | 0.748 | | | Detected Data appear Normal at 5% Significance Level | | | |
| 3998 | Lilliefors Test Statistic | | | | | 0.244 | | | **Lilliefors GOF Test** | | | |
| 3999 | 5% Lilliefors Critical Value | | | | | 0.443 | | | Detected Data appear Normal at 5% Significance Level | | | |
| 4000 | **Detected Data appear Normal at 5% Significance Level** | | | | | | | | | | | |
| 4001 | | | | | | | | | | | | |
| 4002 | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | | | | | |
| 4003 | Mean | | | | | 0.485 | | | Standard Error of Mean | | | 0.0989 |
| 4004 | SD | | | | | 0.282 | | | 95% KM (BCA) UCL | | | N/A |
| 4005 | 95% KM (t) UCL | | | | | 0.655 | | | 95% KM (Percentile Bootstrap) UCL | | | N/A |
| 4006 | 95% KM (z) UCL | | | | | 0.648 | | | 95% KM Bootstrap t UCL | | | N/A |
| 4007 | 90% KM Chebyshev UCL | | | | | 0.782 | | | 95% KM Chebyshev UCL | | | 0.916 |
| 4008 | 97.5% KM Chebyshev UCL | | | | | 1.103 | | | 99% KM Chebyshev UCL | | | 1.47 |
| 4009 | | | | | | | | | | | | |
| 4010 | **Gamma GOF Tests on Detected Observations Only** | | | | | | | | | | | |
| 4011 | A-D Test Statistic | | | | | 0.372 | | | **Anderson-Darling GOF Test** | | | |
| 4012 | 5% A-D Critical Value | | | | | 0.659 | | | Detected data appear Gamma Distributed at 5% Significance Level | | | |
| 4013 | K-S Test Statistic | | | | | 0.276 | | | **Kolmogrov-Smirnoff GOF** | | | |
| 4014 | 5% K-S Critical Value | | | | | 0.396 | | | Detected data appear Gamma Distributed at 5% Significance Level | | | |
| 4015 | **Detected data appear Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 4016 | | | | | | | | | | | | |
| 4017 | **Gamma Statistics on Detected Data Only** | | | | | | | | | | | |
| 4018 | k hat (MLE) | | | | | 4.441 | | | k star (bias corrected MLE) | | | 1.277 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4019 | Theta hat (MLE) | | | | | 0.189 | Theta star (bias corrected MLE) | | | | | 0.656 |
| 4020 | nu hat (MLE) | | | | | 35.53 | nu star (bias corrected) | | | | | 10.22 |
| 4021 | MLE Mean (bias corrected) | | | | | 0.838 | MLE Sd (bias corrected) | | | | | 0.741 |
| 4022 | | | | | | | | | | | | |
| 4023 | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | | | | | |
| 4024 | k hat (KM) | | | | | 2.97 | nu hat (KM) | | | | | 148.5 |
| 4025 | Approximate Chi Square Value (148.50, α) | | | | | 121.3 | Adjusted Chi Square Value (148.50, β) | | | | | 119.7 |
| 4026 | 95% Gamma Approximate KM-UCL (use when n>=50) | | | | | 0.594 | 95% Gamma Adjusted KM-UCL (use when n<50) | | | | | 0.602 |
| 4027 | | | | | | | | | | | | |
| 4028 | **Gamma ROS Statistics using Imputed Non-Detects** | | | | | | | | | | | |
| 4029 | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | | | | |
| 4030 | GROS may not be used when kstar of detected data is small such as < 0.1 | | | | | | | | | | | |
| 4031 | For such situations, GROS method tends to yield inflated values of UCLs and BTVs | | | | | | | | | | | |
| 4032 | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | | | | |
| 4033 | Minimum | | | | | 0.202 | Mean | | | | | 0.484 |
| 4034 | Maximum | | | | | 1.2 | Median | | | | | 0.45 |
| 4035 | SD | | | | | 0.241 | CV | | | | | 0.499 |
| 4036 | k hat (MLE) | | | | | 5.306 | k star (bias corrected MLE) | | | | | 4.696 |
| 4037 | Theta hat (MLE) | | | | | 0.0912 | Theta star (bias corrected MLE) | | | | | 0.103 |
| 4038 | nu hat (MLE) | | | | | 265.3 | nu star (bias corrected) | | | | | 234.8 |
| 4039 | MLE Mean (bias corrected) | | | | | 0.484 | MLE Sd (bias corrected) | | | | | 0.223 |
| 4040 | | | | | | | Adjusted Level of Significance (β) | | | | | 0.0395 |
| 4041 | Approximate Chi Square Value (234.82, α) | | | | | 200.3 | Adjusted Chi Square Value (234.82, β) | | | | | 198.2 |
| 4042 | 95% Gamma Approximate UCL (use when n>=50) | | | | | 0.567 | 95% Gamma Adjusted UCL (use when n<50) | | | | | N/A |
| 4043 | | | | | | | | | | | | |
| 4044 | **Lognormal GOF Test on Detected Observations Only** | | | | | | | | | | | |
| 4045 | Shapiro Wilk Test Statistic | | | | | 0.873 | **Shapiro Wilk GOF Test** | | | | | |
| 4046 | 5% Shapiro Wilk Critical Value | | | | | 0.748 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 4047 | Lilliefors Test Statistic | | | | | 0.241 | **Lilliefors GOF Test** | | | | | |
| 4048 | 5% Lilliefors Critical Value | | | | | 0.443 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 4049 | **Detected Data appear Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 4050 | | | | | | | | | | | | |
| 4051 | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | | | | | |
| 4052 | Mean in Original Scale | | | | | 0.47 | Mean in Log Scale | | | | | -0.843 |
| 4053 | SD in Original Scale | | | | | 0.235 | SD in Log Scale | | | | | 0.399 |
| 4054 | 95% t UCL (assumes normality of ROS data) | | | | | 0.55 | 95% Percentile Bootstrap UCL | | | | | 0.551 |
| 4055 | 95% BCA Bootstrap UCL | | | | | 0.573 | 95% Bootstrap t UCL | | | | | 0.609 |
| 4056 | 95% H-UCL (Log ROS) | | | | | 0.543 | | | | | | |
| 4057 | | | | | | | | | | | | |
| 4058 | **UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed** | | | | | | | | | | | |
| 4059 | KM Mean (logged) | | | | | -0.85 | 95% H-UCL (KM -Log) | | | | | 0.574 |
| 4060 | KM SD (logged) | | | | | 0.468 | 95% Critical H Value (KM-Log) | | | | | 1.933 |
| 4061 | KM Standard Error of Mean (logged) | | | | | 0.179 | | | | | | |
| 4062 | | | | | | | | | | | | |
| 4063 | **DL/2 Statistics** | | | | | | | | | | | |
| 4064 | **DL/2 Normal** | | | | | | **DL/2 Log-Transformed** | | | | | |
| 4065 | Mean in Original Scale | | | | | 0.621 | Mean in Log Scale | | | | | -0.558 |
| 4066 | SD in Original Scale | | | | | 0.262 | SD in Log Scale | | | | | 0.409 |
| 4067 | 95% t UCL (Assumes normality) | | | | | 0.71 | 95% H-Stat UCL | | | | | 0.728 |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4068 | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | | | | | |
| 4069 | | | | | | | | | | | | |
| 4070 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 4071 | **Detected Data appear Normal Distributed at 5% Significance Level** | | | | | | | | | | | |
| 4072 | | | | | | | | | | | | |
| 4073 | **Suggested UCL to Use** | | | | | | | | | | | |
| 4074 | 95% KM (t) UCL | | | | | 0.655 | 95% KM (Percentile Bootstrap) UCL | | | | | N/A |
| 4075 | **Warning: One or more Recommended UCL(s) not available!** | | | | | | | | | | | |
| 4076 | | | | | | | | | | | | |
| 4077 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 4078 | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | | | | | |
| 4079 | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | | | | | |
| 4080 | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 4081 | | | | | | | | | | | | |
| 4082 | **Silver** | | | | | | | | | | | |
| 4083 | | | | | | | | | | | | |
| 4084 | **General Statistics** | | | | | | | | | | | |
| 4085 | Total Number of Observations | | | | | 25 | Number of Distinct Observations | | | | | 21 |
| 4086 | Number of Detects | | | | | 18 | Number of Non-Detects | | | | | 7 |
| 4087 | Number of Distinct Detects | | | | | 17 | Number of Distinct Non-Detects | | | | | 6 |
| 4088 | Minimum Detect | | | | | 0.075 | Minimum Non-Detect | | | | | 0.22 |
| 4089 | Maximum Detect | | | | | 2.2 | Maximum Non-Detect | | | | | 1.2 |
| 4090 | Variance Detects | | | | | 0.34 | Percent Non-Detects | | | | | 28% |
| 4091 | Mean Detects | | | | | 0.556 | SD Detects | | | | | 0.583 |
| 4092 | Median Detects | | | | | 0.275 | CV Detects | | | | | 1.049 |
| 4093 | Skewness Detects | | | | | 1.662 | Kurtosis Detects | | | | | 2.435 |
| 4094 | Mean of Logged Detects | | | | | -1.044 | SD of Logged Detects | | | | | 0.968 |
| 4095 | | | | | | | | | | | | |
| 4096 | **Normal GOF Test on Detects Only** | | | | | | | | | | | |
| 4097 | Shapiro Wilk Test Statistic | | | | | 0.766 | **Shapiro Wilk GOF Test** | | | | | |
| 4098 | 5% Shapiro Wilk Critical Value | | | | | 0.897 | Detected Data Not Normal at 5% Significance Level | | | | | |
| 4099 | Lilliefors Test Statistic | | | | | 0.279 | **Lilliefors GOF Test** | | | | | |
| 4100 | 5% Lilliefors Critical Value | | | | | 0.209 | Detected Data Not Normal at 5% Significance Level | | | | | |
| 4101 | **Detected Data Not Normal at 5% Significance Level** | | | | | | | | | | | |
| 4102 | | | | | | | | | | | | |
| 4103 | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | | | | | |
| 4104 | Mean | | | | | 0.459 | Standard Error of Mean | | | | | 0.106 |
| 4105 | SD | | | | | 0.51 | 95% KM (BCA) UCL | | | | | 0.648 |
| 4106 | 95% KM (t) UCL | | | | | 0.64 | 95% KM (Percentile Bootstrap) UCL | | | | | 0.645 |
| 4107 | 95% KM (z) UCL | | | | | 0.633 | 95% KM Bootstrap t UCL | | | | | 0.718 |
| 4108 | 90% KM Chebyshev UCL | | | | | 0.777 | 95% KM Chebyshev UCL | | | | | 0.921 |
| 4109 | 97.5% KM Chebyshev UCL | | | | | 1.121 | 99% KM Chebyshev UCL | | | | | 1.514 |
| 4110 | | | | | | | | | | | | |
| 4111 | **Gamma GOF Tests on Detected Observations Only** | | | | | | | | | | | |
| 4112 | A-D Test Statistic | | | | | 0.801 | **Anderson-Darling GOF Test** | | | | | |
| 4113 | 5% A-D Critical Value | | | | | 0.762 | Detected Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 4114 | K-S Test Statistic | | | | | 0.191 | **Kolmogrov-Smirnoff GOF** | | | | | |
| 4115 | 5% K-S Critical Value | | | | | 0.208 | Detected data appear Gamma Distributed at 5% Significance Level | | | | | |
| 4116 | **Detected data follow Appr. Gamma Distribution at 5% Significance Level** | | | | | | | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4117 | | | | | | | | | | | | |
| 4118 | **Gamma Statistics on Detected Data Only** | | | | | | | | | | | |
| 4119 | | | | | k hat (MLE) | 1.235 | | | k star (bias corrected MLE) | 1.066 | | |
| 4120 | | | | | Theta hat (MLE) | 0.45 | | | Theta star (bias corrected MLE) | 0.521 | | |
| 4121 | | | | | nu hat (MLE) | 44.45 | | | nu star (bias corrected) | 38.38 | | |
| 4122 | | | | | MLE Mean (bias corrected) | 0.556 | | | MLE Sd (bias corrected) | 0.538 | | |
| 4123 | | | | | | | | | | | | |
| 4124 | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | | | | | |
| 4125 | | | | | k hat (KM) | 0.808 | | | nu hat (KM) | 40.42 | | |
| 4126 | | | | | Approximate Chi Square Value (40.42, α) | 26.85 | | | Adjusted Chi Square Value (40.42, β) | 26.1 | | |
| 4127 | | | | | 95% Gamma Approximate KM-UCL (use when n>=50) | 0.69 | | | 95% Gamma Adjusted KM-UCL (use when n<50) | 0.71 | | |
| 4128 | | | | | | | | | | | | |
| 4129 | **Gamma ROS Statistics using Imputed Non-Detects** | | | | | | | | | | | |
| 4130 | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | | | | |
| 4131 | GROS may not be used when kstar of detected data is small such as < 0.1 | | | | | | | | | | | |
| 4132 | For such situations, GROS method tends to yield inflated values of UCLs and BTVs | | | | | | | | | | | |
| 4133 | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | | | | |
| 4134 | | | | | Minimum | 0.0466 | | | Mean | 0.443 | | |
| 4135 | | | | | Maximum | 2.2 | | | Median | 0.217 | | |
| 4136 | | | | | SD | 0.527 | | | CV | 1.189 | | |
| 4137 | | | | | k hat (MLE) | 1.096 | | | k star (bias corrected MLE) | 0.991 | | |
| 4138 | | | | | Theta hat (MLE) | 0.404 | | | Theta star (bias corrected MLE) | 0.447 | | |
| 4139 | | | | | nu hat (MLE) | 54.8 | | | nu star (bias corrected) | 49.56 | | |
| 4140 | | | | | MLE Mean (bias corrected) | 0.443 | | | MLE Sd (bias corrected) | 0.445 | | |
| 4141 | | | | | | | | | Adjusted Level of Significance (β) | 0.0395 | | |
| 4142 | | | | | Approximate Chi Square Value (49.56, α) | 34.39 | | | Adjusted Chi Square Value (49.56, β) | 33.53 | | |
| 4143 | | | | | 95% Gamma Approximate UCL (use when n>=50) | 0.639 | | | 95% Gamma Adjusted UCL (use when n<50) | 0.655 | | |
| 4144 | | | | | | | | | | | | |
| 4145 | **Lognormal GOF Test on Detected Observations Only** | | | | | | | | | | | |
| 4146 | | | | | Shapiro Wilk Test Statistic | 0.946 | | | **Shapiro Wilk GOF Test** | | | |
| 4147 | | | | | 5% Shapiro Wilk Critical Value | 0.897 | | | Detected Data appear Lognormal at 5% Significance Level | | | |
| 4148 | | | | | Lilliefors Test Statistic | 0.135 | | | **Lilliefors GOF Test** | | | |
| 4149 | | | | | 5% Lilliefors Critical Value | 0.209 | | | Detected Data appear Lognormal at 5% Significance Level | | | |
| 4150 | **Detected Data appear Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 4151 | | | | | | | | | | | | |
| 4152 | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | | | | | |
| 4153 | | | | | Mean in Original Scale | 0.457 | | | Mean in Log Scale | -1.208 | | |
| 4154 | | | | | SD in Original Scale | 0.517 | | | SD in Log Scale | 0.869 | | |
| 4155 | | | | | 95% t UCL (assumes normality of ROS data) | 0.634 | | | 95% Percentile Bootstrap UCL | 0.633 | | |
| 4156 | | | | | 95% BCA Bootstrap UCL | 0.688 | | | 95% Bootstrap t UCL | 0.741 | | |
| 4157 | | | | | 95% H-UCL (Log ROS) | 0.66 | | | | | | |
| 4158 | | | | | | | | | | | | |
| 4159 | **UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed** | | | | | | | | | | | |
| 4160 | | | | | KM Mean (logged) | -1.229 | | | 95% H-UCL (KM -Log) | 0.669 | | |
| 4161 | | | | | KM SD (logged) | 0.892 | | | 95% Critical H Value (KM-Log) | 2.361 | | |
| 4162 | | | | | KM Standard Error of Mean (logged) | 0.194 | | | | | | |
| 4163 | | | | | | | | | | | | |
| 4164 | **DL/2 Statistics** | | | | | | | | | | | |
| 4165 | **DL/2 Normal** | | | | | | | | **DL/2 Log-Transformed** | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
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| 4166 | | | | | Mean in Original Scale | 0.493 | | | | | Mean in Log Scale | -1.129 |
| 4167 | | | | | SD in Original Scale | 0.515 | | | | | SD in Log Scale | 0.912 |
| 4168 | | | | | 95% t UCL (Assumes normality) | 0.669 | | | | | 95% H-Stat UCL | 0.763 |
| 4169 | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | | | | | |
| 4170 | | | | | | | | | | | | |
| 4171 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 4172 | **Detected Data appear Approximate Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 4173 | | | | | | | | | | | | |
| 4174 | **Suggested UCL to Use** | | | | | | | | | | | |
| 4175 | | | | | 95% KM (Percentile Bootstrap) UCL | 0.645 | | | | | 95% GROS Adjusted Gamma UCL | 0.655 |
| 4176 | | | | | 95% Adjusted Gamma KM-UCL | 0.71 | | | | | | |
| 4177 | | | | | | | | | | | | |
| 4178 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 4179 | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | | | | | |
| 4180 | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | | | | | |
| 4181 | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 4182 | | | | | | | | | | | | |
| 4183 | **Thallium** | | | | | | | | | | | |
| 4184 | | | | | | | | | | | | |
| 4185 | **General Statistics** | | | | | | | | | | | |
| 4186 | | | | | Total Number of Observations | 20 | | | | | Number of Distinct Observations | 15 |
| 4187 | | | | | Number of Detects | 8 | | | | | Number of Non-Detects | 12 |
| 4188 | | | | | Number of Distinct Detects | 8 | | | | | Number of Distinct Non-Detects | 9 |
| 4189 | | | | | Minimum Detect | 0.13 | | | | | Minimum Non-Detect | 0.42 |
| 4190 | | | | | Maximum Detect | 1.7 | | | | | Maximum Non-Detect | 0.71 |
| 4191 | | | | | Variance Detects | 0.341 | | | | | Percent Non-Detects | 60% |
| 4192 | | | | | Mean Detects | 0.818 | | | | | SD Detects | 0.584 |
| 4193 | | | | | Median Detects | 0.735 | | | | | CV Detects | 0.714 |
| 4194 | | | | | Skewness Detects | 0.296 | | | | | Kurtosis Detects | -1.561 |
| 4195 | | | | | Mean of Logged Detects | -0.513 | | | | | SD of Logged Detects | 0.929 |
| 4196 | | | | | | | | | | | | |
| 4197 | **Normal GOF Test on Detects Only** | | | | | | | | | | | |
| 4198 | | | | | Shapiro Wilk Test Statistic | 0.927 | **Shapiro Wilk GOF Test** | | | | | |
| 4199 | | | | | 5% Shapiro Wilk Critical Value | 0.818 | Detected Data appear Normal at 5% Significance Level | | | | | |
| 4200 | | | | | Lilliefors Test Statistic | 0.213 | **Lilliefors GOF Test** | | | | | |
| 4201 | | | | | 5% Lilliefors Critical Value | 0.313 | Detected Data appear Normal at 5% Significance Level | | | | | |
| 4202 | **Detected Data appear Normal at 5% Significance Level** | | | | | | | | | | | |
| 4203 | | | | | | | | | | | | |
| 4204 | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | | | | | |
| 4205 | | | | | Mean | 0.478 | | | | | Standard Error of Mean | 0.116 |
| 4206 | | | | | SD | 0.454 | | | | | 95% KM (BCA) UCL | 0.72 |
| 4207 | | | | | 95% KM (t) UCL | 0.679 | | | | | 95% KM (Percentile Bootstrap) UCL | 0.697 |
| 4208 | | | | | 95% KM (z) UCL | 0.669 | | | | | 95% KM Bootstrap t UCL | 0.71 |
| 4209 | | | | | 90% KM Chebyshev UCL | 0.826 | | | | | 95% KM Chebyshev UCL | 0.984 |
| 4210 | | | | | 97.5% KM Chebyshev UCL | 1.203 | | | | | 99% KM Chebyshev UCL | 1.633 |
| 4211 | | | | | | | | | | | | |
| 4212 | **Gamma GOF Tests on Detected Observations Only** | | | | | | | | | | | |
| 4213 | | | | | A-D Test Statistic | 0.295 | **Anderson-Darling GOF Test** | | | | | |
| 4214 | | | | | 5% A-D Critical Value | 0.726 | Detected data appear Gamma Distributed at 5% Significance Level | | | | | |

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| 4215 | | | | | K-S Test Statistic | 0.191 | **Kolmogrov-Smirnoff GOF** | | | | | |
| 4216 | | | | | 5% K-S Critical Value | 0.298 | Detected data appear Gamma Distributed at 5% Significance Level | | | | | |
| 4217 | **Detected data appear Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 4218 | | | | | | | | | | | | |
| 4219 | **Gamma Statistics on Detected Data Only** | | | | | | | | | | | |
| 4220 | | | | | k hat (MLE) | 1.752 | | | | k star (bias corrected MLE) | | 1.178 |
| 4221 | | | | | Theta hat (MLE) | 0.467 | | | | Theta star (bias corrected MLE) | | 0.694 |
| 4222 | | | | | nu hat (MLE) | 28.03 | | | | nu star (bias corrected) | | 18.85 |
| 4223 | | | | | MLE Mean (bias corrected) | 0.818 | | | | MLE Sd (bias corrected) | | 0.753 |
| 4224 | | | | | | | | | | | | |
| 4225 | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | | | | | |
| 4226 | | | | | k hat (KM) | 1.113 | | | | nu hat (KM) | | 44.5 |
| 4227 | | | | | Approximate Chi Square Value (44.50, α) | 30.2 | | | | Adjusted Chi Square Value (44.50, β) | | 29.27 |
| 4228 | | | | | 95% Gamma Approximate KM-UCL (use when n>=50) | 0.705 | | | | 95% Gamma Adjusted KM-UCL (use when n<50) | | 0.727 |
| 4229 | | | | | | | | | | | | |
| 4230 | **Gamma ROS Statistics using Imputed Non-Detects** | | | | | | | | | | | |
| 4231 | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | | | | |
| 4232 | GROS may not be used when kstar of detected data is small such as < 0.1 | | | | | | | | | | | |
| 4233 | For such situations, GROS method tends to yield inflated values of UCLs and BTVs | | | | | | | | | | | |
| 4234 | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | | | | |
| 4235 | | | | | Minimum | 0.0917 | | | | Mean | | 0.456 |
| 4236 | | | | | Maximum | 1.7 | | | | Median | | 0.235 |
| 4237 | | | | | SD | 0.475 | | | | CV | | 1.043 |
| 4238 | | | | | k hat (MLE) | 1.3 | | | | k star (bias corrected MLE) | | 1.139 |
| 4239 | | | | | Theta hat (MLE) | 0.35 | | | | Theta star (bias corrected MLE) | | 0.4 |
| 4240 | | | | | nu hat (MLE) | 52.02 | | | | nu star (bias corrected) | | 45.55 |
| 4241 | | | | | MLE Mean (bias corrected) | 0.456 | | | | MLE Sd (bias corrected) | | 0.427 |
| 4242 | | | | | | | | | | Adjusted Level of Significance (β) | | 0.038 |
| 4243 | | | | | Approximate Chi Square Value (45.55, α) | 31.07 | | | | Adjusted Chi Square Value (45.55, β) | | 30.12 |
| 4244 | | | | | 95% Gamma Approximate UCL (use when n>=50) | 0.668 | | | | 95% Gamma Adjusted UCL (use when n<50) | | 0.689 |
| 4245 | | | | | | | | | | | | |
| 4246 | **Lognormal GOF Test on Detected Observations Only** | | | | | | | | | | | |
| 4247 | | | | | Shapiro Wilk Test Statistic | 0.925 | **Shapiro Wilk GOF Test** | | | | | |
| 4248 | | | | | 5% Shapiro Wilk Critical Value | 0.818 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 4249 | | | | | Lilliefors Test Statistic | 0.202 | **Lilliefors GOF Test** | | | | | |
| 4250 | | | | | 5% Lilliefors Critical Value | 0.313 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 4251 | **Detected Data appear Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 4252 | | | | | | | | | | | | |
| 4253 | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | | | | | |
| 4254 | | | | | Mean in Original Scale | 0.471 | | | | Mean in Log Scale | | -1.083 |
| 4255 | | | | | SD in Original Scale | 0.461 | | | | SD in Log Scale | | 0.77 |
| 4256 | | | | | 95% t UCL (assumes normality of ROS data) | 0.65 | | | | 95% Percentile Bootstrap UCL | | 0.645 |
| 4257 | | | | | 95% BCA Bootstrap UCL | 0.685 | | | | 95% Bootstrap t UCL | | 0.757 |
| 4258 | | | | | 95% H-UCL (Log ROS) | 0.686 | | | | | | |
| 4259 | | | | | | | | | | | | |
| 4260 | **UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed** | | | | | | | | | | | |
| 4261 | | | | | KM Mean (logged) | -1.105 | | | | 95% H-UCL (KM -Log) | | 0.73 |
| 4262 | | | | | KM SD (logged) | 0.823 | | | | 95% Critical H Value (KM-Log) | | 2.39 |
| 4263 | | | | | KM Standard Error of Mean (logged) | 0.258 | | | | | | |

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| 4264 | | | | | | | | | | | | |
| 4265 | **DL/2 Statistics** | | | | | | | | | | | |
| 4266 | **DL/2 Normal** | | | | | | **DL/2 Log-Transformed** | | | | | |
| 4267 | Mean in Original Scale | | | | | 0.496 | Mean in Log Scale | | | | | -0.976 |
| 4268 | SD in Original Scale | | | | | 0.447 | SD in Log Scale | | | | | 0.697 |
| 4269 | 95% t UCL (Assumes normality) | | | | | 0.668 | 95% H-Stat UCL | | | | | 0.687 |
| 4270 | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | | | | | |
| 4271 | | | | | | | | | | | | |
| 4272 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 4273 | **Detected Data appear Normal Distributed at 5% Significance Level** | | | | | | | | | | | |
| 4274 | | | | | | | | | | | | |
| 4275 | **Suggested UCL to Use** | | | | | | | | | | | |
| 4276 | 95% KM (t) UCL | | | | | 0.679 | 95% KM (Percentile Bootstrap) UCL | | | | | 0.697 |
| 4277 | | | | | | | | | | | | |
| 4278 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 4279 | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | | | | | |
| 4280 | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | | | | | |
| 4281 | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 4282 | | | | | | | | | | | | |
| 4283 | **Toluene** | | | | | | | | | | | |
| 4284 | | | | | | | | | | | | |
| 4285 | **General Statistics** | | | | | | | | | | | |
| 4286 | Total Number of Observations | | | | | 24 | Number of Distinct Observations | | | | | 17 |
| 4287 | Number of Detects | | | | | 8 | Number of Non-Detects | | | | | 16 |
| 4288 | Number of Distinct Detects | | | | | 8 | Number of Distinct Non-Detects | | | | | 10 |
| 4289 | Minimum Detect | | | | | 0.83 | Minimum Non-Detect | | | | | 0.5 |
| 4290 | Maximum Detect | | | | | 20 | Maximum Non-Detect | | | | | 6.25 |
| 4291 | Variance Detects | | | | | 39.82 | Percent Non-Detects | | | | | 66.67% |
| 4292 | Mean Detects | | | | | 5.266 | SD Detects | | | | | 6.31 |
| 4293 | Median Detects | | | | | 2.75 | CV Detects | | | | | 1.198 |
| 4294 | Skewness Detects | | | | | 2.257 | Kurtosis Detects | | | | | 5.477 |
| 4295 | Mean of Logged Detects | | | | | 1.174 | SD of Logged Detects | | | | | 1.02 |
| 4296 | | | | | | | | | | | | |
| 4297 | **Normal GOF Test on Detects Only** | | | | | | | | | | | |
| 4298 | Shapiro Wilk Test Statistic | | | | | 0.705 | **Shapiro Wilk GOF Test** | | | | | |
| 4299 | 5% Shapiro Wilk Critical Value | | | | | 0.818 | Detected Data Not Normal at 5% Significance Level | | | | | |
| 4300 | Lilliefors Test Statistic | | | | | 0.297 | **Lilliefors GOF Test** | | | | | |
| 4301 | 5% Lilliefors Critical Value | | | | | 0.313 | Detected Data appear Normal at 5% Significance Level | | | | | |
| 4302 | **Detected Data appear Approximate Normal at 5% Significance Level** | | | | | | | | | | | |
| 4303 | | | | | | | | | | | | |
| 4304 | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | | | | | |
| 4305 | Mean | | | | | 2.692 | Standard Error of Mean | | | | | 0.908 |
| 4306 | SD | | | | | 3.95 | 95% KM (BCA) UCL | | | | | 4.25 |
| 4307 | 95% KM (t) UCL | | | | | 4.248 | 95% KM (Percentile Bootstrap) UCL | | | | | 4.31 |
| 4308 | 95% KM (z) UCL | | | | | 4.185 | 95% KM Bootstrap t UCL | | | | | 5.559 |
| 4309 | 90% KM Chebyshev UCL | | | | | 5.415 | 95% KM Chebyshev UCL | | | | | 6.649 |
| 4310 | 97.5% KM Chebyshev UCL | | | | | 8.362 | 99% KM Chebyshev UCL | | | | | 11.73 |
| 4311 | | | | | | | | | | | | |
| 4312 | **Gamma GOF Tests on Detected Observations Only** | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
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| 4313 | | | | | A-D Test Statistic | 0.398 | **Anderson-Darling GOF Test** | | | | | |
| 4314 | | | | | 5% A-D Critical Value | 0.733 | Detected data appear Gamma Distributed at 5% Significance Level | | | | | |
| 4315 | | | | | K-S Test Statistic | 0.203 | **Kolmogrov-Smirnoff GOF** | | | | | |
| 4316 | | | | | 5% K-S Critical Value | 0.301 | Detected data appear Gamma Distributed at 5% Significance Level | | | | | |
| 4317 | **Detected data appear Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 4318 | | | | | | | | | | | | |
| 4319 | **Gamma Statistics on Detected Data Only** | | | | | | | | | | | |
| 4320 | | | | | k hat (MLE) | 1.165 | | | | k star (bias corrected MLE) | | 0.811 |
| 4321 | | | | | Theta hat (MLE) | 4.52 | | | | Theta star (bias corrected MLE) | | 6.49 |
| 4322 | | | | | nu hat (MLE) | 18.64 | | | | nu star (bias corrected) | | 12.98 |
| 4323 | | | | | MLE Mean (bias corrected) | 5.266 | | | | MLE Sd (bias corrected) | | 5.846 |
| 4324 | | | | | | | | | | | | |
| 4325 | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | | | | | |
| 4326 | | | | | k hat (KM) | 0.464 | | | | nu hat (KM) | | 22.29 |
| 4327 | | | | | Approximate Chi Square Value (22.29, α) | 12.56 | | | | Adjusted Chi Square Value (22.29, β) | | 12.04 |
| 4328 | | | | | 95% Gamma Approximate KM-UCL (use when n>=50) | 4.779 | | | | 95% Gamma Adjusted KM-UCL (use when n<50) | | 4.982 |
| 4329 | | | | | | | | | | | | |
| 4330 | **Gamma ROS Statistics using Imputed Non-Detects** | | | | | | | | | | | |
| 4331 | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | | | | |
| 4332 | GROS may not be used when kstar of detected data is small such as < 0.1 | | | | | | | | | | | |
| 4333 | For such situations, GROS method tends to yield inflated values of UCLs and BTVs | | | | | | | | | | | |
| 4334 | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | | | | |
| 4335 | | | | | Minimum | 0.01 | | | | Mean | | 2.075 |
| 4336 | | | | | Maximum | 20 | | | | Median | | 0.536 |
| 4337 | | | | | SD | 4.238 | | | | CV | | 2.042 |
| 4338 | | | | | k hat (MLE) | 0.318 | | | | k star (bias corrected MLE) | | 0.306 |
| 4339 | | | | | Theta hat (MLE) | 6.527 | | | | Theta star (bias corrected MLE) | | 6.782 |
| 4340 | | | | | nu hat (MLE) | 15.26 | | | | nu star (bias corrected) | | 14.69 |
| 4341 | | | | | MLE Mean (bias corrected) | 2.075 | | | | MLE Sd (bias corrected) | | 3.751 |
| 4342 | | | | | | | | | | Adjusted Level of Significance (β) | | 0.0392 |
| 4343 | | | | | Approximate Chi Square Value (14.69, α) | 7.043 | | | | Adjusted Chi Square Value (14.69, β) | | 6.672 |
| 4344 | | | | | 95% Gamma Approximate UCL (use when n>=50) | 4.326 | | | | 95% Gamma Adjusted UCL (use when n<50) | | 4.566 |
| 4345 | | | | | | | | | | | | |
| 4346 | **Lognormal GOF Test on Detected Observations Only** | | | | | | | | | | | |
| 4347 | | | | | Shapiro Wilk Test Statistic | 0.966 | **Shapiro Wilk GOF Test** | | | | | |
| 4348 | | | | | 5% Shapiro Wilk Critical Value | 0.818 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 4349 | | | | | Lilliefors Test Statistic | 0.164 | **Lilliefors GOF Test** | | | | | |
| 4350 | | | | | 5% Lilliefors Critical Value | 0.313 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 4351 | **Detected Data appear Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 4352 | | | | | | | | | | | | |
| 4353 | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | | | | | |
| 4354 | | | | | Mean in Original Scale | 2.508 | | | | Mean in Log Scale | | 0.374 |
| 4355 | | | | | SD in Original Scale | 4.04 | | | | SD in Log Scale | | 0.938 |
| 4356 | | | | | 95% t UCL (assumes normality of ROS data) | 3.921 | | | | 95% Percentile Bootstrap UCL | | 3.984 |
| 4357 | | | | | 95% BCA Bootstrap UCL | 4.657 | | | | 95% Bootstrap t UCL | | 6.246 |
| 4358 | | | | | 95% H-UCL (Log ROS) | 3.655 | | | | | | |
| 4359 | | | | | | | | | | | | |
| 4360 | **UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed** | | | | | | | | | | | |
| 4361 | | | | | KM Mean (logged) | 0.449 | | | | 95% H-UCL (KM -Log) | | 4.033 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4362 | | | | KM SD (logged) | | 0.952 | | | 95% Critical H Value (KM-Log) | | | 2.479 |
| 4363 | | | | KM Standard Error of Mean (logged) | | 0.288 | | | | | | |
| 4364 | | | | | | | | | | | | |
| 4365 | | | | | | **DL/2 Statistics** | | | | | | |
| 4366 | | | | **DL/2 Normal** | | | | | **DL/2 Log-Transformed** | | | |
| 4367 | | | | Mean in Original Scale | | 3.294 | | | Mean in Log Scale | | | 0.828 |
| 4368 | | | | SD in Original Scale | | 3.828 | | | SD in Log Scale | | | 0.898 |
| 4369 | | | | 95% t UCL (Assumes normality) | | 4.633 | | | 95% H-Stat UCL | | | 5.376 |
| 4370 | | | | | | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | |
| 4371 | | | | | | | | | | | | |
| 4372 | | | | | | **Nonparametric Distribution Free UCL Statistics** | | | | | | |
| 4373 | | | | | | **Detected Data appear Approximate Normal Distributed at 5% Significance Level** | | | | | | |
| 4374 | | | | | | | | | | | | |
| 4375 | | | | | | **Suggested UCL to Use** | | | | | | |
| 4376 | | | | 95% KM (t) UCL | | 4.248 | | | 95% KM (Percentile Bootstrap) UCL | | | 4.31 |
| 4377 | | | | | | | | | | | | |
| 4378 | | | | | | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | |
| 4379 | | | | | | Recommendations are based upon data size, data distribution, and skewness. | | | | | | |
| 4380 | | | | | | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | |
| 4381 | | | | | | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | |
| 4382 | | | | | | | | | | | | |
| 4383 | | | | | | | | | | | | |
| 4384 | **Vanadium** | | | | | | | | | | | |
| 4385 | | | | | | | | | | | | |
| 4386 | | | | | | **General Statistics** | | | | | | |
| 4387 | | | | Total Number of Observations | | 25 | | | Number of Distinct Observations | | | 19 |
| 4388 | | | | | | | | | Number of Missing Observations | | | 0 |
| 4389 | | | | Minimum | | 27 | | | Mean | | | 41.28 |
| 4390 | | | | Maximum | | 90 | | | Median | | | 36 |
| 4391 | | | | SD | | 15.63 | | | Std. Error of Mean | | | 3.127 |
| 4392 | | | | Coefficient of Variation | | 0.379 | | | Skewness | | | 1.906 |
| 4393 | | | | | | | | | | | | |
| 4394 | | | | | | **Normal GOF Test** | | | | | | |
| 4395 | | | | Shapiro Wilk Test Statistic | | 0.785 | | | **Shapiro Wilk GOF Test** | | | |
| 4396 | | | | 5% Shapiro Wilk Critical Value | | 0.918 | | | Data Not Normal at 5% Significance Level | | | |
| 4397 | | | | Lilliefors Test Statistic | | 0.183 | | | **Lilliefors GOF Test** | | | |
| 4398 | | | | 5% Lilliefors Critical Value | | 0.177 | | | Data Not Normal at 5% Significance Level | | | |
| 4399 | | | | | | **Data Not Normal at 5% Significance Level** | | | | | | |
| 4400 | | | | | | | | | | | | |
| 4401 | | | | | | **Assuming Normal Distribution** | | | | | | |
| 4402 | | | | **95% Normal UCL** | | | | | **95% UCLs (Adjusted for Skewness)** | | | |
| 4403 | | | | 95% Student's-t UCL | | 46.63 | | | 95% Adjusted-CLT UCL (Chen-1995) | | | 47.7 |
| 4404 | | | | | | | | | 95% Modified-t UCL (Johnson-1978) | | | 46.83 |
| 4405 | | | | | | | | | | | | |
| 4406 | | | | | | **Gamma GOF Test** | | | | | | |
| 4407 | | | | A-D Test Statistic | | 1.069 | | | **Anderson-Darling Gamma GOF Test** | | | |
| 4408 | | | | 5% A-D Critical Value | | 0.745 | | | Data Not Gamma Distributed at 5% Significance Level | | | |
| 4409 | | | | K-S Test Statistic | | 0.157 | | | **Kolmogrov-Smirnoff Gamma GOF Test** | | | |
| 4410 | | | | 5% K-S Critical Value | | 0.175 | | | Detected data appear Gamma Distributed at 5% Significance Level | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
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| 4411 | **Detected data follow Appr. Gamma Distribution at 5% Significance Level** | | | | | | | | | | | |
| 4412 | | | | | | | | | | | | |
| 4413 | **Gamma Statistics** | | | | | | | | | | | |
| 4414 | k hat (MLE) | | | | | 9.463 | k star (bias corrected MLE) | | | | | 8.354 |
| 4415 | Theta hat (MLE) | | | | | 4.363 | Theta star (bias corrected MLE) | | | | | 4.942 |
| 4416 | nu hat (MLE) | | | | | 473.1 | nu star (bias corrected) | | | | | 417.7 |
| 4417 | MLE Mean (bias corrected) | | | | | 41.28 | MLE Sd (bias corrected) | | | | | 14.28 |
| 4418 | | | | | | | Approximate Chi Square Value (0.05) | | | | | 371.3 |
| 4419 | Adjusted Level of Significance | | | | | 0.0395 | Adjusted Chi Square Value | | | | | 368.3 |
| 4420 | | | | | | | | | | | | |
| 4421 | **Assuming Gamma Distribution** | | | | | | | | | | | |
| 4422 | 95% Approximate Gamma UCL (use when n>=50) | | | | | 46.44 | 95% Adjusted Gamma UCL (use when n<50) | | | | | 46.82 |
| 4423 | | | | | | | | | | | | |
| 4424 | **Lognormal GOF Test** | | | | | | | | | | | |
| 4425 | Shapiro Wilk Test Statistic | | | | | 0.892 | **Shapiro Wilk Lognormal GOF Test** | | | | | |
| 4426 | 5% Shapiro Wilk Critical Value | | | | | 0.918 | Data Not Lognormal at 5% Significance Level | | | | | |
| 4427 | Lilliefors Test Statistic | | | | | 0.137 | **Lilliefors Lognormal GOF Test** | | | | | |
| 4428 | 5% Lilliefors Critical Value | | | | | 0.177 | Data appear Lognormal at 5% Significance Level | | | | | |
| 4429 | **Data appear Approximate Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 4430 | | | | | | | | | | | | |
| 4431 | **Lognormal Statistics** | | | | | | | | | | | |
| 4432 | Minimum of Logged Data | | | | | 3.296 | Mean of logged Data | | | | | 3.667 |
| 4433 | Maximum of Logged Data | | | | | 4.5 | SD of logged Data | | | | | 0.317 |
| 4434 | | | | | | | | | | | | |
| 4435 | **Assuming Lognormal Distribution** | | | | | | | | | | | |
| 4436 | 95% H-UCL | | | | | 46.29 | 90% Chebyshev (MVUE) UCL | | | | | 48.99 |
| 4437 | 95% Chebyshev (MVUE) UCL | | | | | 52.58 | 97.5% Chebyshev (MVUE) UCL | | | | | 57.57 |
| 4438 | 99% Chebyshev (MVUE) UCL | | | | | 67.37 | | | | | | |
| 4439 | | | | | | | | | | | | |
| 4440 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 4441 | **Data appear to follow a Discernible Distribution at 5% Significance Level** | | | | | | | | | | | |
| 4442 | | | | | | | | | | | | |
| 4443 | **Nonparametric Distribution Free UCLs** | | | | | | | | | | | |
| 4444 | 95% CLT UCL | | | | | 46.43 | 95% Jackknife UCL | | | | | 46.63 |
| 4445 | 95% Standard Bootstrap UCL | | | | | 46.3 | 95% Bootstrap-t UCL | | | | | 49.9 |
| 4446 | 95% Hall's Bootstrap UCL | | | | | 53.37 | 95% Percentile Bootstrap UCL | | | | | 46.74 |
| 4447 | 95% BCA Bootstrap UCL | | | | | 47.64 | | | | | | |
| 4448 | 90% Chebyshev(Mean, Sd) UCL | | | | | 50.66 | 95% Chebyshev(Mean, Sd) UCL | | | | | 54.91 |
| 4449 | 97.5% Chebyshev(Mean, Sd) UCL | | | | | 60.81 | 99% Chebyshev(Mean, Sd) UCL | | | | | 72.4 |
| 4450 | | | | | | | | | | | | |
| 4451 | **Suggested UCL to Use** | | | | | | | | | | | |
| 4452 | 95% Adjusted Gamma UCL | | | | | 46.82 | | | | | | |
| 4453 | | | | | | | | | | | | |
| 4454 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 4455 | These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) | | | | | | | | | | | |
| 4456 | and Singh and Singh (2003). However, simulations results will not cover all Real World data sets. | | | | | | | | | | | |
| 4457 | For additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 4458 | | | | | | | | | | | | |
| 4459 | **Xylene (total)** | | | | | | | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4460 | | | | | | | | | | | | |
| 4461 | **General Statistics** | | | | | | | | | | | |
| 4462 | | | | | Total Number of Observations | 24 | | | Number of Distinct Observations | 17 | | |
| 4463 | | | | | Number of Detects | 8 | | | Number of Non-Detects | 16 | | |
| 4464 | | | | | Number of Distinct Detects | 7 | | | Number of Distinct Non-Detects | 10 | | |
| 4465 | | | | | Minimum Detect | 1.6 | | | Minimum Non-Detect | 0.5 | | |
| 4466 | | | | | Maximum Detect | 37 | | | Maximum Non-Detect | 12 | | |
| 4467 | | | | | Variance Detects | 158.7 | | | Percent Non-Detects | 66.67% | | |
| 4468 | | | | | Mean Detects | 9.675 | | | SD Detects | 12.6 | | |
| 4469 | | | | | Median Detects | 4.4 | | | CV Detects | 1.302 | | |
| 4470 | | | | | Skewness Detects | 1.871 | | | Kurtosis Detects | 3.033 | | |
| 4471 | | | | | Mean of Logged Detects | 1.626 | | | SD of Logged Detects | 1.17 | | |
| 4472 | | | | | | | | | | | | |
| 4473 | **Normal GOF Test on Detects Only** | | | | | | | | | | | |
| 4474 | | | | | Shapiro Wilk Test Statistic | 0.712 | | | **Shapiro Wilk GOF Test** | | | |
| 4475 | | | | | 5% Shapiro Wilk Critical Value | 0.818 | | | Detected Data Not Normal at 5% Significance Level | | | |
| 4476 | | | | | Lilliefors Test Statistic | 0.353 | | | **Lilliefors GOF Test** | | | |
| 4477 | | | | | 5% Lilliefors Critical Value | 0.313 | | | Detected Data Not Normal at 5% Significance Level | | | |
| 4478 | **Detected Data Not Normal at 5% Significance Level** | | | | | | | | | | | |
| 4479 | | | | | | | | | | | | |
| 4480 | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | | | | | |
| 4481 | | | | | Mean | 4.664 | | | Standard Error of Mean | 1.777 | | |
| 4482 | | | | | SD | 7.818 | | | 95% KM (BCA) UCL | 8.166 | | |
| 4483 | | | | | 95% KM (t) UCL | 7.709 | | | 95% KM (Percentile Bootstrap) UCL | 7.548 | | |
| 4484 | | | | | 95% KM (z) UCL | 7.587 | | | 95% KM Bootstrap t UCL | 10.83 | | |
| 4485 | | | | | 90% KM Chebyshev UCL | 9.995 | | | 95% KM Chebyshev UCL | 12.41 | | |
| 4486 | | | | | 97.5% KM Chebyshev UCL | 15.76 | | | 99% KM Chebyshev UCL | 22.34 | | |
| 4487 | | | | | | | | | | | | |
| 4488 | **Gamma GOF Tests on Detected Observations Only** | | | | | | | | | | | |
| 4489 | | | | | A-D Test Statistic | 0.59 | | | **Anderson-Darling GOF Test** | | | |
| 4490 | | | | | 5% A-D Critical Value | 0.739 | | | Detected data appear Gamma Distributed at 5% Significance Level | | | |
| 4491 | | | | | K-S Test Statistic | 0.252 | | | **Kolmogrov-Smirnoff GOF** | | | |
| 4492 | | | | | 5% K-S Critical Value | 0.302 | | | Detected data appear Gamma Distributed at 5% Significance Level | | | |
| 4493 | **Detected data appear Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 4494 | | | | | | | | | | | | |
| 4495 | **Gamma Statistics on Detected Data Only** | | | | | | | | | | | |
| 4496 | | | | | k hat (MLE) | 0.907 | | | k star (bias corrected MLE) | 0.65 | | |
| 4497 | | | | | Theta hat (MLE) | 10.66 | | | Theta star (bias corrected MLE) | 14.88 | | |
| 4498 | | | | | nu hat (MLE) | 14.52 | | | nu star (bias corrected) | 10.41 | | |
| 4499 | | | | | MLE Mean (bias corrected) | 9.675 | | | MLE Sd (bias corrected) | 12 | | |
| 4500 | | | | | | | | | | | | |
| 4501 | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | | | | | |
| 4502 | | | | | k hat (KM) | 0.356 | | | nu hat (KM) | 17.09 | | |
| 4503 | | | | | Approximate Chi Square Value (17.09, α) | 8.734 | | | Adjusted Chi Square Value (17.09, β) | 8.315 | | |
| 4504 | | | | | 95% Gamma Approximate KM-UCL (use when n>=50) | 9.125 | | | 95% Gamma Adjusted KM-UCL (use when n<50) | 9.585 | | |
| 4505 | | | | | | | | | | | | |
| 4506 | **Gamma ROS Statistics using Imputed Non-Detects** | | | | | | | | | | | |
| 4507 | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | | | | |
| 4508 | GROS may not be used when kstar of detected data is small such as < 0.1 | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4509 | For such situations, GROS method tends to yield inflated values of UCLs and BTVs | | | | | | | | | | | |
| 4510 | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | | | | |
| 4511 | | | | | Minimum | 0.01 | | | | Mean | | 3.727 |
| 4512 | | | | | Maximum | 37 | | | | Median | | 0.01 |
| 4513 | | | | | SD | 8.279 | | | | CV | | 2.221 |
| 4514 | | | | | k hat (MLE) | 0.232 | | | | k star (bias corrected MLE) | | 0.231 |
| 4515 | | | | | Theta hat (MLE) | 16.07 | | | | Theta star (bias corrected MLE) | | 16.15 |
| 4516 | | | | | nu hat (MLE) | 11.13 | | | | nu star (bias corrected) | | 11.08 |
| 4517 | | | | | MLE Mean (bias corrected) | 3.727 | | | | MLE Sd (bias corrected) | | 7.758 |
| 4518 | | | | | | | | | | Adjusted Level of Significance (β) | | 0.0392 |
| 4519 | | | | | Approximate Chi Square Value (11.08, α) | 4.625 | | | | Adjusted Chi Square Value (11.08, β) | | 4.334 |
| 4520 | | | | | 95% Gamma Approximate UCL (use when n>=50) | 8.925 | | | | 95% Gamma Adjusted UCL (use when n<50) | | 9.523 |
| 4521 | | | | | | | | | | | | |
| 4522 | **Lognormal GOF Test on Detected Observations Only** | | | | | | | | | | | |
| 4523 | | | | | Shapiro Wilk Test Statistic | 0.896 | | | | **Shapiro Wilk GOF Test** | | |
| 4524 | | | | | 5% Shapiro Wilk Critical Value | 0.818 | | | | Detected Data appear Lognormal at 5% Significance Level | | |
| 4525 | | | | | Lilliefors Test Statistic | 0.172 | | | | **Lilliefors GOF Test** | | |
| 4526 | | | | | 5% Lilliefors Critical Value | 0.313 | | | | Detected Data appear Lognormal at 5% Significance Level | | |
| 4527 | **Detected Data appear Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 4528 | | | | | | | | | | | | |
| 4529 | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | | | | | |
| 4530 | | | | | Mean in Original Scale | 4.383 | | | | Mean in Log Scale | | 0.783 |
| 4531 | | | | | SD in Original Scale | 7.975 | | | | SD in Log Scale | | 1.046 |
| 4532 | | | | | 95% t UCL (assumes normality of ROS data) | 7.173 | | | | 95% Percentile Bootstrap UCL | | 7.205 |
| 4533 | | | | | 95% BCA Bootstrap UCL | 8.501 | | | | 95% Bootstrap t UCL | | 17.3 |
| 4534 | | | | | 95% H-UCL (Log ROS) | 6.673 | | | | | | |
| 4535 | | | | | | | | | | | | |
| 4536 | **UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed** | | | | | | | | | | | |
| 4537 | | | | | KM Mean (logged) | 0.796 | | | | 95% H-UCL (KM -Log) | | 8.09 |
| 4538 | | | | | KM SD (logged) | 1.138 | | | | 95% Critical H Value (KM-Log) | | 2.73 |
| 4539 | | | | | KM Standard Error of Mean (logged) | 0.345 | | | | | | |
| 4540 | | | | | | | | | | | | |
| 4541 | **DL/2 Statistics** | | | | | | | | | | | |
| 4542 | **DL/2 Normal** | | | | | | **DL/2 Log-Transformed** | | | | | |
| 4543 | | | | | Mean in Original Scale | 5.809 | | | | Mean in Log Scale | | 1.273 |
| 4544 | | | | | SD in Original Scale | 7.618 | | | | SD in Log Scale | | 1.063 |
| 4545 | | | | | 95% t UCL (Assumes normality) | 8.475 | | | | 95% H-Stat UCL | | 11.25 |
| 4546 | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | | | | | |
| 4547 | | | | | | | | | | | | |
| 4548 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 4549 | **Detected Data appear Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 4550 | | | | | | | | | | | | |
| 4551 | **Suggested UCL to Use** | | | | | | | | | | | |
| 4552 | | | | | 95% KM (t) UCL | 7.709 | | | | 95% GROS Adjusted Gamma UCL | | 9.523 |
| 4553 | | | | | 95% Adjusted Gamma KM-UCL | 9.585 | | | | | | |
| 4554 | | | | | | | | | | | | |
| 4555 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 4556 | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | | | | | |
| 4557 | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4558 | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 4559 | | | | | | | | | | | | |
| 4560 | | | | | | | | | | | | |
| 4561 | **Zinc** | | | | | | | | | | | |
| 4562 | | | | | | | | | | | | |
| 4563 | **General Statistics** | | | | | | | | | | | |
| 4564 | | | | Total Number of Observations | | 26 | | | Number of Distinct Observations | | | 20 |
| 4565 | | | | | | | | | Number of Missing Observations | | | 0 |
| 4566 | | | | Minimum | | 23 | | | Mean | | | 341.1 |
| 4567 | | | | Maximum | | 2420 | | | Median | | | 180 |
| 4568 | | | | SD | | 522.7 | | | Std. Error of Mean | | | 102.5 |
| 4569 | | | | Coefficient of Variation | | 1.532 | | | Skewness | | | 3.128 |
| 4570 | | | | | | | | | | | | |
| 4571 | **Normal GOF Test** | | | | | | | | | | | |
| 4572 | | | | Shapiro Wilk Test Statistic | | 0.588 | **Shapiro Wilk GOF Test** | | | | | |
| 4573 | | | | 5% Shapiro Wilk Critical Value | | 0.92 | Data Not Normal at 5% Significance Level | | | | | |
| 4574 | | | | Lilliefors Test Statistic | | 0.271 | **Lilliefors GOF Test** | | | | | |
| 4575 | | | | 5% Lilliefors Critical Value | | 0.174 | Data Not Normal at 5% Significance Level | | | | | |
| 4576 | **Data Not Normal at 5% Significance Level** | | | | | | | | | | | |
| 4577 | | | | | | | | | | | | |
| 4578 | **Assuming Normal Distribution** | | | | | | | | | | | |
| 4579 | **95% Normal UCL** | | | | | | **95% UCLs (Adjusted for Skewness)** | | | | | |
| 4580 | | | | 95% Student's-t UCL | | 516.2 | | | 95% Adjusted-CLT UCL (Chen-1995) | | | 576.9 |
| 4581 | | | | | | | | | 95% Modified-t UCL (Johnson-1978) | | | 526.7 |
| 4582 | | | | | | | | | | | | |
| 4583 | **Gamma GOF Test** | | | | | | | | | | | |
| 4584 | | | | A-D Test Statistic | | 0.805 | **Anderson-Darling Gamma GOF Test** | | | | | |
| 4585 | | | | 5% A-D Critical Value | | 0.781 | Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 4586 | | | | K-S Test Statistic | | 0.155 | **Kolmogrov-Smirnoff Gamma GOF Test** | | | | | |
| 4587 | | | | 5% K-S Critical Value | | 0.178 | Detected data appear Gamma Distributed at 5% Significance Level | | | | | |
| 4588 | **Detected data follow Appr. Gamma Distribution at 5% Significance Level** | | | | | | | | | | | |
| 4589 | | | | | | | | | | | | |
| 4590 | **Gamma Statistics** | | | | | | | | | | | |
| 4591 | | | | k hat (MLE) | | 0.823 | | | k star (bias corrected MLE) | | | 0.754 |
| 4592 | | | | Theta hat (MLE) | | 414.5 | | | Theta star (bias corrected MLE) | | | 452.6 |
| 4593 | | | | nu hat (MLE) | | 42.8 | | | nu star (bias corrected) | | | 39.19 |
| 4594 | | | | MLE Mean (bias corrected) | | 341.1 | | | MLE Sd (bias corrected) | | | 392.9 |
| 4595 | | | | | | | | | Approximate Chi Square Value (0.05) | | | 25.85 |
| 4596 | | | | Adjusted Level of Significance | | 0.0398 | | | Adjusted Chi Square Value | | | 25.14 |
| 4597 | | | | | | | | | | | | |
| 4598 | **Assuming Gamma Distribution** | | | | | | | | | | | |
| 4599 | | | | 95% Approximate Gamma UCL (use when n>=50) | | 517.2 | | | 95% Adjusted Gamma UCL (use when n<50) | | | 531.9 |
| 4600 | | | | | | | | | | | | |
| 4601 | **Lognormal GOF Test** | | | | | | | | | | | |
| 4602 | | | | Shapiro Wilk Test Statistic | | 0.967 | **Shapiro Wilk Lognormal GOF Test** | | | | | |
| 4603 | | | | 5% Shapiro Wilk Critical Value | | 0.92 | Data appear Lognormal at 5% Significance Level | | | | | |
| 4604 | | | | Lilliefors Test Statistic | | 0.118 | **Lilliefors Lognormal GOF Test** | | | | | |
| 4605 | | | | 5% Lilliefors Critical Value | | 0.174 | Data appear Lognormal at 5% Significance Level | | | | | |
| 4606 | **Data appear Lognormal at 5% Significance Level** | | | | | | | | | | | |

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| 4607 | | | | | | | | | | | | |
| 4608 | **Lognormal Statistics** | | | | | | | | | | | |
| 4609 | Minimum of Logged Data | | | | | 3.135 | Mean of logged Data | | | | | 5.114 |
| 4610 | Maximum of Logged Data | | | | | 7.792 | SD of logged Data | | | | | 1.201 |
| 4611 | | | | | | | | | | | | |
| 4612 | **Assuming Lognormal Distribution** | | | | | | | | | | | |
| 4613 | 95% H-UCL | | | | | 666 | 90% Chebyshev (MVUE) UCL | | | | | 600 |
| 4614 | 95% Chebyshev (MVUE) UCL | | | | | 723.7 | 97.5% Chebyshev (MVUE) UCL | | | | | 895.3 |
| 4615 | 99% Chebyshev (MVUE) UCL | | | | | 1232 | | | | | | |
| 4616 | | | | | | | | | | | | |
| 4617 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 4618 | **Data appear to follow a Discernible Distribution at 5% Significance Level** | | | | | | | | | | | |
| 4619 | | | | | | | | | | | | |
| 4620 | **Nonparametric Distribution Free UCLs** | | | | | | | | | | | |
| 4621 | 95% CLT UCL | | | | | 509.7 | 95% Jackknife UCL | | | | | 516.2 |
| 4622 | 95% Standard Bootstrap UCL | | | | | 507.2 | 95% Bootstrap-t UCL | | | | | 785 |
| 4623 | 95% Hall's Bootstrap UCL | | | | | 1333 | 95% Percentile Bootstrap UCL | | | | | 521.3 |
| 4624 | 95% BCA Bootstrap UCL | | | | | 592.8 | | | | | | |
| 4625 | 90% Chebyshev(Mean, Sd) UCL | | | | | 648.7 | 95% Chebyshev(Mean, Sd) UCL | | | | | 788 |
| 4626 | 97.5% Chebyshev(Mean, Sd) UCL | | | | | 981.3 | 99% Chebyshev(Mean, Sd) UCL | | | | | 1361 |
| 4627 | | | | | | | | | | | | |
| 4628 | **Suggested UCL to Use** | | | | | | | | | | | |
| 4629 | 95% Adjusted Gamma UCL | | | | | 531.9 | | | | | | |
| 4630 | | | | | | | | | | | | |
| 4631 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 4632 | These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) | | | | | | | | | | | |
| 4633 | and Singh and Singh (2003). However, simulations results will not cover all Real World data sets. | | | | | | | | | | | |
| 4634 | For additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 4635 | | | | | | | | | | | | |

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| 1 | **UCL Statistics for Total Soil** | | | | | | | | | | | |
| 2 | | | | | | | | | | | | |
| 3 | User Selected Options | | | | | | | | | | | |
| 4 | Date/Time of Computation | 6/2/2015 9:35:05 PM | | | | | | | | | | |
| 5 | From File | Oakland_ProUCLInput_a.xls | | | | | | | | | | |
| 6 | Full Precision | OFF | | | | | | | | | | |
| 7 | Confidence Coefficient | 95% | | | | | | | | | | |
| 8 | Number of Bootstrap Operations | 2000 | | | | | | | | | | |
| 9 | | | | | | | | | | | | |
| 10 | **1,2,4-Trichlorobenzene** | | | | | | | | | | | |
| 11 | | | | | | | | | | | | |
| 12 | **General Statistics** | | | | | | | | | | | |
| 13 | Total Number of Observations | 120 | Number of Distinct Observations | 46 | | | | | | | | |
| 14 | Number of Detects | 1 | Number of Non-Detects | 119 | | | | | | | | |
| 15 | Number of Distinct Detects | 1 | Number of Distinct Non-Detects | 45 | | | | | | | | |
| 16 | | | | | | | | | | | | |
| 17 | **Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!** | | | | | | | | | | | |
| 18 | **It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).** | | | | | | | | | | | |
| 19 | | | | | | | | | | | | |
| 20 | **The data set for variable 1,2,4-Trichlorobenzene was not processed!** | | | | | | | | | | | |
| 21 | | | | | | | | | | | | |
| 22 | | | | | | | | | | | | |
| 23 | **1,2-Dichloroethane** | | | | | | | | | | | |
| 24 | | | | | | | | | | | | |
| 25 | **General Statistics** | | | | | | | | | | | |
| 26 | Total Number of Observations | 81 | Number of Distinct Observations | 25 | | | | | | | | |
| 27 | Number of Detects | 4 | Number of Non-Detects | 77 | | | | | | | | |
| 28 | Number of Distinct Detects | 4 | Number of Distinct Non-Detects | 22 | | | | | | | | |
| 29 | Minimum Detect | 0.33 | Minimum Non-Detect | 0.5 | | | | | | | | |
| 30 | Maximum Detect | 6 | Maximum Non-Detect | 6.25 | | | | | | | | |
| 31 | Variance Detects | 7.806 | Percent Non-Detects | 95.06% | | | | | | | | |
| 32 | Mean Detects | 1.81 | SD Detects | 2.794 | | | | | | | | |
| 33 | Median Detects | 0.455 | CV Detects | 1.544 | | | | | | | | |
| 34 | Skewness Detects | 1.997 | Kurtosis Detects | 3.991 | | | | | | | | |
| 35 | Mean of Logged Detects | -0.223 | SD of Logged Detects | 1.352 | | | | | | | | |
| 36 | | | | | | | | | | | | |
| 37 | **Normal GOF Test on Detects Only** | | | | | | | | | | | |
| 38 | Shapiro Wilk Test Statistic | 0.65 | **Shapiro Wilk GOF Test** | | | | | | | | | |
| 39 | 5% Shapiro Wilk Critical Value | 0.748 | Detected Data Not Normal at 5% Significance Level | | | | | | | | | |
| 40 | Lilliefors Test Statistic | 0.434 | **Lilliefors GOF Test** | | | | | | | | | |
| 41 | 5% Lilliefors Critical Value | 0.443 | Detected Data appear Normal at 5% Significance Level | | | | | | | | | |
| 42 | **Detected Data appear Approximate Normal at 5% Significance Level** | | | | | | | | | | | |
| 43 | | | | | | | | | | | | |
| 44 | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | | | | | |
| 45 | Mean | 0.483 | Standard Error of Mean | 0.0894 | | | | | | | | |
| 46 | SD | 0.624 | 95% KM (BCA) UCL | N/A | | | | | | | | |
| 47 | 95% KM (t) UCL | 0.632 | 95% KM (Percentile Bootstrap) UCL | N/A | | | | | | | | |
| 48 | 95% KM (z) UCL | 0.63 | 95% KM Bootstrap t UCL | N/A | | | | | | | | |
| 49 | 90% KM Chebyshev UCL | 0.751 | 95% KM Chebyshev UCL | 0.873 | | | | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 50 | 97.5% KM Chebyshev UCL | | | | | 1.041 | 99% KM Chebyshev UCL | | | | | 1.373 |
| 51 | | | | | | | | | | | | |
| 52 | **Gamma GOF Tests on Detected Observations Only** | | | | | | | | | | | |
| 53 | A-D Test Statistic | | | | | 0.804 | **Anderson-Darling GOF Test** | | | | | |
| 54 | 5% A-D Critical Value | | | | | 0.671 | Detected Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 55 | K-S Test Statistic | | | | | 0.451 | **Kolmogrov-Smirnoff GOF** | | | | | |
| 56 | 5% K-S Critical Value | | | | | 0.405 | Detected Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 57 | **Detected Data Not Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 58 | | | | | | | | | | | | |
| 59 | **Gamma Statistics on Detected Data Only** | | | | | | | | | | | |
| 60 | k hat (MLE) | | | | | 0.735 | k star (bias corrected MLE) | | | | | 0.35 |
| 61 | Theta hat (MLE) | | | | | 2.462 | Theta star (bias corrected MLE) | | | | | 5.165 |
| 62 | nu hat (MLE) | | | | | 5.881 | nu star (bias corrected) | | | | | 2.804 |
| 63 | MLE Mean (bias corrected) | | | | | 1.81 | MLE Sd (bias corrected) | | | | | 3.058 |
| 64 | | | | | | | | | | | | |
| 65 | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | | | | | |
| 66 | k hat (KM) | | | | | 0.6 | nu hat (KM) | | | | | 97.26 |
| 67 | Approximate Chi Square Value (97.26, α) | | | | | 75.51 | Adjusted Chi Square Value (97.26, β) | | | | | 75.17 |
| 68 | 95% Gamma Approximate KM-UCL (use when n>=50) | | | | | 0.622 | 95% Gamma Adjusted KM-UCL (use when n<50) | | | | | 0.625 |
| 69 | | | | | | | | | | | | |
| 70 | **Gamma ROS Statistics using Imputed Non-Detects** | | | | | | | | | | | |
| 71 | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | | | | |
| 72 | GROS may not be used when kstar of detected data is small such as < 0.1 | | | | | | | | | | | |
| 73 | For such situations, GROS method tends to yield inflated values of UCLs and BTVs | | | | | | | | | | | |
| 74 | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | | | | |
| 75 | Minimum | | | | | 0.01 | Mean | | | | | 0.583 |
| 76 | Maximum | | | | | 6 | Median | | | | | 0.329 |
| 77 | SD | | | | | 0.819 | CV | | | | | 1.405 |
| 78 | k hat (MLE) | | | | | 0.563 | k star (bias corrected MLE) | | | | | 0.55 |
| 79 | Theta hat (MLE) | | | | | 1.036 | Theta star (bias corrected MLE) | | | | | 1.06 |
| 80 | nu hat (MLE) | | | | | 91.18 | nu star (bias corrected) | | | | | 89.14 |
| 81 | MLE Mean (bias corrected) | | | | | 0.583 | MLE Sd (bias corrected) | | | | | 0.786 |
| 82 | | | | | | | Adjusted Level of Significance (β) | | | | | 0.047 |
| 83 | Approximate Chi Square Value (89.14, α) | | | | | 68.37 | Adjusted Chi Square Value (89.14, β) | | | | | 68.04 |
| 84 | 95% Gamma Approximate UCL (use when n>=50) | | | | | 0.76 | 95% Gamma Adjusted UCL (use when n<50) | | | | | N/A |
| 85 | | | | | | | | | | | | |
| 86 | **Lognormal GOF Test on Detected Observations Only** | | | | | | | | | | | |
| 87 | Shapiro Wilk Test Statistic | | | | | 0.732 | **Shapiro Wilk GOF Test** | | | | | |
| 88 | 5% Shapiro Wilk Critical Value | | | | | 0.748 | Detected Data Not Lognormal at 5% Significance Level | | | | | |
| 89 | Lilliefors Test Statistic | | | | | 0.403 | **Lilliefors GOF Test** | | | | | |
| 90 | 5% Lilliefors Critical Value | | | | | 0.443 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 91 | **Detected Data appear Approximate Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 92 | | | | | | | | | | | | |
| 93 | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | | | | | |
| 94 | Mean in Original Scale | | | | | 0.586 | Mean in Log Scale | | | | | -0.787 |
| 95 | SD in Original Scale | | | | | 0.68 | SD in Log Scale | | | | | 0.647 |
| 96 | 95% t UCL (assumes normality of ROS data) | | | | | 0.712 | 95% Percentile Bootstrap UCL | | | | | 0.721 |
| 97 | 95% BCA Bootstrap UCL | | | | | 0.791 | 95% Bootstrap t UCL | | | | | 0.844 |
| 98 | 95% H-UCL (Log ROS) | | | | | 0.645 | | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 99 | | | | | | | | | | | | |
| 100 | **UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed** | | | | | | | | | | | |
| 101 | | | | | KM Mean (logged) | -0.861 | | | | 95% H-UCL (KM -Log) | 0.477 | |
| 102 | | | | | KM SD (logged) | 0.335 | | | | 95% Critical H Value (KM-Log) | 1.755 | |
| 103 | | | | | KM Standard Error of Mean (logged) | 0.108 | | | | | | |
| 104 | | | | | | | | | | | | |
| 105 | **DL/2 Statistics** | | | | | | | | | | | |
| 106 | **DL/2 Normal** | | | | | | | **DL/2 Log-Transformed** | | | | |
| 107 | | | | | Mean in Original Scale | 2.336 | | | | Mean in Log Scale | 0.767 | |
| 108 | | | | | SD in Original Scale | 0.705 | | | | SD in Log Scale | 0.507 | |
| 109 | | | | | 95% t UCL (Assumes normality) | 2.466 | | | | 95% H-Stat UCL | 2.718 | |
| 110 | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | | | | | |
| 111 | | | | | | | | | | | | |
| 112 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 113 | **Detected Data appear Approximate Normal Distributed at 5% Significance Level** | | | | | | | | | | | |
| 114 | | | | | | | | | | | | |
| 115 | **Suggested UCL to Use** | | | | | | | | | | | |
| 116 | | | | | 95% KM (t) UCL | 0.632 | | | | 95% KM (Percentile Bootstrap) UCL | N/A | |
| 117 | **Warning: One or more Recommended UCL(s) not available!** | | | | | | | | | | | |
| 118 | | | | | | | | | | | | |
| 119 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 120 | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | | | | | |
| 121 | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | | | | | |
| 122 | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 123 | | | | | | | | | | | | |
| 124 | **2-Chloronaphthalene** | | | | | | | | | | | |
| 125 | | | | | | | | | | | | |
| 126 | **General Statistics** | | | | | | | | | | | |
| 127 | | | | | Total Number of Observations | 120 | | | | Number of Distinct Observations | 45 | |
| 128 | | | | | Number of Detects | 1 | | | | Number of Non-Detects | 119 | |
| 129 | | | | | Number of Distinct Detects | 1 | | | | Number of Distinct Non-Detects | 45 | |
| 130 | | | | | | | | | | | | |
| 131 | **Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!** | | | | | | | | | | | |
| 132 | **It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).** | | | | | | | | | | | |
| 133 | | | | | | | | | | | | |
| 134 | **The data set for variable 2-Chloronaphthalene was not processed!** | | | | | | | | | | | |
| 135 | | | | | | | | | | | | |
| 136 | | | | | | | | | | | | |
| 137 | **2-Methylnaphthalene** | | | | | | | | | | | |
| 138 | | | | | | | | | | | | |
| 139 | **General Statistics** | | | | | | | | | | | |
| 140 | | | | | Total Number of Observations | 133 | | | | Number of Distinct Observations | 60 | |
| 141 | | | | | Number of Detects | 24 | | | | Number of Non-Detects | 109 | |
| 142 | | | | | Number of Distinct Detects | 21 | | | | Number of Distinct Non-Detects | 41 | |
| 143 | | | | | Minimum Detect | 7.9 | | | | Minimum Non-Detect | 69 | |
| 144 | | | | | Maximum Detect | 4800 | | | | Maximum Non-Detect | 15000 | |
| 145 | | | | | Variance Detects | 989795 | | | | Percent Non-Detects | 81.95% | |
| 146 | | | | | Mean Detects | 379.1 | | | | SD Detects | 994.9 | |
| 147 | | | | | Median Detects | 100 | | | | CV Detects | 2.624 | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 148 | | | | Skewness Detects | | 4.223 | | | | Kurtosis Detects | | 18.72 |
| 149 | | | | Mean of Logged Detects | | 4.627 | | | | SD of Logged Detects | | 1.459 |
| 150 | | | | | | | | | | | | |
| 151 | **Normal GOF Test on Detects Only** | | | | | | | | | | | |
| 152 | | | | Shapiro Wilk Test Statistic | | 0.38 | **Shapiro Wilk GOF Test** | | | | | |
| 153 | | | | 5% Shapiro Wilk Critical Value | | 0.916 | Detected Data Not Normal at 5% Significance Level | | | | | |
| 154 | | | | Lilliefors Test Statistic | | 0.404 | **Lilliefors GOF Test** | | | | | |
| 155 | | | | 5% Lilliefors Critical Value | | 0.181 | Detected Data Not Normal at 5% Significance Level | | | | | |
| 156 | **Detected Data Not Normal at 5% Significance Level** | | | | | | | | | | | |
| 157 | | | | | | | | | | | | |
| 158 | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | | | | | |
| 159 | | | | Mean | | 106.4 | | | | Standard Error of Mean | | 39.93 |
| 160 | | | | SD | | 440.5 | | | | 95% KM (BCA) UCL | | 189.5 |
| 161 | | | | 95% KM (t) UCL | | 172.5 | | | | 95% KM (Percentile Bootstrap) UCL | | 178.6 |
| 162 | | | | 95% KM (z) UCL | | 172.1 | | | | 95% KM Bootstrap t UCL | | 379.2 |
| 163 | | | | 90% KM Chebyshev UCL | | 226.2 | | | | 95% KM Chebyshev UCL | | 280.4 |
| 164 | | | | 97.5% KM Chebyshev UCL | | 355.8 | | | | 99% KM Chebyshev UCL | | 503.7 |
| 165 | | | | | | | | | | | | |
| 166 | **Gamma GOF Tests on Detected Observations Only** | | | | | | | | | | | |
| 167 | | | | A-D Test Statistic | | 1.97 | **Anderson-Darling GOF Test** | | | | | |
| 168 | | | | 5% A-D Critical Value | | 0.809 | Detected Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 169 | | | | K-S Test Statistic | | 0.214 | **Kolmogrov-Smirnoff GOF** | | | | | |
| 170 | | | | 5% K-S Critical Value | | 0.188 | Detected Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 171 | **Detected Data Not Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 172 | | | | | | | | | | | | |
| 173 | **Gamma Statistics on Detected Data Only** | | | | | | | | | | | |
| 174 | | | | k hat (MLE) | | 0.487 | | | | k star (bias corrected MLE) | | 0.453 |
| 175 | | | | Theta hat (MLE) | | 779.3 | | | | Theta star (bias corrected MLE) | | 836 |
| 176 | | | | nu hat (MLE) | | 23.35 | | | | nu star (bias corrected) | | 21.77 |
| 177 | | | | MLE Mean (bias corrected) | | 379.1 | | | | MLE Sd (bias corrected) | | 563 |
| 178 | | | | | | | | | | | | |
| 179 | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | | | | | |
| 180 | | | | k hat (KM) | | 0.0583 | | | | nu hat (KM) | | 15.51 |
| 181 | | | | Approximate Chi Square Value (15.51, α) | | 7.621 | | | | Adjusted Chi Square Value (15.51, β) | | 7.56 |
| 182 | | | | 95% Gamma Approximate KM-UCL (use when n>=50) | | 216.6 | | | | 95% Gamma Adjusted KM-UCL (use when n<50) | | 218.3 |
| 183 | Gamma (KM) may not be used when k hat (KM) is < 0.1 | | | | | | | | | | | |
| 184 | | | | | | | | | | | | |
| 185 | **Gamma ROS Statistics using Imputed Non-Detects** | | | | | | | | | | | |
| 186 | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | | | | |
| 187 | GROS may not be used when kstar of detected data is small such as < 0.1 | | | | | | | | | | | |
| 188 | For such situations, GROS method tends to yield inflated values of UCLs and BTVs | | | | | | | | | | | |
| 189 | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | | | | |
| 190 | | | | Minimum | | 0.01 | | | | Mean | | 71.68 |
| 191 | | | | Maximum | | 4800 | | | | Median | | 0.01 |
| 192 | | | | SD | | 440.2 | | | | CV | | 6.141 |
| 193 | | | | k hat (MLE) | | 0.117 | | | | k star (bias corrected MLE) | | 0.12 |
| 194 | | | | Theta hat (MLE) | | 610.7 | | | | Theta star (bias corrected MLE) | | 598.6 |
| 195 | | | | nu hat (MLE) | | 31.22 | | | | nu star (bias corrected) | | 31.85 |
| 196 | | | | MLE Mean (bias corrected) | | 71.68 | | | | MLE Sd (bias corrected) | | 207.2 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 197 | | | | | | | | | | | Adjusted Level of Significance (β) | 0.0482 |
| 198 | | | | Approximate Chi Square Value (31.85, α) | | 19.96 | | | | | Adjusted Chi Square Value (31.85, β) | 19.85 |
| 199 | | | | 95% Gamma Approximate UCL (use when n>=50) | | 114.4 | | | | | 95% Gamma Adjusted UCL (use when n<50) | 115 |
| 200 | | | | | | | | | | | | |
| 201 | | | | | | **Lognormal GOF Test on Detected Observations Only** | | | | | | | |
| 202 | | | | | | Shapiro Wilk Test Statistic | 0.96 | | | | **Shapiro Wilk GOF Test** | |
| 203 | | | | | | 5% Shapiro Wilk Critical Value | 0.916 | | | | Detected Data appear Lognormal at 5% Significance Level | |
| 204 | | | | | | Lilliefors Test Statistic | 0.0943 | | | | **Lilliefors GOF Test** | |
| 205 | | | | | | 5% Lilliefors Critical Value | 0.181 | | | | Detected Data appear Lognormal at 5% Significance Level | |
| 206 | | | | | | **Detected Data appear Lognormal at 5% Significance Level** | | | | | | |
| 207 | | | | | | | | | | | | |
| 208 | | | | | | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | |
| 209 | | | | | | Mean in Original Scale | 101 | | | | Mean in Log Scale | 3.688 |
| 210 | | | | | | SD in Original Scale | 436 | | | | SD in Log Scale | 0.963 |
| 211 | | | | | | 95% t UCL (assumes normality of ROS data) | 163.6 | | | | 95% Percentile Bootstrap UCL | 169 |
| 212 | | | | | | 95% BCA Bootstrap UCL | 238.4 | | | | 95% Bootstrap t UCL | 483.5 |
| 213 | | | | | | 95% H-UCL (Log ROS) | 76.18 | | | | | |
| 214 | | | | | | | | | | | | |
| 215 | | | | | | **UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed** | | | | | | |
| 216 | | | | | | KM Mean (logged) | 3.719 | | | | 95% H-UCL (KM -Log) | 81.85 |
| 217 | | | | | | KM SD (logged) | 0.996 | | | | 95% Critical H Value (KM-Log) | 2.19 |
| 218 | | | | | | KM Standard Error of Mean (logged) | 0.185 | | | | | |
| 219 | | | | | | | | | | | | |
| 220 | | | | | | **DL/2 Statistics** | | | | | | |
| 221 | | | | | | **DL/2 Normal** | | | | | **DL/2 Log-Transformed** | |
| 222 | | | | | | Mean in Original Scale | 389.7 | | | | Mean in Log Scale | 4.706 |
| 223 | | | | | | SD in Original Scale | 900.6 | | | | SD in Log Scale | 1.445 |
| 224 | | | | | | 95% t UCL (Assumes normality) | 519 | | | | 95% H-Stat UCL | 437.8 |
| 225 | | | | | | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | |
| 226 | | | | | | | | | | | | |
| 227 | | | | | | **Nonparametric Distribution Free UCL Statistics** | | | | | | |
| 228 | | | | | | **Detected Data appear Lognormal Distributed at 5% Significance Level** | | | | | | |
| 229 | | | | | | | | | | | | |
| 230 | | | | | | **Suggested UCL to Use** | | | | | | |
| 231 | | | | | | 95% KM (BCA) UCL | 189.5 | | | | | |
| 232 | | | | | | | | | | | | |
| 233 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 234 | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | | | | | |
| 235 | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | | | | | |
| 236 | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 237 | | | | | | | | | | | | |
| 238 | **Acenaphthene** | | | | | | | | | | | |
| 239 | | | | | | | | | | | | |
| 240 | | | | | | **General Statistics** | | | | | | |
| 241 | | | | | | Total Number of Observations | 135 | | | | Number of Distinct Observations | 55 |
| 242 | | | | | | Number of Detects | 12 | | | | Number of Non-Detects | 123 |
| 243 | | | | | | Number of Distinct Detects | 11 | | | | Number of Distinct Non-Detects | 46 |
| 244 | | | | | | Minimum Detect | 6.8 | | | | Minimum Non-Detect | 5.8 |
| 245 | | | | | | Maximum Detect | 6900 | | | | Maximum Non-Detect | 15000 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 246 | | | | | Variance Detects | 3757980 | | | | | Percent Non-Detects | 91.11% |
| 247 | | | | | Mean Detects | 955.6 | | | | | SD Detects | 1939 |
| 248 | | | | | Median Detects | 240 | | | | | CV Detects | 2.029 |
| 249 | | | | | Skewness Detects | 3.08 | | | | | Kurtosis Detects | 9.945 |
| 250 | | | | | Mean of Logged Detects | 5.257 | | | | | SD of Logged Detects | 2.154 |
| 251 | | | | | | | | | | | | |
| 252 | | | | | **Normal GOF Test on Detects Only** | | | | | | | |
| 253 | | | | | Shapiro Wilk Test Statistic | 0.528 | | | | | **Shapiro Wilk GOF Test** | |
| 254 | | | | | 5% Shapiro Wilk Critical Value | 0.859 | | | | | Detected Data Not Normal at 5% Significance Level | |
| 255 | | | | | Lilliefors Test Statistic | 0.312 | | | | | **Lilliefors GOF Test** | |
| 256 | | | | | 5% Lilliefors Critical Value | 0.256 | | | | | Detected Data Not Normal at 5% Significance Level | |
| 257 | | | | | **Detected Data Not Normal at 5% Significance Level** | | | | | | | |
| 258 | | | | | | | | | | | | |
| 259 | | | | | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | |
| 260 | | | | | Mean | 102.4 | | | | | Standard Error of Mean | 56.69 |
| 261 | | | | | SD | 621.8 | | | | | 95% KM (BCA) UCL | 221.4 |
| 262 | | | | | 95% KM (t) UCL | 196.2 | | | | | 95% KM (Percentile Bootstrap) UCL | 207.4 |
| 263 | | | | | 95% KM (z) UCL | 195.6 | | | | | 95% KM Bootstrap t UCL | 424.8 |
| 264 | | | | | 90% KM Chebyshev UCL | 272.4 | | | | | 95% KM Chebyshev UCL | 349.4 |
| 265 | | | | | 97.5% KM Chebyshev UCL | 456.4 | | | | | 99% KM Chebyshev UCL | 666.4 |
| 266 | | | | | | | | | | | | |
| 267 | | | | | **Gamma GOF Tests on Detected Observations Only** | | | | | | | |
| 268 | | | | | A-D Test Statistic | 0.511 | | | | | **Anderson-Darling GOF Test** | |
| 269 | | | | | 5% A-D Critical Value | 0.803 | | | | | Detected data appear Gamma Distributed at 5% Significance Level | |
| 270 | | | | | K-S Test Statistic | 0.228 | | | | | **Kolmogrov-Smirnoff GOF** | |
| 271 | | | | | 5% K-S Critical Value | 0.262 | | | | | Detected data appear Gamma Distributed at 5% Significance Level | |
| 272 | | | | | **Detected data appear Gamma Distributed at 5% Significance Level** | | | | | | | |
| 273 | | | | | | | | | | | | |
| 274 | | | | | **Gamma Statistics on Detected Data Only** | | | | | | | |
| 275 | | | | | k hat (MLE) | 0.409 | | | | | k star (bias corrected MLE) | 0.362 |
| 276 | | | | | Theta hat (MLE) | 2339 | | | | | Theta star (bias corrected MLE) | 2640 |
| 277 | | | | | nu hat (MLE) | 9.807 | | | | | nu star (bias corrected) | 8.688 |
| 278 | | | | | MLE Mean (bias corrected) | 955.6 | | | | | MLE Sd (bias corrected) | 1588 |
| 279 | | | | | | | | | | | | |
| 280 | | | | | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | |
| 281 | | | | | k hat (KM) | 0.0271 | | | | | nu hat (KM) | 7.316 |
| 282 | | | | | Approximate Chi Square Value (7.32, α) | 2.345 | | | | | Adjusted Chi Square Value (7.32, β) | 2.315 |
| 283 | | | | | 95% Gamma Approximate KM-UCL (use when n>=50) | 319.3 | | | | | 95% Gamma Adjusted KM-UCL (use when n<50) | 323.4 |
| 284 | | | | | Gamma (KM) may not be used when k hat (KM) is < 0.1 | | | | | | | |
| 285 | | | | | | | | | | | | |
| 286 | | | | | **Gamma ROS Statistics using Imputed Non-Detects** | | | | | | | |
| 287 | | | | | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | |
| 288 | | | | | GROS may not be used when kstar of detected data is small such as < 0.1 | | | | | | | |
| 289 | | | | | For such situations, GROS method tends to yield inflated values of UCLs and BTVs | | | | | | | |
| 290 | | | | | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | |
| 291 | | | | | Minimum | 0.01 | | | | | Mean | 84.95 |
| 292 | | | | | Maximum | 6900 | | | | | Median | 0.01 |
| 293 | | | | | SD | 618.9 | | | | | CV | 7.285 |
| 294 | | | | | k hat (MLE) | 0.0995 | | | | | k star (bias corrected MLE) | 0.102 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 295 | Theta hat (MLE) | | | | | 854.1 | Theta star (bias corrected MLE) | | | | | 831.3 |
| 296 | nu hat (MLE) | | | | | 26.85 | nu star (bias corrected) | | | | | 27.59 |
| 297 | MLE Mean (bias corrected) | | | | | 84.95 | MLE Sd (bias corrected) | | | | | 265.7 |
| 298 | | | | | | | Adjusted Level of Significance (β) | | | | | 0.0482 |
| 299 | Approximate Chi Square Value (27.59, α) | | | | | 16.61 | Adjusted Chi Square Value (27.59, β) | | | | | 16.52 |
| 300 | 95% Gamma Approximate UCL (use when n>=50) | | | | | 141.1 | 95% Gamma Adjusted UCL (use when n<50) | | | | | 141.9 |
| 301 | | | | | | | | | | | | |
| 302 | **Lognormal GOF Test on Detected Observations Only** | | | | | | | | | | | |
| 303 | Shapiro Wilk Test Statistic | | | | | 0.924 | **Shapiro Wilk GOF Test** | | | | | |
| 304 | 5% Shapiro Wilk Critical Value | | | | | 0.859 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 305 | Lilliefors Test Statistic | | | | | 0.204 | **Lilliefors GOF Test** | | | | | |
| 306 | 5% Lilliefors Critical Value | | | | | 0.256 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 307 | **Detected Data appear Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 308 | | | | | | | | | | | | |
| 309 | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | | | | | |
| 310 | Mean in Original Scale | | | | | 93.93 | Mean in Log Scale | | | | | 1.818 |
| 311 | SD in Original Scale | | | | | 617.8 | SD in Log Scale | | | | | 1.812 |
| 312 | 95% t UCL (assumes normality of ROS data) | | | | | 182 | 95% Percentile Bootstrap UCL | | | | | 195.1 |
| 313 | 95% BCA Bootstrap UCL | | | | | 263 | 95% Bootstrap t UCL | | | | | 510.9 |
| 314 | 95% H-UCL (Log ROS) | | | | | 51.31 | | | | | | |
| 315 | | | | | | | | | | | | |
| 316 | **UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed** | | | | | | | | | | | |
| 317 | KM Mean (logged) | | | | | 2.447 | 95% H-UCL (KM -Log) | | | | | 32.43 |
| 318 | KM SD (logged) | | | | | 1.242 | 95% Critical H Value (KM-Log) | | | | | 2.425 |
| 319 | KM Standard Error of Mean (logged) | | | | | 0.173 | | | | | | |
| 320 | | | | | | | | | | | | |
| 321 | **DL/2 Statistics** | | | | | | | | | | | |
| 322 | **DL/2 Normal** | | | | | | **DL/2 Log-Transformed** | | | | | |
| 323 | Mean in Original Scale | | | | | 423.7 | Mean in Log Scale | | | | | 4.751 |
| 324 | SD in Original Scale | | | | | 987.3 | SD in Log Scale | | | | | 1.525 |
| 325 | 95% t UCL (Assumes normality) | | | | | 564.4 | 95% H-Stat UCL | | | | | 530.4 |
| 326 | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | | | | | |
| 327 | | | | | | | | | | | | |
| 328 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 329 | **Detected Data appear Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 330 | | | | | | | | | | | | |
| 331 | **Suggested UCL to Use** | | | | | | | | | | | |
| 332 | 95% KM (t) UCL | | | | | 196.2 | 95% GROS Approximate Gamma UCL | | | | | 141.1 |
| 333 | 95% Approximate Gamma KM-UCL | | | | | 319.3 | | | | | | |
| 334 | | | | | | | | | | | | |
| 335 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 336 | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | | | | | |
| 337 | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | | | | | |
| 338 | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 339 | | | | | | | | | | | | |
| 340 | **Acenaphthylene** | | | | | | | | | | | |
| 341 | | | | | | | | | | | | |
| 342 | **General Statistics** | | | | | | | | | | | |
| 343 | Total Number of Observations | | | | | 135 | Number of Distinct Observations | | | | | 62 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 344 | | | | | Number of Detects | 20 | | | | Number of Non-Detects | | 115 |
| 345 | | | | | Number of Distinct Detects | 20 | | | | Number of Distinct Non-Detects | | 46 |
| 346 | | | | | Minimum Detect | 10 | | | | Minimum Non-Detect | | 5.8 |
| 347 | | | | | Maximum Detect | 44000 | | | | Maximum Non-Detect | | 6900 |
| 348 | | | | | Variance Detects | 98322304 | | | | Percent Non-Detects | | 85.19% |
| 349 | | | | | Mean Detects | 2923 | | | | SD Detects | | 9916 |
| 350 | | | | | Median Detects | 135 | | | | CV Detects | | 3.393 |
| 351 | | | | | Skewness Detects | 4.157 | | | | Kurtosis Detects | | 17.76 |
| 352 | | | | | Mean of Logged Detects | 5.219 | | | | SD of Logged Detects | | 2.098 |
| 353 | | | | | | | | | | | | |
| 354 | | | | | **Normal GOF Test on Detects Only** | | | | | | | |
| 355 | | | | | Shapiro Wilk Test Statistic | 0.326 | | | | **Shapiro Wilk GOF Test** | | |
| 356 | | | | | 5% Shapiro Wilk Critical Value | 0.905 | | | | Detected Data Not Normal at 5% Significance Level | | |
| 357 | | | | | Lilliefors Test Statistic | 0.469 | | | | **Lilliefors GOF Test** | | |
| 358 | | | | | 5% Lilliefors Critical Value | 0.198 | | | | Detected Data Not Normal at 5% Significance Level | | |
| 359 | | | | | **Detected Data Not Normal at 5% Significance Level** | | | | | | | |
| 360 | | | | | | | | | | | | |
| 361 | | | | | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | |
| 362 | | | | | Mean | 466.7 | | | | Standard Error of Mean | | 340.9 |
| 363 | | | | | SD | 3859 | | | | 95% KM (BCA) UCL | | 1138 |
| 364 | | | | | 95% KM (t) UCL | 1031 | | | | 95% KM (Percentile Bootstrap) UCL | | 1112 |
| 365 | | | | | 95% KM (z) UCL | 1027 | | | | 95% KM Bootstrap t UCL | | 9636 |
| 366 | | | | | 90% KM Chebyshev UCL | 1489 | | | | 95% KM Chebyshev UCL | | 1953 |
| 367 | | | | | 97.5% KM Chebyshev UCL | 2595 | | | | 99% KM Chebyshev UCL | | 3858 |
| 368 | | | | | | | | | | | | |
| 369 | | | | | **Gamma GOF Tests on Detected Observations Only** | | | | | | | |
| 370 | | | | | A-D Test Statistic | 2.668 | | | | **Anderson-Darling GOF Test** | | |
| 371 | | | | | 5% A-D Critical Value | 0.866 | | | | Detected Data Not Gamma Distributed at 5% Significance Level | | |
| 372 | | | | | K-S Test Statistic | 0.3 | | | | **Kolmogrov-Smirnoff GOF** | | |
| 373 | | | | | 5% K-S Critical Value | 0.212 | | | | Detected Data Not Gamma Distributed at 5% Significance Level | | |
| 374 | | | | | **Detected Data Not Gamma Distributed at 5% Significance Level** | | | | | | | |
| 375 | | | | | | | | | | | | |
| 376 | | | | | **Gamma Statistics on Detected Data Only** | | | | | | | |
| 377 | | | | | k hat (MLE) | 0.256 | | | | k star (bias corrected MLE) | | 0.251 |
| 378 | | | | | Theta hat (MLE) | 11406 | | | | Theta star (bias corrected MLE) | | 11638 |
| 379 | | | | | nu hat (MLE) | 10.25 | | | | nu star (bias corrected) | | 10.04 |
| 380 | | | | | MLE Mean (bias corrected) | 2923 | | | | MLE Sd (bias corrected) | | 5832 |
| 381 | | | | | | | | | | | | |
| 382 | | | | | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | |
| 383 | | | | | k hat (KM) | 0.0146 | | | | nu hat (KM) | | 3.948 |
| 384 | | | | | Approximate Chi Square Value (3.95, α) | 0.701 | | | | Adjusted Chi Square Value (3.95, β) | | 0.688 |
| 385 | | | | | 95% Gamma Approximate KM-UCL (use when n>=50) | 2627 | | | | 95% Gamma Adjusted KM-UCL (use when n<50) | | 2680 |
| 386 | | | | | Gamma (KM) may not be used when k hat (KM) is < 0.1 | | | | | | | |
| 387 | | | | | | | | | | | | |
| 388 | | | | | **Gamma ROS Statistics using Imputed Non-Detects** | | | | | | | |
| 389 | | | | | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | |
| 390 | | | | | GROS may not be used when kstar of detected data is small such as < 0.1 | | | | | | | |
| 391 | | | | | For such situations, GROS method tends to yield inflated values of UCLs and BTVs | | | | | | | |
| 392 | | | | | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 393 | | | | | Minimum | 0.01 | | | | | Mean | 433 |
| 394 | | | | | Maximum | 44000 | | | | | Median | 0.01 |
| 395 | | | | | SD | 3876 | | | | | CV | 8.953 |
| 396 | | | | | k hat (MLE) | 0.0893 | | | | | k star (bias corrected MLE) | 0.0923 |
| 397 | | | | | Theta hat (MLE) | 4848 | | | | | Theta star (bias corrected MLE) | 4693 |
| 398 | | | | | nu hat (MLE) | 24.11 | | | | | nu star (bias corrected) | 24.91 |
| 399 | | | | | MLE Mean (bias corrected) | 433 | | | | | MLE Sd (bias corrected) | 1425 |
| 400 | | | | | | | | | | | Adjusted Level of Significance (β) | 0.0482 |
| 401 | | | | | Approximate Chi Square Value (24.91, α) | 14.54 | | | | | Adjusted Chi Square Value (24.91, β) | 14.46 |
| 402 | | | | | 95% Gamma Approximate UCL (use when n>=50) | 741.6 | | | | | 95% Gamma Adjusted UCL (use when n<50) | 746 |
| 403 | | | | | | | | | | | | |
| 404 | | | | | **Lognormal GOF Test on Detected Observations Only** | | | | | | | |
| 405 | | | | | Shapiro Wilk Test Statistic | 0.926 | | | | | **Shapiro Wilk GOF Test** | |
| 406 | | | | | 5% Shapiro Wilk Critical Value | 0.905 | | | | | Detected Data appear Lognormal at 5% Significance Level | |
| 407 | | | | | Lilliefors Test Statistic | 0.13 | | | | | **Lilliefors GOF Test** | |
| 408 | | | | | 5% Lilliefors Critical Value | 0.198 | | | | | Detected Data appear Lognormal at 5% Significance Level | |
| 409 | | | | | **Detected Data appear Lognormal at 5% Significance Level** | | | | | | | |
| 410 | | | | | | | | | | | | |
| 411 | | | | | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | |
| 412 | | | | | Mean in Original Scale | 455.5 | | | | | Mean in Log Scale | 3.138 |
| 413 | | | | | SD in Original Scale | 3874 | | | | | SD in Log Scale | 1.541 |
| 414 | | | | | 95% t UCL (assumes normality of ROS data) | 1008 | | | | | 95% Percentile Bootstrap UCL | 1095 |
| 415 | | | | | 95% BCA Bootstrap UCL | 1835 | | | | | 95% Bootstrap t UCL | 12585 |
| 416 | | | | | 95% H-UCL (Log ROS) | 108.9 | | | | | | |
| 417 | | | | | | | | | | | | |
| 418 | | | | | **UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed** | | | | | | | |
| 419 | | | | | KM Mean (logged) | 3.482 | | | | | 95% H-UCL (KM -Log) | 109.1 |
| 420 | | | | | KM SD (logged) | 1.352 | | | | | 95% Critical H Value (KM-Log) | 2.537 |
| 421 | | | | | KM Standard Error of Mean (logged) | 0.261 | | | | | | |
| 422 | | | | | | | | | | | | |
| 423 | | | | | **DL/2 Statistics** | | | | | | | |
| 424 | | | | | **DL/2 Normal** | | | | | | **DL/2 Log-Transformed** | |
| 425 | | | | | Mean in Original Scale | 700.6 | | | | | Mean in Log Scale | 4.776 |
| 426 | | | | | SD in Original Scale | 3878 | | | | | SD in Log Scale | 1.531 |
| 427 | | | | | 95% t UCL (Assumes normality) | 1253 | | | | | 95% H-Stat UCL | 549.5 |
| 428 | | | | | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | |
| 429 | | | | | | | | | | | | |
| 430 | | | | | **Nonparametric Distribution Free UCL Statistics** | | | | | | | |
| 431 | | | | | **Detected Data appear Lognormal Distributed at 5% Significance Level** | | | | | | | |
| 432 | | | | | | | | | | | | |
| 433 | | | | | **Suggested UCL to Use** | | | | | | | |
| 434 | | | | | 97.5% KM (Chebyshev) UCL | 2595 | | | | | | |
| 435 | | | | | | | | | | | | |
| 436 | | | | | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | |
| 437 | | | | | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | |
| 438 | | | | | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | |
| 439 | | | | | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | |
| 440 | | | | | | | | | | | | |
| 441 | **Acetone** | | | | | | | | | | | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 442 | | | | | | | | | | | | |
| 443 | **General Statistics** | | | | | | | | | | | |
| 444 | | | | | Total Number of Observations | 9 | | | | Number of Distinct Observations | 9 | |
| 445 | | | | | Number of Detects | 8 | | | | Number of Non-Detects | 1 | |
| 446 | | | | | Number of Distinct Detects | 8 | | | | Number of Distinct Non-Detects | 1 | |
| 447 | | | | | Minimum Detect | 21 | | | | Minimum Non-Detect | 10000 | |
| 448 | | | | | Maximum Detect | 120 | | | | Maximum Non-Detect | 10000 | |
| 449 | | | | | Variance Detects | 1012 | | | | Percent Non-Detects | 11.11% | |
| 450 | | | | | Mean Detects | 65.5 | | | | SD Detects | 31.81 | |
| 451 | | | | | Median Detects | 65.5 | | | | CV Detects | 0.486 | |
| 452 | | | | | Skewness Detects | 0.234 | | | | Kurtosis Detects | -0.0225 | |
| 453 | | | | | Mean of Logged Detects | 4.055 | | | | SD of Logged Detects | 0.575 | |
| 454 | | | | | | | | | | | | |
| 455 | **Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use** | | | | | | | | | | | |
| 456 | **guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.** | | | | | | | | | | | |
| 457 | **For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).** | | | | | | | | | | | |
| 458 | **Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.0** | | | | | | | | | | | |
| 459 | | | | | | | | | | | | |
| 460 | **Normal GOF Test on Detects Only** | | | | | | | | | | | |
| 461 | | | | | Shapiro Wilk Test Statistic | 0.966 | | | | **Shapiro Wilk GOF Test** | | |
| 462 | | | | | 5% Shapiro Wilk Critical Value | 0.818 | | | | Detected Data appear Normal at 5% Significance Level | | |
| 463 | | | | | Lilliefors Test Statistic | 0.155 | | | | **Lilliefors GOF Test** | | |
| 464 | | | | | 5% Lilliefors Critical Value | 0.313 | | | | Detected Data appear Normal at 5% Significance Level | | |
| 465 | **Detected Data appear Normal at 5% Significance Level** | | | | | | | | | | | |
| 466 | | | | | | | | | | | | |
| 467 | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | | | | | |
| 468 | | | | | Mean | 65.5 | | | | Standard Error of Mean | 11.25 | |
| 469 | | | | | SD | 29.75 | | | | 95% KM (BCA) UCL | 83.38 | |
| 470 | | | | | 95% KM (t) UCL | 86.41 | | | | 95% KM (Percentile Bootstrap) UCL | 83.38 | |
| 471 | | | | | 95% KM (z) UCL | 84 | | | | 95% KM Bootstrap t UCL | 88.22 | |
| 472 | | | | | 90% KM Chebyshev UCL | 99.24 | | | | 95% KM Chebyshev UCL | 114.5 | |
| 473 | | | | | 97.5% KM Chebyshev UCL | 135.7 | | | | 99% KM Chebyshev UCL | 177.4 | |
| 474 | | | | | | | | | | | | |
| 475 | **Gamma GOF Tests on Detected Observations Only** | | | | | | | | | | | |
| 476 | | | | | A-D Test Statistic | 0.288 | | | | **Anderson-Darling GOF Test** | | |
| 477 | | | | | 5% A-D Critical Value | 0.719 | | | | Detected data appear Gamma Distributed at 5% Significance Level | | |
| 478 | | | | | K-S Test Statistic | 0.18 | | | | **Kolmogrov-Smirnoff GOF** | | |
| 479 | | | | | 5% K-S Critical Value | 0.295 | | | | Detected data appear Gamma Distributed at 5% Significance Level | | |
| 480 | **Detected data appear Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 481 | | | | | | | | | | | | |
| 482 | **Gamma Statistics on Detected Data Only** | | | | | | | | | | | |
| 483 | | | | | k hat (MLE) | 4.099 | | | | k star (bias corrected MLE) | 2.645 | |
| 484 | | | | | Theta hat (MLE) | 15.98 | | | | Theta star (bias corrected MLE) | 24.76 | |
| 485 | | | | | nu hat (MLE) | 65.58 | | | | nu star (bias corrected) | 42.32 | |
| 486 | | | | | MLE Mean (bias corrected) | 65.5 | | | | MLE Sd (bias corrected) | 40.27 | |
| 487 | | | | | | | | | | | | |
| 488 | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | | | | | |
| 489 | | | | | k hat (KM) | 4.846 | | | | nu hat (KM) | 87.23 | |
| 490 | | | | | Approximate Chi Square Value (87.23, α) | 66.7 | | | | Adjusted Chi Square Value (87.23, β) | 62.93 | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 491 | 95% Gamma Approximate KM-UCL (use when n>=50) | | | | | 85.66 | 95% Gamma Adjusted KM-UCL (use when n<50) | | | | | 90.8 |
| 492 | | | | | | | | | | | | |
| 493 | **Gamma ROS Statistics using Imputed Non-Detects** | | | | | | | | | | | |
| 494 | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | | | | |
| 495 | GROS may not be used when kstar of detected data is small such as < 0.1 | | | | | | | | | | | |
| 496 | For such situations, GROS method tends to yield inflated values of UCLs and BTVs | | | | | | | | | | | |
| 497 | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | | | | |
| 498 | Minimum | | | | | 21 | Mean | | | | | 65.09 |
| 499 | Maximum | | | | | 120 | Median | | | | | 61.8 |
| 500 | SD | | | | | 29.78 | CV | | | | | 0.458 |
| 501 | k hat (MLE) | | | | | 4.586 | k star (bias corrected MLE) | | | | | 3.131 |
| 502 | Theta hat (MLE) | | | | | 14.19 | Theta star (bias corrected MLE) | | | | | 20.79 |
| 503 | nu hat (MLE) | | | | | 82.55 | nu star (bias corrected) | | | | | 56.36 |
| 504 | MLE Mean (bias corrected) | | | | | 65.09 | MLE Sd (bias corrected) | | | | | 36.78 |
| 505 | | | | | | | Adjusted Level of Significance (β) | | | | | 0.0231 |
| 506 | Approximate Chi Square Value (56.36, α) | | | | | 40.11 | Adjusted Chi Square Value (56.36, β) | | | | | 37.23 |
| 507 | 95% Gamma Approximate UCL (use when n>=50) | | | | | 91.47 | 95% Gamma Adjusted UCL (use when n<50) | | | | | 98.53 |
| 508 | | | | | | | | | | | | |
| 509 | **Lognormal GOF Test on Detected Observations Only** | | | | | | | | | | | |
| 510 | Shapiro Wilk Test Statistic | | | | | 0.927 | **Shapiro Wilk GOF Test** | | | | | |
| 511 | 5% Shapiro Wilk Critical Value | | | | | 0.818 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 512 | Lilliefors Test Statistic | | | | | 0.217 | **Lilliefors GOF Test** | | | | | |
| 513 | 5% Lilliefors Critical Value | | | | | 0.313 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 514 | **Detected Data appear Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 515 | | | | | | | | | | | | |
| 516 | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | | | | | |
| 517 | Mean in Original Scale | | | | | 64.63 | Mean in Log Scale | | | | | 4.055 |
| 518 | SD in Original Scale | | | | | 29.87 | SD in Log Scale | | | | | 0.538 |
| 519 | 95% t UCL (assumes normality of ROS data) | | | | | 83.15 | 95% Percentile Bootstrap UCL | | | | | 79.93 |
| 520 | 95% BCA Bootstrap UCL | | | | | 80.97 | 95% Bootstrap t UCL | | | | | 83.85 |
| 521 | 95% H-UCL (Log ROS) | | | | | 103.2 | | | | | | |
| 522 | | | | | | | | | | | | |
| 523 | **UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed** | | | | | | | | | | | |
| 524 | KM Mean (logged) | | | | | 4.055 | 95% H-UCL (KM -Log) | | | | | 103.2 |
| 525 | KM SD (logged) | | | | | 0.538 | 95% Critical H Value (KM-Log) | | | | | 2.294 |
| 526 | KM Standard Error of Mean (logged) | | | | | 0.203 | | | | | | |
| 527 | | | | | | | | | | | | |
| 528 | **DL/2 Statistics** | | | | | | | | | | | |
| 529 | **DL/2 Normal** | | | | | | **DL/2 Log-Transformed** | | | | | |
| 530 | Mean in Original Scale | | | | | 613.8 | Mean in Log Scale | | | | | 4.551 |
| 531 | SD in Original Scale | | | | | 1645 | SD in Log Scale | | | | | 1.582 |
| 532 | 95% t UCL (Assumes normality) | | | | | 1633 | 95% H-Stat UCL | | | | | 4448 |
| 533 | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | | | | | |
| 534 | | | | | | | | | | | | |
| 535 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 536 | **Detected Data appear Normal Distributed at 5% Significance Level** | | | | | | | | | | | |
| 537 | | | | | | | | | | | | |
| 538 | **Suggested UCL to Use** | | | | | | | | | | | |
| 539 | 95% KM (t) UCL | | | | | 86.41 | 95% KM (Percentile Bootstrap) UCL | | | | | 83.38 |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 540 | | | | | | | | | | | | |
| 541 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 542 | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | | | | | |
| 543 | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | | | | | |
| 544 | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 545 | | | | | | | | | | | | |
| 546 | **Anthracene** | | | | | | | | | | | |
| 547 | | | | | | | | | | | | |
| 548 | **General Statistics** | | | | | | | | | | | |
| 549 | | | | | Total Number of Observations | 135 | | | Number of Distinct Observations | 73 | | |
| 550 | | | | | Number of Detects | 41 | | | Number of Non-Detects | 94 | | |
| 551 | | | | | Number of Distinct Detects | 37 | | | Number of Distinct Non-Detects | 38 | | |
| 552 | | | | | Minimum Detect | 6.1 | | | Minimum Non-Detect | 5.8 | | |
| 553 | | | | | Maximum Detect | 25000 | | | Maximum Non-Detect | 6900 | | |
| 554 | | | | | Variance Detects | 19483745 | | | Percent Non-Detects | 69.63% | | |
| 555 | | | | | Mean Detects | 1348 | | | SD Detects | 4414 | | |
| 556 | | | | | Median Detects | 96 | | | CV Detects | 3.275 | | |
| 557 | | | | | Skewness Detects | 4.499 | | | Kurtosis Detects | 21.88 | | |
| 558 | | | | | Mean of Logged Detects | 4.726 | | | SD of Logged Detects | 2.047 | | |
| 559 | | | | | | | | | | | | |
| 560 | **Normal GOF Test on Detects Only** | | | | | | | | | | | |
| 561 | | | | | Shapiro Wilk Test Statistic | 0.348 | | | **Shapiro Wilk GOF Test** | | | |
| 562 | | | | | 5% Shapiro Wilk Critical Value | 0.941 | | | Detected Data Not Normal at 5% Significance Level | | | |
| 563 | | | | | Lilliefors Test Statistic | 0.441 | | | **Lilliefors GOF Test** | | | |
| 564 | | | | | 5% Lilliefors Critical Value | 0.138 | | | Detected Data Not Normal at 5% Significance Level | | | |
| 565 | **Detected Data Not Normal at 5% Significance Level** | | | | | | | | | | | |
| 566 | | | | | | | | | | | | |
| 567 | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | | | | | |
| 568 | | | | | Mean | 438.7 | | | Standard Error of Mean | 216 | | |
| 569 | | | | | SD | 2478 | | | 95% KM (BCA) UCL | 862.1 | | |
| 570 | | | | | 95% KM (t) UCL | 796.5 | | | 95% KM (Percentile Bootstrap) UCL | 803.1 | | |
| 571 | | | | | 95% KM (z) UCL | 794 | | | 95% KM Bootstrap t UCL | 1436 | | |
| 572 | | | | | 90% KM Chebyshev UCL | 1087 | | | 95% KM Chebyshev UCL | 1380 | | |
| 573 | | | | | 97.5% KM Chebyshev UCL | 1788 | | | 99% KM Chebyshev UCL | 2588 | | |
| 574 | | | | | | | | | | | | |
| 575 | **Gamma GOF Tests on Detected Observations Only** | | | | | | | | | | | |
| 576 | | | | | A-D Test Statistic | 4.325 | | | **Anderson-Darling GOF Test** | | | |
| 577 | | | | | 5% A-D Critical Value | 0.868 | | | Detected Data Not Gamma Distributed at 5% Significance Level | | | |
| 578 | | | | | K-S Test Statistic | 0.288 | | | **Kolmogrov-Smirnoff GOF** | | | |
| 579 | | | | | 5% K-S Critical Value | 0.15 | | | Detected Data Not Gamma Distributed at 5% Significance Level | | | |
| 580 | **Detected Data Not Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 581 | | | | | | | | | | | | |
| 582 | **Gamma Statistics on Detected Data Only** | | | | | | | | | | | |
| 583 | | | | | k hat (MLE) | 0.281 | | | k star (bias corrected MLE) | 0.277 | | |
| 584 | | | | | Theta hat (MLE) | 4796 | | | Theta star (bias corrected MLE) | 4871 | | |
| 585 | | | | | nu hat (MLE) | 23.04 | | | nu star (bias corrected) | 22.69 | | |
| 586 | | | | | MLE Mean (bias corrected) | 1348 | | | MLE Sd (bias corrected) | 2562 | | |
| 587 | | | | | | | | | | | | |
| 588 | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 589 | k hat (KM) | | | | | 0.0313 | nu hat (KM) | | | | | 8.464 |
| 590 | Approximate Chi Square Value (8.46, α) | | | | | 3.007 | Adjusted Chi Square Value (8.46, β) | | | | | 2.972 |
| 591 | 95% Gamma Approximate KM-UCL (use when n>=50) | | | | | 1235 | 95% Gamma Adjusted KM-UCL (use when n<50) | | | | | 1250 |
| 592 | Gamma (KM) may not be used when k hat (KM) is < 0.1 | | | | | | | | | | | |
| 593 | | | | | | | | | | | | |
| 594 | **Gamma ROS Statistics using Imputed Non-Detects** | | | | | | | | | | | |
| 595 | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | | | | |
| 596 | GROS may not be used when kstar of detected data is small such as < 0.1 | | | | | | | | | | | |
| 597 | For such situations, GROS method tends to yield inflated values of UCLs and BTVs | | | | | | | | | | | |
| 598 | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | | | | |
| 599 | Minimum | | | | | 0.01 | Mean | | | | | 410.1 |
| 600 | Maximum | | | | | 25000 | Median | | | | | 0.01 |
| 601 | SD | | | | | 2490 | CV | | | | | 6.073 |
| 602 | k hat (MLE) | | | | | 0.105 | k star (bias corrected MLE) | | | | | 0.107 |
| 603 | Theta hat (MLE) | | | | | 3920 | Theta star (bias corrected MLE) | | | | | 3825 |
| 604 | nu hat (MLE) | | | | | 28.24 | nu star (bias corrected) | | | | | 28.95 |
| 605 | MLE Mean (bias corrected) | | | | | 410.1 | MLE Sd (bias corrected) | | | | | 1252 |
| 606 | | | | | | | Adjusted Level of Significance (β) | | | | | 0.0482 |
| 607 | Approximate Chi Square Value (28.95, α) | | | | | 17.67 | Adjusted Chi Square Value (28.95, β) | | | | | 17.57 |
| 608 | 95% Gamma Approximate UCL (use when n>=50) | | | | | 671.9 | 95% Gamma Adjusted UCL (use when n<50) | | | | | 675.5 |
| 609 | | | | | | | | | | | | |
| 610 | **Lognormal GOF Test on Detected Observations Only** | | | | | | | | | | | |
| 611 | Shapiro Wilk Test Statistic | | | | | 0.937 | **Shapiro Wilk GOF Test** | | | | | |
| 612 | 5% Shapiro Wilk Critical Value | | | | | 0.941 | Detected Data Not Lognormal at 5% Significance Level | | | | | |
| 613 | Lilliefors Test Statistic | | | | | 0.0965 | **Lilliefors GOF Test** | | | | | |
| 614 | 5% Lilliefors Critical Value | | | | | 0.138 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 615 | **Detected Data appear Approximate Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 616 | | | | | | | | | | | | |
| 617 | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | | | | | |
| 618 | Mean in Original Scale | | | | | 432.2 | Mean in Log Scale | | | | | 3.564 |
| 619 | SD in Original Scale | | | | | 2487 | SD in Log Scale | | | | | 1.609 |
| 620 | 95% t UCL (assumes normality of ROS data) | | | | | 786.7 | 95% Percentile Bootstrap UCL | | | | | 855.5 |
| 621 | 95% BCA Bootstrap UCL | | | | | 1027 | 95% Bootstrap t UCL | | | | | 1754 |
| 622 | 95% H-UCL (Log ROS) | | | | | 190.7 | | | | | | |
| 623 | | | | | | | | | | | | |
| 624 | **UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed** | | | | | | | | | | | |
| 625 | KM Mean (logged) | | | | | 3.615 | 95% H-UCL (KM -Log) | | | | | 183.9 |
| 626 | KM SD (logged) | | | | | 1.565 | 95% Critical H Value (KM-Log) | | | | | 2.768 |
| 627 | KM Standard Error of Mean (logged) | | | | | 0.192 | | | | | | |
| 628 | | | | | | | | | | | | |
| 629 | **DL/2 Statistics** | | | | | | | | | | | |
| 630 | **DL/2 Normal** | | | | | | **DL/2 Log-Transformed** | | | | | |
| 631 | Mean in Original Scale | | | | | 641 | Mean in Log Scale | | | | | 4.647 |
| 632 | SD in Original Scale | | | | | 2504 | SD in Log Scale | | | | | 1.66 |
| 633 | 95% t UCL (Assumes normality) | | | | | 998 | 95% H-Stat UCL | | | | | 624.7 |
| 634 | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | | | | | |
| 635 | | | | | | | | | | | | |
| 636 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 637 | **Detected Data appear Approximate Lognormal Distributed at 5% Significance Level** | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 638 | | | | | | | | | | | | |
| 639 | **Suggested UCL to Use** | | | | | | | | | | | |
| 640 | 97.5% KM (Chebyshev) UCL | | | | | 1788 | | | | | | |
| 641 | | | | | | | | | | | | |
| 642 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 643 | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | | | | | |
| 644 | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | | | | | |
| 645 | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 646 | | | | | | | | | | | | |
| 647 | **Antimony** | | | | | | | | | | | |
| 648 | | | | | | | | | | | | |
| 649 | **General Statistics** | | | | | | | | | | | |
| 650 | Total Number of Observations | | | | | 98 | Number of Distinct Observations | | | | | 69 |
| 651 | Number of Detects | | | | | 74 | Number of Non-Detects | | | | | 24 |
| 652 | Number of Distinct Detects | | | | | 58 | Number of Distinct Non-Detects | | | | | 15 |
| 653 | Minimum Detect | | | | | 0.1 | Minimum Non-Detect | | | | | 0.45 |
| 654 | Maximum Detect | | | | | 13 | Maximum Non-Detect | | | | | 7.4 |
| 655 | Variance Detects | | | | | 6.713 | Percent Non-Detects | | | | | 24.49% |
| 656 | Mean Detects | | | | | 1.646 | SD Detects | | | | | 2.591 |
| 657 | Median Detects | | | | | 0.77 | CV Detects | | | | | 1.574 |
| 658 | Skewness Detects | | | | | 2.948 | Kurtosis Detects | | | | | 8.919 |
| 659 | Mean of Logged Detects | | | | | -0.258 | SD of Logged Detects | | | | | 1.18 |
| 660 | | | | | | | | | | | | |
| 661 | **Normal GOF Test on Detects Only** | | | | | | | | | | | |
| 662 | Shapiro Wilk Test Statistic | | | | | 0.588 | **Normal GOF Test on Detected Observations Only** | | | | | |
| 663 | 5% Shapiro Wilk P Value | | | | | 0 | Detected Data Not Normal at 5% Significance Level | | | | | |
| 664 | Lilliefors Test Statistic | | | | | 0.275 | **Lilliefors GOF Test** | | | | | |
| 665 | 5% Lilliefors Critical Value | | | | | 0.103 | Detected Data Not Normal at 5% Significance Level | | | | | |
| 666 | **Detected Data Not Normal at 5% Significance Level** | | | | | | | | | | | |
| 667 | | | | | | | | | | | | |
| 668 | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | | | | | |
| 669 | Mean | | | | | 1.367 | Standard Error of Mean | | | | | 0.239 |
| 670 | SD | | | | | 2.321 | 95% KM (BCA) UCL | | | | | 1.814 |
| 671 | 95% KM (t) UCL | | | | | 1.764 | 95% KM (Percentile Bootstrap) UCL | | | | | 1.787 |
| 672 | 95% KM (z) UCL | | | | | 1.76 | 95% KM Bootstrap t UCL | | | | | 1.887 |
| 673 | 90% KM Chebyshev UCL | | | | | 2.084 | 95% KM Chebyshev UCL | | | | | 2.409 |
| 674 | 97.5% KM Chebyshev UCL | | | | | 2.859 | 99% KM Chebyshev UCL | | | | | 3.744 |
| 675 | | | | | | | | | | | | |
| 676 | **Gamma GOF Tests on Detected Observations Only** | | | | | | | | | | | |
| 677 | A-D Test Statistic | | | | | 2.866 | **Anderson-Darling GOF Test** | | | | | |
| 678 | 5% A-D Critical Value | | | | | 0.791 | Detected Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 679 | K-S Test Statistic | | | | | 0.157 | **Kolmogrov-Smirnoff GOF** | | | | | |
| 680 | 5% K-S Critical Value | | | | | 0.108 | Detected Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 681 | **Detected Data Not Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 682 | | | | | | | | | | | | |
| 683 | **Gamma Statistics on Detected Data Only** | | | | | | | | | | | |
| 684 | k hat (MLE) | | | | | 0.786 | k star (bias corrected MLE) | | | | | 0.763 |
| 685 | Theta hat (MLE) | | | | | 2.094 | Theta star (bias corrected MLE) | | | | | 2.157 |
| 686 | nu hat (MLE) | | | | | 116.3 | nu star (bias corrected) | | | | | 113 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 687 | MLE Mean (bias corrected) | | | | | 1.646 | MLE Sd (bias corrected) | | | | | 1.884 |
| 688 | | | | | | | | | | | | |
| 689 | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | | | | | |
| 690 | k hat (KM) | | | | | 0.347 | nu hat (KM) | | | | | 68.05 |
| 691 | Approximate Chi Square Value (68.05, α) | | | | | 50.06 | Adjusted Chi Square Value (68.05, β) | | | | | 49.83 |
| 692 | 95% Gamma Approximate KM-UCL (use when n>=50) | | | | | 1.859 | 95% Gamma Adjusted KM-UCL (use when n<50) | | | | | 1.867 |
| 693 | | | | | | | | | | | | |
| 694 | **Gamma ROS Statistics using Imputed Non-Detects** | | | | | | | | | | | |
| 695 | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | | | | |
| 696 | GROS may not be used when kstar of detected data is small such as < 0.1 | | | | | | | | | | | |
| 697 | For such situations, GROS method tends to yield inflated values of UCLs and BTVs | | | | | | | | | | | |
| 698 | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | | | | |
| 699 | Minimum | | | | | 0.01 | Mean | | | | | 1.292 |
| 700 | Maximum | | | | | 13 | Median | | | | | 0.525 |
| 701 | SD | | | | | 2.342 | CV | | | | | 1.813 |
| 702 | k hat (MLE) | | | | | 0.473 | k star (bias corrected MLE) | | | | | 0.465 |
| 703 | Theta hat (MLE) | | | | | 2.732 | Theta star (bias corrected MLE) | | | | | 2.777 |
| 704 | nu hat (MLE) | | | | | 92.68 | nu star (bias corrected) | | | | | 91.17 |
| 705 | MLE Mean (bias corrected) | | | | | 1.292 | MLE Sd (bias corrected) | | | | | 1.894 |
| 706 | | | | | | | Adjusted Level of Significance (β) | | | | | 0.0476 |
| 707 | Approximate Chi Square Value (91.17, α) | | | | | 70.15 | Adjusted Chi Square Value (91.17, β) | | | | | 69.88 |
| 708 | 95% Gamma Approximate UCL (use when n>=50) | | | | | 1.679 | 95% Gamma Adjusted UCL (use when n<50) | | | | | 1.685 |
| 709 | | | | | | | | | | | | |
| 710 | **Lognormal GOF Test on Detected Observations Only** | | | | | | | | | | | |
| 711 | Lilliefors Test Statistic | | | | | 0.0832 | **Lilliefors GOF Test** | | | | | |
| 712 | 5% Lilliefors Critical Value | | | | | 0.103 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 713 | **Detected Data appear Approximate Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 714 | | | | | | | | | | | | |
| 715 | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | | | | | |
| 716 | Mean in Original Scale | | | | | 1.343 | Mean in Log Scale | | | | | -0.449 |
| 717 | SD in Original Scale | | | | | 2.314 | SD in Log Scale | | | | | 1.106 |
| 718 | 95% t UCL (assumes normality of ROS data) | | | | | 1.731 | 95% Percentile Bootstrap UCL | | | | | 1.758 |
| 719 | 95% BCA Bootstrap UCL | | | | | 1.824 | 95% Bootstrap t UCL | | | | | 1.838 |
| 720 | 95% H-UCL (Log ROS) | | | | | 1.535 | | | | | | |
| 721 | | | | | | | | | | | | |
| 722 | **UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed** | | | | | | | | | | | |
| 723 | KM Mean (logged) | | | | | -0.468 | 95% H-UCL (KM -Log) | | | | | 1.609 |
| 724 | KM SD (logged) | | | | | 1.151 | 95% Critical H Value (KM-Log) | | | | | 2.407 |
| 725 | KM Standard Error of Mean (logged) | | | | | 0.123 | | | | | | |
| 726 | | | | | | | | | | | | |
| 727 | **DL/2 Statistics** | | | | | | | | | | | |
| 728 | **DL/2 Normal** | | | | | | **DL/2 Log-Transformed** | | | | | |
| 729 | Mean in Original Scale | | | | | 1.577 | Mean in Log Scale | | | | | -0.3 |
| 730 | SD in Original Scale | | | | | 2.374 | SD in Log Scale | | | | | 1.19 |
| 731 | 95% t UCL (Assumes normality) | | | | | 1.975 | 95% H-Stat UCL | | | | | 2.02 |
| 732 | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | | | | | |
| 733 | | | | | | | | | | | | |
| 734 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 735 | **Detected Data appear Approximate Lognormal Distributed at 5% Significance Level** | | | | | | | | | | | |

| | | | | | | | | | | | | |
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| 736 | | | | | | | | | | | | |
| 737 | **Suggested UCL to Use** | | | | | | | | | | | |
| 738 | | | | 95% KM (Chebyshev) UCL | | 2.409 | | | | | | |
| 739 | | | | | | | | | | | | |
| 740 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 741 | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | | | | | |
| 742 | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | | | | | |
| 743 | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 744 | | | | | | | | | | | | |
| 745 | **Aroclor-1242 (PCB-1242)** | | | | | | | | | | | |
| 746 | | | | | | | | | | | | |
| 747 | **General Statistics** | | | | | | | | | | | |
| 748 | | | | Total Number of Observations | | 147 | | | Number of Distinct Observations | | | 34 |
| 749 | | | | Number of Detects | | 3 | | | Number of Non-Detects | | | 144 |
| 750 | | | | Number of Distinct Detects | | 3 | | | Number of Distinct Non-Detects | | | 31 |
| 751 | | | | Minimum Detect | | 1.5000E-4 | | | Minimum Non-Detect | | | 2.1000E-5 |
| 752 | | | | Maximum Detect | | 0.0023 | | | Maximum Non-Detect | | | 5.4 |
| 753 | | | | Variance Detects | | 1.2246E-6 | | | Percent Non-Detects | | | 97.96% |
| 754 | | | | Mean Detects | | 0.00107 | | | SD Detects | | | 0.00111 |
| 755 | | | | Median Detects | | 7.7000E-4 | | | CV Detects | | | 1.031 |
| 756 | | | | Skewness Detects | | 1.141 | | | Kurtosis Detects | | | N/A |
| 757 | | | | Mean of Logged Detects | | -7.35 | | | SD of Logged Detects | | | 1.374 |
| 758 | | | | | | | | | | | | |
| 759 | **Warning: Data set has only 3 Detected Values.** | | | | | | | | | | | |
| 760 | **This is not enough to compute meaningful or reliable statistics and estimates.** | | | | | | | | | | | |
| 761 | | | | | | | | | | | | |
| 762 | | | | | | | | | | | | |
| 763 | **Normal GOF Test on Detects Only** | | | | | | | | | | | |
| 764 | | | | Shapiro Wilk Test Statistic | | 0.944 | | | **Shapiro Wilk GOF Test** | | | |
| 765 | | | | 5% Shapiro Wilk Critical Value | | 0.767 | | | Detected Data appear Normal at 5% Significance Level | | | |
| 766 | | | | Lilliefors Test Statistic | | 0.275 | | | **Lilliefors GOF Test** | | | |
| 767 | | | | 5% Lilliefors Critical Value | | 0.512 | | | Detected Data appear Normal at 5% Significance Level | | | |
| 768 | **Detected Data appear Normal at 5% Significance Level** | | | | | | | | | | | |
| 769 | | | | | | | | | | | | |
| 770 | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | | | | | |
| 771 | | | | Mean | | 3.0947E-4 | | | Standard Error of Mean | | | 2.4546E-4 |
| 772 | | | | SD | | 6.6457E-4 | | | 95% KM (BCA) UCL | | | N/A |
| 773 | | | | 95% KM (t) UCL | | 7.1579E-4 | | | 95% KM (Percentile Bootstrap) UCL | | | N/A |
| 774 | | | | 95% KM (z) UCL | | 7.1321E-4 | | | 95% KM Bootstrap t UCL | | | N/A |
| 775 | | | | 90% KM Chebyshev UCL | | 0.00105 | | | 95% KM Chebyshev UCL | | | 0.00138 |
| 776 | | | | 97.5% KM Chebyshev UCL | | 0.00184 | | | 99% KM Chebyshev UCL | | | 0.00275 |
| 777 | | | | | | | | | | | | |
| 778 | **Gamma GOF Tests on Detected Observations Only** | | | | | | | | | | | |
| 779 | **Not Enough Data to Perform GOF Test** | | | | | | | | | | | |
| 780 | | | | | | | | | | | | |
| 781 | **Gamma Statistics on Detected Data Only** | | | | | | | | | | | |
| 782 | | | | k hat (MLE) | | 1.112 | | | k star (bias corrected MLE) | | | N/A |
| 783 | | | | Theta hat (MLE) | | 9.6485E-4 | | | Theta star (bias corrected MLE) | | | N/A |
| 784 | | | | nu hat (MLE) | | 6.675 | | | nu star (bias corrected) | | | N/A |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 785 | MLE Mean (bias corrected) | | | | | N/A | MLE Sd (bias corrected) | | | | | N/A |
| 786 | | | | | | | | | | | | |
| 787 | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | | | | | |
| 788 | k hat (KM) | | | | | 0.217 | nu hat (KM) | | | | | 63.75 |
| 789 | | | | | | | Adjusted Level of Significance (β) | | | | | 0.0484 |
| 790 | Approximate Chi Square Value (63.75, α) | | | | | 46.38 | Adjusted Chi Square Value (63.75, β) | | | | | 46.24 |
| 791 | 95% Gamma Approximate KM-UCL (use when n>=50) | | | | | 4.2535E-4 | 95% Gamma Adjusted KM-UCL (use when n<50) | | | | | 4.2669E-4 |
| 792 | | | | | | | | | | | | |
| 793 | **Lognormal GOF Test on Detected Observations Only** | | | | | | | | | | | |
| 794 | Shapiro Wilk Test Statistic | | | | | 0.987 | **Shapiro Wilk GOF Test** | | | | | |
| 795 | 5% Shapiro Wilk Critical Value | | | | | 0.767 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 796 | Lilliefors Test Statistic | | | | | 0.219 | **Lilliefors GOF Test** | | | | | |
| 797 | 5% Lilliefors Critical Value | | | | | 0.512 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 798 | **Detected Data appear Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 799 | | | | | | | | | | | | |
| 800 | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | | | | | |
| 801 | Mean in Original Scale | | | | | 1.8634E-4 | Mean in Log Scale | | | | | -11.17 |
| 802 | SD in Original Scale | | | | | 6.4407E-4 | SD in Log Scale | | | | | 2.489 |
| 803 | 95% t UCL (assumes normality of ROS data) | | | | | 2.7428E-4 | 95% Percentile Bootstrap UCL | | | | | 2.8184E-4 |
| 804 | 95% BCA Bootstrap UCL | | | | | 3.1641E-4 | 95% Bootstrap t UCL | | | | | 3.5907E-4 |
| 805 | 95% H-UCL (Log ROS) | | | | | 6.9568E-4 | | | | | | |
| 806 | | | | | | | | | | | | |
| 807 | **UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed** | | | | | | | | | | | |
| 808 | KM Mean (logged) | | | | | -9.816 | 95% H-UCL (KM -Log) | | | | | 3.0478E-4 |
| 809 | KM SD (logged) | | | | | 1.633 | 95% Critical H Value (KM-Log) | | | | | 2.858 |
| 810 | KM Standard Error of Mean (logged) | | | | | 0.608 | | | | | | |
| 811 | | | | | | | | | | | | |
| 812 | **DL/2 Statistics** | | | | | | | | | | | |
| 813 | **DL/2 Normal** | | | | | | **DL/2 Log-Transformed** | | | | | |
| 814 | Mean in Original Scale | | | | | 0.0847 | Mean in Log Scale | | | | | -4.234 |
| 815 | SD in Original Scale | | | | | 0.326 | SD in Log Scale | | | | | 2.183 |
| 816 | 95% t UCL (Assumes normality) | | | | | 0.129 | 95% H-Stat UCL | | | | | 0.297 |
| 817 | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | | | | | |
| 818 | | | | | | | | | | | | |
| 819 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 820 | **Detected Data appear Normal Distributed at 5% Significance Level** | | | | | | | | | | | |
| 821 | | | | | | | | | | | | |
| 822 | **Suggested UCL to Use** | | | | | | | | | | | |
| 823 | 95% KM (t) UCL | | | | | 7.1579E-4 | 95% KM (Percentile Bootstrap) UCL | | | | | N/A |
| 824 | **Warning: One or more Recommended UCL(s) not available!** | | | | | | | | | | | |
| 825 | | | | | | | | | | | | |
| 826 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 827 | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | | | | | |
| 828 | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | | | | | |
| 829 | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 830 | | | | | | | | | | | | |
| 831 | **Aroclor-1248 (PCB-1248)** | | | | | | | | | | | |
| 832 | | | | | | | | | | | | |
| 833 | **General Statistics** | | | | | | | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 834 | Total Number of Observations | | | | | 147 | Number of Distinct Observations | | | | | 41 |
| 835 | Number of Detects | | | | | 11 | Number of Non-Detects | | | | | 136 |
| 836 | Number of Distinct Detects | | | | | 11 | Number of Distinct Non-Detects | | | | | 31 |
| 837 | Minimum Detect | | | | | 0.056 | Minimum Non-Detect | | | | | 2.1000E-5 |
| 838 | Maximum Detect | | | | | 4.5 | Maximum Non-Detect | | | | | 5.4 |
| 839 | Variance Detects | | | | | 3.562 | Percent Non-Detects | | | | | 92.52% |
| 840 | Mean Detects | | | | | 1.455 | SD Detects | | | | | 1.887 |
| 841 | Median Detects | | | | | 0.34 | CV Detects | | | | | 1.298 |
| 842 | Skewness Detects | | | | | 1.062 | Kurtosis Detects | | | | | -0.904 |
| 843 | Mean of Logged Detects | | | | | -0.683 | SD of Logged Detects | | | | | 1.642 |
| 844 | | | | | | | | | | | | |
| 845 | **Normal GOF Test on Detects Only** | | | | | | | | | | | |
| 846 | Shapiro Wilk Test Statistic | | | | | 0.703 | **Shapiro Wilk GOF Test** | | | | | |
| 847 | 5% Shapiro Wilk Critical Value | | | | | 0.85 | Detected Data Not Normal at 5% Significance Level | | | | | |
| 848 | Lilliefors Test Statistic | | | | | 0.319 | **Lilliefors GOF Test** | | | | | |
| 849 | 5% Lilliefors Critical Value | | | | | 0.267 | Detected Data Not Normal at 5% Significance Level | | | | | |
| 850 | **Detected Data Not Normal at 5% Significance Level** | | | | | | | | | | | |
| 851 | | | | | | | | | | | | |
| 852 | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | | | | | |
| 853 | Mean | | | | | 0.111 | Standard Error of Mean | | | | | 0.0547 |
| 854 | SD | | | | | 0.628 | 95% KM (BCA) UCL | | | | | 0.202 |
| 855 | 95% KM (t) UCL | | | | | 0.202 | 95% KM (Percentile Bootstrap) UCL | | | | | 0.201 |
| 856 | 95% KM (z) UCL | | | | | 0.201 | 95% KM Bootstrap t UCL | | | | | 0.241 |
| 857 | 90% KM Chebyshev UCL | | | | | 0.275 | 95% KM Chebyshev UCL | | | | | 0.349 |
| 858 | 97.5% KM Chebyshev UCL | | | | | 0.453 | 99% KM Chebyshev UCL | | | | | 0.655 |
| 859 | | | | | | | | | | | | |
| 860 | **Gamma GOF Tests on Detected Observations Only** | | | | | | | | | | | |
| 861 | A-D Test Statistic | | | | | 0.723 | **Anderson-Darling GOF Test** | | | | | |
| 862 | 5% A-D Critical Value | | | | | 0.775 | Detected data appear Gamma Distributed at 5% Significance Level | | | | | |
| 863 | K-S Test Statistic | | | | | 0.213 | **Kolmogrov-Smirnoff GOF** | | | | | |
| 864 | 5% K-S Critical Value | | | | | 0.268 | Detected data appear Gamma Distributed at 5% Significance Level | | | | | |
| 865 | **Detected data appear Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 866 | | | | | | | | | | | | |
| 867 | **Gamma Statistics on Detected Data Only** | | | | | | | | | | | |
| 868 | k hat (MLE) | | | | | 0.586 | k star (bias corrected MLE) | | | | | 0.487 |
| 869 | Theta hat (MLE) | | | | | 2.482 | Theta star (bias corrected MLE) | | | | | 2.987 |
| 870 | nu hat (MLE) | | | | | 12.89 | nu star (bias corrected) | | | | | 10.71 |
| 871 | MLE Mean (bias corrected) | | | | | 1.455 | MLE Sd (bias corrected) | | | | | 2.085 |
| 872 | | | | | | | | | | | | |
| 873 | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | | | | | |
| 874 | k hat (KM) | | | | | 0.0313 | nu hat (KM) | | | | | 9.204 |
| 875 | Approximate Chi Square Value (9.20, α) | | | | | 3.451 | Adjusted Chi Square Value (9.20, β) | | | | | 3.416 |
| 876 | 95% Gamma Approximate KM-UCL (use when n>=50) | | | | | 0.296 | 95% Gamma Adjusted KM-UCL (use when n<50) | | | | | 0.299 |
| 877 | Gamma (KM) may not be used when k hat (KM) is < 0.1 | | | | | | | | | | | |
| 878 | | | | | | | | | | | | |
| 879 | **Gamma ROS Statistics using Imputed Non-Detects** | | | | | | | | | | | |
| 880 | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | | | | |
| 881 | GROS may not be used when kstar of detected data is small such as < 0.1 | | | | | | | | | | | |
| 882 | For such situations, GROS method tends to yield inflated values of UCLs and BTVs | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 883 | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | | | | |
| 884 | | | | | Minimum | 0.01 | | | | Mean | | 0.118 |
| 885 | | | | | Maximum | 4.5 | | | | Median | | 0.01 |
| 886 | | | | | SD | 0.624 | | | | CV | | 5.284 |
| 887 | | | | | k hat (MLE) | 0.315 | | | | k star (bias corrected MLE) | | 0.313 |
| 888 | | | | | Theta hat (MLE) | 0.375 | | | | Theta star (bias corrected MLE) | | 0.378 |
| 889 | | | | | nu hat (MLE) | 92.47 | | | | nu star (bias corrected) | | 91.92 |
| 890 | | | | | MLE Mean (bias corrected) | 0.118 | | | | MLE Sd (bias corrected) | | 0.211 |
| 891 | | | | | | | | | | Adjusted Level of Significance (β) | | 0.0484 |
| 892 | | | | | Approximate Chi Square Value (91.92, α) | 70.81 | | | | Adjusted Chi Square Value (91.92, β) | | 70.63 |
| 893 | | | | | 95% Gamma Approximate UCL (use when n>=50) | 0.153 | | | | 95% Gamma Adjusted UCL (use when n<50) | | 0.154 |
| 894 | | | | | | | | | | | | |
| 895 | **Lognormal GOF Test on Detected Observations Only** | | | | | | | | | | | |
| 896 | | | | | Shapiro Wilk Test Statistic | 0.903 | **Shapiro Wilk GOF Test** | | | | | |
| 897 | | | | | 5% Shapiro Wilk Critical Value | 0.85 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 898 | | | | | Lilliefors Test Statistic | 0.174 | **Lilliefors GOF Test** | | | | | |
| 899 | | | | | 5% Lilliefors Critical Value | 0.267 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 900 | **Detected Data appear Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 901 | | | | | | | | | | | | |
| 902 | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | | | | | |
| 903 | | | | | Mean in Original Scale | 0.11 | | | | Mean in Log Scale | | -8.852 |
| 904 | | | | | SD in Original Scale | 0.625 | | | | SD in Log Scale | | 3.675 |
| 905 | | | | | 95% t UCL (assumes normality of ROS data) | 0.195 | | | | 95% Percentile Bootstrap UCL | | 0.199 |
| 906 | | | | | 95% BCA Bootstrap UCL | 0.262 | | | | 95% Bootstrap t UCL | | 0.244 |
| 907 | | | | | 95% H-UCL (Log ROS) | 0.644 | | | | | | |
| 908 | | | | | | | | | | | | |
| 909 | **UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed** | | | | | | | | | | | |
| 910 | | | | | KM Mean (logged) | -9.948 | | | | 95% H-UCL (KM -Log) | | 0.00599 |
| 911 | | | | | KM SD (logged) | 2.775 | | | | 95% Critical H Value (KM-Log) | | 4.266 |
| 912 | | | | | KM Standard Error of Mean (logged) | 0.252 | | | | | | |
| 913 | | | | | | | | | | | | |
| 914 | **DL/2 Statistics** | | | | | | | | | | | |
| 915 | **DL/2 Normal** | | | | | | **DL/2 Log-Transformed** | | | | | |
| 916 | | | | | Mean in Original Scale | 0.178 | | | | Mean in Log Scale | | -4.17 |
| 917 | | | | | SD in Original Scale | 0.691 | | | | SD in Log Scale | | 2.442 |
| 918 | | | | | 95% t UCL (Assumes normality) | 0.273 | | | | 95% H-Stat UCL | | 0.663 |
| 919 | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | | | | | |
| 920 | | | | | | | | | | | | |
| 921 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 922 | **Detected Data appear Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 923 | | | | | | | | | | | | |
| 924 | **Suggested UCL to Use** | | | | | | | | | | | |
| 925 | | | | | 95% KM (t) UCL | 0.202 | | | | 95% GROS Approximate Gamma UCL | | 0.153 |
| 926 | | | | | 95% Approximate Gamma KM-UCL | 0.296 | | | | | | |
| 927 | | | | | | | | | | | | |
| 928 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 929 | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | | | | | |
| 930 | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | | | | | |
| 931 | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 932 | | | | | | | | | | | | |
| 933 | **Aroclor-1254 (PCB-1254)** | | | | | | | | | | | |
| 934 | | | | | | | | | | | | |
| 935 | **General Statistics** | | | | | | | | | | | |
| 936 | Total Number of Observations | | | | | 146 | Number of Distinct Observations | | | | | 40 |
| 937 | Number of Detects | | | | | 12 | Number of Non-Detects | | | | | 134 |
| 938 | Number of Distinct Detects | | | | | 11 | Number of Distinct Non-Detects | | | | | 29 |
| 939 | Minimum Detect | | | | | 1.9000E-4 | Minimum Non-Detect | | | | | 2.1000E-5 |
| 940 | Maximum Detect | | | | | 0.48 | Maximum Non-Detect | | | | | 5.4 |
| 941 | Variance Detects | | | | | 0.0285 | Percent Non-Detects | | | | | 91.78% |
| 942 | Mean Detects | | | | | 0.116 | SD Detects | | | | | 0.169 |
| 943 | Median Detects | | | | | 0.019 | CV Detects | | | | | 1.459 |
| 944 | Skewness Detects | | | | | 1.377 | Kurtosis Detects | | | | | 0.47 |
| 945 | Mean of Logged Detects | | | | | -3.708 | SD of Logged Detects | | | | | 2.264 |
| 946 | | | | | | | | | | | | |
| 947 | **Normal GOF Test on Detects Only** | | | | | | | | | | | |
| 948 | Shapiro Wilk Test Statistic | | | | | 0.713 | **Shapiro Wilk GOF Test** | | | | | |
| 949 | 5% Shapiro Wilk Critical Value | | | | | 0.859 | Detected Data Not Normal at 5% Significance Level | | | | | |
| 950 | Lilliefors Test Statistic | | | | | 0.34 | **Lilliefors GOF Test** | | | | | |
| 951 | 5% Lilliefors Critical Value | | | | | 0.256 | Detected Data Not Normal at 5% Significance Level | | | | | |
| 952 | **Detected Data Not Normal at 5% Significance Level** | | | | | | | | | | | |
| 953 | | | | | | | | | | | | |
| 954 | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | | | | | |
| 955 | Mean | | | | | 0.0118 | Standard Error of Mean | | | | | 0.00522 |
| 956 | SD | | | | | 0.0578 | 95% KM (BCA) UCL | | | | | 0.0213 |
| 957 | 95% KM (t) UCL | | | | | 0.0205 | 95% KM (Percentile Bootstrap) UCL | | | | | 0.0205 |
| 958 | 95% KM (z) UCL | | | | | 0.0204 | 95% KM Bootstrap t UCL | | | | | 0.0287 |
| 959 | 90% KM Chebyshev UCL | | | | | 0.0275 | 95% KM Chebyshev UCL | | | | | 0.0346 |
| 960 | 97.5% KM Chebyshev UCL | | | | | 0.0444 | 99% KM Chebyshev UCL | | | | | 0.0638 |
| 961 | | | | | | | | | | | | |
| 962 | **Gamma GOF Tests on Detected Observations Only** | | | | | | | | | | | |
| 963 | A-D Test Statistic | | | | | 0.502 | **Anderson-Darling GOF Test** | | | | | |
| 964 | 5% A-D Critical Value | | | | | 0.8 | Detected data appear Gamma Distributed at 5% Significance Level | | | | | |
| 965 | K-S Test Statistic | | | | | 0.217 | **Kolmogrov-Smirnoff GOF** | | | | | |
| 966 | 5% K-S Critical Value | | | | | 0.261 | Detected data appear Gamma Distributed at 5% Significance Level | | | | | |
| 967 | **Detected data appear Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 968 | | | | | | | | | | | | |
| 969 | **Gamma Statistics on Detected Data Only** | | | | | | | | | | | |
| 970 | k hat (MLE) | | | | | 0.421 | k star (bias corrected MLE) | | | | | 0.371 |
| 971 | Theta hat (MLE) | | | | | 0.275 | Theta star (bias corrected MLE) | | | | | 0.312 |
| 972 | nu hat (MLE) | | | | | 10.09 | nu star (bias corrected) | | | | | 8.904 |
| 973 | MLE Mean (bias corrected) | | | | | 0.116 | MLE Sd (bias corrected) | | | | | 0.19 |
| 974 | | | | | | | | | | | | |
| 975 | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | | | | | |
| 976 | k hat (KM) | | | | | 0.0418 | nu hat (KM) | | | | | 12.21 |
| 977 | Approximate Chi Square Value (12.21, α) | | | | | 5.363 | Adjusted Chi Square Value (12.21, β) | | | | | 5.318 |
| 978 | 95% Gamma Approximate KM-UCL (use when n>=50) | | | | | 0.0269 | 95% Gamma Adjusted KM-UCL (use when n<50) | | | | | 0.0271 |
| 979 | Gamma (KM) may not be used when k hat (KM) is < 0.1 | | | | | | | | | | | |
| 980 | | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 981 | **Gamma ROS Statistics using Imputed Non-Detects** | | | | | | | | | | | |
| 982 | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | | | | |
| 983 | GROS may not be used when kstar of detected data is small such as < 0.1 | | | | | | | | | | | |
| 984 | For such situations, GROS method tends to yield inflated values of UCLs and BTVs | | | | | | | | | | | |
| 985 | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | | | | |
| 986 | | | | | Minimum | 1.9000E-4 | | | | Mean | | 0.0188 |
| 987 | | | | | Maximum | 0.48 | | | | Median | | 0.01 |
| 988 | | | | | SD | 0.0549 | | | | CV | | 2.922 |
| 989 | | | | | k hat (MLE) | 1.045 | | | | k star (bias corrected MLE) | | 1.028 |
| 990 | | | | | Theta hat (MLE) | 0.018 | | | | Theta star (bias corrected MLE) | | 0.0183 |
| 991 | | | | | nu hat (MLE) | 305 | | | | nu star (bias corrected) | | 300.1 |
| 992 | | | | | MLE Mean (bias corrected) | 0.0188 | | | | MLE Sd (bias corrected) | | 0.0185 |
| 993 | | | | | | | | | | Adjusted Level of Significance (β) | | 0.0484 |
| 994 | | | | | Approximate Chi Square Value (300.09, α) | 261 | | | | Adjusted Chi Square Value (300.09, β) | | 260.6 |
| 995 | | | | | 95% Gamma Approximate UCL (use when n>=50) | 0.0216 | | | | 95% Gamma Adjusted UCL (use when n<50) | | 0.0216 |
| 996 | | | | | | | | | | | | |
| 997 | **Lognormal GOF Test on Detected Observations Only** | | | | | | | | | | | |
| 998 | | | | | Shapiro Wilk Test Statistic | 0.937 | **Shapiro Wilk GOF Test** | | | | | |
| 999 | | | | | 5% Shapiro Wilk Critical Value | 0.859 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 1000 | | | | | Lilliefors Test Statistic | 0.122 | **Lilliefors GOF Test** | | | | | |
| 1001 | | | | | 5% Lilliefors Critical Value | 0.256 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 1002 | **Detected Data appear Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 1003 | | | | | | | | | | | | |
| 1004 | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | | | | | |
| 1005 | | | | | Mean in Original Scale | 0.00997 | | | | Mean in Log Scale | | -9.344 |
| 1006 | | | | | SD in Original Scale | 0.0564 | | | | SD in Log Scale | | 2.974 |
| 1007 | | | | | 95% t UCL (assumes normality of ROS data) | 0.0177 | | | | 95% Percentile Bootstrap UCL | | 0.018 |
| 1008 | | | | | 95% BCA Bootstrap UCL | 0.0212 | | | | 95% Bootstrap t UCL | | 0.0249 |
| 1009 | | | | | 95% H-UCL (Log ROS) | 0.0223 | | | | | | |
| 1010 | | | | | | | | | | | | |
| 1011 | **UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed** | | | | | | | | | | | |
| 1012 | | | | | KM Mean (logged) | -9.114 | | | | 95% H-UCL (KM -Log) | | 0.0138 |
| 1013 | | | | | KM SD (logged) | 2.774 | | | | 95% Critical H Value (KM-Log) | | 4.262 |
| 1014 | | | | | KM Standard Error of Mean (logged) | 0.521 | | | | | | |
| 1015 | | | | | | | | | | | | |
| 1016 | **DL/2 Statistics** | | | | | | | | | | | |
| 1017 | **DL/2 Normal** | | | | | | **DL/2 Log-Transformed** | | | | | |
| 1018 | | | | | Mean in Original Scale | 0.0921 | | | | Mean in Log Scale | | -4.233 |
| 1019 | | | | | SD in Original Scale | 0.33 | | | | SD in Log Scale | | 2.278 |
| 1020 | | | | | 95% t UCL (Assumes normality) | 0.137 | | | | 95% H-Stat UCL | | 0.386 |
| 1021 | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | | | | | |
| 1022 | | | | | | | | | | | | |
| 1023 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 1024 | **Detected Data appear Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 1025 | | | | | | | | | | | | |
| 1026 | **Suggested UCL to Use** | | | | | | | | | | | |
| 1027 | | | | | 95% KM (t) UCL | 0.0205 | | | | 95% GROS Approximate Gamma UCL | | 0.0216 |
| 1028 | | | | | 95% Approximate Gamma KM-UCL | 0.0269 | | | | | | |
| 1029 | | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1030 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 1031 | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | | | | | |
| 1032 | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | | | | | |
| 1033 | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 1034 | | | | | | | | | | | | |
| 1035 | **Aroclor-1260 (PCB-1260)** | | | | | | | | | | | |
| 1036 | | | | | | | | | | | | |
| 1037 | **General Statistics** | | | | | | | | | | | |
| 1038 | | | | | Total Number of Observations | 159 | | | Number of Distinct Observations | 76 | | |
| 1039 | | | | | Number of Detects | 66 | | | Number of Non-Detects | 93 | | |
| 1040 | | | | | Number of Distinct Detects | 58 | | | Number of Distinct Non-Detects | 23 | | |
| 1041 | | | | | Minimum Detect | 2.4000E-5 | | | Minimum Non-Detect | 2.1000E-5 | | |
| 1042 | | | | | Maximum Detect | 32 | | | Maximum Non-Detect | 0.57 | | |
| 1043 | | | | | Variance Detects | 26.46 | | | Percent Non-Detects | 58.49% | | |
| 1044 | | | | | Mean Detects | 1.24 | | | SD Detects | 5.144 | | |
| 1045 | | | | | Median Detects | 0.058 | | | CV Detects | 4.147 | | |
| 1046 | | | | | Skewness Detects | 5.394 | | | Kurtosis Detects | 29.06 | | |
| 1047 | | | | | Mean of Logged Detects | -2.696 | | | SD of Logged Detects | 2.42 | | |
| 1048 | | | | | | | | | | | | |
| 1049 | **Normal GOF Test on Detects Only** | | | | | | | | | | | |
| 1050 | | | | | Shapiro Wilk Test Statistic | 0.26 | | | **Normal GOF Test on Detected Observations Only** | | | |
| 1051 | | | | | 5% Shapiro Wilk P Value | 0 | | | Detected Data Not Normal at 5% Significance Level | | | |
| 1052 | | | | | Lilliefors Test Statistic | 0.435 | | | **Lilliefors GOF Test** | | | |
| 1053 | | | | | 5% Lilliefors Critical Value | 0.109 | | | Detected Data Not Normal at 5% Significance Level | | | |
| 1054 | **Detected Data Not Normal at 5% Significance Level** | | | | | | | | | | | |
| 1055 | | | | | | | | | | | | |
| 1056 | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | | | | | |
| 1057 | | | | | Mean | 0.519 | | | Standard Error of Mean | 0.267 | | |
| 1058 | | | | | SD | 3.345 | | | 95% KM (BCA) UCL | 1.074 | | |
| 1059 | | | | | 95% KM (t) UCL | 0.962 | | | 95% KM (Percentile Bootstrap) UCL | 1.033 | | |
| 1060 | | | | | 95% KM (z) UCL | 0.959 | | | 95% KM Bootstrap t UCL | 2.92 | | |
| 1061 | | | | | 90% KM Chebyshev UCL | 1.321 | | | 95% KM Chebyshev UCL | 1.684 | | |
| 1062 | | | | | 97.5% KM Chebyshev UCL | 2.189 | | | 99% KM Chebyshev UCL | 3.179 | | |
| 1063 | | | | | | | | | | | | |
| 1064 | **Gamma GOF Tests on Detected Observations Only** | | | | | | | | | | | |
| 1065 | | | | | A-D Test Statistic | 6.203 | | | **Anderson-Darling GOF Test** | | | |
| 1066 | | | | | 5% A-D Critical Value | 0.892 | | | Detected Data Not Gamma Distributed at 5% Significance Level | | | |
| 1067 | | | | | K-S Test Statistic | 0.256 | | | **Kolmogrov-Smirnoff GOF** | | | |
| 1068 | | | | | 5% K-S Critical Value | 0.121 | | | Detected Data Not Gamma Distributed at 5% Significance Level | | | |
| 1069 | **Detected Data Not Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 1070 | | | | | | | | | | | | |
| 1071 | **Gamma Statistics on Detected Data Only** | | | | | | | | | | | |
| 1072 | | | | | k hat (MLE) | 0.245 | | | k star (bias corrected MLE) | 0.244 | | |
| 1073 | | | | | Theta hat (MLE) | 5.068 | | | Theta star (bias corrected MLE) | 5.089 | | |
| 1074 | | | | | nu hat (MLE) | 32.31 | | | nu star (bias corrected) | 32.17 | | |
| 1075 | | | | | MLE Mean (bias corrected) | 1.24 | | | MLE Sd (bias corrected) | 2.513 | | |
| 1076 | | | | | | | | | | | | |
| 1077 | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | | | | | |
| 1078 | | | | | k hat (KM) | 0.0241 | | | nu hat (KM) | 7.669 | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1079 | Approximate Chi Square Value (7.67, α) | | | | | 2.545 | Adjusted Chi Square Value (7.67, β) | | | | | 2.518 |
| 1080 | 95% Gamma Approximate KM-UCL (use when n>=50) | | | | | 1.565 | 95% Gamma Adjusted KM-UCL (use when n<50) | | | | | 1.582 |
| 1081 | Gamma (KM) may not be used when k hat (KM) is < 0.1 | | | | | | | | | | | |
| 1082 | | | | | | | | | | | | |
| 1083 | **Gamma ROS Statistics using Imputed Non-Detects** | | | | | | | | | | | |
| 1084 | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | | | | |
| 1085 | GROS may not be used when kstar of detected data is small such as < 0.1 | | | | | | | | | | | |
| 1086 | For such situations, GROS method tends to yield inflated values of UCLs and BTVs | | | | | | | | | | | |
| 1087 | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | | | | |
| 1088 | Minimum | | | | | 2.4000E-5 | Mean | | | | | 0.521 |
| 1089 | Maximum | | | | | 32 | Median | | | | | 0.01 |
| 1090 | SD | | | | | 3.355 | CV | | | | | 6.443 |
| 1091 | k hat (MLE) | | | | | 0.228 | k star (bias corrected MLE) | | | | | 0.228 |
| 1092 | Theta hat (MLE) | | | | | 2.283 | Theta star (bias corrected MLE) | | | | | 2.284 |
| 1093 | nu hat (MLE) | | | | | 72.53 | nu star (bias corrected) | | | | | 72.49 |
| 1094 | MLE Mean (bias corrected) | | | | | 0.521 | MLE Sd (bias corrected) | | | | | 1.091 |
| 1095 | | | | | | | Adjusted Level of Significance (β) | | | | | 0.0485 |
| 1096 | Approximate Chi Square Value (72.49, α) | | | | | 53.89 | Adjusted Chi Square Value (72.49, β) | | | | | 53.74 |
| 1097 | 95% Gamma Approximate UCL (use when n>=50) | | | | | 0.701 | 95% Gamma Adjusted UCL (use when n<50) | | | | | 0.702 |
| 1098 | | | | | | | | | | | | |
| 1099 | **Lognormal GOF Test on Detected Observations Only** | | | | | | | | | | | |
| 1100 | Lilliefors Test Statistic | | | | | 0.0964 | **Lilliefors GOF Test** | | | | | |
| 1101 | 5% Lilliefors Critical Value | | | | | 0.109 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 1102 | **Detected Data appear Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 1103 | | | | | | | | | | | | |
| 1104 | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | | | | | |
| 1105 | Mean in Original Scale | | | | | 0.517 | Mean in Log Scale | | | | | -5.313 |
| 1106 | SD in Original Scale | | | | | 3.356 | SD in Log Scale | | | | | 3.096 |
| 1107 | 95% t UCL (assumes normality of ROS data) | | | | | 0.957 | 95% Percentile Bootstrap UCL | | | | | 0.968 |
| 1108 | 95% BCA Bootstrap UCL | | | | | 1.225 | 95% Bootstrap t UCL | | | | | 3.002 |
| 1109 | 95% H-UCL (Log ROS) | | | | | 1.898 | | | | | | |
| 1110 | | | | | | | | | | | | |
| 1111 | **UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed** | | | | | | | | | | | |
| 1112 | KM Mean (logged) | | | | | -5.964 | 95% H-UCL (KM -Log) | | | | | 32.29 |
| 1113 | KM SD (logged) | | | | | 3.907 | 95% Critical H Value (KM-Log) | | | | | 5.81 |
| 1114 | KM Standard Error of Mean (logged) | | | | | 0.415 | | | | | | |
| 1115 | | | | | | | | | | | | |
| 1116 | **DL/2 Statistics** | | | | | | | | | | | |
| 1117 | **DL/2 Normal** | | | | | | **DL/2 Log-Transformed** | | | | | |
| 1118 | Mean in Original Scale | | | | | 0.532 | Mean in Log Scale | | | | | -3.86 |
| 1119 | SD in Original Scale | | | | | 3.353 | SD in Log Scale | | | | | 2.493 |
| 1120 | 95% t UCL (Assumes normality) | | | | | 0.972 | 95% H-Stat UCL | | | | | 1.027 |
| 1121 | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | | | | | |
| 1122 | | | | | | | | | | | | |
| 1123 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 1124 | **Detected Data appear Lognormal Distributed at 5% Significance Level** | | | | | | | | | | | |
| 1125 | | | | | | | | | | | | |
| 1126 | **Suggested UCL to Use** | | | | | | | | | | | |
| 1127 | 97.5% KM (Chebyshev) UCL | | | | | 2.189 | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1128 | | | | | | | | | | | | |
| 1129 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 1130 | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | | | | | |
| 1131 | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | | | | | |
| 1132 | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 1133 | | | | | | | | | | | | |
| 1134 | | | | | | | | | | | | |
| 1135 | **Arsenic** | | | | | | | | | | | |
| 1136 | | | | | | | | | | | | |
| 1137 | **General Statistics** | | | | | | | | | | | |
| 1138 | Total Number of Observations | | | | | 98 | Number of Distinct Observations | | | | | 64 |
| 1139 | | | | | | | Number of Missing Observations | | | | | 0 |
| 1140 | Minimum | | | | | 1.5 | Mean | | | | | 8.679 |
| 1141 | Maximum | | | | | 49 | Median | | | | | 6.1 |
| 1142 | SD | | | | | 7.955 | Std. Error of Mean | | | | | 0.804 |
| 1143 | Coefficient of Variation | | | | | 0.917 | Skewness | | | | | 2.974 |
| 1144 | | | | | | | | | | | | |
| 1145 | **Normal GOF Test** | | | | | | | | | | | |
| 1146 | Shapiro Wilk Test Statistic | | | | | 0.668 | **Shapiro Wilk GOF Test** | | | | | |
| 1147 | 5% Shapiro Wilk P Value | | | | | 0 | Data Not Normal at 5% Significance Level | | | | | |
| 1148 | Lilliefors Test Statistic | | | | | 0.25 | **Lilliefors GOF Test** | | | | | |
| 1149 | 5% Lilliefors Critical Value | | | | | 0.0895 | Data Not Normal at 5% Significance Level | | | | | |
| 1150 | **Data Not Normal at 5% Significance Level** | | | | | | | | | | | |
| 1151 | | | | | | | | | | | | |
| 1152 | **Assuming Normal Distribution** | | | | | | | | | | | |
| 1153 | **95% Normal UCL** | | | | | | **95% UCLs (Adjusted for Skewness)** | | | | | |
| 1154 | 95% Student's-t UCL | | | | | 10.01 | 95% Adjusted-CLT UCL (Chen-1995) | | | | | 10.26 |
| 1155 | | | | | | | 95% Modified-t UCL (Johnson-1978) | | | | | 10.05 |
| 1156 | | | | | | | | | | | | |
| 1157 | **Gamma GOF Test** | | | | | | | | | | | |
| 1158 | A-D Test Statistic | | | | | 3.447 | **Anderson-Darling Gamma GOF Test** | | | | | |
| 1159 | 5% A-D Critical Value | | | | | 0.764 | Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 1160 | K-S Test Statistic | | | | | 0.147 | **Kolmogrov-Smirnoff Gamma GOF Test** | | | | | |
| 1161 | 5% K-S Critical Value | | | | | 0.0915 | Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 1162 | **Data Not Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 1163 | | | | | | | | | | | | |
| 1164 | **Gamma Statistics** | | | | | | | | | | | |
| 1165 | k hat (MLE) | | | | | 2.162 | k star (bias corrected MLE) | | | | | 2.102 |
| 1166 | Theta hat (MLE) | | | | | 4.015 | Theta star (bias corrected MLE) | | | | | 4.128 |
| 1167 | nu hat (MLE) | | | | | 423.7 | nu star (bias corrected) | | | | | 412.1 |
| 1168 | MLE Mean (bias corrected) | | | | | 8.679 | MLE Sd (bias corrected) | | | | | 5.986 |
| 1169 | | | | | | | Approximate Chi Square Value (0.05) | | | | | 366 |
| 1170 | Adjusted Level of Significance | | | | | 0.0476 | Adjusted Chi Square Value | | | | | 365.4 |
| 1171 | | | | | | | | | | | | |
| 1172 | **Assuming Gamma Distribution** | | | | | | | | | | | |
| 1173 | 95% Approximate Gamma UCL (use when n>=50)) | | | | | 9.771 | 95% Adjusted Gamma UCL (use when n<50) | | | | | 9.788 |
| 1174 | | | | | | | | | | | | |
| 1175 | **Lognormal GOF Test** | | | | | | | | | | | |
| 1176 | Shapiro Wilk Test Statistic | | | | | 0.956 | **Shapiro Wilk Lognormal GOF Test** | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1177 | | | | 5% Shapiro Wilk P Value | 0.0107 | Data Not Lognormal at 5% Significance Level | | | | | | |
| 1178 | | | | Lilliefors Test Statistic | 0.0979 | **Lilliefors Lognormal GOF Test** | | | | | | |
| 1179 | | | | 5% Lilliefors Critical Value | 0.0895 | Data Not Lognormal at 5% Significance Level | | | | | | |
| 1180 | **Data Not Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 1181 | | | | | | | | | | | | |
| 1182 | **Lognormal Statistics** | | | | | | | | | | | |
| 1183 | | | | Minimum of Logged Data | 0.405 | Mean of logged Data | 1.912 | | | | | |
| 1184 | | | | Maximum of Logged Data | 3.892 | SD of logged Data | 0.655 | | | | | |
| 1185 | | | | | | | | | | | | |
| 1186 | **Assuming Lognormal Distribution** | | | | | | | | | | | |
| 1187 | | | | 95% H-UCL | 9.563 | 90% Chebyshev (MVUE) UCL | 10.18 | | | | | |
| 1188 | | | | 95% Chebyshev (MVUE) UCL | 11 | 97.5% Chebyshev (MVUE) UCL | 12.14 | | | | | |
| 1189 | | | | 99% Chebyshev (MVUE) UCL | 14.38 | | | | | | | |
| 1190 | | | | | | | | | | | | |
| 1191 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 1192 | **Data do not follow a Discernible Distribution (0.05)** | | | | | | | | | | | |
| 1193 | | | | | | | | | | | | |
| 1194 | **Nonparametric Distribution Free UCLs** | | | | | | | | | | | |
| 1195 | | | | 95% CLT UCL | 10 | 95% Jackknife UCL | 10.01 | | | | | |
| 1196 | | | | 95% Standard Bootstrap UCL | 9.989 | 95% Bootstrap-t UCL | 10.34 | | | | | |
| 1197 | | | | 95% Hall's Bootstrap UCL | 10.35 | 95% Percentile Bootstrap UCL | 10.12 | | | | | |
| 1198 | | | | 95% BCA Bootstrap UCL | 10.25 | | | | | | | |
| 1199 | | | | 90% Chebyshev(Mean, Sd) UCL | 11.09 | 95% Chebyshev(Mean, Sd) UCL | 12.18 | | | | | |
| 1200 | | | | 97.5% Chebyshev(Mean, Sd) UCL | 13.7 | 99% Chebyshev(Mean, Sd) UCL | 16.67 | | | | | |
| 1201 | | | | | | | | | | | | |
| 1202 | **Suggested UCL to Use** | | | | | | | | | | | |
| 1203 | | | | 95% Chebyshev (Mean, Sd) UCL | 12.18 | | | | | | | |
| 1204 | | | | | | | | | | | | |
| 1205 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 1206 | These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) | | | | | | | | | | | |
| 1207 | and Singh and Singh (2003). However, simulations results will not cover all Real World data sets. | | | | | | | | | | | |
| 1208 | For additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 1209 | | | | | | | | | | | | |
| 1210 | | | | | | | | | | | | |
| 1211 | **Barium** | | | | | | | | | | | |
| 1212 | | | | | | | | | | | | |
| 1213 | **General Statistics** | | | | | | | | | | | |
| 1214 | | | | Total Number of Observations | 104 | Number of Distinct Observations | 45 | | | | | |
| 1215 | | | | | | Number of Missing Observations | 0 | | | | | |
| 1216 | | | | Minimum | 36 | Mean | 226.6 | | | | | |
| 1217 | | | | Maximum | 1500 | Median | 170 | | | | | |
| 1218 | | | | SD | 218 | Std. Error of Mean | 21.38 | | | | | |
| 1219 | | | | Coefficient of Variation | 0.962 | Skewness | 3.551 | | | | | |
| 1220 | | | | | | | | | | | | |
| 1221 | **Normal GOF Test** | | | | | | | | | | | |
| 1222 | | | | Shapiro Wilk Test Statistic | 0.593 | **Shapiro Wilk GOF Test** | | | | | | |
| 1223 | | | | 5% Shapiro Wilk P Value | 0 | Data Not Normal at 5% Significance Level | | | | | | |
| 1224 | | | | Lilliefors Test Statistic | 0.329 | **Lilliefors GOF Test** | | | | | | |
| 1225 | | | | 5% Lilliefors Critical Value | 0.0869 | Data Not Normal at 5% Significance Level | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1226 | **Data Not Normal at 5% Significance Level** | | | | | | | | | | | |
| 1227 | | | | | | | | | | | | |
| 1228 | **Assuming Normal Distribution** | | | | | | | | | | | |
| 1229 | **95% Normal UCL** | | | | | | **95% UCLs (Adjusted for Skewness)** | | | | | |
| 1230 | 95% Student's-t UCL | | | | | 262.1 | 95% Adjusted-CLT UCL (Chen-1995) | | | | | 269.7 |
| 1231 | | | | | | | 95% Modified-t UCL (Johnson-1978) | | | | | 263.3 |
| 1232 | | | | | | | | | | | | |
| 1233 | **Gamma GOF Test** | | | | | | | | | | | |
| 1234 | A-D Test Statistic | | | | | 7.228 | **Anderson-Darling Gamma GOF Test** | | | | | |
| 1235 | 5% A-D Critical Value | | | | | 0.763 | Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 1236 | K-S Test Statistic | | | | | 0.246 | **Kolmogrov-Smirnoff Gamma GOF Test** | | | | | |
| 1237 | 5% K-S Critical Value | | | | | 0.0894 | Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 1238 | **Data Not Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 1239 | | | | | | | | | | | | |
| 1240 | **Gamma Statistics** | | | | | | | | | | | |
| 1241 | k hat (MLE) | | | | | 2.263 | k star (bias corrected MLE) | | | | | 2.204 |
| 1242 | Theta hat (MLE) | | | | | 100.1 | Theta star (bias corrected MLE) | | | | | 102.8 |
| 1243 | nu hat (MLE) | | | | | 470.7 | nu star (bias corrected) | | | | | 458.5 |
| 1244 | MLE Mean (bias corrected) | | | | | 226.6 | MLE Sd (bias corrected) | | | | | 152.6 |
| 1245 | | | | | | | Approximate Chi Square Value (0.05) | | | | | 409.8 |
| 1246 | Adjusted Level of Significance | | | | | 0.0477 | Adjusted Chi Square Value | | | | | 409.2 |
| 1247 | | | | | | | | | | | | |
| 1248 | **Assuming Gamma Distribution** | | | | | | | | | | | |
| 1249 | 95% Approximate Gamma UCL (use when n>=50)) | | | | | 253.5 | 95% Adjusted Gamma UCL (use when n<50) | | | | | 253.9 |
| 1250 | | | | | | | | | | | | |
| 1251 | **Lognormal GOF Test** | | | | | | | | | | | |
| 1252 | Shapiro Wilk Test Statistic | | | | | 0.906 | **Shapiro Wilk Lognormal GOF Test** | | | | | |
| 1253 | 5% Shapiro Wilk P Value | | | | | 1.3068E-8 | Data Not Lognormal at 5% Significance Level | | | | | |
| 1254 | Lilliefors Test Statistic | | | | | 0.192 | **Lilliefors Lognormal GOF Test** | | | | | |
| 1255 | 5% Lilliefors Critical Value | | | | | 0.0869 | Data Not Lognormal at 5% Significance Level | | | | | |
| 1256 | **Data Not Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 1257 | | | | | | | | | | | | |
| 1258 | **Lognormal Statistics** | | | | | | | | | | | |
| 1259 | Minimum of Logged Data | | | | | 3.584 | Mean of logged Data | | | | | 5.186 |
| 1260 | Maximum of Logged Data | | | | | 7.313 | SD of logged Data | | | | | 0.621 |
| 1261 | | | | | | | | | | | | |
| 1262 | **Assuming Lognormal Distribution** | | | | | | | | | | | |
| 1263 | 95% H-UCL | | | | | 243.7 | 90% Chebyshev (MVUE) UCL | | | | | 259.3 |
| 1264 | 95% Chebyshev (MVUE) UCL | | | | | 278.7 | 97.5% Chebyshev (MVUE) UCL | | | | | 305.7 |
| 1265 | 99% Chebyshev (MVUE) UCL | | | | | 358.6 | | | | | | |
| 1266 | | | | | | | | | | | | |
| 1267 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 1268 | **Data do not follow a Discernible Distribution (0.05)** | | | | | | | | | | | |
| 1269 | | | | | | | | | | | | |
| 1270 | **Nonparametric Distribution Free UCLs** | | | | | | | | | | | |
| 1271 | 95% CLT UCL | | | | | 261.8 | 95% Jackknife UCL | | | | | 262.1 |
| 1272 | 95% Standard Bootstrap UCL | | | | | 260.9 | 95% Bootstrap-t UCL | | | | | 273.9 |
| 1273 | 95% Hall's Bootstrap UCL | | | | | 277.7 | 95% Percentile Bootstrap UCL | | | | | 262.8 |
| 1274 | 95% BCA Bootstrap UCL | | | | | 271.8 | | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1275 | 90% Chebyshev(Mean, Sd) UCL | | | | | 290.7 | 95% Chebyshev(Mean, Sd) UCL | | | | | 319.8 |
| 1276 | 97.5% Chebyshev(Mean, Sd) UCL | | | | | 360.1 | 99% Chebyshev(Mean, Sd) UCL | | | | | 439.3 |
| 1277 | | | | | | | | | | | | |
| 1278 | **Suggested UCL to Use** | | | | | | | | | | | |
| 1279 | 95% Chebyshev (Mean, Sd) UCL | | | | | 319.8 | | | | | | |
| 1280 | | | | | | | | | | | | |
| 1281 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 1282 | These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) | | | | | | | | | | | |
| 1283 | and Singh and Singh (2003). However, simulations results will not cover all Real World data sets. | | | | | | | | | | | |
| 1284 | For additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 1285 | | | | | | | | | | | | |
| 1286 | **Benzene** | | | | | | | | | | | |
| 1287 | | | | | | | | | | | | |
| 1288 | **General Statistics** | | | | | | | | | | | |
| 1289 | Total Number of Observations | | | | | 97 | Number of Distinct Observations | | | | | 38 |
| 1290 | Number of Detects | | | | | 18 | Number of Non-Detects | | | | | 79 |
| 1291 | Number of Distinct Detects | | | | | 18 | Number of Distinct Non-Detects | | | | | 21 |
| 1292 | Minimum Detect | | | | | 0.3 | Minimum Non-Detect | | | | | 0.5 |
| 1293 | Maximum Detect | | | | | 130 | Maximum Non-Detect | | | | | 6.25 |
| 1294 | Variance Detects | | | | | 908.6 | Percent Non-Detects | | | | | 81.44% |
| 1295 | Mean Detects | | | | | 9.929 | SD Detects | | | | | 30.14 |
| 1296 | Median Detects | | | | | 1.95 | CV Detects | | | | | 3.036 |
| 1297 | Skewness Detects | | | | | 4.162 | Kurtosis Detects | | | | | 17.5 |
| 1298 | Mean of Logged Detects | | | | | 0.776 | SD of Logged Detects | | | | | 1.442 |
| 1299 | | | | | | | | | | | | |
| 1300 | **Normal GOF Test on Detects Only** | | | | | | | | | | | |
| 1301 | Shapiro Wilk Test Statistic | | | | | 0.328 | **Shapiro Wilk GOF Test** | | | | | |
| 1302 | 5% Shapiro Wilk Critical Value | | | | | 0.897 | Detected Data Not Normal at 5% Significance Level | | | | | |
| 1303 | Lilliefors Test Statistic | | | | | 0.439 | **Lilliefors GOF Test** | | | | | |
| 1304 | 5% Lilliefors Critical Value | | | | | 0.209 | Detected Data Not Normal at 5% Significance Level | | | | | |
| 1305 | **Detected Data Not Normal at 5% Significance Level** | | | | | | | | | | | |
| 1306 | | | | | | | | | | | | |
| 1307 | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | | | | | |
| 1308 | Mean | | | | | 3.043 | Standard Error of Mean | | | | | 1.393 |
| 1309 | SD | | | | | 13.09 | 95% KM (BCA) UCL | | | | | 5.94 |
| 1310 | 95% KM (t) UCL | | | | | 5.356 | 95% KM (Percentile Bootstrap) UCL | | | | | 5.571 |
| 1311 | 95% KM (z) UCL | | | | | 5.334 | 95% KM Bootstrap t UCL | | | | | 11.33 |
| 1312 | 90% KM Chebyshev UCL | | | | | 7.222 | 95% KM Chebyshev UCL | | | | | 9.115 |
| 1313 | 97.5% KM Chebyshev UCL | | | | | 11.74 | 99% KM Chebyshev UCL | | | | | 16.9 |
| 1314 | | | | | | | | | | | | |
| 1315 | **Gamma GOF Tests on Detected Observations Only** | | | | | | | | | | | |
| 1316 | A-D Test Statistic | | | | | 2.225 | **Anderson-Darling GOF Test** | | | | | |
| 1317 | 5% A-D Critical Value | | | | | 0.815 | Detected Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 1318 | K-S Test Statistic | | | | | 0.298 | **Kolmogrov-Smirnoff GOF** | | | | | |
| 1319 | 5% K-S Critical Value | | | | | 0.217 | Detected Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 1320 | **Detected Data Not Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 1321 | | | | | | | | | | | | |
| 1322 | **Gamma Statistics on Detected Data Only** | | | | | | | | | | | |
| 1323 | k hat (MLE) | | | | | 0.428 | k star (bias corrected MLE) | | | | | 0.394 |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1324 | | | | | Theta hat (MLE) | 23.18 | | | | Theta star (bias corrected MLE) | | 25.2 |
| 1325 | | | | | nu hat (MLE) | 15.42 | | | | nu star (bias corrected) | | 14.18 |
| 1326 | | | | | MLE Mean (bias corrected) | 9.929 | | | | MLE Sd (bias corrected) | | 15.82 |
| 1327 | | | | | | | | | | | | |
| 1328 | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | | | | | |
| 1329 | | | | | k hat (KM) | 0.0541 | | | | nu hat (KM) | | 10.49 |
| 1330 | | | | | Approximate Chi Square Value (10.49, α) | 4.251 | | | | Adjusted Chi Square Value (10.49, β) | | 4.191 |
| 1331 | | | | | 95% Gamma Approximate KM-UCL (use when n>=50) | 7.51 | | | | 95% Gamma Adjusted KM-UCL (use when n<50) | | 7.617 |
| 1332 | Gamma (KM) may not be used when k hat (KM) is < 0.1 | | | | | | | | | | | |
| 1333 | | | | | | | | | | | | |
| 1334 | **Gamma ROS Statistics using Imputed Non-Detects** | | | | | | | | | | | |
| 1335 | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | | | | |
| 1336 | GROS may not be used when kstar of detected data is small such as < 0.1 | | | | | | | | | | | |
| 1337 | For such situations, GROS method tends to yield inflated values of UCLs and BTVs | | | | | | | | | | | |
| 1338 | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | | | | |
| 1339 | | | | | Minimum | 0.01 | | | | Mean | | 2.981 |
| 1340 | | | | | Maximum | 130 | | | | Median | | 0.01 |
| 1341 | | | | | SD | 13.41 | | | | CV | | 4.5 |
| 1342 | | | | | k hat (MLE) | 0.21 | | | | k star (bias corrected MLE) | | 0.21 |
| 1343 | | | | | Theta hat (MLE) | 14.19 | | | | Theta star (bias corrected MLE) | | 14.17 |
| 1344 | | | | | nu hat (MLE) | 40.74 | | | | nu star (bias corrected) | | 40.81 |
| 1345 | | | | | MLE Mean (bias corrected) | 2.981 | | | | MLE Sd (bias corrected) | | 6.499 |
| 1346 | | | | | | | | | | Adjusted Level of Significance (β) | | 0.0475 |
| 1347 | | | | | Approximate Chi Square Value (40.81, α) | 27.17 | | | | Adjusted Chi Square Value (40.81, β) | | 27.01 |
| 1348 | | | | | 95% Gamma Approximate UCL (use when n>=50) | 4.477 | | | | 95% Gamma Adjusted UCL (use when n<50) | | 4.505 |
| 1349 | | | | | | | | | | | | |
| 1350 | **Lognormal GOF Test on Detected Observations Only** | | | | | | | | | | | |
| 1351 | | | | | Shapiro Wilk Test Statistic | 0.908 | | | | **Shapiro Wilk GOF Test** | | |
| 1352 | | | | | 5% Shapiro Wilk Critical Value | 0.897 | | | | Detected Data appear Lognormal at 5% Significance Level | | |
| 1353 | | | | | Lilliefors Test Statistic | 0.134 | | | | **Lilliefors GOF Test** | | |
| 1354 | | | | | 5% Lilliefors Critical Value | 0.209 | | | | Detected Data appear Lognormal at 5% Significance Level | | |
| 1355 | **Detected Data appear Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 1356 | | | | | | | | | | | | |
| 1357 | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | | | | | |
| 1358 | | | | | Mean in Original Scale | 2.956 | | | | Mean in Log Scale | | 0.156 |
| 1359 | | | | | SD in Original Scale | 13.15 | | | | SD in Log Scale | | 0.99 |
| 1360 | | | | | 95% t UCL (assumes normality of ROS data) | 5.175 | | | | 95% Percentile Bootstrap UCL | | 5.649 |
| 1361 | | | | | 95% BCA Bootstrap UCL | 7.126 | | | | 95% Bootstrap t UCL | | 19.05 |
| 1362 | | | | | 95% H-UCL (Log ROS) | 2.392 | | | | | | |
| 1363 | | | | | | | | | | | | |
| 1364 | **UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed** | | | | | | | | | | | |
| 1365 | | | | | KM Mean (logged) | 0.178 | | | | 95% H-UCL (KM -Log) | | 2.529 |
| 1366 | | | | | KM SD (logged) | 1.015 | | | | 95% Critical H Value (KM-Log) | | 2.268 |
| 1367 | | | | | KM Standard Error of Mean (logged) | 0.218 | | | | | | |
| 1368 | | | | | | | | | | | | |
| 1369 | **DL/2 Statistics** | | | | | | | | | | | |
| 1370 | **DL/2 Normal** | | | | | | **DL/2 Log-Transformed** | | | | | |
| 1371 | | | | | Mean in Original Scale | 3.762 | | | | Mean in Log Scale | | 0.809 |
| 1372 | | | | | SD in Original Scale | 13.03 | | | | SD in Log Scale | | 0.695 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1373 | 95% t UCL (Assumes normality) | | | | | 5.96 | 95% H-Stat UCL | | | | | 3.299 |
| 1374 | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | | | | | |
| 1375 | | | | | | | | | | | | |
| 1376 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 1377 | **Detected Data appear Lognormal Distributed at 5% Significance Level** | | | | | | | | | | | |
| 1378 | | | | | | | | | | | | |
| 1379 | **Suggested UCL to Use** | | | | | | | | | | | |
| 1380 | 95% KM (BCA) UCL | | | | | 5.94 | | | | | | |
| 1381 | | | | | | | | | | | | |
| 1382 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 1383 | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | | | | | |
| 1384 | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | | | | | |
| 1385 | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 1386 | | | | | | | | | | | | |
| 1387 | **Benzo(a)anthracene** | | | | | | | | | | | |
| 1388 | | | | | | | | | | | | |
| 1389 | **General Statistics** | | | | | | | | | | | |
| 1390 | Total Number of Observations | | | | | 135 | Number of Distinct Observations | | | | | 73 |
| 1391 | Number of Detects | | | | | 57 | Number of Non-Detects | | | | | 78 |
| 1392 | Number of Distinct Detects | | | | | 49 | Number of Distinct Non-Detects | | | | | 27 |
| 1393 | Minimum Detect | | | | | 22 | Minimum Non-Detect | | | | | 5.8 |
| 1394 | Maximum Detect | | | | | 51000 | Maximum Non-Detect | | | | | 34000 |
| 1395 | Variance Detects | | | | | 92823301 | Percent Non-Detects | | | | | 57.78% |
| 1396 | Mean Detects | | | | | 3412 | SD Detects | | | | | 9634 |
| 1397 | Median Detects | | | | | 480 | CV Detects | | | | | 2.824 |
| 1398 | Skewness Detects | | | | | 4.362 | Kurtosis Detects | | | | | 19.61 |
| 1399 | Mean of Logged Detects | | | | | 6.085 | SD of Logged Detects | | | | | 2.02 |
| 1400 | | | | | | | | | | | | |
| 1401 | **Normal GOF Test on Detects Only** | | | | | | | | | | | |
| 1402 | Shapiro Wilk Test Statistic | | | | | 0.384 | **Normal GOF Test on Detected Observations Only** | | | | | |
| 1403 | 5% Shapiro Wilk P Value | | | | | 0 | Detected Data Not Normal at 5% Significance Level | | | | | |
| 1404 | Lilliefors Test Statistic | | | | | 0.367 | **Lilliefors GOF Test** | | | | | |
| 1405 | 5% Lilliefors Critical Value | | | | | 0.117 | Detected Data Not Normal at 5% Significance Level | | | | | |
| 1406 | **Detected Data Not Normal at 5% Significance Level** | | | | | | | | | | | |
| 1407 | | | | | | | | | | | | |
| 1408 | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | | | | | |
| 1409 | Mean | | | | | 1568 | Standard Error of Mean | | | | | 561.2 |
| 1410 | SD | | | | | 6432 | 95% KM (BCA) UCL | | | | | 2603 |
| 1411 | 95% KM (t) UCL | | | | | 2498 | 95% KM (Percentile Bootstrap) UCL | | | | | 2582 |
| 1412 | 95% KM (z) UCL | | | | | 2491 | 95% KM Bootstrap t UCL | | | | | 3875 |
| 1413 | 90% KM Chebyshev UCL | | | | | 3252 | 95% KM Chebyshev UCL | | | | | 4014 |
| 1414 | 97.5% KM Chebyshev UCL | | | | | 5073 | 99% KM Chebyshev UCL | | | | | 7152 |
| 1415 | | | | | | | | | | | | |
| 1416 | **Gamma GOF Tests on Detected Observations Only** | | | | | | | | | | | |
| 1417 | A-D Test Statistic | | | | | 3.685 | **Anderson-Darling GOF Test** | | | | | |
| 1418 | 5% A-D Critical Value | | | | | 0.856 | Detected Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 1419 | K-S Test Statistic | | | | | 0.252 | **Kolmogrov-Smirnoff GOF** | | | | | |
| 1420 | 5% K-S Critical Value | | | | | 0.127 | Detected Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 1421 | **Detected Data Not Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1422 | | | | | | | | | | | | |
| 1423 | **Gamma Statistics on Detected Data Only** | | | | | | | | | | | |
| 1424 | | | | | k hat (MLE) | 0.331 | | | k star (bias corrected MLE) | | | 0.325 |
| 1425 | | | | | Theta hat (MLE) | 10306 | | | Theta star (bias corrected MLE) | | | 10488 |
| 1426 | | | | | nu hat (MLE) | 37.74 | | | nu star (bias corrected) | | | 37.09 |
| 1427 | | | | | MLE Mean (bias corrected) | 3412 | | | MLE Sd (bias corrected) | | | 5982 |
| 1428 | | | | | | | | | | | | |
| 1429 | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | | | | | |
| 1430 | | | | | k hat (KM) | 0.0594 | | | nu hat (KM) | | | 16.05 |
| 1431 | | | | | Approximate Chi Square Value (16.05, α) | 7.996 | | | Adjusted Chi Square Value (16.05, β) | | | 7.935 |
| 1432 | | | | | 95% Gamma Approximate KM-UCL (use when n>=50) | 3147 | | | 95% Gamma Adjusted KM-UCL (use when n<50) | | | 3172 |
| 1433 | Gamma (KM) may not be used when k hat (KM) is < 0.1 | | | | | | | | | | | |
| 1434 | | | | | | | | | | | | |
| 1435 | **Gamma ROS Statistics using Imputed Non-Detects** | | | | | | | | | | | |
| 1436 | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | | | | |
| 1437 | GROS may not be used when kstar of detected data is small such as < 0.1 | | | | | | | | | | | |
| 1438 | For such situations, GROS method tends to yield inflated values of UCLs and BTVs | | | | | | | | | | | |
| 1439 | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | | | | |
| 1440 | | | | | Minimum | 0.01 | | | Mean | | | 1447 |
| 1441 | | | | | Maximum | 51000 | | | Median | | | 0.01 |
| 1442 | | | | | SD | 6453 | | | CV | | | 4.461 |
| 1443 | | | | | k hat (MLE) | 0.11 | | | k star (bias corrected MLE) | | | 0.113 |
| 1444 | | | | | Theta hat (MLE) | 13137 | | | Theta star (bias corrected MLE) | | | 12847 |
| 1445 | | | | | nu hat (MLE) | 29.73 | | | nu star (bias corrected) | | | 30.4 |
| 1446 | | | | | MLE Mean (bias corrected) | 1447 | | | MLE Sd (bias corrected) | | | 4311 |
| 1447 | | | | | | | | | Adjusted Level of Significance (β) | | | 0.0482 |
| 1448 | | | | | Approximate Chi Square Value (30.40, α) | 18.81 | | | Adjusted Chi Square Value (30.40, β) | | | 18.71 |
| 1449 | | | | | 95% Gamma Approximate UCL (use when n>=50) | 2338 | | | 95% Gamma Adjusted UCL (use when n<50) | | | 2350 |
| 1450 | | | | | | | | | | | | |
| 1451 | **Lognormal GOF Test on Detected Observations Only** | | | | | | | | | | | |
| 1452 | | | | | Lilliefors Test Statistic | 0.0967 | | | **Lilliefors GOF Test** | | | |
| 1453 | | | | | 5% Lilliefors Critical Value | 0.117 | | | Detected Data appear Lognormal at 5% Significance Level | | | |
| 1454 | **Detected Data appear Approximate Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 1455 | | | | | | | | | | | | |
| 1456 | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | | | | | |
| 1457 | | | | | Mean in Original Scale | 1518 | | | Mean in Log Scale | | | 5.129 |
| 1458 | | | | | SD in Original Scale | 6437 | | | SD in Log Scale | | | 1.764 |
| 1459 | | | | | 95% t UCL (assumes normality of ROS data) | 2436 | | | 95% Percentile Bootstrap UCL | | | 2500 |
| 1460 | | | | | 95% BCA Bootstrap UCL | 2984 | | | 95% Bootstrap t UCL | | | 3978 |
| 1461 | | | | | 95% H-UCL (Log ROS) | 1263 | | | | | | |
| 1462 | | | | | | | | | | | | |
| 1463 | **UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed** | | | | | | | | | | | |
| 1464 | | | | | KM Mean (logged) | 5.112 | | | 95% H-UCL (KM -Log) | | | 1347 |
| 1465 | | | | | KM SD (logged) | 1.801 | | | 95% Critical H Value (KM-Log) | | | 3.035 |
| 1466 | | | | | KM Standard Error of Mean (logged) | 0.2 | | | | | | |
| 1467 | | | | | | | | | | | | |
| 1468 | **DL/2 Statistics** | | | | | | | | | | | |
| 1469 | **DL/2 Normal** | | | | | | | | **DL/2 Log-Transformed** | | | |
| 1470 | | | | | Mean in Original Scale | 2347 | | | Mean in Log Scale | | | 6.087 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1471 | | | | SD in Original Scale | | 6684 | | | | SD in Log Scale | | 1.74 |
| 1472 | | | | 95% t UCL (Assumes normality) | | 3300 | | | | 95% H-Stat UCL | | 3124 |
| 1473 | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | | | | | |
| 1474 | | | | | | | | | | | | |
| 1475 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 1476 | **Detected Data appear Approximate Lognormal Distributed at 5% Significance Level** | | | | | | | | | | | |
| 1477 | | | | | | | | | | | | |
| 1478 | **Suggested UCL to Use** | | | | | | | | | | | |
| 1479 | | | | 97.5% KM (Chebyshev) UCL | | 5073 | | | | | | |
| 1480 | | | | | | | | | | | | |
| 1481 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 1482 | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | | | | | |
| 1483 | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | | | | | |
| 1484 | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 1485 | | | | | | | | | | | | |
| 1486 | **Benzo(a)pyrene** | | | | | | | | | | | |
| 1487 | | | | | | | | | | | | |
| 1488 | **General Statistics** | | | | | | | | | | | |
| 1489 | | | | Total Number of Observations | | 135 | | | | Number of Distinct Observations | | 81 |
| 1490 | | | | Number of Detects | | 73 | | | | Number of Non-Detects | | 62 |
| 1491 | | | | Number of Distinct Detects | | 58 | | | | Number of Distinct Non-Detects | | 26 |
| 1492 | | | | Minimum Detect | | 9.5 | | | | Minimum Non-Detect | | 5.8 |
| 1493 | | | | Maximum Detect | | 110000 | | | | Maximum Non-Detect | | 6900 |
| 1494 | | | | Variance Detects | | 2.777E+8 | | | | Percent Non-Detects | | 45.93% |
| 1495 | | | | Mean Detects | | 4409 | | | | SD Detects | | 16665 |
| 1496 | | | | Median Detects | | 260 | | | | CV Detects | | 3.779 |
| 1497 | | | | Skewness Detects | | 5.635 | | | | Kurtosis Detects | | 32.21 |
| 1498 | | | | Mean of Logged Detects | | 5.909 | | | | SD of Logged Detects | | 2.17 |
| 1499 | | | | | | | | | | | | |
| 1500 | **Normal GOF Test on Detects Only** | | | | | | | | | | | |
| 1501 | | | | Shapiro Wilk Test Statistic | | 0.283 | | | | **Normal GOF Test on Detected Observations Only** | | |
| 1502 | | | | 5% Shapiro Wilk P Value | | 0 | | | | Detected Data Not Normal at 5% Significance Level | | |
| 1503 | | | | Lilliefors Test Statistic | | 0.396 | | | | **Lilliefors GOF Test** | | |
| 1504 | | | | 5% Lilliefors Critical Value | | 0.104 | | | | Detected Data Not Normal at 5% Significance Level | | |
| 1505 | **Detected Data Not Normal at 5% Significance Level** | | | | | | | | | | | |
| 1506 | | | | | | | | | | | | |
| 1507 | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | | | | | |
| 1508 | | | | Mean | | 2420 | | | | Standard Error of Mean | | 1071 |
| 1509 | | | | SD | | 12362 | | | | 95% KM (BCA) UCL | | 4666 |
| 1510 | | | | 95% KM (t) UCL | | 4195 | | | | 95% KM (Percentile Bootstrap) UCL | | 4315 |
| 1511 | | | | 95% KM (z) UCL | | 4183 | | | | 95% KM Bootstrap t UCL | | 10113 |
| 1512 | | | | 90% KM Chebyshev UCL | | 5634 | | | | 95% KM Chebyshev UCL | | 7090 |
| 1513 | | | | 97.5% KM Chebyshev UCL | | 9111 | | | | 99% KM Chebyshev UCL | | 13080 |
| 1514 | | | | | | | | | | | | |
| 1515 | **Gamma GOF Tests on Detected Observations Only** | | | | | | | | | | | |
| 1516 | | | | A-D Test Statistic | | 5.527 | | | | **Anderson-Darling GOF Test** | | |
| 1517 | | | | 5% A-D Critical Value | | 0.875 | | | | Detected Data Not Gamma Distributed at 5% Significance Level | | |
| 1518 | | | | K-S Test Statistic | | 0.253 | | | | **Kolmogrov-Smirnoff GOF** | | |
| 1519 | | | | 5% K-S Critical Value | | 0.114 | | | | Detected Data Not Gamma Distributed at 5% Significance Level | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1520 | **Detected Data Not Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 1521 | | | | | | | | | | | | |
| 1522 | **Gamma Statistics on Detected Data Only** | | | | | | | | | | | |
| 1523 | | | | | k hat (MLE) | 0.281 | | | k star (bias corrected MLE) | | | 0.278 |
| 1524 | | | | | Theta hat (MLE) | 15706 | | | Theta star (bias corrected MLE) | | | 15842 |
| 1525 | | | | | nu hat (MLE) | 40.99 | | | nu star (bias corrected) | | | 40.64 |
| 1526 | | | | | MLE Mean (bias corrected) | 4409 | | | MLE Sd (bias corrected) | | | 8358 |
| 1527 | | | | | | | | | | | | |
| 1528 | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | | | | | |
| 1529 | | | | | k hat (KM) | 0.0383 | | | nu hat (KM) | | | 10.35 |
| 1530 | | | | | Approximate Chi Square Value (10.35, α) | 4.162 | | | Adjusted Chi Square Value (10.35, β) | | | 4.119 |
| 1531 | | | | | 95% Gamma Approximate KM-UCL (use when n>=50) | 6019 | | | 95% Gamma Adjusted KM-UCL (use when n<50) | | | 6081 |
| 1532 | Gamma (KM) may not be used when k hat (KM) is < 0.1 | | | | | | | | | | | |
| 1533 | | | | | | | | | | | | |
| 1534 | **Gamma ROS Statistics using Imputed Non-Detects** | | | | | | | | | | | |
| 1535 | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | | | | |
| 1536 | GROS may not be used when kstar of detected data is small such as < 0.1 | | | | | | | | | | | |
| 1537 | For such situations, GROS method tends to yield inflated values of UCLs and BTVs | | | | | | | | | | | |
| 1538 | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | | | | |
| 1539 | | | | | Minimum | 0.01 | | | Mean | | | 2384 |
| 1540 | | | | | Maximum | 110000 | | | Median | | | 16 |
| 1541 | | | | | SD | 12413 | | | CV | | | 5.206 |
| 1542 | | | | | k hat (MLE) | 0.119 | | | k star (bias corrected MLE) | | | 0.121 |
| 1543 | | | | | Theta hat (MLE) | 20103 | | | Theta star (bias corrected MLE) | | | 19720 |
| 1544 | | | | | nu hat (MLE) | 32.02 | | | nu star (bias corrected) | | | 32.65 |
| 1545 | | | | | MLE Mean (bias corrected) | 2384 | | | MLE Sd (bias corrected) | | | 6857 |
| 1546 | | | | | | | | | Adjusted Level of Significance (β) | | | 0.0482 |
| 1547 | | | | | Approximate Chi Square Value (32.65, α) | 20.58 | | | Adjusted Chi Square Value (32.65, β) | | | 20.48 |
| 1548 | | | | | 95% Gamma Approximate UCL (use when n>=50) | 3781 | | | 95% Gamma Adjusted UCL (use when n<50) | | | 3800 |
| 1549 | | | | | | | | | | | | |
| 1550 | **Lognormal GOF Test on Detected Observations Only** | | | | | | | | | | | |
| 1551 | | | | | Lilliefors Test Statistic | 0.075 | | | **Lilliefors GOF Test** | | | |
| 1552 | | | | | 5% Lilliefors Critical Value | 0.104 | | | Detected Data appear Lognormal at 5% Significance Level | | | |
| 1553 | **Detected Data appear Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 1554 | | | | | | | | | | | | |
| 1555 | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | | | | | |
| 1556 | | | | | Mean in Original Scale | 2404 | | | Mean in Log Scale | | | 4.664 |
| 1557 | | | | | SD in Original Scale | 12410 | | | SD in Log Scale | | | 2.242 |
| 1558 | | | | | 95% t UCL (assumes normality of ROS data) | 4173 | | | 95% Percentile Bootstrap UCL | | | 4301 |
| 1559 | | | | | 95% BCA Bootstrap UCL | 5307 | | | 95% Bootstrap t UCL | | | 10753 |
| 1560 | | | | | 95% H-UCL (Log ROS) | 2609 | | | | | | |
| 1561 | | | | | | | | | | | | |
| 1562 | **UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed** | | | | | | | | | | | |
| 1563 | | | | | KM Mean (logged) | 4.738 | | | 95% H-UCL (KM -Log) | | | 2228 |
| 1564 | | | | | KM SD (logged) | 2.157 | | | 95% Critical H Value (KM-Log) | | | 3.462 |
| 1565 | | | | | KM Standard Error of Mean (logged) | 0.205 | | | | | | |
| 1566 | | | | | | | | | | | | |
| 1567 | **DL/2 Statistics** | | | | | | | | | | | |
| 1568 | **DL/2 Normal** | | | | | | **DL/2 Log-Transformed** | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1569 | Mean in Original Scale | | | | | 2540 | Mean in Log Scale | | | | | 5.236 |
| 1570 | SD in Original Scale | | | | | 12392 | SD in Log Scale | | | | | 2.026 |
| 1571 | 95% t UCL (Assumes normality) | | | | | 4307 | 95% H-Stat UCL | | | | | 2612 |
| 1572 | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | | | | | |
| 1573 | | | | | | | | | | | | |
| 1574 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 1575 | **Detected Data appear Lognormal Distributed at 5% Significance Level** | | | | | | | | | | | |
| 1576 | | | | | | | | | | | | |
| 1577 | **Suggested UCL to Use** | | | | | | | | | | | |
| 1578 | 97.5% KM (Chebyshev) UCL | | | | | 9111 | | | | | | |
| 1579 | | | | | | | | | | | | |
| 1580 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 1581 | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | | | | | |
| 1582 | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | | | | | |
| 1583 | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 1584 | | | | | | | | | | | | |
| 1585 | **Benzo(b)fluoranthene** | | | | | | | | | | | |
| 1586 | | | | | | | | | | | | |
| 1587 | **General Statistics** | | | | | | | | | | | |
| 1588 | Total Number of Observations | | | | | 135 | Number of Distinct Observations | | | | | 82 |
| 1589 | Number of Detects | | | | | 68 | Number of Non-Detects | | | | | 67 |
| 1590 | Number of Distinct Detects | | | | | 57 | Number of Distinct Non-Detects | | | | | 28 |
| 1591 | Minimum Detect | | | | | 11 | Minimum Non-Detect | | | | | 5.8 |
| 1592 | Maximum Detect | | | | | 94000 | Maximum Non-Detect | | | | | 6900 |
| 1593 | Variance Detects | | | | | 2.085E+8 | Percent Non-Detects | | | | | 49.63% |
| 1594 | Mean Detects | | | | | 4227 | SD Detects | | | | | 14440 |
| 1595 | Median Detects | | | | | 310 | CV Detects | | | | | 3.416 |
| 1596 | Skewness Detects | | | | | 5.301 | Kurtosis Detects | | | | | 29.21 |
| 1597 | Mean of Logged Detects | | | | | 6.005 | SD of Logged Detects | | | | | 2.142 |
| 1598 | | | | | | | | | | | | |
| 1599 | **Normal GOF Test on Detects Only** | | | | | | | | | | | |
| 1600 | Shapiro Wilk Test Statistic | | | | | 0.321 | **Normal GOF Test on Detected Observations Only** | | | | | |
| 1601 | 5% Shapiro Wilk P Value | | | | | 0 | Detected Data Not Normal at 5% Significance Level | | | | | |
| 1602 | Lilliefors Test Statistic | | | | | 0.385 | **Lilliefors GOF Test** | | | | | |
| 1603 | 5% Lilliefors Critical Value | | | | | 0.107 | Detected Data Not Normal at 5% Significance Level | | | | | |
| 1604 | **Detected Data Not Normal at 5% Significance Level** | | | | | | | | | | | |
| 1605 | | | | | | | | | | | | |
| 1606 | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | | | | | |
| 1607 | Mean | | | | | 2169 | Standard Error of Mean | | | | | 900.4 |
| 1608 | SD | | | | | 10383 | 95% KM (BCA) UCL | | | | | 3915 |
| 1609 | 95% KM (t) UCL | | | | | 3660 | 95% KM (Percentile Bootstrap) UCL | | | | | 3797 |
| 1610 | 95% KM (z) UCL | | | | | 3650 | 95% KM Bootstrap t UCL | | | | | 7759 |
| 1611 | 90% KM Chebyshev UCL | | | | | 4870 | 95% KM Chebyshev UCL | | | | | 6094 |
| 1612 | 97.5% KM Chebyshev UCL | | | | | 7792 | 99% KM Chebyshev UCL | | | | | 11128 |
| 1613 | | | | | | | | | | | | |
| 1614 | **Gamma GOF Tests on Detected Observations Only** | | | | | | | | | | | |
| 1615 | A-D Test Statistic | | | | | 4.702 | **Anderson-Darling GOF Test** | | | | | |
| 1616 | 5% A-D Critical Value | | | | | 0.868 | Detected Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 1617 | K-S Test Statistic | | | | | 0.224 | **Kolmogrov-Smirnoff GOF** | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1618 | | | | | 5% K-S Critical Value | 0.118 | Detected Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 1619 | **Detected Data Not Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 1620 | | | | | | | | | | | | |
| 1621 | **Gamma Statistics on Detected Data Only** | | | | | | | | | | | |
| 1622 | | | | | k hat (MLE) | 0.295 | | | | k star (bias corrected MLE) | | 0.292 |
| 1623 | | | | | Theta hat (MLE) | 14332 | | | | Theta star (bias corrected MLE) | | 14489 |
| 1624 | | | | | nu hat (MLE) | 40.11 | | | | nu star (bias corrected) | | 39.67 |
| 1625 | | | | | MLE Mean (bias corrected) | 4227 | | | | MLE Sd (bias corrected) | | 7826 |
| 1626 | | | | | | | | | | | | |
| 1627 | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | | | | | |
| 1628 | | | | | k hat (KM) | 0.0436 | | | | nu hat (KM) | | 11.78 |
| 1629 | | | | | Approximate Chi Square Value (11.78, α) | 5.085 | | | | Adjusted Chi Square Value (11.78, β) | | 5.038 |
| 1630 | | | | | 95% Gamma Approximate KM-UCL (use when n>=50) | 5027 | | | | 95% Gamma Adjusted KM-UCL (use when n<50) | | 5074 |
| 1631 | Gamma (KM) may not be used when k hat (KM) is < 0.1 | | | | | | | | | | | |
| 1632 | | | | | | | | | | | | |
| 1633 | **Gamma ROS Statistics using Imputed Non-Detects** | | | | | | | | | | | |
| 1634 | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | | | | |
| 1635 | GROS may not be used when kstar of detected data is small such as < 0.1 | | | | | | | | | | | |
| 1636 | For such situations, GROS method tends to yield inflated values of UCLs and BTVs | | | | | | | | | | | |
| 1637 | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | | | | |
| 1638 | | | | | Minimum | 0.01 | | | | Mean | | 2129 |
| 1639 | | | | | Maximum | 94000 | | | | Median | | 11 |
| 1640 | | | | | SD | 10428 | | | | CV | | 4.898 |
| 1641 | | | | | k hat (MLE) | 0.115 | | | | k star (bias corrected MLE) | | 0.118 |
| 1642 | | | | | Theta hat (MLE) | 18488 | | | | Theta star (bias corrected MLE) | | 18114 |
| 1643 | | | | | nu hat (MLE) | 31.09 | | | | nu star (bias corrected) | | 31.74 |
| 1644 | | | | | MLE Mean (bias corrected) | 2129 | | | | MLE Sd (bias corrected) | | 6210 |
| 1645 | | | | | | | | | | Adjusted Level of Significance (β) | | 0.0482 |
| 1646 | | | | | Approximate Chi Square Value (31.74, α) | 19.86 | | | | Adjusted Chi Square Value (31.74, β) | | 19.76 |
| 1647 | | | | | 95% Gamma Approximate UCL (use when n>=50) | 3402 | | | | 95% Gamma Adjusted UCL (use when n<50) | | 3419 |
| 1648 | | | | | | | | | | | | |
| 1649 | **Lognormal GOF Test on Detected Observations Only** | | | | | | | | | | | |
| 1650 | | | | | Lilliefors Test Statistic | 0.0586 | **Lilliefors GOF Test** | | | | | |
| 1651 | | | | | 5% Lilliefors Critical Value | 0.107 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 1652 | **Detected Data appear Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 1653 | | | | | | | | | | | | |
| 1654 | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | | | | | |
| 1655 | | | | | Mean in Original Scale | 2153 | | | | Mean in Log Scale | | 4.701 |
| 1656 | | | | | SD in Original Scale | 10423 | | | | SD in Log Scale | | 2.168 |
| 1657 | | | | | 95% t UCL (assumes normality of ROS data) | 3639 | | | | 95% Percentile Bootstrap UCL | | 3856 |
| 1658 | | | | | 95% BCA Bootstrap UCL | 4682 | | | | 95% Bootstrap t UCL | | 7454 |
| 1659 | | | | | 95% H-UCL (Log ROS) | 2215 | | | | | | |
| 1660 | | | | | | | | | | | | |
| 1661 | **UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed** | | | | | | | | | | | |
| 1662 | | | | | KM Mean (logged) | 4.779 | | | | 95% H-UCL (KM -Log) | | 1952 |
| 1663 | | | | | KM SD (logged) | 2.091 | | | | 95% Critical H Value (KM-Log) | | 3.382 |
| 1664 | | | | | KM Standard Error of Mean (logged) | 0.207 | | | | | | |
| 1665 | | | | | | | | | | | | |
| 1666 | **DL/2 Statistics** | | | | | | | | | | | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1667 | **DL/2 Normal** | | | | | | **DL/2 Log-Transformed** | | | | | |
| 1668 | | | | Mean in Original Scale | 2293 | | | | | Mean in Log Scale | 5.235 | |
| 1669 | | | | SD in Original Scale | 10406 | | | | | SD in Log Scale | 1.999 | |
| 1670 | | | | 95% t UCL (Assumes normality) | 3776 | | | | | 95% H-Stat UCL | 2433 | |
| 1671 | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | | | | | |
| 1672 | | | | | | | | | | | | |
| 1673 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 1674 | **Detected Data appear Lognormal Distributed at 5% Significance Level** | | | | | | | | | | | |
| 1675 | | | | | | | | | | | | |
| 1676 | **Suggested UCL to Use** | | | | | | | | | | | |
| 1677 | | | | 97.5% KM (Chebyshev) UCL | 7792 | | | | | | | |
| 1678 | | | | | | | | | | | | |
| 1679 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 1680 | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | | | | | |
| 1681 | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | | | | | |
| 1682 | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 1683 | | | | | | | | | | | | |
| 1684 | **Benzo(g,h,i)perylene** | | | | | | | | | | | |
| 1685 | | | | | | | | | | | | |
| 1686 | **General Statistics** | | | | | | | | | | | |
| 1687 | | | | Total Number of Observations | 135 | | | | | Number of Distinct Observations | 74 | |
| 1688 | | | | Number of Detects | 58 | | | | | Number of Non-Detects | 77 | |
| 1689 | | | | Number of Distinct Detects | 49 | | | | | Number of Distinct Non-Detects | 30 | |
| 1690 | | | | Minimum Detect | 27 | | | | | Minimum Non-Detect | 5.8 | |
| 1691 | | | | Maximum Detect | 93000 | | | | | Maximum Non-Detect | 6900 | |
| 1692 | | | | Variance Detects | 2.171E+8 | | | | | Percent Non-Detects | 57.04% | |
| 1693 | | | | Mean Detects | 4396 | | | | | SD Detects | 14735 | |
| 1694 | | | | Median Detects | 520 | | | | | CV Detects | 3.352 | |
| 1695 | | | | Skewness Detects | 5.204 | | | | | Kurtosis Detects | 27.9 | |
| 1696 | | | | Mean of Logged Detects | 6.351 | | | | | SD of Logged Detects | 1.911 | |
| 1697 | | | | | | | | | | | | |
| 1698 | **Normal GOF Test on Detects Only** | | | | | | | | | | | |
| 1699 | | | | Shapiro Wilk Test Statistic | 0.318 | | **Normal GOF Test on Detected Observations Only** | | | | | |
| 1700 | | | | 5% Shapiro Wilk P Value | 0 | | Detected Data Not Normal at 5% Significance Level | | | | | |
| 1701 | | | | Lilliefors Test Statistic | 0.383 | | **Lilliefors GOF Test** | | | | | |
| 1702 | | | | 5% Lilliefors Critical Value | 0.116 | | Detected Data Not Normal at 5% Significance Level | | | | | |
| 1703 | **Detected Data Not Normal at 5% Significance Level** | | | | | | | | | | | |
| 1704 | | | | | | | | | | | | |
| 1705 | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | | | | | |
| 1706 | | | | Mean | 1938 | | | | | Standard Error of Mean | 851.9 | |
| 1707 | | | | SD | 9811 | | | | | 95% KM (BCA) UCL | 3730 | |
| 1708 | | | | 95% KM (t) UCL | 3349 | | | | | 95% KM (Percentile Bootstrap) UCL | 3388 | |
| 1709 | | | | 95% KM (z) UCL | 3340 | | | | | 95% KM Bootstrap t UCL | 8477 | |
| 1710 | | | | 90% KM Chebyshev UCL | 4494 | | | | | 95% KM Chebyshev UCL | 5652 | |
| 1711 | | | | 97.5% KM Chebyshev UCL | 7259 | | | | | 99% KM Chebyshev UCL | 10415 | |
| 1712 | | | | | | | | | | | | |
| 1713 | **Gamma GOF Tests on Detected Observations Only** | | | | | | | | | | | |
| 1714 | | | | A-D Test Statistic | 4.256 | | **Anderson-Darling GOF Test** | | | | | |
| 1715 | | | | 5% A-D Critical Value | 0.855 | | Detected Data Not Gamma Distributed at 5% Significance Level | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1716 | | | | | K-S Test Statistic | 0.253 | **Kolmogrov-Smirnoff GOF** | | | | | |
| 1717 | | | | | 5% K-S Critical Value | 0.126 | Detected Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 1718 | **Detected Data Not Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 1719 | | | | | | | | | | | | |
| 1720 | **Gamma Statistics on Detected Data Only** | | | | | | | | | | | |
| 1721 | | | | | k hat (MLE) | 0.333 | | | | k star (bias corrected MLE) | | 0.327 |
| 1722 | | | | | Theta hat (MLE) | 13212 | | | | Theta star (bias corrected MLE) | | 13443 |
| 1723 | | | | | nu hat (MLE) | 38.6 | | | | nu star (bias corrected) | | 37.94 |
| 1724 | | | | | MLE Mean (bias corrected) | 4396 | | | | MLE Sd (bias corrected) | | 7688 |
| 1725 | | | | | | | | | | | | |
| 1726 | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | | | | | |
| 1727 | | | | | k hat (KM) | 0.039 | | | | nu hat (KM) | | 10.54 |
| 1728 | | | | | Approximate Chi Square Value (10.54, α) | 4.283 | | | | Adjusted Chi Square Value (10.54, β) | | 4.239 |
| 1729 | | | | | 95% Gamma Approximate KM-UCL (use when n>=50) | 4771 | | | | 95% Gamma Adjusted KM-UCL (use when n<50) | | 4820 |
| 1730 | Gamma (KM) may not be used when k hat (KM) is < 0.1 | | | | | | | | | | | |
| 1731 | | | | | | | | | | | | |
| 1732 | **Gamma ROS Statistics using Imputed Non-Detects** | | | | | | | | | | | |
| 1733 | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | | | | |
| 1734 | GROS may not be used when kstar of detected data is small such as < 0.1 | | | | | | | | | | | |
| 1735 | For such situations, GROS method tends to yield inflated values of UCLs and BTVs | | | | | | | | | | | |
| 1736 | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | | | | |
| 1737 | | | | | Minimum | 0.01 | | | | Mean | | 1889 |
| 1738 | | | | | Maximum | 93000 | | | | Median | | 0.01 |
| 1739 | | | | | SD | 9855 | | | | CV | | 5.218 |
| 1740 | | | | | k hat (MLE) | 0.108 | | | | k star (bias corrected MLE) | | 0.111 |
| 1741 | | | | | Theta hat (MLE) | 17480 | | | | Theta star (bias corrected MLE) | | 17079 |
| 1742 | | | | | nu hat (MLE) | 29.17 | | | | nu star (bias corrected) | | 29.86 |
| 1743 | | | | | MLE Mean (bias corrected) | 1889 | | | | MLE Sd (bias corrected) | | 5680 |
| 1744 | | | | | | | | | | Adjusted Level of Significance (β) | | 0.0482 |
| 1745 | | | | | Approximate Chi Square Value (29.86, α) | 18.38 | | | | Adjusted Chi Square Value (29.86, β) | | 18.29 |
| 1746 | | | | | 95% Gamma Approximate UCL (use when n>=50) | 3068 | | | | 95% Gamma Adjusted UCL (use when n<50) | | 3084 |
| 1747 | | | | | | | | | | | | |
| 1748 | **Lognormal GOF Test on Detected Observations Only** | | | | | | | | | | | |
| 1749 | | | | | Lilliefors Test Statistic | 0.0989 | **Lilliefors GOF Test** | | | | | |
| 1750 | | | | | 5% Lilliefors Critical Value | 0.116 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 1751 | **Detected Data appear Approximate Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 1752 | | | | | | | | | | | | |
| 1753 | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | | | | | |
| 1754 | | | | | Mean in Original Scale | 1916 | | | | Mean in Log Scale | | 4.621 |
| 1755 | | | | | SD in Original Scale | 9850 | | | | SD in Log Scale | | 2.144 |
| 1756 | | | | | 95% t UCL (assumes normality of ROS data) | 3320 | | | | 95% Percentile Bootstrap UCL | | 3379 |
| 1757 | | | | | 95% BCA Bootstrap UCL | 4136 | | | | 95% Bootstrap t UCL | | 8100 |
| 1758 | | | | | 95% H-UCL (Log ROS) | 1918 | | | | | | |
| 1759 | | | | | | | | | | | | |
| 1760 | **UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed** | | | | | | | | | | | |
| 1761 | | | | | KM Mean (logged) | 4.884 | | | | 95% H-UCL (KM -Log) | | 1438 |
| 1762 | | | | | KM SD (logged) | 1.927 | | | | 95% Critical H Value (KM-Log) | | 3.184 |
| 1763 | | | | | KM Standard Error of Mean (logged) | 0.211 | | | | | | |
| 1764 | | | | | | | | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1765 | **DL/2 Statistics** | | | | | | | | | | | |
| 1766 | **DL/2 Normal** | | | | | | **DL/2 Log-Transformed** | | | | | |
| 1767 | | | | Mean in Original Scale | 2075 | | | | | Mean in Log Scale | 5.297 | |
| 1768 | | | | SD in Original Scale | 9832 | | | | | SD in Log Scale | 1.906 | |
| 1769 | | | | 95% t UCL (Assumes normality) | 3477 | | | | | 95% H-Stat UCL | 2065 | |
| 1770 | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | | | | | |
| 1771 | | | | | | | | | | | | |
| 1772 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 1773 | **Detected Data appear Approximate Lognormal Distributed at 5% Significance Level** | | | | | | | | | | | |
| 1774 | | | | | | | | | | | | |
| 1775 | **Suggested UCL to Use** | | | | | | | | | | | |
| 1776 | | | | 95% KM (Chebyshev) UCL | 5652 | | | | | | | |
| 1777 | | | | | | | | | | | | |
| 1778 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 1779 | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | | | | | |
| 1780 | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | | | | | |
| 1781 | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 1782 | | | | | | | | | | | | |
| 1783 | **Benzo(k)fluoranthene** | | | | | | | | | | | |
| 1784 | | | | | | | | | | | | |
| 1785 | **General Statistics** | | | | | | | | | | | |
| 1786 | | | | Total Number of Observations | 135 | | | | | Number of Distinct Observations | 76 | |
| 1787 | | | | Number of Detects | 59 | | | | | Number of Non-Detects | 76 | |
| 1788 | | | | Number of Distinct Detects | 53 | | | | | Number of Distinct Non-Detects | 32 | |
| 1789 | | | | Minimum Detect | 20 | | | | | Minimum Non-Detect | 5.8 | |
| 1790 | | | | Maximum Detect | 68000 | | | | | Maximum Non-Detect | 6900 | |
| 1791 | | | | Variance Detects | 1.275E+8 | | | | | Percent Non-Detects | 56.3% | |
| 1792 | | | | Mean Detects | 3720 | | | | | SD Detects | 11293 | |
| 1793 | | | | Median Detects | 430 | | | | | CV Detects | 3.036 | |
| 1794 | | | | Skewness Detects | 4.79 | | | | | Kurtosis Detects | 23.88 | |
| 1795 | | | | Mean of Logged Detects | 6.16 | | | | | SD of Logged Detects | 1.998 | |
| 1796 | | | | | | | | | | | | |
| 1797 | **Normal GOF Test on Detects Only** | | | | | | | | | | | |
| 1798 | | | | Shapiro Wilk Test Statistic | 0.36 | | **Normal GOF Test on Detected Observations Only** | | | | | |
| 1799 | | | | 5% Shapiro Wilk P Value | 0 | | Detected Data Not Normal at 5% Significance Level | | | | | |
| 1800 | | | | Lilliefors Test Statistic | 0.372 | | **Lilliefors GOF Test** | | | | | |
| 1801 | | | | 5% Lilliefors Critical Value | 0.115 | | Detected Data Not Normal at 5% Significance Level | | | | | |
| 1802 | **Detected Data Not Normal at 5% Significance Level** | | | | | | | | | | | |
| 1803 | | | | | | | | | | | | |
| 1804 | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | | | | | |
| 1805 | | | | Mean | 1668 | | | | | Standard Error of Mean | 661.7 | |
| 1806 | | | | SD | 7621 | | | | | 95% KM (BCA) UCL | 3016 | |
| 1807 | | | | 95% KM (t) UCL | 2764 | | | | | 95% KM (Percentile Bootstrap) UCL | 2893 | |
| 1808 | | | | 95% KM (z) UCL | 2756 | | | | | 95% KM Bootstrap t UCL | 5000 | |
| 1809 | | | | 90% KM Chebyshev UCL | 3653 | | | | | 95% KM Chebyshev UCL | 4552 | |
| 1810 | | | | 97.5% KM Chebyshev UCL | 5800 | | | | | 99% KM Chebyshev UCL | 8252 | |
| 1811 | | | | | | | | | | | | |
| 1812 | **Gamma GOF Tests on Detected Observations Only** | | | | | | | | | | | |
| 1813 | | | | A-D Test Statistic | 3.801 | | **Anderson-Darling GOF Test** | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1814 | | | | | 5% A-D Critical Value | 0.856 | Detected Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 1815 | | | | | K-S Test Statistic | 0.219 | **Kolmogrov-Smirnoff GOF** | | | | | |
| 1816 | | | | | 5% K-S Critical Value | 0.125 | Detected Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 1817 | **Detected Data Not Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 1818 | | | | | | | | | | | | |
| 1819 | **Gamma Statistics on Detected Data Only** | | | | | | | | | | | |
| 1820 | | | | | k hat (MLE) | 0.329 | | | k star (bias corrected MLE) | | | 0.324 |
| 1821 | | | | | Theta hat (MLE) | 11291 | | | Theta star (bias corrected MLE) | | | 11481 |
| 1822 | | | | | nu hat (MLE) | 38.88 | | | nu star (bias corrected) | | | 38.23 |
| 1823 | | | | | MLE Mean (bias corrected) | 3720 | | | MLE Sd (bias corrected) | | | 6535 |
| 1824 | | | | | | | | | | | | |
| 1825 | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | | | | | |
| 1826 | | | | | k hat (KM) | 0.0479 | | | nu hat (KM) | | | 12.93 |
| 1827 | | | | | Approximate Chi Square Value (12.93, α) | 5.848 | | | Adjusted Chi Square Value (12.93, β) | | | 5.796 |
| 1828 | | | | | 95% Gamma Approximate KM-UCL (use when n>=50) | 3689 | | | 95% Gamma Adjusted KM-UCL (use when n<50) | | | 3722 |
| 1829 | Gamma (KM) may not be used when k hat (KM) is < 0.1 | | | | | | | | | | | |
| 1830 | | | | | | | | | | | | |
| 1831 | **Gamma ROS Statistics using Imputed Non-Detects** | | | | | | | | | | | |
| 1832 | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | | | | |
| 1833 | GROS may not be used when kstar of detected data is small such as < 0.1 | | | | | | | | | | | |
| 1834 | For such situations, GROS method tends to yield inflated values of UCLs and BTVs | | | | | | | | | | | |
| 1835 | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | | | | |
| 1836 | | | | | Minimum | 0.01 | | | Mean | | | 1626 |
| 1837 | | | | | Maximum | 68000 | | | Median | | | 0.01 |
| 1838 | | | | | SD | 7657 | | | CV | | | 4.71 |
| 1839 | | | | | k hat (MLE) | 0.11 | | | k star (bias corrected MLE) | | | 0.112 |
| 1840 | | | | | Theta hat (MLE) | 14781 | | | Theta star (bias corrected MLE) | | | 14453 |
| 1841 | | | | | nu hat (MLE) | 29.7 | | | nu star (bias corrected) | | | 30.37 |
| 1842 | | | | | MLE Mean (bias corrected) | 1626 | | | MLE Sd (bias corrected) | | | 4847 |
| 1843 | | | | | | | | | Adjusted Level of Significance (β) | | | 0.0482 |
| 1844 | | | | | Approximate Chi Square Value (30.37, α) | 18.78 | | | Adjusted Chi Square Value (30.37, β) | | | 18.69 |
| 1845 | | | | | 95% Gamma Approximate UCL (use when n>=50) | 2628 | | | 95% Gamma Adjusted UCL (use when n<50) | | | 2642 |
| 1846 | | | | | | | | | | | | |
| 1847 | **Lognormal GOF Test on Detected Observations Only** | | | | | | | | | | | |
| 1848 | | | | | Lilliefors Test Statistic | 0.066 | **Lilliefors GOF Test** | | | | | |
| 1849 | | | | | 5% Lilliefors Critical Value | 0.115 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 1850 | **Detected Data appear Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 1851 | | | | | | | | | | | | |
| 1852 | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | | | | | |
| 1853 | | | | | Mean in Original Scale | 1653 | | | Mean in Log Scale | | | 4.592 |
| 1854 | | | | | SD in Original Scale | 7652 | | | SD in Log Scale | | | 2.09 |
| 1855 | | | | | 95% t UCL (assumes normality of ROS data) | 2744 | | | 95% Percentile Bootstrap UCL | | | 2819 |
| 1856 | | | | | 95% BCA Bootstrap UCL | 3397 | | | 95% Bootstrap t UCL | | | 5152 |
| 1857 | | | | | 95% H-UCL (Log ROS) | 1612 | | | | | | |
| 1858 | | | | | | | | | | | | |
| 1859 | **UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed** | | | | | | | | | | | |
| 1860 | | | | | KM Mean (logged) | 4.738 | | | 95% H-UCL (KM -Log) | | | 1293 |
| 1861 | | | | | KM SD (logged) | 1.944 | | | 95% Critical H Value (KM-Log) | | | 3.204 |
| 1862 | | | | | KM Standard Error of Mean (logged) | 0.198 | | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1863 | | | | | | | | | | | | |
| 1864 | **DL/2 Statistics** | | | | | | | | | | | |
| 1865 | **DL/2 Normal** | | | | | | **DL/2 Log-Transformed** | | | | | |
| 1866 | | | | Mean in Original Scale | 1807 | | | | | Mean in Log Scale | 5.228 | |
| 1867 | | | | SD in Original Scale | 7634 | | | | | SD in Log Scale | 1.901 | |
| 1868 | | | | 95% t UCL (Assumes normality) | 2895 | | | | | 95% H-Stat UCL | 1904 | |
| 1869 | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | | | | | |
| 1870 | | | | | | | | | | | | |
| 1871 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 1872 | **Detected Data appear Lognormal Distributed at 5% Significance Level** | | | | | | | | | | | |
| 1873 | | | | | | | | | | | | |
| 1874 | **Suggested UCL to Use** | | | | | | | | | | | |
| 1875 | | | | 95% KM (Chebyshev) UCL | 4552 | | | | | | | |
| 1876 | | | | | | | | | | | | |
| 1877 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 1878 | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | | | | | |
| 1879 | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | | | | | |
| 1880 | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 1881 | | | | | | | | | | | | |
| 1882 | **Beryllium** | | | | | | | | | | | |
| 1883 | | | | | | | | | | | | |
| 1884 | **General Statistics** | | | | | | | | | | | |
| 1885 | | | | Total Number of Observations | 98 | | | | | Number of Distinct Observations | 48 | |
| 1886 | | | | Number of Detects | 83 | | | | | Number of Non-Detects | 15 | |
| 1887 | | | | Number of Distinct Detects | 46 | | | | | Number of Distinct Non-Detects | 8 | |
| 1888 | | | | Minimum Detect | 0.047 | | | | | Minimum Non-Detect | 0.071 | |
| 1889 | | | | Maximum Detect | 1.1 | | | | | Maximum Non-Detect | 0.25 | |
| 1890 | | | | Variance Detects | 0.0293 | | | | | Percent Non-Detects | 15.31% | |
| 1891 | | | | Mean Detects | 0.332 | | | | | SD Detects | 0.171 | |
| 1892 | | | | Median Detects | 0.34 | | | | | CV Detects | 0.516 | |
| 1893 | | | | Skewness Detects | 1.098 | | | | | Kurtosis Detects | 3.945 | |
| 1894 | | | | Mean of Logged Detects | -1.263 | | | | | SD of Logged Detects | 0.628 | |
| 1895 | | | | | | | | | | | | |
| 1896 | **Normal GOF Test on Detects Only** | | | | | | | | | | | |
| 1897 | | | | Shapiro Wilk Test Statistic | 0.933 | | **Normal GOF Test on Detected Observations Only** | | | | | |
| 1898 | | | | 5% Shapiro Wilk P Value | 3.0842E-4 | | Detected Data Not Normal at 5% Significance Level | | | | | |
| 1899 | | | | Lilliefors Test Statistic | 0.0887 | | **Lilliefors GOF Test** | | | | | |
| 1900 | | | | 5% Lilliefors Critical Value | 0.0973 | | Detected Data appear Normal at 5% Significance Level | | | | | |
| 1901 | **Detected Data appear Approximate Normal at 5% Significance Level** | | | | | | | | | | | |
| 1902 | | | | | | | | | | | | |
| 1903 | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | | | | | |
| 1904 | | | | Mean | 0.295 | | | | | Standard Error of Mean | 0.0184 | |
| 1905 | | | | SD | 0.18 | | | | | 95% KM (BCA) UCL | 0.324 | |
| 1906 | | | | 95% KM (t) UCL | 0.326 | | | | | 95% KM (Percentile Bootstrap) UCL | 0.326 | |
| 1907 | | | | 95% KM (z) UCL | 0.325 | | | | | 95% KM Bootstrap t UCL | 0.326 | |
| 1908 | | | | 90% KM Chebyshev UCL | 0.35 | | | | | 95% KM Chebyshev UCL | 0.375 | |
| 1909 | | | | 97.5% KM Chebyshev UCL | 0.41 | | | | | 99% KM Chebyshev UCL | 0.478 | |
| 1910 | | | | | | | | | | | | |
| 1911 | **Gamma GOF Tests on Detected Observations Only** | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1912 | | | | | A-D Test Statistic | 1.455 | **Anderson-Darling GOF Test** | | | | | |
| 1913 | | | | | 5% A-D Critical Value | 0.758 | Detected Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 1914 | | | | | K-S Test Statistic | 0.117 | **Kolmogrov-Smirnoff GOF** | | | | | |
| 1915 | | | | | 5% K-S Critical Value | 0.0987 | Detected Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 1916 | **Detected Data Not Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 1917 | | | | | | | | | | | | |
| 1918 | **Gamma Statistics on Detected Data Only** | | | | | | | | | | | |
| 1919 | | | | | k hat (MLE) | 3.291 | | | | k star (bias corrected MLE) | | 3.18 |
| 1920 | | | | | Theta hat (MLE) | 0.101 | | | | Theta star (bias corrected MLE) | | 0.104 |
| 1921 | | | | | nu hat (MLE) | 546.2 | | | | nu star (bias corrected) | | 527.8 |
| 1922 | | | | | MLE Mean (bias corrected) | 0.332 | | | | MLE Sd (bias corrected) | | 0.186 |
| 1923 | | | | | | | | | | | | |
| 1924 | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | | | | | |
| 1925 | | | | | k hat (KM) | 2.693 | | | | nu hat (KM) | | 527.9 |
| 1926 | | | | | Approximate Chi Square Value (527.87, α) | 475.6 | | | | Adjusted Chi Square Value (527.87, β) | | 474.8 |
| 1927 | | | | | 95% Gamma Approximate KM-UCL (use when n>=50) | 0.328 | | | | 95% Gamma Adjusted KM-UCL (use when n<50) | | 0.328 |
| 1928 | | | | | | | | | | | | |
| 1929 | **Gamma ROS Statistics using Imputed Non-Detects** | | | | | | | | | | | |
| 1930 | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | | | | |
| 1931 | GROS may not be used when kstar of detected data is small such as < 0.1 | | | | | | | | | | | |
| 1932 | For such situations, GROS method tends to yield inflated values of UCLs and BTVs | | | | | | | | | | | |
| 1933 | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | | | | |
| 1934 | | | | | Minimum | 0.047 | | | | Mean | | 0.299 |
| 1935 | | | | | Maximum | 1.1 | | | | Median | | 0.305 |
| 1936 | | | | | SD | 0.176 | | | | CV | | 0.588 |
| 1937 | | | | | k hat (MLE) | 2.71 | | | | k star (bias corrected MLE) | | 2.634 |
| 1938 | | | | | Theta hat (MLE) | 0.11 | | | | Theta star (bias corrected MLE) | | 0.114 |
| 1939 | | | | | nu hat (MLE) | 531.2 | | | | nu star (bias corrected) | | 516.2 |
| 1940 | | | | | MLE Mean (bias corrected) | 0.299 | | | | MLE Sd (bias corrected) | | 0.184 |
| 1941 | | | | | | | | | | Adjusted Level of Significance (β) | | 0.0476 |
| 1942 | | | | | Approximate Chi Square Value (516.24, α) | 464.6 | | | | Adjusted Chi Square Value (516.24, β) | | 463.8 |
| 1943 | | | | | 95% Gamma Approximate UCL (use when n>=50) | 0.332 | | | | 95% Gamma Adjusted UCL (use when n<50) | | 0.333 |
| 1944 | | | | | | | | | | | | |
| 1945 | **Lognormal GOF Test on Detected Observations Only** | | | | | | | | | | | |
| 1946 | | | | | Lilliefors Test Statistic | 0.152 | **Lilliefors GOF Test** | | | | | |
| 1947 | | | | | 5% Lilliefors Critical Value | 0.0973 | Detected Data Not Lognormal at 5% Significance Level | | | | | |
| 1948 | **Detected Data Not Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 1949 | | | | | | | | | | | | |
| 1950 | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | | | | | |
| 1951 | | | | | Mean in Original Scale | 0.298 | | | | Mean in Log Scale | | -1.406 |
| 1952 | | | | | SD in Original Scale | 0.176 | | | | SD in Log Scale | | 0.675 |
| 1953 | | | | | 95% t UCL (assumes normality of ROS data) | 0.328 | | | | 95% Percentile Bootstrap UCL | | 0.328 |
| 1954 | | | | | 95% BCA Bootstrap UCL | 0.331 | | | | 95% Bootstrap t UCL | | 0.331 |
| 1955 | | | | | 95% H-UCL (Log ROS) | 0.353 | | | | | | |
| 1956 | | | | | | | | | | | | |
| 1957 | **DL/2 Statistics** | | | | | | | | | | | |
| 1958 | **DL/2 Normal** | | | | | | **DL/2 Log-Transformed** | | | | | |
| 1959 | | | | | Mean in Original Scale | 0.294 | | | | Mean in Log Scale | | -1.458 |
| 1960 | | | | | SD in Original Scale | 0.181 | | | | SD in Log Scale | | 0.758 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1961 | 95% t UCL (Assumes normality) | | | | | 0.325 | 95% H-Stat UCL | | | | | 0.364 |
| 1962 | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | | | | | |
| 1963 | | | | | | | | | | | | |
| 1964 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 1965 | **Detected Data appear Approximate Normal Distributed at 5% Significance Level** | | | | | | | | | | | |
| 1966 | | | | | | | | | | | | |
| 1967 | **Suggested UCL to Use** | | | | | | | | | | | |
| 1968 | 95% KM (t) UCL | | | | | 0.326 | 95% KM (Percentile Bootstrap) UCL | | | | | 0.326 |
| 1969 | | | | | | | | | | | | |
| 1970 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 1971 | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | | | | | |
| 1972 | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | | | | | |
| 1973 | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 1974 | | | | | | | | | | | | |
| 1975 | **bis(2-Ethylhexyl)phthalate** | | | | | | | | | | | |
| 1976 | | | | | | | | | | | | |
| 1977 | **General Statistics** | | | | | | | | | | | |
| 1978 | Total Number of Observations | | | | | 121 | Number of Distinct Observations | | | | | 73 |
| 1979 | Number of Detects | | | | | 51 | Number of Non-Detects | | | | | 70 |
| 1980 | Number of Distinct Detects | | | | | 47 | Number of Distinct Non-Detects | | | | | 28 |
| 1981 | Minimum Detect | | | | | 8.3 | Minimum Non-Detect | | | | | 340 |
| 1982 | Maximum Detect | | | | | 3200000 | Maximum Non-Detect | | | | | 34000 |
| 1983 | Variance Detects | | | | | 2.007E+11 | Percent Non-Detects | | | | | 57.85% |
| 1984 | Mean Detects | | | | | 63271 | SD Detects | | | | | 448016 |
| 1985 | Median Detects | | | | | 130 | CV Detects | | | | | 7.081 |
| 1986 | Skewness Detects | | | | | 7.141 | Kurtosis Detects | | | | | 51 |
| 1987 | Mean of Logged Detects | | | | | 5.028 | SD of Logged Detects | | | | | 2.191 |
| 1988 | | | | | | | | | | | | |
| 1989 | **Normal GOF Test on Detects Only** | | | | | | | | | | | |
| 1990 | Shapiro Wilk Test Statistic | | | | | 0.143 | **Normal GOF Test on Detected Observations Only** | | | | | |
| 1991 | 5% Shapiro Wilk P Value | | | | | 0 | Detected Data Not Normal at 5% Significance Level | | | | | |
| 1992 | Lilliefors Test Statistic | | | | | 0.53 | **Lilliefors GOF Test** | | | | | |
| 1993 | 5% Lilliefors Critical Value | | | | | 0.124 | Detected Data Not Normal at 5% Significance Level | | | | | |
| 1994 | **Detected Data Not Normal at 5% Significance Level** | | | | | | | | | | | |
| 1995 | | | | | | | | | | | | |
| 1996 | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | | | | | |
| 1997 | Mean | | | | | 26764 | Standard Error of Mean | | | | | 26596 |
| 1998 | SD | | | | | 289677 | 95% KM (BCA) UCL | | | | | 79621 |
| 1999 | 95% KM (t) UCL | | | | | 70851 | 95% KM (Percentile Bootstrap) UCL | | | | | 79635 |
| 2000 | 95% KM (z) UCL | | | | | 70511 | 95% KM Bootstrap t UCL | | | | | 13321414 |
| 2001 | 90% KM Chebyshev UCL | | | | | 106553 | 95% KM Chebyshev UCL | | | | | 142695 |
| 2002 | 97.5% KM Chebyshev UCL | | | | | 192858 | 99% KM Chebyshev UCL | | | | | 291394 |
| 2003 | | | | | | | | | | | | |
| 2004 | **Gamma GOF Tests on Detected Observations Only** | | | | | | | | | | | |
| 2005 | A-D Test Statistic | | | | | 13.24 | **Anderson-Darling GOF Test** | | | | | |
| 2006 | 5% A-D Critical Value | | | | | 0.979 | Detected Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 2007 | K-S Test Statistic | | | | | 0.42 | **Kolmogrov-Smirnoff GOF** | | | | | |
| 2008 | 5% K-S Critical Value | | | | | 0.141 | Detected Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 2009 | **Detected Data Not Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2010 | | | | | | | | | | | | |
| 2011 | **Gamma Statistics on Detected Data Only** | | | | | | | | | | | |
| 2012 | | | | | k hat (MLE) | 0.13 | | | k star (bias corrected MLE) | | | 0.136 |
| 2013 | | | | | Theta hat (MLE) | 486275 | | | Theta star (bias corrected MLE) | | | 466835 |
| 2014 | | | | | nu hat (MLE) | 13.27 | | | nu star (bias corrected) | | | 13.82 |
| 2015 | | | | | MLE Mean (bias corrected) | 63271 | | | MLE Sd (bias corrected) | | | 171864 |
| 2016 | | | | | | | | | | | | |
| 2017 | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | | | | | |
| 2018 | | | | | k hat (KM) | 0.00854 | | | nu hat (KM) | | | 2.066 |
| 2019 | | | | | Approximate Chi Square Value (2.07, α) | 0.16 | | | Adjusted Chi Square Value (2.07, β) | | | 0.156 |
| 2020 | | | | | 95% Gamma Approximate KM-UCL (use when n>=50) | 345950 | | | 95% Gamma Adjusted KM-UCL (use when n<50) | | | 353580 |
| 2021 | Gamma (KM) may not be used when k hat (KM) is < 0.1 | | | | | | | | | | | |
| 2022 | | | | | | | | | | | | |
| 2023 | **Gamma ROS Statistics using Imputed Non-Detects** | | | | | | | | | | | |
| 2024 | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | | | | |
| 2025 | GROS may not be used when kstar of detected data is small such as < 0.1 | | | | | | | | | | | |
| 2026 | For such situations, GROS method tends to yield inflated values of UCLs and BTVs | | | | | | | | | | | |
| 2027 | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | | | | |
| 2028 | | | | | Minimum | 0.01 | | | Mean | | | 26668 |
| 2029 | | | | | Maximum | 3200000 | | | Median | | | 0.01 |
| 2030 | | | | | SD | 290890 | | | CV | | | 10.91 |
| 2031 | | | | | k hat (MLE) | 0.0779 | | | k star (bias corrected MLE) | | | 0.0815 |
| 2032 | | | | | Theta hat (MLE) | 342215 | | | Theta star (bias corrected MLE) | | | 327194 |
| 2033 | | | | | nu hat (MLE) | 18.86 | | | nu star (bias corrected) | | | 19.72 |
| 2034 | | | | | MLE Mean (bias corrected) | 26668 | | | MLE Sd (bias corrected) | | | 93411 |
| 2035 | | | | | | | | | Adjusted Level of Significance (β) | | | 0.048 |
| 2036 | | | | | Approximate Chi Square Value (19.72, α) | 10.65 | | | Adjusted Chi Square Value (19.72, β) | | | 10.57 |
| 2037 | | | | | 95% Gamma Approximate UCL (use when n>=50) | 49399 | | | 95% Gamma Adjusted UCL (use when n<50) | | | 49775 |
| 2038 | | | | | | | | | | | | |
| 2039 | **Lognormal GOF Test on Detected Observations Only** | | | | | | | | | | | |
| 2040 | | | | | Lilliefors Test Statistic | 0.102 | | | **Lilliefors GOF Test** | | | |
| 2041 | | | | | 5% Lilliefors Critical Value | 0.124 | | | Detected Data appear Lognormal at 5% Significance Level | | | |
| 2042 | **Detected Data appear Approximate Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 2043 | | | | | | | | | | | | |
| 2044 | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | | | | | |
| 2045 | | | | | Mean in Original Scale | 26735 | | | Mean in Log Scale | | | 4.623 |
| 2046 | | | | | SD in Original Scale | 290884 | | | SD in Log Scale | | | 1.639 |
| 2047 | | | | | 95% t UCL (assumes normality of ROS data) | 70570 | | | 95% Percentile Bootstrap UCL | | | 79620 |
| 2048 | | | | | 95% BCA Bootstrap UCL | 132365 | | | 95% Bootstrap t UCL | | | 16702874 |
| 2049 | | | | | 95% H-UCL (Log ROS) | 595.5 | | | | | | |
| 2050 | | | | | | | | | | | | |
| 2051 | **UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed** | | | | | | | | | | | |
| 2052 | | | | | KM Mean (logged) | 4.567 | | | 95% H-UCL (KM -Log) | | | 699.5 |
| 2053 | | | | | KM SD (logged) | 1.741 | | | 95% Critical H Value (KM-Log) | | | 2.947 |
| 2054 | | | | | KM Standard Error of Mean (logged) | 0.208 | | | | | | |
| 2055 | | | | | | | | | | | | |
| 2056 | **DL/2 Statistics** | | | | | | | | | | | |
| 2057 | **DL/2 Normal** | | | | | | | | **DL/2 Log-Transformed** | | | |
| 2058 | | | | | Mean in Original Scale | 27804 | | | Mean in Log Scale | | | 5.824 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2059 | | | | SD in Original Scale | | 290797 | | | | SD in Log Scale | | 1.942 |
| 2060 | | | | 95% t UCL (Assumes normality) | | 71625 | | | | 95% H-Stat UCL | | 3918 |
| 2061 | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | | | | | |
| 2062 | | | | | | | | | | | | |
| 2063 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 2064 | **Detected Data appear Approximate Lognormal Distributed at 5% Significance Level** | | | | | | | | | | | |
| 2065 | | | | | | | | | | | | |
| 2066 | **Suggested UCL to Use** | | | | | | | | | | | |
| 2067 | | | | 97.5% KM (Chebyshev) UCL | | 192858 | | | | | | |
| 2068 | | | | | | | | | | | | |
| 2069 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 2070 | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | | | | | |
| 2071 | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | | | | | |
| 2072 | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 2073 | | | | | | | | | | | | |
| 2074 | **Butyl benzylphthalate** | | | | | | | | | | | |
| 2075 | | | | | | | | | | | | |
| 2076 | **General Statistics** | | | | | | | | | | | |
| 2077 | | | | Total Number of Observations | | 120 | | | | Number of Distinct Observations | | 43 |
| 2078 | | | | Number of Detects | | 10 | | | | Number of Non-Detects | | 110 |
| 2079 | | | | Number of Distinct Detects | | 10 | | | | Number of Distinct Non-Detects | | 34 |
| 2080 | | | | Minimum Detect | | 41 | | | | Minimum Non-Detect | | 180 |
| 2081 | | | | Maximum Detect | | 1400 | | | | Maximum Non-Detect | | 17000 |
| 2082 | | | | Variance Detects | | 175734 | | | | Percent Non-Detects | | 91.67% |
| 2083 | | | | Mean Detects | | 347.2 | | | | SD Detects | | 419.2 |
| 2084 | | | | Median Detects | | 170 | | | | CV Detects | | 1.207 |
| 2085 | | | | Skewness Detects | | 2.073 | | | | Kurtosis Detects | | 4.578 |
| 2086 | | | | Mean of Logged Detects | | 5.285 | | | | SD of Logged Detects | | 1.114 |
| 2087 | | | | | | | | | | | | |
| 2088 | **Normal GOF Test on Detects Only** | | | | | | | | | | | |
| 2089 | | | | Shapiro Wilk Test Statistic | | 0.74 | | | | **Shapiro Wilk GOF Test** | | |
| 2090 | | | | 5% Shapiro Wilk Critical Value | | 0.842 | | | | Detected Data Not Normal at 5% Significance Level | | |
| 2091 | | | | Lilliefors Test Statistic | | 0.255 | | | | **Lilliefors GOF Test** | | |
| 2092 | | | | 5% Lilliefors Critical Value | | 0.28 | | | | Detected Data appear Normal at 5% Significance Level | | |
| 2093 | **Detected Data appear Approximate Normal at 5% Significance Level** | | | | | | | | | | | |
| 2094 | | | | | | | | | | | | |
| 2095 | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | | | | | |
| 2096 | | | | Mean | | 129.1 | | | | Standard Error of Mean | | 25.97 |
| 2097 | | | | SD | | 167 | | | | 95% KM (BCA) UCL | | 173.5 |
| 2098 | | | | 95% KM (t) UCL | | 172.1 | | | | 95% KM (Percentile Bootstrap) UCL | | 174.3 |
| 2099 | | | | 95% KM (z) UCL | | 171.8 | | | | 95% KM Bootstrap t UCL | | 192.3 |
| 2100 | | | | 90% KM Chebyshev UCL | | 207 | | | | 95% KM Chebyshev UCL | | 242.3 |
| 2101 | | | | 97.5% KM Chebyshev UCL | | 291.3 | | | | 99% KM Chebyshev UCL | | 387.5 |
| 2102 | | | | | | | | | | | | |
| 2103 | **Gamma GOF Tests on Detected Observations Only** | | | | | | | | | | | |
| 2104 | | | | A-D Test Statistic | | 0.365 | | | | **Anderson-Darling GOF Test** | | |
| 2105 | | | | 5% A-D Critical Value | | 0.748 | | | | Detected data appear Gamma Distributed at 5% Significance Level | | |
| 2106 | | | | K-S Test Statistic | | 0.199 | | | | **Kolmogrov-Smirnoff GOF** | | |
| 2107 | | | | 5% K-S Critical Value | | 0.274 | | | | Detected data appear Gamma Distributed at 5% Significance Level | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2108 | **Detected data appear Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 2109 | | | | | | | | | | | | |
| 2110 | **Gamma Statistics on Detected Data Only** | | | | | | | | | | | |
| 2111 | | | | | k hat (MLE) | 1.02 | | | k star (bias corrected MLE) | | | 0.781 |
| 2112 | | | | | Theta hat (MLE) | 340.5 | | | Theta star (bias corrected MLE) | | | 444.8 |
| 2113 | | | | | nu hat (MLE) | 20.4 | | | nu star (bias corrected) | | | 15.61 |
| 2114 | | | | | MLE Mean (bias corrected) | 347.2 | | | MLE Sd (bias corrected) | | | 393 |
| 2115 | | | | | | | | | | | | |
| 2116 | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | | | | | |
| 2117 | | | | | k hat (KM) | 0.597 | | | nu hat (KM) | | | 143.3 |
| 2118 | | | | | Approximate Chi Square Value (143.32, α) | 116.7 | | | Adjusted Chi Square Value (143.32, β) | | | 116.4 |
| 2119 | | | | | 95% Gamma Approximate KM-UCL (use when n>=50) | 158.6 | | | 95% Gamma Adjusted KM-UCL (use when n<50) | | | 159 |
| 2120 | | | | | | | | | | | | |
| 2121 | **Gamma ROS Statistics using Imputed Non-Detects** | | | | | | | | | | | |
| 2122 | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | | | | |
| 2123 | GROS may not be used when kstar of detected data is small such as < 0.1 | | | | | | | | | | | |
| 2124 | For such situations, GROS method tends to yield inflated values of UCLs and BTVs | | | | | | | | | | | |
| 2125 | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | | | | |
| 2126 | | | | | Minimum | 0.01 | | | Mean | | | 96.56 |
| 2127 | | | | | Maximum | 1400 | | | Median | | | 39.95 |
| 2128 | | | | | SD | 166.4 | | | CV | | | 1.723 |
| 2129 | | | | | k hat (MLE) | 0.234 | | | k star (bias corrected MLE) | | | 0.234 |
| 2130 | | | | | Theta hat (MLE) | 412.4 | | | Theta star (bias corrected MLE) | | | 412.9 |
| 2131 | | | | | nu hat (MLE) | 56.19 | | | nu star (bias corrected) | | | 56.12 |
| 2132 | | | | | MLE Mean (bias corrected) | 96.56 | | | MLE Sd (bias corrected) | | | 199.7 |
| 2133 | | | | | | | | | Adjusted Level of Significance (β) | | | 0.048 |
| 2134 | | | | | Approximate Chi Square Value (56.12, α) | 39.9 | | | Adjusted Chi Square Value (56.12, β) | | | 39.74 |
| 2135 | | | | | 95% Gamma Approximate UCL (use when n>=50) | 135.8 | | | 95% Gamma Adjusted UCL (use when n<50) | | | 136.4 |
| 2136 | | | | | | | | | | | | |
| 2137 | **Lognormal GOF Test on Detected Observations Only** | | | | | | | | | | | |
| 2138 | | | | | Shapiro Wilk Test Statistic | 0.972 | | | **Shapiro Wilk GOF Test** | | | |
| 2139 | | | | | 5% Shapiro Wilk Critical Value | 0.842 | | | Detected Data appear Lognormal at 5% Significance Level | | | |
| 2140 | | | | | Lilliefors Test Statistic | 0.138 | | | **Lilliefors GOF Test** | | | |
| 2141 | | | | | 5% Lilliefors Critical Value | 0.28 | | | Detected Data appear Lognormal at 5% Significance Level | | | |
| 2142 | **Detected Data appear Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 2143 | | | | | | | | | | | | |
| 2144 | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | | | | | |
| 2145 | | | | | Mean in Original Scale | 123.6 | | | Mean in Log Scale | | | 4.546 |
| 2146 | | | | | SD in Original Scale | 145.3 | | | SD in Log Scale | | | 0.673 |
| 2147 | | | | | 95% t UCL (assumes normality of ROS data) | 145.6 | | | 95% Percentile Bootstrap UCL | | | 146.7 |
| 2148 | | | | | 95% BCA Bootstrap UCL | 155.3 | | | 95% Bootstrap t UCL | | | 163.4 |
| 2149 | | | | | 95% H-UCL (Log ROS) | 133.3 | | | | | | |
| 2150 | | | | | | | | | | | | |
| 2151 | **UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed** | | | | | | | | | | | |
| 2152 | | | | | KM Mean (logged) | 4.572 | | | 95% H-UCL (KM -Log) | | | 133.9 |
| 2153 | | | | | KM SD (logged) | 0.649 | | | 95% Critical H Value (KM-Log) | | | 1.935 |
| 2154 | | | | | KM Standard Error of Mean (logged) | 0.203 | | | | | | |
| 2155 | | | | | | | | | | | | |
| 2156 | **DL/2 Statistics** | | | | | | | | | | | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2157 | **DL/2 Normal** | | | | | | **DL/2 Log-Transformed** | | | | | |
| 2158 | | | | Mean in Original Scale | | 804.2 | | | | Mean in Log Scale | | 5.674 |
| 2159 | | | | SD in Original Scale | | 1323 | | | | SD in Log Scale | | 1.371 |
| 2160 | | | | 95% t UCL (Assumes normality) | | 1004 | | | | 95% H-Stat UCL | | 1034 |
| 2161 | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | | | | | |
| 2162 | | | | | | | | | | | | |
| 2163 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 2164 | **Detected Data appear Approximate Normal Distributed at 5% Significance Level** | | | | | | | | | | | |
| 2165 | | | | | | | | | | | | |
| 2166 | **Suggested UCL to Use** | | | | | | | | | | | |
| 2167 | | | | 95% KM (t) UCL | | 172.1 | | | | 95% KM (Percentile Bootstrap) UCL | | 174.3 |
| 2168 | | | | | | | | | | | | |
| 2169 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 2170 | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | | | | | |
| 2171 | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | | | | | |
| 2172 | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 2173 | | | | | | | | | | | | |
| 2174 | **Cadmium** | | | | | | | | | | | |
| 2175 | | | | | | | | | | | | |
| 2176 | **General Statistics** | | | | | | | | | | | |
| 2177 | | | | Total Number of Observations | | 102 | | | | Number of Distinct Observations | | 72 |
| 2178 | | | | Number of Detects | | 92 | | | | Number of Non-Detects | | 10 |
| 2179 | | | | Number of Distinct Detects | | 70 | | | | Number of Distinct Non-Detects | | 7 |
| 2180 | | | | Minimum Detect | | 0.014 | | | | Minimum Non-Detect | | 0.11 |
| 2181 | | | | Maximum Detect | | 27 | | | | Maximum Non-Detect | | 0.28 |
| 2182 | | | | Variance Detects | | 10.63 | | | | Percent Non-Detects | | 9.804% |
| 2183 | | | | Mean Detects | | 1.251 | | | | SD Detects | | 3.261 |
| 2184 | | | | Median Detects | | 0.375 | | | | CV Detects | | 2.607 |
| 2185 | | | | Skewness Detects | | 6.266 | | | | Kurtosis Detects | | 45.41 |
| 2186 | | | | Mean of Logged Detects | | -1.004 | | | | SD of Logged Detects | | 1.528 |
| 2187 | | | | | | | | | | | | |
| 2188 | **Normal GOF Test on Detects Only** | | | | | | | | | | | |
| 2189 | | | | Shapiro Wilk Test Statistic | | 0.383 | **Normal GOF Test on Detected Observations Only** | | | | | |
| 2190 | | | | 5% Shapiro Wilk P Value | | 0 | Detected Data Not Normal at 5% Significance Level | | | | | |
| 2191 | | | | Lilliefors Test Statistic | | 0.352 | **Lilliefors GOF Test** | | | | | |
| 2192 | | | | 5% Lilliefors Critical Value | | 0.0924 | Detected Data Not Normal at 5% Significance Level | | | | | |
| 2193 | **Detected Data Not Normal at 5% Significance Level** | | | | | | | | | | | |
| 2194 | | | | | | | | | | | | |
| 2195 | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | | | | | |
| 2196 | | | | Mean | | 1.135 | | | | Standard Error of Mean | | 0.309 |
| 2197 | | | | SD | | 3.1 | | | | 95% KM (BCA) UCL | | 1.744 |
| 2198 | | | | 95% KM (t) UCL | | 1.648 | | | | 95% KM (Percentile Bootstrap) UCL | | 1.695 |
| 2199 | | | | 95% KM (z) UCL | | 1.643 | | | | 95% KM Bootstrap t UCL | | 2.354 |
| 2200 | | | | 90% KM Chebyshev UCL | | 2.061 | | | | 95% KM Chebyshev UCL | | 2.48 |
| 2201 | | | | 97.5% KM Chebyshev UCL | | 3.063 | | | | 99% KM Chebyshev UCL | | 4.206 |
| 2202 | | | | | | | | | | | | |
| 2203 | **Gamma GOF Tests on Detected Observations Only** | | | | | | | | | | | |
| 2204 | | | | A-D Test Statistic | | 3.391 | **Anderson-Darling GOF Test** | | | | | |
| 2205 | | | | 5% A-D Critical Value | | 0.817 | Detected Data Not Gamma Distributed at 5% Significance Level | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2206 | | | | | K-S Test Statistic | 0.15 | **Kolmogrov-Smirnoff GOF** | | | | | |
| 2207 | | | | | 5% K-S Critical Value | 0.0985 | Detected Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 2208 | **Detected Data Not Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 2209 | | | | | | | | | | | | |
| 2210 | **Gamma Statistics on Detected Data Only** | | | | | | | | | | | |
| 2211 | | | | | k hat (MLE) | 0.515 | | | | k star (bias corrected MLE) | | 0.505 |
| 2212 | | | | | Theta hat (MLE) | 2.429 | | | | Theta star (bias corrected MLE) | | 2.475 |
| 2213 | | | | | nu hat (MLE) | 94.73 | | | | nu star (bias corrected) | | 92.98 |
| 2214 | | | | | MLE Mean (bias corrected) | 1.251 | | | | MLE Sd (bias corrected) | | 1.759 |
| 2215 | | | | | | | | | | | | |
| 2216 | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | | | | | |
| 2217 | | | | | k hat (KM) | 0.134 | | | | nu hat (KM) | | 27.36 |
| 2218 | | | | | Approximate Chi Square Value (27.36, α) | 16.43 | | | | Adjusted Chi Square Value (27.36, β) | | 16.31 |
| 2219 | | | | | 95% Gamma Approximate KM-UCL (use when n>=50) | 1.89 | | | | 95% Gamma Adjusted KM-UCL (use when n<50) | | 1.904 |
| 2220 | | | | | | | | | | | | |
| 2221 | **Gamma ROS Statistics using Imputed Non-Detects** | | | | | | | | | | | |
| 2222 | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | | | | |
| 2223 | GROS may not be used when kstar of detected data is small such as < 0.1 | | | | | | | | | | | |
| 2224 | For such situations, GROS method tends to yield inflated values of UCLs and BTVs | | | | | | | | | | | |
| 2225 | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | | | | |
| 2226 | | | | | Minimum | 0.01 | | | | Mean | | 1.129 |
| 2227 | | | | | Maximum | 27 | | | | Median | | 0.26 |
| 2228 | | | | | SD | 3.117 | | | | CV | | 2.761 |
| 2229 | | | | | k hat (MLE) | 0.438 | | | | k star (bias corrected MLE) | | 0.432 |
| 2230 | | | | | Theta hat (MLE) | 2.575 | | | | Theta star (bias corrected MLE) | | 2.613 |
| 2231 | | | | | nu hat (MLE) | 89.45 | | | | nu star (bias corrected) | | 88.15 |
| 2232 | | | | | MLE Mean (bias corrected) | 1.129 | | | | MLE Sd (bias corrected) | | 1.718 |
| 2233 | | | | | | | | | | Adjusted Level of Significance (β) | | 0.0476 |
| 2234 | | | | | Approximate Chi Square Value (88.15, α) | 67.5 | | | | Adjusted Chi Square Value (88.15, β) | | 67.25 |
| 2235 | | | | | 95% Gamma Approximate UCL (use when n>=50) | 1.474 | | | | 95% Gamma Adjusted UCL (use when n<50) | | 1.48 |
| 2236 | | | | | | | | | | | | |
| 2237 | **Lognormal GOF Test on Detected Observations Only** | | | | | | | | | | | |
| 2238 | | | | | Lilliefors Test Statistic | 0.0561 | **Lilliefors GOF Test** | | | | | |
| 2239 | | | | | 5% Lilliefors Critical Value | 0.0924 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 2240 | **Detected Data appear Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 2241 | | | | | | | | | | | | |
| 2242 | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | | | | | |
| 2243 | | | | | Mean in Original Scale | 1.135 | | | | Mean in Log Scale | | -1.175 |
| 2244 | | | | | SD in Original Scale | 3.115 | | | | SD in Log Scale | | 1.545 |
| 2245 | | | | | 95% t UCL (assumes normality of ROS data) | 1.647 | | | | 95% Percentile Bootstrap UCL | | 1.697 |
| 2246 | | | | | 95% BCA Bootstrap UCL | 2.005 | | | | 95% Bootstrap t UCL | | 2.355 |
| 2247 | | | | | 95% H-UCL (Log ROS) | 1.559 | | | | | | |
| 2248 | | | | | | | | | | | | |
| 2249 | **UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed** | | | | | | | | | | | |
| 2250 | | | | | KM Mean (logged) | -1.181 | | | | 95% H-UCL (KM -Log) | | 1.573 |
| 2251 | | | | | KM SD (logged) | 1.553 | | | | 95% Critical H Value (KM-Log) | | 2.773 |
| 2252 | | | | | KM Standard Error of Mean (logged) | 0.156 | | | | | | |
| 2253 | | | | | | | | | | | | |
| 2254 | **DL/2 Statistics** | | | | | | | | | | | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2255 | **DL/2 Normal** | | | | | | **DL/2 Log-Transformed** | | | | | |
| 2256 | | | | | Mean in Original Scale | 1.136 | | | | | Mean in Log Scale | -1.159 |
| 2257 | | | | | SD in Original Scale | 3.115 | | | | | SD in Log Scale | 1.527 |
| 2258 | | | | | 95% t UCL (Assumes normality) | 1.648 | | | | | 95% H-Stat UCL | 1.528 |
| 2259 | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | | | | | |
| 2260 | | | | | | | | | | | | |
| 2261 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 2262 | **Detected Data appear Lognormal Distributed at 5% Significance Level** | | | | | | | | | | | |
| 2263 | | | | | | | | | | | | |
| 2264 | **Suggested UCL to Use** | | | | | | | | | | | |
| 2265 | | | | | 97.5% KM (Chebyshev) UCL | 3.063 | | | | | | |
| 2266 | | | | | | | | | | | | |
| 2267 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 2268 | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | | | | | |
| 2269 | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | | | | | |
| 2270 | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 2271 | | | | | | | | | | | | |
| 2272 | **Carbon disulfide** | | | | | | | | | | | |
| 2273 | | | | | | | | | | | | |
| 2274 | **General Statistics** | | | | | | | | | | | |
| 2275 | | | | | Total Number of Observations | 10 | | | | | Number of Distinct Observations | 5 |
| 2276 | | | | | Number of Detects | 2 | | | | | Number of Non-Detects | 8 |
| 2277 | | | | | Number of Distinct Detects | 2 | | | | | Number of Distinct Non-Detects | 3 |
| 2278 | | | | | Minimum Detect | 1.2 | | | | | Minimum Non-Detect | 6 |
| 2279 | | | | | Maximum Detect | 3.8 | | | | | Maximum Non-Detect | 5000 |
| 2280 | | | | | Variance Detects | 3.38 | | | | | Percent Non-Detects | 80% |
| 2281 | | | | | Mean Detects | 2.5 | | | | | SD Detects | 1.838 |
| 2282 | | | | | Median Detects | 2.5 | | | | | CV Detects | 0.735 |
| 2283 | | | | | Skewness Detects | N/A | | | | | Kurtosis Detects | N/A |
| 2284 | | | | | Mean of Logged Detects | 0.759 | | | | | SD of Logged Detects | 0.815 |
| 2285 | | | | | | | | | | | | |
| 2286 | **Warning: Data set has only 2 Detected Values.** | | | | | | | | | | | |
| 2287 | **This is not enough to compute meaningful or reliable statistics and estimates.** | | | | | | | | | | | |
| 2288 | | | | | | | | | | | | |
| 2289 | | | | | | | | | | | | |
| 2290 | **Normal GOF Test on Detects Only** | | | | | | | | | | | |
| 2291 | **Not Enough Data to Perform GOF Test** | | | | | | | | | | | |
| 2292 | | | | | | | | | | | | |
| 2293 | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | | | | | |
| 2294 | | | | | Mean | 2.5 | | | | | Standard Error of Mean | 1.3 |
| 2295 | | | | | SD | 1.3 | | | | | 95% KM (BCA) UCL | N/A |
| 2296 | | | | | 95% KM (t) UCL | 4.883 | | | | | 95% KM (Percentile Bootstrap) UCL | N/A |
| 2297 | | | | | 95% KM (z) UCL | 4.638 | | | | | 95% KM Bootstrap t UCL | N/A |
| 2298 | | | | | 90% KM Chebyshev UCL | 6.4 | | | | | 95% KM Chebyshev UCL | 8.167 |
| 2299 | | | | | 97.5% KM Chebyshev UCL | 10.62 | | | | | 99% KM Chebyshev UCL | 15.43 |
| 2300 | | | | | | | | | | | | |
| 2301 | **Gamma GOF Tests on Detected Observations Only** | | | | | | | | | | | |
| 2302 | **Not Enough Data to Perform GOF Test** | | | | | | | | | | | |
| 2303 | | | | | | | | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2304 | **Gamma Statistics on Detected Data Only** | | | | | | | | | | | |
| 2305 | | | | | k hat (MLE) | 3.329 | | | k star (bias corrected MLE) | | | N/A |
| 2306 | | | | | Theta hat (MLE) | 0.751 | | | Theta star (bias corrected MLE) | | | N/A |
| 2307 | | | | | nu hat (MLE) | 13.32 | | | nu star (bias corrected) | | | N/A |
| 2308 | | | | | MLE Mean (bias corrected) | N/A | | | MLE Sd (bias corrected) | | | N/A |
| 2309 | | | | | | | | | | | | |
| 2310 | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | | | | | |
| 2311 | | | | | k hat (KM) | 3.698 | | | nu hat (KM) | | | 73.96 |
| 2312 | | | | | | | | | Adjusted Level of Significance (β) | | | 0.0267 |
| 2313 | | | | | Approximate Chi Square Value (73.96, α) | 55.16 | | | Adjusted Chi Square Value (73.96, β) | | | 52.35 |
| 2314 | | | | | 95% Gamma Approximate KM-UCL (use when n>=50) | 3.352 | | | 95% Gamma Adjusted KM-UCL (use when n<50) | | | 3.533 |
| 2315 | | | | | | | | | | | | |
| 2316 | **Lognormal GOF Test on Detected Observations Only** | | | | | | | | | | | |
| 2317 | **Not Enough Data to Perform GOF Test** | | | | | | | | | | | |
| 2318 | | | | | | | | | | | | |
| 2319 | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | | | | | |
| 2320 | | | | | Mean in Original Scale | 2.864 | | | Mean in Log Scale | | | 0.759 |
| 2321 | | | | | SD in Original Scale | 2.462 | | | SD in Log Scale | | | 0.817 |
| 2322 | | | | | 95% t UCL (assumes normality of ROS data) | 4.291 | | | 95% Percentile Bootstrap UCL | | | 4.205 |
| 2323 | | | | | 95% BCA Bootstrap UCL | 4.606 | | | 95% Bootstrap t UCL | | | 5.519 |
| 2324 | | | | | 95% H-UCL (Log ROS) | 6.291 | | | | | | |
| 2325 | | | | | | | | | | | | |
| 2326 | **DL/2 Statistics** | | | | | | | | | | | |
| 2327 | | | | | **DL/2 Normal** | | | | **DL/2 Log-Transformed** | | | |
| 2328 | | | | | Mean in Original Scale | 252.6 | | | Mean in Log Scale | | | 1.707 |
| 2329 | | | | | SD in Original Scale | 789.7 | | | SD in Log Scale | | | 2.171 |
| 2330 | | | | | 95% t UCL (Assumes normality) | 710.4 | | | 95% H-Stat UCL | | | 3906 |
| 2331 | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | | | | | |
| 2332 | | | | | | | | | | | | |
| 2333 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 2334 | **Data do not follow a Discernible Distribution at 5% Significance Level** | | | | | | | | | | | |
| 2335 | | | | | | | | | | | | |
| 2336 | **Suggested UCL to Use** | | | | | | | | | | | |
| 2337 | | | | | 95% KM (t) UCL | 4.883 | | | 95% KM (% Bootstrap) UCL | | | N/A |
| 2338 | **Warning: One or more Recommended UCL(s) not available!** | | | | | | | | | | | |
| 2339 | **Warning: Recommended UCL exceeds the maximum observation** | | | | | | | | | | | |
| 2340 | | | | | | | | | | | | |
| 2341 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 2342 | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | | | | | |
| 2343 | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | | | | | |
| 2344 | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 2345 | | | | | | | | | | | | |
| 2346 | **Chloroform (Trichloromethane)** | | | | | | | | | | | |
| 2347 | | | | | | | | | | | | |
| 2348 | **General Statistics** | | | | | | | | | | | |
| 2349 | | | | | Total Number of Observations | 10 | | | Number of Distinct Observations | | | 5 |
| 2350 | | | | | Number of Detects | 2 | | | Number of Non-Detects | | | 8 |
| 2351 | | | | | Number of Distinct Detects | 2 | | | Number of Distinct Non-Detects | | | 3 |
| 2352 | | | | | Minimum Detect | 0.7 | | | Minimum Non-Detect | | | 6 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2353 | | | | Maximum Detect | | 0.9 | | | | Maximum Non-Detect | | 5000 |
| 2354 | | | | Variance Detects | | 0.02 | | | | Percent Non-Detects | | 80% |
| 2355 | | | | Mean Detects | | 0.8 | | | | SD Detects | | 0.141 |
| 2356 | | | | Median Detects | | 0.8 | | | | CV Detects | | 0.177 |
| 2357 | | | | Skewness Detects | | N/A | | | | Kurtosis Detects | | N/A |
| 2358 | | | | Mean of Logged Detects | | -0.231 | | | | SD of Logged Detects | | 0.178 |
| 2359 | | | | | | | | | | | | |
| 2360 | **Warning: Data set has only 2 Detected Values.** | | | | | | | | | | | |
| 2361 | **This is not enough to compute meaningful or reliable statistics and estimates.** | | | | | | | | | | | |
| 2362 | | | | | | | | | | | | |
| 2363 | | | | | | | | | | | | |
| 2364 | **Normal GOF Test on Detects Only** | | | | | | | | | | | |
| 2365 | **Not Enough Data to Perform GOF Test** | | | | | | | | | | | |
| 2366 | | | | | | | | | | | | |
| 2367 | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | | | | | |
| 2368 | | | | Mean | | 0.8 | | | | Standard Error of Mean | | 0.1 |
| 2369 | | | | SD | | 0.1 | | | | 95% KM (BCA) UCL | | N/A |
| 2370 | | | | 95% KM (t) UCL | | 0.983 | | | | 95% KM (Percentile Bootstrap) UCL | | N/A |
| 2371 | | | | 95% KM (z) UCL | | 0.964 | | | | 95% KM Bootstrap t UCL | | N/A |
| 2372 | | | | 90% KM Chebyshev UCL | | 1.1 | | | | 95% KM Chebyshev UCL | | 1.236 |
| 2373 | | | | 97.5% KM Chebyshev UCL | | 1.424 | | | | 99% KM Chebyshev UCL | | 1.795 |
| 2374 | | | | | | | | | | | | |
| 2375 | **Gamma GOF Tests on Detected Observations Only** | | | | | | | | | | | |
| 2376 | **Not Enough Data to Perform GOF Test** | | | | | | | | | | | |
| 2377 | | | | | | | | | | | | |
| 2378 | **Gamma Statistics on Detected Data Only** | | | | | | | | | | | |
| 2379 | | | | k hat (MLE) | | 63.66 | | | | k star (bias corrected MLE) | | N/A |
| 2380 | | | | Theta hat (MLE) | | 0.0126 | | | | Theta star (bias corrected MLE) | | N/A |
| 2381 | | | | nu hat (MLE) | | 254.7 | | | | nu star (bias corrected) | | N/A |
| 2382 | | | | MLE Mean (bias corrected) | | N/A | | | | MLE Sd (bias corrected) | | N/A |
| 2383 | | | | | | | | | | | | |
| 2384 | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | | | | | |
| 2385 | | | | k hat (KM) | | 64 | | | | nu hat (KM) | | 1280 |
| 2386 | | | | | | | | | | Adjusted Level of Significance (β) | | 0.0267 |
| 2387 | | | | Approximate Chi Square Value (N/A, α) | | 1198 | | | | Adjusted Chi Square Value (N/A, β) | | 1184 |
| 2388 | | | | 95% Gamma Approximate KM-UCL (use when n>=50) | | 0.855 | | | | 95% Gamma Adjusted KM-UCL (use when n<50) | | 0.865 |
| 2389 | | | | | | | | | | | | |
| 2390 | **Lognormal GOF Test on Detected Observations Only** | | | | | | | | | | | |
| 2391 | **Not Enough Data to Perform GOF Test** | | | | | | | | | | | |
| 2392 | | | | | | | | | | | | |
| 2393 | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | | | | | |
| 2394 | | | | Mean in Original Scale | | 0.805 | | | | Mean in Log Scale | | -0.231 |
| 2395 | | | | SD in Original Scale | | 0.144 | | | | SD in Log Scale | | 0.178 |
| 2396 | | | | 95% t UCL (assumes normality of ROS data) | | 0.889 | | | | 95% Percentile Bootstrap UCL | | 0.881 |
| 2397 | | | | 95% BCA Bootstrap UCL | | 0.883 | | | | 95% Bootstrap t UCL | | 0.9 |
| 2398 | | | | 95% H-UCL (Log ROS) | | 0.901 | | | | | | |
| 2399 | | | | | | | | | | | | |
| 2400 | **DL/2 Statistics** | | | | | | | | | | | |
| 2401 | **DL/2 Normal** | | | | | | | | | **DL/2 Log-Transformed** | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2402 | | | | Mean in Original Scale | 252.3 | | | | | Mean in Log Scale | 1.509 | |
| 2403 | | | | SD in Original Scale | 789.8 | | | | | SD in Log Scale | 2.288 | |
| 2404 | | | | 95% t UCL (Assumes normality) | 710.1 | | | | | 95% H-Stat UCL | 6485 | |
| 2405 | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | | | | | |
| 2406 | | | | | | | | | | | | |
| 2407 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 2408 | **Data do not follow a Discernible Distribution at 5% Significance Level** | | | | | | | | | | | |
| 2409 | | | | | | | | | | | | |
| 2410 | **Suggested UCL to Use** | | | | | | | | | | | |
| 2411 | | | | 95% KM (t) UCL | 0.983 | | | | | 95% KM (% Bootstrap) UCL | N/A | |
| 2412 | **Warning: One or more Recommended UCL(s) not available!** | | | | | | | | | | | |
| 2413 | **Warning: Recommended UCL exceeds the maximum observation** | | | | | | | | | | | |
| 2414 | | | | | | | | | | | | |
| 2415 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 2416 | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | | | | | |
| 2417 | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | | | | | |
| 2418 | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 2419 | | | | | | | | | | | | |
| 2420 | | | | | | | | | | | | |
| 2421 | **Chromium** | | | | | | | | | | | |
| 2422 | | | | | | | | | | | | |
| 2423 | **General Statistics** | | | | | | | | | | | |
| 2424 | | | | Total Number of Observations | 98 | | | | | Number of Distinct Observations | 59 | |
| 2425 | | | | | | | | | | Number of Missing Observations | 0 | |
| 2426 | | | | Minimum | 20.4 | | | | | Mean | 71.75 | |
| 2427 | | | | Maximum | 470 | | | | | Median | 61.35 | |
| 2428 | | | | SD | 53.41 | | | | | Std. Error of Mean | 5.395 | |
| 2429 | | | | Coefficient of Variation | 0.744 | | | | | Skewness | 4.805 | |
| 2430 | | | | | | | | | | | | |
| 2431 | **Normal GOF Test** | | | | | | | | | | | |
| 2432 | | | | Shapiro Wilk Test Statistic | 0.612 | | | | | **Shapiro Wilk GOF Test** | | |
| 2433 | | | | 5% Shapiro Wilk P Value | 0 | | | | | Data Not Normal at 5% Significance Level | | |
| 2434 | | | | Lilliefors Test Statistic | 0.261 | | | | | **Lilliefors GOF Test** | | |
| 2435 | | | | 5% Lilliefors Critical Value | 0.0895 | | | | | Data Not Normal at 5% Significance Level | | |
| 2436 | **Data Not Normal at 5% Significance Level** | | | | | | | | | | | |
| 2437 | | | | | | | | | | | | |
| 2438 | **Assuming Normal Distribution** | | | | | | | | | | | |
| 2439 | **95% Normal UCL** | | | | | | | | | **95% UCLs (Adjusted for Skewness)** | | |
| 2440 | | | | 95% Student's-t UCL | 80.71 | | | | | 95% Adjusted-CLT UCL (Chen-1995) | 83.42 | |
| 2441 | | | | | | | | | | 95% Modified-t UCL (Johnson-1978) | 81.15 | |
| 2442 | | | | | | | | | | | | |
| 2443 | **Gamma GOF Test** | | | | | | | | | | | |
| 2444 | | | | A-D Test Statistic | 3.189 | | | | | **Anderson-Darling Gamma GOF Test** | | |
| 2445 | | | | 5% A-D Critical Value | 0.757 | | | | | Data Not Gamma Distributed at 5% Significance Level | | |
| 2446 | | | | K-S Test Statistic | 0.169 | | | | | **Kolmogrov-Smirnoff Gamma GOF Test** | | |
| 2447 | | | | 5% K-S Critical Value | 0.0908 | | | | | Data Not Gamma Distributed at 5% Significance Level | | |
| 2448 | **Data Not Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 2449 | | | | | | | | | | | | |
| 2450 | **Gamma Statistics** | | | | | | | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2451 | | | | | k hat (MLE) | 3.688 | | | | k star (bias corrected MLE) | | 3.582 |
| 2452 | | | | | Theta hat (MLE) | 19.46 | | | | Theta star (bias corrected MLE) | | 20.03 |
| 2453 | | | | | nu hat (MLE) | 722.9 | | | | nu star (bias corrected) | | 702.1 |
| 2454 | | | | | MLE Mean (bias corrected) | 71.75 | | | | MLE Sd (bias corrected) | | 37.91 |
| 2455 | | | | | | | | | | Approximate Chi Square Value (0.05) | | 641.6 |
| 2456 | | | | | Adjusted Level of Significance | 0.0476 | | | | Adjusted Chi Square Value | | 640.7 |
| 2457 | | | | | | | | | | | | |
| 2458 | **Assuming Gamma Distribution** | | | | | | | | | | | |
| 2459 | | | | 95% Approximate Gamma UCL (use when n>=50)) | | 78.51 | | | | 95% Adjusted Gamma UCL (use when n<50) | | 78.62 |
| 2460 | | | | | | | | | | | | |
| 2461 | **Lognormal GOF Test** | | | | | | | | | | | |
| 2462 | | | | | Shapiro Wilk Test Statistic | 0.954 | | | | **Shapiro Wilk Lognormal GOF Test** | | |
| 2463 | | | | | 5% Shapiro Wilk P Value | 0.00653 | | | | Data Not Lognormal at 5% Significance Level | | |
| 2464 | | | | | Lilliefors Test Statistic | 0.123 | | | | **Lilliefors Lognormal GOF Test** | | |
| 2465 | | | | | 5% Lilliefors Critical Value | 0.0895 | | | | Data Not Lognormal at 5% Significance Level | | |
| 2466 | **Data Not Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 2467 | | | | | | | | | | | | |
| 2468 | **Lognormal Statistics** | | | | | | | | | | | |
| 2469 | | | | | Minimum of Logged Data | 3.016 | | | | Mean of logged Data | | 4.132 |
| 2470 | | | | | Maximum of Logged Data | 6.153 | | | | SD of logged Data | | 0.487 |
| 2471 | | | | | | | | | | | | |
| 2472 | **Assuming Lognormal Distribution** | | | | | | | | | | | |
| 2473 | | | | | 95% H-UCL | 76.8 | | | | 90% Chebyshev (MVUE) UCL | | 80.89 |
| 2474 | | | | | 95% Chebyshev (MVUE) UCL | 85.81 | | | | 97.5% Chebyshev (MVUE) UCL | | 92.65 |
| 2475 | | | | | 99% Chebyshev (MVUE) UCL | 106.1 | | | | | | |
| 2476 | | | | | | | | | | | | |
| 2477 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 2478 | **Data do not follow a Discernible Distribution (0.05)** | | | | | | | | | | | |
| 2479 | | | | | | | | | | | | |
| 2480 | **Nonparametric Distribution Free UCLs** | | | | | | | | | | | |
| 2481 | | | | | 95% CLT UCL | 80.63 | | | | 95% Jackknife UCL | | 80.71 |
| 2482 | | | | | 95% Standard Bootstrap UCL | 80.62 | | | | 95% Bootstrap-t UCL | | 86.25 |
| 2483 | | | | | 95% Hall's Bootstrap UCL | 118.4 | | | | 95% Percentile Bootstrap UCL | | 81.11 |
| 2484 | | | | | 95% BCA Bootstrap UCL | 84.38 | | | | | | |
| 2485 | | | | | 90% Chebyshev(Mean, Sd) UCL | 87.94 | | | | 95% Chebyshev(Mean, Sd) UCL | | 95.27 |
| 2486 | | | | | 97.5% Chebyshev(Mean, Sd) UCL | 105.4 | | | | 99% Chebyshev(Mean, Sd) UCL | | 125.4 |
| 2487 | | | | | | | | | | | | |
| 2488 | **Suggested UCL to Use** | | | | | | | | | | | |
| 2489 | | | | | 95% Student's-t UCL | 80.71 | | | | or 95% Modified-t UCL | | 81.15 |
| 2490 | | | | | | | | | | | | |
| 2491 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 2492 | These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) | | | | | | | | | | | |
| 2493 | and Singh and Singh (2003). However, simulations results will not cover all Real World data sets. | | | | | | | | | | | |
| 2494 | For additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 2495 | | | | | | | | | | | | |
| 2496 | **Chromium VI** | | | | | | | | | | | |
| 2497 | | | | | | | | | | | | |
| 2498 | **General Statistics** | | | | | | | | | | | |
| 2499 | | | | | Total Number of Observations | 8 | | | | Number of Distinct Observations | | 5 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2500 | | | | | Number of Detects | 4 | | | | | Number of Non-Detects | 4 |
| 2501 | | | | | Number of Distinct Detects | 4 | | | | | Number of Distinct Non-Detects | 2 |
| 2502 | | | | | Minimum Detect | 0.012 | | | | | Minimum Non-Detect | 0.011 |
| 2503 | | | | | Maximum Detect | 0.084 | | | | | Maximum Non-Detect | 0.012 |
| 2504 | | | | | Variance Detects | 0.00102 | | | | | Percent Non-Detects | 50% |
| 2505 | | | | | Mean Detects | 0.038 | | | | | SD Detects | 0.032 |
| 2506 | | | | | Median Detects | 0.028 | | | | | CV Detects | 0.841 |
| 2507 | | | | | Skewness Detects | 1.544 | | | | | Kurtosis Detects | 2.478 |
| 2508 | | | | | Mean of Logged Detects | -3.524 | | | | | SD of Logged Detects | 0.819 |
| 2509 | | | | | | | | | | | | |
| 2510 | | | | | **Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use** | | | | | | | |
| 2511 | | | | | **guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.** | | | | | | | |
| 2512 | | | | | **For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).** | | | | | | | |
| 2513 | | | | | **Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.0** | | | | | | | |
| 2514 | | | | | | | | | | | | |
| 2515 | | | | | **Normal GOF Test on Detects Only** | | | | | | | |
| 2516 | | | | | Shapiro Wilk Test Statistic | 0.865 | **Shapiro Wilk GOF Test** | | | | | |
| 2517 | | | | | 5% Shapiro Wilk Critical Value | 0.748 | Detected Data appear Normal at 5% Significance Level | | | | | |
| 2518 | | | | | Lilliefors Test Statistic | 0.3 | **Lilliefors GOF Test** | | | | | |
| 2519 | | | | | 5% Lilliefors Critical Value | 0.443 | Detected Data appear Normal at 5% Significance Level | | | | | |
| 2520 | | | | | **Detected Data appear Normal at 5% Significance Level** | | | | | | | |
| 2521 | | | | | | | | | | | | |
| 2522 | | | | | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | |
| 2523 | | | | | Mean | 0.0245 | Standard Error of Mean | 0.00971 | | | | |
| 2524 | | | | | SD | 0.0238 | 95% KM (BCA) UCL | N/A | | | | |
| 2525 | | | | | 95% KM (t) UCL | 0.0429 | 95% KM (Percentile Bootstrap) UCL | N/A | | | | |
| 2526 | | | | | 95% KM (z) UCL | 0.0405 | 95% KM Bootstrap t UCL | N/A | | | | |
| 2527 | | | | | 90% KM Chebyshev UCL | 0.0536 | 95% KM Chebyshev UCL | 0.0668 | | | | |
| 2528 | | | | | 97.5% KM Chebyshev UCL | 0.0851 | 99% KM Chebyshev UCL | 0.121 | | | | |
| 2529 | | | | | | | | | | | | |
| 2530 | | | | | **Gamma GOF Tests on Detected Observations Only** | | | | | | | |
| 2531 | | | | | A-D Test Statistic | 0.263 | **Anderson-Darling GOF Test** | | | | | |
| 2532 | | | | | 5% A-D Critical Value | 0.66 | Detected data appear Gamma Distributed at 5% Significance Level | | | | | |
| 2533 | | | | | K-S Test Statistic | 0.22 | **Kolmogrov-Smirnoff GOF** | | | | | |
| 2534 | | | | | 5% K-S Critical Value | 0.398 | Detected data appear Gamma Distributed at 5% Significance Level | | | | | |
| 2535 | | | | | **Detected data appear Gamma Distributed at 5% Significance Level** | | | | | | | |
| 2536 | | | | | | | | | | | | |
| 2537 | | | | | **Gamma Statistics on Detected Data Only** | | | | | | | |
| 2538 | | | | | k hat (MLE) | 2.118 | k star (bias corrected MLE) | 0.696 | | | | |
| 2539 | | | | | Theta hat (MLE) | 0.0179 | Theta star (bias corrected MLE) | 0.0546 | | | | |
| 2540 | | | | | nu hat (MLE) | 16.94 | nu star (bias corrected) | 5.569 | | | | |
| 2541 | | | | | MLE Mean (bias corrected) | 0.038 | MLE Sd (bias corrected) | 0.0455 | | | | |
| 2542 | | | | | | | | | | | | |
| 2543 | | | | | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | |
| 2544 | | | | | k hat (KM) | 1.062 | nu hat (KM) | 16.99 | | | | |
| 2545 | | | | | Approximate Chi Square Value (16.99, α) | 8.666 | Adjusted Chi Square Value (16.99, β) | 7.213 | | | | |
| 2546 | | | | | 95% Gamma Approximate KM-UCL (use when n>=50) | 0.048 | 95% Gamma Adjusted KM-UCL (use when n<50) | 0.0577 | | | | |
| 2547 | | | | | | | | | | | | |
| 2548 | | | | | **Gamma ROS Statistics using Imputed Non-Detects** | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2549 | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | | | | |
| 2550 | GROS may not be used when kstar of detected data is small such as < 0.1 | | | | | | | | | | | |
| 2551 | For such situations, GROS method tends to yield inflated values of UCLs and BTVs | | | | | | | | | | | |
| 2552 | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | | | | |
| 2553 | | | | | Minimum | 0.01 | | | | Mean | 0.024 | |
| 2554 | | | | | Maximum | 0.084 | | | | Median | 0.011 | |
| 2555 | | | | | SD | 0.0257 | | | | CV | 1.072 | |
| 2556 | | | | | k hat (MLE) | 1.639 | | | | k star (bias corrected MLE) | 1.108 | |
| 2557 | | | | | Theta hat (MLE) | 0.0146 | | | | Theta star (bias corrected MLE) | 0.0217 | |
| 2558 | | | | | nu hat (MLE) | 26.22 | | | | nu star (bias corrected) | 17.72 | |
| 2559 | | | | | MLE Mean (bias corrected) | 0.024 | | | | MLE Sd (bias corrected) | 0.0228 | |
| 2560 | | | | | | | | | | Adjusted Level of Significance (β) | 0.0195 | |
| 2561 | | | | | Approximate Chi Square Value (17.72, α) | 9.19 | | | | Adjusted Chi Square Value (17.72, β) | 7.687 | |
| 2562 | | | | | 95% Gamma Approximate UCL (use when n>=50) | 0.0463 | | | | 95% Gamma Adjusted UCL (use when n<50) | N/A | |
| 2563 | | | | | | | | | | | | |
| 2564 | **Lognormal GOF Test on Detected Observations Only** | | | | | | | | | | | |
| 2565 | | | | | Shapiro Wilk Test Statistic | 0.989 | | | | **Shapiro Wilk GOF Test** | | |
| 2566 | | | | | 5% Shapiro Wilk Critical Value | 0.748 | | | | Detected Data appear Lognormal at 5% Significance Level | | |
| 2567 | | | | | Lilliefors Test Statistic | 0.181 | | | | **Lilliefors GOF Test** | | |
| 2568 | | | | | 5% Lilliefors Critical Value | 0.443 | | | | Detected Data appear Lognormal at 5% Significance Level | | |
| 2569 | **Detected Data appear Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 2570 | | | | | | | | | | | | |
| 2571 | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | | | | | |
| 2572 | | | | | Mean in Original Scale | 0.0202 | | | | Mean in Log Scale | -4.844 | |
| 2573 | | | | | SD in Original Scale | 0.0283 | | | | SD in Log Scale | 1.565 | |
| 2574 | | | | | 95% t UCL (assumes normality of ROS data) | 0.0392 | | | | 95% Percentile Bootstrap UCL | 0.037 | |
| 2575 | | | | | 95% BCA Bootstrap UCL | 0.0433 | | | | 95% Bootstrap t UCL | 0.0657 | |
| 2576 | | | | | 95% H-UCL (Log ROS) | 0.491 | | | | | | |
| 2577 | | | | | | | | | | | | |
| 2578 | **UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed** | | | | | | | | | | | |
| 2579 | | | | | KM Mean (logged) | -4.017 | | | | 95% H-UCL (KM -Log) | 0.0477 | |
| 2580 | | | | | KM SD (logged) | 0.703 | | | | 95% Critical H Value (KM-Log) | 2.741 | |
| 2581 | | | | | KM Standard Error of Mean (logged) | 0.287 | | | | | | |
| 2582 | | | | | | | | | | | | |
| 2583 | **DL/2 Statistics** | | | | | | | | | | | |
| 2584 | **DL/2 Normal** | | | | | | **DL/2 Log-Transformed** | | | | | |
| 2585 | | | | | Mean in Original Scale | 0.0219 | | | | Mean in Log Scale | -4.331 | |
| 2586 | | | | | SD in Original Scale | 0.0271 | | | | SD in Log Scale | 1.016 | |
| 2587 | | | | | 95% t UCL (Assumes normality) | 0.0401 | | | | 95% H-Stat UCL | 0.0833 | |
| 2588 | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | | | | | |
| 2589 | | | | | | | | | | | | |
| 2590 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 2591 | **Detected Data appear Normal Distributed at 5% Significance Level** | | | | | | | | | | | |
| 2592 | | | | | | | | | | | | |
| 2593 | **Suggested UCL to Use** | | | | | | | | | | | |
| 2594 | | | | | 95% KM (t) UCL | 0.0429 | | | | 95% KM (Percentile Bootstrap) UCL | N/A | |
| 2595 | **Warning: One or more Recommended UCL(s) not available!** | | | | | | | | | | | |
| 2596 | | | | | | | | | | | | |
| 2597 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2598 | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | | | | | |
| 2599 | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | | | | | |
| 2600 | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 2601 | | | | | | | | | | | | |
| 2602 | **Chrysene** | | | | | | | | | | | |
| 2603 | | | | | | | | | | | | |
| 2604 | **General Statistics** | | | | | | | | | | | |
| 2605 | | | | | Total Number of Observations | 135 | | | Number of Distinct Observations | | | 72 |
| 2606 | | | | | Number of Detects | 52 | | | Number of Non-Detects | | | 83 |
| 2607 | | | | | Number of Distinct Detects | 44 | | | Number of Distinct Non-Detects | | | 34 |
| 2608 | | | | | Minimum Detect | 43 | | | Minimum Non-Detect | | | 5.8 |
| 2609 | | | | | Maximum Detect | 78000 | | | Maximum Non-Detect | | | 6900 |
| 2610 | | | | | Variance Detects | 2.360E+8 | | | Percent Non-Detects | | | 61.48% |
| 2611 | | | | | Mean Detects | 5805 | | | SD Detects | | | 15362 |
| 2612 | | | | | Median Detects | 720 | | | CV Detects | | | 2.647 |
| 2613 | | | | | Skewness Detects | 4.093 | | | Kurtosis Detects | | | 17.27 |
| 2614 | | | | | Mean of Logged Detects | 6.689 | | | SD of Logged Detects | | | 2 |
| 2615 | | | | | | | | | | | | |
| 2616 | **Normal GOF Test on Detects Only** | | | | | | | | | | | |
| 2617 | | | | | Shapiro Wilk Test Statistic | 0.411 | | **Normal GOF Test on Detected Observations Only** | | | | |
| 2618 | | | | | 5% Shapiro Wilk P Value | 0 | | Detected Data Not Normal at 5% Significance Level | | | | |
| 2619 | | | | | Lilliefors Test Statistic | 0.354 | | **Lilliefors GOF Test** | | | | |
| 2620 | | | | | 5% Lilliefors Critical Value | 0.123 | | Detected Data Not Normal at 5% Significance Level | | | | |
| 2621 | **Detected Data Not Normal at 5% Significance Level** | | | | | | | | | | | |
| 2622 | | | | | | | | | | | | |
| 2623 | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | | | | | |
| 2624 | | | | | Mean | 2290 | | | Standard Error of Mean | | | 855.7 |
| 2625 | | | | | SD | 9845 | | | 95% KM (BCA) UCL | | | 3859 |
| 2626 | | | | | 95% KM (t) UCL | 3707 | | | 95% KM (Percentile Bootstrap) UCL | | | 3751 |
| 2627 | | | | | 95% KM (z) UCL | 3697 | | | 95% KM Bootstrap t UCL | | | 5985 |
| 2628 | | | | | 90% KM Chebyshev UCL | 4857 | | | 95% KM Chebyshev UCL | | | 6020 |
| 2629 | | | | | 97.5% KM Chebyshev UCL | 7634 | | | 99% KM Chebyshev UCL | | | 10804 |
| 2630 | | | | | | | | | | | | |
| 2631 | **Gamma GOF Tests on Detected Observations Only** | | | | | | | | | | | |
| 2632 | | | | | A-D Test Statistic | 3.199 | | **Anderson-Darling GOF Test** | | | | |
| 2633 | | | | | 5% A-D Critical Value | 0.853 | | Detected Data Not Gamma Distributed at 5% Significance Level | | | | |
| 2634 | | | | | K-S Test Statistic | 0.224 | | **Kolmogrov-Smirnoff GOF** | | | | |
| 2635 | | | | | 5% K-S Critical Value | 0.133 | | Detected Data Not Gamma Distributed at 5% Significance Level | | | | |
| 2636 | **Detected Data Not Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 2637 | | | | | | | | | | | | |
| 2638 | **Gamma Statistics on Detected Data Only** | | | | | | | | | | | |
| 2639 | | | | | k hat (MLE) | 0.341 | | | k star (bias corrected MLE) | | | 0.335 |
| 2640 | | | | | Theta hat (MLE) | 17002 | | | Theta star (bias corrected MLE) | | | 17351 |
| 2641 | | | | | nu hat (MLE) | 35.51 | | | nu star (bias corrected) | | | 34.79 |
| 2642 | | | | | MLE Mean (bias corrected) | 5805 | | | MLE Sd (bias corrected) | | | 10036 |
| 2643 | | | | | | | | | | | | |
| 2644 | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | | | | | |
| 2645 | | | | | k hat (KM) | 0.0541 | | | nu hat (KM) | | | 14.61 |
| 2646 | | | | | Approximate Chi Square Value (14.61, α) | 6.989 | | | Adjusted Chi Square Value (14.61, β) | | | 6.932 |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2647 | 95% Gamma Approximate KM-UCL (use when n>=50) | | | | | 4786 | 95% Gamma Adjusted KM-UCL (use when n<50) | | | | | 4825 |
| 2648 | Gamma (KM) may not be used when k hat (KM) is < 0.1 | | | | | | | | | | | |
| 2649 | | | | | | | | | | | | |
| 2650 | **Gamma ROS Statistics using Imputed Non-Detects** | | | | | | | | | | | |
| 2651 | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | | | | |
| 2652 | GROS may not be used when kstar of detected data is small such as < 0.1 | | | | | | | | | | | |
| 2653 | For such situations, GROS method tends to yield inflated values of UCLs and BTVs | | | | | | | | | | | |
| 2654 | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | | | | |
| 2655 | Minimum | | | | | 0.01 | Mean | | | | | 2236 |
| 2656 | Maximum | | | | | 78000 | Median | | | | | 0.01 |
| 2657 | SD | | | | | 9892 | CV | | | | | 4.424 |
| 2658 | k hat (MLE) | | | | | 0.102 | k star (bias corrected MLE) | | | | | 0.104 |
| 2659 | Theta hat (MLE) | | | | | 21982 | Theta star (bias corrected MLE) | | | | | 21418 |
| 2660 | nu hat (MLE) | | | | | 27.46 | nu star (bias corrected) | | | | | 28.19 |
| 2661 | MLE Mean (bias corrected) | | | | | 2236 | MLE Sd (bias corrected) | | | | | 6920 |
| 2662 | | | | | | | Adjusted Level of Significance (β) | | | | | 0.0482 |
| 2663 | Approximate Chi Square Value (28.19, α) | | | | | 17.07 | Adjusted Chi Square Value (28.19, β) | | | | | 16.98 |
| 2664 | 95% Gamma Approximate UCL (use when n>=50) | | | | | 3691 | 95% Gamma Adjusted UCL (use when n<50) | | | | | 3712 |
| 2665 | | | | | | | | | | | | |
| 2666 | **Lognormal GOF Test on Detected Observations Only** | | | | | | | | | | | |
| 2667 | Lilliefors Test Statistic | | | | | 0.0812 | **Lilliefors GOF Test** | | | | | |
| 2668 | 5% Lilliefors Critical Value | | | | | 0.123 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 2669 | **Detected Data appear Approximate Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 2670 | | | | | | | | | | | | |
| 2671 | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | | | | | |
| 2672 | Mean in Original Scale | | | | | 2266 | Mean in Log Scale | | | | | 4.609 |
| 2673 | SD in Original Scale | | | | | 9886 | SD in Log Scale | | | | | 2.274 |
| 2674 | 95% t UCL (assumes normality of ROS data) | | | | | 3675 | 95% Percentile Bootstrap UCL | | | | | 3868 |
| 2675 | 95% BCA Bootstrap UCL | | | | | 4504 | 95% Bootstrap t UCL | | | | | 6010 |
| 2676 | 95% H-UCL (Log ROS) | | | | | 2701 | | | | | | |
| 2677 | | | | | | | | | | | | |
| 2678 | **UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed** | | | | | | | | | | | |
| 2679 | KM Mean (logged) | | | | | 4.95 | 95% H-UCL (KM -Log) | | | | | 1839 |
| 2680 | KM SD (logged) | | | | | 2.001 | 95% Critical H Value (KM-Log) | | | | | 3.272 |
| 2681 | KM Standard Error of Mean (logged) | | | | | 0.235 | | | | | | |
| 2682 | | | | | | | | | | | | |
| 2683 | **DL/2 Statistics** | | | | | | | | | | | |
| 2684 | **DL/2 Normal** | | | | | | **DL/2 Log-Transformed** | | | | | |
| 2685 | Mean in Original Scale | | | | | 2434 | Mean in Log Scale | | | | | 5.375 |
| 2686 | SD in Original Scale | | | | | 9859 | SD in Log Scale | | | | | 1.979 |
| 2687 | 95% t UCL (Assumes normality) | | | | | 3839 | 95% H-Stat UCL | | | | | 2669 |
| 2688 | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | | | | | |
| 2689 | | | | | | | | | | | | |
| 2690 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 2691 | **Detected Data appear Approximate Lognormal Distributed at 5% Significance Level** | | | | | | | | | | | |
| 2692 | | | | | | | | | | | | |
| 2693 | **Suggested UCL to Use** | | | | | | | | | | | |
| 2694 | 97.5% KM (Chebyshev) UCL | | | | | 7634 | | | | | | |
| 2695 | | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2696 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 2697 | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | | | | | |
| 2698 | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | | | | | |
| 2699 | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 2700 | | | | | | | | | | | | |
| 2701 | | | | | | | | | | | | |
| 2702 | **Cobalt** | | | | | | | | | | | |
| 2703 | | | | | | | | | | | | |
| 2704 | **General Statistics** | | | | | | | | | | | |
| 2705 | | | | | Total Number of Observations | 98 | | | Number of Distinct Observations | 51 | | |
| 2706 | | | | | | | | | Number of Missing Observations | 0 | | |
| 2707 | | | | | Minimum | 3.64 | | | Mean | 12.68 | | |
| 2708 | | | | | Maximum | 37 | | | Median | 12 | | |
| 2709 | | | | | SD | 6.057 | | | Std. Error of Mean | 0.612 | | |
| 2710 | | | | | Coefficient of Variation | 0.478 | | | Skewness | 1.724 | | |
| 2711 | | | | | | | | | | | | |
| 2712 | **Normal GOF Test** | | | | | | | | | | | |
| 2713 | | | | | Shapiro Wilk Test Statistic | 0.858 | | | **Shapiro Wilk GOF Test** | | | |
| 2714 | | | | | 5% Shapiro Wilk P Value | 1.299E-13 | | | Data Not Normal at 5% Significance Level | | | |
| 2715 | | | | | Lilliefors Test Statistic | 0.169 | | | **Lilliefors GOF Test** | | | |
| 2716 | | | | | 5% Lilliefors Critical Value | 0.0895 | | | Data Not Normal at 5% Significance Level | | | |
| 2717 | **Data Not Normal at 5% Significance Level** | | | | | | | | | | | |
| 2718 | | | | | | | | | | | | |
| 2719 | **Assuming Normal Distribution** | | | | | | | | | | | |
| 2720 | **95% Normal UCL** | | | | | | | | **95% UCLs (Adjusted for Skewness)** | | | |
| 2721 | | | | | 95% Student's-t UCL | 13.69 | | | 95% Adjusted-CLT UCL (Chen-1995) | 13.8 | | |
| 2722 | | | | | | | | | 95% Modified-t UCL (Johnson-1978) | 13.71 | | |
| 2723 | | | | | | | | | | | | |
| 2724 | **Gamma GOF Test** | | | | | | | | | | | |
| 2725 | | | | | A-D Test Statistic | 1.053 | | | **Anderson-Darling Gamma GOF Test** | | | |
| 2726 | | | | | 5% A-D Critical Value | 0.754 | | | Data Not Gamma Distributed at 5% Significance Level | | | |
| 2727 | | | | | K-S Test Statistic | 0.108 | | | **Kolmogrov-Smirnoff Gamma GOF Test** | | | |
| 2728 | | | | | 5% K-S Critical Value | 0.0905 | | | Data Not Gamma Distributed at 5% Significance Level | | | |
| 2729 | **Data Not Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 2730 | | | | | | | | | | | | |
| 2731 | **Gamma Statistics** | | | | | | | | | | | |
| 2732 | | | | | k hat (MLE) | 5.26 | | | k star (bias corrected MLE) | 5.105 | | |
| 2733 | | | | | Theta hat (MLE) | 2.41 | | | Theta star (bias corrected MLE) | 2.483 | | |
| 2734 | | | | | nu hat (MLE) | 1031 | | | nu star (bias corrected) | 1001 | | |
| 2735 | | | | | MLE Mean (bias corrected) | 12.68 | | | MLE Sd (bias corrected) | 5.61 | | |
| 2736 | | | | | | | | | Approximate Chi Square Value (0.05) | 928.2 | | |
| 2737 | | | | | Adjusted Level of Significance | 0.0476 | | | Adjusted Chi Square Value | 927.2 | | |
| 2738 | | | | | | | | | | | | |
| 2739 | **Assuming Gamma Distribution** | | | | | | | | | | | |
| 2740 | | | | | 95% Approximate Gamma UCL (use when n>=50)) | 13.66 | | | 95% Adjusted Gamma UCL (use when n<50) | 13.68 | | |
| 2741 | | | | | | | | | | | | |
| 2742 | **Lognormal GOF Test** | | | | | | | | | | | |
| 2743 | | | | | Shapiro Wilk Test Statistic | 0.972 | | | **Shapiro Wilk Lognormal GOF Test** | | | |
| 2744 | | | | | 5% Shapiro Wilk P Value | 0.192 | | | Data appear Lognormal at 5% Significance Level | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2745 | | | | Lilliefors Test Statistic | | 0.0834 | **Lilliefors Lognormal GOF Test** | | | | | |
| 2746 | | | | 5% Lilliefors Critical Value | | 0.0895 | Data appear Lognormal at 5% Significance Level | | | | | |
| 2747 | **Data appear Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 2748 | | | | | | | | | | | | |
| 2749 | **Lognormal Statistics** | | | | | | | | | | | |
| 2750 | | | | Minimum of Logged Data | | 1.292 | | | | Mean of logged Data | | 2.442 |
| 2751 | | | | Maximum of Logged Data | | 3.611 | | | | SD of logged Data | | 0.444 |
| 2752 | | | | | | | | | | | | |
| 2753 | **Assuming Lognormal Distribution** | | | | | | | | | | | |
| 2754 | | | | 95% H-UCL | | 13.77 | | | | 90% Chebyshev (MVUE) UCL | | 14.45 |
| 2755 | | | | 95% Chebyshev (MVUE) UCL | | 15.25 | | | | 97.5% Chebyshev (MVUE) UCL | | 16.37 |
| 2756 | | | | 99% Chebyshev (MVUE) UCL | | 18.57 | | | | | | |
| 2757 | | | | | | | | | | | | |
| 2758 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 2759 | **Data appear to follow a Discernible Distribution at 5% Significance Level** | | | | | | | | | | | |
| 2760 | | | | | | | | | | | | |
| 2761 | **Nonparametric Distribution Free UCLs** | | | | | | | | | | | |
| 2762 | | | | 95% CLT UCL | | 13.68 | | | | 95% Jackknife UCL | | 13.69 |
| 2763 | | | | 95% Standard Bootstrap UCL | | 13.69 | | | | 95% Bootstrap-t UCL | | 13.81 |
| 2764 | | | | 95% Hall's Bootstrap UCL | | 13.81 | | | | 95% Percentile Bootstrap UCL | | 13.77 |
| 2765 | | | | 95% BCA Bootstrap UCL | | 13.83 | | | | | | |
| 2766 | | | | 90% Chebyshev(Mean, Sd) UCL | | 14.51 | | | | 95% Chebyshev(Mean, Sd) UCL | | 15.34 |
| 2767 | | | | 97.5% Chebyshev(Mean, Sd) UCL | | 16.5 | | | | 99% Chebyshev(Mean, Sd) UCL | | 18.76 |
| 2768 | | | | | | | | | | | | |
| 2769 | **Suggested UCL to Use** | | | | | | | | | | | |
| 2770 | | | | 95% Student's-t UCL | | 13.69 | | | | or 95% Modified-t UCL | | 13.71 |
| 2771 | | | | or 95% H-UCL | | 13.77 | | | | | | |
| 2772 | | | | | | | | | | | | |
| 2773 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 2774 | These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) | | | | | | | | | | | |
| 2775 | and Singh and Singh (2003). However, simulations results will not cover all Real World data sets. | | | | | | | | | | | |
| 2776 | For additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 2777 | | | | | | | | | | | | |
| 2778 | **ProUCL computes and outputs H-statistic based UCLs for historical reasons only.** | | | | | | | | | | | |
| 2779 | **H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.** | | | | | | | | | | | |
| 2780 | **It is therefore recommended to avoid the use of H-statistic based 95% UCLs.** | | | | | | | | | | | |
| 2781 | **Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.** | | | | | | | | | | | |
| 2782 | | | | | | | | | | | | |
| 2783 | | | | | | | | | | | | |
| 2784 | **Copper** | | | | | | | | | | | |
| 2785 | | | | | | | | | | | | |
| 2786 | **General Statistics** | | | | | | | | | | | |
| 2787 | | | | Total Number of Observations | | 99 | | | | Number of Distinct Observations | | 58 |
| 2788 | | | | | | | | | | Number of Missing Observations | | 0 |
| 2789 | | | | Minimum | | 14 | | | | Mean | | 78.51 |
| 2790 | | | | Maximum | | 680 | | | | Median | | 28 |
| 2791 | | | | SD | | 126 | | | | Std. Error of Mean | | 12.66 |
| 2792 | | | | Coefficient of Variation | | 1.604 | | | | Skewness | | 3.181 |
| 2793 | | | | | | | | | | | | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2794 | **Normal GOF Test** | | | | | | | | | | | |
| 2795 | | | | Shapiro Wilk Test Statistic | | 0.534 | **Shapiro Wilk GOF Test** | | | | | |
| 2796 | | | | 5% Shapiro Wilk P Value | | 0 | Data Not Normal at 5% Significance Level | | | | | |
| 2797 | | | | Lilliefors Test Statistic | | 0.307 | **Lilliefors GOF Test** | | | | | |
| 2798 | | | | 5% Lilliefors Critical Value | | 0.089 | Data Not Normal at 5% Significance Level | | | | | |
| 2799 | **Data Not Normal at 5% Significance Level** | | | | | | | | | | | |
| 2800 | | | | | | | | | | | | |
| 2801 | **Assuming Normal Distribution** | | | | | | | | | | | |
| 2802 | | | | **95% Normal UCL** | | | | | **95% UCLs (Adjusted for Skewness)** | | | |
| 2803 | | | | 95% Student's-t UCL | | 99.53 | | | 95% Adjusted-CLT UCL (Chen-1995) | | 103.7 | |
| 2804 | | | | | | | | | 95% Modified-t UCL (Johnson-1978) | | 100.2 | |
| 2805 | | | | | | | | | | | | |
| 2806 | **Gamma GOF Test** | | | | | | | | | | | |
| 2807 | | | | A-D Test Statistic | | 9.271 | **Anderson-Darling Gamma GOF Test** | | | | | |
| 2808 | | | | 5% A-D Critical Value | | 0.786 | Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 2809 | | | | K-S Test Statistic | | 0.232 | **Kolmogrov-Smirnoff Gamma GOF Test** | | | | | |
| 2810 | | | | 5% K-S Critical Value | | 0.0929 | Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 2811 | **Data Not Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 2812 | | | | | | | | | | | | |
| 2813 | **Gamma Statistics** | | | | | | | | | | | |
| 2814 | | | | k hat (MLE) | | 0.93 | | | k star (bias corrected MLE) | | 0.908 | |
| 2815 | | | | Theta hat (MLE) | | 84.42 | | | Theta star (bias corrected MLE) | | 86.42 | |
| 2816 | | | | nu hat (MLE) | | 184.1 | | | nu star (bias corrected) | | 179.9 | |
| 2817 | | | | MLE Mean (bias corrected) | | 78.51 | | | MLE Sd (bias corrected) | | 82.37 | |
| 2818 | | | | | | | | | Approximate Chi Square Value (0.05) | | 149.9 | |
| 2819 | | | | Adjusted Level of Significance | | 0.0476 | | | Adjusted Chi Square Value | | 149.5 | |
| 2820 | | | | | | | | | | | | |
| 2821 | **Assuming Gamma Distribution** | | | | | | | | | | | |
| 2822 | | | | 95% Approximate Gamma UCL (use when n>=50)) | | 94.24 | | | 95% Adjusted Gamma UCL (use when n<50) | | 94.49 | |
| 2823 | | | | | | | | | | | | |
| 2824 | **Lognormal GOF Test** | | | | | | | | | | | |
| 2825 | | | | Shapiro Wilk Test Statistic | | 0.834 | **Shapiro Wilk Lognormal GOF Test** | | | | | |
| 2826 | | | | 5% Shapiro Wilk P Value | | 1.110E-16 | Data Not Lognormal at 5% Significance Level | | | | | |
| 2827 | | | | Lilliefors Test Statistic | | 0.186 | **Lilliefors Lognormal GOF Test** | | | | | |
| 2828 | | | | 5% Lilliefors Critical Value | | 0.089 | Data Not Lognormal at 5% Significance Level | | | | | |
| 2829 | **Data Not Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 2830 | | | | | | | | | | | | |
| 2831 | **Lognormal Statistics** | | | | | | | | | | | |
| 2832 | | | | Minimum of Logged Data | | 2.639 | | | Mean of logged Data | | 3.737 | |
| 2833 | | | | Maximum of Logged Data | | 6.522 | | | SD of logged Data | | 0.965 | |
| 2834 | | | | | | | | | | | | |
| 2835 | **Assuming Lognormal Distribution** | | | | | | | | | | | |
| 2836 | | | | 95% H-UCL | | 83.08 | | | 90% Chebyshev (MVUE) UCL | | 89.39 | |
| 2837 | | | | 95% Chebyshev (MVUE) UCL | | 99.79 | | | 97.5% Chebyshev (MVUE) UCL | | 114.2 | |
| 2838 | | | | 99% Chebyshev (MVUE) UCL | | 142.6 | | | | | | |
| 2839 | | | | | | | | | | | | |
| 2840 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 2841 | **Data do not follow a Discernible Distribution (0.05)** | | | | | | | | | | | |
| 2842 | | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2843 | **Nonparametric Distribution Free UCLs** | | | | | | | | | | | |
| 2844 | 95% CLT UCL | | | | | 99.33 | 95% Jackknife UCL | | | | | 99.53 |
| 2845 | 95% Standard Bootstrap UCL | | | | | 99.36 | 95% Bootstrap-t UCL | | | | | 105.3 |
| 2846 | 95% Hall's Bootstrap UCL | | | | | 103.5 | 95% Percentile Bootstrap UCL | | | | | 100.1 |
| 2847 | 95% BCA Bootstrap UCL | | | | | 105.1 | | | | | | |
| 2848 | 90% Chebyshev(Mean, Sd) UCL | | | | | 116.5 | 95% Chebyshev(Mean, Sd) UCL | | | | | 133.7 |
| 2849 | 97.5% Chebyshev(Mean, Sd) UCL | | | | | 157.6 | 99% Chebyshev(Mean, Sd) UCL | | | | | 204.5 |
| 2850 | | | | | | | | | | | | |
| 2851 | **Suggested UCL to Use** | | | | | | | | | | | |
| 2852 | 95% Chebyshev (Mean, Sd) UCL | | | | | 133.7 | | | | | | |
| 2853 | | | | | | | | | | | | |
| 2854 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 2855 | These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) | | | | | | | | | | | |
| 2856 | and Singh and Singh (2003). However, simulations results will not cover all Real World data sets. | | | | | | | | | | | |
| 2857 | For additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 2858 | | | | | | | | | | | | |
| 2859 | **Dibenz(a,h)anthracene** | | | | | | | | | | | |
| 2860 | | | | | | | | | | | | |
| 2861 | **General Statistics** | | | | | | | | | | | |
| 2862 | Total Number of Observations | | | | | 135 | Number of Distinct Observations | | | | | 67 |
| 2863 | Number of Detects | | | | | 37 | Number of Non-Detects | | | | | 98 |
| 2864 | Number of Distinct Detects | | | | | 33 | Number of Distinct Non-Detects | | | | | 39 |
| 2865 | Minimum Detect | | | | | 18 | Minimum Non-Detect | | | | | 5.8 |
| 2866 | Maximum Detect | | | | | 13000 | Maximum Non-Detect | | | | | 6900 |
| 2867 | Variance Detects | | | | | 7666259 | Percent Non-Detects | | | | | 72.59% |
| 2868 | Mean Detects | | | | | 1423 | SD Detects | | | | | 2769 |
| 2869 | Median Detects | | | | | 270 | CV Detects | | | | | 1.946 |
| 2870 | Skewness Detects | | | | | 3.057 | Kurtosis Detects | | | | | 9.868 |
| 2871 | Mean of Logged Detects | | | | | 5.8 | SD of Logged Detects | | | | | 1.805 |
| 2872 | | | | | | | | | | | | |
| 2873 | **Normal GOF Test on Detects Only** | | | | | | | | | | | |
| 2874 | Shapiro Wilk Test Statistic | | | | | 0.558 | **Shapiro Wilk GOF Test** | | | | | |
| 2875 | 5% Shapiro Wilk Critical Value | | | | | 0.936 | Detected Data Not Normal at 5% Significance Level | | | | | |
| 2876 | Lilliefors Test Statistic | | | | | 0.306 | **Lilliefors GOF Test** | | | | | |
| 2877 | 5% Lilliefors Critical Value | | | | | 0.146 | Detected Data Not Normal at 5% Significance Level | | | | | |
| 2878 | **Detected Data Not Normal at 5% Significance Level** | | | | | | | | | | | |
| 2879 | | | | | | | | | | | | |
| 2880 | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | | | | | |
| 2881 | Mean | | | | | 439.5 | Standard Error of Mean | | | | | 136.8 |
| 2882 | SD | | | | | 1559 | 95% KM (BCA) UCL | | | | | 708.2 |
| 2883 | 95% KM (t) UCL | | | | | 666 | 95% KM (Percentile Bootstrap) UCL | | | | | 681.3 |
| 2884 | 95% KM (z) UCL | | | | | 664.5 | 95% KM Bootstrap t UCL | | | | | 870.1 |
| 2885 | 90% KM Chebyshev UCL | | | | | 849.8 | 95% KM Chebyshev UCL | | | | | 1036 |
| 2886 | 97.5% KM Chebyshev UCL | | | | | 1294 | 99% KM Chebyshev UCL | | | | | 1800 |
| 2887 | | | | | | | | | | | | |
| 2888 | **Gamma GOF Tests on Detected Observations Only** | | | | | | | | | | | |
| 2889 | A-D Test Statistic | | | | | 1.428 | **Anderson-Darling GOF Test** | | | | | |
| 2890 | 5% A-D Critical Value | | | | | 0.825 | Detected Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 2891 | K-S Test Statistic | | | | | 0.167 | **Kolmogrov-Smirnoff GOF** | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2892 | | | | | 5% K-S Critical Value | 0.154 | Detected Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 2893 | **Detected Data Not Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 2894 | | | | | | | | | | | | |
| 2895 | **Gamma Statistics on Detected Data Only** | | | | | | | | | | | |
| 2896 | | | | | k hat (MLE) | 0.443 | | | | k star (bias corrected MLE) | | 0.425 |
| 2897 | | | | | Theta hat (MLE) | 3211 | | | | Theta star (bias corrected MLE) | | 3346 |
| 2898 | | | | | nu hat (MLE) | 32.79 | | | | nu star (bias corrected) | | 31.47 |
| 2899 | | | | | MLE Mean (bias corrected) | 1423 | | | | MLE Sd (bias corrected) | | 2182 |
| 2900 | | | | | | | | | | | | |
| 2901 | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | | | | | |
| 2902 | | | | | k hat (KM) | 0.0794 | | | | nu hat (KM) | | 21.45 |
| 2903 | | | | | Approximate Chi Square Value (21.45, α) | 11.93 | | | | Adjusted Chi Square Value (21.45, β) | | 11.85 |
| 2904 | | | | | 95% Gamma Approximate KM-UCL (use when n>=50) | 790.4 | | | | 95% Gamma Adjusted KM-UCL (use when n<50) | | 795.6 |
| 2905 | Gamma (KM) may not be used when k hat (KM) is < 0.1 | | | | | | | | | | | |
| 2906 | | | | | | | | | | | | |
| 2907 | **Gamma ROS Statistics using Imputed Non-Detects** | | | | | | | | | | | |
| 2908 | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | | | | |
| 2909 | GROS may not be used when kstar of detected data is small such as < 0.1 | | | | | | | | | | | |
| 2910 | For such situations, GROS method tends to yield inflated values of UCLs and BTVs | | | | | | | | | | | |
| 2911 | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | | | | |
| 2912 | | | | | Minimum | 0.01 | | | | Mean | | 390.2 |
| 2913 | | | | | Maximum | 13000 | | | | Median | | 0.01 |
| 2914 | | | | | SD | 1570 | | | | CV | | 4.023 |
| 2915 | | | | | k hat (MLE) | 0.105 | | | | k star (bias corrected MLE) | | 0.108 |
| 2916 | | | | | Theta hat (MLE) | 3705 | | | | Theta star (bias corrected MLE) | | 3616 |
| 2917 | | | | | nu hat (MLE) | 28.44 | | | | nu star (bias corrected) | | 29.14 |
| 2918 | | | | | MLE Mean (bias corrected) | 390.2 | | | | MLE Sd (bias corrected) | | 1188 |
| 2919 | | | | | | | | | | Adjusted Level of Significance (β) | | 0.0482 |
| 2920 | | | | | Approximate Chi Square Value (29.14, α) | 17.82 | | | | Adjusted Chi Square Value (29.14, β) | | 17.72 |
| 2921 | | | | | 95% Gamma Approximate UCL (use when n>=50) | 638.2 | | | | 95% Gamma Adjusted UCL (use when n<50) | | 641.7 |
| 2922 | | | | | | | | | | | | |
| 2923 | **Lognormal GOF Test on Detected Observations Only** | | | | | | | | | | | |
| 2924 | | | | | Shapiro Wilk Test Statistic | 0.96 | **Shapiro Wilk GOF Test** | | | | | |
| 2925 | | | | | 5% Shapiro Wilk Critical Value | 0.936 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 2926 | | | | | Lilliefors Test Statistic | 0.0973 | **Lilliefors GOF Test** | | | | | |
| 2927 | | | | | 5% Lilliefors Critical Value | 0.146 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 2928 | **Detected Data appear Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 2929 | | | | | | | | | | | | |
| 2930 | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | | | | | |
| 2931 | | | | | Mean in Original Scale | 423.7 | | | | Mean in Log Scale | | 4.062 |
| 2932 | | | | | SD in Original Scale | 1562 | | | | SD in Log Scale | | 1.666 |
| 2933 | | | | | 95% t UCL (assumes normality of ROS data) | 646.4 | | | | 95% Percentile Bootstrap UCL | | 660.3 |
| 2934 | | | | | 95% BCA Bootstrap UCL | 766.1 | | | | 95% Bootstrap t UCL | | 850.7 |
| 2935 | | | | | 95% H-UCL (Log ROS) | 352 | | | | | | |
| 2936 | | | | | | | | | | | | |
| 2937 | **UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed** | | | | | | | | | | | |
| 2938 | | | | | KM Mean (logged) | 4.221 | | | | 95% H-UCL (KM -Log) | | 340.6 |
| 2939 | | | | | KM SD (logged) | 1.571 | | | | 95% Critical H Value (KM-Log) | | 2.774 |
| 2940 | | | | | KM Standard Error of Mean (logged) | 0.217 | | | | | | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2941 | | | | | | | | | | | | |
| 2942 | **DL/2 Statistics** | | | | | | | | | | | |
| 2943 | **DL/2 Normal** | | | | | | **DL/2 Log-Transformed** | | | | | |
| 2944 | | | | Mean in Original Scale | 619.4 | | | | | Mean in Log Scale | 4.936 | |
| 2945 | | | | SD in Original Scale | 1592 | | | | | SD in Log Scale | 1.625 | |
| 2946 | | | | 95% t UCL (Assumes normality) | 846.4 | | | | | 95% H-Stat UCL | 775.8 | |
| 2947 | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | | | | | |
| 2948 | | | | | | | | | | | | |
| 2949 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 2950 | **Detected Data appear Lognormal Distributed at 5% Significance Level** | | | | | | | | | | | |
| 2951 | | | | | | | | | | | | |
| 2952 | **Suggested UCL to Use** | | | | | | | | | | | |
| 2953 | | | | 95% KM (Chebyshev) UCL | 1036 | | | | | | | |
| 2954 | | | | | | | | | | | | |
| 2955 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 2956 | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | | | | | |
| 2957 | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | | | | | |
| 2958 | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 2959 | | | | | | | | | | | | |
| 2960 | **Dibenzofuran** | | | | | | | | | | | |
| 2961 | | | | | | | | | | | | |
| 2962 | **General Statistics** | | | | | | | | | | | |
| 2963 | | | | Total Number of Observations | 133 | | | | | Number of Distinct Observations | 51 | |
| 2964 | | | | Number of Detects | 7 | | | | | Number of Non-Detects | 126 | |
| 2965 | | | | Number of Distinct Detects | 7 | | | | | Number of Distinct Non-Detects | 47 | |
| 2966 | | | | Minimum Detect | 13 | | | | | Minimum Non-Detect | 69 | |
| 2967 | | | | Maximum Detect | 2500 | | | | | Maximum Non-Detect | 15000 | |
| 2968 | | | | Variance Detects | 964990 | | | | | Percent Non-Detects | 94.74% | |
| 2969 | | | | Mean Detects | 767.1 | | | | | SD Detects | 982.3 | |
| 2970 | | | | Median Detects | 350 | | | | | CV Detects | 1.281 | |
| 2971 | | | | Skewness Detects | 1.271 | | | | | Kurtosis Detects | 0.0808 | |
| 2972 | | | | Mean of Logged Detects | 5.566 | | | | | SD of Logged Detects | 1.863 | |
| 2973 | | | | | | | | | | | | |
| 2974 | **Normal GOF Test on Detects Only** | | | | | | | | | | | |
| 2975 | | | | Shapiro Wilk Test Statistic | 0.786 | | **Shapiro Wilk GOF Test** | | | | | |
| 2976 | | | | 5% Shapiro Wilk Critical Value | 0.803 | | Detected Data Not Normal at 5% Significance Level | | | | | |
| 2977 | | | | Lilliefors Test Statistic | 0.31 | | **Lilliefors GOF Test** | | | | | |
| 2978 | | | | 5% Lilliefors Critical Value | 0.335 | | Detected Data appear Normal at 5% Significance Level | | | | | |
| 2979 | **Detected Data appear Approximate Normal at 5% Significance Level** | | | | | | | | | | | |
| 2980 | | | | | | | | | | | | |
| 2981 | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | | | | | |
| 2982 | | | | Mean | 60.57 | | | | | Standard Error of Mean | 27.99 | |
| 2983 | | | | SD | 282.2 | | | | | 95% KM (BCA) UCL | 153.4 | |
| 2984 | | | | 95% KM (t) UCL | 106.9 | | | | | 95% KM (Percentile Bootstrap) UCL | 141.7 | |
| 2985 | | | | 95% KM (z) UCL | 106.6 | | | | | 95% KM Bootstrap t UCL | 150.6 | |
| 2986 | | | | 90% KM Chebyshev UCL | 144.6 | | | | | 95% KM Chebyshev UCL | 182.6 | |
| 2987 | | | | 97.5% KM Chebyshev UCL | 235.4 | | | | | 99% KM Chebyshev UCL | 339.1 | |
| 2988 | | | | | | | | | | | | |
| 2989 | **Gamma GOF Tests on Detected Observations Only** | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2990 | | | | | A-D Test Statistic | 0.255 | **Anderson-Darling GOF Test** | | | | | |
| 2991 | | | | | 5% A-D Critical Value | 0.747 | Detected data appear Gamma Distributed at 5% Significance Level | | | | | |
| 2992 | | | | | K-S Test Statistic | 0.183 | **Kolmogrov-Smirnoff GOF** | | | | | |
| 2993 | | | | | 5% K-S Critical Value | 0.326 | Detected data appear Gamma Distributed at 5% Significance Level | | | | | |
| 2994 | **Detected data appear Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 2995 | | | | | | | | | | | | |
| 2996 | **Gamma Statistics on Detected Data Only** | | | | | | | | | | | |
| 2997 | | | | | k hat (MLE) | 0.577 | | | | k star (bias corrected MLE) | | 0.425 |
| 2998 | | | | | Theta hat (MLE) | 1329 | | | | Theta star (bias corrected MLE) | | 1804 |
| 2999 | | | | | nu hat (MLE) | 8.083 | | | | nu star (bias corrected) | | 5.952 |
| 3000 | | | | | MLE Mean (bias corrected) | 767.1 | | | | MLE Sd (bias corrected) | | 1177 |
| 3001 | | | | | | | | | | | | |
| 3002 | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | | | | | |
| 3003 | | | | | k hat (KM) | 0.0461 | | | | nu hat (KM) | | 12.25 |
| 3004 | | | | | Approximate Chi Square Value (12.25, α) | 5.393 | | | | Adjusted Chi Square Value (12.25, β) | | 5.343 |
| 3005 | | | | | 95% Gamma Approximate KM-UCL (use when n>=50) | 137.6 | | | | 95% Gamma Adjusted KM-UCL (use when n<50) | | 138.9 |
| 3006 | Gamma (KM) may not be used when k hat (KM) is < 0.1 | | | | | | | | | | | |
| 3007 | | | | | | | | | | | | |
| 3008 | **Gamma ROS Statistics using Imputed Non-Detects** | | | | | | | | | | | |
| 3009 | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | | | | |
| 3010 | GROS may not be used when kstar of detected data is small such as < 0.1 | | | | | | | | | | | |
| 3011 | For such situations, GROS method tends to yield inflated values of UCLs and BTVs | | | | | | | | | | | |
| 3012 | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | | | | |
| 3013 | | | | | Minimum | 0.01 | | | | Mean | | 40.39 |
| 3014 | | | | | Maximum | 2500 | | | | Median | | 0.01 |
| 3015 | | | | | SD | 271 | | | | CV | | 6.71 |
| 3016 | | | | | k hat (MLE) | 0.104 | | | | k star (bias corrected MLE) | | 0.107 |
| 3017 | | | | | Theta hat (MLE) | 388.2 | | | | Theta star (bias corrected MLE) | | 378.5 |
| 3018 | | | | | nu hat (MLE) | 27.67 | | | | nu star (bias corrected) | | 28.38 |
| 3019 | | | | | MLE Mean (bias corrected) | 40.39 | | | | MLE Sd (bias corrected) | | 123.6 |
| 3020 | | | | | | | | | | Adjusted Level of Significance (β) | | 0.0482 |
| 3021 | | | | | Approximate Chi Square Value (28.38, α) | 17.22 | | | | Adjusted Chi Square Value (28.38, β) | | 17.13 |
| 3022 | | | | | 95% Gamma Approximate UCL (use when n>=50) | 66.54 | | | | 95% Gamma Adjusted UCL (use when n<50) | | 66.91 |
| 3023 | | | | | | | | | | | | |
| 3024 | **Lognormal GOF Test on Detected Observations Only** | | | | | | | | | | | |
| 3025 | | | | | Shapiro Wilk Test Statistic | 0.958 | **Shapiro Wilk GOF Test** | | | | | |
| 3026 | | | | | 5% Shapiro Wilk Critical Value | 0.803 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 3027 | | | | | Lilliefors Test Statistic | 0.135 | **Lilliefors GOF Test** | | | | | |
| 3028 | | | | | 5% Lilliefors Critical Value | 0.335 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 3029 | **Detected Data appear Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 3030 | | | | | | | | | | | | |
| 3031 | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | | | | | |
| 3032 | | | | | Mean in Original Scale | 53.33 | | | | Mean in Log Scale | | 2.224 |
| 3033 | | | | | SD in Original Scale | 269.5 | | | | SD in Log Scale | | 1.418 |
| 3034 | | | | | 95% t UCL (assumes normality of ROS data) | 92.03 | | | | 95% Percentile Bootstrap UCL | | 98.05 |
| 3035 | | | | | 95% BCA Bootstrap UCL | 113.4 | | | | 95% Bootstrap t UCL | | 249.4 |
| 3036 | | | | | 95% H-UCL (Log ROS) | 34.82 | | | | | | |
| 3037 | | | | | | | | | | | | |
| 3038 | **UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed** | | | | | | | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3039 | | | | KM Mean (logged) | | 2.799 | | | | 95% H-UCL (KM -Log) | | 28.56 |
| 3040 | | | | KM SD (logged) | | 0.885 | | | | 95% Critical H Value (KM-Log) | | 2.094 |
| 3041 | | | | KM Standard Error of Mean (logged) | | 0.101 | | | | | | |
| 3042 | | | | | | | | | | | | |
| 3043 | | | | | | **DL/2 Statistics** | | | | | | |
| 3044 | | | | **DL/2 Normal** | | | | | | **DL/2 Log-Transformed** | | |
| 3045 | | | | Mean in Original Scale | | 393.7 | | | | Mean in Log Scale | | 4.801 |
| 3046 | | | | SD in Original Scale | | 836.4 | | | | SD in Log Scale | | 1.441 |
| 3047 | | | | 95% t UCL (Assumes normality) | | 513.8 | | | | 95% H-Stat UCL | | 477.2 |
| 3048 | | | | | | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | |
| 3049 | | | | | | | | | | | | |
| 3050 | | | | | | **Nonparametric Distribution Free UCL Statistics** | | | | | | |
| 3051 | | | | | | **Detected Data appear Approximate Normal Distributed at 5% Significance Level** | | | | | | |
| 3052 | | | | | | | | | | | | |
| 3053 | | | | | | **Suggested UCL to Use** | | | | | | |
| 3054 | | | | 95% KM (t) UCL | | 106.9 | | | | 95% KM (Percentile Bootstrap) UCL | | 141.7 |
| 3055 | | | | | | | | | | | | |
| 3056 | | | | | | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | |
| 3057 | | | | | | Recommendations are based upon data size, data distribution, and skewness. | | | | | | |
| 3058 | | | | | | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | |
| 3059 | | | | | | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | |
| 3060 | | | | | | | | | | | | |
| 3061 | **Dichlorofluoromethane** | | | | | | | | | | | |
| 3062 | | | | | | | | | | | | |
| 3063 | | | | | | **General Statistics** | | | | | | |
| 3064 | | | | Total Number of Observations | | 3 | | | | Number of Distinct Observations | | 3 |
| 3065 | | | | Number of Detects | | 1 | | | | Number of Non-Detects | | 2 |
| 3066 | | | | Number of Distinct Detects | | 1 | | | | Number of Distinct Non-Detects | | 2 |
| 3067 | | | | | | | | | | | | |
| 3068 | | | | | | **Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!** | | | | | | |
| 3069 | | | | | | **It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).** | | | | | | |
| 3070 | | | | | | | | | | | | |
| 3071 | | | | | | **The data set for variable Dichlorofluoromethane was not processed!** | | | | | | |
| 3072 | | | | | | | | | | | | |
| 3073 | | | | | | | | | | | | |
| 3074 | **Diethyl phthalate** | | | | | | | | | | | |
| 3075 | | | | | | | | | | | | |
| 3076 | | | | | | **General Statistics** | | | | | | |
| 3077 | | | | Total Number of Observations | | 120 | | | | Number of Distinct Observations | | 36 |
| 3078 | | | | Number of Detects | | 1 | | | | Number of Non-Detects | | 119 |
| 3079 | | | | Number of Distinct Detects | | 1 | | | | Number of Distinct Non-Detects | | 35 |
| 3080 | | | | | | | | | | | | |
| 3081 | | | | | | **Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!** | | | | | | |
| 3082 | | | | | | **It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).** | | | | | | |
| 3083 | | | | | | | | | | | | |
| 3084 | | | | | | **The data set for variable Diethyl phthalate was not processed!** | | | | | | |
| 3085 | | | | | | | | | | | | |
| 3086 | | | | | | | | | | | | |
| 3087 | **Diisopropyl ether** | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3088 | | | | | | | | | | | | |
| 3089 | **General Statistics** | | | | | | | | | | | |
| 3090 | | | | | Total Number of Observations | 72 | | | | Number of Distinct Observations | | 21 |
| 3091 | | | | | Number of Detects | 1 | | | | Number of Non-Detects | | 71 |
| 3092 | | | | | Number of Distinct Detects | 1 | | | | Number of Distinct Non-Detects | | 20 |
| 3093 | | | | | | | | | | | | |
| 3094 | **Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!** | | | | | | | | | | | |
| 3095 | **It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).** | | | | | | | | | | | |
| 3096 | | | | | | | | | | | | |
| 3097 | **The data set for variable Diisopropyl ether was not processed!** | | | | | | | | | | | |
| 3098 | | | | | | | | | | | | |
| 3099 | | | | | | | | | | | | |
| 3100 | **Di-n-butyl phthalate** | | | | | | | | | | | |
| 3101 | | | | | | | | | | | | |
| 3102 | **General Statistics** | | | | | | | | | | | |
| 3103 | | | | | Total Number of Observations | 120 | | | | Number of Distinct Observations | | 38 |
| 3104 | | | | | Number of Detects | 4 | | | | Number of Non-Detects | | 116 |
| 3105 | | | | | Number of Distinct Detects | 4 | | | | Number of Distinct Non-Detects | | 35 |
| 3106 | | | | | Minimum Detect | 140 | | | | Minimum Non-Detect | | 180 |
| 3107 | | | | | Maximum Detect | 1400 | | | | Maximum Non-Detect | | 17000 |
| 3108 | | | | | Variance Detects | 269600 | | | | Percent Non-Detects | | 96.67% |
| 3109 | | | | | Mean Detects | 820 | | | | SD Detects | | 519.2 |
| 3110 | | | | | Median Detects | 870 | | | | CV Detects | | 0.633 |
| 3111 | | | | | Skewness Detects | -0.563 | | | | Kurtosis Detects | | 1.5 |
| 3112 | | | | | Mean of Logged Detects | 6.43 | | | | SD of Logged Detects | | 1.018 |
| 3113 | | | | | | | | | | | | |
| 3114 | **Normal GOF Test on Detects Only** | | | | | | | | | | | |
| 3115 | | | | | Shapiro Wilk Test Statistic | 0.963 | | | **Shapiro Wilk GOF Test** | | | |
| 3116 | | | | | 5% Shapiro Wilk Critical Value | 0.748 | | | Detected Data appear Normal at 5% Significance Level | | | |
| 3117 | | | | | Lilliefors Test Statistic | 0.25 | | | **Lilliefors GOF Test** | | | |
| 3118 | | | | | 5% Lilliefors Critical Value | 0.443 | | | Detected Data appear Normal at 5% Significance Level | | | |
| 3119 | **Detected Data appear Normal at 5% Significance Level** | | | | | | | | | | | |
| 3120 | | | | | | | | | | | | |
| 3121 | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | | | | | |
| 3122 | | | | | Mean | 175.6 | | | | Standard Error of Mean | | 23.94 |
| 3123 | | | | | SD | 182 | | | | 95% KM (BCA) UCL | | N/A |
| 3124 | | | | | 95% KM (t) UCL | 215.3 | | | | 95% KM (Percentile Bootstrap) UCL | | N/A |
| 3125 | | | | | 95% KM (z) UCL | 215 | | | | 95% KM Bootstrap t UCL | | N/A |
| 3126 | | | | | 90% KM Chebyshev UCL | 247.4 | | | | 95% KM Chebyshev UCL | | 280 |
| 3127 | | | | | 97.5% KM Chebyshev UCL | 325.1 | | | | 99% KM Chebyshev UCL | | 413.8 |
| 3128 | | | | | | | | | | | | |
| 3129 | **Gamma GOF Tests on Detected Observations Only** | | | | | | | | | | | |
| 3130 | | | | | A-D Test Statistic | 0.444 | | | **Anderson-Darling GOF Test** | | | |
| 3131 | | | | | 5% A-D Critical Value | 0.661 | | | Detected data appear Gamma Distributed at 5% Significance Level | | | |
| 3132 | | | | | K-S Test Statistic | 0.345 | | | **Kolmogrov-Smirnoff GOF** | | | |
| 3133 | | | | | 5% K-S Critical Value | 0.398 | | | Detected data appear Gamma Distributed at 5% Significance Level | | | |
| 3134 | **Detected data appear Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 3135 | | | | | | | | | | | | |
| 3136 | **Gamma Statistics on Detected Data Only** | | | | | | | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3137 | k hat (MLE) | | | | | 1.94 | k star (bias corrected MLE) | | | | | 0.652 |
| 3138 | Theta hat (MLE) | | | | | 422.8 | Theta star (bias corrected MLE) | | | | | 1259 |
| 3139 | nu hat (MLE) | | | | | 15.52 | nu star (bias corrected) | | | | | 5.212 |
| 3140 | MLE Mean (bias corrected) | | | | | 820 | MLE Sd (bias corrected) | | | | | 1016 |
| 3141 | | | | | | | | | | | | |
| 3142 | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | | | | | |
| 3143 | k hat (KM) | | | | | 0.931 | nu hat (KM) | | | | | 223.4 |
| 3144 | Approximate Chi Square Value (223.43, α) | | | | | 189.8 | Adjusted Chi Square Value (223.43, β) | | | | | 189.5 |
| 3145 | 95% Gamma Approximate KM-UCL (use when n>=50) | | | | | 206.7 | 95% Gamma Adjusted KM-UCL (use when n<50) | | | | | 207.1 |
| 3146 | | | | | | | | | | | | |
| 3147 | **Gamma ROS Statistics using Imputed Non-Detects** | | | | | | | | | | | |
| 3148 | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | | | | |
| 3149 | GROS may not be used when kstar of detected data is small such as < 0.1 | | | | | | | | | | | |
| 3150 | For such situations, GROS method tends to yield inflated values of UCLs and BTVs | | | | | | | | | | | |
| 3151 | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | | | | |
| 3152 | Minimum | | | | | 0.01 | Mean | | | | | 171 |
| 3153 | Maximum | | | | | 1400 | Median | | | | | 111.8 |
| 3154 | SD | | | | | 214.2 | CV | | | | | 1.253 |
| 3155 | k hat (MLE) | | | | | 0.289 | k star (bias corrected MLE) | | | | | 0.287 |
| 3156 | Theta hat (MLE) | | | | | 591.8 | Theta star (bias corrected MLE) | | | | | 595.2 |
| 3157 | nu hat (MLE) | | | | | 69.36 | nu star (bias corrected) | | | | | 68.96 |
| 3158 | MLE Mean (bias corrected) | | | | | 171 | MLE Sd (bias corrected) | | | | | 319 |
| 3159 | | | | | | | Adjusted Level of Significance (β) | | | | | 0.048 |
| 3160 | Approximate Chi Square Value (68.96, α) | | | | | 50.85 | Adjusted Chi Square Value (68.96, β) | | | | | 50.66 |
| 3161 | 95% Gamma Approximate UCL (use when n>=50) | | | | | 232 | 95% Gamma Adjusted UCL (use when n<50) | | | | | N/A |
| 3162 | | | | | | | | | | | | |
| 3163 | **Lognormal GOF Test on Detected Observations Only** | | | | | | | | | | | |
| 3164 | Shapiro Wilk Test Statistic | | | | | 0.824 | **Shapiro Wilk GOF Test** | | | | | |
| 3165 | 5% Shapiro Wilk Critical Value | | | | | 0.748 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 3166 | Lilliefors Test Statistic | | | | | 0.358 | **Lilliefors GOF Test** | | | | | |
| 3167 | 5% Lilliefors Critical Value | | | | | 0.443 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 3168 | **Detected Data appear Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 3169 | | | | | | | | | | | | |
| 3170 | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | | | | | |
| 3171 | Mean in Original Scale | | | | | 190.2 | Mean in Log Scale | | | | | 5.004 |
| 3172 | SD in Original Scale | | | | | 175.4 | SD in Log Scale | | | | | 0.669 |
| 3173 | 95% t UCL (assumes normality of ROS data) | | | | | 216.8 | 95% Percentile Bootstrap UCL | | | | | 218.5 |
| 3174 | 95% BCA Bootstrap UCL | | | | | 224.5 | 95% Bootstrap t UCL | | | | | 227.3 |
| 3175 | 95% H-UCL (Log ROS) | | | | | 209.9 | | | | | | |
| 3176 | | | | | | | | | | | | |
| 3177 | **UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed** | | | | | | | | | | | |
| 3178 | KM Mean (logged) | | | | | 5.02 | 95% H-UCL (KM -Log) | | | | | 174 |
| 3179 | KM SD (logged) | | | | | 0.388 | 95% Critical H Value (KM-Log) | | | | | 1.778 |
| 3180 | KM Standard Error of Mean (logged) | | | | | 0.0514 | | | | | | |
| 3181 | | | | | | | | | | | | |
| 3182 | **DL/2 Statistics** | | | | | | | | | | | |
| 3183 | **DL/2 Normal** | | | | | | **DL/2 Log-Transformed** | | | | | |
| 3184 | Mean in Original Scale | | | | | 840 | Mean in Log Scale | | | | | 5.763 |
| 3185 | SD in Original Scale | | | | | 1320 | SD in Log Scale | | | | | 1.366 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3186 | | | | 95% t UCL (Assumes normality) | | 1040 | | | | 95% H-Stat UCL | | 1120 |
| 3187 | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | | | | | |
| 3188 | | | | | | | | | | | | |
| 3189 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 3190 | **Detected Data appear Normal Distributed at 5% Significance Level** | | | | | | | | | | | |
| 3191 | | | | | | | | | | | | |
| 3192 | **Suggested UCL to Use** | | | | | | | | | | | |
| 3193 | | | | 95% KM (t) UCL | | 215.3 | | | | 95% KM (Percentile Bootstrap) UCL | | N/A |
| 3194 | **Warning: One or more Recommended UCL(s) not available!** | | | | | | | | | | | |
| 3195 | | | | | | | | | | | | |
| 3196 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 3197 | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | | | | | |
| 3198 | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | | | | | |
| 3199 | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 3200 | | | | | | | | | | | | |
| 3201 | **Di-n-octyl phthalate** | | | | | | | | | | | |
| 3202 | | | | | | | | | | | | |
| 3203 | **General Statistics** | | | | | | | | | | | |
| 3204 | | | | Total Number of Observations | | 133 | | | | Number of Distinct Observations | | 44 |
| 3205 | | | | Number of Detects | | 7 | | | | Number of Non-Detects | | 126 |
| 3206 | | | | Number of Distinct Detects | | 7 | | | | Number of Distinct Non-Detects | | 37 |
| 3207 | | | | Minimum Detect | | 5.5 | | | | Minimum Non-Detect | | 180 |
| 3208 | | | | Maximum Detect | | 95 | | | | Maximum Non-Detect | | 37000 |
| 3209 | | | | Variance Detects | | 1001 | | | | Percent Non-Detects | | 94.74% |
| 3210 | | | | Mean Detects | | 24.2 | | | | SD Detects | | 31.64 |
| 3211 | | | | Median Detects | | 16 | | | | CV Detects | | 1.307 |
| 3212 | | | | Skewness Detects | | 2.501 | | | | Kurtosis Detects | | 6.424 |
| 3213 | | | | Mean of Logged Detects | | 2.725 | | | | SD of Logged Detects | | 0.927 |
| 3214 | | | | | | | | | | | | |
| 3215 | **Normal GOF Test on Detects Only** | | | | | | | | | | | |
| 3216 | | | | Shapiro Wilk Test Statistic | | 0.605 | | | | **Shapiro Wilk GOF Test** | | |
| 3217 | | | | 5% Shapiro Wilk Critical Value | | 0.803 | | | | Detected Data Not Normal at 5% Significance Level | | |
| 3218 | | | | Lilliefors Test Statistic | | 0.422 | | | | **Lilliefors GOF Test** | | |
| 3219 | | | | 5% Lilliefors Critical Value | | 0.335 | | | | Detected Data Not Normal at 5% Significance Level | | |
| 3220 | **Detected Data Not Normal at 5% Significance Level** | | | | | | | | | | | |
| 3221 | | | | | | | | | | | | |
| 3222 | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | | | | | |
| 3223 | | | | Mean | | 24.2 | | | | Standard Error of Mean | | 11.96 |
| 3224 | | | | SD | | 29.29 | | | | 95% KM (BCA) UCL | | 47.8 |
| 3225 | | | | 95% KM (t) UCL | | 44.01 | | | | 95% KM (Percentile Bootstrap) UCL | | 46.18 |
| 3226 | | | | 95% KM (z) UCL | | 43.87 | | | | 95% KM Bootstrap t UCL | | 119.3 |
| 3227 | | | | 90% KM Chebyshev UCL | | 60.07 | | | | 95% KM Chebyshev UCL | | 76.32 |
| 3228 | | | | 97.5% KM Chebyshev UCL | | 98.87 | | | | 99% KM Chebyshev UCL | | 143.2 |
| 3229 | | | | | | | | | | | | |
| 3230 | **Gamma GOF Tests on Detected Observations Only** | | | | | | | | | | | |
| 3231 | | | | A-D Test Statistic | | 0.761 | | | | **Anderson-Darling GOF Test** | | |
| 3232 | | | | 5% A-D Critical Value | | 0.725 | | | | Detected Data Not Gamma Distributed at 5% Significance Level | | |
| 3233 | | | | K-S Test Statistic | | 0.336 | | | | **Kolmogrov-Smirnoff GOF** | | |
| 3234 | | | | 5% K-S Critical Value | | 0.318 | | | | Detected Data Not Gamma Distributed at 5% Significance Level | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3235 | **Detected Data Not Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 3236 | | | | | | | | | | | | |
| 3237 | **Gamma Statistics on Detected Data Only** | | | | | | | | | | | |
| 3238 | | | | | k hat (MLE) | 1.223 | | | k star (bias corrected MLE) | | | 0.794 |
| 3239 | | | | | Theta hat (MLE) | 19.79 | | | Theta star (bias corrected MLE) | | | 30.48 |
| 3240 | | | | | nu hat (MLE) | 17.12 | | | nu star (bias corrected) | | | 11.12 |
| 3241 | | | | | MLE Mean (bias corrected) | 24.2 | | | MLE Sd (bias corrected) | | | 27.16 |
| 3242 | | | | | | | | | | | | |
| 3243 | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | | | | | |
| 3244 | | | | | k hat (KM) | 0.683 | | | nu hat (KM) | | | 181.6 |
| 3245 | | | | | Approximate Chi Square Value (181.59, α) | 151.4 | | | Adjusted Chi Square Value (181.59, β) | | | 151.1 |
| 3246 | | | | | 95% Gamma Approximate KM-UCL (use when n>=50) | 29.02 | | | 95% Gamma Adjusted KM-UCL (use when n<50) | | | 29.08 |
| 3247 | | | | | | | | | | | | |
| 3248 | **Gamma ROS Statistics using Imputed Non-Detects** | | | | | | | | | | | |
| 3249 | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | | | | |
| 3250 | GROS may not be used when kstar of detected data is small such as < 0.1 | | | | | | | | | | | |
| 3251 | For such situations, GROS method tends to yield inflated values of UCLs and BTVs | | | | | | | | | | | |
| 3252 | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | | | | |
| 3253 | | | | | Minimum | 0.01 | | | Mean | | | 24.51 |
| 3254 | | | | | Maximum | 121.7 | | | Median | | | 18.23 |
| 3255 | | | | | SD | 24.75 | | | CV | | | 1.01 |
| 3256 | | | | | k hat (MLE) | 0.501 | | | k star (bias corrected MLE) | | | 0.495 |
| 3257 | | | | | Theta hat (MLE) | 48.89 | | | Theta star (bias corrected MLE) | | | 49.51 |
| 3258 | | | | | nu hat (MLE) | 133.3 | | | nu star (bias corrected) | | | 131.7 |
| 3259 | | | | | MLE Mean (bias corrected) | 24.51 | | | MLE Sd (bias corrected) | | | 34.83 |
| 3260 | | | | | | | | | Adjusted Level of Significance (β) | | | 0.0482 |
| 3261 | | | | | Approximate Chi Square Value (131.65, α) | 106.1 | | | Adjusted Chi Square Value (131.65, β) | | | 105.9 |
| 3262 | | | | | 95% Gamma Approximate UCL (use when n>=50) | 30.39 | | | 95% Gamma Adjusted UCL (use when n<50) | | | 30.47 |
| 3263 | | | | | | | | | | | | |
| 3264 | **Lognormal GOF Test on Detected Observations Only** | | | | | | | | | | | |
| 3265 | | | | | Shapiro Wilk Test Statistic | 0.88 | | | **Shapiro Wilk GOF Test** | | | |
| 3266 | | | | | 5% Shapiro Wilk Critical Value | 0.803 | | | Detected Data appear Lognormal at 5% Significance Level | | | |
| 3267 | | | | | Lilliefors Test Statistic | 0.263 | | | **Lilliefors GOF Test** | | | |
| 3268 | | | | | 5% Lilliefors Critical Value | 0.335 | | | Detected Data appear Lognormal at 5% Significance Level | | | |
| 3269 | **Detected Data appear Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 3270 | | | | | | | | | | | | |
| 3271 | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | | | | | |
| 3272 | | | | | Mean in Original Scale | 20.65 | | | Mean in Log Scale | | | 2.725 |
| 3273 | | | | | SD in Original Scale | 18.8 | | | SD in Log Scale | | | 0.774 |
| 3274 | | | | | 95% t UCL (assumes normality of ROS data) | 23.35 | | | 95% Percentile Bootstrap UCL | | | 23.31 |
| 3275 | | | | | 95% BCA Bootstrap UCL | 23.78 | | | 95% Bootstrap t UCL | | | 23.85 |
| 3276 | | | | | 95% H-UCL (Log ROS) | 23.55 | | | | | | |
| 3277 | | | | | | | | | | | | |
| 3278 | **UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed** | | | | | | | | | | | |
| 3279 | | | | | KM Mean (logged) | 2.725 | | | 95% H-UCL (KM -Log) | | | 25.74 |
| 3280 | | | | | KM SD (logged) | 0.859 | | | 95% Critical H Value (KM-Log) | | | 2.072 |
| 3281 | | | | | KM Standard Error of Mean (logged) | 0.35 | | | | | | |
| 3282 | | | | | | | | | | | | |
| 3283 | **DL/2 Statistics** | | | | | | | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3284 | **DL/2 Normal** | | | | | | **DL/2 Log-Transformed** | | | | | |
| 3285 | | | | Mean in Original Scale | | 1002 | | | | Mean in Log Scale | | 5.635 |
| 3286 | | | | SD in Original Scale | | 2143 | | | | SD in Log Scale | | 1.588 |
| 3287 | | | | 95% t UCL (Assumes normality) | | 1310 | | | | 95% H-Stat UCL | | 1455 |
| 3288 | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | | | | | |
| 3289 | | | | | | | | | | | | |
| 3290 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 3291 | **Detected Data appear Lognormal Distributed at 5% Significance Level** | | | | | | | | | | | |
| 3292 | | | | | | | | | | | | |
| 3293 | **Suggested UCL to Use** | | | | | | | | | | | |
| 3294 | | | | 95% KM (t) UCL | | 44.01 | | | | 95% KM (% Bootstrap) UCL | | 46.18 |
| 3295 | | | | | | | | | | | | |
| 3296 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 3297 | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | | | | | |
| 3298 | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | | | | | |
| 3299 | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 3300 | | | | | | | | | | | | |
| 3301 | **Ethylbenzene** | | | | | | | | | | | |
| 3302 | | | | | | | | | | | | |
| 3303 | **General Statistics** | | | | | | | | | | | |
| 3304 | | | | Total Number of Observations | | 97 | | | | Number of Distinct Observations | | 35 |
| 3305 | | | | Number of Detects | | 15 | | | | Number of Non-Detects | | 82 |
| 3306 | | | | Number of Distinct Detects | | 15 | | | | Number of Distinct Non-Detects | | 22 |
| 3307 | | | | Minimum Detect | | 0.72 | | | | Minimum Non-Detect | | 0.5 |
| 3308 | | | | Maximum Detect | | 570 | | | | Maximum Non-Detect | | 6.25 |
| 3309 | | | | Variance Detects | | 21946 | | | | Percent Non-Detects | | 84.54% |
| 3310 | | | | Mean Detects | | 64.84 | | | | SD Detects | | 148.1 |
| 3311 | | | | Median Detects | | 4.9 | | | | CV Detects | | 2.285 |
| 3312 | | | | Skewness Detects | | 3.247 | | | | Kurtosis Detects | | 11.16 |
| 3313 | | | | Mean of Logged Detects | | 2.17 | | | | SD of Logged Detects | | 2.094 |
| 3314 | | | | | | | | | | | | |
| 3315 | **Normal GOF Test on Detects Only** | | | | | | | | | | | |
| 3316 | | | | Shapiro Wilk Test Statistic | | 0.496 | **Shapiro Wilk GOF Test** | | | | | |
| 3317 | | | | 5% Shapiro Wilk Critical Value | | 0.881 | Detected Data Not Normal at 5% Significance Level | | | | | |
| 3318 | | | | Lilliefors Test Statistic | | 0.339 | **Lilliefors GOF Test** | | | | | |
| 3319 | | | | 5% Lilliefors Critical Value | | 0.229 | Detected Data Not Normal at 5% Significance Level | | | | | |
| 3320 | **Detected Data Not Normal at 5% Significance Level** | | | | | | | | | | | |
| 3321 | | | | | | | | | | | | |
| 3322 | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | | | | | |
| 3323 | | | | Mean | | 11.2 | | | | Standard Error of Mean | | 6.393 |
| 3324 | | | | SD | | 60.78 | | | | 95% KM (BCA) UCL | | 24.66 |
| 3325 | | | | 95% KM (t) UCL | | 21.82 | | | | 95% KM (Percentile Bootstrap) UCL | | 23.07 |
| 3326 | | | | 95% KM (z) UCL | | 21.72 | | | | 95% KM Bootstrap t UCL | | 66.59 |
| 3327 | | | | 90% KM Chebyshev UCL | | 30.38 | | | | 95% KM Chebyshev UCL | | 39.07 |
| 3328 | | | | 97.5% KM Chebyshev UCL | | 51.13 | | | | 99% KM Chebyshev UCL | | 74.82 |
| 3329 | | | | | | | | | | | | |
| 3330 | **Gamma GOF Tests on Detected Observations Only** | | | | | | | | | | | |
| 3331 | | | | A-D Test Statistic | | 1.184 | **Anderson-Darling GOF Test** | | | | | |
| 3332 | | | | 5% A-D Critical Value | | 0.827 | Detected Data Not Gamma Distributed at 5% Significance Level | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3333 | | | | | K-S Test Statistic | 0.296 | **Kolmogrov-Smirnoff GOF** | | | | | |
| 3334 | | | | | 5% K-S Critical Value | 0.239 | Detected Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 3335 | **Detected Data Not Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 3336 | | | | | | | | | | | | |
| 3337 | **Gamma Statistics on Detected Data Only** | | | | | | | | | | | |
| 3338 | | | | | k hat (MLE) | 0.338 | | | | k star (bias corrected MLE) | | 0.315 |
| 3339 | | | | | Theta hat (MLE) | 192 | | | | Theta star (bias corrected MLE) | | 206.1 |
| 3340 | | | | | nu hat (MLE) | 10.13 | | | | nu star (bias corrected) | | 9.44 |
| 3341 | | | | | MLE Mean (bias corrected) | 64.84 | | | | MLE Sd (bias corrected) | | 115.6 |
| 3342 | | | | | | | | | | | | |
| 3343 | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | | | | | |
| 3344 | | | | | k hat (KM) | 0.034 | | | | nu hat (KM) | | 6.591 |
| 3345 | | | | | Approximate Chi Square Value (6.59, α) | 1.949 | | | | Adjusted Chi Square Value (6.59, β) | | 1.911 |
| 3346 | | | | | 95% Gamma Approximate KM-UCL (use when n>=50) | 37.89 | | | | 95% Gamma Adjusted KM-UCL (use when n<50) | | 38.63 |
| 3347 | Gamma (KM) may not be used when k hat (KM) is < 0.1 | | | | | | | | | | | |
| 3348 | | | | | | | | | | | | |
| 3349 | **Gamma ROS Statistics using Imputed Non-Detects** | | | | | | | | | | | |
| 3350 | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | | | | |
| 3351 | GROS may not be used when kstar of detected data is small such as < 0.1 | | | | | | | | | | | |
| 3352 | For such situations, GROS method tends to yield inflated values of UCLs and BTVs | | | | | | | | | | | |
| 3353 | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | | | | |
| 3354 | | | | | Minimum | 0.01 | | | | Mean | | 10.39 |
| 3355 | | | | | Maximum | 570 | | | | Median | | 0.01 |
| 3356 | | | | | SD | 61.25 | | | | CV | | 5.895 |
| 3357 | | | | | k hat (MLE) | 0.138 | | | | k star (bias corrected MLE) | | 0.141 |
| 3358 | | | | | Theta hat (MLE) | 75.16 | | | | Theta star (bias corrected MLE) | | 73.78 |
| 3359 | | | | | nu hat (MLE) | 26.82 | | | | nu star (bias corrected) | | 27.32 |
| 3360 | | | | | MLE Mean (bias corrected) | 10.39 | | | | MLE Sd (bias corrected) | | 27.69 |
| 3361 | | | | | | | | | | Adjusted Level of Significance (β) | | 0.0475 |
| 3362 | | | | | Approximate Chi Square Value (27.32, α) | 16.4 | | | | Adjusted Chi Square Value (27.32, β) | | 16.28 |
| 3363 | | | | | 95% Gamma Approximate UCL (use when n>=50) | 17.31 | | | | 95% Gamma Adjusted UCL (use when n<50) | | 17.45 |
| 3364 | | | | | | | | | | | | |
| 3365 | **Lognormal GOF Test on Detected Observations Only** | | | | | | | | | | | |
| 3366 | | | | | Shapiro Wilk Test Statistic | 0.909 | **Shapiro Wilk GOF Test** | | | | | |
| 3367 | | | | | 5% Shapiro Wilk Critical Value | 0.881 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 3368 | | | | | Lilliefors Test Statistic | 0.196 | **Lilliefors GOF Test** | | | | | |
| 3369 | | | | | 5% Lilliefors Critical Value | 0.229 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 3370 | **Detected Data appear Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 3371 | | | | | | | | | | | | |
| 3372 | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | | | | | |
| 3373 | | | | | Mean in Original Scale | 11.16 | | | | Mean in Log Scale | | -0.00534 |
| 3374 | | | | | SD in Original Scale | 61.12 | | | | SD in Log Scale | | 1.701 |
| 3375 | | | | | 95% t UCL (assumes normality of ROS data) | 21.47 | | | | 95% Percentile Bootstrap UCL | | 23.41 |
| 3376 | | | | | 95% BCA Bootstrap UCL | 31.01 | | | | 95% Bootstrap t UCL | | 60.81 |
| 3377 | | | | | 95% H-UCL (Log ROS) | 7.152 | | | | | | |
| 3378 | | | | | | | | | | | | |
| 3379 | **UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed** | | | | | | | | | | | |
| 3380 | | | | | KM Mean (logged) | 0.433 | | | | 95% H-UCL (KM -Log) | | 4.575 |
| 3381 | | | | | KM SD (logged) | 1.241 | | | | 95% Critical H Value (KM-Log) | | 2.502 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3382 | KM Standard Error of Mean (logged) | | | | | 0.226 | | | | | | |
| 3383 | | | | | | | | | | | | |
| 3384 | **DL/2 Statistics** | | | | | | | | | | | |
| 3385 | **DL/2 Normal** | | | | | | **DL/2 Log-Transformed** | | | | | |
| 3386 | Mean in Original Scale | | | | | 12.03 | Mean in Log Scale | | | | | 1.03 |
| 3387 | SD in Original Scale | | | | | 60.96 | SD in Log Scale | | | | | 0.998 |
| 3388 | 95% t UCL (Assumes normality) | | | | | 22.31 | 95% H-Stat UCL | | | | | 5.799 |
| 3389 | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | | | | | |
| 3390 | | | | | | | | | | | | |
| 3391 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 3392 | **Detected Data appear Lognormal Distributed at 5% Significance Level** | | | | | | | | | | | |
| 3393 | | | | | | | | | | | | |
| 3394 | **Suggested UCL to Use** | | | | | | | | | | | |
| 3395 | 97.5% KM (Chebyshev) UCL | | | | | 51.13 | | | | | | |
| 3396 | | | | | | | | | | | | |
| 3397 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 3398 | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | | | | | |
| 3399 | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | | | | | |
| 3400 | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 3401 | | | | | | | | | | | | |
| 3402 | **Fluoranthene** | | | | | | | | | | | |
| 3403 | | | | | | | | | | | | |
| 3404 | **General Statistics** | | | | | | | | | | | |
| 3405 | Total Number of Observations | | | | | 135 | Number of Distinct Observations | | | | | 79 |
| 3406 | Number of Detects | | | | | 71 | Number of Non-Detects | | | | | 64 |
| 3407 | Number of Distinct Detects | | | | | 60 | Number of Distinct Non-Detects | | | | | 27 |
| 3408 | Minimum Detect | | | | | 1.1 | Minimum Non-Detect | | | | | 71 |
| 3409 | Maximum Detect | | | | | 180000 | Maximum Non-Detect | | | | | 6900 |
| 3410 | Variance Detects | | | | | 8.522E+8 | Percent Non-Detects | | | | | 47.41% |
| 3411 | Mean Detects | | | | | 6869 | SD Detects | | | | | 29192 |
| 3412 | Median Detects | | | | | 230 | CV Detects | | | | | 4.25 |
| 3413 | Skewness Detects | | | | | 5.63 | Kurtosis Detects | | | | | 31.31 |
| 3414 | Mean of Logged Detects | | | | | 5.876 | SD of Logged Detects | | | | | 2.377 |
| 3415 | | | | | | | | | | | | |
| 3416 | **Normal GOF Test on Detects Only** | | | | | | | | | | | |
| 3417 | Shapiro Wilk Test Statistic | | | | | 0.247 | **Normal GOF Test on Detected Observations Only** | | | | | |
| 3418 | 5% Shapiro Wilk P Value | | | | | 0 | Detected Data Not Normal at 5% Significance Level | | | | | |
| 3419 | Lilliefors Test Statistic | | | | | 0.407 | **Lilliefors GOF Test** | | | | | |
| 3420 | 5% Lilliefors Critical Value | | | | | 0.105 | Detected Data Not Normal at 5% Significance Level | | | | | |
| 3421 | **Detected Data Not Normal at 5% Significance Level** | | | | | | | | | | | |
| 3422 | | | | | | | | | | | | |
| 3423 | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | | | | | |
| 3424 | Mean | | | | | 3646 | Standard Error of Mean | | | | | 1846 |
| 3425 | SD | | | | | 21294 | 95% KM (BCA) UCL | | | | | 7041 |
| 3426 | 95% KM (t) UCL | | | | | 6703 | 95% KM (Percentile Bootstrap) UCL | | | | | 7067 |
| 3427 | 95% KM (z) UCL | | | | | 6682 | 95% KM Bootstrap t UCL | | | | | 22600 |
| 3428 | 90% KM Chebyshev UCL | | | | | 9184 | 95% KM Chebyshev UCL | | | | | 11692 |
| 3429 | 97.5% KM Chebyshev UCL | | | | | 15173 | 99% KM Chebyshev UCL | | | | | 22012 |
| 3430 | | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3431 | **Gamma GOF Tests on Detected Observations Only** | | | | | | | | | | | |
| 3432 | | | | | A-D Test Statistic | 6.246 | **Anderson-Darling GOF Test** | | | | | |
| 3433 | | | | | 5% A-D Critical Value | 0.894 | Detected Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 3434 | | | | | K-S Test Statistic | 0.226 | **Kolmogrov-Smirnoff GOF** | | | | | |
| 3435 | | | | | 5% K-S Critical Value | 0.116 | Detected Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 3436 | **Detected Data Not Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 3437 | | | | | | | | | | | | |
| 3438 | **Gamma Statistics on Detected Data Only** | | | | | | | | | | | |
| 3439 | | | | | k hat (MLE) | 0.241 | | | k star (bias corrected MLE) | | | 0.241 |
| 3440 | | | | | Theta hat (MLE) | 28448 | | | Theta star (bias corrected MLE) | | | 28544 |
| 3441 | | | | | nu hat (MLE) | 34.28 | | | nu star (bias corrected) | | | 34.17 |
| 3442 | | | | | MLE Mean (bias corrected) | 6869 | | | MLE Sd (bias corrected) | | | 14002 |
| 3443 | | | | | | | | | | | | |
| 3444 | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | | | | | |
| 3445 | | | | | k hat (KM) | 0.0293 | | | nu hat (KM) | | | 7.917 |
| 3446 | | | | | Approximate Chi Square Value (7.92, α) | 2.687 | | | Adjusted Chi Square Value (7.92, β) | | | 2.654 |
| 3447 | | | | | 95% Gamma Approximate KM-UCL (use when n>=50) | 10743 | | | 95% Gamma Adjusted KM-UCL (use when n<50) | | | 10876 |
| 3448 | Gamma (KM) may not be used when k hat (KM) is < 0.1 | | | | | | | | | | | |
| 3449 | | | | | | | | | | | | |
| 3450 | **Gamma ROS Statistics using Imputed Non-Detects** | | | | | | | | | | | |
| 3451 | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | | | | |
| 3452 | GROS may not be used when kstar of detected data is small such as < 0.1 | | | | | | | | | | | |
| 3453 | For such situations, GROS method tends to yield inflated values of UCLs and BTVs | | | | | | | | | | | |
| 3454 | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | | | | |
| 3455 | | | | | Minimum | 0.01 | | | Mean | | | 3612 |
| 3456 | | | | | Maximum | 180000 | | | Median | | | 10 |
| 3457 | | | | | SD | 21378 | | | CV | | | 5.918 |
| 3458 | | | | | k hat (MLE) | 0.11 | | | k star (bias corrected MLE) | | | 0.113 |
| 3459 | | | | | Theta hat (MLE) | 32807 | | | Theta star (bias corrected MLE) | | | 32081 |
| 3460 | | | | | nu hat (MLE) | 29.73 | | | nu star (bias corrected) | | | 30.4 |
| 3461 | | | | | MLE Mean (bias corrected) | 3612 | | | MLE Sd (bias corrected) | | | 10765 |
| 3462 | | | | | | | | | Adjusted Level of Significance (β) | | | 0.0482 |
| 3463 | | | | | Approximate Chi Square Value (30.40, α) | 18.81 | | | Adjusted Chi Square Value (30.40, β) | | | 18.71 |
| 3464 | | | | | 95% Gamma Approximate UCL (use when n>=50) | 5839 | | | 95% Gamma Adjusted UCL (use when n<50) | | | 5870 |
| 3465 | | | | | | | | | | | | |
| 3466 | **Lognormal GOF Test on Detected Observations Only** | | | | | | | | | | | |
| 3467 | | | | | Lilliefors Test Statistic | 0.089 | **Lilliefors GOF Test** | | | | | |
| 3468 | | | | | 5% Lilliefors Critical Value | 0.105 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 3469 | **Detected Data appear Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 3470 | | | | | | | | | | | | |
| 3471 | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | | | | | |
| 3472 | | | | | Mean in Original Scale | 3630 | | | Mean in Log Scale | | | 4.557 |
| 3473 | | | | | SD in Original Scale | 21375 | | | SD in Log Scale | | | 2.343 |
| 3474 | | | | | 95% t UCL (assumes normality of ROS data) | 6677 | | | 95% Percentile Bootstrap UCL | | | 7094 |
| 3475 | | | | | 95% BCA Bootstrap UCL | 8773 | | | 95% Bootstrap t UCL | | | 22512 |
| 3476 | | | | | 95% H-UCL (Log ROS) | 3136 | | | | | | |
| 3477 | | | | | | | | | | | | |
| 3478 | **UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed** | | | | | | | | | | | |
| 3479 | | | | | KM Mean (logged) | 4.613 | | | 95% H-UCL (KM -Log) | | | 3275 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3480 | | | | KM SD (logged) | | 2.339 | | | | 95% Critical H Value (KM-Log) | | 3.687 |
| 3481 | | | | KM Standard Error of Mean (logged) | | 0.241 | | | | | | |
| 3482 | | | | | | | | | | | | |
| 3483 | **DL/2 Statistics** | | | | | | | | | | | |
| 3484 | **DL/2 Normal** | | | | | | **DL/2 Log-Transformed** | | | | | |
| 3485 | | | | Mean in Original Scale | | 3761 | | | | Mean in Log Scale | | 5.189 |
| 3486 | | | | SD in Original Scale | | 21358 | | | | SD in Log Scale | | 2.101 |
| 3487 | | | | 95% t UCL (Assumes normality) | | 6805 | | | | 95% H-Stat UCL | | 3019 |
| 3488 | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | | | | | |
| 3489 | | | | | | | | | | | | |
| 3490 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 3491 | **Detected Data appear Lognormal Distributed at 5% Significance Level** | | | | | | | | | | | |
| 3492 | | | | | | | | | | | | |
| 3493 | **Suggested UCL to Use** | | | | | | | | | | | |
| 3494 | | | | 97.5% KM (Chebyshev) UCL | | 15173 | | | | | | |
| 3495 | | | | | | | | | | | | |
| 3496 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 3497 | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | | | | | |
| 3498 | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | | | | | |
| 3499 | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 3500 | | | | | | | | | | | | |
| 3501 | **Fluorene** | | | | | | | | | | | |
| 3502 | | | | | | | | | | | | |
| 3503 | **General Statistics** | | | | | | | | | | | |
| 3504 | | | | Total Number of Observations | | 135 | | | | Number of Distinct Observations | | 58 |
| 3505 | | | | Number of Detects | | 17 | | | | Number of Non-Detects | | 118 |
| 3506 | | | | Number of Distinct Detects | | 16 | | | | Number of Distinct Non-Detects | | 44 |
| 3507 | | | | Minimum Detect | | 10 | | | | Minimum Non-Detect | | 5.8 |
| 3508 | | | | Maximum Detect | | 17000 | | | | Maximum Non-Detect | | 6900 |
| 3509 | | | | Variance Detects | | 17578153 | | | | Percent Non-Detects | | 87.41% |
| 3510 | | | | Mean Detects | | 1546 | | | | SD Detects | | 4193 |
| 3511 | | | | Median Detects | | 100 | | | | CV Detects | | 2.712 |
| 3512 | | | | Skewness Detects | | 3.564 | | | | Kurtosis Detects | | 13.24 |
| 3513 | | | | Mean of Logged Detects | | 5.078 | | | | SD of Logged Detects | | 2.055 |
| 3514 | | | | | | | | | | | | |
| 3515 | **Normal GOF Test on Detects Only** | | | | | | | | | | | |
| 3516 | | | | Shapiro Wilk Test Statistic | | 0.42 | **Shapiro Wilk GOF Test** | | | | | |
| 3517 | | | | 5% Shapiro Wilk Critical Value | | 0.892 | Detected Data Not Normal at 5% Significance Level | | | | | |
| 3518 | | | | Lilliefors Test Statistic | | 0.387 | **Lilliefors GOF Test** | | | | | |
| 3519 | | | | 5% Lilliefors Critical Value | | 0.215 | Detected Data Not Normal at 5% Significance Level | | | | | |
| 3520 | **Detected Data Not Normal at 5% Significance Level** | | | | | | | | | | | |
| 3521 | | | | | | | | | | | | |
| 3522 | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | | | | | |
| 3523 | | | | Mean | | 229.9 | | | | Standard Error of Mean | | 136 |
| 3524 | | | | SD | | 1529 | | | | 95% KM (BCA) UCL | | 503.8 |
| 3525 | | | | 95% KM (t) UCL | | 455.2 | | | | 95% KM (Percentile Bootstrap) UCL | | 474.7 |
| 3526 | | | | 95% KM (z) UCL | | 453.7 | | | | 95% KM Bootstrap t UCL | | 1741 |
| 3527 | | | | 90% KM Chebyshev UCL | | 638 | | | | 95% KM Chebyshev UCL | | 822.9 |
| 3528 | | | | 97.5% KM Chebyshev UCL | | 1079 | | | | 99% KM Chebyshev UCL | | 1583 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3529 | | | | | | | | | | | | |
| 3530 | **Gamma GOF Tests on Detected Observations Only** | | | | | | | | | | | |
| 3531 | | | | | A-D Test Statistic | 1.787 | **Anderson-Darling GOF Test** | | | | | |
| 3532 | | | | | 5% A-D Critical Value | 0.841 | Detected Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 3533 | | | | | K-S Test Statistic | 0.292 | **Kolmogrov-Smirnoff GOF** | | | | | |
| 3534 | | | | | 5% K-S Critical Value | 0.227 | Detected Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 3535 | **Detected Data Not Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 3536 | | | | | | | | | | | | |
| 3537 | **Gamma Statistics on Detected Data Only** | | | | | | | | | | | |
| 3538 | | | | | k hat (MLE) | 0.304 | k star (bias corrected MLE) | 0.289 | | | | |
| 3539 | | | | | Theta hat (MLE) | 5088 | Theta star (bias corrected MLE) | 5341 | | | | |
| 3540 | | | | | nu hat (MLE) | 10.33 | nu star (bias corrected) | 9.839 | | | | |
| 3541 | | | | | MLE Mean (bias corrected) | 1546 | MLE Sd (bias corrected) | 2873 | | | | |
| 3542 | | | | | | | | | | | | |
| 3543 | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | | | | | |
| 3544 | | | | | k hat (KM) | 0.0226 | nu hat (KM) | 6.102 | | | | |
| 3545 | | | | | Approximate Chi Square Value (6.10, α) | 1.692 | Adjusted Chi Square Value (6.10, β) | 1.667 | | | | |
| 3546 | | | | | 95% Gamma Approximate KM-UCL (use when n>=50) | 829.1 | 95% Gamma Adjusted KM-UCL (use when n<50) | 841.3 | | | | |
| 3547 | Gamma (KM) may not be used when k hat (KM) is < 0.1 | | | | | | | | | | | |
| 3548 | | | | | | | | | | | | |
| 3549 | **Gamma ROS Statistics using Imputed Non-Detects** | | | | | | | | | | | |
| 3550 | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | | | | |
| 3551 | GROS may not be used when kstar of detected data is small such as < 0.1 | | | | | | | | | | | |
| 3552 | For such situations, GROS method tends to yield inflated values of UCLs and BTVs | | | | | | | | | | | |
| 3553 | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | | | | |
| 3554 | | | | | Minimum | 0.01 | Mean | 194.7 | | | | |
| 3555 | | | | | Maximum | 17000 | Median | 0.01 | | | | |
| 3556 | | | | | SD | 1537 | CV | 7.899 | | | | |
| 3557 | | | | | k hat (MLE) | 0.0945 | k star (bias corrected MLE) | 0.0973 | | | | |
| 3558 | | | | | Theta hat (MLE) | 2060 | Theta star (bias corrected MLE) | 2000 | | | | |
| 3559 | | | | | nu hat (MLE) | 25.51 | nu star (bias corrected) | 26.27 | | | | |
| 3560 | | | | | MLE Mean (bias corrected) | 194.7 | MLE Sd (bias corrected) | 624 | | | | |
| 3561 | | | | | | | Adjusted Level of Significance (β) | 0.0482 | | | | |
| 3562 | | | | | Approximate Chi Square Value (26.27, α) | 15.59 | Adjusted Chi Square Value (26.27, β) | 15.5 | | | | |
| 3563 | | | | | 95% Gamma Approximate UCL (use when n>=50) | 328 | 95% Gamma Adjusted UCL (use when n<50) | 329.9 | | | | |
| 3564 | | | | | | | | | | | | |
| 3565 | **Lognormal GOF Test on Detected Observations Only** | | | | | | | | | | | |
| 3566 | | | | | Shapiro Wilk Test Statistic | 0.923 | **Shapiro Wilk GOF Test** | | | | | |
| 3567 | | | | | 5% Shapiro Wilk Critical Value | 0.892 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 3568 | | | | | Lilliefors Test Statistic | 0.203 | **Lilliefors GOF Test** | | | | | |
| 3569 | | | | | 5% Lilliefors Critical Value | 0.215 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 3570 | **Detected Data appear Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 3571 | | | | | | | | | | | | |
| 3572 | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | | | | | |
| 3573 | | | | | Mean in Original Scale | 220.5 | Mean in Log Scale | 3.207 | | | | |
| 3574 | | | | | SD in Original Scale | 1534 | SD in Log Scale | 1.383 | | | | |
| 3575 | | | | | 95% t UCL (assumes normality of ROS data) | 439.2 | 95% Percentile Bootstrap UCL | 464.7 | | | | |
| 3576 | | | | | 95% BCA Bootstrap UCL | 647.4 | 95% Bootstrap t UCL | 2077 | | | | |
| 3577 | | | | | 95% H-UCL (Log ROS) | 87.38 | | | | | | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3578 | | | | | | | | | | | | |
| 3579 | **UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed** | | | | | | | | | | | |
| 3580 | | | | | KM Mean (logged) | 3.484 | | | | 95% H-UCL (KM -Log) | 94.48 | |
| 3581 | | | | | KM SD (logged) | 1.263 | | | | 95% Critical H Value (KM-Log) | 2.446 | |
| 3582 | | | | | KM Standard Error of Mean (logged) | 0.29 | | | | | | |
| 3583 | | | | | | | | | | | | |
| 3584 | **DL/2 Statistics** | | | | | | | | | | | |
| 3585 | **DL/2 Normal** | | | | | | **DL/2 Log-Transformed** | | | | | |
| 3586 | | | | | Mean in Original Scale | 472.6 | | | | Mean in Log Scale | 4.724 | |
| 3587 | | | | | SD in Original Scale | 1587 | | | | SD in Log Scale | 1.509 | |
| 3588 | | | | | 95% t UCL (Assumes normality) | 698.8 | | | | 95% H-Stat UCL | 500.5 | |
| 3589 | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | | | | | |
| 3590 | | | | | | | | | | | | |
| 3591 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 3592 | **Detected Data appear Lognormal Distributed at 5% Significance Level** | | | | | | | | | | | |
| 3593 | | | | | | | | | | | | |
| 3594 | **Suggested UCL to Use** | | | | | | | | | | | |
| 3595 | | | | | 97.5% KM (Chebyshev) UCL | 1079 | | | | | | |
| 3596 | | | | | | | | | | | | |
| 3597 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 3598 | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | | | | | |
| 3599 | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | | | | | |
| 3600 | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 3601 | | | | | | | | | | | | |
| 3602 | **Indeno(1,2,3-cd)pyrene** | | | | | | | | | | | |
| 3603 | | | | | | | | | | | | |
| 3604 | **General Statistics** | | | | | | | | | | | |
| 3605 | | | | | Total Number of Observations | 135 | | | | Number of Distinct Observations | 75 | |
| 3606 | | | | | Number of Detects | 59 | | | | Number of Non-Detects | 76 | |
| 3607 | | | | | Number of Distinct Detects | 51 | | | | Number of Distinct Non-Detects | 30 | |
| 3608 | | | | | Minimum Detect | 21 | | | | Minimum Non-Detect | 5.8 | |
| 3609 | | | | | Maximum Detect | 74000 | | | | Maximum Non-Detect | 6900 | |
| 3610 | | | | | Variance Detects | 1.397E+8 | | | | Percent Non-Detects | 56.3% | |
| 3611 | | | | | Mean Detects | 3563 | | | | SD Detects | 11818 | |
| 3612 | | | | | Median Detects | 330 | | | | CV Detects | 3.317 | |
| 3613 | | | | | Skewness Detects | 5.156 | | | | Kurtosis Detects | 27.32 | |
| 3614 | | | | | Mean of Logged Detects | 6.107 | | | | SD of Logged Detects | 1.931 | |
| 3615 | | | | | | | | | | | | |
| 3616 | **Normal GOF Test on Detects Only** | | | | | | | | | | | |
| 3617 | | | | | Shapiro Wilk Test Statistic | 0.322 | **Normal GOF Test on Detected Observations Only** | | | | | |
| 3618 | | | | | 5% Shapiro Wilk P Value | 0 | Detected Data Not Normal at 5% Significance Level | | | | | |
| 3619 | | | | | Lilliefors Test Statistic | 0.382 | **Lilliefors GOF Test** | | | | | |
| 3620 | | | | | 5% Lilliefors Critical Value | 0.115 | Detected Data Not Normal at 5% Significance Level | | | | | |
| 3621 | **Detected Data Not Normal at 5% Significance Level** | | | | | | | | | | | |
| 3622 | | | | | | | | | | | | |
| 3623 | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | | | | | |
| 3624 | | | | | Mean | 1603 | | | | Standard Error of Mean | 689.2 | |
| 3625 | | | | | SD | 7938 | | | | 95% KM (BCA) UCL | 3097 | |
| 3626 | | | | | 95% KM (t) UCL | 2744 | | | | 95% KM (Percentile Bootstrap) UCL | 2837 | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3627 | | | | 95% KM (z) UCL | 2736 | | | | | 95% KM Bootstrap t UCL | | 6492 |
| 3628 | | | | 90% KM Chebyshev UCL | 3670 | | | | | 95% KM Chebyshev UCL | | 4607 |
| 3629 | | | | 97.5% KM Chebyshev UCL | 5907 | | | | | 99% KM Chebyshev UCL | | 8460 |
| 3630 | | | | | | | | | | | | |
| 3631 | | | | **Gamma GOF Tests on Detected Observations Only** | | | | | | | | |
| 3632 | | | | A-D Test Statistic | 4.423 | | | | **Anderson-Darling GOF Test** | | | |
| 3633 | | | | 5% A-D Critical Value | 0.857 | | | | Detected Data Not Gamma Distributed at 5% Significance Level | | | |
| 3634 | | | | K-S Test Statistic | 0.231 | | | | **Kolmogrov-Smirnoff GOF** | | | |
| 3635 | | | | 5% K-S Critical Value | 0.125 | | | | Detected Data Not Gamma Distributed at 5% Significance Level | | | |
| 3636 | | | | **Detected Data Not Gamma Distributed at 5% Significance Level** | | | | | | | | |
| 3637 | | | | | | | | | | | | |
| 3638 | | | | **Gamma Statistics on Detected Data Only** | | | | | | | | |
| 3639 | | | | k hat (MLE) | 0.328 | | | | k star (bias corrected MLE) | | | 0.323 |
| 3640 | | | | Theta hat (MLE) | 10859 | | | | Theta star (bias corrected MLE) | | | 11041 |
| 3641 | | | | nu hat (MLE) | 38.72 | | | | nu star (bias corrected) | | | 38.08 |
| 3642 | | | | MLE Mean (bias corrected) | 3563 | | | | MLE Sd (bias corrected) | | | 6272 |
| 3643 | | | | | | | | | | | | |
| 3644 | | | | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | | |
| 3645 | | | | k hat (KM) | 0.0408 | | | | nu hat (KM) | | | 11.01 |
| 3646 | | | | Approximate Chi Square Value (11.01, α) | 4.58 | | | | Adjusted Chi Square Value (11.01, β) | | | 4.535 |
| 3647 | | | | 95% Gamma Approximate KM-UCL (use when n>=50) | 3851 | | | | 95% Gamma Adjusted KM-UCL (use when n<50) | | | 3889 |
| 3648 | | | | Gamma (KM) may not be used when k hat (KM) is < 0.1 | | | | | | | | |
| 3649 | | | | | | | | | | | | |
| 3650 | | | | **Gamma ROS Statistics using Imputed Non-Detects** | | | | | | | | |
| 3651 | | | | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | |
| 3652 | | | | GROS may not be used when kstar of detected data is small such as < 0.1 | | | | | | | | |
| 3653 | | | | For such situations, GROS method tends to yield inflated values of UCLs and BTVs | | | | | | | | |
| 3654 | | | | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | |
| 3655 | | | | Minimum | 0.01 | | | | Mean | | | 1557 |
| 3656 | | | | Maximum | 74000 | | | | Median | | | 0.01 |
| 3657 | | | | SD | 7975 | | | | CV | | | 5.121 |
| 3658 | | | | k hat (MLE) | 0.11 | | | | k star (bias corrected MLE) | | | 0.113 |
| 3659 | | | | Theta hat (MLE) | 14124 | | | | Theta star (bias corrected MLE) | | | 13812 |
| 3660 | | | | nu hat (MLE) | 29.77 | | | | nu star (bias corrected) | | | 30.44 |
| 3661 | | | | MLE Mean (bias corrected) | 1557 | | | | MLE Sd (bias corrected) | | | 4638 |
| 3662 | | | | | | | | | Adjusted Level of Significance (β) | | | 0.0482 |
| 3663 | | | | Approximate Chi Square Value (30.44, α) | 18.84 | | | | Adjusted Chi Square Value (30.44, β) | | | 18.74 |
| 3664 | | | | 95% Gamma Approximate UCL (use when n>=50) | 2516 | | | | 95% Gamma Adjusted UCL (use when n<50) | | | 2529 |
| 3665 | | | | | | | | | | | | |
| 3666 | | | | **Lognormal GOF Test on Detected Observations Only** | | | | | | | | |
| 3667 | | | | Lilliefors Test Statistic | 0.111 | | | | **Lilliefors GOF Test** | | | |
| 3668 | | | | 5% Lilliefors Critical Value | 0.115 | | | | Detected Data appear Lognormal at 5% Significance Level | | | |
| 3669 | | | | **Detected Data appear Approximate Lognormal at 5% Significance Level** | | | | | | | | |
| 3670 | | | | | | | | | | | | |
| 3671 | | | | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | | |
| 3672 | | | | Mean in Original Scale | 1587 | | | | Mean in Log Scale | | | 4.626 |
| 3673 | | | | SD in Original Scale | 7969 | | | | SD in Log Scale | | | 2.002 |
| 3674 | | | | 95% t UCL (assumes normality of ROS data) | 2723 | | | | 95% Percentile Bootstrap UCL | | | 2877 |
| 3675 | | | | 95% BCA Bootstrap UCL | 3421 | | | | 95% Bootstrap t UCL | | | 6410 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3676 | | | | 95% H-UCL (Log ROS) | | 1335 | | | | | | |
| 3677 | | | | | | | | | | | | |
| 3678 | **UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed** | | | | | | | | | | | |
| 3679 | | | | KM Mean (logged) | | 4.794 | | | | 95% H-UCL (KM -Log) | | 1096 |
| 3680 | | | | KM SD (logged) | | 1.85 | | | | 95% Critical H Value (KM-Log) | | 3.093 |
| 3681 | | | | KM Standard Error of Mean (logged) | | 0.192 | | | | | | |
| 3682 | | | | | | | | | | | | |
| 3683 | **DL/2 Statistics** | | | | | | | | | | | |
| 3684 | **DL/2 Normal** | | | | | | | | | **DL/2 Log-Transformed** | | |
| 3685 | | | | Mean in Original Scale | | 1741 | | | | Mean in Log Scale | | 5.194 |
| 3686 | | | | SD in Original Scale | | 7954 | | | | SD in Log Scale | | 1.868 |
| 3687 | | | | 95% t UCL (Assumes normality) | | 2875 | | | | 95% H-Stat UCL | | 1703 |
| 3688 | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | | | | | |
| 3689 | | | | | | | | | | | | |
| 3690 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 3691 | **Detected Data appear Approximate Lognormal Distributed at 5% Significance Level** | | | | | | | | | | | |
| 3692 | | | | | | | | | | | | |
| 3693 | **Suggested UCL to Use** | | | | | | | | | | | |
| 3694 | | | | 95% KM (Chebyshev) UCL | | 4607 | | | | | | |
| 3695 | | | | | | | | | | | | |
| 3696 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 3697 | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | | | | | |
| 3698 | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | | | | | |
| 3699 | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 3700 | | | | | | | | | | | | |
| 3701 | | | | | | | | | | | | |
| 3702 | **Lead** | | | | | | | | | | | |
| 3703 | | | | | | | | | | | | |
| 3704 | **General Statistics** | | | | | | | | | | | |
| 3705 | | | | Total Number of Observations | | 108 | | | | Number of Distinct Observations | | 85 |
| 3706 | | | | | | | | | | Number of Missing Observations | | 0 |
| 3707 | | | | Minimum | | 3.2 | | | | Mean | | 122.9 |
| 3708 | | | | Maximum | | 2000 | | | | Median | | 18.45 |
| 3709 | | | | SD | | 274.9 | | | | Std. Error of Mean | | 26.45 |
| 3710 | | | | Coefficient of Variation | | 2.236 | | | | Skewness | | 5 |
| 3711 | | | | | | | | | | | | |
| 3712 | **Normal GOF Test** | | | | | | | | | | | |
| 3713 | | | | Shapiro Wilk Test Statistic | | 0.463 | | | | **Shapiro Wilk GOF Test** | | |
| 3714 | | | | 5% Shapiro Wilk P Value | | 0 | | | | Data Not Normal at 5% Significance Level | | |
| 3715 | | | | Lilliefors Test Statistic | | 0.332 | | | | **Lilliefors GOF Test** | | |
| 3716 | | | | 5% Lilliefors Critical Value | | 0.0853 | | | | Data Not Normal at 5% Significance Level | | |
| 3717 | **Data Not Normal at 5% Significance Level** | | | | | | | | | | | |
| 3718 | | | | | | | | | | | | |
| 3719 | **Assuming Normal Distribution** | | | | | | | | | | | |
| 3720 | **95% Normal UCL** | | | | | | | | | **95% UCLs (Adjusted for Skewness)** | | |
| 3721 | | | | 95% Student's-t UCL | | 166.8 | | | | 95% Adjusted-CLT UCL (Chen-1995) | | 180 |
| 3722 | | | | | | | | | | 95% Modified-t UCL (Johnson-1978) | | 168.9 |
| 3723 | | | | | | | | | | | | |
| 3724 | **Gamma GOF Test** | | | | | | | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3725 | | | | | A-D Test Statistic | 5.838 | **Anderson-Darling Gamma GOF Test** | | | | | |
| 3726 | | | | | 5% A-D Critical Value | 0.825 | Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 3727 | | | | | K-S Test Statistic | 0.191 | **Kolmogrov-Smirnoff Gamma GOF Test** | | | | | |
| 3728 | | | | | 5% K-S Critical Value | 0.0927 | Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 3729 | **Data Not Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 3730 | | | | | | | | | | | | |
| 3731 | **Gamma Statistics** | | | | | | | | | | | |
| 3732 | | | | | k hat (MLE) | 0.475 | k star (bias corrected MLE) | | | | | 0.468 |
| 3733 | | | | | Theta hat (MLE) | 258.6 | Theta star (bias corrected MLE) | | | | | 262.5 |
| 3734 | | | | | nu hat (MLE) | 102.7 | nu star (bias corrected) | | | | | 101.2 |
| 3735 | | | | | MLE Mean (bias corrected) | 122.9 | MLE Sd (bias corrected) | | | | | 179.6 |
| 3736 | | | | | | | Approximate Chi Square Value (0.05) | | | | | 78.97 |
| 3737 | | | | | Adjusted Level of Significance | 0.0478 | Adjusted Chi Square Value | | | | | 78.7 |
| 3738 | | | | | | | | | | | | |
| 3739 | **Assuming Gamma Distribution** | | | | | | | | | | | |
| 3740 | | | | | 95% Approximate Gamma UCL (use when n>=50)) | 157.5 | 95% Adjusted Gamma UCL (use when n<50) | | | | | 158 |
| 3741 | | | | | | | | | | | | |
| 3742 | **Lognormal GOF Test** | | | | | | | | | | | |
| 3743 | | | | | Shapiro Wilk Test Statistic | 0.887 | **Shapiro Wilk Lognormal GOF Test** | | | | | |
| 3744 | | | | | 5% Shapiro Wilk P Value | 1.503E-11 | Data Not Lognormal at 5% Significance Level | | | | | |
| 3745 | | | | | Lilliefors Test Statistic | 0.179 | **Lilliefors Lognormal GOF Test** | | | | | |
| 3746 | | | | | 5% Lilliefors Critical Value | 0.0853 | Data Not Lognormal at 5% Significance Level | | | | | |
| 3747 | **Data Not Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 3748 | | | | | | | | | | | | |
| 3749 | **Lognormal Statistics** | | | | | | | | | | | |
| 3750 | | | | | Minimum of Logged Data | 1.163 | Mean of logged Data | | | | | 3.465 |
| 3751 | | | | | Maximum of Logged Data | 7.601 | SD of logged Data | | | | | 1.632 |
| 3752 | | | | | | | | | | | | |
| 3753 | **Assuming Lognormal Distribution** | | | | | | | | | | | |
| 3754 | | | | | 95% H-UCL | 190.5 | 90% Chebyshev (MVUE) UCL | | | | | 197.9 |
| 3755 | | | | | 95% Chebyshev (MVUE) UCL | 234.1 | 97.5% Chebyshev (MVUE) UCL | | | | | 284.5 |
| 3756 | | | | | 99% Chebyshev (MVUE) UCL | 383.4 | | | | | | |
| 3757 | | | | | | | | | | | | |
| 3758 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 3759 | **Data do not follow a Discernible Distribution (0.05)** | | | | | | | | | | | |
| 3760 | | | | | | | | | | | | |
| 3761 | **Nonparametric Distribution Free UCLs** | | | | | | | | | | | |
| 3762 | | | | | 95% CLT UCL | 166.4 | 95% Jackknife UCL | | | | | 166.8 |
| 3763 | | | | | 95% Standard Bootstrap UCL | 166.7 | 95% Bootstrap-t UCL | | | | | 206.2 |
| 3764 | | | | | 95% Hall's Bootstrap UCL | 380.7 | 95% Percentile Bootstrap UCL | | | | | 170.7 |
| 3765 | | | | | 95% BCA Bootstrap UCL | 187.5 | | | | | | |
| 3766 | | | | | 90% Chebyshev(Mean, Sd) UCL | 202.3 | 95% Chebyshev(Mean, Sd) UCL | | | | | 238.2 |
| 3767 | | | | | 97.5% Chebyshev(Mean, Sd) UCL | 288.1 | 99% Chebyshev(Mean, Sd) UCL | | | | | 386.1 |
| 3768 | | | | | | | | | | | | |
| 3769 | **Suggested UCL to Use** | | | | | | | | | | | |
| 3770 | | | | | 95% Chebyshev (Mean, Sd) UCL | 238.2 | | | | | | |
| 3771 | | | | | | | | | | | | |
| 3772 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 3773 | These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3774 | and Singh and Singh (2003). However, simulations results will not cover all Real World data sets. | | | | | | | | | | | |
| 3775 | For additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 3776 | | | | | | | | | | | | |
| 3777 | **Mercury** | | | | | | | | | | | |
| 3778 | | | | | | | | | | | | |
| 3779 | **General Statistics** | | | | | | | | | | | |
| 3780 | Total Number of Observations | | | | | 98 | Number of Distinct Observations | | | | | 54 |
| 3781 | Number of Detects | | | | | 89 | Number of Non-Detects | | | | | 9 |
| 3782 | Number of Distinct Detects | | | | | 53 | Number of Distinct Non-Detects | | | | | 3 |
| 3783 | Minimum Detect | | | | | 0.04 | Minimum Non-Detect | | | | | 0.011 |
| 3784 | Maximum Detect | | | | | 9.5 | Maximum Non-Detect | | | | | 0.12 |
| 3785 | Variance Detects | | | | | 1.345 | Percent Non-Detects | | | | | 9.184% |
| 3786 | Mean Detects | | | | | 0.538 | SD Detects | | | | | 1.16 |
| 3787 | Median Detects | | | | | 0.21 | CV Detects | | | | | 2.156 |
| 3788 | Skewness Detects | | | | | 6.011 | Kurtosis Detects | | | | | 42.46 |
| 3789 | Mean of Logged Detects | | | | | -1.333 | SD of Logged Detects | | | | | 1.03 |
| 3790 | | | | | | | | | | | | |
| 3791 | **Normal GOF Test on Detects Only** | | | | | | | | | | | |
| 3792 | Shapiro Wilk Test Statistic | | | | | 0.402 | **Normal GOF Test on Detected Observations Only** | | | | | |
| 3793 | 5% Shapiro Wilk P Value | | | | | 0 | Detected Data Not Normal at 5% Significance Level | | | | | |
| 3794 | Lilliefors Test Statistic | | | | | 0.334 | **Lilliefors GOF Test** | | | | | |
| 3795 | 5% Lilliefors Critical Value | | | | | 0.0939 | Detected Data Not Normal at 5% Significance Level | | | | | |
| 3796 | **Detected Data Not Normal at 5% Significance Level** | | | | | | | | | | | |
| 3797 | | | | | | | | | | | | |
| 3798 | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | | | | | |
| 3799 | Mean | | | | | 0.494 | Standard Error of Mean | | | | | 0.113 |
| 3800 | SD | | | | | 1.107 | 95% KM (BCA) UCL | | | | | 0.714 |
| 3801 | 95% KM (t) UCL | | | | | 0.681 | 95% KM (Percentile Bootstrap) UCL | | | | | 0.714 |
| 3802 | 95% KM (z) UCL | | | | | 0.679 | 95% KM Bootstrap t UCL | | | | | 0.901 |
| 3803 | 90% KM Chebyshev UCL | | | | | 0.832 | 95% KM Chebyshev UCL | | | | | 0.985 |
| 3804 | 97.5% KM Chebyshev UCL | | | | | 1.197 | 99% KM Chebyshev UCL | | | | | 1.614 |
| 3805 | | | | | | | | | | | | |
| 3806 | **Gamma GOF Tests on Detected Observations Only** | | | | | | | | | | | |
| 3807 | A-D Test Statistic | | | | | 5.458 | **Anderson-Darling GOF Test** | | | | | |
| 3808 | 5% A-D Critical Value | | | | | 0.79 | Detected Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 3809 | K-S Test Statistic | | | | | 0.211 | **Kolmogrov-Smirnoff GOF** | | | | | |
| 3810 | 5% K-S Critical Value | | | | | 0.0982 | Detected Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 3811 | **Detected Data Not Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 3812 | | | | | | | | | | | | |
| 3813 | **Gamma Statistics on Detected Data Only** | | | | | | | | | | | |
| 3814 | k hat (MLE) | | | | | 0.829 | k star (bias corrected MLE) | | | | | 0.808 |
| 3815 | Theta hat (MLE) | | | | | 0.649 | Theta star (bias corrected MLE) | | | | | 0.665 |
| 3816 | nu hat (MLE) | | | | | 147.5 | nu star (bias corrected) | | | | | 143.9 |
| 3817 | MLE Mean (bias corrected) | | | | | 0.538 | MLE Sd (bias corrected) | | | | | 0.598 |
| 3818 | | | | | | | | | | | | |
| 3819 | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | | | | | |
| 3820 | k hat (KM) | | | | | 0.199 | nu hat (KM) | | | | | 39.06 |
| 3821 | Approximate Chi Square Value (39.06, α) | | | | | 25.74 | Adjusted Chi Square Value (39.06, β) | | | | | 25.58 |
| 3822 | 95% Gamma Approximate KM-UCL (use when n>=50) | | | | | 0.75 | 95% Gamma Adjusted KM-UCL (use when n<50) | | | | | 0.755 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3823 | | | | | | | | | | | | |
| 3824 | **Gamma ROS Statistics using Imputed Non-Detects** | | | | | | | | | | | |
| 3825 | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | | | | |
| 3826 | GROS may not be used when kstar of detected data is small such as < 0.1 | | | | | | | | | | | |
| 3827 | For such situations, GROS method tends to yield inflated values of UCLs and BTVs | | | | | | | | | | | |
| 3828 | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | | | | |
| 3829 | | | | | Minimum | 0.01 | | | | Mean | 0.489 | |
| 3830 | | | | | Maximum | 9.5 | | | | Median | 0.2 | |
| 3831 | | | | | SD | 1.115 | | | | CV | 2.278 | |
| 3832 | | | | | k hat (MLE) | 0.663 | | | | k star (bias corrected MLE) | 0.649 | |
| 3833 | | | | | Theta hat (MLE) | 0.738 | | | | Theta star (bias corrected MLE) | 0.754 | |
| 3834 | | | | | nu hat (MLE) | 129.9 | | | | nu star (bias corrected) | 127.3 | |
| 3835 | | | | | MLE Mean (bias corrected) | 0.489 | | | | MLE Sd (bias corrected) | 0.607 | |
| 3836 | | | | | | | | | | Adjusted Level of Significance (β) | 0.0476 | |
| 3837 | | | | | Approximate Chi Square Value (127.28, α) | 102.2 | | | | Adjusted Chi Square Value (127.28, β) | 101.9 | |
| 3838 | | | | | 95% Gamma Approximate UCL (use when n>=50) | 0.609 | | | | 95% Gamma Adjusted UCL (use when n<50) | 0.611 | |
| 3839 | | | | | | | | | | | | |
| 3840 | **Lognormal GOF Test on Detected Observations Only** | | | | | | | | | | | |
| 3841 | | | | | Lilliefors Test Statistic | 0.126 | | | | **Lilliefors GOF Test** | | |
| 3842 | | | | | 5% Lilliefors Critical Value | 0.0939 | | | | Detected Data Not Lognormal at 5% Significance Level | | |
| 3843 | **Detected Data Not Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 3844 | | | | | | | | | | | | |
| 3845 | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | | | | | |
| 3846 | | | | | Mean in Original Scale | 0.494 | | | | Mean in Log Scale | -1.486 | |
| 3847 | | | | | SD in Original Scale | 1.113 | | | | SD in Log Scale | 1.107 | |
| 3848 | | | | | 95% t UCL (assumes normality of ROS data) | 0.68 | | | | 95% Percentile Bootstrap UCL | 0.687 | |
| 3849 | | | | | 95% BCA Bootstrap UCL | 0.802 | | | | 95% Bootstrap t UCL | 0.892 | |
| 3850 | | | | | 95% H-UCL (Log ROS) | 0.544 | | | | | | |
| 3851 | | | | | | | | | | | | |
| 3852 | **DL/2 Statistics** | | | | | | | | | | | |
| 3853 | **DL/2 Normal** | | | | | | | | | **DL/2 Log-Transformed** | | |
| 3854 | | | | | Mean in Original Scale | 0.493 | | | | Mean in Log Scale | -1.496 | |
| 3855 | | | | | SD in Original Scale | 1.113 | | | | SD in Log Scale | 1.131 | |
| 3856 | | | | | 95% t UCL (Assumes normality) | 0.68 | | | | 95% H-Stat UCL | 0.559 | |
| 3857 | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | | | | | |
| 3858 | | | | | | | | | | | | |
| 3859 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 3860 | **Data do not follow a Discernible Distribution at 5% Significance Level** | | | | | | | | | | | |
| 3861 | | | | | | | | | | | | |
| 3862 | **Suggested UCL to Use** | | | | | | | | | | | |
| 3863 | | | | | 95% KM (Chebyshev) UCL | 0.985 | | | | | | |
| 3864 | | | | | | | | | | | | |
| 3865 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 3866 | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | | | | | |
| 3867 | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | | | | | |
| 3868 | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 3869 | | | | | | | | | | | | |
| 3870 | **Methyl Tert Butyl Ether** | | | | | | | | | | | |
| 3871 | | | | | | | | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3872 | **General Statistics** | | | | | | | | | | | |
| 3873 | | | | Total Number of Observations | | 14 | | | Number of Distinct Observations | | | 11 |
| 3874 | | | | Number of Detects | | 1 | | | Number of Non-Detects | | | 13 |
| 3875 | | | | Number of Distinct Detects | | 1 | | | Number of Distinct Non-Detects | | | 10 |
| 3876 | | | | | | | | | | | | |
| 3877 | **Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!** | | | | | | | | | | | |
| 3878 | **It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).** | | | | | | | | | | | |
| 3879 | | | | | | | | | | | | |
| 3880 | **The data set for variable Methyl Tert Butyl Ether was not processed!** | | | | | | | | | | | |
| 3881 | | | | | | | | | | | | |
| 3882 | | | | | | | | | | | | |
| 3883 | **Methylene chloride** | | | | | | | | | | | |
| 3884 | | | | | | | | | | | | |
| 3885 | **General Statistics** | | | | | | | | | | | |
| 3886 | | | | Total Number of Observations | | 10 | | | Number of Distinct Observations | | | 6 |
| 3887 | | | | Number of Detects | | 4 | | | Number of Non-Detects | | | 6 |
| 3888 | | | | Number of Distinct Detects | | 4 | | | Number of Distinct Non-Detects | | | 3 |
| 3889 | | | | Minimum Detect | | 2.1 | | | Minimum Non-Detect | | | 6 |
| 3890 | | | | Maximum Detect | | 7 | | | Maximum Non-Detect | | | 5000 |
| 3891 | | | | Variance Detects | | 5.309 | | | Percent Non-Detects | | | 60% |
| 3892 | | | | Mean Detects | | 4.575 | | | SD Detects | | | 2.304 |
| 3893 | | | | Median Detects | | 4.6 | | | CV Detects | | | 0.504 |
| 3894 | | | | Skewness Detects | | -0.033 | | | Kurtosis Detects | | | -4.063 |
| 3895 | | | | Mean of Logged Detects | | 1.411 | | | SD of Logged Detects | | | 0.56 |
| 3896 | | | | | | | | | | | | |
| 3897 | **Normal GOF Test on Detects Only** | | | | | | | | | | | |
| 3898 | | | | Shapiro Wilk Test Statistic | | 0.924 | | | **Shapiro Wilk GOF Test** | | | |
| 3899 | | | | 5% Shapiro Wilk Critical Value | | 0.748 | | | Detected Data appear Normal at 5% Significance Level | | | |
| 3900 | | | | Lilliefors Test Statistic | | 0.232 | | | **Lilliefors GOF Test** | | | |
| 3901 | | | | 5% Lilliefors Critical Value | | 0.443 | | | Detected Data appear Normal at 5% Significance Level | | | |
| 3902 | **Detected Data appear Normal at 5% Significance Level** | | | | | | | | | | | |
| 3903 | | | | | | | | | | | | |
| 3904 | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | | | | | |
| 3905 | | | | Mean | | 3.559 | | | Standard Error of Mean | | | 0.737 |
| 3906 | | | | SD | | 1.712 | | | 95% KM (BCA) UCL | | | N/A |
| 3907 | | | | 95% KM (t) UCL | | 4.91 | | | 95% KM (Percentile Bootstrap) UCL | | | N/A |
| 3908 | | | | 95% KM (z) UCL | | 4.771 | | | 95% KM Bootstrap t UCL | | | N/A |
| 3909 | | | | 90% KM Chebyshev UCL | | 5.77 | | | 95% KM Chebyshev UCL | | | 6.771 |
| 3910 | | | | 97.5% KM Chebyshev UCL | | 8.161 | | | 99% KM Chebyshev UCL | | | 10.89 |
| 3911 | | | | | | | | | | | | |
| 3912 | **Gamma GOF Tests on Detected Observations Only** | | | | | | | | | | | |
| 3913 | | | | A-D Test Statistic | | 0.326 | | | **Anderson-Darling GOF Test** | | | |
| 3914 | | | | 5% A-D Critical Value | | 0.659 | | | Detected data appear Gamma Distributed at 5% Significance Level | | | |
| 3915 | | | | K-S Test Statistic | | 0.278 | | | **Kolmogrov-Smirnoff GOF** | | | |
| 3916 | | | | 5% K-S Critical Value | | 0.396 | | | Detected data appear Gamma Distributed at 5% Significance Level | | | |
| 3917 | **Detected data appear Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 3918 | | | | | | | | | | | | |
| 3919 | **Gamma Statistics on Detected Data Only** | | | | | | | | | | | |
| 3920 | | | | k hat (MLE) | | 4.709 | | | k star (bias corrected MLE) | | | 1.344 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3921 | | | | | Theta hat (MLE) | 0.972 | | | | Theta star (bias corrected MLE) | | 3.404 |
| 3922 | | | | | nu hat (MLE) | 37.67 | | | | nu star (bias corrected) | | 10.75 |
| 3923 | | | | | MLE Mean (bias corrected) | 4.575 | | | | MLE Sd (bias corrected) | | 3.946 |
| 3924 | | | | | | | | | | | | |
| 3925 | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | | | | | |
| 3926 | | | | | k hat (KM) | 4.319 | | | | nu hat (KM) | | 86.38 |
| 3927 | | | | | Approximate Chi Square Value (86.38, α) | 65.96 | | | | Adjusted Chi Square Value (86.38, β) | | 62.86 |
| 3928 | | | | | 95% Gamma Approximate KM-UCL (use when n>=50) | 4.661 | | | | 95% Gamma Adjusted KM-UCL (use when n<50) | | 4.89 |
| 3929 | | | | | | | | | | | | |
| 3930 | **Gamma ROS Statistics using Imputed Non-Detects** | | | | | | | | | | | |
| 3931 | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | | | | |
| 3932 | GROS may not be used when kstar of detected data is small such as < 0.1 | | | | | | | | | | | |
| 3933 | For such situations, GROS method tends to yield inflated values of UCLs and BTVs | | | | | | | | | | | |
| 3934 | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | | | | |
| 3935 | | | | | Minimum | 1.629 | | | | Mean | | 3.576 |
| 3936 | | | | | Maximum | 7 | | | | Median | | 3.162 |
| 3937 | | | | | SD | 1.69 | | | | CV | | 0.473 |
| 3938 | | | | | k hat (MLE) | 5.664 | | | | k star (bias corrected MLE) | | 4.031 |
| 3939 | | | | | Theta hat (MLE) | 0.631 | | | | Theta star (bias corrected MLE) | | 0.887 |
| 3940 | | | | | nu hat (MLE) | 113.3 | | | | nu star (bias corrected) | | 80.63 |
| 3941 | | | | | MLE Mean (bias corrected) | 3.576 | | | | MLE Sd (bias corrected) | | 1.781 |
| 3942 | | | | | | | | | | Adjusted Level of Significance (β) | | 0.0267 |
| 3943 | | | | | Approximate Chi Square Value (80.63, α) | 60.94 | | | | Adjusted Chi Square Value (80.63, β) | | 57.97 |
| 3944 | | | | | 95% Gamma Approximate UCL (use when n>=50) | 4.732 | | | | 95% Gamma Adjusted UCL (use when n<50) | | N/A |
| 3945 | | | | | | | | | | | | |
| 3946 | **Lognormal GOF Test on Detected Observations Only** | | | | | | | | | | | |
| 3947 | | | | | Shapiro Wilk Test Statistic | 0.925 | | | | **Shapiro Wilk GOF Test** | | |
| 3948 | | | | | 5% Shapiro Wilk Critical Value | 0.748 | | | | Detected Data appear Lognormal at 5% Significance Level | | |
| 3949 | | | | | Lilliefors Test Statistic | 0.252 | | | | **Lilliefors GOF Test** | | |
| 3950 | | | | | 5% Lilliefors Critical Value | 0.443 | | | | Detected Data appear Lognormal at 5% Significance Level | | |
| 3951 | **Detected Data appear Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 3952 | | | | | | | | | | | | |
| 3953 | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | | | | | |
| 3954 | | | | | Mean in Original Scale | 3.518 | | | | Mean in Log Scale | | 1.17 |
| 3955 | | | | | SD in Original Scale | 1.685 | | | | SD in Log Scale | | 0.428 |
| 3956 | | | | | 95% t UCL (assumes normality of ROS data) | 4.494 | | | | 95% Percentile Bootstrap UCL | | 4.376 |
| 3957 | | | | | 95% BCA Bootstrap UCL | 4.577 | | | | 95% Bootstrap t UCL | | 5.724 |
| 3958 | | | | | 95% H-UCL (Log ROS) | 4.78 | | | | | | |
| 3959 | | | | | | | | | | | | |
| 3960 | **UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed** | | | | | | | | | | | |
| 3961 | | | | | KM Mean (logged) | 1.169 | | | | 95% H-UCL (KM -Log) | | 4.798 |
| 3962 | | | | | KM SD (logged) | 0.431 | | | | 95% Critical H Value (KM-Log) | | 2.128 |
| 3963 | | | | | KM Standard Error of Mean (logged) | 0.203 | | | | | | |
| 3964 | | | | | | | | | | | | |
| 3965 | **DL/2 Statistics** | | | | | | | | | | | |
| 3966 | **DL/2 Normal** | | | | | | | | | **DL/2 Log-Transformed** | | |
| 3967 | | | | | Mean in Original Scale | 253.3 | | | | Mean in Log Scale | | 1.9 |
| 3968 | | | | | SD in Original Scale | 789.4 | | | | SD in Log Scale | | 2.112 |
| 3969 | | | | | 95% t UCL (Assumes normality) | 710.9 | | | | 95% H-Stat UCL | | 3360 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3970 | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | | | | | |
| 3971 | | | | | | | | | | | | |
| 3972 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 3973 | **Detected Data appear Normal Distributed at 5% Significance Level** | | | | | | | | | | | |
| 3974 | | | | | | | | | | | | |
| 3975 | **Suggested UCL to Use** | | | | | | | | | | | |
| 3976 | 95% KM (t) UCL | | | | 4.91 | | 95% KM (Percentile Bootstrap) UCL | | | | | N/A |
| 3977 | **Warning: One or more Recommended UCL(s) not available!** | | | | | | | | | | | |
| 3978 | | | | | | | | | | | | |
| 3979 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 3980 | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | | | | | |
| 3981 | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | | | | | |
| 3982 | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 3983 | | | | | | | | | | | | |
| 3984 | **Molybdenum** | | | | | | | | | | | |
| 3985 | | | | | | | | | | | | |
| 3986 | **General Statistics** | | | | | | | | | | | |
| 3987 | Total Number of Observations | | | | 97 | | Number of Distinct Observations | | | | | 67 |
| 3988 | Number of Detects | | | | 82 | | Number of Non-Detects | | | | | 15 |
| 3989 | Number of Distinct Detects | | | | 60 | | Number of Distinct Non-Detects | | | | | 10 |
| 3990 | Minimum Detect | | | | 0.076 | | Minimum Non-Detect | | | | | 0.45 |
| 3991 | Maximum Detect | | | | 46 | | Maximum Non-Detect | | | | | 3.7 |
| 3992 | Variance Detects | | | | 55.03 | | Percent Non-Detects | | | | | 15.46% |
| 3993 | Mean Detects | | | | 2.761 | | SD Detects | | | | | 7.418 |
| 3994 | Median Detects | | | | 0.38 | | CV Detects | | | | | 2.687 |
| 3995 | Skewness Detects | | | | 4.082 | | Kurtosis Detects | | | | | 17.84 |
| 3996 | Mean of Logged Detects | | | | -0.528 | | SD of Logged Detects | | | | | 1.504 |
| 3997 | | | | | | | | | | | | |
| 3998 | **Normal GOF Test on Detects Only** | | | | | | | | | | | |
| 3999 | Shapiro Wilk Test Statistic | | | | 0.407 | | **Normal GOF Test on Detected Observations Only** | | | | | |
| 4000 | 5% Shapiro Wilk P Value | | | | 0 | | Detected Data Not Normal at 5% Significance Level | | | | | |
| 4001 | Lilliefors Test Statistic | | | | 0.368 | | **Lilliefors GOF Test** | | | | | |
| 4002 | 5% Lilliefors Critical Value | | | | 0.0978 | | Detected Data Not Normal at 5% Significance Level | | | | | |
| 4003 | **Detected Data Not Normal at 5% Significance Level** | | | | | | | | | | | |
| 4004 | | | | | | | | | | | | |
| 4005 | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | | | | | |
| 4006 | Mean | | | | 2.406 | | Standard Error of Mean | | | | | 0.699 |
| 4007 | SD | | | | 6.834 | | 95% KM (BCA) UCL | | | | | 3.739 |
| 4008 | 95% KM (t) UCL | | | | 3.566 | | 95% KM (Percentile Bootstrap) UCL | | | | | 3.627 |
| 4009 | 95% KM (z) UCL | | | | 3.555 | | 95% KM Bootstrap t UCL | | | | | 4.372 |
| 4010 | 90% KM Chebyshev UCL | | | | 4.501 | | 95% KM Chebyshev UCL | | | | | 5.451 |
| 4011 | 97.5% KM Chebyshev UCL | | | | 6.768 | | 99% KM Chebyshev UCL | | | | | 9.356 |
| 4012 | | | | | | | | | | | | |
| 4013 | **Gamma GOF Tests on Detected Observations Only** | | | | | | | | | | | |
| 4014 | A-D Test Statistic | | | | 8.769 | | **Anderson-Darling GOF Test** | | | | | |
| 4015 | 5% A-D Critical Value | | | | 0.837 | | Detected Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 4016 | K-S Test Statistic | | | | 0.238 | | **Kolmogrov-Smirnoff GOF** | | | | | |
| 4017 | 5% K-S Critical Value | | | | 0.105 | | Detected Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 4018 | **Detected Data Not Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |

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| 4019 | | | | | | | | | | | | |
| 4020 | **Gamma Statistics on Detected Data Only** | | | | | | | | | | | |
| 4021 | | | | | k hat (MLE) | 0.423 | | | k star (bias corrected MLE) | 0.415 | | |
| 4022 | | | | | Theta hat (MLE) | 6.533 | | | Theta star (bias corrected MLE) | 6.648 | | |
| 4023 | | | | | nu hat (MLE) | 69.31 | | | nu star (bias corrected) | 68.11 | | |
| 4024 | | | | | MLE Mean (bias corrected) | 2.761 | | | MLE Sd (bias corrected) | 4.284 | | |
| 4025 | | | | | | | | | | | | |
| 4026 | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | | | | | |
| 4027 | | | | | k hat (KM) | 0.124 | | | nu hat (KM) | 24.04 | | |
| 4028 | | | | | Approximate Chi Square Value (24.04, α) | 13.88 | | | Adjusted Chi Square Value (24.04, β) | 13.76 | | |
| 4029 | | | | | 95% Gamma Approximate KM-UCL (use when n>=50) | 4.167 | | | 95% Gamma Adjusted KM-UCL (use when n<50) | 4.202 | | |
| 4030 | | | | | | | | | | | | |
| 4031 | **Gamma ROS Statistics using Imputed Non-Detects** | | | | | | | | | | | |
| 4032 | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | | | | |
| 4033 | GROS may not be used when kstar of detected data is small such as < 0.1 | | | | | | | | | | | |
| 4034 | For such situations, GROS method tends to yield inflated values of UCLs and BTVs | | | | | | | | | | | |
| 4035 | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | | | | |
| 4036 | | | | | Minimum | 0.01 | | | Mean | 2.377 | | |
| 4037 | | | | | Maximum | 46 | | | Median | 0.31 | | |
| 4038 | | | | | SD | 6.877 | | | CV | 2.893 | | |
| 4039 | | | | | k hat (MLE) | 0.358 | | | k star (bias corrected MLE) | 0.353 | | |
| 4040 | | | | | Theta hat (MLE) | 6.65 | | | Theta star (bias corrected MLE) | 6.728 | | |
| 4041 | | | | | nu hat (MLE) | 69.36 | | | nu star (bias corrected) | 68.55 | | |
| 4042 | | | | | MLE Mean (bias corrected) | 2.377 | | | MLE Sd (bias corrected) | 3.999 | | |
| 4043 | | | | | | | | | Adjusted Level of Significance (β) | 0.0475 | | |
| 4044 | | | | | Approximate Chi Square Value (68.55, α) | 50.49 | | | Adjusted Chi Square Value (68.55, β) | 50.26 | | |
| 4045 | | | | | 95% Gamma Approximate UCL (use when n>=50) | 3.228 | | | 95% Gamma Adjusted UCL (use when n<50) | 3.243 | | |
| 4046 | | | | | | | | | | | | |
| 4047 | **Lognormal GOF Test on Detected Observations Only** | | | | | | | | | | | |
| 4048 | | | | | Lilliefors Test Statistic | 0.136 | | | **Lilliefors GOF Test** | | | |
| 4049 | | | | | 5% Lilliefors Critical Value | 0.0978 | | | Detected Data Not Lognormal at 5% Significance Level | | | |
| 4050 | **Detected Data Not Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 4051 | | | | | | | | | | | | |
| 4052 | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | | | | | |
| 4053 | | | | | Mean in Original Scale | 2.397 | | | Mean in Log Scale | -0.608 | | |
| 4054 | | | | | SD in Original Scale | 6.868 | | | SD in Log Scale | 1.41 | | |
| 4055 | | | | | 95% t UCL (assumes normality of ROS data) | 3.556 | | | 95% Percentile Bootstrap UCL | 3.677 | | |
| 4056 | | | | | 95% BCA Bootstrap UCL | 3.88 | | | 95% Bootstrap t UCL | 4.168 | | |
| 4057 | | | | | 95% H-UCL (Log ROS) | 2.168 | | | | | | |
| 4058 | | | | | | | | | | | | |
| 4059 | **DL/2 Statistics** | | | | | | | | | | | |
| 4060 | **DL/2 Normal** | | | | | | | | **DL/2 Log-Transformed** | | | |
| 4061 | | | | | Mean in Original Scale | 2.498 | | | Mean in Log Scale | -0.494 | | |
| 4062 | | | | | SD in Original Scale | 6.848 | | | SD in Log Scale | 1.432 | | |
| 4063 | | | | | 95% t UCL (Assumes normality) | 3.653 | | | 95% H-Stat UCL | 2.531 | | |
| 4064 | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | | | | | |
| 4065 | | | | | | | | | | | | |
| 4066 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 4067 | **Data do not follow a Discernible Distribution at 5% Significance Level** | | | | | | | | | | | |

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| 4068 | | | | | | | | | | | | |
| 4069 | **Suggested UCL to Use** | | | | | | | | | | | |
| 4070 | 97.5% KM (Chebyshev) UCL | | | | 6.768 | | | | | | | |
| 4071 | | | | | | | | | | | | |
| 4072 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 4073 | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | | | | | |
| 4074 | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | | | | | |
| 4075 | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 4076 | | | | | | | | | | | | |
| 4077 | **Naphthalene** | | | | | | | | | | | |
| 4078 | | | | | | | | | | | | |
| 4079 | **General Statistics** | | | | | | | | | | | |
| 4080 | Total Number of Observations | | | | 135 | | | Number of Distinct Observations | | | 63 | |
| 4081 | Number of Detects | | | | 30 | | | Number of Non-Detects | | | 105 | |
| 4082 | Number of Distinct Detects | | | | 27 | | | Number of Distinct Non-Detects | | | 42 | |
| 4083 | Minimum Detect | | | | 5.9 | | | Minimum Non-Detect | | | 5.8 | |
| 4084 | Maximum Detect | | | | 77000 | | | Maximum Non-Detect | | | 6900 | |
| 4085 | Variance Detects | | | | 1.974E+8 | | | Percent Non-Detects | | | 77.78% | |
| 4086 | Mean Detects | | | | 3215 | | | SD Detects | | | 14049 | |
| 4087 | Median Detects | | | | 230 | | | CV Detects | | | 4.37 | |
| 4088 | Skewness Detects | | | | 5.347 | | | Kurtosis Detects | | | 28.94 | |
| 4089 | Mean of Logged Detects | | | | 5.237 | | | SD of Logged Detects | | | 2.027 | |
| 4090 | | | | | | | | | | | | |
| 4091 | **Normal GOF Test on Detects Only** | | | | | | | | | | | |
| 4092 | Shapiro Wilk Test Statistic | | | | 0.24 | | | **Shapiro Wilk GOF Test** | | | | |
| 4093 | 5% Shapiro Wilk Critical Value | | | | 0.927 | | | Detected Data Not Normal at 5% Significance Level | | | | |
| 4094 | Lilliefors Test Statistic | | | | 0.449 | | | **Lilliefors GOF Test** | | | | |
| 4095 | 5% Lilliefors Critical Value | | | | 0.162 | | | Detected Data Not Normal at 5% Significance Level | | | | |
| 4096 | **Detected Data Not Normal at 5% Significance Level** | | | | | | | | | | | |
| 4097 | | | | | | | | | | | | |
| 4098 | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | | | | | |
| 4099 | Mean | | | | 750.9 | | | Standard Error of Mean | | | 581.7 | |
| 4100 | SD | | | | 6644 | | | 95% KM (BCA) UCL | | | 1898 | |
| 4101 | 95% KM (t) UCL | | | | 1714 | | | 95% KM (Percentile Bootstrap) UCL | | | 1894 | |
| 4102 | 95% KM (z) UCL | | | | 1708 | | | 95% KM Bootstrap t UCL | | | 16221 | |
| 4103 | 90% KM Chebyshev UCL | | | | 2496 | | | 95% KM Chebyshev UCL | | | 3286 | |
| 4104 | 97.5% KM Chebyshev UCL | | | | 4383 | | | 99% KM Chebyshev UCL | | | 6538 | |
| 4105 | | | | | | | | | | | | |
| 4106 | **Gamma GOF Tests on Detected Observations Only** | | | | | | | | | | | |
| 4107 | A-D Test Statistic | | | | 4.096 | | | **Anderson-Darling GOF Test** | | | | |
| 4108 | 5% A-D Critical Value | | | | 0.879 | | | Detected Data Not Gamma Distributed at 5% Significance Level | | | | |
| 4109 | K-S Test Statistic | | | | 0.345 | | | **Kolmogrov-Smirnoff GOF** | | | | |
| 4110 | 5% K-S Critical Value | | | | 0.176 | | | Detected Data Not Gamma Distributed at 5% Significance Level | | | | |
| 4111 | **Detected Data Not Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 4112 | | | | | | | | | | | | |
| 4113 | **Gamma Statistics on Detected Data Only** | | | | | | | | | | | |
| 4114 | k hat (MLE) | | | | 0.25 | | | k star (bias corrected MLE) | | | 0.247 | |
| 4115 | Theta hat (MLE) | | | | 12849 | | | Theta star (bias corrected MLE) | | | 12995 | |
| 4116 | nu hat (MLE) | | | | 15.01 | | | nu star (bias corrected) | | | 14.84 | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4117 | MLE Mean (bias corrected) | | | | | 3215 | MLE Sd (bias corrected) | | | | | 6463 |
| 4118 | | | | | | | | | | | | |
| 4119 | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | | | | | |
| 4120 | k hat (KM) | | | | | 0.0128 | nu hat (KM) | | | | | 3.449 |
| 4121 | Approximate Chi Square Value (3.45, α) | | | | | 0.517 | Adjusted Chi Square Value (3.45, β) | | | | | 0.506 |
| 4122 | 95% Gamma Approximate KM-UCL (use when n>=50) | | | | | 5009 | 95% Gamma Adjusted KM-UCL (use when n<50) | | | | | 5118 |
| 4123 | Gamma (KM) may not be used when k hat (KM) is < 0.1 | | | | | | | | | | | |
| 4124 | | | | | | | | | | | | |
| 4125 | **Gamma ROS Statistics using Imputed Non-Detects** | | | | | | | | | | | |
| 4126 | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | | | | |
| 4127 | GROS may not be used when kstar of detected data is small such as < 0.1 | | | | | | | | | | | |
| 4128 | For such situations, GROS method tends to yield inflated values of UCLs and BTVs | | | | | | | | | | | |
| 4129 | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | | | | |
| 4130 | Minimum | | | | | 0.01 | Mean | | | | | 714.4 |
| 4131 | Maximum | | | | | 77000 | Median | | | | | 0.01 |
| 4132 | SD | | | | | 6672 | CV | | | | | 9.339 |
| 4133 | k hat (MLE) | | | | | 0.0914 | k star (bias corrected MLE) | | | | | 0.0943 |
| 4134 | Theta hat (MLE) | | | | | 7820 | Theta star (bias corrected MLE) | | | | | 7579 |
| 4135 | nu hat (MLE) | | | | | 24.67 | nu star (bias corrected) | | | | | 25.45 |
| 4136 | MLE Mean (bias corrected) | | | | | 714.4 | MLE Sd (bias corrected) | | | | | 2327 |
| 4137 | | | | | | | Adjusted Level of Significance (β) | | | | | 0.0482 |
| 4138 | Approximate Chi Square Value (25.45, α) | | | | | 14.96 | Adjusted Chi Square Value (25.45, β) | | | | | 14.87 |
| 4139 | 95% Gamma Approximate UCL (use when n>=50) | | | | | 1216 | 95% Gamma Adjusted UCL (use when n<50) | | | | | 1223 |
| 4140 | | | | | | | | | | | | |
| 4141 | **Lognormal GOF Test on Detected Observations Only** | | | | | | | | | | | |
| 4142 | Shapiro Wilk Test Statistic | | | | | 0.949 | **Shapiro Wilk GOF Test** | | | | | |
| 4143 | 5% Shapiro Wilk Critical Value | | | | | 0.927 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 4144 | Lilliefors Test Statistic | | | | | 0.145 | **Lilliefors GOF Test** | | | | | |
| 4145 | 5% Lilliefors Critical Value | | | | | 0.162 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 4146 | **Detected Data appear Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 4147 | | | | | | | | | | | | |
| 4148 | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | | | | | |
| 4149 | Mean in Original Scale | | | | | 738.2 | Mean in Log Scale | | | | | 3.451 |
| 4150 | SD in Original Scale | | | | | 6669 | SD in Log Scale | | | | | 1.645 |
| 4151 | 95% t UCL (assumes normality of ROS data) | | | | | 1689 | 95% Percentile Bootstrap UCL | | | | | 1859 |
| 4152 | 95% BCA Bootstrap UCL | | | | | 2908 | 95% Bootstrap t UCL | | | | | 18893 |
| 4153 | 95% H-UCL (Log ROS) | | | | | 183.2 | | | | | | |
| 4154 | | | | | | | | | | | | |
| 4155 | **UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed** | | | | | | | | | | | |
| 4156 | KM Mean (logged) | | | | | 3.669 | 95% H-UCL (KM -Log) | | | | | 183.8 |
| 4157 | KM SD (logged) | | | | | 1.537 | 95% Critical H Value (KM-Log) | | | | | 2.737 |
| 4158 | KM Standard Error of Mean (logged) | | | | | 0.237 | | | | | | |
| 4159 | | | | | | | | | | | | |
| 4160 | **DL/2 Statistics** | | | | | | | | | | | |
| 4161 | **DL/2 Normal** | | | | | | **DL/2 Log-Transformed** | | | | | |
| 4162 | Mean in Original Scale | | | | | 973.1 | Mean in Log Scale | | | | | 4.795 |
| 4163 | SD in Original Scale | | | | | 6664 | SD in Log Scale | | | | | 1.608 |
| 4164 | 95% t UCL (Assumes normality) | | | | | 1923 | 95% H-Stat UCL | | | | | 650.6 |
| 4165 | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | | | | | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4166 | | | | | | | | | | | | |
| 4167 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 4168 | **Detected Data appear Lognormal Distributed at 5% Significance Level** | | | | | | | | | | | |
| 4169 | | | | | | | | | | | | |
| 4170 | **Suggested UCL to Use** | | | | | | | | | | | |
| 4171 | 97.5% KM (Chebyshev) UCL | | | | | 4383 | | | | | | |
| 4172 | | | | | | | | | | | | |
| 4173 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 4174 | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | | | | | |
| 4175 | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | | | | | |
| 4176 | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 4177 | | | | | | | | | | | | |
| 4178 | | | | | | | | | | | | |
| 4179 | **Nickel** | | | | | | | | | | | |
| 4180 | | | | | | | | | | | | |
| 4181 | **General Statistics** | | | | | | | | | | | |
| 4182 | Total Number of Observations | | | | | 104 | Number of Distinct Observations | | | | | 65 |
| 4183 | | | | | | | Number of Missing Observations | | | | | 0 |
| 4184 | Minimum | | | | | 18.3 | Mean | | | | | 98.95 |
| 4185 | Maximum | | | | | 570 | Median | | | | | 86 |
| 4186 | SD | | | | | 70.87 | Std. Error of Mean | | | | | 6.949 |
| 4187 | Coefficient of Variation | | | | | 0.716 | Skewness | | | | | 3.377 |
| 4188 | | | | | | | | | | | | |
| 4189 | **Normal GOF Test** | | | | | | | | | | | |
| 4190 | Shapiro Wilk Test Statistic | | | | | 0.756 | **Shapiro Wilk GOF Test** | | | | | |
| 4191 | 5% Shapiro Wilk P Value | | | | | 0 | Data Not Normal at 5% Significance Level | | | | | |
| 4192 | Lilliefors Test Statistic | | | | | 0.162 | **Lilliefors GOF Test** | | | | | |
| 4193 | 5% Lilliefors Critical Value | | | | | 0.0869 | Data Not Normal at 5% Significance Level | | | | | |
| 4194 | **Data Not Normal at 5% Significance Level** | | | | | | | | | | | |
| 4195 | | | | | | | | | | | | |
| 4196 | **Assuming Normal Distribution** | | | | | | | | | | | |
| 4197 | **95% Normal UCL** | | | | | | **95% UCLs (Adjusted for Skewness)** | | | | | |
| 4198 | 95% Student's-t UCL | | | | | 110.5 | 95% Adjusted-CLT UCL (Chen-1995) | | | | | 112.8 |
| 4199 | | | | | | | 95% Modified-t UCL (Johnson-1978) | | | | | 110.9 |
| 4200 | | | | | | | | | | | | |
| 4201 | **Gamma GOF Test** | | | | | | | | | | | |
| 4202 | A-D Test Statistic | | | | | 0.671 | **Anderson-Darling Gamma GOF Test** | | | | | |
| 4203 | 5% A-D Critical Value | | | | | 0.759 | Detected data appear Gamma Distributed at 5% Significance Level | | | | | |
| 4204 | K-S Test Statistic | | | | | 0.0754 | **Kolmogrov-Smirnoff Gamma GOF Test** | | | | | |
| 4205 | 5% K-S Critical Value | | | | | 0.0891 | Detected data appear Gamma Distributed at 5% Significance Level | | | | | |
| 4206 | **Detected data appear Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 4207 | | | | | | | | | | | | |
| 4208 | **Gamma Statistics** | | | | | | | | | | | |
| 4209 | k hat (MLE) | | | | | 2.934 | k star (bias corrected MLE) | | | | | 2.856 |
| 4210 | Theta hat (MLE) | | | | | 33.72 | Theta star (bias corrected MLE) | | | | | 34.64 |
| 4211 | nu hat (MLE) | | | | | 610.3 | nu star (bias corrected) | | | | | 594.1 |
| 4212 | MLE Mean (bias corrected) | | | | | 98.95 | MLE Sd (bias corrected) | | | | | 58.55 |
| 4213 | | | | | | | Approximate Chi Square Value (0.05) | | | | | 538.5 |
| 4214 | Adjusted Level of Significance | | | | | 0.0477 | Adjusted Chi Square Value | | | | | 537.8 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4215 | | | | | | | | | | | | |
| 4216 | **Assuming Gamma Distribution** | | | | | | | | | | | |
| 4217 | 95% Approximate Gamma UCL (use when n>=50) | | | | | 109.1 | 95% Adjusted Gamma UCL (use when n<50) | | | | | 109.3 |
| 4218 | | | | | | | | | | | | |
| 4219 | **Lognormal GOF Test** | | | | | | | | | | | |
| 4220 | Shapiro Wilk Test Statistic | | | | | 0.991 | **Shapiro Wilk Lognormal GOF Test** | | | | | |
| 4221 | 5% Shapiro Wilk P Value | | | | | 0.966 | Data appear Lognormal at 5% Significance Level | | | | | |
| 4222 | Lilliefors Test Statistic | | | | | 0.0432 | **Lilliefors Lognormal GOF Test** | | | | | |
| 4223 | 5% Lilliefors Critical Value | | | | | 0.0869 | Data appear Lognormal at 5% Significance Level | | | | | |
| 4224 | **Data appear Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 4225 | | | | | | | | | | | | |
| 4226 | **Lognormal Statistics** | | | | | | | | | | | |
| 4227 | Minimum of Logged Data | | | | | 2.907 | Mean of logged Data | | | | | 4.415 |
| 4228 | Maximum of Logged Data | | | | | 6.346 | SD of logged Data | | | | | 0.591 |
| 4229 | | | | | | | | | | | | |
| 4230 | **Assuming Lognormal Distribution** | | | | | | | | | | | |
| 4231 | 95% H-UCL | | | | | 109.9 | 90% Chebyshev (MVUE) UCL | | | | | 116.7 |
| 4232 | 95% Chebyshev (MVUE) UCL | | | | | 125 | 97.5% Chebyshev (MVUE) UCL | | | | | 136.6 |
| 4233 | 99% Chebyshev (MVUE) UCL | | | | | 159.3 | | | | | | |
| 4234 | | | | | | | | | | | | |
| 4235 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 4236 | **Data appear to follow a Discernible Distribution at 5% Significance Level** | | | | | | | | | | | |
| 4237 | | | | | | | | | | | | |
| 4238 | **Nonparametric Distribution Free UCLs** | | | | | | | | | | | |
| 4239 | 95% CLT UCL | | | | | 110.4 | 95% Jackknife UCL | | | | | 110.5 |
| 4240 | 95% Standard Bootstrap UCL | | | | | 110.2 | 95% Bootstrap-t UCL | | | | | 113.3 |
| 4241 | 95% Hall's Bootstrap UCL | | | | | 117.1 | 95% Percentile Bootstrap UCL | | | | | 110.9 |
| 4242 | 95% BCA Bootstrap UCL | | | | | 114 | | | | | | |
| 4243 | 90% Chebyshev(Mean, Sd) UCL | | | | | 119.8 | 95% Chebyshev(Mean, Sd) UCL | | | | | 129.2 |
| 4244 | 97.5% Chebyshev(Mean, Sd) UCL | | | | | 142.3 | 99% Chebyshev(Mean, Sd) UCL | | | | | 168.1 |
| 4245 | | | | | | | | | | | | |
| 4246 | **Suggested UCL to Use** | | | | | | | | | | | |
| 4247 | 95% Approximate Gamma UCL | | | | | 109.1 | | | | | | |
| 4248 | | | | | | | | | | | | |
| 4249 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 4250 | These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) | | | | | | | | | | | |
| 4251 | and Singh and Singh (2003). However, simulations results will not cover all Real World data sets. | | | | | | | | | | | |
| 4252 | For additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 4253 | | | | | | | | | | | | |
| 4254 | **Nitrobenzene** | | | | | | | | | | | |
| 4255 | | | | | | | | | | | | |
| 4256 | **General Statistics** | | | | | | | | | | | |
| 4257 | Total Number of Observations | | | | | 13 | Number of Distinct Observations | | | | | 11 |
| 4258 | Number of Detects | | | | | 1 | Number of Non-Detects | | | | | 12 |
| 4259 | Number of Distinct Detects | | | | | 1 | Number of Distinct Non-Detects | | | | | 10 |
| 4260 | | | | | | | | | | | | |
| 4261 | **Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!** | | | | | | | | | | | |
| 4262 | **It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).** | | | | | | | | | | | |
| 4263 | | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4264 | **The data set for variable Nitrobenzene was not processed!** | | | | | | | | | | | |
| 4265 | | | | | | | | | | | | |
| 4266 | | | | | | | | | | | | |
| 4267 | **N-Nitrosodiphenylamine** | | | | | | | | | | | |
| 4268 | | | | | | | | | | | | |
| 4269 | **General Statistics** | | | | | | | | | | | |
| 4270 | Total Number of Observations | | | | | 120 | Number of Distinct Observations | | | | | 45 |
| 4271 | Number of Detects | | | | | 2 | Number of Non-Detects | | | | | 118 |
| 4272 | Number of Distinct Detects | | | | | 2 | Number of Distinct Non-Detects | | | | | 43 |
| 4273 | Minimum Detect | | | | | 25 | Minimum Non-Detect | | | | | 69 |
| 4274 | Maximum Detect | | | | | 53 | Maximum Non-Detect | | | | | 6900 |
| 4275 | Variance Detects | | | | | 392 | Percent Non-Detects | | | | | 98.33% |
| 4276 | Mean Detects | | | | | 39 | SD Detects | | | | | 19.8 |
| 4277 | Median Detects | | | | | 39 | CV Detects | | | | | 0.508 |
| 4278 | Skewness Detects | | | | | N/A | Kurtosis Detects | | | | | N/A |
| 4279 | Mean of Logged Detects | | | | | 3.595 | SD of Logged Detects | | | | | 0.531 |
| 4280 | | | | | | | | | | | | |
| 4281 | **Warning: Data set has only 2 Detected Values.** | | | | | | | | | | | |
| 4282 | **This is not enough to compute meaningful or reliable statistics and estimates.** | | | | | | | | | | | |
| 4283 | | | | | | | | | | | | |
| 4284 | | | | | | | | | | | | |
| 4285 | **Normal GOF Test on Detects Only** | | | | | | | | | | | |
| 4286 | **Not Enough Data to Perform GOF Test** | | | | | | | | | | | |
| 4287 | | | | | | | | | | | | |
| 4288 | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | | | | | |
| 4289 | Mean | | | | | 39 | Standard Error of Mean | | | | | 14 |
| 4290 | SD | | | | | 14 | 95% KM (BCA) UCL | | | | | N/A |
| 4291 | 95% KM (t) UCL | | | | | 62.21 | 95% KM (Percentile Bootstrap) UCL | | | | | N/A |
| 4292 | 95% KM (z) UCL | | | | | 62.03 | 95% KM Bootstrap t UCL | | | | | N/A |
| 4293 | 90% KM Chebyshev UCL | | | | | 81 | 95% KM Chebyshev UCL | | | | | 100 |
| 4294 | 97.5% KM Chebyshev UCL | | | | | 126.4 | 99% KM Chebyshev UCL | | | | | 178.3 |
| 4295 | | | | | | | | | | | | |
| 4296 | **Gamma GOF Tests on Detected Observations Only** | | | | | | | | | | | |
| 4297 | **Not Enough Data to Perform GOF Test** | | | | | | | | | | | |
| 4298 | | | | | | | | | | | | |
| 4299 | **Gamma Statistics on Detected Data Only** | | | | | | | | | | | |
| 4300 | k hat (MLE) | | | | | 7.411 | k star (bias corrected MLE) | | | | | N/A |
| 4301 | Theta hat (MLE) | | | | | 5.262 | Theta star (bias corrected MLE) | | | | | N/A |
| 4302 | nu hat (MLE) | | | | | 29.65 | nu star (bias corrected) | | | | | N/A |
| 4303 | MLE Mean (bias corrected) | | | | | N/A | MLE Sd (bias corrected) | | | | | N/A |
| 4304 | | | | | | | | | | | | |
| 4305 | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | | | | | |
| 4306 | k hat (KM) | | | | | 7.76 | nu hat (KM) | | | | | 1862 |
| 4307 | | | | | | | Adjusted Level of Significance (β) | | | | | 0.048 |
| 4308 | Approximate Chi Square Value (N/A, α) | | | | | 1763 | Adjusted Chi Square Value (N/A, β) | | | | | 1762 |
| 4309 | 95% Gamma Approximate KM-UCL (use when n>=50) | | | | | 41.2 | 95% Gamma Adjusted KM-UCL (use when n<50) | | | | | 41.22 |
| 4310 | | | | | | | | | | | | |
| 4311 | **Lognormal GOF Test on Detected Observations Only** | | | | | | | | | | | |
| 4312 | **Not Enough Data to Perform GOF Test** | | | | | | | | | | | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4313 | | | | | | | | | | | | |
| 4314 | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | | | | | |
| 4315 | | | | | Mean in Original Scale | 41.54 | | | Mean in Log Scale | 3.595 | | |
| 4316 | | | | | SD in Original Scale | 22.06 | | | SD in Log Scale | 0.519 | | |
| 4317 | | | | | 95% t UCL (assumes normality of ROS data) | 44.88 | | | 95% Percentile Bootstrap UCL | 44.88 | | |
| 4318 | | | | | 95% BCA Bootstrap UCL | 45.04 | | | 95% Bootstrap t UCL | 45.03 | | |
| 4319 | | | | | 95% H-UCL (Log ROS) | 45.48 | | | | | | |
| 4320 | | | | | | | | | | | | |
| 4321 | **DL/2 Statistics** | | | | | | | | | | | |
| 4322 | | | | | **DL/2 Normal** | | | | **DL/2 Log-Transformed** | | | |
| 4323 | | | | | Mean in Original Scale | 333 | | | Mean in Log Scale | 4.816 | | |
| 4324 | | | | | SD in Original Scale | 526.4 | | | SD in Log Scale | 1.381 | | |
| 4325 | | | | | 95% t UCL (Assumes normality) | 412.7 | | | 95% H-Stat UCL | 445.6 | | |
| 4326 | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | | | | | |
| 4327 | | | | | | | | | | | | |
| 4328 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 4329 | **Data do not follow a Discernible Distribution at 5% Significance Level** | | | | | | | | | | | |
| 4330 | | | | | | | | | | | | |
| 4331 | **Suggested UCL to Use** | | | | | | | | | | | |
| 4332 | | | | | 95% KM (t) UCL | 62.21 | | | 95% KM (% Bootstrap) UCL | N/A | | |
| 4333 | **Warning: One or more Recommended UCL(s) not available!** | | | | | | | | | | | |
| 4334 | **Warning: Recommended UCL exceeds the maximum observation** | | | | | | | | | | | |
| 4335 | | | | | | | | | | | | |
| 4336 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 4337 | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | | | | | |
| 4338 | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | | | | | |
| 4339 | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 4340 | | | | | | | | | | | | |
| 4341 | **Phenanthrene** | | | | | | | | | | | |
| 4342 | | | | | | | | | | | | |
| 4343 | **General Statistics** | | | | | | | | | | | |
| 4344 | | | | | Total Number of Observations | 135 | | | Number of Distinct Observations | 76 | | |
| 4345 | | | | | Number of Detects | 60 | | | Number of Non-Detects | 75 | | |
| 4346 | | | | | Number of Distinct Detects | 52 | | | Number of Distinct Non-Detects | 29 | | |
| 4347 | | | | | Minimum Detect | 1.2 | | | Minimum Non-Detect | 71 | | |
| 4348 | | | | | Maximum Detect | 260000 | | | Maximum Non-Detect | 6900 | | |
| 4349 | | | | | Variance Detects | 1.214E+9 | | | Percent Non-Detects | 55.56% | | |
| 4350 | | | | | Mean Detects | 7234 | | | SD Detects | 34837 | | |
| 4351 | | | | | Median Detects | 260 | | | CV Detects | 4.815 | | |
| 4352 | | | | | Skewness Detects | 6.824 | | | Kurtosis Detects | 49.11 | | |
| 4353 | | | | | Mean of Logged Detects | 5.686 | | | SD of Logged Detects | 2.392 | | |
| 4354 | | | | | | | | | | | | |
| 4355 | **Normal GOF Test on Detects Only** | | | | | | | | | | | |
| 4356 | | | | | Shapiro Wilk Test Statistic | 0.228 | | | **Normal GOF Test on Detected Observations Only** | | | |
| 4357 | | | | | 5% Shapiro Wilk P Value | 0 | | | Detected Data Not Normal at 5% Significance Level | | | |
| 4358 | | | | | Lilliefors Test Statistic | 0.44 | | | **Lilliefors GOF Test** | | | |
| 4359 | | | | | 5% Lilliefors Critical Value | 0.114 | | | Detected Data Not Normal at 5% Significance Level | | | |
| 4360 | **Detected Data Not Normal at 5% Significance Level** | | | | | | | | | | | |
| 4361 | | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4362 | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | | | | | |
| 4363 | | | | | Mean | 3256 | | | | Standard Error of Mean | | 2023 |
| 4364 | | | | | SD | 23304 | | | | 95% KM (BCA) UCL | | 7525 |
| 4365 | | | | | 95% KM (t) UCL | 6606 | | | | 95% KM (Percentile Bootstrap) UCL | | 6773 |
| 4366 | | | | | 95% KM (z) UCL | 6583 | | | | 95% KM Bootstrap t UCL | | 22200 |
| 4367 | | | | | 90% KM Chebyshev UCL | 9324 | | | | 95% KM Chebyshev UCL | | 12073 |
| 4368 | | | | | 97.5% KM Chebyshev UCL | 15888 | | | | 99% KM Chebyshev UCL | | 23381 |
| 4369 | | | | | | | | | | | | |
| 4370 | **Gamma GOF Tests on Detected Observations Only** | | | | | | | | | | | |
| 4371 | | | | | A-D Test Statistic | 6.217 | **Anderson-Darling GOF Test** | | | | | |
| 4372 | | | | | 5% A-D Critical Value | 0.901 | Detected Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 4373 | | | | | K-S Test Statistic | 0.24 | **Kolmogrov-Smirnoff GOF** | | | | | |
| 4374 | | | | | 5% K-S Critical Value | 0.127 | Detected Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 4375 | **Detected Data Not Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 4376 | | | | | | | | | | | | |
| 4377 | **Gamma Statistics on Detected Data Only** | | | | | | | | | | | |
| 4378 | | | | | k hat (MLE) | 0.226 | | | | k star (bias corrected MLE) | | 0.225 |
| 4379 | | | | | Theta hat (MLE) | 32070 | | | | Theta star (bias corrected MLE) | | 32094 |
| 4380 | | | | | nu hat (MLE) | 27.07 | | | | nu star (bias corrected) | | 27.05 |
| 4381 | | | | | MLE Mean (bias corrected) | 7234 | | | | MLE Sd (bias corrected) | | 15238 |
| 4382 | | | | | | | | | | | | |
| 4383 | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | | | | | |
| 4384 | | | | | k hat (KM) | 0.0195 | | | | nu hat (KM) | | 5.27 |
| 4385 | | | | | Approximate Chi Square Value (5.27, α) | 1.279 | | | | Adjusted Chi Square Value (5.27, β) | | 1.258 |
| 4386 | | | | | 95% Gamma Approximate KM-UCL (use when n>=50) | 13416 | | | | 95% Gamma Adjusted KM-UCL (use when n<50) | | 13635 |
| 4387 | Gamma (KM) may not be used when k hat (KM) is < 0.1 | | | | | | | | | | | |
| 4388 | | | | | | | | | | | | |
| 4389 | **Gamma ROS Statistics using Imputed Non-Detects** | | | | | | | | | | | |
| 4390 | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | | | | |
| 4391 | GROS may not be used when kstar of detected data is small such as < 0.1 | | | | | | | | | | | |
| 4392 | For such situations, GROS method tends to yield inflated values of UCLs and BTVs | | | | | | | | | | | |
| 4393 | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | | | | |
| 4394 | | | | | Minimum | 0.01 | | | | Mean | | 3215 |
| 4395 | | | | | Maximum | 260000 | | | | Median | | 0.01 |
| 4396 | | | | | SD | 23396 | | | | CV | | 7.276 |
| 4397 | | | | | k hat (MLE) | 0.1 | | | | k star (bias corrected MLE) | | 0.103 |
| 4398 | | | | | Theta hat (MLE) | 32104 | | | | Theta star (bias corrected MLE) | | 31257 |
| 4399 | | | | | nu hat (MLE) | 27.04 | | | | nu star (bias corrected) | | 27.77 |
| 4400 | | | | | MLE Mean (bias corrected) | 3215 | | | | MLE Sd (bias corrected) | | 10025 |
| 4401 | | | | | | | | | | Adjusted Level of Significance (β) | | 0.0482 |
| 4402 | | | | | Approximate Chi Square Value (27.77, α) | 16.75 | | | | Adjusted Chi Square Value (27.77, β) | | 16.66 |
| 4403 | | | | | 95% Gamma Approximate UCL (use when n>=50) | 5331 | | | | 95% Gamma Adjusted UCL (use when n<50) | | 5360 |
| 4404 | | | | | | | | | | | | |
| 4405 | **Lognormal GOF Test on Detected Observations Only** | | | | | | | | | | | |
| 4406 | | | | | Lilliefors Test Statistic | 0.0797 | **Lilliefors GOF Test** | | | | | |
| 4407 | | | | | 5% Lilliefors Critical Value | 0.114 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 4408 | **Detected Data appear Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 4409 | | | | | | | | | | | | |
| 4410 | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4411 | | | | | Mean in Original Scale | 3243 | | | | Mean in Log Scale | | 4.43 |
| 4412 | | | | | SD in Original Scale | 23392 | | | | SD in Log Scale | | 2.115 |
| 4413 | | | | 95% t UCL (assumes normality of ROS data) | | 6578 | | | | 95% Percentile Bootstrap UCL | | 7004 |
| 4414 | | | | | 95% BCA Bootstrap UCL | 11011 | | | | 95% Bootstrap t UCL | | 22546 |
| 4415 | | | | | 95% H-UCL (Log ROS) | 1464 | | | | | | |
| 4416 | | | | | | | | | | | | |
| 4417 | **UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed** | | | | | | | | | | | |
| 4418 | | | | | KM Mean (logged) | 4.449 | | | | 95% H-UCL (KM -Log) | | 1591 |
| 4419 | | | | | KM SD (logged) | 2.139 | | | | 95% Critical H Value (KM-Log) | | 3.44 |
| 4420 | | | | | KM Standard Error of Mean (logged) | 0.236 | | | | | | |
| 4421 | | | | | | | | | | | | |
| 4422 | **DL/2 Statistics** | | | | | | | | | | | |
| 4423 | **DL/2 Normal** | | | | | | **DL/2 Log-Transformed** | | | | | |
| 4424 | | | | | Mean in Original Scale | 3384 | | | | Mean in Log Scale | | 5.009 |
| 4425 | | | | | SD in Original Scale | 23377 | | | | SD in Log Scale | | 1.99 |
| 4426 | | | | | 95% t UCL (Assumes normality) | 6716 | | | | 95% H-Stat UCL | | 1898 |
| 4427 | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | | | | | |
| 4428 | | | | | | | | | | | | |
| 4429 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 4430 | **Detected Data appear Lognormal Distributed at 5% Significance Level** | | | | | | | | | | | |
| 4431 | | | | | | | | | | | | |
| 4432 | **Suggested UCL to Use** | | | | | | | | | | | |
| 4433 | | | | | 97.5% KM (Chebyshev) UCL | 15888 | | | | | | |
| 4434 | | | | | | | | | | | | |
| 4435 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 4436 | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | | | | | |
| 4437 | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | | | | | |
| 4438 | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 4439 | | | | | | | | | | | | |
| 4440 | **Phenol** | | | | | | | | | | | |
| 4441 | | | | | | | | | | | | |
| 4442 | **General Statistics** | | | | | | | | | | | |
| 4443 | | | | | Total Number of Observations | 120 | | | | Number of Distinct Observations | | 46 |
| 4444 | | | | | Number of Detects | 2 | | | | Number of Non-Detects | | 118 |
| 4445 | | | | | Number of Distinct Detects | 2 | | | | Number of Distinct Non-Detects | | 44 |
| 4446 | | | | | Minimum Detect | 17 | | | | Minimum Non-Detect | | 69 |
| 4447 | | | | | Maximum Detect | 64 | | | | Maximum Non-Detect | | 6900 |
| 4448 | | | | | Variance Detects | 1105 | | | | Percent Non-Detects | | 98.33% |
| 4449 | | | | | Mean Detects | 40.5 | | | | SD Detects | | 33.23 |
| 4450 | | | | | Median Detects | 40.5 | | | | CV Detects | | 0.821 |
| 4451 | | | | | Skewness Detects | N/A | | | | Kurtosis Detects | | N/A |
| 4452 | | | | | Mean of Logged Detects | 3.496 | | | | SD of Logged Detects | | 0.937 |
| 4453 | | | | | | | | | | | | |
| 4454 | **Warning: Data set has only 2 Detected Values.** | | | | | | | | | | | |
| 4455 | **This is not enough to compute meaningful or reliable statistics and estimates.** | | | | | | | | | | | |
| 4456 | | | | | | | | | | | | |
| 4457 | | | | | | | | | | | | |
| 4458 | **Normal GOF Test on Detects Only** | | | | | | | | | | | |
| 4459 | **Not Enough Data to Perform GOF Test** | | | | | | | | | | | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4460 | | | | | | | | | | | | |
| 4461 | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | | | | | |
| 4462 | | | | | Mean | 40.5 | | | Standard Error of Mean | 23.5 | | |
| 4463 | | | | | SD | 23.5 | | | 95% KM (BCA) UCL | N/A | | |
| 4464 | | | | | 95% KM (t) UCL | 79.46 | | | 95% KM (Percentile Bootstrap) UCL | N/A | | |
| 4465 | | | | | 95% KM (z) UCL | 79.15 | | | 95% KM Bootstrap t UCL | N/A | | |
| 4466 | | | | | 90% KM Chebyshev UCL | 111 | | | 95% KM Chebyshev UCL | 142.9 | | |
| 4467 | | | | | 97.5% KM Chebyshev UCL | 187.3 | | | 99% KM Chebyshev UCL | 274.3 | | |
| 4468 | | | | | | | | | | | | |
| 4469 | **Gamma GOF Tests on Detected Observations Only** | | | | | | | | | | | |
| 4470 | **Not Enough Data to Perform GOF Test** | | | | | | | | | | | |
| 4471 | | | | | | | | | | | | |
| 4472 | **Gamma Statistics on Detected Data Only** | | | | | | | | | | | |
| 4473 | | | | | k hat (MLE) | 2.591 | | | k star (bias corrected MLE) | N/A | | |
| 4474 | | | | | Theta hat (MLE) | 15.63 | | | Theta star (bias corrected MLE) | N/A | | |
| 4475 | | | | | nu hat (MLE) | 10.36 | | | nu star (bias corrected) | N/A | | |
| 4476 | | | | | MLE Mean (bias corrected) | N/A | | | MLE Sd (bias corrected) | N/A | | |
| 4477 | | | | | | | | | | | | |
| 4478 | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | | | | | |
| 4479 | | | | | k hat (KM) | 2.97 | | | nu hat (KM) | 712.8 | | |
| 4480 | | | | | | | | | Adjusted Level of Significance (β) | 0.048 | | |
| 4481 | | | | | Approximate Chi Square Value (712.83, α) | 651.9 | | | Adjusted Chi Square Value (712.83, β) | 651.2 | | |
| 4482 | | | | | 95% Gamma Approximate KM-UCL (use when n>=50) | 44.29 | | | 95% Gamma Adjusted KM-UCL (use when n<50) | 44.33 | | |
| 4483 | | | | | | | | | | | | |
| 4484 | **Lognormal GOF Test on Detected Observations Only** | | | | | | | | | | | |
| 4485 | **Not Enough Data to Perform GOF Test** | | | | | | | | | | | |
| 4486 | | | | | | | | | | | | |
| 4487 | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | | | | | |
| 4488 | | | | | Mean in Original Scale | 49.02 | | | Mean in Log Scale | 3.496 | | |
| 4489 | | | | | SD in Original Scale | 47.51 | | | SD in Log Scale | 0.909 | | |
| 4490 | | | | | 95% t UCL (assumes normality of ROS data) | 56.21 | | | 95% Percentile Bootstrap UCL | 56.29 | | |
| 4491 | | | | | 95% BCA Bootstrap UCL | 57.07 | | | 95% Bootstrap t UCL | 57.51 | | |
| 4492 | | | | | 95% H-UCL (Log ROS) | 59.58 | | | | | | |
| 4493 | | | | | | | | | | | | |
| 4494 | **DL/2 Statistics** | | | | | | | | | | | |
| 4495 | **DL/2 Normal** | | | | | | | | **DL/2 Log-Transformed** | | | |
| 4496 | | | | | Mean in Original Scale | 333.6 | | | Mean in Log Scale | 4.819 | | |
| 4497 | | | | | SD in Original Scale | 526.2 | | | SD in Log Scale | 1.383 | | |
| 4498 | | | | | 95% t UCL (Assumes normality) | 413.2 | | | 95% H-Stat UCL | 449.3 | | |
| 4499 | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | | | | | |
| 4500 | | | | | | | | | | | | |
| 4501 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 4502 | **Data do not follow a Discernible Distribution at 5% Significance Level** | | | | | | | | | | | |
| 4503 | | | | | | | | | | | | |
| 4504 | **Suggested UCL to Use** | | | | | | | | | | | |
| 4505 | | | | | 95% KM (t) UCL | 79.46 | | | 95% KM (% Bootstrap) UCL | N/A | | |
| 4506 | **Warning: One or more Recommended UCL(s) not available!** | | | | | | | | | | | |
| 4507 | **Warning: Recommended UCL exceeds the maximum observation** | | | | | | | | | | | |
| 4508 | | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4509 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 4510 | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | | | | | |
| 4511 | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | | | | | |
| 4512 | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 4513 | | | | | | | | | | | | |
| 4514 | **Pyrene** | | | | | | | | | | | |
| 4515 | | | | | | | | | | | | |
| 4516 | **General Statistics** | | | | | | | | | | | |
| 4517 | Total Number of Observations | | | | | 136 | Number of Distinct Observations | | | | | 84 |
| 4518 | Number of Detects | | | | | 83 | Number of Non-Detects | | | | | 53 |
| 4519 | Number of Distinct Detects | | | | | 67 | Number of Distinct Non-Detects | | | | | 22 |
| 4520 | Minimum Detect | | | | | 1.8 | Minimum Non-Detect | | | | | 72 |
| 4521 | Maximum Detect | | | | | 210000 | Maximum Non-Detect | | | | | 330000 |
| 4522 | Variance Detects | | | | | 1.004E+9 | Percent Non-Detects | | | | | 38.97% |
| 4523 | Mean Detects | | | | | 7185 | SD Detects | | | | | 31690 |
| 4524 | Median Detects | | | | | 240 | CV Detects | | | | | 4.411 |
| 4525 | Skewness Detects | | | | | 6.089 | Kurtosis Detects | | | | | 36.89 |
| 4526 | Mean of Logged Detects | | | | | 5.777 | SD of Logged Detects | | | | | 2.557 |
| 4527 | | | | | | | | | | | | |
| 4528 | **Normal GOF Test on Detects Only** | | | | | | | | | | | |
| 4529 | Shapiro Wilk Test Statistic | | | | | 0.236 | **Normal GOF Test on Detected Observations Only** | | | | | |
| 4530 | 5% Shapiro Wilk P Value | | | | | 0 | Detected Data Not Normal at 5% Significance Level | | | | | |
| 4531 | Lilliefors Test Statistic | | | | | 0.41 | **Lilliefors GOF Test** | | | | | |
| 4532 | 5% Lilliefors Critical Value | | | | | 0.0973 | Detected Data Not Normal at 5% Significance Level | | | | | |
| 4533 | **Detected Data Not Normal at 5% Significance Level** | | | | | | | | | | | |
| 4534 | | | | | | | | | | | | |
| 4535 | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | | | | | |
| 4536 | Mean | | | | | 4447 | Standard Error of Mean | | | | | 2160 |
| 4537 | SD | | | | | 24940 | 95% KM (BCA) UCL | | | | | 8669 |
| 4538 | 95% KM (t) UCL | | | | | 8023 | 95% KM (Percentile Bootstrap) UCL | | | | | 8124 |
| 4539 | 95% KM (z) UCL | | | | | 7999 | 95% KM Bootstrap t UCL | | | | | 24739 |
| 4540 | 90% KM Chebyshev UCL | | | | | 10925 | 95% KM Chebyshev UCL | | | | | 13860 |
| 4541 | 97.5% KM Chebyshev UCL | | | | | 17933 | 99% KM Chebyshev UCL | | | | | 25934 |
| 4542 | | | | | | | | | | | | |
| 4543 | **Gamma GOF Tests on Detected Observations Only** | | | | | | | | | | | |
| 4544 | A-D Test Statistic | | | | | 6.19 | **Anderson-Darling GOF Test** | | | | | |
| 4545 | 5% A-D Critical Value | | | | | 0.899 | Detected Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 4546 | K-S Test Statistic | | | | | 0.214 | **Kolmogrov-Smirnoff GOF** | | | | | |
| 4547 | 5% K-S Critical Value | | | | | 0.108 | Detected Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 4548 | **Detected Data Not Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 4549 | | | | | | | | | | | | |
| 4550 | **Gamma Statistics on Detected Data Only** | | | | | | | | | | | |
| 4551 | k hat (MLE) | | | | | 0.232 | k star (bias corrected MLE) | | | | | 0.231 |
| 4552 | Theta hat (MLE) | | | | | 31002 | Theta star (bias corrected MLE) | | | | | 31048 |
| 4553 | nu hat (MLE) | | | | | 38.47 | nu star (bias corrected) | | | | | 38.41 |
| 4554 | MLE Mean (bias corrected) | | | | | 7185 | MLE Sd (bias corrected) | | | | | 14936 |
| 4555 | | | | | | | | | | | | |
| 4556 | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | | | | | |
| 4557 | k hat (KM) | | | | | 0.0318 | nu hat (KM) | | | | | 8.646 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4558 | Approximate Chi Square Value (8.65, α) | | | | | 3.115 | Adjusted Chi Square Value (8.65, β) | | | | | 3.079 |
| 4559 | 95% Gamma Approximate KM-UCL (use when n>=50) | | | | | 12343 | 95% Gamma Adjusted KM-UCL (use when n<50) | | | | | 12485 |
| 4560 | Gamma (KM) may not be used when k hat (KM) is < 0.1 | | | | | | | | | | | |
| 4561 | | | | | | | | | | | | |
| 4562 | **Gamma ROS Statistics using Imputed Non-Detects** | | | | | | | | | | | |
| 4563 | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | | | | |
| 4564 | GROS may not be used when kstar of detected data is small such as < 0.1 | | | | | | | | | | | |
| 4565 | For such situations, GROS method tends to yield inflated values of UCLs and BTVs | | | | | | | | | | | |
| 4566 | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | | | | |
| 4567 | Minimum | | | | | 0.01 | Mean | | | | | 4385 |
| 4568 | Maximum | | | | | 210000 | Median | | | | | 19 |
| 4569 | SD | | | | | 24947 | CV | | | | | 5.689 |
| 4570 | k hat (MLE) | | | | | 0.119 | k star (bias corrected MLE) | | | | | 0.122 |
| 4571 | Theta hat (MLE) | | | | | 36766 | Theta star (bias corrected MLE) | | | | | 36079 |
| 4572 | nu hat (MLE) | | | | | 32.44 | nu star (bias corrected) | | | | | 33.06 |
| 4573 | MLE Mean (bias corrected) | | | | | 4385 | MLE Sd (bias corrected) | | | | | 12578 |
| 4574 | | | | | | | Adjusted Level of Significance (β) | | | | | 0.0482 |
| 4575 | Approximate Chi Square Value (33.06, α) | | | | | 20.91 | Adjusted Chi Square Value (33.06, β) | | | | | 20.81 |
| 4576 | 95% Gamma Approximate UCL (use when n>=50) | | | | | 6932 | 95% Gamma Adjusted UCL (use when n<50) | | | | | 6966 |
| 4577 | | | | | | | | | | | | |
| 4578 | **Lognormal GOF Test on Detected Observations Only** | | | | | | | | | | | |
| 4579 | Lilliefors Test Statistic | | | | | 0.0579 | **Lilliefors GOF Test** | | | | | |
| 4580 | 5% Lilliefors Critical Value | | | | | 0.0973 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 4581 | **Detected Data appear Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 4582 | | | | | | | | | | | | |
| 4583 | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | | | | | |
| 4584 | Mean in Original Scale | | | | | 4399 | Mean in Log Scale | | | | | 4.719 |
| 4585 | SD in Original Scale | | | | | 24945 | SD in Log Scale | | | | | 2.506 |
| 4586 | 95% t UCL (assumes normality of ROS data) | | | | | 7942 | 95% Percentile Bootstrap UCL | | | | | 8539 |
| 4587 | 95% BCA Bootstrap UCL | | | | | 10351 | 95% Bootstrap t UCL | | | | | 26022 |
| 4588 | 95% H-UCL (Log ROS) | | | | | 6008 | | | | | | |
| 4589 | | | | | | | | | | | | |
| 4590 | **UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed** | | | | | | | | | | | |
| 4591 | KM Mean (logged) | | | | | 4.67 | 95% H-UCL (KM -Log) | | | | | 6986 |
| 4592 | KM SD (logged) | | | | | 2.57 | 95% Critical H Value (KM-Log) | | | | | 3.979 |
| 4593 | KM Standard Error of Mean (logged) | | | | | 0.241 | | | | | | |
| 4594 | | | | | | | | | | | | |
| 4595 | **DL/2 Statistics** | | | | | | | | | | | |
| 4596 | **DL/2 Normal** | | | | | | **DL/2 Log-Transformed** | | | | | |
| 4597 | Mean in Original Scale | | | | | 5730 | Mean in Log Scale | | | | | 5.315 |
| 4598 | SD in Original Scale | | | | | 28470 | SD in Log Scale | | | | | 2.352 |
| 4599 | 95% t UCL (Assumes normality) | | | | | 9773 | 95% H-Stat UCL | | | | | 6852 |
| 4600 | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | | | | | |
| 4601 | | | | | | | | | | | | |
| 4602 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 4603 | **Detected Data appear Lognormal Distributed at 5% Significance Level** | | | | | | | | | | | |
| 4604 | | | | | | | | | | | | |
| 4605 | **Suggested UCL to Use** | | | | | | | | | | | |
| 4606 | 97.5% KM (Chebyshev) UCL | | | | | 17933 | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4607 | | | | | | | | | | | | |
| 4608 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 4609 | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | | | | | |
| 4610 | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | | | | | |
| 4611 | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 4612 | | | | | | | | | | | | |
| 4613 | **Selenium** | | | | | | | | | | | |
| 4614 | | | | | | | | | | | | |
| 4615 | **General Statistics** | | | | | | | | | | | |
| 4616 | Total Number of Observations | | | | | 97 | Number of Distinct Observations | | | | | 46 |
| 4617 | Number of Detects | | | | | 41 | Number of Non-Detects | | | | | 56 |
| 4618 | Number of Distinct Detects | | | | | 30 | Number of Distinct Non-Detects | | | | | 20 |
| 4619 | Minimum Detect | | | | | 0.17 | Minimum Non-Detect | | | | | 0.6 |
| 4620 | Maximum Detect | | | | | 3.5 | Maximum Non-Detect | | | | | 5 |
| 4621 | Variance Detects | | | | | 0.299 | Percent Non-Detects | | | | | 57.73% |
| 4622 | Mean Detects | | | | | 0.583 | SD Detects | | | | | 0.546 |
| 4623 | Median Detects | | | | | 0.38 | CV Detects | | | | | 0.937 |
| 4624 | Skewness Detects | | | | | 4.062 | Kurtosis Detects | | | | | 20.57 |
| 4625 | Mean of Logged Detects | | | | | -0.757 | SD of Logged Detects | | | | | 0.602 |
| 4626 | | | | | | | | | | | | |
| 4627 | **Normal GOF Test on Detects Only** | | | | | | | | | | | |
| 4628 | Shapiro Wilk Test Statistic | | | | | 0.591 | **Shapiro Wilk GOF Test** | | | | | |
| 4629 | 5% Shapiro Wilk Critical Value | | | | | 0.941 | Detected Data Not Normal at 5% Significance Level | | | | | |
| 4630 | Lilliefors Test Statistic | | | | | 0.234 | **Lilliefors GOF Test** | | | | | |
| 4631 | 5% Lilliefors Critical Value | | | | | 0.138 | Detected Data Not Normal at 5% Significance Level | | | | | |
| 4632 | **Detected Data Not Normal at 5% Significance Level** | | | | | | | | | | | |
| 4633 | | | | | | | | | | | | |
| 4634 | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | | | | | |
| 4635 | Mean | | | | | 0.491 | Standard Error of Mean | | | | | 0.0448 |
| 4636 | SD | | | | | 0.387 | 95% KM (BCA) UCL | | | | | 0.57 |
| 4637 | 95% KM (t) UCL | | | | | 0.565 | 95% KM (Percentile Bootstrap) UCL | | | | | 0.566 |
| 4638 | 95% KM (z) UCL | | | | | 0.565 | 95% KM Bootstrap t UCL | | | | | 0.596 |
| 4639 | 90% KM Chebyshev UCL | | | | | 0.625 | 95% KM Chebyshev UCL | | | | | 0.686 |
| 4640 | 97.5% KM Chebyshev UCL | | | | | 0.771 | 99% KM Chebyshev UCL | | | | | 0.937 |
| 4641 | | | | | | | | | | | | |
| 4642 | **Gamma GOF Tests on Detected Observations Only** | | | | | | | | | | | |
| 4643 | A-D Test Statistic | | | | | 1.59 | **Anderson-Darling GOF Test** | | | | | |
| 4644 | 5% A-D Critical Value | | | | | 0.757 | Detected Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 4645 | K-S Test Statistic | | | | | 0.169 | **Kolmogrov-Smirnoff GOF** | | | | | |
| 4646 | 5% K-S Critical Value | | | | | 0.139 | Detected Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 4647 | **Detected Data Not Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 4648 | | | | | | | | | | | | |
| 4649 | **Gamma Statistics on Detected Data Only** | | | | | | | | | | | |
| 4650 | k hat (MLE) | | | | | 2.447 | k star (bias corrected MLE) | | | | | 2.284 |
| 4651 | Theta hat (MLE) | | | | | 0.238 | Theta star (bias corrected MLE) | | | | | 0.255 |
| 4652 | nu hat (MLE) | | | | | 200.6 | nu star (bias corrected) | | | | | 187.3 |
| 4653 | MLE Mean (bias corrected) | | | | | 0.583 | MLE Sd (bias corrected) | | | | | 0.386 |
| 4654 | | | | | | | | | | | | |
| 4655 | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4656 | | | | | k hat (KM) | 1.605 | | | | | nu hat (KM) | 311.4 |
| 4657 | | | | | Approximate Chi Square Value (311.43, α) | 271.5 | | | | | Adjusted Chi Square Value (311.43, β) | 271 |
| 4658 | | | | | 95% Gamma Approximate KM-UCL (use when n>=50) | 0.563 | | | | | 95% Gamma Adjusted KM-UCL (use when n<50) | 0.564 |
| 4659 | | | | | | | | | | | | |
| 4660 | | | | | **Gamma ROS Statistics using Imputed Non-Detects** | | | | | | | |
| 4661 | | | | | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | |
| 4662 | | | | | GROS may not be used when kstar of detected data is small such as < 0.1 | | | | | | | |
| 4663 | | | | | For such situations, GROS method tends to yield inflated values of UCLs and BTVs | | | | | | | |
| 4664 | | | | | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | |
| 4665 | | | | | Minimum | 0.0177 | | | | | Mean | 0.481 |
| 4666 | | | | | Maximum | 3.5 | | | | | Median | 0.388 |
| 4667 | | | | | SD | 0.397 | | | | | CV | 0.825 |
| 4668 | | | | | k hat (MLE) | 2.514 | | | | | k star (bias corrected MLE) | 2.443 |
| 4669 | | | | | Theta hat (MLE) | 0.191 | | | | | Theta star (bias corrected MLE) | 0.197 |
| 4670 | | | | | nu hat (MLE) | 487.7 | | | | | nu star (bias corrected) | 473.9 |
| 4671 | | | | | MLE Mean (bias corrected) | 0.481 | | | | | MLE Sd (bias corrected) | 0.308 |
| 4672 | | | | | | | | | | | Adjusted Level of Significance (β) | 0.0475 |
| 4673 | | | | | Approximate Chi Square Value (473.92, α) | 424.4 | | | | | Adjusted Chi Square Value (473.92, β) | 423.7 |
| 4674 | | | | | 95% Gamma Approximate UCL (use when n>=50) | 0.537 | | | | | 95% Gamma Adjusted UCL (use when n<50) | 0.538 |
| 4675 | | | | | | | | | | | | |
| 4676 | | | | | **Lognormal GOF Test on Detected Observations Only** | | | | | | | |
| 4677 | | | | | Shapiro Wilk Test Statistic | 0.939 | | | | | **Shapiro Wilk GOF Test** | |
| 4678 | | | | | 5% Shapiro Wilk Critical Value | 0.941 | | | | | Detected Data Not Lognormal at 5% Significance Level | |
| 4679 | | | | | Lilliefors Test Statistic | 0.149 | | | | | **Lilliefors GOF Test** | |
| 4680 | | | | | 5% Lilliefors Critical Value | 0.138 | | | | | Detected Data Not Lognormal at 5% Significance Level | |
| 4681 | | | | | **Detected Data Not Lognormal at 5% Significance Level** | | | | | | | |
| 4682 | | | | | | | | | | | | |
| 4683 | | | | | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | |
| 4684 | | | | | Mean in Original Scale | 0.489 | | | | | Mean in Log Scale | -0.851 |
| 4685 | | | | | SD in Original Scale | 0.376 | | | | | SD in Log Scale | 0.468 |
| 4686 | | | | | 95% t UCL (assumes normality of ROS data) | 0.552 | | | | | 95% Percentile Bootstrap UCL | 0.558 |
| 4687 | | | | | 95% BCA Bootstrap UCL | 0.584 | | | | | 95% Bootstrap t UCL | 0.605 |
| 4688 | | | | | 95% H-UCL (Log ROS) | 0.52 | | | | | | |
| 4689 | | | | | | | | | | | | |
| 4690 | | | | | **DL/2 Statistics** | | | | | | | |
| 4691 | | | | | **DL/2 Normal** | | | | | | **DL/2 Log-Transformed** | |
| 4692 | | | | | Mean in Original Scale | 0.593 | | | | | Mean in Log Scale | -0.664 |
| 4693 | | | | | SD in Original Scale | 0.428 | | | | | SD in Log Scale | 0.493 |
| 4694 | | | | | 95% t UCL (Assumes normality) | 0.665 | | | | | 95% H-Stat UCL | 0.638 |
| 4695 | | | | | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | |
| 4696 | | | | | | | | | | | | |
| 4697 | | | | | **Nonparametric Distribution Free UCL Statistics** | | | | | | | |
| 4698 | | | | | **Data do not follow a Discernible Distribution at 5% Significance Level** | | | | | | | |
| 4699 | | | | | | | | | | | | |
| 4700 | | | | | **Suggested UCL to Use** | | | | | | | |
| 4701 | | | | | 95% KM (t) UCL | 0.565 | | | | | 95% KM (% Bootstrap) UCL | 0.566 |
| 4702 | | | | | | | | | | | | |
| 4703 | | | | | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | |
| 4704 | | | | | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | |

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

**Silver**

**General Statistics**

| | | | |
|---|---|---|---|
| Total Number of Observations | 98 | Number of Distinct Observations | 43 |
| Number of Detects | 49 | Number of Non-Detects | 49 |
| Number of Distinct Detects | 38 | Number of Distinct Non-Detects | 14 |
| Minimum Detect | 0.06 | Minimum Non-Detect | 0.22 |
| Maximum Detect | 2.2 | Maximum Non-Detect | 1.2 |
| Variance Detects | 0.198 | Percent Non-Detects | 50% |
| Mean Detects | 0.395 | SD Detects | 0.445 |
| Median Detects | 0.22 | CV Detects | 1.127 |
| Skewness Detects | 2.229 | Kurtosis Detects | 5.337 |
| Mean of Logged Detects | -1.384 | SD of Logged Detects | 0.921 |

**Normal GOF Test on Detects Only**

| | | |
|---|---|---|
| Shapiro Wilk Test Statistic | 0.711 | **Shapiro Wilk GOF Test** |
| 5% Shapiro Wilk Critical Value | 0.947 | Detected Data Not Normal at 5% Significance Level |
| Lilliefors Test Statistic | 0.266 | **Lilliefors GOF Test** |
| 5% Lilliefors Critical Value | 0.127 | Detected Data Not Normal at 5% Significance Level |

**Detected Data Not Normal at 5% Significance Level**

**Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs**

| | | | |
|---|---|---|---|
| Mean | 0.278 | Standard Error of Mean | 0.0356 |
| SD | 0.339 | 95% KM (BCA) UCL | 0.344 |
| 95% KM (t) UCL | 0.337 | 95% KM (Percentile Bootstrap) UCL | 0.342 |
| 95% KM (z) UCL | 0.337 | 95% KM Bootstrap t UCL | 0.352 |
| 90% KM Chebyshev UCL | 0.385 | 95% KM Chebyshev UCL | 0.433 |
| 97.5% KM Chebyshev UCL | 0.501 | 99% KM Chebyshev UCL | 0.632 |

**Gamma GOF Tests on Detected Observations Only**

| | | |
|---|---|---|
| A-D Test Statistic | 1.849 | **Anderson-Darling GOF Test** |
| 5% A-D Critical Value | 0.774 | Detected Data Not Gamma Distributed at 5% Significance Level |
| K-S Test Statistic | 0.182 | **Kolmogrov-Smirnoff GOF** |
| 5% K-S Critical Value | 0.13 | Detected Data Not Gamma Distributed at 5% Significance Level |

**Detected Data Not Gamma Distributed at 5% Significance Level**

**Gamma Statistics on Detected Data Only**

| | | | |
|---|---|---|---|
| k hat (MLE) | 1.241 | k star (bias corrected MLE) | 1.178 |
| Theta hat (MLE) | 0.318 | Theta star (bias corrected MLE) | 0.335 |
| nu hat (MLE) | 121.6 | nu star (bias corrected) | 115.5 |
| MLE Mean (bias corrected) | 0.395 | MLE Sd (bias corrected) | 0.364 |

**Gamma Kaplan-Meier (KM) Statistics**

| | | | |
|---|---|---|---|
| k hat (KM) | 0.676 | nu hat (KM) | 132.4 |
| Approximate Chi Square Value (132.41, α) | 106.8 | Adjusted Chi Square Value (132.41, β) | 106.5 |
| 95% Gamma Approximate KM-UCL (use when n>=50) | 0.345 | 95% Gamma Adjusted KM-UCL (use when n<50) | 0.346 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4754 | | | | | | | | | | | | |
| 4755 | **Gamma ROS Statistics using Imputed Non-Detects** | | | | | | | | | | | |
| 4756 | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | | | | |
| 4757 | GROS may not be used when kstar of detected data is small such as < 0.1 | | | | | | | | | | | |
| 4758 | For such situations, GROS method tends to yield inflated values of UCLs and BTVs | | | | | | | | | | | |
| 4759 | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | | | | |
| 4760 | | | | | Minimum | 0.01 | | | | Mean | 0.265 | |
| 4761 | | | | | Maximum | 2.2 | | | | Median | 0.169 | |
| 4762 | | | | | SD | 0.35 | | | | CV | 1.321 | |
| 4763 | | | | | k hat (MLE) | 0.858 | | | | k star (bias corrected MLE) | 0.838 | |
| 4764 | | | | | Theta hat (MLE) | 0.309 | | | | Theta star (bias corrected MLE) | 0.316 | |
| 4765 | | | | | nu hat (MLE) | 168.1 | | | | nu star (bias corrected) | 164.3 | |
| 4766 | | | | | MLE Mean (bias corrected) | 0.265 | | | | MLE Sd (bias corrected) | 0.29 | |
| 4767 | | | | | | | | | | Adjusted Level of Significance (β) | 0.0476 | |
| 4768 | | | | | Approximate Chi Square Value (164.28, α) | 135.6 | | | | Adjusted Chi Square Value (164.28, β) | 135.3 | |
| 4769 | | | | | 95% Gamma Approximate UCL (use when n>=50) | 0.321 | | | | 95% Gamma Adjusted UCL (use when n<50) | 0.322 | |
| 4770 | | | | | | | | | | | | |
| 4771 | **Lognormal GOF Test on Detected Observations Only** | | | | | | | | | | | |
| 4772 | | | | | Shapiro Wilk Test Statistic | 0.945 | | | | **Shapiro Wilk GOF Test** | | |
| 4773 | | | | | 5% Shapiro Wilk Critical Value | 0.947 | | | | Detected Data Not Lognormal at 5% Significance Level | | |
| 4774 | | | | | Lilliefors Test Statistic | 0.117 | | | | **Lilliefors GOF Test** | | |
| 4775 | | | | | 5% Lilliefors Critical Value | 0.127 | | | | Detected Data appear Lognormal at 5% Significance Level | | |
| 4776 | **Detected Data appear Approximate Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 4777 | | | | | | | | | | | | |
| 4778 | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | | | | | |
| 4779 | | | | | Mean in Original Scale | 0.282 | | | | Mean in Log Scale | -1.634 | |
| 4780 | | | | | SD in Original Scale | 0.337 | | | | SD in Log Scale | 0.77 | |
| 4781 | | | | | 95% t UCL (assumes normality of ROS data) | 0.338 | | | | 95% Percentile Bootstrap UCL | 0.339 | |
| 4782 | | | | | 95% BCA Bootstrap UCL | 0.354 | | | | 95% Bootstrap t UCL | 0.356 | |
| 4783 | | | | | 95% H-UCL (Log ROS) | 0.309 | | | | | | |
| 4784 | | | | | | | | | | | | |
| 4785 | **UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed** | | | | | | | | | | | |
| 4786 | | | | | KM Mean (logged) | -1.664 | | | | 95% H-UCL (KM -Log) | 0.304 | |
| 4787 | | | | | KM SD (logged) | 0.784 | | | | 95% Critical H Value (KM-Log) | 2.071 | |
| 4788 | | | | | KM Standard Error of Mean (logged) | 0.0956 | | | | | | |
| 4789 | | | | | | | | | | | | |
| 4790 | **DL/2 Statistics** | | | | | | | | | | | |
| 4791 | **DL/2 Normal** | | | | | | | | | **DL/2 Log-Transformed** | | |
| 4792 | | | | | Mean in Original Scale | 0.305 | | | | Mean in Log Scale | -1.552 | |
| 4793 | | | | | SD in Original Scale | 0.346 | | | | SD in Log Scale | 0.772 | |
| 4794 | | | | | 95% t UCL (Assumes normality) | 0.363 | | | | 95% H-Stat UCL | 0.336 | |
| 4795 | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | | | | | |
| 4796 | | | | | | | | | | | | |
| 4797 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 4798 | **Detected Data appear Approximate Lognormal Distributed at 5% Significance Level** | | | | | | | | | | | |
| 4799 | | | | | | | | | | | | |
| 4800 | **Suggested UCL to Use** | | | | | | | | | | | |
| 4801 | | | | | 95% KM (t) UCL | 0.337 | | | | 95% KM (% Bootstrap) UCL | 0.342 | |
| 4802 | | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4803 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 4804 | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | | | | | |
| 4805 | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | | | | | |
| 4806 | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 4807 | | | | | | | | | | | | |
| 4808 | **Thallium** | | | | | | | | | | | |
| 4809 | | | | | | | | | | | | |
| 4810 | **General Statistics** | | | | | | | | | | | |
| 4811 | | | | | | Total Number of Observations | 83 | | | | Number of Distinct Observations | 42 |
| 4812 | | | | | | Number of Detects | 36 | | | | Number of Non-Detects | 47 |
| 4813 | | | | | | Number of Distinct Detects | 30 | | | | Number of Distinct Non-Detects | 18 |
| 4814 | | | | | | Minimum Detect | 0.13 | | | | Minimum Non-Detect | 0.4 |
| 4815 | | | | | | Maximum Detect | 8.6 | | | | Maximum Non-Detect | 1.1 |
| 4816 | | | | | | Variance Detects | 2.011 | | | | Percent Non-Detects | 56.63% |
| 4817 | | | | | | Mean Detects | 1.24 | | | | SD Detects | 1.418 |
| 4818 | | | | | | Median Detects | 0.945 | | | | CV Detects | 1.144 |
| 4819 | | | | | | Skewness Detects | 4.197 | | | | Kurtosis Detects | 21.47 |
| 4820 | | | | | | Mean of Logged Detects | -0.14 | | | | SD of Logged Detects | 0.836 |
| 4821 | | | | | | | | | | | | |
| 4822 | **Normal GOF Test on Detects Only** | | | | | | | | | | | |
| 4823 | | | | | | Shapiro Wilk Test Statistic | 0.582 | | | **Shapiro Wilk GOF Test** | | |
| 4824 | | | | | | 5% Shapiro Wilk Critical Value | 0.935 | | | Detected Data Not Normal at 5% Significance Level | | |
| 4825 | | | | | | Lilliefors Test Statistic | 0.217 | | | **Lilliefors GOF Test** | | |
| 4826 | | | | | | 5% Lilliefors Critical Value | 0.148 | | | Detected Data Not Normal at 5% Significance Level | | |
| 4827 | **Detected Data Not Normal at 5% Significance Level** | | | | | | | | | | | |
| 4828 | | | | | | | | | | | | |
| 4829 | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | | | | | |
| 4830 | | | | | | Mean | 0.708 | | | | Standard Error of Mean | 0.117 |
| 4831 | | | | | | SD | 1.035 | | | | 95% KM (BCA) UCL | 0.929 |
| 4832 | | | | | | 95% KM (t) UCL | 0.903 | | | | 95% KM (Percentile Bootstrap) UCL | 0.901 |
| 4833 | | | | | | 95% KM (z) UCL | 0.9 | | | | 95% KM Bootstrap t UCL | 1.03 |
| 4834 | | | | | | 90% KM Chebyshev UCL | 1.059 | | | | 95% KM Chebyshev UCL | 1.218 |
| 4835 | | | | | | 97.5% KM Chebyshev UCL | 1.439 | | | | 99% KM Chebyshev UCL | 1.872 |
| 4836 | | | | | | | | | | | | |
| 4837 | **Gamma GOF Tests on Detected Observations Only** | | | | | | | | | | | |
| 4838 | | | | | | A-D Test Statistic | 0.522 | | | **Anderson-Darling GOF Test** | | |
| 4839 | | | | | | 5% A-D Critical Value | 0.766 | | | Detected data appear Gamma Distributed at 5% Significance Level | | |
| 4840 | | | | | | K-S Test Statistic | 0.0989 | | | **Kolmogrov-Smirnoff GOF** | | |
| 4841 | | | | | | 5% K-S Critical Value | 0.149 | | | Detected data appear Gamma Distributed at 5% Significance Level | | |
| 4842 | **Detected data appear Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 4843 | | | | | | | | | | | | |
| 4844 | **Gamma Statistics on Detected Data Only** | | | | | | | | | | | |
| 4845 | | | | | | k hat (MLE) | 1.553 | | | | k star (bias corrected MLE) | 1.442 |
| 4846 | | | | | | Theta hat (MLE) | 0.798 | | | | Theta star (bias corrected MLE) | 0.86 |
| 4847 | | | | | | nu hat (MLE) | 111.8 | | | | nu star (bias corrected) | 103.8 |
| 4848 | | | | | | MLE Mean (bias corrected) | 1.24 | | | | MLE Sd (bias corrected) | 1.033 |
| 4849 | | | | | | | | | | | | |
| 4850 | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | | | | | |
| 4851 | | | | | | k hat (KM) | 0.468 | | | | nu hat (KM) | 77.61 |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4852 | Approximate Chi Square Value (77.61, α) | | | | | 58.32 | Adjusted Chi Square Value (77.61, β) | | | | | 58.02 |
| 4853 | 95% Gamma Approximate KM-UCL (use when n>=50) | | | | | 0.942 | 95% Gamma Adjusted KM-UCL (use when n<50) | | | | | 0.947 |
| 4854 | | | | | | | | | | | | |
| 4855 | **Gamma ROS Statistics using Imputed Non-Detects** | | | | | | | | | | | |
| 4856 | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | | | | |
| 4857 | GROS may not be used when kstar of detected data is small such as < 0.1 | | | | | | | | | | | |
| 4858 | For such situations, GROS method tends to yield inflated values of UCLs and BTVs | | | | | | | | | | | |
| 4859 | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | | | | |
| 4860 | Minimum | | | | | 0.01 | Mean | | | | | 0.569 |
| 4861 | Maximum | | | | | 8.6 | Median | | | | | 0.148 |
| 4862 | SD | | | | | 1.101 | CV | | | | | 1.936 |
| 4863 | k hat (MLE) | | | | | 0.384 | k star (bias corrected MLE) | | | | | 0.378 |
| 4864 | Theta hat (MLE) | | | | | 1.48 | Theta star (bias corrected MLE) | | | | | 1.503 |
| 4865 | nu hat (MLE) | | | | | 63.79 | nu star (bias corrected) | | | | | 62.82 |
| 4866 | MLE Mean (bias corrected) | | | | | 0.569 | MLE Sd (bias corrected) | | | | | 0.925 |
| 4867 | | | | | | | Adjusted Level of Significance (β) | | | | | 0.0471 |
| 4868 | Approximate Chi Square Value (62.82, α) | | | | | 45.59 | Adjusted Chi Square Value (62.82, β) | | | | | 45.33 |
| 4869 | 95% Gamma Approximate UCL (use when n>=50) | | | | | 0.784 | 95% Gamma Adjusted UCL (use when n<50) | | | | | 0.788 |
| 4870 | | | | | | | | | | | | |
| 4871 | **Lognormal GOF Test on Detected Observations Only** | | | | | | | | | | | |
| 4872 | Shapiro Wilk Test Statistic | | | | | 0.983 | **Shapiro Wilk GOF Test** | | | | | |
| 4873 | 5% Shapiro Wilk Critical Value | | | | | 0.935 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 4874 | Lilliefors Test Statistic | | | | | 0.0768 | **Lilliefors GOF Test** | | | | | |
| 4875 | 5% Lilliefors Critical Value | | | | | 0.148 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 4876 | **Detected Data appear Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 4877 | | | | | | | | | | | | |
| 4878 | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | | | | | |
| 4879 | Mean in Original Scale | | | | | 0.704 | Mean in Log Scale | | | | | -0.799 |
| 4880 | SD in Original Scale | | | | | 1.043 | SD in Log Scale | | | | | 0.853 |
| 4881 | 95% t UCL (assumes normality of ROS data) | | | | | 0.894 | 95% Percentile Bootstrap UCL | | | | | 0.904 |
| 4882 | 95% BCA Bootstrap UCL | | | | | 1.019 | 95% Bootstrap t UCL | | | | | 1.02 |
| 4883 | 95% H-UCL (Log ROS) | | | | | 0.789 | | | | | | |
| 4884 | | | | | | | | | | | | |
| 4885 | **UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed** | | | | | | | | | | | |
| 4886 | KM Mean (logged) | | | | | -0.785 | 95% H-UCL (KM -Log) | | | | | 0.787 |
| 4887 | KM SD (logged) | | | | | 0.839 | 95% Critical H Value (KM-Log) | | | | | 2.088 |
| 4888 | KM Standard Error of Mean (logged) | | | | | 0.122 | | | | | | |
| 4889 | | | | | | | | | | | | |
| 4890 | **DL/2 Statistics** | | | | | | | | | | | |
| 4891 | **DL/2 Normal** | | | | | | **DL/2 Log-Transformed** | | | | | |
| 4892 | Mean in Original Scale | | | | | 0.699 | Mean in Log Scale | | | | | -0.781 |
| 4893 | SD in Original Scale | | | | | 1.043 | SD in Log Scale | | | | | 0.796 |
| 4894 | 95% t UCL (Assumes normality) | | | | | 0.889 | 95% H-Stat UCL | | | | | 0.753 |
| 4895 | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | | | | | |
| 4896 | | | | | | | | | | | | |
| 4897 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 4898 | **Detected Data appear Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 4899 | | | | | | | | | | | | |
| 4900 | **Suggested UCL to Use** | | | | | | | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4901 | | | | 95% KM (t) UCL | | 0.903 | | | 95% GROS Approximate Gamma UCL | | | 0.784 |
| 4902 | | | | 95% Approximate Gamma KM-UCL | | 0.942 | | | | | | |
| 4903 | | | | | | | | | | | | |
| 4904 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 4905 | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | | | | | |
| 4906 | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | | | | | |
| 4907 | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 4908 | | | | | | | | | | | | |
| 4909 | **Toluene** | | | | | | | | | | | |
| 4910 | | | | | | | | | | | | |
| 4911 | **General Statistics** | | | | | | | | | | | |
| 4912 | | | | Total Number of Observations | | 97 | | | Number of Distinct Observations | | | 36 |
| 4913 | | | | Number of Detects | | 17 | | | Number of Non-Detects | | | 80 |
| 4914 | | | | Number of Distinct Detects | | 16 | | | Number of Distinct Non-Detects | | | 22 |
| 4915 | | | | Minimum Detect | | 0.82 | | | Minimum Non-Detect | | | 0.5 |
| 4916 | | | | Maximum Detect | | 33 | | | Maximum Non-Detect | | | 6.25 |
| 4917 | | | | Variance Detects | | 70.91 | | | Percent Non-Detects | | | 82.47% |
| 4918 | | | | Mean Detects | | 5.462 | | | SD Detects | | | 8.421 |
| 4919 | | | | Median Detects | | 2.1 | | | CV Detects | | | 1.542 |
| 4920 | | | | Skewness Detects | | 2.766 | | | Kurtosis Detects | | | 7.616 |
| 4921 | | | | Mean of Logged Detects | | 1.063 | | | SD of Logged Detects | | | 1.03 |
| 4922 | | | | | | | | | | | | |
| 4923 | **Normal GOF Test on Detects Only** | | | | | | | | | | | |
| 4924 | | | | Shapiro Wilk Test Statistic | | 0.568 | | | **Shapiro Wilk GOF Test** | | | |
| 4925 | | | | 5% Shapiro Wilk Critical Value | | 0.892 | | | Detected Data Not Normal at 5% Significance Level | | | |
| 4926 | | | | Lilliefors Test Statistic | | 0.333 | | | **Lilliefors GOF Test** | | | |
| 4927 | | | | 5% Lilliefors Critical Value | | 0.215 | | | Detected Data Not Normal at 5% Significance Level | | | |
| 4928 | **Detected Data Not Normal at 5% Significance Level** | | | | | | | | | | | |
| 4929 | | | | | | | | | | | | |
| 4930 | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | | | | | |
| 4931 | | | | Mean | | 2.334 | | | Standard Error of Mean | | | 0.458 |
| 4932 | | | | SD | | 3.814 | | | 95% KM (BCA) UCL | | | 3.126 |
| 4933 | | | | 95% KM (t) UCL | | 3.095 | | | 95% KM (Percentile Bootstrap) UCL | | | 3.106 |
| 4934 | | | | 95% KM (z) UCL | | 3.088 | | | 95% KM Bootstrap t UCL | | | 3.491 |
| 4935 | | | | 90% KM Chebyshev UCL | | 3.708 | | | 95% KM Chebyshev UCL | | | 4.331 |
| 4936 | | | | 97.5% KM Chebyshev UCL | | 5.195 | | | 99% KM Chebyshev UCL | | | 6.893 |
| 4937 | | | | | | | | | | | | |
| 4938 | **Gamma GOF Tests on Detected Observations Only** | | | | | | | | | | | |
| 4939 | | | | A-D Test Statistic | | 1.365 | | | **Anderson-Darling GOF Test** | | | |
| 4940 | | | | 5% A-D Critical Value | | 0.769 | | | Detected Data Not Gamma Distributed at 5% Significance Level | | | |
| 4941 | | | | K-S Test Statistic | | 0.239 | | | **Kolmogrov-Smirnoff GOF** | | | |
| 4942 | | | | 5% K-S Critical Value | | 0.216 | | | Detected Data Not Gamma Distributed at 5% Significance Level | | | |
| 4943 | **Detected Data Not Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 4944 | | | | | | | | | | | | |
| 4945 | **Gamma Statistics on Detected Data Only** | | | | | | | | | | | |
| 4946 | | | | k hat (MLE) | | 0.919 | | | k star (bias corrected MLE) | | | 0.796 |
| 4947 | | | | Theta hat (MLE) | | 5.944 | | | Theta star (bias corrected MLE) | | | 6.862 |
| 4948 | | | | nu hat (MLE) | | 31.24 | | | nu star (bias corrected) | | | 27.06 |
| 4949 | | | | MLE Mean (bias corrected) | | 5.462 | | | MLE Sd (bias corrected) | | | 6.122 |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4950 | | | | | | | | | | | | |
| 4951 | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | | | | | |
| 4952 | k hat (KM) | | | | | 0.374 | nu hat (KM) | | | | | 72.65 |
| 4953 | Approximate Chi Square Value (72.65, α) | | | | | 54.02 | Adjusted Chi Square Value (72.65, β) | | | | | 53.78 |
| 4954 | 95% Gamma Approximate KM-UCL (use when n>=50) | | | | | 3.138 | 95% Gamma Adjusted KM-UCL (use when n<50) | | | | | 3.153 |
| 4955 | | | | | | | | | | | | |
| 4956 | **Gamma ROS Statistics using Imputed Non-Detects** | | | | | | | | | | | |
| 4957 | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | | | | | |
| 4958 | GROS may not be used when kstar of detected data is small such as < 0.1 | | | | | | | | | | | |
| 4959 | For such situations, GROS method tends to yield inflated values of UCLs and BTVs | | | | | | | | | | | |
| 4960 | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | | | | | |
| 4961 | Minimum | | | | | 0.01 | Mean | | | | | 1.975 |
| 4962 | Maximum | | | | | 33 | Median | | | | | 0.629 |
| 4963 | SD | | | | | 4.125 | CV | | | | | 2.089 |
| 4964 | k hat (MLE) | | | | | 0.339 | k star (bias corrected MLE) | | | | | 0.336 |
| 4965 | Theta hat (MLE) | | | | | 5.82 | Theta star (bias corrected MLE) | | | | | 5.883 |
| 4966 | nu hat (MLE) | | | | | 65.83 | nu star (bias corrected) | | | | | 65.12 |
| 4967 | MLE Mean (bias corrected) | | | | | 1.975 | MLE Sd (bias corrected) | | | | | 3.408 |
| 4968 | | | | | | | Adjusted Level of Significance (β) | | | | | 0.0475 |
| 4969 | Approximate Chi Square Value (65.12, α) | | | | | 47.56 | Adjusted Chi Square Value (65.12, β) | | | | | 47.33 |
| 4970 | 95% Gamma Approximate UCL (use when n>=50) | | | | | 2.704 | 95% Gamma Adjusted UCL (use when n<50) | | | | | 2.717 |
| 4971 | | | | | | | | | | | | |
| 4972 | **Lognormal GOF Test on Detected Observations Only** | | | | | | | | | | | |
| 4973 | Shapiro Wilk Test Statistic | | | | | 0.902 | **Shapiro Wilk GOF Test** | | | | | |
| 4974 | 5% Shapiro Wilk Critical Value | | | | | 0.892 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 4975 | Lilliefors Test Statistic | | | | | 0.193 | **Lilliefors GOF Test** | | | | | |
| 4976 | 5% Lilliefors Critical Value | | | | | 0.215 | Detected Data appear Lognormal at 5% Significance Level | | | | | |
| 4977 | **Detected Data appear Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 4978 | | | | | | | | | | | | |
| 4979 | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | | | | | |
| 4980 | Mean in Original Scale | | | | | 2.316 | Mean in Log Scale | | | | | 0.45 |
| 4981 | SD in Original Scale | | | | | 3.839 | SD in Log Scale | | | | | 0.759 |
| 4982 | 95% t UCL (assumes normality of ROS data) | | | | | 2.964 | 95% Percentile Bootstrap UCL | | | | | 3.021 |
| 4983 | 95% BCA Bootstrap UCL | | | | | 3.384 | 95% Bootstrap t UCL | | | | | 4.176 |
| 4984 | 95% H-UCL (Log ROS) | | | | | 2.454 | | | | | | |
| 4985 | | | | | | | | | | | | |
| 4986 | **UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed** | | | | | | | | | | | |
| 4987 | KM Mean (logged) | | | | | 0.462 | 95% H-UCL (KM -Log) | | | | | 2.47 |
| 4988 | KM SD (logged) | | | | | 0.753 | 95% Critical H Value (KM-Log) | | | | | 2.059 |
| 4989 | KM Standard Error of Mean (logged) | | | | | 0.164 | | | | | | |
| 4990 | | | | | | | | | | | | |
| 4991 | **DL/2 Statistics** | | | | | | | | | | | |
| 4992 | **DL/2 Normal** | | | | | | **DL/2 Log-Transformed** | | | | | |
| 4993 | Mean in Original Scale | | | | | 2.914 | Mean in Log Scale | | | | | 0.865 |
| 4994 | SD in Original Scale | | | | | 3.658 | SD in Log Scale | | | | | 0.548 |
| 4995 | 95% t UCL (Assumes normality) | | | | | 3.531 | 95% H-Stat UCL | | | | | 3.067 |
| 4996 | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | | | | | |
| 4997 | | | | | | | | | | | | |
| 4998 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4999 | **Detected Data appear Lognormal Distributed at 5% Significance Level** | | | | | | | | | | | |
| 5000 | | | | | | | | | | | | |
| 5001 | **Suggested UCL to Use** | | | | | | | | | | | |
| 5002 | 95% KM (BCA) UCL | | | | 3.126 | | | | | | | |
| 5003 | | | | | | | | | | | | |
| 5004 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 5005 | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | | | | | |
| 5006 | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | | | | | |
| 5007 | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 5008 | | | | | | | | | | | | |
| 5009 | | | | | | | | | | | | |
| 5010 | **Vanadium** | | | | | | | | | | | |
| 5011 | | | | | | | | | | | | |
| 5012 | **General Statistics** | | | | | | | | | | | |
| 5013 | Total Number of Observations | | | | 97 | | | Number of Distinct Observations | | | | 40 |
| 5014 | | | | | | | | Number of Missing Observations | | | | 0 |
| 5015 | Minimum | | | | 10.2 | | | Mean | | | | 38.66 |
| 5016 | Maximum | | | | 90 | | | Median | | | | 37 |
| 5017 | SD | | | | 10.82 | | | Std. Error of Mean | | | | 1.098 |
| 5018 | Coefficient of Variation | | | | 0.28 | | | Skewness | | | | 1.677 |
| 5019 | | | | | | | | | | | | |
| 5020 | **Normal GOF Test** | | | | | | | | | | | |
| 5021 | Shapiro Wilk Test Statistic | | | | 0.885 | | | **Shapiro Wilk GOF Test** | | | | |
| 5022 | 5% Shapiro Wilk P Value | | | | 2.663E-10 | | | Data Not Normal at 5% Significance Level | | | | |
| 5023 | Lilliefors Test Statistic | | | | 0.139 | | | **Lilliefors GOF Test** | | | | |
| 5024 | 5% Lilliefors Critical Value | | | | 0.09 | | | Data Not Normal at 5% Significance Level | | | | |
| 5025 | **Data Not Normal at 5% Significance Level** | | | | | | | | | | | |
| 5026 | | | | | | | | | | | | |
| 5027 | **Assuming Normal Distribution** | | | | | | | | | | | |
| 5028 | **95% Normal UCL** | | | | | | | **95% UCLs (Adjusted for Skewness)** | | | | |
| 5029 | 95% Student's-t UCL | | | | 40.48 | | | 95% Adjusted-CLT UCL (Chen-1995) | | | | 40.67 |
| 5030 | | | | | | | | 95% Modified-t UCL (Johnson-1978) | | | | 40.51 |
| 5031 | | | | | | | | | | | | |
| 5032 | **Gamma GOF Test** | | | | | | | | | | | |
| 5033 | A-D Test Statistic | | | | 1.944 | | | **Anderson-Darling Gamma GOF Test** | | | | |
| 5034 | 5% A-D Critical Value | | | | 0.751 | | | Data Not Gamma Distributed at 5% Significance Level | | | | |
| 5035 | K-S Test Statistic | | | | 0.112 | | | **Kolmogrov-Smirnoff Gamma GOF Test** | | | | |
| 5036 | 5% K-S Critical Value | | | | 0.0907 | | | Data Not Gamma Distributed at 5% Significance Level | | | | |
| 5037 | **Data Not Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 5038 | | | | | | | | | | | | |
| 5039 | **Gamma Statistics** | | | | | | | | | | | |
| 5040 | k hat (MLE) | | | | 13.89 | | | k star (bias corrected MLE) | | | | 13.46 |
| 5041 | Theta hat (MLE) | | | | 2.784 | | | Theta star (bias corrected MLE) | | | | 2.871 |
| 5042 | nu hat (MLE) | | | | 2694 | | | nu star (bias corrected) | | | | 2612 |
| 5043 | MLE Mean (bias corrected) | | | | 38.66 | | | MLE Sd (bias corrected) | | | | 10.54 |
| 5044 | | | | | | | | Approximate Chi Square Value (0.05) | | | | 2494 |
| 5045 | Adjusted Level of Significance | | | | 0.0475 | | | Adjusted Chi Square Value | | | | 2493 |
| 5046 | | | | | | | | | | | | |
| 5047 | **Assuming Gamma Distribution** | | | | | | | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5048 | 95% Approximate Gamma UCL (use when n>=50)) | | | | | 40.48 | 95% Adjusted Gamma UCL (use when n<50) | | | | | 40.51 |
| 5049 | | | | | | | | | | | | |
| 5050 | **Lognormal GOF Test** | | | | | | | | | | | |
| 5051 | Shapiro Wilk Test Statistic | | | | | 0.927 | **Shapiro Wilk Lognormal GOF Test** | | | | | |
| 5052 | 5% Shapiro Wilk P Value | | | | | 1.3715E-5 | Data Not Lognormal at 5% Significance Level | | | | | |
| 5053 | Lilliefors Test Statistic | | | | | 0.11 | **Lilliefors Lognormal GOF Test** | | | | | |
| 5054 | 5% Lilliefors Critical Value | | | | | 0.09 | Data Not Lognormal at 5% Significance Level | | | | | |
| 5055 | **Data Not Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 5056 | | | | | | | | | | | | |
| 5057 | **Lognormal Statistics** | | | | | | | | | | | |
| 5058 | Minimum of Logged Data | | | | | 2.322 | Mean of logged Data | | | | | 3.618 |
| 5059 | Maximum of Logged Data | | | | | 4.5 | SD of logged Data | | | | | 0.276 |
| 5060 | | | | | | | | | | | | |
| 5061 | **Assuming Lognormal Distribution** | | | | | | | | | | | |
| 5062 | 95% H-UCL | | | | | 40.67 | 90% Chebyshev (MVUE) UCL | | | | | 42.03 |
| 5063 | 95% Chebyshev (MVUE) UCL | | | | | 43.53 | 97.5% Chebyshev (MVUE) UCL | | | | | 45.61 |
| 5064 | 99% Chebyshev (MVUE) UCL | | | | | 49.71 | | | | | | |
| 5065 | | | | | | | | | | | | |
| 5066 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 5067 | **Data do not follow a Discernible Distribution (0.05)** | | | | | | | | | | | |
| 5068 | | | | | | | | | | | | |
| 5069 | **Nonparametric Distribution Free UCLs** | | | | | | | | | | | |
| 5070 | 95% CLT UCL | | | | | 40.47 | 95% Jackknife UCL | | | | | 40.48 |
| 5071 | 95% Standard Bootstrap UCL | | | | | 40.53 | 95% Bootstrap-t UCL | | | | | 40.66 |
| 5072 | 95% Hall's Bootstrap UCL | | | | | 40.86 | 95% Percentile Bootstrap UCL | | | | | 40.54 |
| 5073 | 95% BCA Bootstrap UCL | | | | | 40.76 | | | | | | |
| 5074 | 90% Chebyshev(Mean, Sd) UCL | | | | | 41.95 | 95% Chebyshev(Mean, Sd) UCL | | | | | 43.45 |
| 5075 | 97.5% Chebyshev(Mean, Sd) UCL | | | | | 45.52 | 99% Chebyshev(Mean, Sd) UCL | | | | | 49.59 |
| 5076 | | | | | | | | | | | | |
| 5077 | **Suggested UCL to Use** | | | | | | | | | | | |
| 5078 | 95% Student's-t UCL | | | | | 40.48 | or 95% Modified-t UCL | | | | | 40.51 |
| 5079 | | | | | | | | | | | | |
| 5080 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 5081 | These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) | | | | | | | | | | | |
| 5082 | and Singh and Singh (2003). However, simulations results will not cover all Real World data sets. | | | | | | | | | | | |
| 5083 | For additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 5084 | | | | | | | | | | | | |
| 5085 | **Xylene (total)** | | | | | | | | | | | |
| 5086 | | | | | | | | | | | | |
| 5087 | **General Statistics** | | | | | | | | | | | |
| 5088 | Total Number of Observations | | | | | 97 | Number of Distinct Observations | | | | | 49 |
| 5089 | Number of Detects | | | | | 25 | Number of Non-Detects | | | | | 72 |
| 5090 | Number of Distinct Detects | | | | | 22 | Number of Distinct Non-Detects | | | | | 27 |
| 5091 | Minimum Detect | | | | | 1 | Minimum Non-Detect | | | | | 0.5 |
| 5092 | Maximum Detect | | | | | 4000 | Maximum Non-Detect | | | | | 12 |
| 5093 | Variance Detects | | | | | 639859 | Percent Non-Detects | | | | | 74.23% |
| 5094 | Mean Detects | | | | | 202.1 | SD Detects | | | | | 799.9 |
| 5095 | Median Detects | | | | | 3.9 | CV Detects | | | | | 3.958 |
| 5096 | Skewness Detects | | | | | 4.837 | Kurtosis Detects | | | | | 23.79 |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5097 | | | | | Mean of Logged Detects | 2.187 | | | | | SD of Logged Detects | 2.086 |
| 5098 | | | | | | | | | | | | |
| 5099 | | | | | **Normal GOF Test on Detects Only** | | | | | | | |
| 5100 | | | | | Shapiro Wilk Test Statistic | 0.273 | **Shapiro Wilk GOF Test** | | | | | |
| 5101 | | | | | 5% Shapiro Wilk Critical Value | 0.918 | Detected Data Not Normal at 5% Significance Level | | | | | |
| 5102 | | | | | Lilliefors Test Statistic | 0.45 | **Lilliefors GOF Test** | | | | | |
| 5103 | | | | | 5% Lilliefors Critical Value | 0.177 | Detected Data Not Normal at 5% Significance Level | | | | | |
| 5104 | | | | | **Detected Data Not Normal at 5% Significance Level** | | | | | | | |
| 5105 | | | | | | | | | | | | |
| 5106 | | | | | **Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs** | | | | | | | |
| 5107 | | | | | Mean | 53.9 | | | | Standard Error of Mean | | 42.22 |
| 5108 | | | | | SD | 407.4 | | | | 95% KM (BCA) UCL | | 136.2 |
| 5109 | | | | | 95% KM (t) UCL | 124 | | | | 95% KM (Percentile Bootstrap) UCL | | 133.9 |
| 5110 | | | | | 95% KM (z) UCL | 123.3 | | | | 95% KM Bootstrap t UCL | | 690.2 |
| 5111 | | | | | 90% KM Chebyshev UCL | 180.5 | | | | 95% KM Chebyshev UCL | | 237.9 |
| 5112 | | | | | 97.5% KM Chebyshev UCL | 317.5 | | | | 99% KM Chebyshev UCL | | 473.9 |
| 5113 | | | | | | | | | | | | |
| 5114 | | | | | **Gamma GOF Tests on Detected Observations Only** | | | | | | | |
| 5115 | | | | | A-D Test Statistic | 4.117 | **Anderson-Darling GOF Test** | | | | | |
| 5116 | | | | | 5% A-D Critical Value | 0.885 | Detected Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 5117 | | | | | K-S Test Statistic | 0.319 | **Kolmogrov-Smirnoff GOF** | | | | | |
| 5118 | | | | | 5% K-S Critical Value | 0.192 | Detected Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 5119 | | | | | **Detected Data Not Gamma Distributed at 5% Significance Level** | | | | | | | |
| 5120 | | | | | | | | | | | | |
| 5121 | | | | | **Gamma Statistics on Detected Data Only** | | | | | | | |
| 5122 | | | | | k hat (MLE) | 0.23 | | | | k star (bias corrected MLE) | | 0.229 |
| 5123 | | | | | Theta hat (MLE) | 876.9 | | | | Theta star (bias corrected MLE) | | 880.6 |
| 5124 | | | | | nu hat (MLE) | 11.52 | | | | nu star (bias corrected) | | 11.47 |
| 5125 | | | | | MLE Mean (bias corrected) | 202.1 | | | | MLE Sd (bias corrected) | | 421.9 |
| 5126 | | | | | | | | | | | | |
| 5127 | | | | | **Gamma Kaplan-Meier (KM) Statistics** | | | | | | | |
| 5128 | | | | | k hat (KM) | 0.0175 | | | | nu hat (KM) | | 3.397 |
| 5129 | | | | | Approximate Chi Square Value (3.40, α) | 0.499 | | | | Adjusted Chi Square Value (3.40, β) | | 0.484 |
| 5130 | | | | | 95% Gamma Approximate KM-UCL (use when n>=50) | 366.9 | | | | 95% Gamma Adjusted KM-UCL (use when n<50) | | 378.2 |
| 5131 | | | | | Gamma (KM) may not be used when k hat (KM) is < 0.1 | | | | | | | |
| 5132 | | | | | | | | | | | | |
| 5133 | | | | | **Gamma ROS Statistics using Imputed Non-Detects** | | | | | | | |
| 5134 | | | | | GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs | | | | | | | |
| 5135 | | | | | GROS may not be used when kstar of detected data is small such as < 0.1 | | | | | | | |
| 5136 | | | | | For such situations, GROS method tends to yield inflated values of UCLs and BTVs | | | | | | | |
| 5137 | | | | | For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates | | | | | | | |
| 5138 | | | | | Minimum | 0.01 | | | | Mean | | 52.28 |
| 5139 | | | | | Maximum | 4000 | | | | Median | | 0.01 |
| 5140 | | | | | SD | 409.7 | | | | CV | | 7.836 |
| 5141 | | | | | k hat (MLE) | 0.119 | | | | k star (bias corrected MLE) | | 0.122 |
| 5142 | | | | | Theta hat (MLE) | 439.3 | | | | Theta star (bias corrected MLE) | | 427.8 |
| 5143 | | | | | nu hat (MLE) | 23.09 | | | | nu star (bias corrected) | | 23.71 |
| 5144 | | | | | MLE Mean (bias corrected) | 52.28 | | | | MLE Sd (bias corrected) | | 149.6 |
| 5145 | | | | | | | | | | Adjusted Level of Significance (β) | | 0.0475 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5146 | Approximate Chi Square Value (23.71, α) | | | | | 13.63 | Adjusted Chi Square Value (23.71, β) | | | | | 13.51 |
| 5147 | 95% Gamma Approximate UCL (use when n>=50) | | | | | 90.96 | 95% Gamma Adjusted UCL (use when n<50) | | | | | 91.74 |
| 5148 | | | | | | | | | | | | |
| 5149 | **Lognormal GOF Test on Detected Observations Only** | | | | | | | | | | | |
| 5150 | Shapiro Wilk Test Statistic | | | | | 0.837 | **Shapiro Wilk GOF Test** | | | | | |
| 5151 | 5% Shapiro Wilk Critical Value | | | | | 0.918 | Detected Data Not Lognormal at 5% Significance Level | | | | | |
| 5152 | Lilliefors Test Statistic | | | | | 0.186 | **Lilliefors GOF Test** | | | | | |
| 5153 | 5% Lilliefors Critical Value | | | | | 0.177 | Detected Data Not Lognormal at 5% Significance Level | | | | | |
| 5154 | **Detected Data Not Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 5155 | | | | | | | | | | | | |
| 5156 | **Lognormal ROS Statistics Using Imputed Non-Detects** | | | | | | | | | | | |
| 5157 | Mean in Original Scale | | | | | 54.25 | Mean in Log Scale | | | | | 1 |
| 5158 | SD in Original Scale | | | | | 409.4 | SD in Log Scale | | | | | 1.56 |
| 5159 | 95% t UCL (assumes normality of ROS data) | | | | | 123.3 | 95% Percentile Bootstrap UCL | | | | | 135.9 |
| 5160 | 95% BCA Bootstrap UCL | | | | | 219.8 | 95% Bootstrap t UCL | | | | | 2002 |
| 5161 | 95% H-UCL (Log ROS) | | | | | 14.48 | | | | | | |
| 5162 | | | | | | | | | | | | |
| 5163 | **DL/2 Statistics** | | | | | | | | | | | |
| 5164 | **DL/2 Normal** | | | | | | **DL/2 Log-Transformed** | | | | | |
| 5165 | Mean in Original Scale | | | | | 55.36 | Mean in Log Scale | | | | | 1.616 |
| 5166 | SD in Original Scale | | | | | 409.3 | SD in Log Scale | | | | | 1.179 |
| 5167 | 95% t UCL (Assumes normality) | | | | | 124.4 | 95% H-Stat UCL | | | | | 13.52 |
| 5168 | **DL/2 is not a recommended method, provided for comparisons and historical reasons** | | | | | | | | | | | |
| 5169 | | | | | | | | | | | | |
| 5170 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 5171 | **Data do not follow a Discernible Distribution at 5% Significance Level** | | | | | | | | | | | |
| 5172 | | | | | | | | | | | | |
| 5173 | **Suggested UCL to Use** | | | | | | | | | | | |
| 5174 | 97.5% KM (Chebyshev) UCL | | | | | 317.5 | | | | | | |
| 5175 | | | | | | | | | | | | |
| 5176 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 5177 | Recommendations are based upon data size, data distribution, and skewness. | | | | | | | | | | | |
| 5178 | These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). | | | | | | | | | | | |
| 5179 | However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 5180 | | | | | | | | | | | | |
| 5181 | | | | | | | | | | | | |
| 5182 | **Zinc** | | | | | | | | | | | |
| 5183 | | | | | | | | | | | | |
| 5184 | **General Statistics** | | | | | | | | | | | |
| 5185 | Total Number of Observations | | | | | 99 | Number of Distinct Observations | | | | | 67 |
| 5186 | | | | | | | Number of Missing Observations | | | | | 0 |
| 5187 | Minimum | | | | | 23 | Mean | | | | | 211.4 |
| 5188 | Maximum | | | | | 2420 | Median | | | | | 54 |
| 5189 | SD | | | | | 394.1 | Std. Error of Mean | | | | | 39.61 |
| 5190 | Coefficient of Variation | | | | | 1.864 | Skewness | | | | | 4.021 |
| 5191 | | | | | | | | | | | | |
| 5192 | **Normal GOF Test** | | | | | | | | | | | |
| 5193 | Shapiro Wilk Test Statistic | | | | | 0.497 | **Shapiro Wilk GOF Test** | | | | | |
| 5194 | 5% Shapiro Wilk P Value | | | | | 0 | Data Not Normal at 5% Significance Level | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5195 | | | | Lilliefors Test Statistic | | 0.316 | **Lilliefors GOF Test** | | | | | |
| 5196 | | | | 5% Lilliefors Critical Value | | 0.089 | Data Not Normal at 5% Significance Level | | | | | |
| 5197 | **Data Not Normal at 5% Significance Level** | | | | | | | | | | | |
| 5198 | | | | | | | | | | | | |
| 5199 | **Assuming Normal Distribution** | | | | | | | | | | | |
| 5200 | **95% Normal UCL** | | | | | | **95% UCLs (Adjusted for Skewness)** | | | | | |
| 5201 | | | | 95% Student's-t UCL | | 277.2 | | | | 95% Adjusted-CLT UCL (Chen-1995) | | 293.7 |
| 5202 | | | | | | | | | | 95% Modified-t UCL (Johnson-1978) | | 279.9 |
| 5203 | | | | | | | | | | | | |
| 5204 | **Gamma GOF Test** | | | | | | | | | | | |
| 5205 | | | | A-D Test Statistic | | 7.213 | **Anderson-Darling Gamma GOF Test** | | | | | |
| 5206 | | | | 5% A-D Critical Value | | 0.796 | Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 5207 | | | | K-S Test Statistic | | 0.244 | **Kolmogrov-Smirnoff Gamma GOF Test** | | | | | |
| 5208 | | | | 5% K-S Critical Value | | 0.0935 | Data Not Gamma Distributed at 5% Significance Level | | | | | |
| 5209 | **Data Not Gamma Distributed at 5% Significance Level** | | | | | | | | | | | |
| 5210 | | | | | | | | | | | | |
| 5211 | **Gamma Statistics** | | | | | | | | | | | |
| 5212 | | | | k hat (MLE) | | 0.741 | | | | k star (bias corrected MLE) | | 0.725 |
| 5213 | | | | Theta hat (MLE) | | 285.4 | | | | Theta star (bias corrected MLE) | | 291.6 |
| 5214 | | | | nu hat (MLE) | | 146.7 | | | | nu star (bias corrected) | | 143.6 |
| 5215 | | | | MLE Mean (bias corrected) | | 211.4 | | | | MLE Sd (bias corrected) | | 248.3 |
| 5216 | | | | | | | | | | Approximate Chi Square Value (0.05) | | 116.9 |
| 5217 | | | | Adjusted Level of Significance | | 0.0476 | | | | Adjusted Chi Square Value | | 116.5 |
| 5218 | | | | | | | | | | | | |
| 5219 | **Assuming Gamma Distribution** | | | | | | | | | | | |
| 5220 | | | | 95% Approximate Gamma UCL (use when n>=50)) | | 259.7 | | | | 95% Adjusted Gamma UCL (use when n<50) | | 260.5 |
| 5221 | | | | | | | | | | | | |
| 5222 | **Lognormal GOF Test** | | | | | | | | | | | |
| 5223 | | | | Shapiro Wilk Test Statistic | | 0.874 | **Shapiro Wilk Lognormal GOF Test** | | | | | |
| 5224 | | | | 5% Shapiro Wilk P Value | | 7.942E-12 | Data Not Lognormal at 5% Significance Level | | | | | |
| 5225 | | | | Lilliefors Test Statistic | | 0.215 | **Lilliefors Lognormal GOF Test** | | | | | |
| 5226 | | | | 5% Lilliefors Critical Value | | 0.089 | Data Not Lognormal at 5% Significance Level | | | | | |
| 5227 | **Data Not Lognormal at 5% Significance Level** | | | | | | | | | | | |
| 5228 | | | | | | | | | | | | |
| 5229 | **Lognormal Statistics** | | | | | | | | | | | |
| 5230 | | | | Minimum of Logged Data | | 3.135 | | | | Mean of logged Data | | 4.544 |
| 5231 | | | | Maximum of Logged Data | | 7.792 | | | | SD of logged Data | | 1.138 |
| 5232 | | | | | | | | | | | | |
| 5233 | **Assuming Lognormal Distribution** | | | | | | | | | | | |
| 5234 | | | | 95% H-UCL | | 237 | | | | 90% Chebyshev (MVUE) UCL | | 254.3 |
| 5235 | | | | 95% Chebyshev (MVUE) UCL | | 288.8 | | | | 97.5% Chebyshev (MVUE) UCL | | 336.8 |
| 5236 | | | | 99% Chebyshev (MVUE) UCL | | 431 | | | | | | |
| 5237 | | | | | | | | | | | | |
| 5238 | **Nonparametric Distribution Free UCL Statistics** | | | | | | | | | | | |
| 5239 | **Data do not follow a Discernible Distribution (0.05)** | | | | | | | | | | | |
| 5240 | | | | | | | | | | | | |
| 5241 | **Nonparametric Distribution Free UCLs** | | | | | | | | | | | |
| 5242 | | | | 95% CLT UCL | | 276.6 | | | | 95% Jackknife UCL | | 277.2 |
| 5243 | | | | 95% Standard Bootstrap UCL | | 275.8 | | | | 95% Bootstrap-t UCL | | 313.8 |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5244 | 95% Hall's Bootstrap UCL | | | | | 298.9 | 95% Percentile Bootstrap UCL | | | | | 281.9 |
| 5245 | 95% BCA Bootstrap UCL | | | | | 303.9 | | | | | | |
| 5246 | 90% Chebyshev(Mean, Sd) UCL | | | | | 330.3 | 95% Chebyshev(Mean, Sd) UCL | | | | | 384.1 |
| 5247 | 97.5% Chebyshev(Mean, Sd) UCL | | | | | 458.8 | 99% Chebyshev(Mean, Sd) UCL | | | | | 605.5 |
| 5248 | | | | | | | | | | | | |
| 5249 | **Suggested UCL to Use** | | | | | | | | | | | |
| 5250 | 95% Chebyshev (Mean, Sd) UCL | | | | | 384.1 | | | | | | |
| 5251 | | | | | | | | | | | | |
| 5252 | Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. | | | | | | | | | | | |
| 5253 | These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) | | | | | | | | | | | |
| 5254 | and Singh and Singh (2003). However, simulations results will not cover all Real World data sets. | | | | | | | | | | | |
| 5255 | For additional insight the user may want to consult a statistician. | | | | | | | | | | | |
| 5256 | | | | | | | | | | | | |

# Appendix C
# Background Risk Calculation Sheets for Soil Exposure

**Table C-1. Risk Calculations - Soil Exposure - Commercial Worker - Surface Soil**

*Human Health Risk Assessment, 744 and 758 High Street, Oakland, California*

| | | Carcinogenic Risk Estiamte (ELCR) Calculations | | | | | | | | | Non-Cancer Hazard Estimate Calculations | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Analyte Group | COPC | EPC (mg/kg) | Intake Oral (mg/kg-day) | Intake Dermal (mg/kg-day) | Intake Inhalation ($mg/m^3$) | Oral Risk | Dermal Risk | Inhalation Risk | Total ELCR | Percent Contribution | Intake Oral (mg/kg-day) | Intake Dermal (mg/kg-day) | Intake Inhalation ($mg/m^3$) | Oral HQ | Dermal HQ | Inhalation HQ | Total HQ | Percent Contribution |
| MET | Antimony | 2.22E+00 | 6.77E-07 | 8.17E-08 | 1.33E-10 | -- | -- | -- | -- | -- | 1.90E-06 | 2.29E-07 | 3.72E-10 | 4.74E-03 | 3.81E-03 | -- | 8.55E-03 | 0.16% |
| MET | Arsenic | 1.53E+01 | 2.81E-06 | 1.69E-06 | 9.18E-10 | 2.67E-05 | 1.61E-05 | 3.03E-09 | 4.28E-05 | 15% | 1.31E-05 | 4.74E-06 | 2.57E-09 | 3.75E+00 | 1.36E+00 | 1.71E-04 | 5.10E+00 | 93% |
| MET | Barium | 4.82E+02 | 1.47E-04 | 1.78E-05 | 2.89E-08 | -- | -- | -- | -- | -- | 4.12E-04 | 4.97E-05 | 8.08E-08 | 2.06E-03 | 3.55E-03 | 1.62E-04 | 5.78E-03 | 0.11% |
| MET | Beryllium | 3.22E-01 | 9.85E-08 | 1.19E-08 | 1.93E-11 | 8.27E-07 | 6.98E-10 | 4.63E-11 | 8.28E-07 | 0.29% | 2.76E-07 | 3.33E-08 | 5.41E-11 | 1.38E-04 | 2.38E-03 | 7.72E-06 | 2.52E-03 | 0.046% |
| MET | Cadmium | 1.64E+00 | 5.01E-07 | 6.05E-09 | 9.83E-11 | 7.52E-06 | 2.27E-09 | 4.13E-10 | 7.52E-06 | 2.6% | 1.40E-06 | 1.69E-08 | 2.75E-10 | 2.81E-03 | 1.36E-03 | 1.38E-05 | 4.18E-03 | 0.076% |
| MET | Chromium | 9.95E+01 | 3.04E-05 | 3.67E-06 | 5.96E-09 | -- | -- | -- | -- | -- | 8.52E-05 | 1.03E-05 | 1.67E-08 | 4.26E-03 | 3.95E-02 | 8.35E-03 | 5.21E-02 | 0.95% |
| MET | Chromium VI | 3.40E-02 | 1.04E-08 | -- | 2.04E-12 | 5.20E-09 | -- | 3.06E-10 | 5.50E-09 | 0.0019% | 2.91E-08 | -- | 5.71E-12 | 1.46E-06 | -- | 2.85E-08 | 1.48E-06 | 0.000027% |
| MET | Cobalt | 1.16E+01 | 3.53E-06 | 4.26E-07 | 6.92E-10 | -- | -- | 6.23E-09 | 6.23E-09 | 0.0022% | 9.89E-06 | 1.19E-06 | 1.94E-09 | 3.30E-02 | 3.98E-03 | 3.23E-04 | 3.73E-02 | 0.68% |
| MET | Copper | 1.89E+02 | 5.79E-05 | 6.98E-06 | 1.13E-08 | -- | -- | -- | -- | -- | 1.62E-04 | 1.96E-05 | 3.18E-08 | 4.05E-03 | 4.89E-04 | -- | 4.54E-03 | 0.083% |
| MET | Lead | 2.19E+02 | 6.69E-05 | -- | 1.31E-08 | -- | -- | -- | -- | -- | 1.87E-04 | -- | 3.67E-08 | -- | -- | -- | -- | -- |
| MET | Mercury | 2.07E+00 | 6.33E-07 | 7.63E-08 | 1.24E-10 | -- | -- | -- | -- | -- | 1.77E-06 | 2.14E-07 | 3.47E-10 | 1.11E-02 | 1.34E-03 | 1.16E-05 | 1.24E-02 | 0.23% |
| MET | Molybdenum | 2.33E+01 | 7.12E-06 | 8.59E-07 | 1.40E-09 | -- | -- | -- | -- | -- | 1.99E-05 | 2.41E-06 | 3.91E-09 | 3.99E-03 | 4.81E-04 | -- | 4.47E-03 | 0.081% |
| MET | Nickel | 7.73E+01 | 2.36E-05 | 2.85E-06 | 4.63E-09 | 2.15E-05 | 1.04E-07 | 1.20E-09 | 2.16E-05 | 7.5% | 6.61E-05 | 7.98E-06 | 1.30E-08 | 6.01E-03 | 1.81E-02 | 9.26E-04 | 2.51E-02 | 0.46% |
| MET | Selenium | 6.55E-01 | 2.00E-07 | 2.42E-08 | 3.93E-11 | -- | -- | -- | -- | -- | 5.61E-07 | 6.77E-08 | 1.10E-10 | 1.12E-04 | 1.35E-05 | 5.50E-09 | 1.26E-04 | 0.0023% |
| MET | Silver | 7.10E-01 | 2.17E-07 | 2.62E-08 | 4.26E-11 | -- | -- | -- | -- | -- | 6.08E-07 | 7.33E-08 | 1.19E-10 | 1.22E-04 | 3.67E-04 | -- | 4.88E-04 | 0.0089% |
| MET | Thallium | 6.97E-01 | 2.13E-07 | 2.57E-08 | 4.18E-11 | -- | -- | -- | -- | -- | 5.97E-07 | 7.20E-08 | 1.17E-10 | 5.97E-02 | 7.20E-03 | -- | 6.69E-02 | 1.2% |
| MET | Vanadium | 4.68E+01 | 1.43E-05 | 1.73E-06 | 2.81E-09 | -- | -- | -- | -- | -- | 4.01E-05 | 4.84E-06 | 7.86E-09 | 7.95E-03 | 3.69E-02 | -- | 4.49E-02 | 0.82% |
| MET | Zinc | 5.32E+02 | 1.63E-04 | 1.96E-05 | 3.19E-08 | -- | -- | -- | -- | -- | 4.55E-04 | 5.49E-05 | 8.93E-08 | 1.52E-03 | 1.83E-04 | -- | 1.70E-03 | 0.031% |
| PAH | Acenaphthene | 3.07E-01 | 9.40E-08 | 1.70E-07 | 1.84E-11 | -- | -- | -- | -- | -- | 2.63E-07 | 4.76E-07 | 5.16E-11 | 4.39E-06 | 7.94E-06 | -- | 1.23E-05 | 0.00022% |
| PAH | Acenaphthylene | 1.40E+01 | 4.29E-06 | 7.77E-06 | 8.42E-10 | -- | -- | -- | -- | -- | 1.20E-05 | 2.18E-05 | 2.36E-09 | 2.00E-04 | 3.63E-04 | -- | 5.63E-04 | 0.01% |
| PAH | Anthracene | 8.24E+00 | 2.52E-06 | 4.56E-06 | 4.94E-10 | -- | -- | -- | -- | -- | 7.05E-06 | 1.28E-05 | 1.38E-09 | 2.35E-05 | 4.25E-05 | -- | 6.61E-05 | 0.0012% |
| PAH | Benzo(a)anthracene | 2.36E+01 | 7.21E-06 | 1.30E-05 | 1.41E-09 | 8.65E-06 | 1.56E-05 | 1.55E-10 | 2.43E-05 | 8.4% | 2.02E-05 | 3.65E-05 | 3.94E-09 | -- | -- | -- | -- | -- |
| PAH | Benzo(a)pyrene | 4.51E+01 | 1.38E-05 | 2.50E-05 | 2.71E-09 | 4.00E-05 | 7.24E-05 | 2.98E-09 | 1.12E-04 | 39% | 3.86E-05 | 6.99E-05 | 7.41E-09 | -- | -- | -- | -- | -- |
| PAH | Benzo(b)fluoranthene | 1.88E+01 | 5.75E-06 | 1.04E-05 | 1.13E-09 | 6.89E-06 | 1.25E-05 | 1.24E-10 | 1.94E-05 | 6.7% | 1.61E-05 | 2.91E-05 | 3.09E-09 | -- | -- | -- | -- | -- |
| PAH | Benzo(g,h,i)perylene | 1.79E+01 | 5.48E-06 | 9.92E-06 | 1.08E-09 | -- | -- | -- | -- | -- | 1.54E-05 | 2.78E-05 | 3.00E-09 | 5.12E-04 | 9.26E-04 | -- | 1.44E-03 | 0.026% |
| PAH | Benzo(k)fluoranthene | 2.78E+01 | 8.50E-06 | 1.54E-05 | 1.67E-09 | 1.02E-05 | 1.85E-05 | 1.83E-10 | 2.86E-05 | 9.9% | 2.38E-05 | 4.31E-05 | 4.57E-09 | -- | -- | -- | -- | -- |
| PAH | Chrysene | 1.71E+01 | 5.22E-06 | 9.45E-06 | 1.02E-09 | 6.27E-07 | 1.13E-06 | 1.13E-11 | 1.76E-06 | 0.61% | 1.46E-05 | 2.65E-05 | 2.85E-09 | -- | -- | -- | -- | -- |
| PAH | Dibenz(a,h)anthracene | 2.79E+00 | 8.52E-07 | 1.54E-06 | 1.67E-10 | 3.49E-06 | 6.32E-06 | 2.00E-10 | 9.81E-06 | 3.4% | 2.38E-06 | 4.31E-06 | 4.43E-10 | -- | -- | -- | -- | -- |
| PAH | Fluoranthene | 7.69E+01 | 2.35E-05 | 4.26E-05 | 4.61E-09 | -- | -- | -- | -- | -- | 6.59E-05 | 1.19E-04 | 1.29E-08 | -- | -- | -- | -- | -- |
| PAH | Fluorene | 4.25E+00 | 1.30E-06 | 2.35E-06 | 2.55E-10 | -- | -- | -- | -- | -- | 3.64E-06 | 6.59E-06 | 7.14E-10 | 9.10E-05 | 1.65E-04 | -- | 2.56E-04 | 0.0047% |
| PAH | Indeno(1,2,3-cd)pyrene | 1.45E+01 | 4.42E-06 | 8.00E-06 | 8.67E-10 | 5.31E-06 | 9.60E-06 | 9.54E-11 | 1.49E-05 | 5.1% | 1.24E-05 | 2.24E-05 | 2.34E-09 | -- | -- | -- | -- | -- |
| PAH | Naphthalene | 2.39E+01 | 7.30E-06 | 1.32E-05 | 1.43E-09 | 8.75E-07 | 1.58E-06 | 4.86E-11 | 2.46E-06 | 0.85% | 2.04E-05 | 3.70E-05 | 4.01E-09 | 1.02E-03 | 1.85E-03 | 4.45E-07 | 2.87E-03 | 0.052% |
| PAH | Phenanthrene | 8.25E+01 | 2.52E-05 | 4.56E-05 | 4.95E-09 | -- | -- | -- | -- | -- | 7.06E-05 | 1.28E-04 | 1.38E-08 | 2.35E-04 | 4.26E-04 | -- | 6.61E-04 | 0.012% |
| PAH | Pyrene | 9.04E+01 | 2.76E-05 | 5.00E-05 | 5.42E-09 | -- | -- | -- | -- | -- | 7.74E-05 | 1.40E-04 | 1.51E-08 | 2.58E-03 | 4.67E-03 | -- | 7.25E-03 | 0.13% |
| PCB | Aroclor-1242 (PCB-1242) | 1.50E-04 | 4.59E-11 | 7.75E-11 | 8.99E-15 | 9.17E-11 | 1.55E-10 | 5.14E-15 | 2.47E-10 | 0.000085% | 1.28E-10 | 2.17E-10 | 2.52E-14 | -- | -- | -- | -- | -- |
| PCB | Aroclor-1248 (PCB-1248) | 3.31E-01 | 1.01E-07 | 1.71E-07 | 1.98E-11 | 2.02E-07 | 3.42E-07 | 1.13E-11 | 5.44E-07 | 0.19% | 2.83E-07 | 4.79E-07 | 5.56E-11 | -- | -- | -- | -- | -- |
| PCB | Aroclor-1254 (PCB-1254) | 3.71E-02 | 1.13E-08 | 1.92E-08 | 2.22E-12 | 2.27E-08 | 3.83E-08 | 1.27E-12 | 6.10E-08 | 0.021% | 3.18E-08 | 5.36E-08 | 6.21E-12 | 1.59E-03 | 2.68E-03 | -- | 4.27E-03 | 0.078% |
| PCB | Aroclor-1260 (PCB-1260) | 2.17E-01 | 6.64E-08 | 1.12E-07 | 1.30E-11 | 1.33E-07 | 2.24E-07 | 7.43E-12 | 3.57E-07 | 0.12% | 1.86E-07 | 3.14E-07 | 3.56E-11 | -- | -- | -- | -- | -- |
| SVOC | 2-Methylnaphthalene | 1.14E+00 | 3.48E-07 | 6.30E-07 | 6.82E-11 | -- | -- | -- | -- | -- | 9.74E-07 | 1.76E-06 | 1.91E-10 | -- | -- | -- | -- | -- |
| SVOC | bis(2-Ethylhexyl)phthalate | 1.08E+03 | 3.31E-04 | 4.00E-04 | 6.49E-08 | 9.94E-07 | 1.20E-06 | 1.56E-10 | 2.19E-06 | 0.76% | 9.27E-04 | 1.12E-03 | 1.79E-07 | 4.64E-02 | 5.59E-02 | -- | 1.02E-01 | 1.9% |
| SVOC | Butyl benzylphthalate | 3.25E-01 | 9.94E-08 | 1.20E-07 | 1.95E-11 | 1.89E-10 | 2.28E-10 | -- | 4.17E-10 | 0.00014% | 2.78E-07 | 3.36E-07 | 5.45E-11 | 1.39E-06 | 1.68E-06 | -- | 3.07E-06 | 0.000056% |
| SVOC | Dibenzofuran | 1.10E+00 | 3.36E-07 | 1.22E-07 | 6.59E-11 | -- | -- | -- | -- | -- | 9.41E-07 | 3.41E-07 | 1.84E-10 | 9.41E-04 | 3.41E-04 | -- | 1.28E-03 | 0.023% |
| VOC | 1,2-Dichloroethane | 4.70E-04 | 1.44E-10 | -- | 2.82E-14 | 6.75E-12 | -- | 5.92E-16 | 6.76E-12 | 0.0000023% | 4.02E-10 | -- | 7.89E-14 | 6.71E-08 | -- | 1.97E-13 | 6.71E-08 | 0.0000012% |
| VOC | Acetone | 1.20E-01 | 3.67E-08 | -- | 7.19E-12 | -- | -- | -- | -- | -- | 1.03E-07 | -- | 2.01E-11 | 1.14E-07 | -- | 6.52E-13 | 1.14E-07 | 0.0000021% |
| VOC | Benzene | 4.22E-02 | 1.29E-08 | -- | 2.53E-12 | 1.29E-09 | -- | 7.34E-14 | 1.29E-09 | 0.00045% | 3.62E-08 | -- | 7.09E-12 | 9.04E-06 | -- | 2.36E-09 | 9.04E-06 | 0.00016% |
| VOC | Carbon disulfide | 3.80E-03 | 1.16E-09 | -- | 2.28E-13 | -- | -- | -- | -- | -- | 3.25E-09 | -- | 6.38E-13 | 3.25E-08 | -- | 7.97E-13 | 3.25E-08 | 0.00000059% |
| VOC | Chloroform (Trichloromethane) | 9.00E-04 | 2.75E-10 | -- | 5.40E-14 | 5.23E-12 | -- | 2.86E-16 | 5.23E-12 | 0.0000018% | 7.71E-10 | -- | 1.51E-13 | 7.71E-08 | -- | 5.04E-13 | 7.71E-08 | 0.0000014% |

**Table C-1. Risk Calculations - Soil Exposure - Commercial Worker - Surface Soil**

*Human Health Risk Assessment, 744 and 758 High Street, Oakland, California*

| | | Carcinogenic Risk Estiamte (ELCR) Calculations | | | | | | | | | Non-Cancer Hazard Estimate Calculations | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Analyte Group** | **COPC** | **EPC (mg/kg)** | **Intake Oral (mg/kg-day)** | **Intake Dermal (mg/kg-day)** | **Intake Inhalation ($mg/m^3$)** | **Oral Risk** | **Dermal Risk** | **Inhalation Risk** | **Total ELCR** | **Percent Contribution** | **Intake Oral (mg/kg-day)** | **Intake Dermal (mg/kg-day)** | **Intake Inhalation ($mg/m^3$)** | **Oral HQ** | **Dermal HQ** | **Inhalation HQ** | **Total HQ** | **Percent Contribution** |
| VOC | Dichlorofluoromethane | 1.00E-03 | 3.06E-10 | -- | 6.00E-14 | -- | -- | -- | -- | -- | 8.56E-10 | -- | 1.68E-13 | 4.28E-09 | -- | 1.68E-12 | 4.28E-09 | 0.000000078% |
| VOC | Diisopropyl ether | 1.10E-03 | 3.36E-10 | -- | 6.60E-14 | -- | -- | -- | -- | -- | 9.42E-10 | -- | 1.85E-13 | -- | -- | 2.64E-13 | 2.64E-13 | 0.00000000000048% |
| VOC | Ethylbenzene | 2.38E-02 | 7.27E-09 | -- | 1.43E-12 | 8.00E-11 | -- | 3.56E-15 | 8.00E-11 | 0.000028% | 2.04E-08 | -- | 3.99E-12 | 2.04E-07 | -- | 2.00E-12 | 2.04E-07 | 0.0000037% |
| VOC | Methylene chloride | 3.20E-03 | 9.78E-10 | -- | 1.92E-13 | 1.37E-11 | -- | 1.92E-16 | 1.37E-11 | 0.0000047% | 2.74E-09 | -- | 5.37E-13 | 4.57E-07 | -- | 1.34E-12 | 4.57E-07 | 0.0000083% |
| VOC | Toluene | 4.31E-03 | 1.32E-09 | -- | 2.58E-13 | -- | -- | -- | -- | -- | 3.69E-09 | -- | 7.24E-13 | 4.61E-08 | -- | 2.41E-12 | 4.61E-08 | 0.00000084% |
| VOC | Xylene (total) | 9.59E-03 | 2.93E-09 | -- | 5.75E-13 | -- | -- | -- | -- | -- | 8.21E-09 | -- | 1.61E-12 | 4.10E-08 | -- | 2.30E-12 | 4.10E-08 | 0.00000075% |
| | **Total** | | | | **Total ELCR:** | **1E-04** | **2E-04** | **2E-08** | **3E-04** | **100%** | | | **HI:** | **4** | **2** | **0.01** | **5** | **100%** |

**Notes:**

COPC: chemical of potential concern

ELCR: excess lifetime cancer risk

EPC: exposure point concentration

HI: hazard index (non-cancer) = summar of hazard quotients

HQ: hazard quotient (non-cancer)

MET: metal

mg/kg: milligrams per kilogram

$mg/m^3$: millgrams per cubic meter

PAH: polyaromatic hydrocarbon

PCB: polychlorindated biphenyl

SVOC: semi-volatile organic compound

VOC: volatile organic compound

**Table C-2. Risk Calculations - Soil Exposure - Construction Worker - Total Soil**

*Human Health Risk Assessment, 744 and 758 High Street, Oakland, California*

| | | Carcinogenic Risk Estiamte (ELCR) Calculations | | | | | | | | | Non-Cancer Hazard Estimate Calculations | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Analyte Group | COPC | EPC (mg/kg) | Intake Oral (mg/kg-day) | Intake Dermal (mg/kg-day) | Intake Inhalation ($mg/m^3$) | Oral Risk | Dermal Risk | Inhalation Risk | Total ELCR | Percent Contribution | Intake Oral (mg/kg-day) | Intake Dermal (mg/kg-day) | Intake Inhalation ($mg/m^3$) | Oral HQ | Dermal HQ | Inhalation HQ | Total HQ | Percent Contribution |
| MET | Antimony | 2.41E+00 | 7.78E-08 | 1.14E-08 | 7.86E-09 | -- | -- | -- | -- | -- | 5.45E-06 | 7.96E-07 | 5.50E-07 | 1.36E-02 | 1.33E-02 | 1.38E-03 | 2.83E-02 | 0.26% |
| MET | Arsenic | 1.22E+01 | 2.36E-07 | 1.73E-07 | 3.97E-08 | 2.24E-06 | 1.64E-06 | 1.31E-07 | 4.01E-06 | 25% | 2.75E-05 | 1.21E-05 | 2.78E-06 | 5.51E-03 | 2.42E-03 | 1.85E-01 | 1.93E-01 | 1.8% |
| MET | Barium | 3.20E+02 | 1.03E-05 | 1.51E-06 | 1.04E-06 | -- | -- | -- | -- | -- | 7.23E-04 | 1.06E-04 | 7.30E-05 | 3.61E-03 | 7.55E-03 | 1.46E-02 | 2.58E-02 | 0.23% |
| MET | Beryllium | 3.26E-01 | 1.05E-08 | 1.54E-09 | 1.06E-09 | 8.84E-08 | 9.05E-11 | 2.55E-09 | 9.11E-08 | 0.57% | 7.37E-07 | 1.08E-07 | 7.44E-08 | 3.68E-04 | 7.70E-03 | 1.06E-02 | 1.87E-02 | 0.17% |
| MET | Cadmium | 3.06E+00 | 9.89E-08 | 1.45E-09 | 9.99E-09 | 1.48E-06 | 5.42E-10 | 4.20E-08 | 1.53E-06 | 9.5% | 6.92E-06 | 1.01E-07 | 6.99E-07 | 1.38E-02 | 8.10E-03 | 7.77E-04 | 2.27E-02 | 0.21% |
| MET | Chromium | 8.12E+01 | 2.62E-06 | 3.83E-07 | 2.65E-07 | -- | -- | -- | -- | -- | 1.83E-04 | 2.68E-05 | 1.85E-05 | 9.17E-03 | 1.03E-01 | 9.26E+00 | 9.38E+00 | 85% |
| MET | Chromium VI | 4.29E-02 | 1.39E-09 | -- | 1.40E-10 | 6.93E-10 | -- | 2.10E-08 | 2.17E-08 | 0.14% | 9.70E-08 | -- | 9.79E-09 | 4.85E-06 | -- | 4.90E-05 | 5.38E-05 | 0.00049% |
| MET | Cobalt | 1.38E+01 | 4.45E-07 | 6.50E-08 | 4.49E-08 | -- | -- | 4.04E-07 | 4.04E-07 | 2.5% | 3.11E-05 | 4.55E-06 | 3.14E-06 | 1.04E-02 | 1.52E-03 | 1.57E-01 | 1.69E-01 | 1.5% |
| MET | Copper | 1.34E+02 | 4.32E-06 | 6.31E-07 | 4.36E-07 | -- | -- | -- | -- | -- | 3.02E-04 | 4.42E-05 | 3.05E-05 | 3.02E-02 | 4.42E-03 | -- | 3.46E-02 | 0.31% |
| MET | Lead | 2.38E+02 | 7.69E-06 | -- | 7.77E-07 | -- | -- | -- | -- | -- | 5.38E-04 | -- | 5.44E-05 | -- | -- | -- | -- | -- |
| MET | Mercury | 9.85E-01 | 3.18E-08 | 4.65E-09 | 3.21E-09 | -- | -- | -- | -- | -- | 2.23E-06 | 3.26E-07 | 2.25E-07 | 1.39E-02 | 2.03E-03 | 7.50E-04 | 1.67E-02 | 0.15% |
| MET | Molybdenum | 6.77E+00 | 2.19E-07 | 3.20E-08 | 2.21E-08 | -- | -- | -- | -- | -- | 1.53E-05 | 2.24E-06 | 1.55E-06 | 3.06E-03 | 4.47E-04 | -- | 3.51E-03 | 0.032% |
| MET | Nickel | 1.09E+02 | 3.52E-06 | 5.15E-07 | 3.56E-07 | 3.21E-06 | 1.88E-08 | 9.25E-08 | 3.32E-06 | 21% | 2.47E-04 | 3.61E-05 | 2.49E-05 | 1.23E-02 | 4.51E-02 | 1.25E-01 | 1.82E-01 | 1.7% |
| MET | Selenium | 5.66E-01 | 1.83E-08 | 2.67E-09 | 1.85E-09 | -- | -- | -- | -- | -- | 1.28E-06 | 1.87E-07 | 1.29E-07 | 2.56E-04 | 3.74E-05 | 6.46E-06 | 3.00E-04 | 0.0027% |
| MET | Silver | 3.42E-01 | 1.10E-08 | 1.61E-09 | 1.12E-09 | -- | -- | -- | -- | -- | 7.73E-07 | 1.13E-07 | 7.81E-08 | 1.55E-04 | 5.65E-04 | -- | 7.20E-04 | 0.0065% |
| MET | Thallium | 9.42E-01 | 3.04E-08 | 4.45E-09 | 3.07E-09 | -- | -- | -- | -- | -- | 2.13E-06 | 3.11E-07 | 2.15E-07 | 5.32E-02 | 7.78E-03 | -- | 6.10E-02 | 0.55% |
| MET | Vanadium | 4.05E+01 | 1.31E-06 | 1.91E-07 | 1.32E-07 | -- | -- | -- | -- | -- | 9.16E-05 | 1.34E-05 | 9.25E-06 | 1.31E-01 | 7.36E-01 | -- | 8.66E-01 | 7.9% |
| MET | Zinc | 3.84E+02 | 1.24E-05 | 1.81E-06 | 1.25E-06 | -- | -- | -- | -- | -- | 8.68E-04 | 1.27E-04 | 8.77E-05 | 2.89E-03 | 4.23E-04 | -- | 3.32E-03 | 0.03% |
| PAH | Acenaphthene | 3.19E-01 | 1.03E-08 | 2.26E-08 | 1.04E-09 | -- | -- | -- | -- | -- | 7.22E-07 | 1.58E-06 | 7.24E-08 | 3.61E-06 | 7.92E-06 | -- | 1.15E-05 | 0.0001% |
| PAH | Acenaphthylene | 2.60E+00 | 8.38E-08 | 1.84E-07 | 8.46E-09 | -- | -- | -- | -- | -- | 5.87E-06 | 1.29E-05 | 5.88E-07 | 2.93E-05 | 6.43E-05 | -- | 9.37E-05 | 0.00085% |
| PAH | Anthracene | 1.79E+00 | 5.77E-08 | 1.27E-07 | 5.83E-09 | -- | -- | -- | -- | -- | 4.04E-06 | 8.86E-06 | 3.97E-07 | 4.04E-06 | 8.86E-06 | -- | 1.29E-05 | 0.00012% |
| PAH | Benzo(a)anthracene | 5.07E+00 | 1.64E-07 | 3.59E-07 | 1.65E-08 | 1.97E-07 | 4.31E-07 | 1.82E-09 | 6.30E-07 | 3.9% | 1.15E-05 | 2.52E-05 | 9.87E-07 | -- | -- | -- | -- | -- |
| PAH | Benzo(a)pyrene | 9.11E+00 | 2.94E-07 | 6.45E-07 | 2.92E-08 | 8.53E-07 | 1.87E-06 | 3.21E-08 | 2.76E-06 | 17% | 2.06E-05 | 4.52E-05 | 9.11E-07 | -- | -- | -- | -- | -- |
| PAH | Benzo(b)fluoranthene | 7.79E+00 | 2.52E-07 | 5.52E-07 | 2.50E-08 | 3.02E-07 | 6.62E-07 | 2.75E-09 | 9.67E-07 | 6% | 1.76E-05 | 3.86E-05 | 8.24E-07 | -- | -- | -- | -- | -- |
| PAH | Benzo(g,h,i)perylene | 5.65E+00 | 1.83E-07 | 4.00E-07 | 1.84E-08 | -- | -- | -- | -- | -- | 1.28E-05 | 2.80E-05 | 1.14E-06 | 4.26E-05 | 9.34E-05 | -- | 1.36E-04 | 0.0012% |
| PAH | Benzo(k)fluoranthene | 4.55E+00 | 1.47E-07 | 3.22E-07 | 1.46E-08 | 1.76E-07 | 3.87E-07 | 1.61E-09 | 5.65E-07 | 3.5% | 1.03E-05 | 2.26E-05 | 4.74E-07 | -- | -- | -- | -- | -- |
| PAH | Chrysene | 7.63E+00 | 2.46E-07 | 5.41E-07 | 2.48E-08 | 2.96E-08 | 6.49E-08 | 2.73E-10 | 9.47E-08 | 0.59% | 1.73E-05 | 3.78E-05 | 1.29E-06 | -- | -- | -- | -- | -- |
| PAH | Dibenz(a,h)anthracene | 1.04E+00 | 3.35E-08 | 7.34E-08 | 3.24E-09 | 1.37E-07 | 3.01E-07 | 3.88E-09 | 4.42E-07 | 2.8% | 2.34E-06 | 5.14E-06 | 5.80E-08 | -- | -- | -- | -- | -- |
| PAH | Fluoranthene | 1.52E+01 | 4.90E-07 | 1.07E-06 | 4.94E-08 | -- | -- | -- | -- | -- | 3.43E-05 | 7.52E-05 | 3.01E-06 | -- | -- | -- | -- | -- |
| PAH | Fluorene | 1.08E+00 | 3.48E-08 | 7.64E-08 | 3.52E-09 | -- | -- | -- | -- | -- | 2.44E-06 | 5.35E-06 | 2.43E-07 | | 1.34E-05 | | 1.34E-05 | 0.00012% |
| PAH | Indeno(1,2,3-cd)pyrene | 4.61E+00 | 1.49E-07 | 3.26E-07 | 1.46E-08 | 1.79E-07 | 3.92E-07 | 1.61E-09 | 5.72E-07 | 3.6% | 1.04E-05 | 2.28E-05 | 3.44E-07 | -- | -- | -- | -- | -- |
| PAH | Naphthalene | 4.38E+00 | 1.42E-07 | 3.10E-07 | 1.43E-08 | 1.70E-08 | 3.73E-08 | 4.86E-10 | 5.47E-08 | 0.34% | 9.91E-06 | 2.17E-05 | 9.98E-07 | 1.65E-05 | 3.62E-05 | 1.11E-04 | 1.64E-04 | 0.0015% |
| PAH | Phenanthrene | 1.59E+01 | 5.13E-07 | 1.13E-06 | 5.18E-08 | -- | -- | -- | -- | -- | 3.59E-05 | 7.88E-05 | 3.53E-06 | 3.59E-05 | 7.88E-05 | -- | 1.15E-04 | 0.001% |
| PAH | Pyrene | 1.79E+01 | 5.79E-07 | 1.27E-06 | 5.84E-08 | -- | -- | -- | -- | -- | 4.05E-05 | 8.89E-05 | 3.63E-06 | 1.35E-04 | 2.96E-04 | -- | 4.31E-04 | 0.0039% |
| PCB | Aroclor-1242 (PCB-1242) | 7.16E-04 | 2.31E-11 | 4.73E-11 | 2.33E-12 | 4.62E-11 | 9.46E-11 | 1.33E-12 | 1.42E-10 | 0.00089% | 1.62E-09 | 3.31E-09 | 1.59E-10 | -- | -- | -- | -- | -- |
| PCB | Aroclor-1248 (PCB-1248) | 2.96E-01 | 9.56E-09 | 1.96E-08 | 9.65E-10 | 1.91E-08 | 3.91E-08 | 5.51E-10 | 5.88E-08 | 0.37% | 6.69E-07 | 1.37E-06 | 6.76E-08 | -- | -- | -- | -- | -- |
| PCB | Aroclor-1254 (PCB-1254) | 2.69E-02 | 8.69E-10 | 1.78E-09 | 8.75E-11 | 1.74E-09 | 3.56E-09 | 5.00E-11 | 5.34E-09 | 0.033% | 6.08E-08 | 1.24E-07 | 5.24E-09 | 2.03E-03 | 4.15E-03 | -- | 6.18E-03 | 0.056% |
| PCB | Aroclor-1260 (PCB-1260) | 2.19E+00 | 7.07E-08 | 1.45E-07 | 7.01E-09 | 1.41E-07 | 2.89E-07 | 4.00E-09 | 4.35E-07 | 2.7% | 4.95E-06 | 1.01E-05 | 2.19E-07 | -- | -- | -- | -- | -- |
| SVOC | 1,2,4-Trichlorobenzene | 2.20E-02 | 7.10E-10 | -- | 7.18E-11 | 2.56E-12 | -- | -- | 2.56E-12 | 0.000016% | 4.97E-08 | -- | 5.01E-09 | 5.53E-07 | -- | 2.51E-07 | 8.03E-07 | 0.0000073% |
| SVOC | 2-Chloronaphthalene | 1.40E-01 | 4.52E-09 | -- | 4.57E-10 | -- | -- | -- | -- | -- | 3.16E-07 | -- | 3.18E-08 | 1.58E-06 | -- | -- | 1.58E-06 | 0.000014% |
| SVOC | 2-Methylnaphthalene | 1.90E-01 | 6.12E-09 | 1.34E-08 | 6.18E-10 | -- | -- | -- | -- | -- | 4.28E-07 | 9.40E-07 | 4.31E-08 | -- | -- | -- | -- | -- |
| SVOC | bis(2-Ethylhexyl)phthalate | 1.93E+02 | 6.23E-06 | 9.11E-06 | 6.21E-07 | 1.87E-08 | 2.73E-08 | 1.49E-09 | 4.75E-08 | 0.3% | 4.36E-04 | 6.37E-04 | 2.36E-05 | 4.36E-03 | 6.37E-03 | -- | 1.07E-02 | 0.097% |
| SVOC | Butyl benzylphthalate | 1.74E-01 | 5.63E-09 | 8.23E-09 | 5.67E-10 | 1.07E-11 | 1.56E-11 | -- | 2.63E-11 | 0.00016% | 3.94E-07 | 5.76E-07 | 3.50E-08 | 1.97E-07 | 2.88E-07 | -- | 4.85E-07 | 0.0000044% |
| SVOC | Dibenzofuran | 1.42E-01 | 4.58E-09 | 2.01E-09 | 4.62E-10 | -- | -- | -- | -- | -- | 3.20E-07 | 1.41E-07 | 3.20E-08 | 8.01E-05 | 3.51E-05 | -- | 1.15E-04 | 0.001% |
| SVOC | Diethyl phthalate | 4.40E-02 | 1.42E-09 | 2.08E-09 | 1.43E-10 | -- | -- | -- | -- | -- | 9.95E-08 | 1.45E-07 | 9.86E-09 | 1.66E-08 | 2.42E-08 | -- | 4.08E-08 | 0.00000037% |
| SVOC | Di-n-butyl phthalate | 2.15E-01 | 6.95E-09 | 1.02E-08 | 7.02E-10 | -- | -- | -- | -- | -- | 4.87E-07 | 7.12E-07 | 4.69E-08 | | 7.12E-07 | | 7.12E-07 | 0.0000065% |
| SVOC | Di-n-octyl phthalate | 4.62E-02 | 1.49E-09 | 2.18E-09 | 1.50E-10 | -- | -- | -- | -- | -- | 1.04E-07 | 1.53E-07 | 7.64E-09 | -- | -- | -- | -- | -- |
| SVOC | Nitrobenzene | 5.10E-02 | 1.65E-09 | -- | 1.66E-10 | -- | -- | 6.65E-12 | 6.65E-12 | 0.000042% | 1.15E-07 | -- | 1.16E-08 | 2.31E-05 | -- | 5.80E-07 | 2.36E-05 | 0.00021% |

**Table C-2. Risk Calculations - Soil Exposure - Construction Worker - Total Soil**

*Human Health Risk Assessment, 744 and 758 High Street, Oakland, California*

| | | Carcinogenic Risk Estiamte (ELCR) Calculations | | | | | | | | | Non-Cancer Hazard Estimate Calculations | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Analyte Group** | **COPC** | **EPC (mg/kg)** | **Intake Oral (mg/kg-day)** | **Intake Dermal (mg/kg-day)** | **Intake Inhalation ($mg/m^3$)** | **Oral Risk** | **Dermal Risk** | **Inhalation Risk** | **Total ELCR** | **Percent Contribution** | **Intake Oral (mg/kg-day)** | **Intake Dermal (mg/kg-day)** | **Intake Inhalation ($mg/m^3$)** | **Oral HQ** | **Dermal HQ** | **Inhalation HQ** | **Total HQ** | **Percent Contribution** |
| SVOC | N-Nitrosodiphenylamine | 5.30E-02 | 1.71E-09 | 2.50E-09 | 1.73E-10 | 1.54E-11 | 2.25E-11 | 4.49E-13 | 3.84E-11 | 0.00024% | 1.20E-07 | 1.75E-07 | 1.17E-08 | 5.99E-06 | 8.76E-06 | -- | 1.47E-05 | 0.00013% |
| SVOC | Phenol | 6.40E-02 | 2.07E-09 | 3.02E-09 | 2.09E-10 | -- | -- | -- | -- | -- | 1.45E-07 | 2.12E-07 | 1.43E-08 | 2.41E-07 | 3.53E-07 | 7.17E-08 | 6.65E-07 | 0.000006% |
| VOC | 1,2-Dichloroethane | 6.32E-04 | 2.04E-11 | -- | 2.06E-12 | 9.59E-13 | -- | 4.33E-14 | 1.00E-12 | 0.0000063% | 1.43E-09 | -- | 1.44E-10 | 7.14E-08 | -- | 2.06E-09 | 7.35E-08 | 0.00000067% |
| VOC | Acetone | 8.64E-02 | 2.79E-09 | -- | 2.82E-10 | -- | -- | -- | -- | -- | 1.95E-07 | -- | 1.97E-08 | 9.77E-08 | -- | 6.38E-10 | 9.83E-08 | 0.00000089% |
| VOC | Benzene | 5.94E-03 | 1.92E-10 | -- | 1.94E-11 | 1.92E-11 | -- | 5.62E-13 | 1.97E-11 | 0.00012% | 1.34E-08 | -- | 1.36E-09 | 1.34E-06 | -- | 1.69E-08 | 1.36E-06 | 0.000012% |
| VOC | Carbon disulfide | 3.80E-03 | 1.23E-10 | -- | 1.24E-11 | -- | -- | -- | -- | -- | 8.59E-09 | -- | 8.68E-10 | 8.59E-08 | -- | 1.24E-09 | 8.71E-08 | 0.00000079% |
| VOC | Chloroform (Trichloromethane) | 9.00E-04 | 2.91E-11 | -- | 2.94E-12 | 5.52E-13 | -- | 1.56E-14 | 5.68E-13 | 0.0000035% | 2.03E-09 | -- | 2.05E-10 | 2.03E-08 | -- | 8.42E-10 | 2.12E-08 | 0.00000019% |
| VOC | Dichlorofluoromethane | 1.00E-03 | 3.23E-11 | -- | 3.26E-12 | -- | -- | -- | -- | -- | 2.26E-09 | -- | 2.28E-10 | 4.52E-08 | -- | 2.28E-10 | 4.54E-08 | 0.00000041% |
| VOC | Diisopropyl ether | 1.10E-03 | 3.55E-11 | -- | 3.59E-12 | -- | -- | -- | -- | -- | 2.49E-09 | -- | 2.51E-10 | -- | -- | 3.59E-10 | 3.59E-10 | 0.0000000033% |
| VOC | Ethylbenzene | 5.11E-02 | 1.65E-09 | -- | 1.67E-10 | 1.82E-11 | -- | 4.17E-13 | 1.86E-11 | 0.00012% | 1.16E-07 | -- | 1.17E-08 | 2.31E-06 | -- | 1.30E-09 | 2.31E-06 | 0.000021% |
| VOC | Methyl Tert Butyl Ether | 1.70E-03 | 5.49E-11 | -- | 5.54E-12 | 9.88E-14 | -- | 1.44E-15 | 1.00E-13 | 0.00000063% | 3.84E-09 | -- | 3.88E-10 | 1.28E-08 | -- | 1.54E-10 | 1.30E-08 | 0.00000012% |
| VOC | Methylene chloride | 4.91E-03 | 1.59E-10 | -- | 1.60E-11 | 2.22E-12 | -- | 1.60E-14 | 2.24E-12 | 0.000014% | 1.11E-08 | -- | 1.12E-09 | 1.85E-07 | -- | 1.08E-09 | 1.86E-07 | 0.0000017% |
| VOC | Toluene | 3.13E-03 | 1.01E-10 | -- | 1.02E-11 | -- | -- | -- | -- | -- | 7.07E-09 | -- | 7.14E-10 | 8.83E-09 | -- | 1.43E-10 | 8.97E-09 | 0.000000081% |
| VOC | Xylene (total) | 3.18E-01 | 1.03E-08 | -- | 1.04E-09 | -- | -- | -- | -- | -- | 7.18E-07 | -- | 7.25E-08 | 1.79E-06 | -- | 1.81E-07 | 1.98E-06 | 0.000018% |
| | **Total** | | | | | **9E-06** | **6E-06** | **7E-07** | **2E-05** | **100%** | | | | **0.3** | **1** | **10** | **11** | **100%** |

**Notes:**

COPC: chemical of potential concern

ELCR: excess lifetime cancer risk

EPC: exposure point concentration

HI: hazard index (non-cancer) = summar of hazard quotients

HQ: hazard quotient (non-cancer)

MET: metal

mg/kg: milligrams per kilogram

$mg/m^3$: millgrams per cubic meter

PAH: polyaromatic hydrocarbon

PCB: polychlorindated biphenyl

SVOC: semi-volatile organic compound

VOC: volatile organic compound

**Table C-3. Risk Calculations - Soil Exposure - Resident - Surface Soil**

*Human Health Risk Assessment, 744 and 758 High Street, Oakland, California*

| | | | Carcinogenic Risk Estiamte (ELCR) Calculations | | | | | | | | Non-Cancer Hazard Estimate Calculations | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Analyte Group | COPC | EPC (mg/kg) | Intake Oral (mg/kg-day) | Intake Dermal (mg/kg-day) | Intake Inhalation ($mg/m^3$) | Oral Risk | Dermal Risk | Inhalation Risk | Total ELCR | Percent Contribution | Intake Oral (mg/kg-day) | Intake Dermal (mg/kg-day) | Intake Inhalation ($mg/m^3$) | Oral HQ | Dermal HQ | Inhalation HQ | Total HQ | Percent Contribution |
| MET | Antimony | 2.22E+00 | 3.29E-06 | 1.07E-07 | 5.80E-10 | -- | -- | -- | -- | -- | 3.14E-05 | 9.49E-07 | 1.56E-09 | 7.84E-02 | 1.58E-02 | -- | 9.42E-02 | 0.13% |
| MET | Arsenic | 1.53E+01 | 2.28E-05 | 2.22E-06 | 4.01E-09 | 2.16E-04 | 2.11E-05 | 1.32E-08 | 2.37E-04 | 25% | 2.17E-04 | 1.97E-05 | 1.08E-08 | 6.19E+01 | 5.62E+00 | 7.20E-04 | 6.75E+01 | 94% |
| MET | Barium | 4.82E+02 | 7.16E-04 | 2.33E-05 | 1.26E-07 | -- | -- | -- | -- | -- | 6.82E-03 | 2.06E-04 | 3.40E-07 | 3.41E-02 | 1.47E-02 | 6.79E-04 | 4.95E-02 | 0.069% |
| MET | Beryllium | 3.22E-01 | 4.79E-07 | 1.56E-08 | 8.43E-11 | 4.02E-06 | 9.15E-10 | 2.02E-10 | 4.02E-06 | 0.43% | 4.56E-06 | 1.38E-07 | 2.27E-10 | 2.28E-03 | 9.86E-03 | 3.24E-05 | 1.22E-02 | 0.017% |
| MET | Cadmium | 1.64E+00 | 2.44E-06 | 7.92E-09 | 4.29E-10 | 3.66E-05 | 2.97E-09 | 1.80E-09 | 3.66E-05 | 3.9% | 2.32E-05 | 7.03E-08 | 1.16E-09 | 4.64E-02 | 5.62E-03 | 5.78E-05 | 5.21E-02 | 0.073% |
| MET | Chromium | 9.95E+01 | 1.48E-04 | 4.81E-06 | 2.61E-08 | -- | -- | -- | -- | -- | 1.41E-03 | 4.26E-05 | 7.01E-08 | 7.04E-02 | 1.64E-01 | 3.51E-02 | 2.70E-01 | 0.38% |
| MET | Chromium VI | 3.40E-02 | 5.06E-08 | -- | 8.90E-12 | 2.53E-08 | -- | 1.34E-09 | 2.66E-08 | 0.0028% | 4.81E-07 | -- | 2.40E-11 | 2.41E-05 | -- | 1.20E-07 | 2.42E-05 | 0.000034% |
| MET | Cobalt | 1.16E+01 | 1.72E-05 | 5.58E-07 | 3.02E-09 | -- | -- | 2.72E-08 | 2.72E-08 | 0.0029% | 1.63E-04 | 4.95E-06 | 8.14E-09 | 5.45E-01 | 1.65E-02 | 1.36E-03 | 5.63E-01 | 0.79% |
| MET | Copper | 1.89E+02 | 2.82E-04 | 9.14E-06 | 4.96E-08 | -- | -- | -- | -- | -- | 2.68E-03 | 8.11E-05 | 1.33E-07 | 6.70E-02 | 2.03E-03 | -- | 6.90E-02 | 0.096% |
| MET | Lead | 2.19E+02 | 3.26E-04 | -- | 5.73E-08 | -- | -- | -- | -- | -- | 3.10E-03 | -- | 1.54E-07 | -- | -- | -- | -- | -- |
| MET | Mercury | 2.07E+00 | 3.08E-06 | 9.99E-08 | 5.42E-10 | -- | -- | -- | -- | -- | 2.93E-05 | 8.87E-07 | 1.46E-09 | 1.83E-01 | 5.54E-03 | 4.86E-05 | 1.89E-01 | 0.26% |
| MET | Molybdenum | 2.33E+01 | 3.46E-05 | 1.13E-06 | 6.10E-09 | -- | -- | -- | -- | -- | 3.30E-04 | 9.98E-06 | 1.64E-08 | 6.59E-02 | 2.00E-03 | -- | 6.79E-02 | 0.095% |
| MET | Nickel | 7.73E+01 | 1.15E-04 | 3.73E-06 | 2.02E-08 | 1.05E-04 | 1.36E-07 | 5.26E-09 | 1.05E-04 | 11% | 1.09E-03 | 3.31E-05 | 5.45E-08 | 9.94E-02 | 7.53E-02 | 3.89E-03 | 1.79E-01 | 0.25% |
| MET | Selenium | 6.55E-01 | 9.74E-07 | 3.16E-08 | 1.72E-10 | -- | -- | -- | -- | -- | 9.27E-06 | 2.81E-07 | 4.62E-10 | 1.85E-03 | 5.61E-05 | 2.31E-08 | 1.91E-03 | 0.0027% |
| MET | Silver | 7.10E-01 | 1.06E-06 | 3.43E-08 | 1.86E-10 | -- | -- | -- | -- | -- | 1.01E-05 | 3.04E-07 | 5.01E-10 | 2.01E-03 | 1.52E-03 | -- | 3.53E-03 | 0.0049% |
| MET | Thallium | 6.97E-01 | 1.04E-06 | 3.37E-08 | 1.83E-10 | -- | -- | -- | -- | -- | 9.87E-06 | 2.99E-07 | 4.91E-10 | 9.87E-01 | 2.99E-02 | -- | 1.02E+00 | 1.4% |
| MET | Vanadium | 4.68E+01 | 6.96E-05 | 2.26E-06 | 1.23E-08 | -- | -- | -- | -- | -- | 6.63E-04 | 2.01E-05 | 3.30E-08 | 1.31E-01 | 1.53E-01 | -- | 2.85E-01 | 0.4% |
| MET | Zinc | 5.32E+02 | 7.91E-04 | 2.57E-05 | 1.39E-07 | -- | -- | -- | -- | -- | 7.53E-03 | 2.28E-04 | 3.75E-07 | 2.51E-02 | 7.60E-04 | -- | 2.59E-02 | 0.036% |
| PAH | Acenaphthene | 3.07E-01 | 4.57E-07 | 2.23E-07 | 8.05E-11 | -- | -- | -- | -- | -- | 4.35E-06 | 1.98E-06 | 2.17E-10 | 7.25E-05 | 3.29E-05 | -- | 1.05E-04 | 0.00015% |
| PAH | Acenaphthylene | 1.40E+01 | 2.09E-05 | 1.02E-05 | 3.68E-09 | -- | -- | -- | -- | -- | 1.99E-04 | 9.03E-05 | 9.90E-09 | 3.31E-03 | 1.50E-03 | -- | 4.82E-03 | 0.0067% |
| PAH | Anthracene | 8.24E+00 | 1.23E-05 | 5.97E-06 | 2.16E-09 | -- | -- | -- | -- | -- | 1.17E-04 | 5.30E-05 | 5.81E-09 | 3.89E-04 | 1.77E-04 | -- | 5.65E-04 | 0.00079% |
| PAH | Benzo(a)anthracene | 2.36E+01 | 3.50E-05 | 1.71E-05 | 6.17E-09 | 4.21E-05 | 2.05E-05 | 6.79E-10 | 6.26E-05 | 6.6% | 3.34E-04 | 1.52E-04 | 1.66E-08 | -- | -- | -- | -- | -- |
| PAH | Benzo(a)pyrene | 4.51E+01 | 6.71E-05 | 3.27E-05 | 1.18E-08 | 1.95E-04 | 9.49E-05 | 1.30E-08 | 2.90E-04 | 31% | 6.39E-04 | 2.90E-04 | 3.18E-08 | -- | -- | -- | -- | -- |
| PAH | Benzo(b)fluoranthene | 1.88E+01 | 2.79E-05 | 1.36E-05 | 4.92E-09 | 3.35E-05 | 1.63E-05 | 5.41E-10 | 4.99E-05 | 5.3% | 2.66E-04 | 1.21E-04 | 1.32E-08 | -- | -- | -- | -- | -- |
| PAH | Benzo(g,h,i)perylene | 1.79E+01 | 2.67E-05 | 1.30E-05 | 4.70E-09 | -- | -- | -- | -- | -- | 2.54E-04 | 1.15E-04 | 1.26E-08 | 8.46E-03 | 3.84E-03 | -- | 1.23E-02 | 0.017% |
| PAH | Benzo(k)fluoranthene | 2.78E+01 | 4.13E-05 | 2.01E-05 | 7.28E-09 | 4.96E-05 | 2.42E-05 | 8.00E-10 | 7.38E-05 | 7.8% | 3.93E-04 | 1.79E-04 | 1.96E-08 | -- | -- | -- | -- | -- |
| PAH | Chrysene | 1.71E+01 | 2.54E-05 | 1.24E-05 | 4.47E-09 | 3.05E-06 | 1.49E-06 | 4.92E-11 | 4.54E-06 | 0.48% | 2.42E-04 | 1.10E-04 | 1.20E-08 | -- | -- | -- | -- | -- |
| PAH | Dibenz(a,h)anthracene | 2.79E+00 | 4.14E-06 | 2.02E-06 | 7.29E-10 | 1.70E-05 | 8.27E-06 | 8.75E-10 | 2.53E-05 | 2.7% | 3.94E-05 | 1.79E-05 | 1.96E-09 | -- | -- | -- | -- | -- |
| PAH | Fluoranthene | 7.69E+01 | 1.14E-04 | 5.57E-05 | 2.01E-08 | -- | -- | -- | -- | -- | 1.09E-03 | 4.95E-04 | 5.42E-08 | -- | -- | -- | -- | -- |
| PAH | Fluorene | 4.25E+00 | 6.32E-06 | 3.08E-06 | 1.11E-09 | -- | -- | -- | -- | -- | 6.02E-05 | 2.73E-05 | 3.00E-09 | 1.50E-03 | 6.83E-04 | -- | 2.19E-03 | 0.0031% |
| PAH | Indeno(1,2,3-cd)pyrene | 1.45E+01 | 2.15E-05 | 1.05E-05 | 3.79E-09 | 2.58E-05 | 1.26E-05 | 4.16E-10 | 3.84E-05 | 4.1% | 2.05E-04 | 9.30E-05 | 1.02E-08 | -- | -- | -- | -- | -- |
| PAH | Naphthalene | 2.39E+01 | 3.55E-05 | 1.73E-05 | 6.25E-09 | 4.26E-06 | 2.07E-06 | 2.12E-10 | 6.33E-06 | 0.67% | 3.38E-04 | 1.53E-04 | 1.68E-08 | 1.69E-02 | 7.67E-03 | 1.87E-06 | 2.46E-02 | 0.034% |
| PAH | Phenanthrene | 8.25E+01 | 1.23E-04 | 5.98E-05 | 2.16E-08 | -- | -- | -- | -- | -- | 1.17E-03 | 5.30E-04 | 5.82E-08 | 3.89E-03 | 1.77E-03 | -- | 5.66E-03 | 0.0079% |
| PAH | Pyrene | 9.04E+01 | 1.34E-04 | 6.55E-05 | 2.37E-08 | -- | -- | -- | -- | -- | 1.28E-03 | 5.81E-04 | 6.37E-08 | 4.27E-02 | 1.94E-02 | -- | 6.20E-02 | 0.087% |
| PCB | Aroclor-1242 (PCB-1242) | 1.50E-04 | 2.23E-10 | 1.01E-10 | 3.93E-14 | 4.46E-10 | 2.03E-10 | 2.24E-14 | 6.49E-10 | 0.000069% | 2.12E-09 | 9.00E-10 | 1.06E-13 | -- | -- | -- | -- | -- |
| PCB | Aroclor-1248 (PCB-1248) | 3.31E-01 | 4.92E-07 | 2.24E-07 | 8.67E-11 | 9.85E-07 | 4.48E-07 | 4.95E-11 | 1.43E-06 | 0.15% | 4.69E-06 | 1.99E-06 | 2.33E-10 | -- | -- | -- | -- | -- |
| PCB | Aroclor-1254 (PCB-1254) | 3.71E-02 | 5.52E-08 | 2.51E-08 | 9.72E-12 | 1.10E-07 | 5.02E-08 | 5.55E-12 | 1.61E-07 | 0.017% | 5.25E-07 | 2.23E-07 | 2.62E-11 | 2.63E-02 | 1.11E-02 | -- | 3.74E-02 | 0.052% |
| PCB | Aroclor-1260 (PCB-1260) | 2.17E-01 | 3.23E-07 | 1.47E-07 | 5.68E-11 | 6.45E-07 | 2.94E-07 | 3.24E-11 | 9.39E-07 | 0.1% | 3.07E-06 | 1.30E-06 | 1.53E-10 | -- | -- | -- | -- | -- |
| SVOC | 2-Methylnaphthalene | 1.14E+00 | 1.69E-06 | 8.25E-07 | 2.98E-10 | -- | -- | -- | -- | -- | 1.61E-05 | 7.32E-06 | 8.02E-10 | -- | -- | -- | -- | -- |
| SVOC | bis(2-Ethylhexyl)phthalate | 1.08E+03 | 1.61E-03 | 5.23E-04 | 2.84E-07 | 4.83E-06 | 1.57E-06 | 6.81E-10 | 6.40E-06 | 0.68% | 1.53E-02 | 4.64E-03 | 7.63E-07 | 7.67E-01 | 2.32E-01 | -- | 9.99E-01 | 1.4% |
| SVOC | Butyl benzylphthalate | 3.25E-01 | 4.84E-07 | 1.57E-07 | 8.52E-11 | 9.19E-10 | 2.98E-10 | -- | 1.22E-09 | 0.00013% | 4.60E-06 | 1.39E-06 | 2.29E-10 | 2.30E-05 | 6.97E-06 | -- | 3.00E-05 | 0.000042% |
| SVOC | Dibenzofuran | 1.10E+00 | 1.63E-06 | 1.59E-07 | 2.88E-10 | -- | -- | -- | -- | -- | 1.56E-05 | 1.41E-06 | 7.75E-10 | 1.56E-02 | 1.41E-03 | -- | 1.70E-02 | 0.024% |
| VOC | 1,2-Dichloroethane | 4.70E-04 | 6.99E-10 | -- | 1.23E-13 | 3.29E-11 | -- | 2.58E-15 | 3.29E-11 | 0.0000035% | 6.65E-09 | -- | 3.31E-13 | 1.11E-06 | -- | 8.28E-13 | 1.11E-06 | 0.0000015% |
| VOC | Acetone | 1.20E-01 | 1.78E-07 | -- | 3.14E-11 | -- | -- | -- | -- | -- | 1.70E-06 | -- | 8.46E-11 | 1.89E-06 | -- | 2.74E-12 | 1.89E-06 | 0.0000026% |
| VOC | Benzene | 4.22E-02 | 6.28E-08 | -- | 1.11E-11 | 6.28E-09 | -- | 3.21E-13 | 6.28E-09 | 0.00067% | 5.98E-07 | -- | 2.98E-11 | 1.49E-04 | -- | 9.93E-09 | 1.49E-04 | 0.00021% |
| VOC | Carbon disulfide | 3.80E-03 | 5.65E-09 | -- | 9.95E-13 | -- | -- | -- | -- | -- | 5.38E-08 | -- | 2.68E-12 | 5.38E-07 | -- | 3.35E-12 | 5.38E-07 | 0.00000075% |
| VOC | Chloroform (Trichloromethane) | 9.00E-04 | 1.34E-09 | -- | 2.36E-13 | 2.54E-11 | -- | 1.25E-15 | 2.54E-11 | 0.0000027% | 1.27E-08 | -- | 6.35E-13 | 1.27E-06 | -- | 2.12E-12 | 1.27E-06 | 0.0000018% |

**Table C-3. Risk Calculations - Soil Exposure - Resident - Surface Soil**

*Human Health Risk Assessment, 744 and 758 High Street, Oakland, California*

| | | | Carcinogenic Risk Estiamte (ELCR) Calculations | | | | | | | | Non-Cancer Hazard Estimate Calculations | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Analyte Group** | **COPC** | **EPC (mg/kg)** | **Intake Oral (mg/kg-day)** | **Intake Dermal (mg/kg-day)** | **Intake Inhalation ($mg/m^3$)** | **Oral Risk** | **Dermal Risk** | **Inhalation Risk** | **Total ELCR** | **Percent Contribution** | **Intake Oral (mg/kg-day)** | **Intake Dermal (mg/kg-day)** | **Intake Inhalation ($mg/m^3$)** | **Oral HQ** | **Dermal HQ** | **Inhalation HQ** | **Total HQ** | **Percent Contribution** |
| VOC | Dichlorofluoromethane | 1.00E-03 | 1.49E-09 | -- | 2.62E-13 | -- | -- | -- | -- | -- | 1.42E-08 | -- | 7.05E-13 | 7.08E-08 | -- | 7.05E-12 | 7.08E-08 | 0.000000099% |
| VOC | Diisopropyl ether | 1.10E-03 | 1.64E-09 | -- | 2.88E-13 | -- | -- | -- | -- | -- | 1.56E-08 | -- | 7.76E-13 | -- | -- | 1.11E-12 | 1.11E-12 | 0.0000000000015% |
| VOC | Ethylbenzene | 2.38E-02 | 3.54E-08 | -- | 6.23E-12 | 3.89E-10 | -- | 1.56E-14 | 3.89E-10 | 0.000041% | 3.37E-07 | -- | 1.68E-11 | 3.37E-06 | -- | 8.38E-12 | 3.37E-06 | 0.0000047% |
| VOC | Methylene chloride | 3.20E-03 | 4.76E-09 | -- | 8.38E-13 | 6.66E-11 | -- | 8.38E-16 | 6.66E-11 | 0.0000071% | 4.53E-08 | -- | 2.26E-12 | 7.55E-06 | -- | 5.64E-12 | 7.55E-06 | 0.000011% |
| VOC | Toluene | 4.31E-03 | 6.41E-09 | -- | 1.13E-12 | -- | -- | -- | -- | -- | 6.10E-08 | -- | 3.04E-12 | 7.63E-07 | -- | 1.01E-11 | 7.63E-07 | 0.0000011% |
| VOC | Xylene (total) | 9.59E-03 | 1.43E-08 | -- | 2.51E-12 | -- | -- | -- | -- | -- | 1.36E-07 | -- | 6.76E-12 | 6.78E-07 | -- | 9.65E-12 | 6.78E-07 | 0.00000095% |
| | **Total** | | | | | **7E-04** | **2E-04** | **7E-08** | **9E-04** | **100%** | | | | **65** | **6** | **0.04** | **72** | **100%** |

**Notes:**

COPC: chemical of potential concern

ELCR: excess lifetime cancer risk

EPC: exposure point concentration

HI: hazard index (non-cancer) = summar of hazard quotients

HQ: hazard quotient (non-cancer)

MET: metal

mg/kg: milligrams per kilogram

$mg/m^3$: millgrams per cubic meter

PAH: polyaromatic hydrocarbon

PCB: polychlorindated biphenyl

SVOC: semi-volatile organic compound

VOC: volatile organic compound

**Table C-4. Risk Calculations - Soil Exposure - Resident - Total Soil**

*Human Health Risk Assessment, 744 and 758 High Street, Oakland, California*

| | | Carcinogenic Risk Estiamte (ELCR) Calculations | | | | | | | | | Non-Cancer Hazard Estimate Calculations | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Analyte Group | COPC | EPC (mg/kg) | Intake Oral (mg/kg-day) | Intake Dermal (mg/kg-day) | Intake Inhalation ($mg/m^3$) | Oral Risk | Dermal Risk | Inhalation Risk | Total ELCR | Percent Contribution | Intake Oral (mg/kg-day) | Intake Dermal (mg/kg-day) | Intake Inhalation ($mg/m^3$) | Oral HQ | Dermal HQ | Inhalation HQ | Total HQ | Percent Contribution |
| MET | Antimony | 2.41E+00 | 3.58E-06 | 1.16E-07 | 6.31E-10 | -- | -- | -- | -- | -- | 3.41E-05 | 1.03E-06 | 1.70E-09 | 8.53E-02 | 1.72E-02 | -- | 1.02E-01 | 0.27% |
| MET | Arsenic | 1.22E+01 | 1.09E-05 | 1.77E-06 | 3.19E-09 | 1.03E-04 | 1.68E-05 | 1.05E-08 | 1.20E-04 | 25% | 1.03E-04 | 1.57E-05 | 8.59E-09 | 2.96E+01 | 4.47E+00 | 5.73E-04 | 3.40E+01 | 91% |
| MET | Barium | 3.20E+02 | 4.76E-04 | 1.54E-05 | 8.38E-08 | -- | -- | -- | -- | -- | 4.53E-03 | 1.37E-04 | 2.25E-07 | 2.26E-02 | 9.79E-03 | 4.51E-04 | 3.29E-02 | 0.088% |
| MET | Beryllium | 3.26E-01 | 4.85E-07 | 1.57E-08 | 8.54E-11 | 4.07E-06 | 9.26E-10 | 2.05E-10 | 4.07E-06 | 0.85% | 4.61E-06 | 1.40E-07 | 2.30E-10 | 2.31E-03 | 9.98E-03 | 3.28E-05 | 1.23E-02 | 0.033% |
| MET | Cadmium | 3.06E+00 | 4.56E-06 | 1.48E-08 | 8.02E-10 | 6.83E-05 | 5.55E-09 | 3.37E-09 | 6.83E-05 | 14% | 4.34E-05 | 1.31E-07 | 2.16E-09 | 8.67E-02 | 1.05E-02 | 1.08E-04 | 9.73E-02 | 0.26% |
| MET | Chromium | 8.12E+01 | 1.21E-04 | 3.92E-06 | 2.13E-08 | -- | -- | -- | -- | -- | 1.15E-03 | 3.48E-05 | 5.72E-08 | 5.74E-02 | 1.34E-01 | 2.86E-02 | 2.20E-01 | 0.59% |
| MET | Chromium VI | 4.29E-02 | 6.38E-08 | -- | 1.12E-11 | 3.19E-08 | -- | 1.69E-09 | 3.36E-08 | 0.007% | 6.07E-07 | -- | 3.02E-11 | 3.04E-05 | -- | 1.51E-07 | 3.05E-05 | 0.000081% |
| MET | Cobalt | 1.38E+01 | 2.05E-05 | 6.65E-07 | 3.61E-09 | -- | -- | 3.25E-08 | 3.25E-08 | 0.0067% | 1.95E-04 | 5.90E-06 | 9.71E-09 | 6.50E-01 | 1.97E-02 | 1.62E-03 | 6.71E-01 | 1.8% |
| MET | Copper | 1.34E+02 | 1.99E-04 | 6.46E-06 | 3.50E-08 | -- | -- | -- | -- | -- | 1.89E-03 | 5.73E-05 | 9.43E-08 | 4.73E-02 | 1.43E-03 | -- | 4.87E-02 | 0.13% |
| MET | Lead | 2.38E+02 | 3.54E-04 | -- | 6.24E-08 | -- | -- | -- | -- | -- | 3.37E-03 | -- | 1.68E-07 | -- | -- | -- | -- | -- |
| MET | Mercury | 9.85E-01 | 1.46E-06 | 4.76E-08 | 2.58E-10 | -- | -- | -- | -- | -- | 1.39E-05 | 4.22E-07 | 6.95E-10 | 8.71E-02 | 2.64E-03 | 2.32E-05 | 8.98E-02 | 0.24% |
| MET | Molybdenum | 6.77E+00 | 1.01E-05 | 3.27E-07 | 1.77E-09 | -- | -- | -- | -- | -- | 9.58E-05 | 2.90E-06 | 4.77E-09 | 1.92E-02 | 5.80E-04 | -- | 1.97E-02 | 0.053% |
| MET | Nickel | 1.09E+02 | 1.62E-04 | 5.27E-06 | 2.86E-08 | 1.48E-04 | 1.92E-07 | 7.43E-09 | 1.48E-04 | 31% | 1.54E-03 | 4.68E-05 | 7.69E-08 | 1.40E-01 | 1.06E-01 | 5.49E-03 | 2.52E-01 | 0.67% |
| MET | Selenium | 5.66E-01 | 8.42E-07 | 2.73E-08 | 1.48E-10 | -- | -- | -- | -- | -- | 8.01E-06 | 2.43E-07 | 3.99E-10 | 1.60E-03 | 4.85E-05 | 2.00E-08 | 1.65E-03 | 0.0044% |
| MET | Silver | 3.42E-01 | 5.09E-07 | 1.65E-08 | 8.96E-11 | -- | -- | -- | -- | -- | 4.84E-06 | 1.47E-07 | 2.41E-10 | 9.68E-04 | 7.33E-04 | -- | 1.70E-03 | 0.0045% |
| MET | Thallium | 9.42E-01 | 1.40E-06 | 4.55E-08 | 2.47E-10 | -- | -- | -- | -- | -- | 1.33E-05 | 4.04E-07 | 6.64E-10 | 1.33E+00 | 4.04E-02 | -- | 1.37E+00 | 3.7% |
| MET | Vanadium | 4.05E+01 | 6.02E-05 | 1.96E-06 | 1.06E-08 | -- | -- | -- | -- | -- | 5.73E-04 | 1.74E-05 | 2.86E-08 | 1.14E-01 | 1.33E-01 | -- | 2.46E-01 | 0.66% |
| MET | Zinc | 3.84E+02 | 5.71E-04 | 1.86E-05 | 1.01E-07 | -- | -- | -- | -- | -- | 5.44E-03 | 1.65E-04 | 2.71E-07 | 1.81E-02 | 5.49E-04 | -- | 1.87E-02 | 0.05% |
| PAH | Acenaphthene | 3.19E-01 | 4.75E-07 | 2.31E-07 | 8.36E-11 | -- | -- | -- | -- | -- | 4.52E-06 | 2.05E-06 | 2.25E-10 | 7.53E-05 | 3.42E-05 | -- | 1.10E-04 | 0.00029% |
| PAH | Acenaphthylene | 2.60E+00 | 3.86E-06 | 1.88E-06 | 6.80E-10 | -- | -- | -- | -- | -- | 3.67E-05 | 1.67E-05 | 1.83E-09 | 6.12E-04 | 2.78E-04 | -- | 8.90E-04 | 0.0024% |
| PAH | Anthracene | 1.79E+00 | 2.66E-06 | 1.30E-06 | 4.68E-10 | -- | -- | -- | -- | -- | 2.53E-05 | 1.15E-05 | 1.26E-09 | 8.44E-05 | 3.83E-05 | -- | 1.23E-04 | 0.00033% |
| PAH | Benzo(a)anthracene | 5.07E+00 | 7.54E-06 | 3.68E-06 | 1.33E-09 | 9.05E-06 | 4.41E-06 | 1.46E-10 | 1.35E-05 | 2.8% | 7.18E-05 | 3.26E-05 | 3.58E-09 | -- | -- | -- | -- | -- |
| PAH | Benzo(a)pyrene | 9.11E+00 | 1.36E-05 | 6.60E-06 | 2.39E-09 | 3.93E-05 | 1.91E-05 | 2.62E-09 | 5.84E-05 | 12% | 1.29E-04 | 5.86E-05 | 6.42E-09 | -- | -- | -- | -- | -- |
| PAH | Benzo(b)fluoranthene | 7.79E+00 | 1.16E-05 | 5.65E-06 | 2.04E-09 | 1.39E-05 | 6.78E-06 | 2.24E-10 | 2.07E-05 | 4.3% | 1.10E-04 | 5.01E-05 | 5.49E-09 | -- | -- | -- | -- | -- |
| PAH | Benzo(g,h,i)perylene | 5.65E+00 | 8.41E-06 | 4.10E-06 | 1.48E-09 | -- | -- | -- | -- | -- | 8.00E-05 | 3.63E-05 | 3.98E-09 | 2.67E-03 | 1.21E-03 | -- | 3.88E-03 | 0.01% |
| PAH | Benzo(k)fluoranthene | 4.55E+00 | 6.77E-06 | 3.30E-06 | 1.19E-09 | 8.12E-06 | 3.96E-06 | 1.31E-10 | 1.21E-05 | 2.5% | 6.44E-05 | 2.93E-05 | 3.21E-09 | -- | -- | -- | -- | -- |
| PAH | Chrysene | 7.63E+00 | 1.14E-05 | 5.53E-06 | 2.00E-09 | 1.36E-06 | 6.64E-07 | 2.20E-11 | 2.03E-06 | 0.42% | 1.08E-04 | 4.91E-05 | 5.38E-09 | -- | -- | -- | -- | -- |
| PAH | Dibenz(a,h)anthracene | 1.04E+00 | 1.54E-06 | 7.51E-07 | 2.71E-10 | 6.32E-06 | 3.08E-06 | 3.25E-10 | 9.40E-06 | 1.9% | 1.47E-05 | 6.66E-06 | 7.29E-10 | -- | -- | -- | -- | -- |
| PAH | Fluoranthene | 1.52E+01 | 2.26E-05 | 1.10E-05 | 3.97E-09 | -- | -- | -- | -- | -- | 2.15E-04 | 9.76E-05 | 1.07E-08 | -- | -- | -- | -- | -- |
| PAH | Fluorene | 1.08E+00 | 1.60E-06 | 7.82E-07 | 2.83E-10 | -- | -- | -- | -- | -- | 1.53E-05 | 6.94E-06 | 7.61E-10 | 3.82E-04 | 1.73E-04 | -- | 5.55E-04 | 0.0015% |
| PAH | Indeno(1,2,3-cd)pyrene | 4.61E+00 | 6.85E-06 | 3.34E-06 | 1.21E-09 | 8.22E-06 | 4.01E-06 | 1.33E-10 | 1.22E-05 | 2.5% | 6.52E-05 | 2.96E-05 | 3.24E-09 | -- | -- | -- | -- | -- |
| PAH | Naphthalene | 4.38E+00 | 6.52E-06 | 3.18E-06 | 1.15E-09 | 7.82E-07 | 3.81E-07 | 3.90E-11 | 1.16E-06 | 0.24% | 6.20E-05 | 2.82E-05 | 3.09E-09 | 3.10E-03 | 1.41E-03 | 3.43E-07 | 4.51E-03 | 0.012% |
| PAH | Phenanthrene | 1.59E+01 | 2.36E-05 | 1.15E-05 | 4.16E-09 | -- | -- | -- | -- | -- | 2.25E-04 | 1.02E-04 | 1.12E-08 | 7.50E-04 | 3.40E-04 | -- | 1.09E-03 | 0.0029% |
| PAH | Pyrene | 1.79E+01 | 2.67E-05 | 1.30E-05 | 4.70E-09 | -- | -- | -- | -- | -- | 2.54E-04 | 1.15E-04 | 1.26E-08 | 8.46E-03 | 3.84E-03 | -- | 1.23E-02 | 0.033% |
| PCB | Aroclor-1242 (PCB-1242) | 7.16E-04 | 1.06E-09 | 4.84E-10 | 1.87E-13 | 2.13E-09 | 9.68E-10 | 1.07E-13 | 3.10E-09 | 0.00064% | 1.01E-08 | 4.30E-09 | 5.05E-13 | -- | -- | -- | -- | -- |
| PCB | Aroclor-1248 (PCB-1248) | 2.96E-01 | 4.40E-07 | 2.00E-07 | 7.75E-11 | 8.80E-07 | 4.00E-07 | 4.43E-11 | 1.28E-06 | 0.27% | 4.19E-06 | 1.78E-06 | 2.09E-10 | -- | -- | -- | -- | -- |
| PCB | Aroclor-1254 (PCB-1254) | 2.69E-02 | 4.00E-08 | 1.82E-08 | 7.04E-12 | 8.00E-08 | 3.64E-08 | 4.02E-12 | 1.16E-07 | 0.024% | 3.81E-07 | 1.61E-07 | 1.90E-11 | 1.90E-02 | 8.07E-03 | -- | 2.71E-02 | 0.072% |
| PCB | Aroclor-1260 (PCB-1260) | 2.19E+00 | 3.26E-06 | 1.48E-06 | 5.73E-10 | 6.51E-06 | 2.96E-06 | 3.27E-10 | 9.47E-06 | 2% | 3.10E-05 | 1.31E-05 | 1.54E-09 | -- | -- | -- | -- | -- |
| SVOC | 1,2,4-Trichlorobenzene | 2.20E-02 | 3.27E-08 | -- | 5.76E-12 | 1.18E-10 | -- | -- | 1.18E-10 | 0.000024% | 3.11E-07 | -- | 1.55E-11 | 3.11E-05 | -- | 7.76E-09 | 3.11E-05 | 0.000083% |
| SVOC | 2-Chloronaphthalene | 1.40E-01 | 2.08E-07 | -- | 3.67E-11 | -- | -- | -- | -- | -- | 1.98E-06 | -- | 9.87E-11 | 2.48E-05 | -- | -- | 2.48E-05 | 0.000066% |
| SVOC | 2-Methylnaphthalene | 1.90E-01 | 2.82E-07 | 1.37E-07 | 4.96E-11 | -- | -- | -- | -- | -- | 2.68E-06 | 1.22E-06 | 1.34E-10 | -- | -- | -- | -- | -- |
| SVOC | bis(2-Ethylhexyl)phthalate | 1.93E+02 | 2.87E-04 | 9.32E-05 | 5.05E-08 | 8.61E-07 | 2.79E-07 | 1.21E-10 | 1.14E-06 | 0.24% | 2.73E-03 | 8.27E-04 | 1.36E-07 | 1.36E-01 | 4.13E-02 | -- | 1.78E-01 | 0.47% |
| SVOC | Butyl benzylphthalate | 1.74E-01 | 2.59E-07 | 8.42E-08 | 4.56E-11 | 4.93E-10 | 1.60E-10 | -- | 6.53E-10 | 0.00014% | 2.47E-06 | 7.47E-07 | 1.23E-10 | 1.23E-05 | 3.74E-06 | -- | 1.61E-05 | 0.000043% |
| SVOC | Dibenzofuran | 1.42E-01 | 2.11E-07 | 2.05E-08 | 3.71E-11 | -- | -- | -- | -- | -- | 2.01E-06 | 1.82E-07 | 9.99E-11 | 2.01E-03 | 1.82E-04 | -- | 2.19E-03 | 0.0058% |
| SVOC | Diethyl phthalate | 4.40E-02 | 6.54E-08 | 2.13E-08 | 1.15E-11 | -- | -- | -- | -- | -- | 6.23E-07 | 1.89E-07 | 3.10E-11 | 7.79E-07 | 2.36E-07 | -- | 1.01E-06 | 0.0000027% |
| SVOC | Di-n-butyl phthalate | 2.15E-01 | 3.20E-07 | 1.04E-07 | 5.64E-11 | -- | -- | -- | -- | -- | 3.05E-06 | 9.23E-07 | 1.52E-10 | 3.05E-05 | 9.23E-06 | -- | 3.97E-05 | 0.00011% |
| SVOC | Di-n-octyl phthalate | 4.62E-02 | 6.87E-08 | 2.23E-08 | 1.21E-11 | -- | -- | -- | -- | -- | 6.54E-07 | 1.98E-07 | 3.26E-11 | -- | -- | -- | -- | -- |
| SVOC | Nitrobenzene | 5.10E-02 | 7.59E-08 | -- | 1.34E-11 | -- | -- | 5.34E-13 | 5.34E-13 | 0.00000011% | 7.22E-07 | -- | 3.60E-11 | 3.61E-04 | -- | 4.00E-09 | 3.61E-04 | 0.00096% |

**Table C-4. Risk Calculations - Soil Exposure - Resident - Total Soil**

*Human Health Risk Assessment, 744 and 758 High Street, Oakland, California*

| | | Carcinogenic Risk Estiamte (ELCR) Calculations | | | | | | | | | Non-Cancer Hazard Estimate Calculations | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Analyte Group** | **COPC** | **EPC (mg/kg)** | **Intake Oral (mg/kg-day)** | **Intake Dermal (mg/kg-day)** | **Intake Inhalation ($mg/m^3$)** | **Oral Risk** | **Dermal Risk** | **Inhalation Risk** | **Total ELCR** | **Percent Contribution** | **Intake Oral (mg/kg-day)** | **Intake Dermal (mg/kg-day)** | **Intake Inhalation ($mg/m^3$)** | **Oral HQ** | **Dermal HQ** | **Inhalation HQ** | **Total HQ** | **Percent Contribution** |
| SVOC | N-Nitrosodiphenylamine | 5.30E-02 | 7.88E-08 | 2.56E-08 | 1.39E-11 | 7.09E-10 | 2.30E-10 | 3.61E-14 | 9.40E-10 | 0.0002% | 7.50E-07 | 2.27E-07 | 3.74E-11 | 3.75E-05 | 1.14E-05 | -- | 4.89E-05 | 0.00013% |
| SVOC | Phenol | 6.40E-02 | 9.52E-08 | 3.09E-08 | 1.68E-11 | -- | -- | -- | -- | -- | 9.06E-07 | 2.74E-07 | 4.51E-11 | 3.02E-06 | 9.14E-07 | 2.26E-10 | 3.93E-06 | 0.000011% |
| VOC | 1,2-Dichloroethane | 6.32E-04 | 9.40E-10 | -- | 1.66E-13 | 4.42E-11 | -- | 3.48E-15 | 4.42E-11 | 0.0000092% | 8.95E-09 | -- | 4.46E-13 | 1.49E-06 | -- | 1.11E-12 | 1.49E-06 | 0.000004% |
| VOC | Acetone | 8.64E-02 | 1.29E-07 | -- | 2.26E-11 | -- | -- | -- | -- | -- | 1.22E-06 | -- | 6.09E-11 | 1.36E-06 | -- | 1.97E-12 | 1.36E-06 | 0.0000036% |
| VOC | Benzene | 5.94E-03 | 8.83E-09 | -- | 1.56E-12 | 8.83E-10 | -- | 4.51E-14 | 8.83E-10 | 0.00018% | 8.41E-08 | -- | 4.19E-12 | 2.10E-05 | -- | 1.40E-09 | 2.10E-05 | 0.000056% |
| VOC | Carbon disulfide | 3.80E-03 | 5.65E-09 | -- | 9.95E-13 | -- | -- | -- | -- | -- | 5.38E-08 | -- | 2.68E-12 | 5.38E-07 | -- | 3.35E-12 | 5.38E-07 | 0.0000014% |
| VOC | Chloroform (Trichloromethane) | 9.00E-04 | 1.34E-09 | -- | 2.36E-13 | 2.54E-11 | -- | 1.25E-15 | 2.54E-11 | 0.0000053% | 1.27E-08 | -- | 6.35E-13 | 1.27E-06 | -- | 2.12E-12 | 1.27E-06 | 0.0000034% |
| VOC | Dichlorofluoromethane | 1.00E-03 | 1.49E-09 | -- | 2.62E-13 | -- | -- | -- | -- | -- | 1.42E-08 | -- | 7.05E-13 | 7.08E-08 | -- | 7.05E-12 | 7.08E-08 | 0.00000019% |
| VOC | Diisopropyl ether | 1.10E-03 | 1.64E-09 | -- | 2.88E-13 | -- | -- | -- | -- | -- | 1.56E-08 | -- | 7.76E-13 | -- | -- | 1.11E-12 | 1.11E-12 | 0.000000000003% |
| VOC | Ethylbenzene | 5.11E-02 | 7.60E-08 | -- | 1.34E-11 | 8.36E-10 | -- | 3.35E-14 | 8.37E-10 | 0.00017% | 7.24E-07 | -- | 3.61E-11 | 7.24E-06 | -- | 1.80E-11 | 7.24E-06 | 0.000019% |
| VOC | Methyl Tert Butyl Ether | 1.70E-03 | 2.53E-09 | -- | 4.45E-13 | 4.55E-12 | -- | 1.16E-16 | 4.55E-12 | 0.00000094% | 2.41E-08 | -- | 1.20E-12 | -- | -- | 1.50E-13 | 1.50E-13 | 0.0000000000004% |
| VOC | Methylene chloride | 4.91E-03 | 7.30E-09 | -- | 1.29E-12 | 1.02E-10 | -- | 1.29E-15 | 1.02E-10 | 0.000021% | 6.95E-08 | -- | 3.46E-12 | 1.16E-05 | -- | 8.65E-12 | 1.16E-05 | 0.000031% |
| VOC | Toluene | 3.13E-03 | 4.65E-09 | -- | 8.19E-13 | -- | -- | -- | -- | -- | 4.42E-08 | -- | 2.20E-12 | 5.53E-07 | -- | 7.35E-12 | 5.53E-07 | 0.0000015% |
| VOC | Xylene (total) | 3.18E-01 | 4.72E-07 | -- | 8.31E-11 | -- | -- | -- | -- | -- | 4.49E-06 | -- | 2.24E-10 | 2.25E-05 | -- | 3.20E-10 | 2.25E-05 | 0.00006% |
| | **Total** | | | | **Total ELCR:** | **4E-04** | **6E-05** | **6E-08** | **5E-04** | **100%** | | | **HI:** | **32** | **5** | **0.04** | **37** | **100%** |

**Notes:**

COPC: chemical of potential concern

ELCR: excess lifetime cancer risk

EPC: exposure point concentration

HI: hazard index (non-cancer) = summar of hazard quotients

HQ: hazard quotient (non-cancer)

MET: metal

mg/kg: milligrams per kilogram

$mg/m^3$: millgrams per cubic meter

PAH: polyaromatic hydrocarbon

PCB: polychlorindated biphenyl

SVOC: semi-volatile organic compound

VOC: volatile organic compound