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M60050.002628
MCAS EL TORO
SSIC #5090.3

Contract No. N68711-92-D-4670

**COMPREHENSIVE LONG-TERM ENVIRONMENTAL
ACTION NAVY
CLEAN II**

**FINAL TECHNICAL MEMORANDUM
WOOD-INLK/1 RISK EVALUATION
FORMER MARINE CORPS AIR STATION
EL TORO, CALIFORNIA**

**CTO-0161/0369
May 2002**

Prepared by:

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Signature: _____

Andrea Temeshy
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Date: _____

5/7/02



CLEAN II Program
Bechtel Job No. 22214
Contract No. N68711-92-D-4670
File Code: 0214

IN REPLY REFERENCE: CTO-0161/0369

May 8, 2002

Contracting Officer
Naval Facilities Engineering Command
Southwest Division
Mr. Richard Selby, Code 02R1
1220 Pacific Highway
San Diego, CA 92132-5190

Subject: Final Technical Memorandum – Wood-INLK/1 Risk Evaluation – Dated May 2002
Former MCAS El Toro, CA

Dear Mr. Selby:

It is our pleasure to submit this copy of the Final Technical Memorandum – Wood-INLK/1 Risk Evaluation – for the Former Marine Corps Air Station (MCAS) El Toro, California. This document was prepared under Contract Task Order (CTO) 0161 and Contract No. N68711-92-D-4670 in support of the Record of Decision for Sites 18 and 24.

This technical memorandum evaluates the risk due to groundwater from Well Wood-INLK/1. This well is used to supply two surface waters: a manmade lake (North Lake) and a children's pool associated with the lake. Risk due to groundwater from this well was evaluated previously in 1996 during the Phase I Remedial Investigation of Site 18. The risk assessment that is presented in this technical memorandum updates the previous risk assessment and is based on groundwater monitoring conducted from 1995 to 2001. Both risk assessments confirmed that the risk to a recreational user of the lake or children's pond is within the range considered unconditionally acceptable to a recreational user of the lake or pond.

We appreciate the opportunity to be of service to you on this project. If you have any questions or would like further information, please contact John Scholfield at (619) 744-3093, or me at (619) 744-3004.

Sincerely,


Thurman L. Heironimus, R.G.
Project Manager

TLH/sp
Enclosure

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BECHTEL NATIONAL INC.

CLEAN II TRANSMITTAL/DELIVERABLE RECEIPT

Contract No. N-68711-92-D-4670

Document Control No.: CTO-0161/0369

File Code: 0214

TO: Contracting Officer
Naval Facilities Engineering Command
Southwest Division
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1220 Pacific Highway
San Diego, CA 92132-5190

DATE: May 8, 2002
CTO #: 0161
LOCATION: MCAS El Toro, CA

FROM: Thurman L. Heironimus, Project Manager

DESCRIPTION: Final Technical Memorandum - Wood-INLK/1 Risk Evaluation
Dated May 2002

TYPE: Contract Deliverable (Cost) X CTO Deliverable (Technical) Other

VERSION: Final REVISION #: 0

ADMIN RECORD: Yes X No Category Confidential

SCHEDULED DELIVERY DATE: 5/8/02 ACTUAL DELIVERY DATE: 5/8/02

NUMBER OF COPIES SUBMITTED: 10/10C/9E

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Attachment

- A GROUNDWATER DATA SUMMARY**
- B PROBABILITY PLOTS AND HISTOGRAMS**

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ACRONYMS/ABBREVIATIONS

Cal/EPA	California Environmental Protection Agency
cm ²	square centimeter
COPC	chemical of potential concern
CSF	cancer slope factor
DCE	dichloroethene
EPC	exposure-point concentrations
g/day	grams per day
kg	kilogram
kg/d	kilograms per day
(kg-day)/mg	kilograms per day per milligram
L/d	liters per day
L/h	liters per hour
m ³ /hour	cubic meters per hour
mg/(kg-day)	milligrams per kilogram per day
OWCD	Orange County Water District
RME	reasonable maximum exposure
TCE	trichloroethene
UCL	upper confidence level
U.S. EPA	United States Environmental Protection Agency
VOC	volatile organic compound

TECHNICAL MEMORANDUM – WOOD-INLK/1 RISK EVALUATION

1 INTRODUCTION

Groundwater from well Wood-INLK/1 is used to supply two surface water bodies, a man-made lake (North Lake) and a Children's Pool (the Lagoon), situated upgradient from the well. Figure 1 shows the location of Wood-INLK/1 in relation to North Lake. North Lake and the pool are primarily used for recreational purposes. Both North Lake and the Children's Pool are located in the Irvine residential community of Woodbridge, California.

A risk evaluation was performed at North Lake and the Children's Pool to address potential exposure to the groundwater used to supply these surface water bodies. In this assessment, it was conservatively assumed that the concentrations of organic chemicals in surface water were equal to the concentrations reported in the groundwater from well Wood-INLK/1.

This technical memorandum (TM) presents the methodology used in the human-health risk assessment and tabulates the risk estimate results.

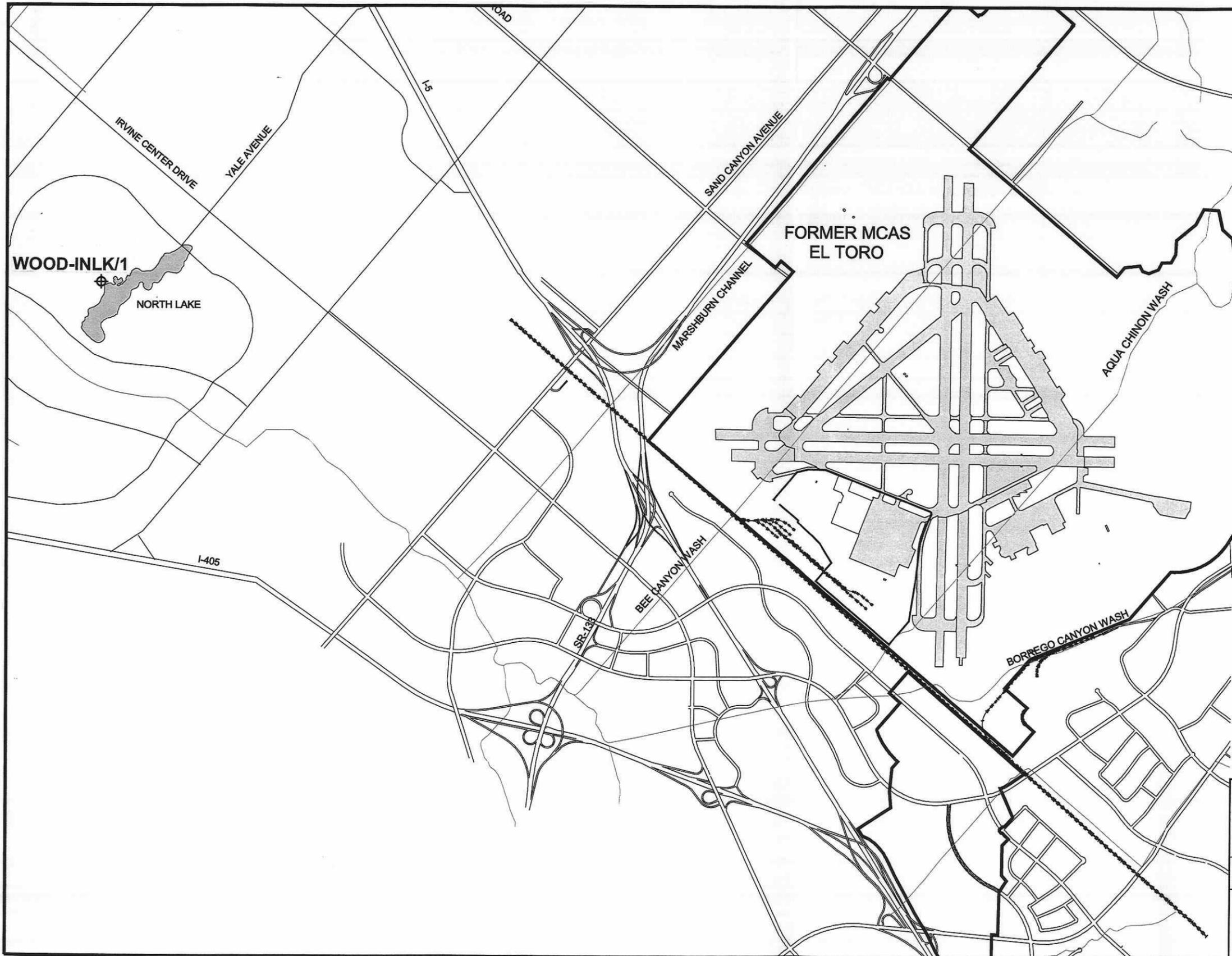
2 HUMAN-HEALTH EVALUATION METHODOLOGY

The risk assessment was conducted in accordance with the Risk Assessment Guidance for Superfund: Part A (U.S. EPA 1989) and Part B (U.S. EPA 1991), and supporting documents and guidelines published by the California Environmental Protection Agency (Cal/EPA 1992). Exposure conditions used in the risk estimation are chosen to represent "reasonable maximum exposure" (RME) conditions. Use of these exposure conditions tends to deliberately overestimate risk, providing risk managers a safety margin when making risk-management decisions.

3 EVALUATION OF ANALYTICAL RESULTS

Analytical results of sampling conducted at Wood-INLK/1 presented by the Orange County Water District (OCWD) from 1995 to August 2001 were evaluated for inclusion in the risk assessment. The data were compared on a yearly basis to identify contaminant and concentration trends. Consistent results were reported for samples collected from 1998 to 2001 for both analyte and concentration parameters. Hence, results associated with the 1998 through 2001 sampling events were used in the risk assessment. Attachment A presents groundwater data collected by OCWD for Wood-INLK/1 from 1995 to 2001.

All organic chemicals reported above laboratory detection limits were identified as chemicals of potential concern (COPCs). This evaluation identified only two organic chemicals, cis-1,2-dichloroethene (DCE) and trichloroethene (TCE), in groundwater. Hence, these two chemicals are considered the COPCs at Wood-INLK/1.



LEGEND

- ROAD
- == FREEWAY
- + RAILROAD
- ▭ RUNWAY
- ▬ BASE BOUNDARY
- STREAM, WASH, OR CHANNEL
- ▭ LAKE
- ⊕ PRODUCTION WELL



Tech Memo - Risk Evaluation

Figure 1

Site Map

Former MCAS, El Toro, California



Bechtel National, Inc.
 CLEAN II Program

Date: 4/8/02
 File No.: 161L8607
 Job No.: 22214-161
 Rev No.: A

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4 EXPOSURE ASSESSMENT

The following exposure settings were considered in this assessment.

- Recreational use of the Children's Pool during low- (2 hours per day) and high-use (6 hours per day, including 2 hours swimming) periods. The pool is used throughout the year by young children assumed to live nearby.
- Adults attending children at the Children's Pool. Nearby residents were assumed to attend children at the pool throughout the year during the high-use period.
- Recreational use of North Lake by a swimmer. This hypothetical site visitor is assumed to be an adult swimmer in direct contact with the water. Nearby residents were chosen as receptors because they are more likely to visit the lake more often and over many more years than those living farther away. Exposure to the lake is assumed to be over a period of 30 years.
- Recreational use of North Lake by a sportfisher. This hypothetical receptor represents the group of fisherman who eat the fish they catch recreationally. Sportfishers were also assumed to live nearby for an upper-bound period of 30 years, and to fish throughout the year.
- Individuals that sit or walk by North Lake. Nearby residents were chosen as receptors because they are more likely to visit the lake more often and over many more years than those living farther away. Exposure to the lake is assumed to occur on a daily basis for 30 years.

A child at the Children's Pool could be exposed to COPCs in the water through the following exposure pathways:

- inhalation of vapors released from surface water
- incidental ingestion of surface water while playing in the pool
- dermal contact with surface water while playing in the pool

An adult in attendance at the Children's Pool could be exposed to COPCs in the water through the following exposure pathway:

- inhalation of vapors released from surface water

A hypothetical adult swimmer at North Lake could be exposed to COPCs in the water through the following exposure pathways:

- inhalation of vapors released from surface water
- incidental ingestion of surface water while swimming
- dermal contact with surface water while swimming

A hypothetical adult sportfisher at North Lake could be exposed to COPCs in the water through the following exposure pathways:

- inhalation of vapors released from surface water while fishing
- ingestion of fish

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Individuals that sit or walk by North Lake could be exposed to COPCs in the water through the following exposure pathway:

- inhalation of vapors released from surface water

4.1 Exposure Quantification

The final step in the exposure assessment is to quantify the exposure for each pathway. This is a two-step process. Step 1 entails estimating exposure-point concentrations (EPCs), and step 2 entails estimating dose rates.

4.1.1 EXPOSURE-POINT CONCENTRATION ESTIMATION

Because of the uncertainty associated with any exposure concentration estimate, the United States Environmental Protection Agency (U.S. EPA) recommends using the 95 percent upper confidence level (UCL) of the average measured chemical concentration when estimating the RME. In calculating the 95 percent UCLs, the data is tested for normality and lognormality. Sets of data that fail these tests are analyzed using a nonparametric approach.

The COPCs in groundwater, cis-1,2-DCE and TCE, are characterized by a nonparametric and a lognormal distribution, respectively. Attachment B presents a probability plot for each chemical and summarizes detection range, frequency of detection, and 95 percent UCLs.

As previously discussed, the concentrations of organic chemicals in North Lake and the Children's Pool water are considered equal to the concentrations reported in the groundwater. Hence, their 95 percent UCLs are the same as the groundwater EPCs. Correspondingly, the concentrations of chemical vapors from water were calculated based on the groundwater EPCs. The U.S. EPA Lagoon model (U.S. EPA 1998) was used to estimate vapor emissions and a "box model" (Cal/EPA 1994) was used subsequently to predict air concentrations associated with the estimated vapor emissions.

4.1.2 DOSE RATE ESTIMATION

Dose rate is the amount of chemical to which a receptor is exposed per unit body weight and time. Dose rates were estimated by integrating intake variables such as ingestion rate, body weight, and exposure duration with the contaminant concentration. The combination of all intake variables results in an estimate of exposure for each pathway.

Exposure assumptions describe the rate of contact that the receptors could have with COPCs in water. U.S. EPA guidelines on upper-bound exposure assumptions are designed to address conservatively the behavior or activity patterns of approximately 90 to 95 percent of the receptor populations. The intent is to estimate an RME.

Exposure parameters for evaluating recreational exposures at a lake or a pool have not been promulgated by U.S. EPA and Cal/EPA. Hence, in order to estimate an RME for these two scenarios, conservative assumptions were implemented in the risk assessment. This deliberate attempt to overestimate dose is made in the interest of public protection.

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This approach is designed to provide high confidence that the actual risk is not underestimated.

4.1.2.1 Exposure Assumptions

The exposure assumptions for the hypothetical receptors exposed to COPCs at North Lake and at the pool are described below.

Assumptions for North Lake – Hypothetical Swimming Scenario

- Recreational exposure by an adult at North Lake was assumed to occur 2 hours per day, 350 days a year, for a total of 30 years.
- For incidental ingestion while swimming, 0.050 liters per hour was assumed for a 70-kilogram adult.
- For dermal exposure while swimming, whole-body exposure (18,150 square centimeters for adults) was assumed.
- Inhalation of vapors was assumed to occur at a rate of 0.83 m³/hour.

Assumptions for North Lake – Hypothetical Sportfishing Scenario

- Sportfishing was assumed to occur at North Lake for 2 hours per day, 350 days a year, for a total of 30 years.
- Inhalation of vapors while fishing was assumed to occur at a rate of 0.83 m³/hour.
- Fish intake for sport-caught fish was based on the 95th percentile consumption rate of 26 grams per day (g/day) (U.S. EPA 1997) for a 70-kilogram adult, in order to encompass all potential high-consuming ethnic groups.
- Exposure depends on availability of suitable fishing areas, and thus fishermen were assumed to fish at other water bodies (area reservoirs) in addition to North Lake. Therefore, the fraction of North Lake ingested fish was assumed to be half the total consumption rate.

Assumptions for North Lake – Hypothetical Strolling Scenario

- Recreational exposure by an adult at North Lake was assumed to occur 4 hours per day, 350 days a year, for a total of 30 years.
- Inhalation of vapors was assumed at a rate of 0.83 m³/hour.

Assumptions for Children's Pool – Recreational Child Scenarios

- Recreational exposure by a child (up to 6 years of age) was assumed to occur 350 days a year for a total of 7 years. For the low-use pool period, exposure was assumed to be swimming only for 2 hours per day. The high-use pool period assumed both swimming and pool-side nonswimming episodes of 2 and 4 hours per day, respectively.
- For incidental ingestion while swimming, 0.050 liters per hour was assumed for a 15-kilogram child.

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- For dermal exposure while swimming, whole-body (7,213 square centimeters [cm²]) exposure was assumed.
- Inhalation of vapors was assumed to occur at a rate of 0.42 m³/hour. For the low-use pool period, exposure to vapors was assumed for 2 hours per day. For the high-use pool period, vapor exposure was assumed for 6 hours per day, the time interval spent in swimming and the pool-side nonswimming episodes.

Assumptions for Children's Pool – Adults Attending Children at the Pool

- Recreational exposure by an adult in attendance at the pool was assumed to occur 6 hours per day, 350 days a year, for a total of 7 years (the time interval assumed for the children they are attending during the high-use pool period).
- Inhalation of vapors was assumed to occur at a rate of 0.83 m³/hour.

4.1.2.2 Exposure Pathway Equations

The specific equations for each exposure pathway and the values assigned to the equation parameters are provided below. The values assigned to the parameters in the dose formulas are presented in Tables 1 and 2.

Inhalation of Airborne Chemical Vapors

$$D_v = (C_a \times IR_a \times ET \times EF \times ED) / (BW \times AT)$$

where

- D_v = dose resulting from inhalation of chemical vapors (milligrams per kilogram per day [mg/kg-day])
- C_a = chemical concentration in air (mg/m³) (predicted based on modeling)
- IR_a = air intake rate by inhalation (m³/hour)
- ET = exposure time (hours/day)
- EF = exposure frequency (days/year)
- ED = exposure duration (years)
- BW = body weight (kilograms)
- AT = averaging time (days)

Incidental Ingestion of Surface Water

$$D_s = (C_{sw} \times IR_{sw} \times CF \times EF \times ED) / (BW \times AT)$$

where

- D_s = dose resulting from ingestion of surface water (mg/kg-day)
- C_{sw} = chemical concentration in surface water (mg/L)
- IR_{sw} = intake rate of surface water by ingestion (L/day)
- CF = conversion factor (10⁻⁶ kg/mg)
- EF = exposure frequency (days/year)
- ED = exposure duration (years)
- BW = body weight (kilograms)
- AT = averaging time (days)

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Table 1
North Lake
Values Assigned to Dose Equation Parameters

Equation Parameter	Unit	Adult Strolling at North Lake ^a	Adult Swimming at North Lake ^a	Recreational Fisherman at North Lake
Inhalation of Vapors				
Inhalation rate ^b	m ³ /hour	0.83	0.83	0.83
Exposure time	hours/day	4	2	2
Surface Water Incidental Ingestion				
Intake rate ^c	L/day	NA	0.1	NA
Surface Water Dermal Contact				
Exposed skin area ^d	cm ²	NA	18,150	NA
Permeability constant		NA	Chemical specific	NA
Exposure time	hours/day	NA	2	NA
Fish				
Fraction of ingested fish from North Lake	unitless	NA	NA	0.5
Ingestion rate of fish at North Lake	kg/d	NA	NA	0.026 ^e
General Parameters				
Exposure frequency	days/year	350	350	350
Exposure duration (cancer)	years	30	30	30
Exposure duration (noncancer)	years	30	30	30
Body weight	kilograms	70	70	70
Averaging time (cancer)	days	25,550	25,550	25,550
Averaging time (noncancer)	days	ED × 365	ED × 365	ED × 365

Notes:

- ^a adult exposure was assumed for a total of 30 years
- ^b U.S. EPA Region 9 recommended default value (U.S. EPA 1998)
- ^c 0.050 L/hr is the U.S. EPA default rate for water ingestion while swimming (U.S. EPA 1989) (0.050 L/hr × 2 hr/day = 0.1 L/day)
- ^d median total body skin area (U.S. EPA 1997)
- ^e recreational freshwater fish ingestion rate (U.S. EPA 1997)

Acronyms/Abbreviations:

- cm² – square centimeters
- ED – exposure duration
- kg/d – kilograms per day
- L/day – liters per day
- L/hr – liters per hour
- m³/hour – cubic meters per hour
- NA – not applicable
- U.S. EPA – United States Environmental Protection Agency

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Table 2
Children's Pool
Values Assigned to Dose Equation Parameters

Equation Parameter	Unit	Child at Pool ^a (low-use period)	Child at Pool ^a (high-use period)	Adult Attending Pool ^b (high-use period)
Inhalation of Vapors				
Inhalation rate ^c	m ³ /hour	0.42	0.42	0.83
Exposure time	hours/day	2	6	6
Surface Water Incidental Ingestion				
Intake rate ^d	L/day	0.1	0.1	NA
Surface Water Dermal Contact				
Exposed skin area ^e	cm ²	7,213	7,213	NA
Permeability constant		Chemical specific	Chemical Specific	NA
Exposure time	hours/day	2	2	NA
General Parameters				
Exposure frequency	days/year	350	350	350
Exposure duration (cancer)	years	7	7	7
Exposure duration (noncancer)	years	7	7	7
Body weight	kilograms	15	15	70
Averaging time (cancer)	days	25,550	25,550	25,550
Averaging time (noncancer)	days	ED × 365	ED × 365	ED × 365

Notes:

- ^a child is up to 6 years of age
- ^b adult exposure (time, frequency, and duration) was assumed to be equivalent to the exposure for the children being monitored
- ^c U.S. EPA Region 9 recommended default value (U.S. EPA 1998)
- ^d 0.050 L/hr is the U.S. EPA default rate for water ingestion while swimming (U.S. EPA 1989) (0.050 L/hr × 2 hr/day = 0.1 L/day)
- ^e median total body skin area (U.S. EPA 1997)

Acronyms/Abbreviations:

- cm² – square centimeters
- ED – exposure duration
- L/day – liters per day
- L/hour – liters per hour
- m³/hour – cubic meters per hour
- NA – not applicable
- U.S. EPA – United States Environmental Protection Agency

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Dermal Contact With Surface Water

$$D_{ab} = (C_s \times CF \times SA \times DPC \times EF \times ED)/(BW \times AT)$$

where

- D_{ab} = absorbed dose from dermal contact with surface water (mg/kg-day)
- C_s = chemical concentration in surface water (mg/L)
- CF = conversion factor (10^{-6} kg/mg)
- SA = skin surface area available for contact (cm^2)
- DPC = dermal permeability constant (cm/hr)
- EF = exposure frequency (days/year)
- ED = exposure duration (years)
- BW = body weight (kilograms)
- AT = averaging time (days)

Ingestion of Fish

$$D_f = (C_f \times IR_f \times FI \times EF \times ED)/(BW \times AT)$$

where

- D_f = dose from ingestion of fish (mg/kg-day)
- C_f = chemical concentration in fish (mg/kg)
- IR_f = fish consumption rate (kilograms per day [kg/day])
- FI = fraction of fish consumed from North Lake (unitless)
- EF = exposure frequency (days/year)
- ED = exposure duration (years)
- BW = body weight (kilograms)
- AT = averaging time (days)

5 TOXICITY ASSESSMENT

Cancer risk was estimated using the results of the dose calculations and both U.S. EPA (U.S. EPA 2000) and Cal/EPA (<http://www.oehha.ca.gov/risk/ChemicalDB/index.asp> toxicity database) cancer slope factors (CSFs). Use of Cal/EPA toxicity values in addition to the U.S. EPA CSFs permits dual tracking of the cancer risk. Dual tracking the risk consists of a risk assessment evaluation using only U.S. EPA toxicity values and a separate risk assessment evaluation using California toxicity values. A noncancer hazard index was calculated for each exposure scenario using dose calculation results and the federal reference dose (U.S. EPA 2000). Toxicity values used for cis-1,2-DCE and TCE, the COPCs at Wood-INLK/1, are as follows:

cis-1,2-DCE

oral reference dose = 1.0E-2

inhalation reference dose = 1.0E-2

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TCE

U.S. EPA oral CSF = 1.1E-2
Cal/EPA oral CSF = 1.53E-2
U.S. EPA inhalation CSF = 6.0E-3
Cal/EPA inhalation CSF = 1.0E-2
oral reference dose = 6.0E-3
inhalation reference dose = 6.0E-3

CSFs are expressed in units of (kg-day)/mg; reference doses are expressed in mg/(kg-day).

6 RISK CHARACTERIZATION RESULTS

The following sections present risk assessment results for receptors exposed to COPCs at North Lake and Children's Pool.

6.1 North Lake Exposure – Hypothetical Swimming Scenario

The estimated cancer risk for the hypothetical recreational adult exposed to surface water at North Lake (assuming surface water concentrations are equal to groundwater concentrations), for 350 days per year over a course of 30 years, is quantified at 2.9×10^{-7} (U.S. EPA) and 4.0×10^{-7} (Cal/EPA). This estimated risk level is considered unconditionally acceptable under U.S. EPA and Cal/EPA guidance.

The estimated hazard index for this scenario is 0.011. A hazard index value of less than 1 indicates that there is not a potential for adverse noncancer health effects under the scenario evaluated, even among the most chemically-sensitive individuals. Cancer risk and hazard index are summarized by pathway in Table 3.

It should be noted that the results associated with this hypothetical scenario are considered conservative estimates of exposure and risk. This risk assessment considered a swimming scenario; swimming however, is not permitted at North Lake (SWDIV 1996). Consequently, activities that differ from those used in the exposure assumptions would lead to lower risks than those estimated.

6.2 North Lake Exposure – Hypothetical Sportfishing Scenario

The estimated cancer risk for a hypothetical adult exposed to chemicals at North Lake from inhalation of volatile organic compounds (VOCs) and from the consumption of fish over a course of 30 years is quantified at 2.3×10^{-7} (U.S. EPA) and 3.3×10^{-7} (Cal/EPA). The estimated cancer risk is considered unconditionally acceptable under U.S. EPA and Cal/EPA guidance. The hazard index is quantified at 0.0087, indicating that systemic toxicity is unlikely.

The risk estimates associated with the sportfishing scenario are considered conservative, as they are based on upper-bound exposure values. As previously discussed, the estimated amount of fish ingested was 25 grams per day at the 95th percentile

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Table 3
Summary of Lifetime Cancer Risk and Hazard Index by Pathway
at North Lake Receptors

Exposure Route	Cancer Risk U.S. EPA*	Cancer Risk State*	Hazard Index
Adult Strolling at North Lake			
<i>Air Volatiles</i>			
Vapor Inhalation	4.6E-09	7.6E-09	0.00033
Air Volatiles Total	4.6E-09	7.6E-09	0.00033
Total	4.6E-09	7.6E-09	0.00033
Adult Swimming at North Lake			
<i>Air Volatiles</i>			
Vapor Inhalation	2.3E-09	3.8E-09	0.00016
Air Volatiles Total	2.3E-09	3.8E-09	0.00016
<i>Surface Water</i>			
Incidental Dermal Contact	2.4E-07	3.4E-07	0.0091
Incidental Ingestion	4.3E-08	6.0E-08	0.0017
Surface Water Total	2.9E-07	4.0E-07	0.011
Total	2.9E-07	4.0E-07	0.011
Recreational Fisherman at North Lake			
<i>Air Volatiles</i>			
Vapor Inhalation	2.3E-09	3.8E-09	0.00016
Air Volatiles Total	2.3E-09	3.8E-09	0.00016
<i>Fish</i>			
Recreation Fish Ingestion	2.3E-07	3.2E-07	0.0085
Fish Total	2.3E-07	3.2E-07	0.0085
Total	2.3E-07	3.3E-07	0.0087

Note:

* risk was calculated using U.S. EPA or Cal/EPA toxicity values

Acronyms/Abbreviations:

Cal/EPA – California Environmental Protection Agency
 U.S. EPA – United States Environmental Protection Agency

Technical Memorandum – WOOD-INLK/1 Risk Evaluation

representative of all potential high-consuming ethnic groups. However, exposure to fish caught recreationally is generally based on an average consumption rate (8 grams per day). The average rate was used since the amount ingested under recreational use would be lower than the amount ingested for high-consuming ethnic groups. Furthermore, it should be noted that fishing at North Lake is only permitted on a catch-and-release basis; consumption of fish is improbable under this condition.

6.3 North Lake Exposure – Hypothetical Strolling Scenario

The estimated cancer risk for a hypothetical adult exposed to chemicals at North Lake from inhalation of VOCs for 350 days per year over a course of 30 years is quantified at 4.6×10^{-9} (U.S. EPA) and 7.6×10^{-9} (Cal/EPA). This estimated risk level is considered unconditionally acceptable under U.S. EPA and Cal/EPA guidance.

The estimated hazard index for this scenario is 0.00033, indicating that noncancer health effects are unlikely under the scenario evaluated.

Cancer risk and hazard index for the North Lake receptors are summarized by pathway in Table 3.

6.4 Children's Pool Exposure – Children's Recreational Scenario

The estimated cancer risk for the child exposed to surface water at the pool for 350 days per year over a course of 7 years is 1.5×10^{-7} (U.S. EPA) and 2.1×10^{-9} (Cal/EPA) for both the low- and high-use pool periods. This estimated risk level is also considered unconditionally acceptable under U.S. EPA and Cal/EPA guidance. The hazard index is estimated at 0.025 for both pool-use periods. Cancer risk and hazard index are summarized by pathway in Table 4.

Exposure conditions at the Children's Pool used conservative assumptions, hence the risk estimates reported in this TM are considered over-estimates. Principally, risks were calculated assuming that surface water concentrations equal groundwater concentrations. In addition, it is unlikely that a small child would frequent the pool 2 hours per day, 350 days a year, for 7 years. Furthermore, the pool is only operational from May to September.

6.5 Children's Pool Exposure – Adult Attending Children at the Pool Scenario

The estimated cancer risk for an adult attending children at the pool from inhalation of VOCs for 350 days per year over a course of 30 years is quantified at 1.6×10^{-9} (U.S. EPA) and 2.7×10^{-9} (Cal/EPA). This estimated risk level is also considered unconditionally acceptable under U.S. EPA and Cal/EPA guidance. The hazard index is estimated at 0.00049. Cancer risk and hazard index are summarized by pathway in Table 4. As discussed above it is unlikely that the pool would be frequented under the conditions evaluated in this assessment; hence the risk estimates reported in this TM are considered over-estimates.

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Table 4
Summary of Lifetime Cancer Risk and Hazard Index by Pathway
at Children's Pool

Exposure Route	Cancer Risk U.S. EPA*	Cancer Risk State*	Hazard Index
Child at Children's Pool (low-use period)			
<i>Air Volatiles</i>			
Vapor Inhalation	1.3E-09	2.1E-09	0.00039
Air Volatiles Total	1.3E-09	2.1E-09	0.00039
<i>Surface Water</i>			
Incidental Dermal Contact	1.1E-07	1.5E-07	0.017
Incidental Ingestion	4.7E-08	6.5E-08	0.0077
Surface Water Total	1.5E-07	2.1E-07	0.025
Total	1.5E-07	2.1E-07	0.025
Child at Children's Pool (high-use period)			
<i>Air Volatiles</i>			
Vapor Inhalation	3.8E-09	6.3E-09	0.0012
Air Volatiles Total	3.8E-09	6.3E-09	0.0012
<i>Surface Water</i>			
Incidental Dermal Contact	1.1E-07	1.5E-07	0.017
Incidental Ingestion	4.7E-08	6.5E-08	0.0077
Surface Water Total	1.5E-07	2.1E-07	0.025
Total	1.5E-07	2.1E-07	0.025
Adult in Attendance at Children's Pool (high-use period)			
<i>Air Volatiles</i>			
Vapor Inhalation	1.6E-09	2.7E-09	0.00049
Air Volatiles Total	1.6E-09	2.7E-09	0.00049
Total	1.6E-09	2.7E-09	0.00049

Note:

* risk was calculated using U.S. EPA or Cal/EPA toxicity values

Acronyms/Abbreviations:

Cal/EPA – California Environmental Protection Agency
 U.S. EPA – United States Environmental Protection Agency

7 REFERENCES

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U.S. EPA. *See* United States Environmental Protection Agency.

ATTACHMENT A

GROUNDWATER DATA SUMMARY

Analytical Results Conducted at Wood-INLK/1
in 2001 by Orange County Water District

Data

Station ID	Sample ID	Lab Sample ID	Analyte ID	Analyte Name	Result	Review Qualifier	Result Units	Method Code	Matrix Code	Collection Date
WOOD-INLK/1	1000440	1000440	156-59-2	CIS-1,2-DICHLOROETHENE	0.001		MG/L	EPA 524.2	GW	1/2/2001
WOOD-INLK/1	1002770	1002770	156-59-2	CIS-1,2-DICHLOROETHENE	0.0017		MG/L	EPA 524.2	GW	2/1/2001
WOOD-INLK/1	1006990	1006990	156-59-2	CIS-1,2-DICHLOROETHENE	0.0014		MG/L	EPA 524.2	GW	3/1/2001
WOOD-INLK/1	1010123	1010123	156-59-2	CIS-1,2-DICHLOROETHENE	0.0018		MG/L	EPA 524.2	GW	4/5/2001
WOOD-INLK/1	1012757	1012757	156-59-2	CIS-1,2-DICHLOROETHENE	0.0008		MG/L	EPA 524.2	GW	5/1/2001
WOOD-INLK/1	1018099	1018099	156-59-2	CIS-1,2-DICHLOROETHENE	0.0008		MG/L	EPA 524.2	GW	6/1/2001
WOOD-INLK/1	1023098	1023098	156-59-2	CIS-1,2-DICHLOROETHENE	0.0008		MG/L	EPA 524.2	GW	7/2/2001
WOOD-INLK/1	1025247	1025247	156-59-2	CIS-1,2-DICHLOROETHENE	0.0009		MG/L	EPA 524.2	GW	8/1/2001
WOOD-INLK/1	1000440	1000440	79-01-6	TRICHLOROETHYLENE	0.0064		MG/L	EPA 524.2	GW	1/2/2001
WOOD-INLK/1	1002770	1002770	79-01-6	TRICHLOROETHYLENE	0.0091		MG/L	EPA 524.2	GW	2/1/2001
WOOD-INLK/1	1006990	1006990	79-01-6	TRICHLOROETHYLENE	0.0092		MG/L	EPA 524.2	GW	3/1/2001
WOOD-INLK/1	1010123	1010123	79-01-6	TRICHLOROETHYLENE	0.0099		MG/L	EPA 524.2	GW	4/5/2001
WOOD-INLK/1	1012757	1012757	79-01-6	TRICHLOROETHYLENE	0.0055		MG/L	EPA 524.2	GW	5/1/2001
WOOD-INLK/1	1018099	1018099	79-01-6	TRICHLOROETHYLENE	0.0051		MG/L	EPA 524.2	GW	6/1/2001
WOOD-INLK/1	1023098	1023098	79-01-6	TRICHLOROETHYLENE	0.0042		MG/L	EPA 524.2	GW	7/2/2001
WOOD-INLK/1	1025247	1025247	79-01-6	TRICHLOROETHYLENE	0.0049		MG/L	EPA 524.2	GW	8/1/2001

Summary Statistics

CAS No	Chemical	95% UCL	Units	Distribution	No. Detects	No. Results	% Detected	Max
156-59-2	CIS-1,2-DICHLOROETHENE	0.00153	MG/L	LogNormal	8	8	100%	0.0018
79-01-6	TRICHLOROETHYLENE	0.00889	MG/L	LogNormal	8	8	100%	0.0099

Analytical Results Conducted at Wood-INLK/1
in 2000 by Orange County Water District

Data

Station ID	Sample ID	Lab Sample ID	Analyte ID	Analyte Name	Result	Review Qualifier	Result Units	Method Code	Matrix Code	Collection Date
WOOD-INLK/1	51302	51302	156-59-2	CIS-1,2-DICHLOROETHENE	0.0013		MG/L	EPA 524.2	GW	1/5/2000
WOOD-INLK/1	53809	53809	156-59-2	CIS-1,2-DICHLOROETHENE	0.0009		MG/L	EPA 524.2	GW	2/2/2000
WOOD-INLK/1	55179	55179	156-59-2	CIS-1,2-DICHLOROETHENE	0.002		MG/L	EPA 524.2	GW	3/1/2000
WOOD-INLK/1	57519	57519	156-59-2	CIS-1,2-DICHLOROETHENE	0.0006		MG/L	EPA 524.2	GW	3/31/2000
WOOD-INLK/1	59492	59492	156-59-2	CIS-1,2-DICHLOROETHENE	0.0009		MG/L	EPA 524.2	GW	5/2/2000
WOOD-INLK/1	63047	63047	156-59-2	CIS-1,2-DICHLOROETHENE	0.0008		MG/L	EPA 524.2	GW	6/1/2000
WOOD-INLK/1	65009	65009	156-59-2	CIS-1,2-DICHLOROETHENE	0.0008		MG/L	EPA 524.2	GW	7/5/2000
WOOD-INLK/1	66804	66804	156-59-2	CIS-1,2-DICHLOROETHENE	0.001		MG/L	EPA 524.2	GW	8/1/2000
WOOD-INLK/1	71930	71930	156-59-2	CIS-1,2-DICHLOROETHENE	0.0007		MG/L	EPA 524.2	GW	9/1/2000
WOOD-INLK/1	76318	76318	156-59-2	CIS-1,2-DICHLOROETHENE	0.0008		MG/L	EPA 524.2	GW	10/2/2000
WOOD-INLK/1	81712	81712	156-59-2	CIS-1,2-DICHLOROETHENE	0.0011		MG/L	EPA 524.2	GW	12/1/2000
WOOD-INLK/1	51302	51302	79-01-6	TRICHLOROETHYLENE	0.0075		MG/L	EPA 524.2	GW	1/5/2000
WOOD-INLK/1	53809	53809	79-01-6	TRICHLOROETHYLENE	0.0052		MG/L	EPA 524.2	GW	2/2/2000
WOOD-INLK/1	55179	55179	79-01-6	TRICHLOROETHYLENE	0.0077		MG/L	EPA 524.2	GW	3/1/2000
WOOD-INLK/1	57519	57519	79-01-6	TRICHLOROETHYLENE	0.003		MG/L	EPA 524.2	GW	3/31/2000
WOOD-INLK/1	59492	59492	79-01-6	TRICHLOROETHYLENE	0.0053		MG/L	EPA 524.2	GW	5/2/2000
WOOD-INLK/1	63047	63047	79-01-6	TRICHLOROETHYLENE	0.0043		MG/L	EPA 524.2	GW	6/1/2000
WOOD-INLK/1	65009	65009	79-01-6	TRICHLOROETHYLENE	0.0048		MG/L	EPA 524.2	GW	7/5/2000
WOOD-INLK/1	66804	66804	79-01-6	TRICHLOROETHYLENE	0.0052		MG/L	EPA 524.2	GW	8/1/2000
WOOD-INLK/1	71930	71930	79-01-6	TRICHLOROETHYLENE	0.005		MG/L	EPA 524.2	GW	9/1/2000
WOOD-INLK/1	76318	76318	79-01-6	TRICHLOROETHYLENE	0.0053		MG/L	EPA 524.2	GW	10/2/2000
WOOD-INLK/1	81712	81712	79-01-6	TRICHLOROETHYLENE	0.0066		MG/L	EPA 524.2	GW	12/1/2000

Summary Statistics

CAS No	Chemical	95% UCL	Units	Distribution	No. Detects	No. Results	% Detected	Max
156-59-2	CIS-1,2-DICHLOROETHENE	0.00122	MG/L	LogNormal	11	11	100	0.002
79-01-6	TRICHLOROETHYLENE	0.00641	MG/L	LogNormal	11	11	100	0.0077

Analytical Results Conducted at Wood-INLK/1
in 1999 by Orange County Water District

Data

Station ID	Sample ID	Lab Sample ID	Analyte ID	Analyte Name	Result	Review Qualifier	Result Units	Method Code	Matrix Code	Collection Date
WOOD-INLK/1	99000396	99000396	156-59-2	CIS-1,2-DICHLOROETHENE	0.0013		MG/L	EPA 524.2	GW	1/4/1999
WOOD-INLK/1	99003727	99003727	156-59-2	CIS-1,2-DICHLOROETHENE	0.0016		MG/L	EPA 524.2	GW	2/1/1999
WOOD-INLK/1	99006074	99006074	156-59-2	CIS-1,2-DICHLOROETHENE	0.001		MG/L	EPA 524.2	GW	3/1/1999
WOOD-INLK/1	99008479	99008479	156-59-2	CIS-1,2-DICHLOROETHENE	0.0014		MG/L	EPA 524.2	GW	4/2/1999
WOOD-INLK/1	99013566	99013566	156-59-2	CIS-1,2-DICHLOROETHENE	0.0011		MG/L	EPA 524.2	GW	5/6/1999
WOOD-INLK/1	99016400	99016400	156-59-2	CIS-1,2-DICHLOROETHENE	0.0013		MG/L	EPA 524.2	GW	6/4/1999
WOOD-INLK/1	99018438	99018438	156-59-2	CIS-1,2-DICHLOROETHENE	0.0009		MG/L	EPA 524.2	GW	7/9/1999
WOOD-INLK/1	99020617	99020617	156-59-2	CIS-1,2-DICHLOROETHENE	0.0008		MG/L	EPA 524.2	GW	8/5/1999
WOOD-INLK/1	99022692	99022692	156-59-2	CIS-1,2-DICHLOROETHENE	0.0009		MG/L	EPA 524.2	GW	8/31/1999
WOOD-INLK/1	99024093	99024093	156-59-2	CIS-1,2-DICHLOROETHENE	0.0016		MG/L	EPA 524.2	GW	10/1/1999
WOOD-INLK/1	99026894	99026894	156-59-2	CIS-1,2-DICHLOROETHENE	0.0008		MG/L	EPA 524.2	GW	11/2/1999
WOOD-INLK/1	50496	50496	156-59-2	CIS-1,2-DICHLOROETHENE	0.0006		MG/L	EPA 524.2	GW	11/29/1999
WOOD-INLK/1	99000396	99000396	79-01-6	TRICHLOROETHYLENE	0.0083		MG/L	EPA 524.2	GW	1/4/1999
WOOD-INLK/1	99003727	99003727	79-01-6	TRICHLOROETHYLENE	0.0085		MG/L	EPA 524.2	GW	2/1/1999
WOOD-INLK/1	99006074	99006074	79-01-6	TRICHLOROETHYLENE	0.0057		MG/L	EPA 524.2	GW	3/1/1999
WOOD-INLK/1	99008479	99008479	79-01-6	TRICHLOROETHYLENE	0.0079		MG/L	EPA 524.2	GW	4/2/1999
WOOD-INLK/1	99013566	99013566	79-01-6	TRICHLOROETHYLENE	0.0061		MG/L	EPA 524.2	GW	5/6/1999
WOOD-INLK/1	99016400	99016400	79-01-6	TRICHLOROETHYLENE	0.0062		MG/L	EPA 524.2	GW	6/4/1999
WOOD-INLK/1	99018438	99018438	79-01-6	TRICHLOROETHYLENE	0.0056		MG/L	EPA 524.2	GW	7/9/1999
WOOD-INLK/1	99020617	99020617	79-01-6	TRICHLOROETHYLENE	0.0046		MG/L	EPA 524.2	GW	8/5/1999
WOOD-INLK/1	99022692	99022692	79-01-6	TRICHLOROETHYLENE	0.0052		MG/L	EPA 524.2	GW	8/31/1999
WOOD-INLK/1	99024093	99024093	79-01-6	TRICHLOROETHYLENE	0.0087		MG/L	EPA 524.2	GW	10/1/1999
WOOD-INLK/1	99026894	99026894	79-01-6	TRICHLOROETHYLENE	0.005		MG/L	EPA 524.2	GW	11/2/1999
WOOD-INLK/1	50496	50496	79-01-6	TRICHLOROETHYLENE	0.0033		MG/L	EPA 524.2	GW	11/29/1999

Summary Statistics

CAS No	Chemical	95% UCL	Units	Distribution	No. Detects	No. Results	% Detected	Max
156-59-2	CIS-1,2-DICHLOROETHENE	0.00133	MG/L	LogNormal	12	12	100%	0.0016
79-01-6	TRICHLOROETHYLENE	0.00744	MG/L	LogNormal	12	12	100%	0.0087

Analytical Results Conducted at Wood-INLK/1
in 1998 by Orange County Water District

Data

Station ID	Sample ID	Lab Sample ID	Analyte ID	Analyte Name	Result	Review Qualifier	Result Units	Method Code	Matrix Code	Collection Date
WOOD-INLK/1	98001211	98001211	156-59-2	CIS-1,2-DICHLOROETHENE	0.0008		MG/L	EPA 502.2	GW	1/7/1998
WOOD-INLK/1	98005303	98005303	156-59-2	CIS-1,2-DICHLOROETHENE	0.0013		MG/L	EPA 502.2	GW	2/4/1998
WOOD-INLK/1	98006196	98006196	156-59-2	CIS-1,2-DICHLOROETHENE	0.0016		MG/L	EPA 502.2	GW	3/2/1998
WOOD-INLK/1	98010169	98010169	156-59-2	CIS-1,2-DICHLOROETHENE	0.0008		MG/L	EPA 502.2	GW	4/3/1998
WOOD-INLK/1	98013494	98013494	156-59-2	CIS-1,2-DICHLOROETHENE	0.0005		MG/L	EPA 502.2	GW	5/5/1998
WOOD-INLK/1	98018381	98018381	156-59-2	CIS-1,2-DICHLOROETHENE	0.0007		MG/L	EPA 502.2	GW	6/2/1998
WOOD-INLK/1	98022497	98022497	156-59-2	CIS-1,2-DICHLOROETHENE	0.0007		MG/L	EPA 502.2	GW	7/1/1998
WOOD-INLK/1	98028311	98028311	156-59-2	CIS-1,2-DICHLOROETHENE	0.001		MG/L	EPA 502.2	GW	8/3/1998
WOOD-INLK/1	98032121	98032121	156-59-2	CIS-1,2-DICHLOROETHENE	0.0005	U	MG/L	EPA 502.2	GW	9/1/1998
WOOD-INLK/1	98034051	98034051	156-59-2	CIS-1,2-DICHLOROETHENE	0.0009		MG/L	EPA 502.2	GW	9/29/1998
WOOD-INLK/1	98038158	98038158	156-59-2	CIS-1,2-DICHLOROETHENE	0.0009		MG/L	EPA 502.2	GW	11/3/1998
WOOD-INLK/1	98039999	98039999	156-59-2	CIS-1,2-DICHLOROETHENE	0.0013		MG/L	EPA 524.2	GW	11/30/1998
WOOD-INLK/1	98001211	98001211	79-01-6	TRICHLOROETHYLENE	0.0067		MG/L	EPA 502.2	GW	1/7/1998
WOOD-INLK/1	98005303	98005303	79-01-6	TRICHLOROETHYLENE	0.0086		MG/L	EPA 502.2	GW	2/4/1998
WOOD-INLK/1	98006196	98006196	79-01-6	TRICHLOROETHYLENE	0.0069		MG/L	EPA 502.2	GW	3/2/1998
WOOD-INLK/1	98010169	98010169	79-01-6	TRICHLOROETHYLENE	0.0032		MG/L	EPA 502.2	GW	4/3/1998
WOOD-INLK/1	98013494	98013494	79-01-6	TRICHLOROETHYLENE	0.0046		MG/L	EPA 502.2	GW	5/5/1998
WOOD-INLK/1	98018381	98018381	79-01-6	TRICHLOROETHYLENE	0.004		MG/L	EPA 502.2	GW	6/2/1998
WOOD-INLK/1	98022497	98022497	79-01-6	TRICHLOROETHYLENE	0.0045		MG/L	EPA 502.2	GW	7/1/1998
WOOD-INLK/1	98028311	98028311	79-01-6	TRICHLOROETHYLENE	0.0075		MG/L	EPA 502.2	GW	8/3/1998
WOOD-INLK/1	98032121	98032121	79-01-6	TRICHLOROETHYLENE	0.0048		MG/L	EPA 502.2	GW	9/1/1998
WOOD-INLK/1	98034051	98034051	79-01-6	TRICHLOROETHYLENE	0.0051		MG/L	EPA 502.2	GW	9/29/1998
WOOD-INLK/1	98038158	98038158	79-01-6	TRICHLOROETHYLENE	0.0074		MG/L	EPA 502.2	GW	11/3/1998
WOOD-INLK/1	98039999	98039999	79-01-6	TRICHLOROETHYLENE	0.0095		MG/L	EPA 524.2	GW	11/30/1998

Summary Statistics

CAS No	Chemical	95% UCL	Units	Distribution	No. Detects	No. Results	% Detected	Max
156-59-2	CIS-1,2-DICHLOROETHENE	0.00126	MG/L	LogNormal	11	12	92%	0.0016
79-01-6	TRICHLOROETHYLENE	0.00744	MG/L	LogNormal	12	12	100%	0.0095

Analytical Results Conducted at Wood-INLK/1
in 1997 by Orange County Water District

Data

Station ID	Sample ID	Lab Sample ID	Analyte ID	Analyte Name	Result	Review Qualifier	Result Units	Method Code	Matrix Code	Collection Date
WOOD-INLK/1	97000697	97000697	156-59-2	CIS-1,2-DICHLOROETHENE	0.001		MG/L	EPA 502.2	GW	1/2/1997
WOOD-INLK/1	97003374	97003374	156-59-2	CIS-1,2-DICHLOROETHENE	0.0007		MG/L	EPA 502.2	GW	2/4/1997
WOOD-INLK/1	97004598	97004598	156-59-2	CIS-1,2-DICHLOROETHENE	0.0005	U	MG/L	EPA 502.2	GW	3/3/1997
WOOD-INLK/1	97011300	97011300	156-59-2	CIS-1,2-DICHLOROETHENE	0.0005	U	MG/L	EPA 502.2	GW	4/10/1997
WOOD-INLK/1	97012673	97012673	156-59-2	CIS-1,2-DICHLOROETHENE	0.0005	U	MG/L	EPA 502.2	GW	5/1/1997
WOOD-INLK/1	97015004	97015004	156-59-2	CIS-1,2-DICHLOROETHENE	0.0005		MG/L	EPA 502.2	GW	6/3/1997
WOOD-INLK/1	97019551	97019551	156-59-2	CIS-1,2-DICHLOROETHENE	0.0005	U	MG/L	EPA 502.2	GW	7/8/1997
WOOD-INLK/1	97023217	97023217	156-59-2	CIS-1,2-DICHLOROETHENE	0.0005		MG/L	EPA 502.2	GW	8/6/1997
WOOD-INLK/1	97023103	97023103	156-59-2	CIS-1,2-DICHLOROETHENE	0.0005		MG/L	EPA 502.2	GW	9/3/1997
WOOD-INLK/1	97027077	97027077	156-59-2	CIS-1,2-DICHLOROETHENE	0.0006		MG/L	EPA 502.2	GW	10/1/1997
WOOD-INLK/1	97029832	97029832	156-59-2	CIS-1,2-DICHLOROETHENE	0.0008		MG/L	EPA 502.2	GW	10/30/1997
WOOD-INLK/1	97031469	97031469	156-59-2	CIS-1,2-DICHLOROETHENE	0.0013		MG/L	EPA 502.2	GW	12/2/1997
WOOD-INLK/1	97000697	97000697	75-71-8	DICHLORODIFLUOROMETHANE	0.0005		MG/L	EPA 502.2	GW	1/2/1997
WOOD-INLK/1	97003374	97003374	75-71-8	DICHLORODIFLUOROMETHANE	0.0005	U	MG/L	EPA 502.2	GW	2/4/1997
WOOD-INLK/1	97004598	97004598	75-71-8	DICHLORODIFLUOROMETHANE	0.0005	U	MG/L	EPA 502.2	GW	3/3/1997
WOOD-INLK/1	97011300	97011300	75-71-8	DICHLORODIFLUOROMETHANE	0.0005	U	MG/L	EPA 502.2	GW	4/10/1997
WOOD-INLK/1	97012673	97012673	75-71-8	DICHLORODIFLUOROMETHANE	0.0005	U	MG/L	EPA 502.2	GW	5/1/1997
WOOD-INLK/1	97015004	97015004	75-71-8	DICHLORODIFLUOROMETHANE	0.0005	U	MG/L	EPA 502.2	GW	6/3/1997
WOOD-INLK/1	97019551	97019551	75-71-8	DICHLORODIFLUOROMETHANE	0.0005	U	MG/L	EPA 502.2	GW	7/8/1997
WOOD-INLK/1	97023217	97023217	75-71-8	DICHLORODIFLUOROMETHANE	0.0005	U	MG/L	EPA 502.2	GW	8/6/1997
WOOD-INLK/1	97023103	97023103	75-71-8	DICHLORODIFLUOROMETHANE	0.0005	U	MG/L	EPA 502.2	GW	9/3/1997
WOOD-INLK/1	97027077	97027077	75-71-8	DICHLORODIFLUOROMETHANE	0.0005	U	MG/L	EPA 502.2	GW	10/1/1997
WOOD-INLK/1	97029832	97029832	75-71-8	DICHLORODIFLUOROMETHANE	0.0005	U	MG/L	EPA 502.2	GW	10/30/1997
WOOD-INLK/1	97031469	97031469	75-71-8	DICHLORODIFLUOROMETHANE	0.0005	U	MG/L	EPA 502.2	GW	12/2/1997
WOOD-INLK/1	97000697	97000697	79-01-6	TRICHLOROETHYLENE	0.0056		MG/L	EPA 502.2	GW	1/2/1997
WOOD-INLK/1	97003374	97003374	79-01-6	TRICHLOROETHYLENE	0.0065		MG/L	EPA 502.2	GW	2/4/1997
WOOD-INLK/1	97004598	97004598	79-01-6	TRICHLOROETHYLENE	0.0017		MG/L	EPA 502.2	GW	3/3/1997
WOOD-INLK/1	97011300	97011300	79-01-6	TRICHLOROETHYLENE	0.0075		MG/L	EPA 502.2	GW	4/10/1997
WOOD-INLK/1	97012673	97012673	79-01-6	TRICHLOROETHYLENE	0.0062		MG/L	EPA 502.2	GW	5/1/1997
WOOD-INLK/1	97015004	97015004	79-01-6	TRICHLOROETHYLENE	0.006		MG/L	EPA 502.2	GW	6/3/1997
WOOD-INLK/1	97019551	97019551	79-01-6	TRICHLOROETHYLENE	0.0036		MG/L	EPA 502.2	GW	7/8/1997
WOOD-INLK/1	97023217	97023217	79-01-6	TRICHLOROETHYLENE	0.0034		MG/L	EPA 502.2	GW	8/6/1997
WOOD-INLK/1	97023103	97023103	79-01-6	TRICHLOROETHYLENE	0.0041		MG/L	EPA 502.2	GW	9/3/1997
WOOD-INLK/1	97027077	97027077	79-01-6	TRICHLOROETHYLENE	0.0044		MG/L	EPA 502.2	GW	10/1/1997
WOOD-INLK/1	97029832	97029832	79-01-6	TRICHLOROETHYLENE	0.0048		MG/L	EPA 502.2	GW	10/30/1997

Analytical Results Conducted at Wood-INLK/1
in 1997 by Orange County Water District

Station ID	Sample ID	Lab Sample ID	Analyte ID	Analyte Name	Result	Review Qualifier	Result Units	Method Code	Matrix Code	Collection Date
WOOD-INLK/1	97031469	97031469	79-01-6	TRICHLOROETHYLENE	0.009		MG/L	EPA 502.2	GW	12/2/1997

Summary Statistics

CAS No	Chemical	95% UCL	Units	Distribution	No. Detects	No. Results	% Detected	Max
156-59-2	CIS-1,2-DICHLOROETHENE	0.000864	MG/L	LogNormal	8	12	67%	0.0013
75-71-8	DICHLORODIFLUOROMETHANE	0.00025	MG/L	Non-parametric	1	12	8%	0.0005
79-01-6	TRICHLOROETHYLENE	0.00702	MG/L	LogNormal	12	12	100%	0.009

Analytical Results Conducted at Wood-INLK/1
in 1996 by Orange County Water District

Data

Station ID	Sample ID	Lab Sample ID	Analyte ID	Analyte Name	Result	Review Qualifier	Result Units	Method Code	Matrix Code	Collection Date
WOOD-INLK/1	96001092	96001092	156-59-2	CIS-1,2-DICHLOROETHENE	0.0005	U	MG/L	EPA 502.2	GW	1/8/1996
WOOD-INLK/1	96002653	96002653	156-59-2	CIS-1,2-DICHLOROETHENE	0.0009		MG/L	EPA 502.2	GW	2/6/1996
WOOD-INLK/1	96006343	96006343	156-59-2	CIS-1,2-DICHLOROETHENE	0.0008		MG/L	EPA 502.2	GW	3/12/1996
WOOD-INLK/1	96008864	96008864	156-59-2	CIS-1,2-DICHLOROETHENE	0.0005	U	MG/L	EPA 502.2	GW	4/10/1996
WOOD-INLK/1	96010484	96010484	156-59-2	CIS-1,2-DICHLOROETHENE	0.0005	U	MG/L	EPA 502.2	GW	5/1/1996
WOOD-INLK/1	96013682	96013682	156-59-2	CIS-1,2-DICHLOROETHENE	0.0005	U	MG/L	EPA 502.2	GW	5/30/1996
WOOD-INLK/1	96016568	96016568	156-59-2	CIS-1,2-DICHLOROETHENE	0.0005	U	MG/L	EPA 502.2	GW	7/2/1996
WOOD-INLK/1	96019833	96019833	156-59-2	CIS-1,2-DICHLOROETHENE	0.0005	U	MG/L	EPA 502.2	GW	8/5/1996
WOOD-INLK/1	96022930	96022930	156-59-2	CIS-1,2-DICHLOROETHENE	0.0005	U	MG/L	EPA 502.2	GW	9/5/1996
WOOD-INLK/1	96026061	96026061	156-59-2	CIS-1,2-DICHLOROETHENE	0.0005	U	MG/L	EPA 502.2	GW	10/1/1996
WOOD-INLK/1	96029910	96029910	156-59-2	CIS-1,2-DICHLOROETHENE	0.0007		MG/L	EPA 502.2	GW	11/4/1996
WOOD-INLK/1	96031175	96031175	156-59-2	CIS-1,2-DICHLOROETHENE	0.0006		MG/L	EPA 502.2	GW	12/5/1996
WOOD-INLK/1	96001092	96001092	79-01-6	TRICHLOROETHYLENE	0.0046		MG/L	EPA 502.2	GW	1/8/1996
WOOD-INLK/1	96002653	96002653	79-01-6	TRICHLOROETHYLENE	0.009		MG/L	EPA 502.2	GW	2/6/1996
WOOD-INLK/1	96006343	96006343	79-01-6	TRICHLOROETHYLENE	0.0069		MG/L	EPA 502.2	GW	3/12/1996
WOOD-INLK/1	96008864	96008864	79-01-6	TRICHLOROETHYLENE	0.0037		MG/L	EPA 502.2	GW	4/10/1996
WOOD-INLK/1	96010484	96010484	79-01-6	TRICHLOROETHYLENE	0.004		MG/L	EPA 502.2	GW	5/1/1996
WOOD-INLK/1	96013682	96013682	79-01-6	TRICHLOROETHYLENE	0.0039		MG/L	EPA 502.2	GW	5/30/1996
WOOD-INLK/1	96016568	96016568	79-01-6	TRICHLOROETHYLENE	0.0038		MG/L	EPA 502.2	GW	7/2/1996
WOOD-INLK/1	96019833	96019833	79-01-6	TRICHLOROETHYLENE	0.004		MG/L	EPA 502.2	GW	8/5/1996
WOOD-INLK/1	96022930	96022930	79-01-6	TRICHLOROETHYLENE	0.0042		MG/L	EPA 502.2	GW	9/5/1996
WOOD-INLK/1	96026061	96026061	79-01-6	TRICHLOROETHYLENE	0.0044		MG/L	EPA 502.2	GW	10/1/1996
WOOD-INLK/1	96029910	96029910	79-01-6	TRICHLOROETHYLENE	0.0084		MG/L	EPA 502.2	GW	11/4/1996
WOOD-INLK/1	96031175	96031175	79-01-6	TRICHLOROETHYLENE	0.0047		MG/L	EPA 502.2	GW	12/5/1996

Summary Statistics

CAS No	Chemical	95% UCL	Units	Distribution	No. Detects	No. Results	% Detected	Max
156-59-2	CIS-1,2-DICHLOROETHENE	0.0006	MG/L	Non-parametric	4	12	33%	0.0009
79-01-6	TRICHLOROETHYLENE	0.0047	MG/L	Non-parametric	12	12	100%	0.009

Analytical Results Conducted at Wood-INLK/1
in 1995 by Orange County Water District

Data

Station ID	Sample ID	Lab Sample ID	Analyte ID	Analyte Name	Result	Review Qualifier	Result Units	Method Code	Matrix Code	Collection Date
WOOD-INLK/1	95001696	95001696	156-59-2	CIS-1,2-DICHLOROETHENE	0.0006		MG/L	EPA 502.2	GW	1/9/1995
WOOD-INLK/1	95003102	95003102	156-59-2	CIS-1,2-DICHLOROETHENE	0.0007		MG/L	EPA 502.2	GW	2/7/1995
WOOD-INLK/1	95004302	95004302	156-59-2	CIS-1,2-DICHLOROETHENE	0.0006		MG/L	EPA 502.2	GW	3/1/1995
WOOD-INLK/1	95006878	95006878	156-59-2	CIS-1,2-DICHLOROETHENE	0.0006		MG/L	EPA 502.2	GW	4/4/1995
WOOD-INLK/1	95009542	95009542	156-59-2	CIS-1,2-DICHLOROETHENE	0.0005	U	MG/L	EPA 502.2	GW	5/3/1995
WOOD-INLK/1	95013155	95013155	156-59-2	CIS-1,2-DICHLOROETHENE	0.0005	U	MG/L	EPA 502.2	GW	6/6/1995
WOOD-INLK/1	95014253	95014253	156-59-2	CIS-1,2-DICHLOROETHENE	0.0005	U	MG/L	EPA 502.2	GW	7/5/1995
WOOD-INLK/1	95016255	95016255	156-59-2	CIS-1,2-DICHLOROETHENE	0.0005	U	MG/L	EPA 502.2	GW	8/11/1995
WOOD-INLK/1	95018619	95018619	156-59-2	CIS-1,2-DICHLOROETHENE	0.0005	U	MG/L	EPA 502.2	GW	9/6/1995
WOOD-INLK/1	95020313	95020313	156-59-2	CIS-1,2-DICHLOROETHENE	0.0005	U	MG/L	EPA 502.2	GW	10/4/1995
WOOD-INLK/1	95021897	95021897	156-59-2	CIS-1,2-DICHLOROETHENE	0.0009		MG/L	EPA 502.2	GW	11/1/1995
WOOD-INLK/1	95023726	95023726	156-59-2	CIS-1,2-DICHLOROETHENE	0.0005	U	MG/L	EPA 502.2	GW	12/8/1995
WOOD-INLK/1	95001696	95001696	79-01-6	TRICHLOROETHYLENE	0.0052		MG/L	EPA 502.2	GW	1/9/1995
WOOD-INLK/1	95003102	95003102	79-01-6	TRICHLOROETHYLENE	0.0072		MG/L	EPA 502.2	GW	2/7/1995
WOOD-INLK/1	95004302	95004302	79-01-6	TRICHLOROETHYLENE	0.0063		MG/L	EPA 502.2	GW	3/1/1995
WOOD-INLK/1	95006878	95006878	79-01-6	TRICHLOROETHYLENE	0.005		MG/L	EPA 502.2	GW	4/4/1995
WOOD-INLK/1	95009542	95009542	79-01-6	TRICHLOROETHYLENE	0.0044		MG/L	EPA 502.2	GW	5/3/1995
WOOD-INLK/1	95013155	95013155	79-01-6	TRICHLOROETHYLENE	0.0035		MG/L	EPA 502.2	GW	6/6/1995
WOOD-INLK/1	95014253	95014253	79-01-6	TRICHLOROETHYLENE	0.004		MG/L	EPA 502.2	GW	7/5/1995
WOOD-INLK/1	95016255	95016255	79-01-6	TRICHLOROETHYLENE	0.0041		MG/L	EPA 502.2	GW	8/11/1995
WOOD-INLK/1	95018619	95018619	79-01-6	TRICHLOROETHYLENE	0.0039		MG/L	EPA 502.2	GW	9/6/1995
WOOD-INLK/1	95020313	95020313	79-01-6	TRICHLOROETHYLENE	0.0039		MG/L	EPA 502.2	GW	10/4/1995
WOOD-INLK/1	95021897	95021897	79-01-6	TRICHLOROETHYLENE	0.0086		MG/L	EPA 502.2	GW	11/1/1995
WOOD-INLK/1	95023726	95023726	79-01-6	TRICHLOROETHYLENE	0.0042		MG/L	EPA 502.2	GW	12/8/1995

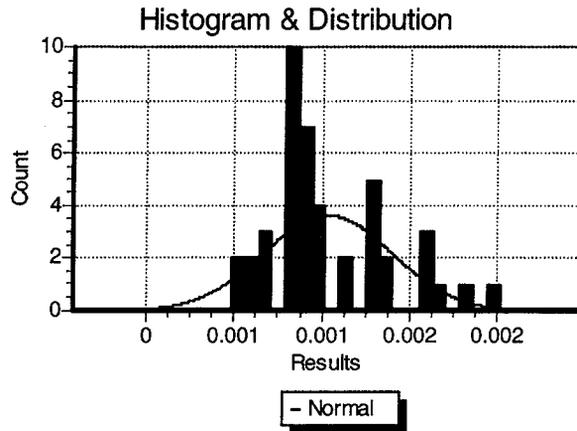
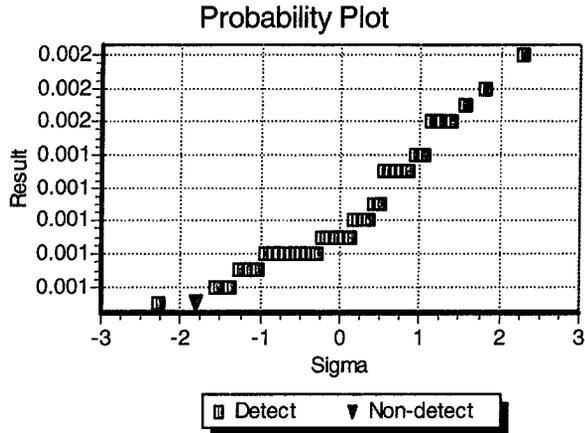
Summary Statistics

CAS No	Chemical	95% UCL	Units	Distribution	No. Detects	No. Results	% Detected	Max
156-59-2	CIS-1,2-DICHLOROETHENE	0.0006	MG/L	Non-parametric	5	12	42%	0.0009
79-01-6	TRICHLOROETHYLENE	0.0059	MG/L	LogNormal	12	12	100%	0.0086

ATTACHMENT B

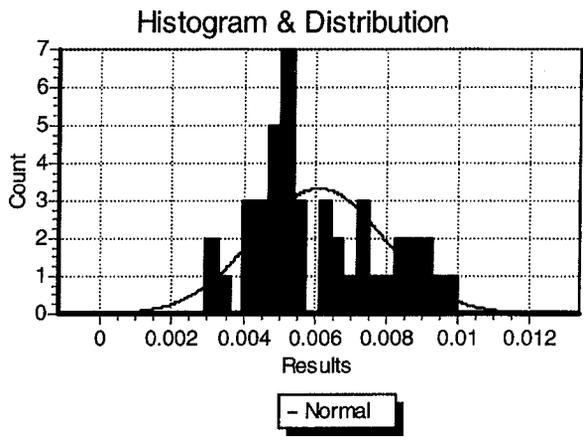
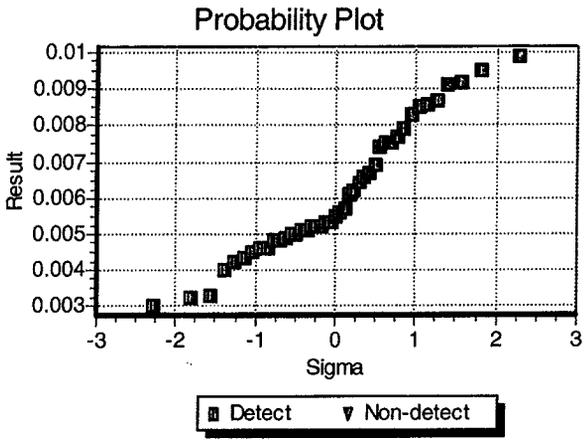
PROBABILITY PLOTS AND HISTOGRAMS

CIS-1,2-DICHLOROETHENE - 156-59-2



No. Samples: 43	EPC: 0.001 mg/l
No. Rejected Samples:	0 Min Detect: 0.0005 mg/l
No. Results: 43	Max Detect: 0.002 mg/l
No. Detects: 42	Mean: 0.00103 mg/l
Non-detects: 1 (2.33%)	Std Dev: 0.000373 mg/l
Distribution: Non-parametric	Median: 0.0009 mg/l

TRICHLOROETHYLENE - 79-01-6



No. Samples: 43	EPC: 0.00663 mg/l
No. Rejected Samples:	0 Min Detect: 0.003 mg/l
No. Results: 43	Max Detect: 0.0099 mg/l
No. Detects: 43	Mean: 0.0061 mg/l
Non-detects: 0 (0%)	Std Dev: 0.00182 mg/l
Distribution: LogNormal	Geo Mean: 0.00583 mg/l