FINAL

BASELINE RISK ASSESSMENT OPERABLE UNIT NO. 2 (GROUNDWATER) FOR FORMER NEBRASKA ORDNANCE PLANT MEAD, NEBRASKA

DACA 41-92-C-0023

Prepared for
Department of the Army
U.S. Army engineers,
Kansas City District
Corps of Engineers
Kansas City, Missouri
September 1994

Woodward-Clyde

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September 6, 1994
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U.S. Army Engineer District, Kansas City
ATTN: CEMRK-ED-TD (Ms. Rosemary Gilbertson)
700 Federal Building
601 East 12th Street
Kansas City, Missouri 64106-2896

Re: Transmittal of Final Baseline Risk Assessment
For Operable Unit No. 2 (Groundwater)
Former Nebraska Ordnance Plant, Mead, Nebraska
Contract No. DACA 41-92-C-0023

Dear Ms. Gilbertson:

We are hereby transmitting nine copies of the Final OU2 Baseline Risk Assessment (BRA) for the former Nebraska Ordnance Plant near Mead, Nebraska. Distribution of the remaining copies of this document has been made in accordance with the attached distribution list.

Please do not hesitate to contact us should you have any questions.

Very truly yours,

James C. Garrison, Ph.D.
Senior Project Scientist

Robert F. Skach, P.E.
Project Manager

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Enclosure

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OPERABLE UNIT NO. 2
FORMER NEBRASKA ORDNANCE PLANT
MEAD, NEBRASKA

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FINAL

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VOLUME I OF II

Section				Page
LIST OF ABBREVIATIONS, ACRONYMS, AND TERMS				viii
0.0	EXECUTIVE SUMMARY			0-1
1.0	INTRODUCTION			1-1
	1.1	PURPOSE AND ORGANIZATION		1-1
	1.2	SITE HISTORY		1-2
	1.3	SUMMARY OF SITE PHYSICAL CHARACTERISTICS		1-4
	1.4	REVIEW OF THE OU1 BASELINE RISK ASSESSMENT		1-5
2.0	CHEMICALS OF CONCERN			2-1
	2.1	SUBSURFACE SOIL		2-1
	2.2	GROUNDWATER		2-2
		2.2.1	Chemicals Excluded From Groundwater Chemicals Of Concern	2-3
			2.2.1.1 Chemicals Not Detected	2-3
			2.2.1.2 Common Laboratory Contaminants	2-3
			2.2.1.3 Chemicals Present at Background Concentrations	2-4
			2.2.1.4 Essential Nutrients	2-4
		2.2.2	Chemicals Of Concern (COCs) Identified In Groundwater	2-5
3.0	EXPOSURE ASSESSMENT			3-1
	3.1	IDENTIFICATION OF POTENTIAL RECEPTOR POPULATIONS		3-1
	3.2	EVALUATION OF POTENTIAL EXPOSURE PATHWAYS		3-2
		3.2.1	Potential Groundwater Exposure	3-3
			3.2.1.1 Ingestion of Well Water	3-3
			3.2.1.2 Dermal Exposure to Groundwater	3-3
			3.2.1.3 Inhalation of Volatile Chemicals in Groundwater	3-4
		3.2.3	Potential Subsurface Soil Exposure Points	3-5
	3.3	RECEPTOR POPULATIONS NOT INCLUDED IN THE RISK ASSESSMENT		3-5
	3.4	EVALUATION OF POTENTIAL EXPOSURE PARAMETERS		3-6
		3.4.1	Lifespan	3-6
		3.4.2	Exposure Duration	3-6
		3.4.3	Exposure Frequency	3-7
		3.4.4	Groundwater Ingestion Rate	3-7
		3.4.5	Soil Ingestion Rate	3-7

Section			Page
		3.4.6 Body Weight	3-8
		3.4.7 Air Inhalation Rate	3-8
		3.4.8 Shower Exposure Time	3-8
		3.4.9 Skin Surface Area	3-8
		3.4.10 Dermal Permeability Constant	3-9
		3.4.11 Soil Adherence	3-9
	3.5	ESTIMATION OF EXPOSURE POINT CONCENTRATIONS	3-9
4.0	TOXICITY ASSESSMENT		4-1
	4.1	TOXICITY ASSESSMENT OF NONCARCINOGENIC EFFECTS	4-1
	4.2	TOXICITY ASSESSMENT OF CARCINOGENIC EFFECTS	4-4
	4.3	SOURCE OF THE CRITICAL TOXICITY VALUES	4-6
5.0	RISK CHARACTERIZATION		5-1
	5.1	PROCEDURES FOR CALCULATION OF POTENTIAL CANCER RISK AND NON-CARCINOGENIC HAZARDS	5-1
	5.2	RME POTENTIAL CANCER RISKS AND NON-CARCINOGENIC HAZARDS FROM GROUNDWATER EXPOSURE - SITE WORKERS AND RESIDENTS	5-2
		5.2.1 MW-5B	5-2
		5.2.2 MW-40B	5-3
	5.3	RME POTENTIAL CANCER RISKS AND NON-CARCINOGENIC HAZARDS - CONSTRUCTION WORKER	5-3
		5.3.1 MW-5B	5-4
		5.3.2 MW-40B	5-4
	5.4	CUMULATIVE RISKS FOR SOIL AND GROUNDWATER PATHWAYS	5-5
	5.5	LEAD	5-5

B07NE003702-07674

Section		Page
6.0	UNCERTAINTY ANALYSIS	6-1
6.1	DATA COLLECTION AND EVALUATION	6-1
6.1.1	Data Collection	6-1
6.1.1.1	Sampling	6-1
6.1.1.2	Data Gaps	6-2
6.1.1.3	Analysis	6-2
6.1.2	Data Evaluation	6-2
6.2	EXPOSURE ASSESSMENT	6-3
6.2.1	Exposure Point Concentrations	6-3
6.2.2	Exposure Scenarios	6-4
6.3	TOXICITY ASSESSMENT	6-5
6.3.1	Uncertainties Associated with Critical Toxicity Values	6-5
6.4	RISK CHARACTERIZATION	6-6
7.0	SUMMARY AND CONCLUSIONS	7-1
8.0	REFERENCES	8-1

B07NE003702-07675

LIST OF TABLES

TABLE 1-1 POSSIBLE SOURCES OF GROUNDWATER CONTAMINATION
TABLE 2-1 VOC COMPOUNDS ELIMINATED AS CHEMICALS OF CONCERN FOR SUBSURFACE SOIL
TABLE 2-2 ATLAS MISSILE AREA ANALYTICAL SUBSURFACE SOIL DATA
TABLE 2-3 LOAD LINE 1 ANALYTICAL SUBSURFACE SOIL DATA
TABLE 2-4 CHEMICALS EXCLUDED FROM GROUNDWATER CHEMICALS OF CONCERN BASED ON NOT-DETECTED
TABLE 2-5 METALS IN GROUNDWATER EXCLUDED AS CHEMICALS OF CONCERN BASED ON COMPARISON TO BACKGROUND CONCENTRATIONS
TABLE 2-6 METALS IN GROUNDWATER EXCLUDED AS CHEMICALS OF CONCERN BASED ON THEIR CLASSIFICATION AS ESSENTIAL NUTRIENTS
TABLE 2-7 CHEMICALS OF CONCERN IN GROUNDWATER AND THEIR FREQUENCY OF DETECTION
TABLE 3-1 REASONABLE MAXIMUM EXPOSURE PARAMETERS FOR ESTIMATION OF CHEMICAL INTAKE BY INGESTION OF GROUNDWATER
TABLE 3-2 REASONABLE MAXIMUM EXPOSURE PARAMETERS FOR ESTIMATION OF CHEMICAL INTAKE BY DERMAL EXPOSURE WHILE SHOWERING
TABLE 3-3 REASONABLE MAXIMUM EXPOSURE PARAMETERS FOR ESTIMATION OF CHEMICAL INTAKE BY INHALATION EXPOSURE TO VOLATILIZED CHEMICALS DURING SHOWERING
TABLE 3-4 REASONABLE MAXIMUM EXPOSURE PARAMETERS FOR ESTIMATION OF CHEMICAL INTAKE BY INGESTION OF SUBSURFACE SOIL
TABLE 3-5 REASONABLE MAXIMUM EXPOSURE PARAMETERS FOR ESTIMATION OF CHEMICAL INTAKE BY DERMAL CONTACT WITH SUBSURFACE SOIL
TABLE 3-6 REASONABLE MAXIMUM EXPOSURE PARAMETERS FOR ESTIMATION OF CHEMICAL INTAKE BY INHALATION OF VOLATILIZED CHEMICALS FROM SUBSURFACE SOIL
TABLE 3-7 RME EXPOSURE POINT CONCENTRATIONS IN GROUNDWATER WELL MW-5B AND MW-40B

B07NE003702-07676

LIST OF APPENDIXES

APPENDIX A SUMMARY GROUNDWATER ANALYTICAL DATA
APPENDIX B FOOD CHAIN EFFECTS
APPENDIX C RISK CALCULATIONS
APPENDIX D AIR EMISSIONS
APPENDIX E TOXICITY PROFILES
APPENDIX F SHOWER MODEL
APPENDIX G CHEMICAL DATA
APPENDIX H W-TEST RESULTS

B07NE003702-07677

APPENDIX I BASELINE RISK ASSESSMENT BASED ON THE PLUME MAXIMUM EXPOSURE APPROACH
APPENDIX J BASELINE RISK ASSESSMENT BASED ON THE REASONABLE AVERAGE EXPOSURE APPROACH

B07NE003702-07678

LIST OF ABBREVIATIONS, ACRONYMS, AND TERMS

The following abbreviations, acronyms, and terms are commonly used in environmental reports, work plans, and guidance documents. Not all of these abbreviations, acronyms, and terms have been used in this document. They are listed here as an aid to the reader because they are in common use in the industry or are specific to the subject of this document.

Term	Definition
2-ADNT	2-Amino-4,6-dinitrotoluene
4-ADNT	4-Amino-2,6-dinitrotoluene
AEC	U.S. Army Environmental Command
AEHA	U.S. Army Environmental Hygiene Agency
ARARs	Applicable or Relevant and Appropriate Requirements
ARDC	Agriculture Research and Development Center of the University of Nebraska, formerly the University of Nebraska Field Laboratory (UNFL)
ASTM	American Society for Testing and Materials
ATSDR	Agency for Toxic Substances and Disease Registry
bgs	below ground surface
BOD	Biochemical Oxygen Demand
BRA	Baseline Risk Assessment
CDAP	Chemical Data Acquisition Plan
CCL	CompuChem Laboratories, Research Triangle Park, North Carolina
CDI	Chronic Daily Intake
CEMRK	U.S. Army Corps of Engineers, Kansas City District
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CFA	Continuous Flight Augers
CFR	Code of Federal Regulations. The CFR are published in numbered titles such as 40 CFR and numbered parts such as 40 CFR 280.
CHSO	Corporate Health and Safety Officer
CLP	Contract Laboratory Program. Protocol for chemical analysis and documentation promulgated by EPA for laboratories under contract to EPA or other laboratories used for CERCLA Sites.
COC	Chemicals of Concern

B07NE003702-07679

Term	Definition
CRDL	Contract Required Detection Limit
CRP	Community Relations Plan
CTV	Critical Toxicity Value
DCA	1,1-Dichloroethane
DCE	cis-1,2-Dichloroethene
DERP	Defense Environmental Restoration Program
DNAPL	Dense, Non-Aqueous Phase Liquid
DNB	Dinitrobenzene
DNT	Dinitrotoluene
2,4-DNT	2,4-Dinitrotoluene
2,6-DNT	2,6-Dinitrotoluene
DoD	Department of Defense
DO	Dissolved Oxygen
Donohue	SEC Donohue, Inc. (now Rust Environment & Infrastructure)
DQO	Data Quality Objectives
ECD	Electron Capture Detector
EP	Extraction Procedure
ECAO	Environmental Criteria Assessment Office
EPA or USEPA	U.S. Environmental Protection Agency
ER	Electrical Resistive Logging Device
ESE	Environmental Science and Engineering, Inc.
FID	Flame Ionization Detector
FP	Field Protocols (CDAP, Part II)
FS	Feasibility Study
FSP	Field Sampling Plan
FUDS	Formerly Used Defense Site
GC	Gas chromatograph
GSA	General Services Administration
HI	Hazard Index
HMX	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine
HNu	Portable organic vapor analyzer using a PID manufactured by HNu Corporation.
HQ	Hazard Quotient
HSA	Hollow-Stem Augers
HSO	Health and Safety Officer
HTW	Hazardous/Toxic Waste

B07NE003702-07680

Term	Definition
IAG	Interagency Agreement
i.d.	inside diameter
IDW	Investigation - Derived Waste
K	Hydraulic conductivity
Kg	Kilogram
K_d	Distribution coefficient
K_{oc}	Organic carbon partition coefficient
K_{ow}	Octanol-water partition coefficient
Law	Law Environmental, Inc., Albuquerque, New Mexico
L/day	Liters per day
Load Line	Bomb Load Line (No. 1, 2, 3, and 4)
LOAEL	Lowest-Observed-Adverse-Effect-Level
MCL	Maximum Contaminant Level
m^3/day	cubic meters per day
mg/day	Milligrams per day
mg/kg	Milligrams per kilogram (ppm by weight) equivalent to µg/g
mg/L	Milligrams per liter (ppm)
MRI	Midwest Research Institute, Kansas City, Missouri
MRD	U.S. Army Corps of Engineers, Missouri River Division
MSL	Mean Sea Level
MTV	Mobility, Toxicity, and Volatility
MW	Monitoring Well (Groundwater)
NAPL	Non-Aqueous Phase Liquid
NCP	National Contingency Plan
ND	Not Detected
NDEQ	Nebraska Department of Environmental Quality
NDOH	Nebraska Department of Health
NOAA	National Oceanic and Atmosphere Agency
NOAEL	No-Observed-Adverse-Effect-Level
NOP	Nebraska Ordnance Plant (Former)
NPL	National Priorities List
NRD	Lower Platte (North) Natural Resources District
OAC	Ordnance Ammunition Command
o.d.	outside diameter
ORP	Oxidation Reduction Potential

Term	Definition
OSWER	Office of Solid Waste and Emergency Response
OU	Operable Unit
OU1	Operable Unit 1
OU2	Operable Unit 2
OU3	Operable Unit 3
OVA	Organic Vapor Analyzer
OVM	Organic Vapor Monitor
Ortek	Ortek Environmental Laboratories
PA	Preliminary Assessment
PCB	Polychlorinated biphenyl
PCE	Tetrachloroethene (also known as perchloroethylene)
PES	Plains Environmental Services, Inc., Salina, Kansas
PHSO	Project Health and Safety Officer
PID	Photo Ionization Detector
PME	Plume Maximum Exposure
POTW	Publicly Owned Treatment Works
ppb	Parts per billion (µg/kg and µg/l)
PPE	Personal Protective Equipment
ppm	Parts per million (mg/kg and mg/l)
PVC	Polyvinyl Chloride
PWP	Project Work Plan
QA	Quality Assurance
QA/QC	Quality Assurance/Quality Control
QAP	Quality Assurance Plan (CDAP, Part III)
QCRs	Quality Control Reports
RA	Remedial Action
RAE	Reasonable Average Exposure
RAGS	Risk Assessment Guidance for Superfund
RD	Remedial Design
RDA	Recommended Daily Allowance
RDX	Hexahydro-1,3,5-trinitro-1,3,5-triazine
Region VII	EPA Region VII
RfC	Reference Concentration
RfD	Reference Dose
RI/FS	Remedial Investigation/Feasibility Study

B07NE003702-07682

Term	Definition
RI	Remedial Investigation
RME	Reasonable Maximum Exposure
ROD	Record of Decision
Rust	Rust Environment and Infrastructure (formerly SEC Donohue)
SARA	Superfund Amendments and Reauthorization Act of 1986
SCBA	Self Contained Breathing Apparatus
SCEM	Site Conceptual Exposure Model
SEC Donohue	SEC Donohue, Inc. (now Rust Environment and Infrastructure)
SF	Slope Factor
SHERP	Safety, Health, and Emergency Response Plan
SI	Site Inspection
Site	Former Nebraska Ordnance Plant (NOP) NPL Site
SQL	Sample Quantitation Limit
SPO	Sampling Plans and Objectives (CDAP, Part I)
SPT	Standard Penetration Test
SSO	Site Safety Officer
SVOC	Semivolatile Organic Compound
T	Transmissivity
TAL	Target Analyte List. EPA's list of hazardous inorganic compounds (see CDAP Part III)
TC	Toxicity Characteristics (Reference: 40 CFR 261.24)
TCA	Trichloroethane (all isomers)
1,1,1-TCA	1,1,1-Trichloroethane
TCE	Trichloroethene (trichloroethylene)
TCL	Target Compound List. EPA's list of hazardous organic compounds (see CDAP Part III)
TCLP	Toxicity Characteristic Leaching Procedure (Reference: 40 CFR 261-Appendix II, SW 846 Method 1311)
TCO	Total Chromatographable Organics
TCT	Twin City Testing
TDS	Total Dissolved Solids
THC	Total hydrocarbons (quantitated as diesel)
TKN	Total Kjeldahl Nitrogen
TNB	1,3,5-Trinitrobenzene
TNT	2,4,6-Trinitrotoluene
TOC	Total Organic Carbon

B07NE003702-07683

Term	Definition
TOX	Total Organic Halides
TSS	Total Suspended Solids
U	Samples qualified as not detected (ND)
UCL	Upper Confidence Limit
UN	University of Nebraska
USACE	U.S. Army Corps of Engineers
USATHMA	United States Army Toxic and Hazardous Materials Agency (now Army Environmental Command)
USC	Unified Soil Classification System
USDA	United States Department of Agriculture
USDHHS	United States Department of Health and Human Services
USEPA or EPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
UV	Ultraviolet
UXO	Unexploded Ordnance
VOA	Volatile Organic Analysis
VOC	Volatile Organic Compound
W-C	Woodward-Clyde
WCC	Woodward-Clyde Consultants
WCFS	Woodward-Clyde Federal Services
WQ1	First set of general water quality parameters collected during the RI
WQ2	Second set of general water quality parameters collected during the February 1993 groundwater sampling event for the FS
µg/L	Micrograms per liter (ppb)
µg/kg	Micrograms per kilogram (ppb by weight)

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EXECUTIVE SUMMARY

The purpose of this BRA is to evaluate potential human health hazards (both non-carcinogenic and carcinogenic effects) that may result from exposure to contaminated media at the former Nebraska Ordnance Plant (NOP) Site located near Mead, Nebraska. An evaluation of risks associated with Site soil (Operable Unit 1 [OU1]) was previously performed by SEC Donohue (1993b). The present document (the OU2 BRA) addresses the potential human health effects associated with groundwater at the Site, and soil contaminants not evaluated in the OU1 BRA. A further objective of the OU2 BRA is to integrate results from OU1 with OU2.

An evaluation of groundwater data identified several VOCs, SVOCs, explosives, and one metal that appeared to be Site-related. In addition, several VOCs were identified in subsurface soil at the former Atlas Missile Area and Load Line 1. The scenarios evaluated included residential (adult and child) and occupational (On-site worker and construction worker) exposure to groundwater and occupational (construction worker) exposure to subsurface soil. Potential health risks were evaluated quantitatively for three potential exposure routes (ingestion, inhalation, and direct dermal contact) for both groundwater and subsurface soil.

To evaluate the highest Site-related risk reasonably expected to occur on the site, a Reasonable Maximum Exposure (RME) approach is used in the BRA. Two wells (MW-5B and MW-40B) were identified as the most contaminated wells. These wells were chosen for evaluation because they contained the highest concentrations of RDX (MW-5B) and TCE (MW-40B) (WCC, 1993), the two chemicals of concern (COCs) that contributed the majority of the Site risks. In the RME approach, all COCs detected in these two wells and maximum exposure parameters are used to calculate the Site-related human health risk. The monitoring wells MW-47A and MW-47B located north of the former Administration Areas are considered background wells.

For well MW-5B, the RME Hazard Indices (HIs) associated with groundwater exceed the threshold value of 1.0 for all resident and Site worker scenarios (7 for child, 3 for adult,

B07NE003702-07685

and 1 for Site worker). Potential total cancer risks associated with adult exposure to MW-5B groundwater (3×10^{-4}) exceeds the EPA advisory range of 10^{-6} to 10^{-4} for acceptable site risk. Cancer risks associated with child resident and Site worker scenarios (child, 7×10^{-5}; Site worker, 4×10^{-5}) are within the acceptable range of 10^{-6} to 10^{-4}.

For well MW-40B, the HIs for child (13) and adult residents (3) are in excess of the threshold value of 1.0, but not for Site worker scenario (0.9). The potential cancer risks associated with MW-40B for all receptor groups are above the advisory risk range of 10^{-4} to 10^{-6} (child, 7×10^{-4}; adult, 2×10^{-3}; on-site worker, 2×10^{-4}).

The potential cancer risks and non-carcinogenic hazards associated with the construction worker scenario for MW-5B for both the Atlas Missile and Load Line 1 areas are within or below acceptable levels, indicating that exposure to chemicals in groundwater and subsurface soil in this area is not likely to result in unacceptable non-carcinogenic or carcinogenic health effects to the construction workers. However, for well MW-40B, the RME HIs (groundwater and soil combined) for potentially exposed construction workers in both Atlas Missile Area (HI = 1) and Load Line 1 area (HI = 1) are at the threshold value of 1.0. Inhalation of volatiles during showering was the significant contributor to the potential non-carcinogenic hazard, indicating that exposure to groundwater in MW-40B may result in a potential non-carcinogenic hazard for the construction worker scenario.

To estimate maximum Site-related risks, the OU1 RME cancer risks and HIs associated with soil ingestion and garden vegetables were added to the RME OU2 groundwater results. Although the HIs associated with RME groundwater exposure may contribute some non-carcinogenic hazards for all scenarios, the primary contributor to site HIs was exposed to site soil. Groundwater exposure contributed little to overall risks and hazards. Cumulative soil/groundwater HIs were as large as 5,000 (child resident), 2,000 (adult resident) and 4.0 (Site worker), indicating a potential non-carcinogenic health hazard. These HIs were primarily a result of exposure to explosives in soil. The cumulative cancer risks for soil (OU1) and groundwater (OU2) were also driven by the soil exposures.

To estimate potential health hazards associated with subsurface soil contamination in the Atlas Missile and Load Line 1 areas, a construction worker scenario was evaluated, assuming excavation activities. Soil ingestion, dermal contact and inhalation of volatilized

B07NE003702-07686

chemicals were evaluated as potential pathways. Because chemical concentrations are very low, potential exposure to subsurface soil does not contribute significantly to Site health hazards or risks. For the Atlas Missile area, the total HI associated with VOCs in soil is 0.000002 and the total cancer risk associated with VOCs in soil is 2×10^{-9}. For the Load Line 1 area, the total HI is 0.0000001 and the total cancer risk for VOCs in soil is 2×10^{-9}.

In conclusion, based upon what is known about current and probable future Site use, exposure to groundwater from the most contaminated portions of the Site may result in unacceptably high health risks (noncarcinogenic and carcinogenic). Exposure to VOCs in subsurface soil in the Atlas Missile Area and Load Line 1 Area are unlikely to pose an unacceptable human health risk.

To provide a more complete risk characterization, USACE has prepared two additional approaches: a Plume Maximum Exposure (PME) approach and a Reasonable Average Exposure (RAE) approach. These are presented in Appendices I and J, respectively.

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1.0
INTRODUCTION

1.1 PURPOSE AND ORGANIZATION

This document presents an assessment of potential human health effects (i.e., cancer risks and non-carcinogenic health hazards) associated with contaminated media at the former Nebraska Ordnance Plant (NOP) Site located near Mead, Nebraska. Woodward-Clyde Consultants (WCC), in conjunction with the U.S. Army Corps of Engineers (USACE) Kansas City District (CEMRK) under Contract No. DACA 41-92-C-0023 has prepared this document in accordance with the Interagency Agreement (IAG) effective January 30, 1992 under the Defense Environmental Restoration Program (DERP). The purpose of a baseline risk assessment (BRA), as defined by Environmental Protection Agency (EPA), is to "provide a framework for developing the risk information necessary to assist decision-making at remedial sites" (Risk Assessment Guidance for Superfund: RAGS; EPA, 1989b). The BRA follows the guidelines set forth in RAGS.

An evaluation of risks associated with Site soil (Operable Unit 1 [OU1]) was previously performed by SEC Donohue (1993b). The present document (the OU2 BRA) addresses the potential human health effects associated with groundwater at the Site, and soil contaminants not evaluated in the OU1 BRA. A further objective of the OU2 BRA is to integrate results from OU1 with OU2.

The identification of Site-related chemicals of concern (COCs) and choice of exposure parameters used to define exposed populations are critical to an accurate assessment of Site-related risks. To evaluate the upperbound risk, a Reasonable Maximum Exposure (RME) approach is used in the BRA. To provide an estimation of upperbound risks associated with the worst-case exposure, two wells (MW-5B and MW-40B) were identified as the most contaminated wells. These wells were chosen for evaluation because they contained the highest concentrations of RDX (MW-5B) and TCE (MW-40B) (WCC, 1993), the two chemicals of concern (COCs) that contributed the majority of the Site risks. In the RME approach, all COCs detected in these two wells and maximum exposure parameters

B07NE003702-07688

are used to calculate the Site-related human health risk. The monitoring wells MW-47A and MW-47B located north of the former Administration Areas are considered background wells.

To provide a more complete risk characterization, two additional approaches were also evaluated and presented in Appendices I and J. The Plume Maximum Exposure (PME) approach (Appendix I) is based on the 95 percent Upper Confidence Level concentrations of the groundwater contamination plumes and EPA identified upperbound exposure parameters to calculate the reasonable maximum risk associated each contamination plume. The Reasonable Average Exposure (RAE) approach (Appendix J) is based on average concentrations and average exposure parameters to estimate the risks associated with more representative exposure conditions.

The organization of the BRA follows the structure presented in RAGS and consists of the following:

- Site background information
- Identification of site-specific COCs
- An exposure assessment, including development of the site conceptual exposure model (SCEM), identification of potentially exposed populations and exposure parameters used to define chemical uptake by these populations.
- An assessment of the toxic properties of the COCs.
- A quantitative estimation of the potential cancer risks and non-carcinogenic health hazards for exposed populations.
- An analysis of uncertainties and limitations associated with the estimation of potential site risks.

1.2 SITE HISTORY

The Site is located one-half mile south of Mead and 30 miles west of Omaha in Saunders County, Nebraska (**Drawing 1-1**). The former NOP occupied 27 square miles in Saunders County and contained an Administration Area, an Ammonium Nitrate Plant, a Bomb Booster Assembly Plant, four Bomb Load Lines, Demolition Grounds, a Sewage Treatment Plant, analytical laboratories, a laundry, vehicle and equipment maintenance shops, and several

B07NE003702-07689

square miles of bermed storage igloos and magazines located north and south of the load lines (**Drawing 1-2**).

During World War II, the production facilities were operated by the Nebraska Defense Corporation, a subsidiary of Firestone Tire and Rubber Company. During the interim period 1945 through 1949, production was terminated and decontamination procedures were implemented. Decontamination procedures included cleaning, flushing, and sweeping of floors, rafters, pipes, and ventilation systems, flushing of contaminated ditches, and removal and burning of contaminated soil. At the North and South Burning Grounds near the Landfill Area, 340,000 pieces of ordnance were destroyed in 1946 (WCC, 1993). Tetryl boosters were destroyed at the Demolition Ground, which is located in the southwestern portion of the former NOP. The former NOP was reactivated in 1950 in order to produce weapons for the Korean Conflict. In 1956 the NOP was again placed on standby status.

In 1959, approximately 960 acres were transferred to the U.S. Army Reserve for training grounds; 2,000 acres were granted to the U.S. Air Force for a missile site; and 40 acres were transferred to the Department of Commerce. From 1959 to 1960, the Offutt Air Force Base Missile Site S-1 launch area, Atlas Missile Area, was built on 1,185 acres north of Load Line 4. TCE was used to degrease and clean pipelines used to carry liquid oxygen fuel for missiles. U.S. Army activities included Nike missile maintenance at the former heavy equipment garage north of Load Line 1. The U.S. Air Force also occupied 34 acres of the northern portion of Load Line 1 for use as a "Tech Area" (WCC, 1993). The silos were abandoned in 1964 and the Launcher Area and the Nike Area were transferred to the Nebraska National Guard.

In 1962, approximately 9,000 acres of the former NOP were purchased by the University of Nebraska for use as their Agricultural Research and Development Center (ARDC). An additional 600 acres were purchased in 1964 for the ARDC. The remaining 5,000 acres were purchased by private individuals and corporations. A fireworks company operated for approximately 20 years at the former bomb booster assembly plant (Bomb Booster Area) until 1989. Two commercial enterprises manufacture insulation board and processed styrofoam packing material at the former administration buildings (Administration Area).

B07NE003702-07690

The University of Nebraska currently owns the Landfill Area, which is reported to have been first used by the former NOP. The landfill consists of a series of trenches near the sewage treatment plant that are filled with solid waste and covered with soil.

The Site was placed on the National Priorities List of Superfund Sites in August 1990 due to identified groundwater contamination and associated potential risk to human health or the environment.

1.3 SUMMARY OF SITE PHYSICAL CHARACTERISTICS

A detailed description of the Site and its physical characteristics is provided in the OU2 RI (WCC, 1993). A summary of the Site information relevant to the risk assessment is presented below.

The climate of Nebraska is temperate continental and characterized by wide seasonal variations in temperature. Summers are warm (average high temperature in July is 88°F) and winters are cool and dry (the average low temperature in January is 13°F). The average annual precipitation is 33 inches.

The Site is located in Todd Valley, an abandoned stream channel of the ancestral Platte River. The hydrostratigraphy of the Site consists of three aquifers, the Omadi Sandstone aquifer, the Todd Valley aquifer, and the Platte River alluvial aquifer; and three aquitards, the Pennsylvanian, the Omadi Shale, and the Platte River aquitards. The sands and sandy gravels of the Platte River Valley, which are 39 to 49 feet thick, are not correlative to the sands and gravels of Todd Valley. Overbank silts and clays, 10 to 17 feet thick, overlay the Platte River alluvial sands. The Platte River aquitard consists of overbank silts and clays. Where the Omadi Shale is absent, the Omadi Sandstone and Todd Valley aquifers are in hydraulic communication and behave as a single aquifer without hydraulic barriers.

As shown in **Drawing 1-2**, the groundwater surface of Todd Valley aquifer slopes toward the south-southeast at an average gradient of 12 feet/mile. East of Johnson Creek, the hydraulic gradient in the Platte River alluvial aquifer is south with a slight westerly component. A major zone of discharge is located along the western side of the Platte River floodplain southeast of the Site.

B07NE003702-07691

Groundwater is the source of potable water for all the cities and towns in the area. Water supply wells for the City of Lincoln are located in the Platte River floodplain approximately 4 miles southeast of the southeast corner of the Site in an area known as the Ashland Well Field. The water supply wells for the communities of Ashland and Memphis are also south of the former NOP. The water supply wells for the community of Ashland, however, are not part of the City of Lincoln's Ashland Well Field. These municipal wells are typically screened in the alluvium. Thirty-nine irrigation wells are also located within the former NOP boundary (WCC, 1993). The OU2 RI Report (WCC, 1993) lists well locations, general construction details, use and ownership of wells in the immediate area east and southeast of the Site. Past investigations at the Site have identified domestic wells which are generally located south and southeast of the Site.

The population of Saunders County is 18,285 and is 80 percent rural. Wahoo, population 3,510, is the county seat and the largest community (Bureau of the Census, 1990). Current residences on the Site have been identified within three of the Load Line Areas (1, 2, and 4), and there is a small residential section near the former Administration Area (WCC, 1993a). Areas adjacent to the Site are primarily used for growing corn with soybeans and sorghum of less but significant importance. Approximately 14 percent of the total area of Saunders County is under irrigation (Nebraska Agricultural Statistics Service, 1989).

1.4 REVIEW OF THE OU1 BASELINE RISK ASSESSMENT

The purpose of the OU1 BRA (SEC Donohue, 1993b) was to evaluate potential human health effects (both non-carcinogenic and carcinogenic effects) that may result from exposure to chemical contaminants in Site soil. Areas evaluated in the OU1 BRA (**Drawing 1-2**) included those portions of the Site that were most likely to have been impacted by contaminants. These areas include the following:

- Bomb Load Lines 1 through 4, located between 3rd and 4th Street
- The former Administration Area, located adjacent to Avenue A, north of 2nd Street
- The Bomb Booster Assembly Plant (i.e., Bomb Booster Area), located north of the load lines off Avenue A

B07NE003702-07692

- The Burning/Proving Grounds, located east of the load lines

- The peripheral area surrounding the four load lines referred to as the Primary Area

Each of the eight study areas was divided into a number of grids (71 grids in the Primary Area, 68 grids in each load line, 12 grids in the Administration Area, 35 grids at the Burning/Proving Grounds, and 22 grids at the Bomb Booster Area) and surface soil samples were collected from each grid. Possible source areas of groundwater contamination at the Site were identified in the OU-1 BRA, and are summarized in **Table 1-1.**

In the OU1 BRA, estimation of potential health risks was performed for a group of exposure scenarios believed to represent the most probable human activities that might occur on or near the Site. Scenarios evaluated included those for on-site residents, on-site workers, and on-site farmers. For the on-site family exposure scenario (farm family), potential health risks were evaluated quantitatively for three potential exposure routes: ingestion of surface soil, ingestion of home-grown vegetables, and ingestion of home-grown beef. For the farmer scenario, the two exposure routes considered were ingestion of surface soil, and inhalation of airborne soil-bound chemicals entrained is a result of tilling activities. Ingestion of surface soil was the only pathway evaluated quantitatively for on-site workers.

Conclusions from the OU1 BRA investigation include the following:

- Cancer risks and non-carcinogenic hazard indices associated with exposure to surface soil within the Primary Area and the Administration Area are below the levels of concern for residential and farming activities.

- In the Bomb Booster Area, exposure to chromium may result in unacceptable non-carcinogenic health effects during tilling operations.

- Chemical analysis of soil along Load Lines 1 through 4 identified several explosives (RDX, HMX, TNT, DNT, and TNB) that appeared to be site-related contaminants.

- Hazard indices associated with exposure to soil along the load lines exceeded unity (1.0) in all grids (indicating that non-carcinogenic health hazards are probable), primarily as a result of inhalation of chromium during tilling operations. However, the ingestion of soil and vegetables grown in soil was also of concern in a number of grids.

B07NE003702-07693

TABLE 1-1

POSSIBLE SOURCES OF GROUNDWATER CONTAMINATION (a)

POSSIBLE SOURCE	POSSIBLE CONTAMINANTS
Administration Area	Metals, VOCs
Bomb Booster Area	Explosives
Atlas Missile Area	VOCs
Load Line 1	Explosives
Load Line 2	Explosives
Load Line 3	Explosives, PCBs
Load Line 4	Explosives, PCBS
Burning / Proving Grounds	Explosives, VOCs

Note:

(a) Source areas as identified in the OU-2 RI report (WCC, 1993).

- In the Burning/Proving Ground, all grids were associated with hazard indices greater than unity (indicating that non-carcinogenic health hazards are probable) as a result of exposure to several inorganics, TNT and RDX. The principal pathway of concern was ingestion of vegetables.

- Eight grids in the Burning/Proving Ground pose unacceptable carcinogenic risks as a result of exposure to explosives and inorganic chemicals. All three ingestion pathways (soil, vegetables, beef) contribute to these risks in varying proportions.

B07NE003702-07695

2.0
CHEMICALS OF CONCERN

The purpose of the Baseline Risk Assessment (BRA) is to evaluate the potential human health risks and environmental impacts associated with the Site under the no-action alternative, i.e., in the absence of remedial or corrective action. The first step in this evaluation is the selection of a subset of chemicals which are termed COCs. This subset represents those site-related chemicals posing the greatest potential health risks at or near the Site. Thus, the quantification of potential health risks can be focused on the COCs without underestimating the total risk.

The identification of COCs was based on an evaluation of data obtained at and near the Site using selection criteria developed by EPA (RAGS, 1989). COCs were identified for subsurface soil (Atlas Missile Area and Load Line 1 Area) and for site-wide groundwater.

2.1 SUBSURFACE SOIL

To identify potential subsurface volatile organic compounds (VOCs) soil contamination at the Site, soil gas samples (collected at depths ranging from 6 to 24 feet below ground surface [bgs]) were screened for VOCs in the field, and follow-up laboratory analyses were performed for samples in which VOCs were detected. VOCs were assumed not to be present in surface soil because of the extensive length of time since surface spills occurred and the volatile nature of these chemicals. Thus no surface soil were analyzed for VOCs. Laboratory analyses indicated that VOCs were present in Site subsurface soil (at estimated concentrations below the quantitation limits) in the Atlas Missile Area and Load Line 1 area. The COCs in these areas were identified by reviewing the results from twenty-four unsaturated soil samples collected from the Atlas Missile Area and thirteen unsaturated soil samples collected from the Load Line 1. These samples were analyzed for VOCs only. Other analytes (i.e., explosives and SVOCs) are present in soil were previously addressed in the OU1 BRA.

Based on chemicals detected in subsurface soil samples, three compounds, trichloroethene (TCE), benzene, and acetone, were retained as VOC, COCs for soil at Atlas Missile Area and two chemicals, TCE and Acetone, were retained at Load Line 1. The remainder of

B07NE003702-07696

VOC compounds analyzed for , as shown in **Table 2-1**, were eliminated as COCs because they were not detected. Analytical soil sample results are summarized in **Tables 2-2**, and **2-3**. These tables present the arithmetic mean concentration, the maximum and minimum detected concentrations, and the number of samples in which each compound was detected. In accordance with RAGS, when a chemical is detected at least once in soil samples, concentrations equal to half the sample quantitation limit (SQL) are assigned to all other results reported as ND (not-detected) for the purposes of calculating mean concentrations. Data presented in these tables were to identify COCs and develop exposure point concentrations in subsurface soil for each area.

2.2 GROUNDWATER

Groundwater samples were collected from monitoring wells and hydropunch samples on and near the Site to identify groundwater COCs. Analyses were performed on select groundwater samples for the following classes of chemicals:

- Volatile organic compounds (VOCs), 41 analytes
- Semi-volatile organic compounds (SVOCs), 64 analytes
- Explosive compounds, 12 analytes
- Dissolved and total metals and cyanide, 24 analytes

Based on historical information and anticipated COCs, explosive and VOC analyses were performed for all Site wells, while SVOC and metal analyses were only performed for selected wells (see the OU2 RI Report {WCC, 1993} for a detailed description of Site sampling and analysis).

COCs identified for the groundwater were based on evaluation of site-wide groundwater data (analytical results from hydropunch samples were only used to evaluate VOCs). A summary of the analytical groundwater results is presented in **Appendix A**. Tables in **Appendix A** present the arithmetic mean concentrations, the maximum and minimum detected concentrations, and the number of samples in which each chemical was detected. When a chemical was detected at least once in groundwater, concentrations equal to one-half the sample quantitation limit (SQL) were assigned to all results reported as less than the SQL

B07NE003702-07697

TABLE 2-1

VOC COMPOUNDS ELIMINATED AS CHEMICALS OF CONCERN FOR SUBSURFACE SOIL

Benzene (Load Line 1 only)	Methylene chloride
Bromoform	1,1,2,2-Tetrachloroethane
Carbon tetrachloride	Tetrachloroethene
Chlorobenzene	Toluene
Dibromochloromethane	1,1,1-Trichloroethane
Chloroethane	1,1,2-Trichloroethane
Chloroform	Vinyl chloride
Bromodichloromethane	Trans-1,3-Dichloropropene
1,1-Dichloroethane	Styrene
1,2-Dichloroethane	2-Butanone
1,1-Dichloroethene	Carbon disulfide
1,2-Dichloropropane	2-Hexanone
Cis-1,3-Dichloropropene	4-Methyl-2-pentanone
Ethylbenzene	Xylenes (Total)
Bromomethane	1,2-Dichloroethene(Total)
Chloromethane	

Note: These chemicals were analyzed for, but not detected in any subsurface soil samples.

TABLE 2-2

ATLAS MISSILE AREA ANALYTICAL SUBSURFACE SOIL DATA

VOC Compound	Frequency of Detection	Concentration (µg/kg) Minimum Detected	Maximum detected	Arithmetic Mean (1,2	UCL (3
Benzene	**10/24**	**2.0**	**2.0**	**4.3**	**5.5**
Bromoform	0/24	ND	ND	NA	NA
Carbon tetrachloride	0/24	ND	ND	NA	NA
Chlorobenzene	0/24	ND	ND	NA	NA
Dibromochloromethane	0/24	ND	ND	NA	NA
Chloroethane	0/24	ND	ND	NA	NA
Chloroform	0/24	ND	ND	NA	NA
Bromodichloromethane	0/24	ND	ND	NA	NA
1,1-Dichloroethane	0/24	ND	ND	NA	NA
1,2-Dichloroethane	0/24	ND	ND	NA	NA
1,1-Dichloroethene	0/24	ND	ND	NA	NA
1,2-Dichloropropane	0/24	ND	ND	NA	NA
Cis-1,3-Dichloropropene	0/24	ND	ND	NA	NA
Ethylbenzene	0/24	ND	ND	NA	NA
Bromomethane	0/24	ND	ND	NA	NA
Chloromethane	0/24	ND	ND	NA	NA
Methylene chloride	0/24	ND	ND	NA	NA
1,1,2,2-Tetrachloroethane	0/24	ND	ND	NA	NA
Tetrachloroethene	0/24	ND	ND	NA	NA
Toluene	0/24	ND	ND	NA	NA
1,1,1-Trichloroethane	0/24	ND	ND	NA	NA
1,1,2-Trichloroethane	0/24	ND	ND	NA	NA
Trichloroethene (TCE)	**2/24**	**4.0**	**4.0**	**5.6**	**5.9**
Vinyl chloride	0/24	ND	ND	NA	NA
Trans-1,3-Dichloropropene	0/24	ND	ND	NA	NA
Styrene	0/24	ND	ND	NA	NA
Acetone	**3/24**	**63.0**	**130.0**	**16.5**	**20.2**
2-Butanone	0/24	ND	ND	NA	NA
Carbon disulfide	0/24	ND	ND	NA	NA
2-Hexanone	0/24	ND	ND	NA	NA
4-Methyl-2-pentanone	0/24	ND	ND	NA	NA
Xylenes (Total)	0/24	ND	ND	NA	NA
1,2-Dichloroethene(Total)	0/24	ND	ND	NA	NA

Notes:

1) Arithmetic mean concentration may exceed the maximum detected value due to use of 1/2 detection limit values.

2) Arithmetic Mean concentrations are developed assuming 1/2 the detection limit as surrogate values for all ND's.

3) UCL= 95% Upper Confidence Limit of the Arithmetic Mean, based on lognormal distribution.

Shaded rows indicate chemicals of concern.

TABLE 2-3

LOAD LINE 1 ANALYTICAL SUBSURFACE SOIL DATA

VOC Compound	Frequency of Detection	CONCENTRATION (µg/kg) Minimum Detected	Maximum Detected	Arithmetic Mean (1,2)	UCL (3)
Benzene	0/13	ND	ND	NA	NA
Bromoform	0/13	ND	ND	NA	NA
Carbon tetrachloride	0/13	ND	ND	NA	NA
Chlorobenzene	0/13	ND	ND	NA	NA
Dibromochloromethane	0/13	ND	ND	NA	NA
Chloroethane	0/13	ND	ND	NA	NA
Chloroform	0/13	ND	ND	NA	NA
Bromodichloromethane	0/13	ND	ND	NA	NA
1,1-Dichloroethane	0/13	ND	ND	NA	NA
1,2-Dichloroethane	0/13	ND	ND	NA	NA
1,1-Dichloroethene	0/13	ND	ND	NA	NA
1,2-Dichloropropane	0/13	ND	ND	NA	NA
Cis-1,3-Dichloropropene	0/13	ND	ND	NA	NA
Ethylbenzene	0/13	ND	ND	NA	NA
Bromomethane	0/13	ND	ND	NA	NA
Chloromethane	0/13	ND	ND	NA	NA
Methylene chloride	0/13	ND	ND	NA	NA
1,1,2,2-Tetrachloroethane	0/13	ND	ND	NA	NA
Tetrachloroethene	0/13	ND	ND	NA	NA
Toluene	0/13	ND	ND	NA	NA
1,1,1-Trichloroethane	0/13	ND	ND	NA	NA
1,1,2-Trichloroethane	0/13	ND	ND	NA	NA
Trichloroethene (TCE)	**2/13**	**10.0**	**10.0**	**6.3**	**7.1**
Vinyl chloride	0/13	ND	ND	NA	NA
Trans-1,3-Dichloropropene	0/13	ND	ND	NA	NA
Styrene	0/13	ND	ND	NA	NA
Acetone	**3/13**	**28.0**	**53.0**	**13.8**	**24.5**
2-Butanone	0/13	ND	ND	NA	NA
Carbon disulfide	0/13	ND	ND	NA	NA
2-Hexanone	0/13	ND	ND	NA	NA
4-Methyl-2-pentanone	0/13	ND	ND	NA	NA
Xylenes (Total)	0/13	ND	ND	NA	NA
1,2-Dichloroethene(Total)	0/13	ND	ND	NA	NA

Notes:

1) Arithmetic mean concentration may exceed maximum detected value due to use of 1/2 detection limit values.

2) Arithmetic Mean concentrations are developed assuming 1/2 the detection limit as surrogate values for all ND's.

3) UCL= 95% Upper Confidence Limit of the Arithmetic Mean, based on lognormal distribution.

Shaded rows indicate chemicals of concern.

for purposes of calculating mean chemical concentrations (EPA, 1989b). If SQLs were unknown, concentrations equal to one-half the Contract Required Detection Limit (CRDL) were used.

2.2.1 Chemicals Excluded From Groundwater Chemicals Of Concern

RAGS, (EPA, 1989b) describes several procedures to select COCs. Chemicals may be excluded from the COC list based on the following criteria:

- The chemical was not detected at the site
- The chemical was a laboratory contaminant
- The chemical was present within background ranges
- The chemical is an essential nutrient

These criteria are discussed in the following subsections.

2.2.1.1 Chemicals Not Detected

Analyses were performed for a total of 141 chemicals in groundwater. Of these, 109 chemicals (32 VOCs, 59 SVOCs, 7 explosives, and 11 metals), were not detected in groundwater, and therefore, were excluded from further consideration as COCs. Chemicals excluded based on lack of detection are presented in **Table 2-4**.

2.2.1.2 Common Laboratory Contaminants

Bis(2-ethylhexyl)phthalate, a common laboratory artifact and a common component of polymers used in laboratory equipment and gloves, was detected during the investigation in groundwater samples and the associated laboratory blanks. In accordance with RAGS, compounds are qualified as not-detected (U) if their reported concentration is less than 10 times the associated contaminated blank concentration, (EPA, 1989b). All samples with reported concentrations of bis (2-ethylhexyl) phthalate met this criterion. Thus, bis(2-ethyhexyl)phthalate was excluded from the list of COCs as a laboratory contaminant.

B07NE003702-07701

TABLE 2-4

CHEMICALS EXCLUDED FROM GROUNDWATER
CHEMICALS OF CONCERN BASED ON NOT-DETECTED

Parameter Group	Parameter
VOCs	1,1,2,2-Tetrachloroethane
	1,1,2-Trichloroethane
	1,1-Dichloroethane
	1,1-Dichloroethene
	1,2-Dibromo-3-chloropropane (DBCP)
	1,2-Dibromoethane (Ethylene dibromide)
	1,2-Dichlorobenzene
	1,2-Dichloroethane
	1,3-Dichlorobenzene
	1,4-Dichlorobenzene
	2-Butanone
	2-Hexanone
	4-Methyl-2-pentanone
	Benzene
	Bromochloromethane
	Bromodichloromethane
	Bromoform
	Bromomethane
	Carbon disulfide
	Carbon tetrachloride

TABLE 2-4

CHEMICALS EXCLUDED FROM GROUNDWATER CHEMICALS OF CONCERN BASED ON NOT-DETECTED

Parameter Group	Parameter
VOCs (Cont)	Chlorobenzene
	Chloroethane
	Chloromethane
	Cis-1,3-Dichloropropene
	Dibromochloromethane
	Ethylbenzene
	Styrene
	Toluene
	Trans-1,2-Dichloroethene
	Trans-1,3-Dichloropropene
	Vinyl chloride
	Xylenes (Total)
SVOCs	1,2,4-Trichlorobenzene
	1,2-Dichlorobenzene
	1,3-Dichlorobenzene
	1,4-Dichlorobenzene
	2,2'-Oxybis(1-chloropropane)
	2,4,5-Trichlorophenol
	2,4,6-Trichlorophenol
	2,4-Dichlorophenol

TABLE 2-4

CHEMICALS EXCLUDED FROM GROUNDWATER
CHEMICALS OF CONCERN BASED ON NOT-DETECTED

Parameter Group	Parameter
SVOCs(Cont.)	2,4-Dimethylphenol
	2,4-Dinitrophenol
	2,6-Dinitrotoluene (2,6-DNT)
	2-Chloronaphthalene
	2-Chlorophenol
	2-Methylnaphthalene
	2-Methylphenol
	2-Nitroaniline
	2-Nitrophenol
	3,3'-Dichlorobenzidine
	3-Nitroaniline
	4,6-Dinitro-2-methylphenol
	4-Bromophenyl phenyl ether
	4-Chloro-3-methylphenol
	4-Chloroaniline
	4-Chlorophenyl phenyl ether
	4-Methylphenol
	4-Nitroaniline

TABLE 2-4

CHEMICALS EXCLUDED FROM GROUNDWATER
CHEMICALS OF CONCERN BASED ON NOT-DETECTED

Parameter Group	Parameter
SVOCs(Cont.)	4-Nitrophenol
	Acenaphthene
	Acenaphthylene
	Anthracene
	Benzo(a)anthracene
	Benzo(a)pyrene
	Benzo(b)fluoranthene
	Benzo(g,h,i)perylene
	Benzo(k)fluoranthene
	bis(2-Chloroethoxy)methane
	bis(2-Chloroethyl)ether
	bis(2-Ethylhexyl)phthalate
	Butyl benzyl phthalate
	Carbazole
	Chrysene
	Di-n-octyl phthalate
	Dibenzo(a,h)anthracene
	Dibenzofuran
	Dimethyl phthalate
	Fluoranthene

TABLE 2-4

CHEMICALS EXCLUDED FROM GROUNDWATER CHEMICALS OF CONCERN BASED ON NOT-DETECTED

Parameter Group	Parameter
SVOCs (Cont)	Fluorene
	Hexachlorobenzene
	Hexachlorobutadiene
	Hexachlorocyclopentadiene
	Hexachloroethane
	Indeno(1,2,3-cd)pyrene
	Isophorone
	N-Nitroso-di-n-propylamine
	Naphthalene
	Nitrobenzene (NB)
	Pentachlorophenol
	Phenanthrene
	Pyrene
	1,3-Dinitrobenzene (DNB)
	2,6-Dinitrotoluene (26DNT)
	2-Nitrotoluene (2NT)
	3-Nitrotoluene (3NT)
	4-Nitrotoluene (4NT)
	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)
	Nitrobenzene (NB)

TABLE 2-4

CHEMICALS EXCLUDED FROM GROUNDWATER CHEMICALS OF CONCERN BASED ON NOT-DETECTED

Parameter Group	Parameter
METALS	Antimony
	Beryllium
	Cadmium
	Chromium
	Cobalt
	Copper
	Cyanide
	Mercury
	Selenium
	Silver
	Thallium

2.2.1.3 Chemicals Present at Background Concentrations

A comparison of sample concentrations to naturally-occurring background concentrations was used to identify non-site-related chemicals. This approach was only used for evaluating inorganic chemicals. Although national guidance (RAGS) does not provide specific methodology for comparing site data to background levels, specific guidance has been provided by Region IV EPA. As contained in the EPA Supplemental Region IV Risk Assessment Guidance (EPA, 1991c), chemicals with mean concentrations less than two times the mean background concentrations are considered comparable to background and can be excluded from the list of COCs.

The concentrations of chemicals detected in Site groundwater samples were compared to concentrations found in upgradient background wells (MW-47A and MW-47B). Seven metals at the Site were excluded from the list of COC by this criterion. These seven metals are listed in **Table 2-5**.

2.2.1.4 Essential Nutrients

Chemicals that are essential nutrients may be excluded from consideration as COCs when they are present at levels that are likely to produce beneficial rather than toxic effects. Comparisons were made between the concentrations of essential nutrients found in Site media and recommended daily allowances (RDAs) established by the National Research Council (1989). Intake from Site sources was estimated by assuming that individuals would ingest 2 L/day of Site groundwater containing the maximum concentration of each element (a conservative assumption). Chemicals were excluded from the COC list when the estimated intake was less than or equal to the RDA. Based on this criterion, four chemicals (calcium, iron, magnesium, and zinc) have been excluded from the COC list (**Table 2-6**).

In addition to the chemicals excluded as COCs based on their role as essential nutrients, sodium and potassium were also excluded, based on a comparison to normal dietary intake. Although sodium and potassium are considered essential nutrients, there are no established RDAs for these elements.

B07NE003702-07708

TABLE 2-5

METALS IN GROUNDWATER EXCLUDED AS CHEMICALS OF CONCERN BASED ON COMPARISON TO BACKGROUND CONCENTRATIONS

	Arithmetic Mean of Groundwater Samples (µg/L)	Arithmetic Mean of Background Groundwater Samples (µg/L)	2x Mean of Background Groundwater Samples (µg/L)
Arsenic	5	17	34
Barium	210	134	267
Calcium	54,980	82,050	164,100
Iron	294	1,575	3,150
Manganese	132	399	789
Potassium	7,808	10,650	21,300
Sodium	18,107	35,100	70,200

Note: The monitoring wells MW-47A and MW-47B located north of the former Administration Area are considered background wells.

TABLE 2-6

METALS IN GROUNDWATER EXCLUDED AS CHEMICALS OF CONCERN BASED ON THEIR CLASSIFICATION AS ESSENTIAL NUTRIENTS

Compound	Max. Detected (mg/L)	Assumed Daily Intake (mg/day) (a	Recommended Daily Allowance (mg/day) (b
Calcium	99.6	199.2	400-1,200
Iron	1.43	2.86	10-30
Magnesium	31.2	62.4	80-400
Potassium	10.5	21	390-780 (c
Sodium	32.9	65.8	1,000 (d
Zinc	0.047	0.094	10-19

Note:

a) Assumes an individual who consumes 2 Liters groundwater per day.

b) Recommended Daily Allowance (RDA) established by the National Research Council (1989). Range of RDAs is age-related (i.e., ages 1 through adult).

c) The recommended daily intake for Potassium is 39-78 mg/kg/day. The value presented here assumes a small child (10 kg body weight).

d) Sodium is recognized as an essential nutrient, but there are no RDA values. Ingestion of less than 1,000 mg/day is considered a Sodium-restricted diet. The average dietary intake of Sodium in the U.S. is greater than 10,000 mg/day (Nelson, 1992).

TABLE 2-7

CHEMICALS OF CONCERN IN GROUNDWATER AND THEIR FREQUENCY OF DETECTION

Parameter Group	Parameter	Frequency
VOCS	1,1,1-Trichloroethane	2/134
	1,2-Dichloroethene (total)	12/134
	1,2-Dichloropropane	1/134
	Acetone	12/42
	Chloroform	1/134
	Methylene chloride	52/134
	Tetrachloroethene	1/134
	Trichloroethene	28/134
SVOCS	Diethyl phthalate	4/13
	Di-n-butyl phthalate	3/13
	N-Nitrosodiphenylamine	1/13
	Phenol	5/13
EXPLOSIVES	1,3,5-Trinitrobenzene (TNB)	5/123
	2,4,6-Trinitrotoluene (TNT)	3/123
	2,4-Dinitrotoluene (2,4-DNT)	1/123
	Hexahydro-1,3,5-trinitro-1,3-5-triazine (RDX)	43/123
	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	12/123
METAL	Aluminum	1/13
	Lead	1/13
	Nickel	1/13
	Vanadium	2/13

3.0
EXPOSURE ASSESSMENT

The purpose of the exposure assessment is to estimate the magnitude of potential chemical exposure among various receptor populations. The steps required to perform an exposure assessment include the following:

- Identification of potential receptor populations
- Evaluation of potential exposure pathways for completeness
- Evaluation of potential exposure parameters
- Estimation of exposure point concentrations
- Estimation of daily intake factors

The approach of this BRA is to incorporate conservative exposure assumptions when estimating the magnitude of potential exposures, so that potential risks posed by the Site are not underestimated. At the same time, exposure scenarios which are considered unlikely are excluded, since they do not reflect realistic exposure conditions.

3.1 IDENTIFICATION OF POTENTIAL RECEPTOR POPULATIONS

The human populations evaluated in the BRA include those who are considered most likely to come in contact with COCs. Potentially exposed populations include:

- Current and future on-site child residents
- Current and future on-site adult residents
- Current and future on-site workers
- Construction workers involved in excavation activities

Under current Site conditions, the population of primary concern is on-site workers. Hypothetical future adult and child residents are also evaluated, assuming a residential

B07NE003702-07712

property is supplied with groundwater from wells on-site (or downgradient from the Site). The full-time resident scenario, which is based on the assumption of an individual who spends 24 hours/day in any one area, provides the most conservative assessment of Site risks.

VOCs were assumed to be absent from surface soil due to the length of time since surface spills occurred and the volatile nature of these compounds. Thus no surface soil pathways were evaluated for VOC exposure.

Trace quantities of volatile organic compounds were identified in subsurface soil from Atlas Missile Area and Load Line 1 Area (See Section 2.1). In order to evaluate risks associated with exposure to chemicals in subsurface soil, a hypothetical construction worker performing intrusive (excavation) activities is included in the BRA.

3.2 EVALUATION OF POTENTIAL EXPOSURE PATHWAYS

An exposure pathway is the mechanism by which a receptor may come in contact with a chemical. As defined by RAGS (EPA, 1989b), there are four major elements that characterize a complete exposure pathway. These elements are:

- A source and mechanism of chemical release
- A transport medium for the chemical
- A point of potential receptor contact with the medium (e.g. exposure point)
- A route of exposure (e.g. ingestion) for the receptor to come into contact with the chemical

For an exposure pathway to be complete, all four elements must be present. The absence of any one of these elements results in an incomplete exposure pathway for which site-related health risks do not exist. Thus, the evaluation of potential exposure pathways is necessary to focus on only those pathways which have potential to impact human health.

Several aspects of the potential exposure pathways have already been discussed. The potential sources of chemical releases were identified in Section 1.0 (Site Description) and

Section 2.0 (Identification of Chemicals of Concern). The presence and identification of receptors was discussed in Section 3.1 (Identification of Potential Receptor Populations). In order to complete the assessment of potential exposure pathways, an evaluation of the potential exposure routes and exposure points associated with contaminated groundwater and soil is required.

Figures 3-1 depicts the Site Conceptual Exposure Model for potential exposure pathways. The evaluation of potential exposure pathways (exposure points and routes) identified in these figures is presented in the following sections.

3.2.1 Potential Groundwater Exposure

An exposure point refers to the point where a receptor contacts a contaminated medium. For this Site, on-site wells represent potential exposure points for Site residents and worker populations.

For the hypothetical future receptors identified in Section 3.1, exposure points to groundwater are assumed to be water supply wells installed on-site as well as adjacent downgradient off-site wells. These exposure points will be evaluated using current chemical concentrations.

3.2.1.1 Ingestion of Well Water

On-site exposure to contaminated drinking water by ingestion of groundwater from wells installed on the Site represents a potentially complete exposure pathway and will be evaluated for the following hypothetical receptors:

- Current and future on-site workers
- Current and future adult residents
- Current and future child residents

3.2.1.2 Dermal Exposure to Groundwater

According to on-site personnel (McMannaman, 1993), there are two sets of six showers (12 total) at the Swine research facility (located in the southwest part of the ARDC). The

showers are used daily year round. There is one shower located in the utility restroom in Load Line 2. The shower is used infrequently. There is one set of 2 and one set of 3 showers (5 total) at the agronomy building (located on the east side of the ARDC). The showers are used daily during the summer. There are three residences at the ARDC (dairy, swine, and veterinary science). Each residence has bathing facilities. All showers use water supplied by the central water system with the exception of the agronomy building which uses water from a well located near the agronomy building. Thus, in addition to evaluating a shower scenario for residents, the on-site worker scenario will also include an evaluation of the health risks associated with shower exposure to groundwater.

Because dermal exposure to contaminated groundwater during showering represents a potentially complete exposure pathway, the following hypothetical receptors will be evaluated:

- Current and future on-site workers
- Future construction workers
- Current and future adult residents
- Current and future child residents

3.2.1.3 Inhalation of Volatile Chemicals in Groundwater

Volatilization of VOCs into the bathroom air could lead to exposure of receptors who shower using impacted groundwater. Thus, inhalation of VOCs released from groundwater is potentially complete and will be evaluated for the following receptors:

- Current and future on-site workers
- Future construction workers
- Current and future adult residents
- Current and future child residents

Although volatile compounds may also be released to the atmosphere during irrigation, chemicals potentially released during irrigation would be greatly diluted by mixing in the atmosphere and dispersion, resulting in low exposure point concentrations. Inhalation exposure to these compounds is expected to represent a minor pathway (relative to a shower scenario). Because a shower scenario provides a more conservative estimation of exposure, inhalation via irrigation will not be evaluated quantitatively in this BRA.

B07NE003702-07715

3.2.3 Potential Subsurface Soil Exposure Points

A construction worker involved in on-site excavation activities was the only receptor population evaluated for potential exposure to subsurface soil. Exposure routes evaluated included ingestion and dermal contact with subsurface soil and inhalation of VOCs volatilized from these soils.

Potential exposure to contaminants at the Site could also occur through ingestion of contaminated plants or animal life found on-site. However, because of the uncertainties inherent in the calculation of food chain effects (i.e., bioconcentration, biomagnification, biotransformation, excretion) in vegetables or in beef, and because food chain effects have already been evaluated for soil in OU1, the exposure to chemicals through the food chain effects is not evaluated quantitatively in the OU2 BRA. A review of potential uptake and bioconcentration of COCs in plant and/or animals on the Site (i.e., food chain effects) is presented in **Appendix B.**

3.3 RECEPTOR POPULATIONS NOT INCLUDED IN THE RISK ASSESSMENT

Certain potential receptor populations are excluded from consideration in the BRA if they are not realistically exposed or are exposed only through minor exposure pathways. These populations and the basis for exclusion are as follows:

- Sensitive populations (e.g., young children in daycare centers, the elderly or infirm in hospitals or elderly care facilities, etc.). These populations do not exist in the vicinity of the Site.

Pregnant women represent a potentially sensitive population that hypothetically could exist on-Site. A review of the toxicity of the COCs (including reproductive and developmental effects) is presented in **Appendix E**. Although several of the COCs can potentially exert developmental or reproductive effects, a review of the IRIS database indicates that these effects have been considered by EPA during the development of the current RfC/RfDs. Thus, risks calculated using current EPA toxicity values should be health protective for all populations, including pregnant women and unborn infants.

B07NE003702-07716

3.4 EVALUATION OF POTENTIAL EXPOSURE PARAMETERS

To calculate the chronic daily intake (CDI) of chemicals of concern (COCs) and to estimate the associated potential health risks, a number of exposure parameters must first be quantified. Parameters which are typically quantified include the following:

- Lifespan (Days)
- Exposure duration (years)
- Exposure frequency (days/year)
- Groundwater ingestion rate (L/day)
- Soil ingestion rate (mg/day)
- Body weight (kg)
- Air inhalation rate (m^3/day)
- Exposure time (hours/day)
- Exposed skin surface area (cm^2)
- Dermal permeability constant (cm/hour)
- Soil adherence (mg/cm^2)

These parameters are assigned numerical values (**Tables 3-1, 3-2, 3-3, 3-4, 3-5, and 3-6**) which are incorporated into the exposure algorithms (**Appendix C**) used to estimate the extent of chemical exposure. The numerical values used in the exposure algorithms have been developed using the Exposure Factors Handbook (EPA, 1989a), OSWER Directive 9285.6-03 (Standard Default Exposure Factors; EPA, 1991b), Dermal Exposure Assessment: Principles and Applications (EPA, 1992a) and RAGS (EPA, 1989b). The exposure parameters presented in this section represent reasonable maximum exposure assumptions (RME assumptions), so that potential exposures and health risks are not underestimated.

3.4.1 Lifespan

The assumed lifespan, as given in the OSWER Directive 9285.6-03 (EPA, 1991b), is 70 years (25,550 days) for all receptors.

3.4.2 Exposure Duration

Exposure duration refers to the number of years in which exposure occurs. To evaluate RME exposure, an adult resident residing in the same house located on-site for 70 years

B07NE003702-07717

TABLE 3-1

REASONABLE MAXIMUM EXPOSURE PARAMETERS FOR ESTIMATION OF CHEMICAL INTAKE BY INGESTION OF GROUNDWATER (a

Parameter	Residential		On-site
	Child (b	Adult	Worker
(IR) Ingestion Rate (liters/day)	1.0 (c	2.0 (c	1.0 (c
(EF)Exposure Frequency (days/year)	350 (d	350 (d	250 (e
(ED) Exposure Duration (years)	6 (f	70 (g	25 (h
(BW) Body Weight (kg)	15 (i	70 (j	70 (j
(AT1) Averaging Time - Non-carcinogenic Effects (days)	2,190 (k	25,550 (k	9,125 (k
(AT2) Averaging Time - Cancer Effects (days)	25,550 (l	25,550 (l	25,550 (l

Note:

a) Reasonable Maximum Exposure (RME) is defined by EPA as reasonable upperbound exposure among potentially exposed population.

b) Assumes a 0- to 6- year old child.

c) Ingestion rates are based on the data presented for maximum intake in Exposure Factors Handbook (EPA, 1989b).

d) Residents are assumed to have an exposure frequency of 350 days per year (Standard Default Exposure Factors; PEA, 1991b).

e) Based on a 5-day working week for 50 weeks per year (Standard Default Exposure Factors; EPA, 1991b).

f) Child residents are assumed to spend first 6 years of life on Site.

g) Adult residents are assumed to have RME duration of 70 years.

h) The default value recommended by Standard Default Exposure Factors (EPA, 1991b).

i) Body weights for 0- to 6- year old children are based on time-weighted average values from Exposure Factors Handbook (EPA, 1989a).

j) Body weight for adults based on Standard Default Exposure Factors (EPA, 1991b).

k) Averaging time for non-carcinogenic effects based on the exposure duration.

l) Averaging time for carcinogenic effects based on lifetime of 70 years, as identified in Standard Default Exposure Exposure Factors (EPA, 1991b).

TABLE 3-2

REASONABLE MAXIMUM EXPOSURE PARAMETERS FOR ESTIMATION OF CHEMICAL INTAKE BY DERMAL EXPOSURE WHILE SHOWERING (a

Parameter	Residential		On-site Worker	Construction Worker
	Child (b	Adult		
(SA) Skin Surface Area Available for Contact (cm2)	6,670 (c	19,400 (c	19,400 (c	19,400 (c
(PC) Chemical-specific Dermal Permeability Constant (cm/hr)	Chemical Specific (d			
(ET) Exposure Time (hours/day)	0.20 (e	0.20 (e	0.20 (e	0.20 (e
(EF) Exposure Frequency (days/year)	350 (f	350 (f	90 (g	90 (g
(ED) Exposure Duration (years)	6 (h	70 (i	25 (j	1 (o
(BW) Body Weight (kg)	15 (k	70 (l	70 (l	70 (l
(AT1) Averaging Time - Non-carcinogenic Effects (days)	2,190 (m	25,550 (m	9,125 (	182 (o
(AT2) Averaging Time - Cancer Effects (days)	25,550 (n	25,550 (n	25,550 (n	25,550 (n

Note:

a) Reasonable Maximum Exposure (RME) is defined by EPA as reasonable upperbound exposure among potentially exposed population.

b) Assumes a 0- to 6- year old child.

c) Surface area based on whole body exposure. Values calculated from Exposure Factors Handbook (EPA, 1989a).

d) *Permeability constants are chemical specific values used to estimate chemical uptake across skin.*

e) An exposure time of 12 minutes/day is based on RME exposure presented in RAGS (EPA, 1989b).

f) Residents are assumed to have an exposure frequency of 350 days per year (Standard Default Exposure Factors; EPA. 1991b).

g) Assumed to take a shower everyday in summer, based on reported shower use at the Agronomy building.

h) Child residents are assumed to spend first 6 years of life on Site.

i) Adult residents are assumed to have RME duration of 70 years.

j) The default value recommended by Standard Default Exposure Factors (EPA, 1991b).

k) Body weights for 0- to 6- year old children are based on time-weighted average values from Exposure Factors Handbook (EPA, 1989a).

l) Body weight for adults based on Standard Default Exposure Factors (EPA, 1991b).

m) Averaging time for non-carcinogenic effects based on the exposure duration.

n) Averaging time for carcinogenic effects based on lifetime of 70 years, as identified in Standard Default Exposure Factors (EPA, 1991b).

o) For construction worker, a construction period duration of 6 months is assumed

TABLE 3-3

REASONABLE MAXIMUM EXPOSURE PARAMETERS FOR ESTIMATION OF CHEMICAL INTAKE BY INHALATION EXPOSURE TO VOLATILIZED CHEMICALS DURING SHOWERING (a

Parameter	Residential		On-site Worker	Construction Worker
	Child (b	Adult		
(IR) Inhalation Rate (m3/hour)	0.83 (c	0.83 (c	0.83 (c	0.83 (c
(ET) Exposure Time (hours/day)	0.20 (d	0.20 (d	0.20 (d	0.20 (d
(EF) Exposure Frequency (days/year)	350 (e	350 (e	90 (f	90 (f
(ED) Exposure Duration (years)	6 (g	70 (h	25 (i	1 (n
(BW) Body Weight (kg)	15 (j	70 (k	70 (k	70 (k
(AT1) Averaging Time - Non-carcinogenic Effects (days)	2,190 (l	25,550 (l	9,125 (l	182 (n
(AT2) Averaging Time - Cancer Effects (days)	25,550 (m	25,550 (m	25,550 (m	25,550 (m

Note:

a) Reasonable Maximum Exposure (RME) is defined by EPA as reasonable upperbound exposure among potentially exposed population.

b) Assumes a 0- to 6- year old child.

c) The default value, 20 m3/day, recommended by Standard Default Exposure Factors (EPA, 1991b) for normal activity levels.

d) An exposure time of 12 minutes/day is based on RME exposure presented in RAGS (EPA, 1989a).

e) Residents are assumed to have an exposure frequency of 350 days per year (Standard Default Exposure Factors; EPA, 1991b).

f) Assume to take a shower everyday in summer, based on reported shower use at the Agronomy building.

g) Child residents are assumed to spend first 6 years of life on Site.

h) Adult residents are assumed to have RME duration of 70 years.

i) The default value recommended by Standard Default Exposure Factors (EPA, 1991b).

j) Body weights for 0- to 6- year old children are based on time-weighted average values from Exposure Factors Handbook (EPA, 1989a).

k) Body weight for adults based on Standard Default Exposure Factors (EPA, 1991b).

l) Averaging time for non-carcinogenic effects based on the exposure duration.

m) Averaging time for carcinogenic effects based on lifetime of 70 years, as identified in Standard Default Exposure Factors (EPA, 1991b).

n) For construction worker, a construction period duration of 6 months is assumed

TABLE 3-4

REASONABLE MAXIMUM EXPOSURE PARAMETERS FOR ESTIMATION OF CHEMICAL INTAKE BY INGESTION OF SUBSURFACE SOIL (a

Parameter	Construction Worker (h
(IR) Ingestion Rate (mg soil /day)	480 (b
(EF)Exposure Frequency (days/year)	130 (c
(ED) Exposure Duration (years)	1.0 (d
(BW) Body Weight (kg)	70 (e
(AT1) Averaging Time - Non-carcinogenic Effects (days)	182 (f
(AT2) Averaging Time - Cancer Effects (days)	25,550 (g

Note:

a) Reasonable Maximum Exposure (RME) is defined by EPA as reasonable upperbond exposure among potentially exposed population.

b) For conservatism, the upperbound soil ingestion rate from Standard Default Exposure Factors (EPA, 1991b) was assumed.

c) Based on 5 working days per week for 6 months..

d) For RME construction activity was assumed to occur for 6 months.

e) Body weight for adults based on Standard Default Exposure Factors (EPA, 1991b).

f) Averaging time for non-carcinogenic effects based on the exposure duration.

g) Averaging time for carcinogenic effects based on lifetime of 70 years, as identified in Standard Default Exposure Factors (EPA, 1991 b).

h) Exposure to subsurface soil was evaluated for Atlas Missle Area and Load Line 1 Area only.

TABLE 3-5

REASONABLE MAXIMUM EXPOSURE PARAMETERS FOR ESTIMATION OF CHEMICAL INTAKE BY DERMAL CONTACT WITH SUBSURFACE SOIL (a

Parameter	Construction Worker (j
(SA) Exposed Surface Area (cm2)	5,300 (b
(AD) Dermal Soil Adherence (mg/cm2)	1.0 (c
(ABS) Absorption Factor (Unitless)	Chemical Specific (d
(EF) Exposure Frequency (days/year)	130 (e
(ED) Exposure Duration (years)	1.0 (f
(BW) Body Weight (kg)	70 (g
(AT1) Averaging Time - Non-carcinogenic Effects (days)	182 (h
(AT2) Averaging Time - Cancer Effects (days)	25,550 (i

Note:

a) Reasonable Maximum Exposure (RME) is defined by EPA as reasonable upperbound exposure among potentially exposed population.

b) The value is based on hands, head, forearms, and 1/2 legs (Exposure Factors Handbook; EPA, 1989a).

c) Based on the values recommended in Dermal Exposure Assessment: Principles and Applications (EPA, 1992a).

d) Based on the EPA Region IV Guidance (Feb.11, 1992), 1.0% is used as the absorption factor for organics and 0.1% is used for inorganics.

e) Based on 5 working days per week for 6 months.

f) For RME, construction activity was assumed to occur for 6 months.

g) Body weight for adults based on Standard Default Exposure Factors (EPA, 1991b).

h) Averaging time for non-carcinogenic effects based on the exposure duration.

i) Averaging time for carcinogenic effects based on lifetime of 70 years, as identified in Standard Default Exposure Factors (EPA, 1991b).

j) Exposure to subsurface soil was evaluated for Atlas Missle Area and Load Line 1 Area only.

TABLE 3-6

REASONABLE MAXIMUM EXPOSURE PARAMETERS FOR ESTIMATION OF CHEMICAL INTAKE BY INHALATION OF VOLATILIZED CHEMICALS FROM SUBSURFACE SOIL (a

Parameter	Construction Worker (i
(IR) Inhalation Rate (m3/hour)	2.50 (b
(ET)Exposure Time (hours/day)	8.0 (c
(EF) Exposure Frequency (days/year)	130 (d
(ED) Exposure Duration (years)	1.0 (e
(BW) Body Weight (kg)	70 (f
(AT1) Averaging Time - Non-carcinogenic Effects (days)	182 (g
(AT2) Averaging Time - Cancer Effects (days)	25,550 (h

Note:

a) Reasonable Maximum Exposure (RME) is defined by EPA as reasonable upperbound exposure among potentially exposed population.

b) The default value, 20 m3/day, recommended by Standard Default Exposure Factors (EPA, 1991b).

c) For RME, assumes 8 working hours per day.

d) Based on 5 working days per week for 6 months.

e) For RME, construction activity was assumed to occur for 6 months.

f) Body weight for adults based on Standard Default Exposure Factors (EPA, 1991b).

g) Averaging time for non-carcinogenic effects based on the exposure duration.

h) Averaging time for carcinogenic effects based on lifetime of 70 years, as identified in Standard Default Exposure Factors (EPA, 1991b).

i) Exposure to subsurface soil was evaluated for Atlas Missle Area and Load Line 1 Area only.

(RME duration of 70 years) is assumed. Child residents (0- to 6- years old) are assumed to have an RME exposure duration of 6 years.

On-site workers are assumed to have a reasonable maximum exposure duration of 25 years as given in OSWER Directive 9285.6-03 (EPA, 1991b). For construction workers, a construction period of 6 months (0.5 year) is assumed.

3.4.3 Exposure Frequency

Exposure frequency refers to the number of days per year spent at or near the Site. Residents are assumed to have an exposure frequency of 350 days per year (RME and average), allowing for 15 days per year for vacations, holidays, etc. (OSWER Directive 9285.6-03; EPA, 1991b).

Current and future on-site workers are assumed to spend 250 days per year on-site, based on a 5-day working week for 50 weeks per year (OSWER Directive 9285.6-03; EPA, 1991b). Hypothetical future construction workers are assumed to have an exposure frequency of 130 days per year, based on 5 working days per week for the 6 month working period.

3.4.4 Groundwater Ingestion Rate

Groundwater ingestion rates are based on data presented for the maximum intake rates in the Exposure Factors Handbook (EPA, 1989a). Adult residents are assumed to drink a maximum of 2 liters of groundwater per day. Child residents (0- to 6- years old) are assumed to ingest 1 liter per day. On-site workers are assumed to drink 1 liter per day, since only half of their daily water intake is assumed to occur during working hours.

3.4.5 Soil Ingestion Rate

The soil ingestion rate refers to the amount of soil that is ingested daily. For RME exposure, Standard Default Exposure Factors (EPA, 1991b) recommends soil ingestion rates of 50 mg/day for worker populations. Since soil excavation activity may involve increased exposure to soil, 480 mg/day was used as the soil ingestion rate for construction workers.

B07NE003702-07724

3.4.6 Body Weight

Body weights were obtained from OSWER Directive 9285.6-03 (EPA, 1991b). The assumed body weight for adults is 70 kg, used for both adult residents and Site workers. The assumed body weight for children (age 0- to 6-years old) is 15 kg.

3.4.7 Air Inhalation Rate

An air inhalation rate of 0.83 m^3/hour (Exposure Factors Handbook; EPA, 1989a) was used for evaluating inhalation during showering for both adult and child receptors. To account for increased inhalation rates during periods of moderate to heavy activity, an inhalation rate of 2.5 m^3/hour was used to evaluate inhalation during construction activities.

3.4.8 Shower Exposure Time

The RME exposure time for showering is given as 12 minutes/day (0.2 hour/day) in the Exposure Factors Handbook (EPA, 1989a). Exposure time is not applicable for soil ingestion or dermal contact.

3.4.9 Skin Surface Area

Exposed skin surface area is important when evaluating uptake of chemicals that are absorbed dermally. For shower scenarios, whole body exposure is assumed. Since body weight has been shown to strongly correlate to surface area, RAGS (EPA, 1989b) recommends use of 50th percentile body surface areas and body weight for dermal exposure to groundwater during showering or bathing. These values were used for RME and average exposures. The adult male surface area (19,400 cm^2) is assumed to represent the average surface area exposure for all adults. The total body surface areas for 0- to 6- year old children, 6,670 cm^2, was calculated as the average of surface areas (50th percentile) for the different age groups from the Exposure Factors Handbook (EPA, 1989a).

For dermal exposure to soil, RME surface area of 5300 cm^2 was estimated for hypothetical construction workers, based on the adult surface areas of hands, head, forearms, and one half of legs (Exposure Factors Handbook; EPA, 1989a).

B07NE003702-07725

3.4.10 Dermal Permeability Constant

Permeability constant is important when evaluating uptake of chemicals that are absorbed dermally. A 100% volatilization rate was assumed for VOCs, and will not available for dermal absorption. For SVOCs and explosives, the chemical specific dermal permeability constants reported in the Dermal Exposure Assessment: Principles and Applications (EPA, 1992a) were used to estimate dermal absorption. The permeability constants for TNT and TNB were assumed to be the same value as reported for DNT (0.0038 cm/hour). For HMX, the permeability constant was assumed to be the same value as the value used for RDX (0.00348) , which is calculated from the K_{ow} with the formula described in the Dermal Exposure Assessment: Principles and Applications (EPA, 1992a). A permeability constant of 0.001 cm/hour was used for all the metals.

3.4.11 Soil Adherence

Dermal soil adherence is used, in conjunction with exposed skin surface area, to define the total amount of soil adhering to exposed skin surfaces. EPA recommends 1.0 mg/cm^2 for upperbound (RME) exposure (Dermal Exposure Assessment: Principles and Applications; EPA, 1992a).

3.5 ESTIMATION OF EXPOSURE POINT CONCENTRATIONS

Exposure point concentrations are the chemical concentrations to which a receptor is exposed when contact is made with a specific environmental medium. For ingestion and dermal contact with groundwater and soil, exposure point concentrations are based on current groundwater and soil concentrations. To provide an estimation of risks associated with the most contaminated conditions, two most contaminated wells have been identified. The chemical concentrations associated with these two wells (MW-5B and MW-40B) are listed in **Table 3-7**. These wells were chosen for evaluation because they contained the highest concentrations of RDX (MW-5B) and TCE (MW-40B) (WCC, 1993), the two chemicals of concern that contributed the majority of the Site risks (based on preliminary screening).

Subsurface soil COC concentrations for the Atlas Missile Area and Load Line 1 Area are presented in **Table 3-8**. In some cases, very high UCL concentrations are calculated,

B07NE003702-07726

especially for small data sets with a high degree of variance. When the calculated 95th percent UCL of the mean concentration is higher than the reported maximum concentration for the given medium, the maximum reported concentration will be used to estimate the RME risk.

Potential exposure of construction workers to volatilized VOCs emitted from subsurface soil was evaluated using the emissions model (Farmer's model) described in **Appendix D**. The results of the emission model are presented in **Table 3-9**.

Potential exposure of residents as a result of volatilization from groundwater was evaluated for a shower scenario using the approach described in **Appendix F** (Shower Model). The air exposure point concentrations for showering are presented in **Table 3-10**.

B07NE003702-07727

TABLE 3-7

RME EXPOSURE POINT CONCENTRATIONS IN GROUNDWATER WELL MW-5B AND MW-40B

GROUP	COC	CONCENTRATION (µg/L)	
		MW-5B	MW-40B
VOCS	1,1,1-Trichloroethane	0.5 [a]	85 [b]
	1,2-Dichloroethene (Total)	0.5 [a]	85 [b]
	1,2-Dichloropropane	0.5 [a]	85 [b]
	Acetone	5 [a]	85 [b]
	Chloroform	0.5 [a]	85 [b]
	Methylene chloride	1 [a]	43 BJ
	Tetrachloroethene	0.5 [a]	85 [b]
	Trichloroethene	0.5 [a]	1800
SVOCS	Diethyl phthalate	NA	NA
	Di-n-butyl phthalate	NA	NA
	N-Nitrosodiphenylamine	NA	NA
	Phenol	NA	NA
EXPLOSIVES	1,3,5-Trinitrobenzene (TNB)	2	0.13 [b]
	2,4,6-Trinitrotoluene (TNT)	20	0.13 [b]
	2,4-Dinitrotoluene (2,4-DNT)	1	0.13 [b]
	Hexahydro-1,3,5-trinitro-1,3-5-triazine (RDX)	98	0.08 [b]
	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	45	0.13 [b]
METAL	Aluminum	NA	NA
	Lead	NA	NA
	Nickel	NA	NA
	Vanadium	NA	NA

Note:
a) Not detected in MW-5B, but assumed present at half of the detection limit.
b) Not detected in MW-40B, but assumed present at half of the detection limit.
NA - Not analyzed per the Data Quality Objectives (DQOs) identified in the RI Workplan.
BJ - Estimated value. Compound was also detected in the associated blank.

TABLE 3-8

EXPOSURE POINT CONCENTRATIONS IN SUBSURFACE SOIL (RME APPROACH)

Group	COC	Frequency of Detection	CONCENTRATION (µg/kg)		
			Maximum Detected	UCL	RME
	Atlas Missile Area				
VOCS	Benzene	10/24	2	5.50	2.00
	Acetone	3/24	130	20.20	20.20
	Trichloroethene	2/24	4	5.90	4.00
	Load Line 1 Area				
VOCS	Acetone	3/13	53	24.50	24.50
	Trichloroethene	2/13	10	7.10	7.10

Note:

VOCs were the only class of chemicals analyzed.

UCL - Upper 95% confidence limit of the mean concentration.

RME - Reasonable Maximum Exposure. RME is based on the 95%UCL of the data or the maximum detected concentrations, whichever is lower.

TABLE 3-9

AIR EXPOSURE POINT CONCENTRATIONS SUBSURFACE SOIL

GROUP	COC	RME AIR CONCENTRATION (mg/m ^{3})
Atlas Missile Area		
VOCS	Acetone	5.31E-05
	Benzene	2.58E-04
	Trichloroethene	5.48E-04
Load Line 1 Area		
VOCS	Acetone	6.43E-05
	Trichloroethene	9.72E-04

Note:
Air concentration are based on subsurface soil exposure point concentrations presented in Table 3-8, using the Farmer's Model presented in Appendix D.

TABLE 3-10

AIR VOC EXPOSURE POINT CONCENTRATIONS IN SHOWER (RME APPROACH)

Chemical Name	MW-5B (mg/m3)	MW-40B (mg/m3)
1,1,1-Trichloroethane	6.67E-03	1.13E+00
1,2-Dichloroethene (total)	6.67E-03	1.13E+00
1,2-Dichloropropane	6.67E-03	1.13E+00
Acetone	6.67E-02	1.13E+00
Chloroform	6.67E-03	1.13E+00
Methylene chloride	1.33E-02	5.74E-01
Tetrachloroethene	6.67E-03	1.13E+00
Trichloroethene	6.67E-03	2.40E+01

Note:

100% volatilization was assumed .

4.0
TOXICITY ASSESSMENT

The purpose of a toxicity assessment is to provide a summary of the potential biological effects of the COCs found on-site. This section includes a concise review of the pertinent literature on the toxic effects of the individual compounds. In particular, the acute and chronic toxicity, teratogenic/reproductive effects, mutagenicity, genotoxicity, and carcinogenicity are discussed. When available, results of epidemiological studies have been incorporated into the discussion to provide information regarding the potential effects of chemicals on human health.

In general, the COCs identified for the OU2 BRA consist of volatile and semivolatile organic compounds, explosives, and metals. The toxic and carcinogenic effects of these compounds are highly variable, and are discussed in detail in the toxicity profiles presented in **Appendix E** of this BRA.

Critical toxicity values (CTVs) are also presented in this section. The CTVs are values developed by the EPA that are used to evaluate potential cancer risks and non-carcinogenic health hazards associated with chemical exposure.

4.1 TOXICITY ASSESSMENT OF NONCARCINOGENIC EFFECTS

The non-carcinogenic CTV is known as the reference dose (RfD). Reference doses are based on the premise that non-carcinogenic (i.e., toxic) effects exhibit a threshold. As long as the chronic daily intake (CDI) of a compound is less than the reference dose, no non-carcinogenic health effect is believed to be posed by the exposure. Reference doses are developed using human and animal studies, and incorporate safety factors to ensure health protection in the most sensitive population.

To develop a toxicity value for noncarcinogenic effects, the approach is to identify this threshold dose or no-observed-adverse-effect level (NOAEL). A NOAEL is the highest level (determined in epidemiological studies or animal studies) at which there was no statistically or biologically significant effect of concern, often called the "critical toxic effect." For

B07NE003702-07732

certain substances, only a LOAEL, or "lowest-observed-adverse-effect level," has been determined. This is the lowest dose of a substance that produces either a statistically or biologically significant indication of the critical toxic effect. The NOAEL or the LOAEL may be used to calculate the RfD (reference dose) of a particular chemical.

RfDs are calculated by dividing the NOAEL (or LOAEL) by uncertainty factors, which generally range from 10 to 1,000. For example, uncertainties include variations in the sensitivity of individuals within a population and the extrapolation of data from experimental animals to humans. The RfD is expressed in units of milligrams of chemical per kilogram of body weight per day (mg/kg-day) for oral exposure and in milligrams of chemical per cubic meter of air (mg/m^3) for inhalation exposure (called a Reference Concentration or RfC). A body weight of 70 kg and a respiration rate of 20 m^3/day are generally used to convert the RfC (mg/m^3) to a dose (i.e., mg/kg-day).

Dermal RfDs can be derived from oral RfDs by adjusting the oral value to account for the percent of gastrointestinal absorption associated with the study used to derive the RfD (i.e., converting the oral RfD from an "administered" to an "absorbed" dose). However, this approach is not currently recommended by ECAO because absorption efficiency is unknown for most compounds (ECAO, 1993). ECAO currently recommends use of oral RfDs to evaluate dermal exposure, although it should be noted that this approach may lead to an underestimation of dermal risk for some compounds (ECAO, 1993). The methodology for deriving RfDs is more fully described in RAGS (EPA, 1989b).

The EPA has developed various types of RfDs depending on the exposure route (ingestion or inhalation), the critical effect, and the length of exposure being evaluated (chronic or subchronic). The EPA bases the RfD on the most sensitive animal species tested (i.e., the species that experiences adverse effects at the lowest dose).

The EPA defines a chronic RfD as an estimate of a daily exposure level for the human population that is unlikely to result in deleterious effects during a lifetime (i.e., 70 years, according to EPA guidance). A chronic RfD is used to evaluate the potential noncarcinogenic hazards associated with long-term chemical exposures (7 years to a lifetime).

B07NE003702-07733

Subchronic RfDs have been developed to characterize potential noncarcinogenic hazards associated with short-term chemical exposures. The EPA defines subchronic exposure as periods ranging from 2 weeks to 7 years (RAGS). Subchronic RfDs tend to be higher, generally by an order of magnitude, than chronic RfDs because of the shorter exposure duration.

Chronic and subchronic RfDs for the COCs are shown in **Table 4-1**. For the ingestion route, the RfD is for the administered dose (assuming 100 percent absorption by the gastrointestinal tract) unless otherwise noted. For the inhalation route, 100 percent of a chemical that is inhaled and retained by the lungs was assumed to be absorbed into the bloodstream unless otherwise noted. Both assumptions enhance the conservatism of the risk assessment. RfDs have also been developed from many of the carcinogens to account for their noncarcinogenic effects.

The potential for noncarcinogenic effects to occur as a result of exposure is evaluated by comparing the exposure level, or daily chemical intake, over a specified time period (e.g., subchronic or chronic) with a RfD derived for a similar exposure period. A Hazard Quotient (HQ) is derived for each chemical as follows:

$$HQ = [Average\ Daily\ Intake] \ / \ [RfD]$$

If exposure is equivalent to or less than the RfD, the HQ is 1.0 or less, which represents an intake level unlikely to be associated with potential adverse effect due to the chemical. If exposure exceeds the RfD, the resulting HQ is exceed 1.0 and it will be concluded that a hazard may exist. For each noncarcinogenic chemical of potential concern specific to each exposure pathway, a HQ will be derived. HQs for each chemical are then summed for each exposure pathway to derive a value referred to as a Hazard Index (HI):

$$HI = HQ_1 + HQ_2 + HQ_3 \ldots\ldots\ldots\ldots\ldots\ldots + HQ_n$$

B07NE003702-07734

TABLE 4-1

CRITICAL TOXICITY VALUES FOR THE CHEMICALS OF CONCERN

Chemical	Reference Dose (mg/kg-day)				Slope Factor (mg/kg-day)-1		EPA Weight of Evidence
	Inhalation		Oral				
	Subchronic	Chronic	Subchronic	Chronic	Inhalation	Oral	
VOCs							
1,1,1-Trichloroethane	2.90E-01	2.90E-01	9.00E-02	9.00E-02	nc	nc	-
1,2-Dichloroethene (Total)	na	na	9.00E-03 [c]	9.00E-03 [c]	nc	nc	-
1,2-Dichloropropane	3.71E-03 [f]	1.14E-03 [g]	na	na	na	6.80E-02	B2
Acetone	na	na	1.00E+00 [d]	1.00E-01 [b]	nc	nc	-
Benzene	na	na	na	na	2.90E-02 [b]	2.90E-02 [b]	A
Chloroform	na	na	1.00E-02	1.00E-02	8.10E-02	6.10E-03	B2
Methylene chloride	8.60E-01 [d]	8.60E-01 [d]	6.00E-02 [d]	6.00E-02 [b]	1.65E-03 [b]	7.50E-03 [b]	B2
Tetrachloroethene	na	na	1.00E-02	1.00E-02	2.00E-03	5.20E-02	B2
Trichloroethene	na	na	na	na	1.70E-02	1.10E-02 [c]	B2
SVOCs							
Diethyl phthalate	na	na	8.00E+00	8.00E-01 [b]	nc	nc	-
Di-n-butyl phthalate	na	na	1.00E+00 [d]	1.00E-01 [b]	nc	nc	-
N-Nitrosodiphenylamine	na	na	na	na	na	4.90E-03	B2
Phenol	na	na	6.00E-01 [d]	6.00E-01 [b]	nc	nc	-
EXPLOSIVES							
TNB	na	na	5.00E-05	5.00E-05	nc	nc	-
TNT	na	na	5.00E-04	5.00E-04	na	3.00E-02	C
2,4-DNT	na	na	2.00E-03 [d]	2.00E-03 [b]	na	6.80E-01 [b]	B2
RDX	na	na	3.00E-03	3.00E-03	na	1.10E-01	C
HMX	na	na	na	5.00E-02	nc	nc	-
METALS							
Aluminum	na	na	na	na	na	na	na
Lead	na	na	na	na	na	na	na
Nickel	na	na	2.00E-02	2.00E-02	nc [h]	nc	-
Vanadium	na	na	7.00E-03 [c]	7.00E-03 [c]	nc	nc	-

Note:

a) Subchronic Reference Dose used for evaluation of construction worker scenario (i.e., short duration exposure). Chronic values were used in risk calculations if no subscronic values were available. b) EPA Integrated Risk Information (IRIS) system database.

c) Health Effects Assessment Summary Tables (HEAST; EPA, 1991).

d) Health Effects Assessment Summary Tables (HEAST; EPA, 1992).

e) Health Effects Assessment Summary Tables, Supplement A (HEAST; EPA, 1992).

f) Derived from subschronic RfC (HEAST; EPA, 1993).

g) Derived from chronic RfC (IRIS; EPA, 1994).

h) Nickel dust/subsulfide is considered an inhalation carcinogen, but not other forms or exposure routes.

na - not available

nc - not considered a carcinogenic compound

ECAO was consulted for identification of ciritical toxicity values.

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HIs greater than 1.0 should generally be viewed as indicating that exposure to a particular medium identified in the exposure scenario represents a potential human health hazard. Exposure pathway HIs are summed across pathways whenever appropriate, since individuals may be simultaneously exposed to chemicals via more than one pathway (e.g., to both soil and groundwater).

4.2 TOXICITY ASSESSMENT OF CARCINOGENIC EFFECTS

The carcinogenic CTV is termed the slope factor (SF). Slope factors are developed based on a dose-response curve for carcinogenicity of the specific chemicals. As with RfD values, slope factors are developed from human and animal studies and are designed to be health protective (i.e., to overestimate the actual risks). The SF is used to estimate an upper-bound probability of an individual developing cancer as a result of exposure to a potential carcinogen. Carcinogens with EPA-derived slope factors are also given an EPA weight-of-evidence classification whereby potential carcinogens are grouped according to the likelihood that the chemical is a human carcinogen, depending on the quality and quantity of carcinogenic potency data for a given chemical. **Table 4-2** presents the EPA weight-of-evidence classification system.

In estimating the risk posed by potential carcinogens, it is the common practice of the EPA and other regulatory agencies to assume that any exposure level is associated with a finite probability, however minute, of producing a carcinogenic response. EPA assumes that a small number of molecular events can evoke changes in a single cell that can lead to uncontrolled cellular proliferation. This mechanism for carcinogenicity is referred to as "non-threshold" since there is theoretically no level of exposure for such a substance that does not pose a small, though finite, probability of producing a carcinogenic response.

Slope factors are based primarily on the results of animal studies. There is uncertainty whether all animal carcinogens are also carcinogenic in humans. While many chemical substances are carcinogenic in one or more animal species, only a small number of chemical substances are known to be human carcinogens. The EPA assumes that humans are as sensitive to all animal carcinogens as the most sensitive animal species. This policy decision is designed to prevent underestimating risk, and introduces the potential to overestimate carcinogenic risk.

B07NE003702-07736

TABLE 4-2

EPA WEIGHT-OF-EVIDENCE CARCINOGENIC CLASSIFICATION OF CHEMICALS

Group	Description	Description of Evidence
A	Human carcinogen	Sufficient evidence from epidemiologic studies to support a causal association between exposure and cancer.
B1 or B2	Probable human carcinogen	B1 indicates that limited human data are available from epidemiologic studies. B2 indicates sufficient evidence in animals and inadeuqeate or no evidence in humans of carcinogneicity.
C	Possible human carcinogen	Limited evidence of carcinogenicity in animals.
D	Not classifiable as to human carcinogenicity	Inadequate evidence of carcinogenicity in animals.
E	No evidence of carcinogenicity in humans	No evidence of carcinogenicity in at least two adequate animal tests or in both epidemiologic and animal studies.

Note:
Substances in groups B and C are considered potential carcinogens.

It is generally assumed by EPA in developing SFs that the risk of cancer is linearly related to dose. A linearized multistage model is one of the most commonly used models by EPA for low-dose extrapolation of experimentally derived data to the low dose range. This conservative mathematical model is based on the multi-stage theory of carcinogenesis wherein the response is assumed to be linear at low doses. From the slope of the extrapolation curve estimated by the model, the EPA calculates the upper 95th percent confidence limit of the slope. This value, the slope factor (SF), expressed in units of $(mg/kg\text{-}day)^{-1}$, is used to convert the average daily intake of chemical, normalized over a lifetime, directly to a cancer risk. This represents an estimation of an upper-bound incremental lifetime probability that an individual will develop cancer as a result of exposure to a potential carcinogen. This model provides a conservative estimate of cancer risk at low doses, and is likely to overestimate the actual cancer risk. The EPA acknowledges that actual slope factors are likely to be between zero and the estimate provided by the linearized multistage model (EPA; 1989a). The slope factors and weight-of-evidence classifications for the COCs are included in **Table 4-1**.

Risks associated with individual COCs can be derived by multiplying the SF and the estimated chronic daily intake (i.e., average daily intake for entire lifetime) for each exposure pathway as follows:

$$\textit{Risk Estimate} = \textit{Chronic Daily Intake} \times \textit{Slope Factor}$$

An overall risk estimate for each exposure scenario can be calculated by combining the risk estimates for individual chemicals and exposure routes. Risk estimates are then compared with EPA's acceptable risk range of 1×10^{-4} (1 in 10,000) to 1×10^{-6} (1 in 1,000,000) incremental excess lifetime cancer risk (NCP, 1990).

Lead cannot be evaluated in a BRA using the same methods applied to other contaminants. The EPA action level for lead is 15 µg/L. EPA does not furnish either reference doses (RfDs) or slope factors (SFs) for lead. As presented in **Appendix A**, only one (out of thirteen) groundwater sample contain Lead at a concentration (2.6 µg/L) close to the detection limit (2.0 µg/L). The lead concentration detected is very low, five times below the EPA action level, and should not cause any health concern.

B07NE003702-07738

4.3 SOURCE OF THE CRITICAL TOXICITY VALUES

The RfD and SF values listed in the present risk assessment were obtained from the following sources:

- EPA's Integrated Risk Information System (EPA, 1992c) on-line database system
- EPA's Health Effects Assessment Summary Tables (EPA, 1992b, 1991a)

Available RfDs and SFs for each COC are presented in **Table 4-1**. It should be noted that oral RfD and SF values were used to evaluate both oral and dermal exposure. In addition, chemicals which did not have inhalation values, such as acetone and DCE, were not evaluated via the inhalation pathway (at the recommendation of ECAO). For compounds with no subchronic RfDs, chronic values were used.

B07NE003702-07739

5.1 PROCEDURES FOR CALCULATION OF POTENTIAL CANCER RISK AND NON-CARCINOGENIC HAZARDS

The purpose of risk characterization is to quantify the potential health risks associated with exposure to Site chemicals. In this portion of the BRA, potential RME health risks are estimated for each compound and exposure pathway. These risk estimates are calculated using the exposure parameters and exposure point concentrations developed in Section 3.0 (**Tables 3-1** through **3-10**) and the CTVs reported in the toxicity assessment (**Table 4-1**).

As discussed in Section 4.0 (Toxicity Assessment), the potential non-carcinogenic health hazard is calculated for each compound as the ratio of the chronic daily intake (CDI) to the respective reference dose (RfD). The ratio is termed the Hazard Quotient (HQ). A HQ in excess of 1.0 indicates that the threshold has been exceeded and a potential hazard may exist, while a value equal to or less than 1.0 indicates the probable absence of a health hazard. The summation of the HQs for all compounds is termed the Hazard Index (HI), which is also compared to a threshold value of 1.0. The assumption of additivity of sub-threshold HQ values in calculating an HI is only valid when the following conditions are met:

- All compounds affect the same target organs
- There are no antagonistic or synergistic effects between compounds (Little is known about these interactions for most chemicals)

The first condition is not true in many cases (see **Appendix E** for a discussion of the target organ effects for each compound). Assuming that no synergistic effects occur, the assumption of additivity does not appear to be valid for all compounds. The use of an HI in this BRA should be considered highly conservative, and will overestimate the potential for a non-carcinogenic health hazard.

Potential cancer risks are calculated for each compound as the arithmetic product of the CDI and the respective slope factor (SF). The estimated cancer risks for each compound may

B07NE003702-07740

be summed to yield an overall cancer risk for each scenario. The basis for this approach is the regulatory assumption that cancer risks are additive (RAGS; EPA, 1989b). This approach is very conservative and is likely to overestimate the true cancer risks associated with exposure to the COCs. In addition to the conservatism associated with additivity, SFs are highly conservative based on toxicological criteria (see toxicity profiles in **Appendix E**). The cancer risks for the individual chemicals and pathways are presented in **Appendix C**.

To calculate RME potential risks, the two most contaminated wells (MW-5B and MW-40B) were evaluated. These wells were chosen for evaluation because they contained the highest concentrations of RDX (MW-5B) and TCE (MW-40B) (WCC, 1993), the two COCs that contributed the majority of the Site risks. By using the contaminant concentrations (**Table 3-7**, **3-8**, **3-9**, and **3-10**) and the maximum exposure parameters (**Tables 3-1** to **3-6**), the potential RME cancer risks and non-carcinogenic hazards associated with these two wells were calculated.

5.2 RME POTENTIAL CANCER RISKS AND NON-CARCINOGENIC HAZARDS FROM GROUNDWATER EXPOSURE - SITE WORKERS AND RESIDENTS

A summary of potential cancer risks and non-carcinogenic HIs associated with exposure to groundwater in MW-5B and MW-40B are presented in **Table 5-1.** Although the results cannot be considered representative of groundwater exposure, these two wells are used to conservatively estimate upperbound (RME) groundwater risks on or downgradient from the Site. The cancer risks and the HQ values for the individual chemicals and pathways are presented in **Appendix C**.

5.2.1 MW-5B

The highest concentration of RDX (98 µg/L) was found in MW-5B. As shown in **Table 5-1**, the RME HIs associated with exposure to groundwater in MW-5B are over 1.0 for all resident and Site worker scenarios (7 for child resident, 3 for adult resident, and 1 for on-site worker), indicating that a potential non-carcinogenic hazard may exist. Ingestion of groundwater contributed significantly to potential non-carcinogenic hazard, with RDX, TNB and TNT contributing significantly to the overall hazard from groundwater.

B07NE003702-07741

TABLE 5-1

SUMMARY OF POTENTIAL CANCER RISKS AND NON-CARCINOGENIC HAZARD INDICES (HIs) MW-5B

RECEPTOR ROUTE	HAZARD INDEX (HI)	CANCER RISK
Adult Resident [a]		
Groundwater Ingestion	3	3E-04
Shower Dermal	0.02	5E-07
Shower Inhalation	0.01	2E-06
TOTAL	**3**	**3E-04**
Child Resident		
Groundwater Ingestion	7	7E-05
Shower Dermal	0.03	6E-08
Shower Inhalation	0.06	6E-07
TOTAL	**7**	**7E-05**
Site Worker		
Groundwater Ingestion	1	4E-05
Shower Dermal	0.004	4E-08
Shower Inhalation	0.003	1E-07
TOTAL	**1**	**4E-05**
Construction Worker (Atlas Missile Area)		
Shower Dermal	0.009	2E-09
Shower Inhalation	0.007	6E-09
Groundwater Subtotal	**0.020**	**8E-09**
Subsurface Soil Ingestion	0.0000001	4E-12
Subsurface Soil Dermal Contact	0.00000001	4E-13
Subsurface Soil VOC inhalation	0.00 [b]	2E-08
Subsurface Soil Subtotal	**0.0000001**	**2E-08**
TOTAL	**0.02**	**3E-08**
Construction Worker (Load Line 1 Area)		
Shower Dermal	0.009	2E-09
Shower Inhalation	0.002	6E-09
Groundwater Subtotal	**0.02**	**8E-09**
Subsurface Soil Ingestion	0.0000001	3E-12
Subsurface Soil Dermal Contact	0.00000001	3E-13
Subsurface Soil VOC inhalation	0.00 [b]	2E-08
Subsurface Soil Subtotal	**0.0000001**	**2E-08**
TOTAL	**0.02**	**3E-08**

Note:

a) 70 year exposure is assumed.

b) No inhalation Reference Dose (RfD) for chemicals of conern in the subsurface soil.

TABLE 5-2

SUMMARY OF RME POTENTIAL CANCER RISKS AND NON-CARCINOGENIC HAZARD INDICES (HIs)
MW-40B

RECEPTOR ROUTE	HAZARD INDEX (HI)	CANCER RISK
Adult Resident [a]		
Groundwater Ingestion	0.9	8E-04
Shower Dermal	0.0006	2E-08
Shower Inhalation	2	1E-03
TOTAL	**3**	**2E-03**
Child Resident		
Groundwater Ingestion	2	2E-04
Shower Dermal	0.0009	2E-09
Shower Inhalation	11	5E-04
TOTAL	**13**	**6E-04**
Site Worker		
Groundwater Ingestion	0.3	1E-04
Shower Dermal	0.0001	2E-09
Shower Inhalation	0.6	1E-04
TOTAL	**0.9**	**2E-04**
Construction Worker (Atlas Missile Area)		
Shower Dermal	0.0003	7E-11
Shower Inhalation	1	4E-06
Groundwater Subtotal	**1**	**4E-06**
Subsurface Soil Ingestion	0.0000001	4E-12
Subsurface Soil Dermal Contact	0.00000001	4E-13
Subsurface Soil VOC inhalation	0.00 [b]	2E-08
Subsurface Soil Subtotal	**0.0000001**	**2E-08**
TOTAL	**1**	**4E-06**
Construction Worker (Load Line 1 Area)		
Shower Dermal	0.0003	7E-11
Shower Inhalation	1	4E-06
Groundwater Subtotal	**1**	**4E-06**
Subsurface Soil Ingestion	0.0000001	3E-12
Subsurface Soil Dermal Contact	0.00000001	3E-13
Subsurface Soil VOC inhalation	0.00 (b	2E-08
Subsurface Soil Subtotal	**0.0000001**	**2E-08**
TOTAL	**1**	**4E-06**

Note:

a) 70 year exposure is assumed.

b) No inhalation Reference Dose (RfD) for chemicals of concern in the subsurface soil.

Potential total cancer risks associated with adult residential exposure to MW-5B groundwater (3×10^{-4}) exceeds the EPA acceptable range of 10^{-4} to 10^{-6} for acceptable site risk. Cancer risks associated with child resident and on-site worker scenarios (child, 7×10^{-5}; on-site worker, 4×10^{-5}) are within the acceptable risk of 10^{-4} to 10^{-6}. Ingestion of groundwater contributed significantly to potential cancer risks, and RDX was the chemical contributing the greatest portion of overall risk from groundwater.

5.2.2 MW-40B

The highest concentration of TCE was found in MW-40B (1,800 µg/L). The HIs for child (13) and adult residents (3) are in excess of the threshold value of 1.0, indicating that exposure to groundwater in MW-40B may result in a potential non-carcinogenic hazard for residential scenarios. The HI for the on-site worker scenario (0.9) is below the threshold value of 1.0. Inhalation of volatiles during showering was the significant contributor to potential non-carcinogenic hazard from groundwater, with 1,2-dichloropropane contributing the greatest proportion of the calculated hazard.

Potential cancer risks associated with exposure to groundwater in MW-40B exceeded the EPA acceptable risk range of 10^{-4} to 10^{-6} for all evaluated residential and on-site worker exposure scenarios (6×10^{-4} for child RME, 2×10^{-3} for adult RME, and 2×10^{-4} for on-site worker). Ingestion of groundwater and inhalation of volatiles during showering were both significant contributors to potential cancer risks, and TCE was the chemical contributing the greatest proportion of overall risk from groundwater.

5.3 RME POTENTIAL CANCER RISKS AND NON-CARCINOGENIC HAZARDS - CONSTRUCTION WORKER

Site construction worker exposure is included in the OU2 BRA to evaluate the risks associated with the subsurface soil in the Atlas Missile Area and Load Line 1 Area as well as risks and hazards associated with inhaled and dermal contact while showering. The potential cancer risks and non-carcinogenic hazards associated with the construction worker scenario are included in **Tables 5-1** and **5-2**.

B07NE003702-07744

5.3.1 MW-5B

HIs (groundwater and soil combined) for potentially exposed construction workers in both the Atlas Missile and Load Line 1 areas are below the threshold value of 1.0 (0.02 for Atlas Missile Area, and 0.01 for Load Line 1 Area), indicating that exposure to chemicals in groundwater and subsurface soil in this area are not likely to result in unacceptable non-carcinogenic health effects to the construction workers. Groundwater exposure pathways during showering were the major contributors to the non-carcinogenic hazard.

Potential cancer risks for construction worker scenarios associated with groundwater and subsurface soil exposure are within or below the EPA acceptable risk range of 1×10^{-4} to 1×10^{-6} (Atlas Missile Area: 3×10^{-8}, and Load Line 1 Area: 3×10^{-8}). The majority of cancer risk was associated with the groundwater pathways.

5.3.2 MW-40B

HIs (groundwater and soil combined) for potentially exposed construction workers in both the Atlas Missile Area (HI = 1) and Load Line 1 area (HI = 1) are in excess of the threshold value of 1.0, while inhalation of volatiles during showering was the significant contributors to potential non-carcinogenic hazard, indicating that exposure to groundwater in MW-40B may result in a potential non-carcinogenic hazard for construction worker scenario. Inhalation of 1,2-dichloropropane during showering was the major contributor to potential non-carcinogenic hazard from groundwater. Soil exposure contributed little to overall hazards.

Potential cancer risks for construction worker scenarios associated with groundwater and subsurface soil exposure are within or below the EPA acceptable risk range of 1×10^{-4} to 1×10^{-6} (Atlas Missile Area: 4×10^{-6}, and Load Line 1 Area: 4×10^{-6}). The majority of cancer risk was associated with the groundwater pathways, while inhalation of volatiles during showering was the significant contributor to potential cancer risks, and TCE was the chemical contributing the greatest proportion of overall risk from groundwater.

B07NE003702-07745

5.4 CUMULATIVE RISKS FOR SOIL AND GROUNDWATER PATHWAYS

The purpose of this section is to integrate the results of the OU1 and OU2 BRAs. To address risks from multiple pathways, it is assumed that the risks/hazards that were reported for Site soil in the OU1 BRA are directly additive to the risks/hazards calculated for groundwater in the OU2 BRA.

Potential cancer risks and non-carcinogenic health hazards were evaluated for surface soil in the OU1 BRA (SEC Donohue, 1993b). In the OU1 BRA, surface soil areas were subdivided to better identify areas of greatest potential concern. To estimate the maximum site related risks for residential scenarios, the RME cancer risks and RME hazard indices associated with soil ingestion and garden vegetables (summarized in the **Table 5-13** of the OU1 BRA, SEC Donohue, 1993b) were added to the OU2 groundwater results. For on-site workers, the potential cancer risks and hazard indices summarized in the OU1 BRA Table 5-4 and Table 5-9 (SEC Donohue, 1993b) were added to the OU2 groundwater results. The cumulative cancer risks and health hazards are presented in **Tables 5-3** and **5-4**.

Although the HIs associated with RME groundwater exposure in MW-5B (presented in **Table 5-3**)and MW-40B (presented in **Table 5-4**) are over 1.0 for almost all scenarios, the primary contributor to site HIs in most cases was exposure to site soil. In most scenarios, groundwater exposure contributed little to overall risks and hazards. Cumulative soil/groundwater HIs were as large as 5000 (child resident), 2000 (adult resident) and 4.0 (on-site worker), indicating that this area presents a potential non-carcinogenic health hazard. These HIs were primarily a result of exposure to explosives in soil. The cumulative cancer risks for soil (OU1) and groundwater (OU2) were also driven by the soil exposures. Cumulative soil/groundwater cancer risks were estimated to be as high as 6×10^{-2} (adult residents) and 6×10^{-5} (on-site workers), and were due primarily to exposure to Site soil.

5.5 LEAD

Although lead was identified as a COC in groundwater (**Table 2-7**), it was found in only one well at a low concentration (2.6 µg/L). This concentration is below the EPA action level or 15 µg/L and should not present a potential health threat at this Site.

B07NE003702-07746

TABLE 5-3

SUMMARY OF CUMULATIVE CANCER RISKS AND HAZARD INDICES (HIs) FOR SOIL (OU1) AND GROUNDWATER (OU2) PATHWAYS (RME EXPOSURE) WELL MW-5B

OU1 Source Area	Receptor	HAZARD INDICES			CANCER RISK		
		OU1	OU2	TOTAL	OU1	OU2	TOTAL
LL1A	Child	45	7	**52**	NA	7E-05	–
	Adult	22	3	**25**	4E-04	3E-04	**7E-04**
	On-site Worker	0.2	1	**1**	1E-06	4E-05	**4E-05**
LL1B	Child	3,400	7	**3,407**	NA	7E-05	-
	Adult	1,070	3	**1,073**	2E-02	3E-04	**2E-02**
	On-site Worker	2	1	**3**	1E-05	4E-05	**5E-05**
LL1C	Child	3,400	7	**3,407**	NA	7E-05	-
	Adult	1,060	3	**1,063**	2E-02	3E-04	**2E-02**
	On-site Worker	2	1	**3**	1E-05	4E-05	**5E-05**
LL1D	Child	220	7	**227**	NA	7E-05	-
	Adult	84	3	**87**	1E-03	3E-04	**1E-03**
	On-site Worker	0.3	1	**1**	1E-06	4E-05	**4E-05**
LL1E	Child	670	7	**677**	NA	7E-05	-
	Adult	310	3	**313**	4E-03	3E-04	**4E-03**
	On-site Worker	0.1	1	**1**	6E-07	4E-05	**4E-05**
LL1F	Child	22	7	**29**	NA	7E-05	-
	Adult	8.4	3	**11**	1E-04	3E-04	**4E-04**
	On-site Worker	0.01	1	**1**	4E-08	4E-05	**4E-05**
LL1G	Child	220	7	**227**	NA	7E-05	-
	Adult	73	3	**76**	1E-03	3E-04	**1E-03**
	On-site Worker	0.06	1	**1**	3E-07	4E-05	**4E-05**
LL2A	Child	1,100	7	**1,107**	NA	7E-05	-
	Adult	420	3	**423**	5E-02	3E-04	**5E-02**
	On-site Worker	3	1	**4**	6E-05	4E-05	**1E-04**
LL2B	Child	5,150	7	**5,157**	NA	7E-05	-
	Adult	2,100	3	**2,103**	5E-02	3E-04	**5E-02**
	On-site Worker	4.0	1	**5**	3E-05	4E-05	**7E-05**
LL2C	Child	210	7	**217**	NA	7E-05	-
	Adult	84	3	**87**	2E-02	3E-04	**2E-02**
	On-site Worker	0.3	1	**1**	8E-06	4E-05	**5E-05**
LL2D	Child	5	7	**12**	NA	7E-05	-
	Adult	2	3	**5**	7E-04	3E-04	**1E-03**
	On-site Worker	0.003	1	**1**	2E-07	4E-05	**4E-05**
LL3A	Child	27	7	**34**	NA	7E-05	-
	Adult	11	3	**14**	2E-04	3E-04	**5E-04**
	On-site Worker	0.01	1	**1**	5E-08	4E-05	**4E-05**

TABLE 5-3

SUMMARY OF CUMULATIVE CANCER RISKS AND HAZARD INDICES (HIs) FOR SOIL (OU1) AND GROUNDWATER (OU2) PATHWAYS (RME EXPOSURE) WELL MW-5B

OU1 Source Area	Receptor	HAZARD INDICES			CANCER RISK		
		OU1	OU2	TOTAL	OU1	OU2	TOTAL
LL3B	Child	1,100	7	**1,107**	NA	7E-05	-
	Adult	420	3	**423**	7E-03	3E-04	**7E-03**
	On-site Worker	1	1	**2**	5E-06	4E-05	**5E-05**
LL3C	Child	4	7	**11**	NA	7E-05	-
	Adult	2	3	**5**	2E-05	3E-04	**3E-04**
	On-site Worker	0.01	1	**1**	3E-08	4E-05	**4E-05**
LL3D	Child	73	7	**80**	NA	7E-05	-
	Adult	32	3	**35**	5E-04	3E-04	**8E-04**
	On-site Worker	0.04	1	**1**	2E-07	4E-05	**4E-05**
LL4A	Child	27	7	**34**	NA	7E-05	-
	Adult	11	3	**14**	3E-04	3E-04	**6E-04**
	On-site Worker	0.02	1	**1**	2E-07	4E-05	**4E-05**
LL4B	Child	1	7	**8**	NA	7E-05	-
	Adult	0.3	3	**3**	4E-06	3E-04	**3E-04**
	On-site Worker	0.0001	1	**1**	6E-10	4E-05	**4E-05**
BPGA	Child	66	7	**73**	NA	7E-05	-
	Adult	34	3	**37**	5E-03	3E-04	**5E-03**
	On-site Worker	1	1	**2**	9E-06	4E-05	**5E-05**
BPGB	Child	3	7	**10**	NA	7E-05	-
	Adult	1	3	**4**	5E-05	3E-04	**3E-04**
	On-site Worker	0.01	1	**1**	2E-07	4E-05	**4E-05**
BPGC	Child	0.3	7	**7**	NA	7E-05	-
	Adult	0.1	3	**3**	3E-05	3E-04	**4E-04**
	On-site Worker	0.001	1	**1**	5E-08	4E-05	**4E-05**
BBA	Child	1	7	**8**	NA	7E-05	-
	Adult	1	3	**4**	5E-06	3E-04	**3E-04**
	On-site Worker	0.01	1	**1**	7E-10	4E-05	**4E-05**

Note:

NA - Not applicable, cancer risk evaluated for adult residents only.

OU1 HIs and Cancer risk values from Tables 5-4 and 5-9 (On-site workers) and 5-13 (resident).

TABLE 5-4

SUMMARY OF CUMULATIVE CANCER RISKS AND HAZARD INDICES (HIs) FOR SOIL (OU1) AND GROUNDWATER (OU2) PATHWAYS (RME EXPOSURE) WELL MW-40B

OU1 Source Area	Receptor	HAZARD INDICES			CANCER RISK		
		OU1	OU2	TOTAL	OU1	OU2	TOTAL
LL1A	Child	45	13	**58**	NA	7E-04	–
	Adult	22	3	**25**	4E-04	2E-03	**2E-03**
	On-site Worker	0.2	0.9	**1**	1E-06	2E-04	**2E-04**
LL1B	Child	3,400	13	**3,413**	NA	7E-04	-
	Adult	1,070	3	**1,073**	2E-02	2E-03	**2E-02**
	On-site Worker	2	0.9	**3**	1E-05	2E-04	**2E-04**
LL1C	Child	3,400	13	**3,413**	NA	7E-04	-
	Adult	1,060	3	**1,063**	2E-02	2E-03	**2E-02**
	On-site Worker	2	0.9	**3**	1E-05	2E-04	**2E-04**
LL1D	Child	220	13	**233**	NA	7E-04	-
	Adult	84	3	**87**	1E-03	2E-03	**3E-03**
	On-site Worker	0.3	0.9	**1**	1E-06	2E-04	**2E-04**
LL1E	Child	670	13	**683**	NA	7E-04	-
	Adult	310	3	**313**	4E-03	2E-03	**6E-03**
	On-site Worker	0.1	0.9	**1**	6E-07	2E-04	**2E-04**
LL1F	Child	22	13	**35**	NA	7E-04	-
	Adult	8	3	**11**	1E-04	2E-03	**2E-03**
	On-site Worker	0.01	0.9	**0.9**	4E-08	2E-04	**2E-04**
LL1G	Child	220	13	**233**	NA	7E-04	-
	Adult	73	3	**76**	1E-03	2E-03	**3E-03**
	On-site Worker	0.06	0.9	**1**	3E-07	2E-04	**2E-04**
LL2A	Child	1,100	13	**1113**	NA	7E-04	-
	Adult	420	3	**423**	5E-02	2E-03	**5E-02**
	On-site Worker	3	0.9	**4**	6E-05	2E-04	**3E-04**
LL2B	Child	5,150	13	**5163**	NA	7E-04	-
	Adult	2,100	3	**2103**	5E-02	2E-03	**5E-02**
	On-site Worker	4	0.9	**5**	3E-05	2E-04	**2E-04**
LL2C	Child	210	13	**223**	NA	7E-04	-
	Adult	84	3	**87**	2E-02	2E-03	**2E-02**
	On-site Worker	0.3	0.9	**1**	8E-06	2E-04	**2E-04**
LL2D	Child	5	13	**18**	NA	7E-04	-
	Adult	2	3	**5**	7E-04	2E-03	**3E-03**
	On-site Worker	0.003	0.9	**0.9**	2E-07	2E-04	**2E-04**
LL3A	Child	27	13	**40**	NA	7E-04	-
	Adult	11	3	**14**	2E-04	2E-03	**2E-03**
	On-site Worker	0.01	0.9	**0.9**	5E-08	2E-04	**2E-04**

TABLE 5-4

SUMMARY OF CUMULATIVE CANCER RISKS AND HAZARD INDICES (HIs) FOR SOIL (OU1) AND GROUNDWATER (OU2) PATHWAYS (RME EXPOSURE) WELL MW-40B

OU1 Source Area	Receptor	HAZARD INDICES			CANCER RISK		
		OU1	OU2	TOTAL	OU1	OU2	TOTAL
LL3B	Child	1,100	13	**1,113**	NA	7E-04	-
	Adult	420	3	**423**	7E-03	2E-03	**9E-03**
	On-site Worker	1	0.9	**2.0**	5E-06	2E-04	**2E-04**
LL3C	Child	4	13	**17**	NA	7E-04	-
	Adult	2	3	**5**	2E-05	2E-03	**2E-03**
	On-site Worker	0.01	0.9	**0.9**	3E-08	2E-04	**2E-04**
LL3D	Child	73	13	**86**	NA	7E-04	-
	Adult	32	3	**35**	5E-04	2E-03	**3E-03**
	On-site Worker	0.04	0.9	**0.9**	2E-07	2E-04	**2E-04**
LL4A	Child	27	13	**40**	NA	7E-04	-
	Adult	11	3	**14**	3E-04	2E-03	**2E-03**
	On-site Worker	0.02	0.9	**0.9**	2E-07	2E-04	**2E-04**
LL4B	Child	0.7	13	**14**	NA	7E-04	-
	Adult	0.3	3	**3**	4E-06	2E-03	**2E-03**
	On-site Worker	0.0001	0.9	**0.9**	6E-10	2E-04	**2E-04**
BPGA	Child	66	13	**79**	NA	7E-04	-
	Adult	34	3	**37**	5E-03	2E-03	**7E-03**
	On-site Worker	1	0.9	**2**	9E-06	2E-04	**2E-04**
BPGB	Child	3	13	**16**	NA	7E-04	-
	Adult	1	3	**4**	5E-05	2E-03	**2E-03**
	On-site Worker	0.01	0.9	**0.9**	2E-07	2E-04	**2E-04**
BPGC	Child	0.3	13	**13**	NA	7E-04	-
	Adult	0.1	3	**3**	3E-05	2E-03	**2E-03**
	On-site Worker	0.001	0.9	**0.9**	5E-08	2E-04	**2E-04**
BBA	Child	1	13	**14**	NA	7E-04	-
	Adult	1	3	**4**	5E-06	2E-03	**2E-03**
	On-site Worker	0.01	0.9	**0.9**	7E-10	2E-04	**2E-04**

Note:

NA - Not applicable, cancer risk evaluated for adult residents only.

OU1 HIs and Cancer risk values from Tables 5-4 and 5-9 (On-site workers) and 5-13 (resident).

6.0
UNCERTAINTY ANALYSIS

The EPA guidance for risk assessment provides a systematic means for organizing, analyzing, and presenting information on the nature and magnitude of potential risks to public health posed by chemical exposures. Despite the advanced state of the current methodology, uncertainties and limitations are inherent in the risk assessment process. The uncertainty can lead to an over- or under-estimation of potential risk. **Table 6-1** presents a qualitative assessment of factors that may contribute to uncertainty in the estimation of potential risks. Available data quality, incomplete information about existing conditions and future circumstances, as well as other factors discussed below contribute to these uncertainties and limitations.

This section discusses the following sources of uncertainties associated with the OU2 BRA:

- Data collection and evaluation
- Exposure assessment
- Toxicity assessment
- Risk characterization

6.1 DATA COLLECTION AND EVALUATION

6.1.1 Data Collection

Data used in the OU2 BRA were collected from Site soil and groundwater. These data are subject to uncertainty associated with sampling and analysis.

6.1.1.1 Sampling

It has been assumed that samples collected were representative of the area to which various populations may be exposed. However, the collected samples may not be completely representative, due to biases in sampling and to random variability of samples. In addition, environmental media are not homogeneously distributed in the environment. Random

B07NE003702-07751

TABLE 6-1

SUMMARY OF UNCERTAINTIES ASSOCIATED WITH RISK ASSESSMENT FOR THE FORMER NOP

Assumption	Estimated Magnitude of Effect on Risk	Direction of Effect on Risk Estimate
ENVIRONMENTAL SAMPLING AND ANALYSIS		
Samples collected were representative of conditions to which various populations may be exposed	Low-Moderate	May over- or under- estimate risk
Errors in chemical analysis	Low	May over- or under- estimate risk
High detection limit	Low-Moderate	May over-estimate risk
Chemical concentrations reported as "below method detection limit" are used at one-half detection limit when calculating mean chemical concentrations	Low-Moderate	May over- or under- estimate risk (usually over-estimates risk)
EXPOSURE POINT CONCENTRATION		
Assumed the chemicals currently in groundwater persist at same concentration indefinitely	Low-Moderate	May over- or under- estimate risk
No attenuation/retardation assumed	Moderate	May over-estimate risk
Assume future wells are located in plume	Moderate	May over-estimate risk
Using conservative shower model to estimate chemical concentration in air while showering	Low-Moderate	May over-estimate risk
Using conservative box model (Farmer's Model) to estimate air chemical concentration in the construction activity	Low-moderate	May over-estimate risk

TABLE 6-1

SUMMARY OF UNCERTAINTIES ASSOCIATED WITH RISK ASSESSMENT FOR THE FORMER NOP

Assumption	Estimated Magnitude of Effect on Risk	Direction of Effect on Risk Estimate
TOXICOLOGICAL DATA		
The conservative USEPA models for developing Slope Factor (SF)	Moderate-High	May over-estimate risk
The Reference dose (RfD) for a compound is an estimate of the threshold concentration for the most sensitive human population associated with the lowest observed adverse effect for that compound.	Moderate-High	May over-estimate risk
Hazard indices (HIs) were developed assuming all toxic effects were additive	Low-Moderate	May over- or under-estimate risk (Typically overestimate risk)
EXPOSURE PARAMETERS		
Conservative values were used for exposure duration, frequency and ingestion rates	Low-Moderate	May over-estimate risk

variability of the media sampled may result in either an over- or under-estimation of actual chemical concentrations, and thus, Site risks.

6.1.1.2 Data Gaps

VOCs were the only class of compounds analyzed in soil from the Atlas Missile Area. Past Site operations history suggests that TCE (and any volatile degradation products) are the only likely COCs for soil in this area. However, risks associated with non-VOC contaminants in soil represent a potential data gap, and may lead to the under-estimation of potential risks for receptors in the Atlas Missile Area.

6.1.1.3 Analysis

Sample analysis is subject to uncertainties associated with precision and accuracy, and detection of chemicals at low concentrations. Analytical precision and accuracy are evaluated through laboratory quality assurance (QA) programs. Uncertainties associated with precision and accuracy of analysis are generally random and may lead to over- or under-estimation of risks. While these errors are typically of low magnitude compared to other sources of uncertainty in the risk assessment, they may lead to a possible over- or under-estimation of risk.

6.1.2 Data Evaluation

In compiling data for use in the risk assessment, 95 percentile upper confidence limits (UCL) on the mean concentrations were compiled for chemicals detected in each media. Use of 95th percentile UCL concentrations will likely result in over-estimation of potential risk.

In evaluating data, it was assumed that a chemical not detected in a given sample was actually present at one-half of its detection limit, if that chemical was present in any sample in that medium from that area. This approach, as described in RAGS, is a conservative approach that may lead to an over- or under-estimation of risk. Use of this method, when the quantitation limits are too high or the measured concentrations are very low, may lead

to calculated concentrations higher than the maximum concentration detected, and thus may lead to an over-estimation of risks.

6.2 EXPOSURE ASSESSMENT

The exposure assessment is based on a series of assumptions concerning concentrations of chemicals to which humans are exposed (exposure point concentrations) and patterns of behavior leading to exposure or intake of chemicals (exposure scenarios). The uncertainties associated with the exposure assessment used in these approaches are evaluated in the following sections.

6.2.1 Exposure Point Concentrations

For the RME approach, the concentration of the COCs detected in the two most contaminated wells were used as exposure point concentrations. It was conservatively assumed that site-wide chemical concentrations are the same as the concentrations in the most contaminated wells. This approach does not adequately address risks in areas of the Site with lower chemical concentrations (i.e., in particular, upgradient and side gradient areas), and thus will lead to an over estimation of Site risk.

However, the groundwater concentrations may vary with time . The BRA is prepared based on the Remedial Investigation Report (WCC, 1993) associated groundwater sampling (Aug., 1992) results. In the subsequent groundwater sampling, an increase in the concentration of RDX and Trichloroethylene was noticed in the two most contaminated well (see **Table 6-2**). The causes of the noticed concentration increases is not clear. It may be related to seasonal fluctuation of the groundwater table, release of TCE and RDX from contaminated soil, migration of contaminants from areas of higher concentration in groundwater upgradient of wells MW-5B and MW-40B, variance during sampling or some other reasons. Although the calculated Site-risk will increase with higher concentrations, the conclusions of the RI/FS are not affected.

Groundwater modeling was not performed, therefore, the potential increase in chemical concentration by release from contaminated sources, migration of the contamination plumes, or seasonal change in the volume of the contaminated groundwater, and the potential

B07NE003702-07755

Table 6-2
The detected concentration of
TCE and RDX in MW-5B and MW-40B
Quaterly Groundwater Sampling

Groundwater Sampling	MW-5B		MW-40B	
	TCE (µg/L)	RDX (µg/L)	TCE (µg/L)	RDX (µg/L)
Aug-92	ND	98	1,800	ND
Nov-92	ND	320	2,800	ND
Feb-93	ND	320	4,800	ND
May-93	ND	534	5,200	ND

Note:

Aug-92 groundwater sampling event results were used for the Site-risk calculation (WCC, 1993).

reduction in chemical concentrations by migration, degradation and attenuation could not be evaluated. In reality, chemical concentrations are affected by all these processes. The use of existing chemical concentrations to predict future risk may result in over or under estimation of potential health risks at the areas.

Chemicals not currently found in groundwater may eventually migrate to the water table, creating groundwater contamination. While it is unlikely that this would result in a major chemical release, given the amount of time these chemicals have been on-site, exclusion of these chemicals from quantitative evaluation in the BRA could lead to an under-estimation of Site risks.

The models which estimate chemical concentrations in the air during showering (**Appendix F**) and construction activities (**Appendix D**) are based on conservative assumptions. By using these models to estimate exposure point concentrations, the potential health risks at the Sites may be over-estimated.

6.2.2 Exposure Scenarios

The exposure assessment relied on a number of assumptions for potential human exposure. Assumptions used were based on:

- Site-specific information
- EPA Guidance (EPA, 1989b), the Exposure Factors Handbook (EPA, 1989a), the Standard Default Exposure Factors (EPA, 1991b), and Dermal Exposure Assessment: Principles and Applications (EPA, 1992a)
- Professional judgement

There is always uncertainty inherent in these assumptions, and any changes in the parameters used in the risk calculation may affect the final risk estimate.

The RME scenarios are based on a combination of maximum exposure assumptions for all variables related to exposure, and thus are highly likely to over-estimate potential risks. For example, to provide an evaluation of estimated risk as a function of exposure duration, cancer risks and HIs were calculated for adult residents for each of the exposure areas

B07NE003702-07757

assuming a 70-year exposure duration. In reality, the likelihood of an individual residing on-site and using the same water supply for his entire life is very low.

In some cases (e.g., dermal absorption), published information for one chemical has been assumed to be representative of other related chemicals. These assumptions may lead to over- or under-estimation of risk. The general approach used in this assessment was to use conservative assumptions for intake variables in the absence of strong scientific data, thus minimizing the likelihood that risks are under-estimated.

6.3 TOXICITY ASSESSMENT

6.3.1 Uncertainties Associated with Critical Toxicity Values

In general, the available scientific information is insufficient to provide a thorough understanding of all the potential toxic properties of chemicals to which humans are potentially exposed. Consequently, varying degrees of uncertainty surround the assessment of adverse health effects in the exposed populations. Sources of uncertainty related directly to toxicity data include:

- Use of dose-response data from experiments on homogenous, sensitive animal populations to predict effects in heterogenous human populations which display a wide range of sensitivities
- Extrapolation of data from:
  - High dose animal studies to low dose human exposures
  - Acute or subchronic exposure
  - One exposure route to another (e.g., from ingestion to inhalation or dermal absorption)
- Use of single-chemical test data that does not account for multiple exposures or synergistic and antagonistic responses
- Use of critical toxicity values (RfDs or Slope Factors) which are predicted values for the most sensitive subpopulations

B07NE003702-07758

- Use of oral RfDs to evaluate dermal exposure

Therefore, a high degree of uncertainty may be associated with the Critical Toxicity Values used in the BRA. In an attempt to minimize the consequences of uncertainty, EPA guidance typically relies on a conservative approach. Use of these current critical toxicity values is highly likely to over-estimate the potential risk.

6.4 RISK CHARACTERIZATION

Because there are uncertainties in each step of the risk assessment process, these uncertainties are often magnified in the final risk characterization. The final quantitative estimates of risk may be one or several orders of magnitude different from the potential risk associated with a given exposure. The uncertainties are further magnified in the process of integrating the results from OU1 BRA with the results from OU2 BRA. Because of the conservative approaches used in each step, the overall results of the BRA are more likely to over-estimate than to under-estimate the potential risk associated with contaminated media at the Site based on available information.

B07NE003702-07759

7.0
SUMMARY AND CONCLUSIONS

The primary purpose of the OU2 BRA is to evaluate potential human health hazards (both non-carcinogenic and carcinogenic effects) associated with groundwater at the Site, as well as soil contaminants not evaluated in the OU1 BRA. A second objective is to integrate results presented in the OU1 BRA with those of the OU2 BRA.

An evaluation of groundwater data identified several VOCs, SVOCs, explosives, and one metal that appeared to be Site-related. In addition, several VOCs were identified in subsurface soil at the Atlas Missile Area and Load Line 1.

Potential health risks (current and hypothetical future use scenarios) were estimated for a group of exposure scenarios believed to represent the most likely forms of human activities that might occur on or near the Site. The scenarios evaluated included residential (adult and child) and occupational exposure to groundwater and occupational exposure to subsurface soil. Potential health risks associated with groundwater use were evaluated quantitatively for three potential exposure routes (ingestion, inhalation, and direct dermal contact).

To evaluate the highest Site-related risk reasonably expected to occur on the site, a Reasonable Maximum Exposure (RME) approach is used in the BRA. To provide an estimation of upperbound risks, two wells (MW-5B and MW-40B) were identified as the most contaminated wells. These wells were chosen for evaluation because they contained the highest concentrations of RDX (MW-5B) and TCE (MW-40B) (WCC, 1993), the two COCs that contributed the majority of the Site risks. In the RME approach, all COCs detected in these two wells and maximum exposure parameters are used to calculate the Site-related human health risk. To provide a more complete risk characterization, two additional approaches, Plume Maximum Exposure (PME) approach and Reasonable Average Exposure (RAE) approach, were also evaluated and presented in Appendices I and J.

For well MW-5B, the RME HIs associated with groundwater were over the threshold value of 1.0 for all resident and on-site worker scenarios (7 for child resident, 3 for adult resident, and 1 for on-site worker). Potential total cancer risks associated with adult exposure to

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MW-5B groundwater (3×10^{-4}) exceeds the EPA advisory range of 10^{-4} to 10^{-6} for acceptable site risk. Cancer risks associated with child resident and on-site worker scenarios (child, 7×10^{-5}; on-site worker, 4×10^{-5}) are within the acceptable range of 10^{-4} to 10^{-6}. For well MW-40B, the HIs for child (13) and adult residents (3) are in excess of the threshold value of 1.0, but not for the on-site worker scenario (0.9). The potential cancer risks associated with MW-40B for all receptor groups are above the advisory risk range of 10^{-4} to 10^{-6} (child, 7 x 10-4; adult, 2×10^{-3}; on-site worker, 2×10^{-4}).

The RME potential cancer risks and non-carcinogenic hazards associated with the construction worker scenario (with exposure to well MW-5B) for both the Atlas Missile and Load Line 1 areas are within, or below, the acceptable range; indicating that exposure to chemicals in subsurface soil in this area is not likely to result in unacceptable non-carcinogenic or carcinogenic health effects. The RME HIs (groundwater and soil combined) for potentially exposed construction workers (with exposure to MW-40B) in both Atlas Missile Area (HI = 1) and Load Line 1 area (HI = 1) are in excess of the threshold value of 1.0. Inhalation of volatiles during showering was the significant contributor to the potential non-carcinogenic health hazard, indicating that exposure to groundwater in MW-40B may result in a potential non-carcinogenic hazard for construction workers.

To estimate total soil and groundwater risks, the OU1 RME cancer risks and HIs associated with soil ingestion and garden vegetables were added to the OU2 groundwater results. Although the HIs associated with OU2 RME groundwater exposure contribute to HIs for all scenarios, the primary contributor to Site HIs was exposure to Site soil. Groundwater exposure contributed relatively little to overall risks and hazards. Cumulative soil/groundwater HIs were as large as 5,000 (child resident), 2,000 (adult resident) and 4.0 (on-site worker), indicating that exposure to contaminants in soil present a potential non-carcinogenic health hazard. These HIs were primarily a result of exposure to explosives in soil. The cumulative cancer risks for soil (OU1) and groundwater (OU2) were also driven by the soil exposures.

To estimate potential health hazards associated with subsurface soil contamination in Atlas Missile Area and Load Line 1, a construction worker scenario was evaluated, assuming excavation activities. Soil ingestion, dermal contact, and inhalation of volatilized chemicals were evaluated as potential pathways. Because chemical concentrations are very low,

B07NE003702-07761

potential exposure to subsurface soil does not contribute significantly to Site health hazards or risks. For Atlas Missile, the total HI associated with VOCs in soil is 0.000002 and the total cancer risk associated with VOCs in soil is 2×10^{-9}. For Load Line 1, the total HI is 0.0000001 and the total cancer risk for VOCs in soil is 2×10^{-9}.

In conclusion, based upon what is known about current and likely future Site use, exposure to the groundwater in the most contaminated Site wells (MW-5B or MW-40B) may present a health concern (noncarcinogenic and cancer). Exposure to VOCs in subsurface soil in the Atlas Missile Area and Load Line 1 Area will not pose an unacceptable human health risk.

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8.0
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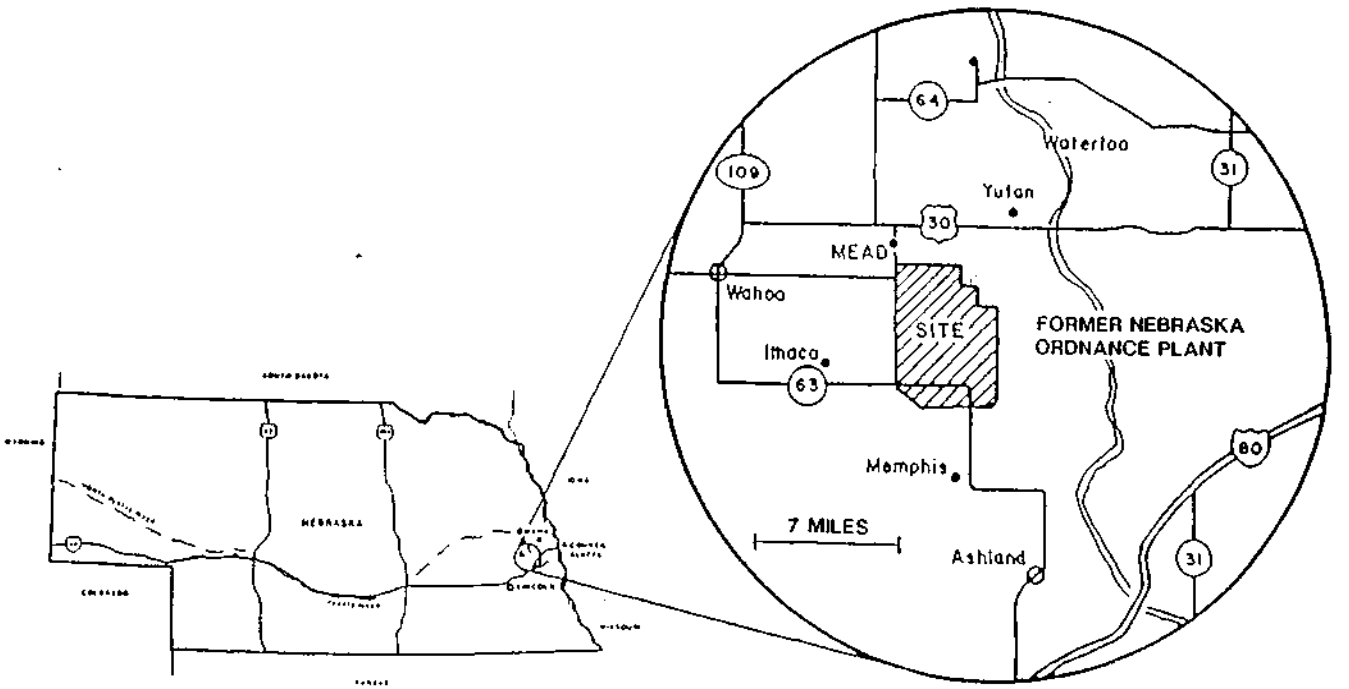
FIGURES



SOURCE: TCT, 1991

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Revisions			
Symbol	Descriptions	Date	Apprv'd

Woodward-Clyde Consultants
Overland Park, Kansas

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

Designed by: A.C.E.
Drawn by: M.A.L.
Checked by: D.C.C.
Submitted by: JCG

U.S. Army Corps of Engineers

BASELINE RISK ASSESSMENT
FOR OPERABLE UNIT NO. 2 – GROUNDWATER
FMR. NEBRASKA ORDNANCE PLANT – MEAD, NE

GENERAL SITE LOCATION MAP

Scale: AS NOTED
Date: APRIL, 1994
Figure No.: 1–1
Sheet number: 1

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M.A.L. SC: 1=1

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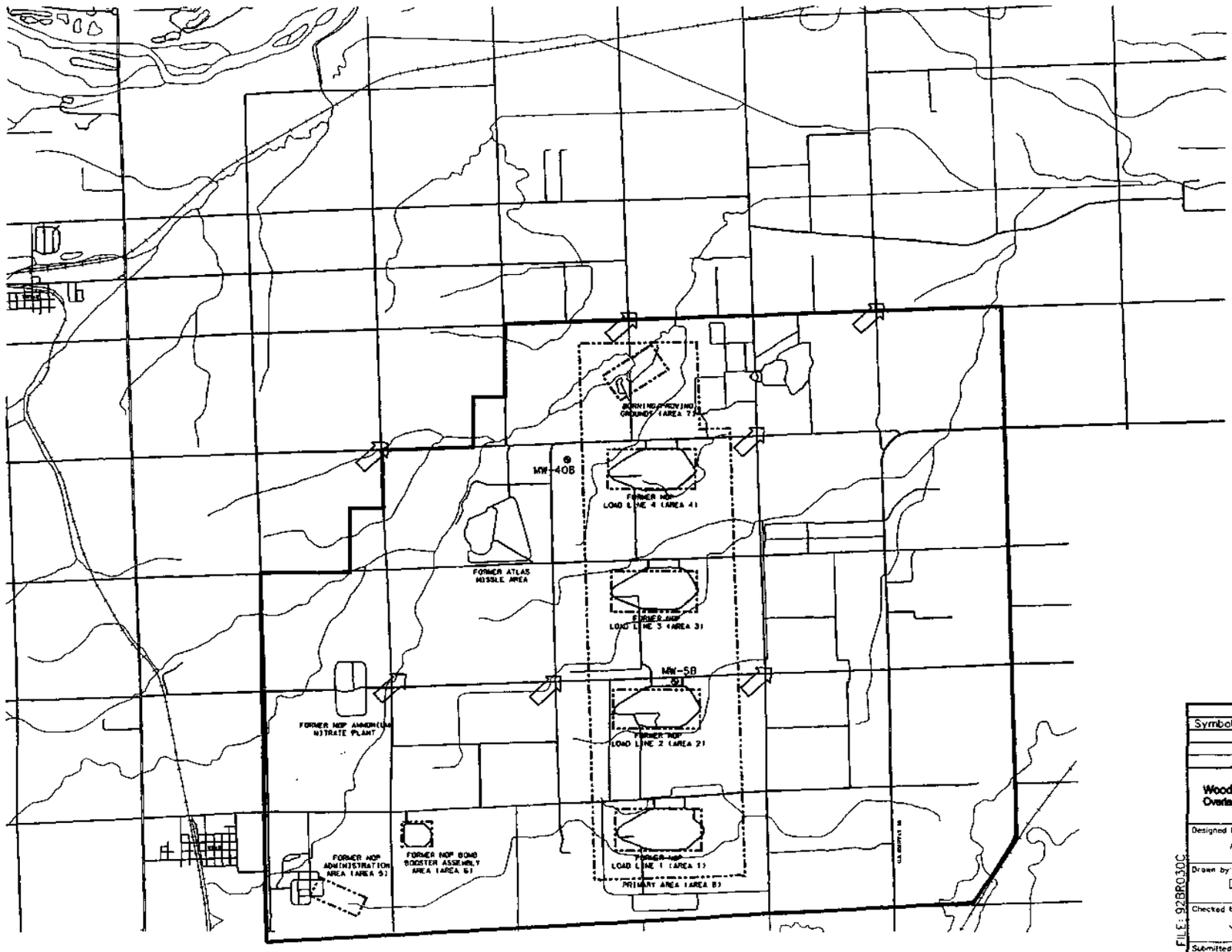

LEGEND:

- ESTIMATED GROUNDWATER FLOW DIRECTION
- OU-1 INVESTIGATION AREAS
- FORMER NOP BOUNDARY
- OU2 MOST CONTAMINATED GROUNDWATER MONITORING WELL LOCATIONS

NOTE:

GROUNDWATER FLOW DIRECTION WAS ESTIMATED FROM GROUNDWATER ELEVATIONS MEASURED 09/09/92.

SOURCE: USGS 7.5 MIN QUADRANGLES (1969) FOR MEAD, ASHLAND EAST, ASHLAND WEST, AND WANN 1927 NAD, 1929 NGVD

N

Revisions			
Symbol	Descriptions	Date	Apprv'd

Woodward-Clyde Consultants
Overland Park, Kansas

U.S. ARMY ENGINEER DISTRICT
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U.S. Army Corps of Engineers

BASELINE RISK ASSESSMENT
FOR OPERABLE UNIT NO. 2 - GROUNDWATER
FMR. NEBRASKA ORDNANCE PLANT - MEAD, NE.

ESTIMATED GROUNDWATER FLOW DIRECTION: OU1 EXPOSURE AREAS: OU2 MOST CONTAMINATED WELLS

Scale: AS NOTED
Date: APRIL, 1994
Figure No.: 1-2
Sheet number: 1

MCS FILE: 92BR030C

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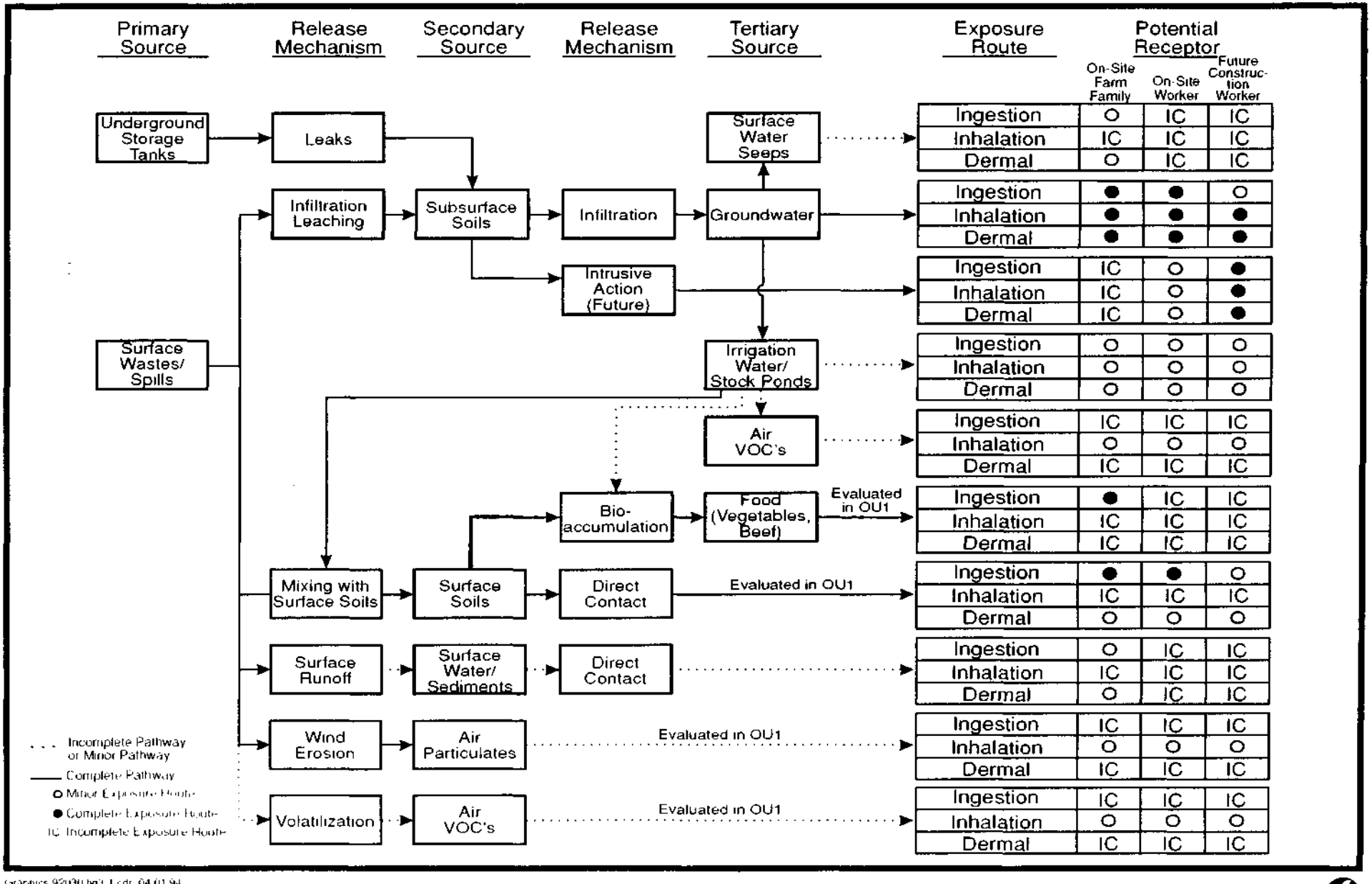
Figure 3-1 Site Co. .eptual Exposure Model Mead OU2 BRA



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Woodward-Clyde Consultants

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APPENDIX A
SUMMARY GROUNDWATER ANALYTICALDATA

METAL COC SELECTION PROCESS

Chemical: METALS	Freq. of Detects	Concentration(ug/L) 2x Bckgrd.	Min. of Detects	Max. of Detects	Mean(a)	Geo. Mean	Drop Due to Non-Det.	Drop Due to Bkgrd.	Drop Due to Ess. Nutr.	Chemical Dropped
Aluminum	1/13	0	1820.00	1820.00	232.31	125.01				
Antimony	0/13	0	ND	ND	ND	ND	✓			Antimony
Arsenic	5/13	33.5	5.00	19.80	5.37	3.67		✓		Arsenic
Barium	13/13	267	116.00	450.00	208.54	188.06		✓		Barium
Beryllium	0/13	0	ND	ND	ND	ND	✓			Beryllium
Cadmium	0/13	0	ND	ND	ND	ND	✓			Cadmium
Calcium	13/13	164100	27100.00	99600.00	56384.62	53475.71		✓	✓	Calcium
Chromium	0/13	0	ND	ND	ND	ND	✓			Chromium
Cobalt	0/13	0	ND	ND	ND	ND	✓			Cobalt
Copper	0/13	0	ND	ND	ND	ND	✓			Copper
Cyanide	0/13	0	ND	ND	ND	ND	✓			Cyanide
Iron	9/13	3150	58.00	1430.00	336.27	102.51		✓	✓	Iron
Lead	1/13	0	2.60	2.60	1.12	1.08				
Magnesium	13/13	30900	8050.00	31200.00	14073.08	13278.56			✓	Magnesium
Manganese	13/13	789	7.00	1090.00	151.59	39.01		✓		Manganese
Mercury	0/13	0	ND	ND	ND	ND	✓			Mercury
Nickel	1/13	0	11.10	11.10	5.47	5.32				
Potassium	13/13	21300	5280.00	10500.00	7979.23	7798.52		✓	✓	Potassium
Selenium	0/13	0	ND	ND	ND	ND	✓			Selenium
Silver	0/13	0	ND	ND	ND	ND	✓			Silver
Sodium	13/13	70200	10800.00	32900.00	18307.69	17463.42		✓	✓	Sodium
Thallium	0/13	0	ND	ND	ND	ND	✓			Thallium
Vanadium	2/13	0	5.5	11.30	3.41	2.98				
Zinc	12/13	9.2	4.10	47.10	11.07	7.02			✓	Zinc

Note:

(a) - arithmetic mean

✓ - indicates chemicals should be dropped.

SVOC COC SELECTION PROCESS

Chemical: SVOC	Freq. of Detects	Concentration(ug/L) Min. of Detects	Max. in Detects	Mean(a)	Geo. Mean	Drop Due to Non-Det.	Drop Due to Blank	Chemical Dropped
1,2,4-Trichlorobenzene	0/13	ND	ND	ND	ND	✓		1,2,4-Trichlorobenzene
1,2-Dichlorobenzene	0/13	ND	ND	ND	ND	✓		1,2-Dichlorobenzene
1,3-Dichlorobenzene	0/13	ND	ND	ND	ND	✓		1,3-Dichlorobenzene
1,4-Dichlorobenzene	0/13	ND	ND	ND	ND	✓		1,4-Dichlorobenzene
2,2'-Oxybis(1-chloropropane)	0/13	ND	ND	ND	ND	✓		2,2'-Oxybis(1-chloropropane)
2,4,5-Trichlorophenol	0/13	ND	ND	ND	ND	✓		2,4,5-Trichlorophenol
2,4,6-Trichlorophenol	0/13	ND	ND	ND	ND	✓		2,4,6-Trichlorophenol
2,4-Dichlorophenol	0/13	ND	ND	ND	ND	✓		2,4-Dichlorophenol
2,4-Dimethylphenol	0/13	ND	ND	ND	ND	✓		2,4-Dimethylphenol
2,4-Dinitrophenol	0/13	ND	ND	ND	ND	✓		2,4-Dinitrophenol
2,4-Dinitrotoluene	0/13	ND	ND	ND	ND	✓		2,4-Dinitrotoluene
2,6-Dinitrotoluene (2,6-DNT)	0/13	ND	ND	ND	ND	✓		2,6-Dinitrotoluene (2,6-DNT)
2-Chloronaphthalene	0/13	ND	ND	ND	ND	✓		2-Chloronaphthalene
2-Chlorophenol	0/13	ND	ND	ND	ND	✓		2-Chlorophenol
2-Methylnaphthalene	0/13	ND	ND	ND	ND	✓		2-Methylnaphthalene
2-Methylphenol	0/13	ND	ND	ND	ND	✓		2-Methylphenol
2-Nitroaniline	0/13	ND	ND	ND	ND	✓		2-Nitroaniline
2-Nitrophenol	0/13	ND	ND	ND	ND	✓		2-Nitrophenol
3-3'-Dichlorobenzidine	0/13	ND	ND	ND	ND	✓		3-3'-Dichlorobenzidine
3-Nitroaniline	0/13	ND	ND	ND	ND	✓		3-Nitroaniline
4,6-Dinitro-2-Methylphenol	0/13	ND	ND	ND	ND	✓		4,6-Dinitro-2-Methylphenol
4-Bromophenyl phenyl ether	0/13	ND	ND	ND	ND	✓		4-Bromophenyl phenyl ether
4-Chloro-3-methylphenol	0/13	ND	ND	ND	ND	✓		4-Chloro-3-methylphenol
4-Chloroaniline	0/13	ND	ND	ND	ND	✓		4-Chloroaniline
4-Chlorophenyl phenyl ether	0/13	ND	ND	ND	ND	✓		4-Chlorophenyl phenyl ether
4-Methylphenol	0/13	ND	ND	ND	ND	✓		4-Methylphenol
4-Nitroaniline	0/13	ND	ND	ND	ND	✓		4-Nitroaniline
4-Nitrophenol	0/13	ND	ND	ND	ND	✓		4-Nitrophenol
Acenaphthene	0/13	ND	ND	ND	ND	✓		Acenaphthene
Acenaphthylene	0/13	ND	ND	ND	ND	✓		Acenaphthylene
Anthracene	0/13	ND	ND	ND	ND	✓		Anthracene
Benzo(a)anthracene	0/13	ND	ND	ND	ND	✓		Benzo(a)anthracene
Benzo(a)pyrene	0/13	ND	ND	ND	ND	✓		Benzo(a)pyrene
Benzo(b)fluoranthene	0/13	ND	ND	ND	ND	✓		Benzo(b)fluoranthene
Benzo(g,h,l)perylene	0/13	ND	ND	ND	ND	✓		Benzo(g,h,l)perylene

SVOC COC SELECTION PROCESS

Chemical: SVOC	Freq. of Detects	Concentration(ug/L) Min. of Detects	Max. in Detects	Mean(a)	Geo. Mean	Drop Due to Non-Det.	Drop Due to Blank	Chemical Dropped
Benzo(k)fluoranthene	0/13	ND	ND	ND	ND	✓		Benzo(k)fluoranthene
bis(2-Chloroethoxy)methane	0/13	ND	ND	ND	ND	✓		bis(2-Chloroethoxy)methane
bis(2-Chloroethyl)ether	0/13	ND	ND	ND	ND	✓		bis(2-Chloroethyl)ether
bis(2-Ethylhexyl)phythalate	13/13	2.00	20.00	6.00	4.67		✓	bis(2-Ethylhexyl)phythalate
Butyl benzyl phthalate	0/13	ND	ND	ND	ND	✓		Butyl benzyl phthalate
Carbazole	0/13	ND	ND	ND	ND	✓		Carbazole
Chrysene	0/13	ND	ND	ND	ND	✓		Chrysene
Di-n-butyl phthalate	3/13	1.00	1.00	4.08	3.45			
Di-n-octyl phthalate	0/13	ND	ND	ND	ND	✓		Di-n-octyl phthalate
Dibenzo(a,h)anthracene	0/13	ND	ND	ND	ND	✓		Dibenzo(a,h)anthracene
Dibenzofuran	0/13	ND	ND	ND	ND	✓		Dibenzofuran
Diethyl phthalate	4/13	1.00	2.00	3.85	3.21			
Dimethyl phthalate	0/13	ND	ND	ND	ND	✓		Dimethyl phthalate
Fluoranthene	0/13	ND	ND	ND	ND	✓		Fluoranthene
Fluorene	0/13	ND	ND	ND	ND	✓		Fluorene
Hexachlorobenzene	0/13	ND	ND	ND	ND	✓		Hexachlorobenzene
Hexachlorobutadiene	0/13	ND	ND	ND	ND	✓		Hexachlorobutadiene
Hexachlorocyclopentadiene	0/13	ND	ND	ND	ND	✓		Hexachlorocyclopentadiene
Hexachloroethane	0/13	ND	ND	ND	ND	✓		Hexachloroethane
Indeno(1,2,3-cd)pyrene	0/13	ND	ND	ND	ND	✓		Indeno(1,2,3-cd)pyrene
Isophorone	0/13	ND	ND	ND	ND	✓		Isophorone
N-Nitroso-di-n-propylamine	0/13	ND	ND	ND	ND	✓		N-Nitroso-di-n-propylamine
N-Nitrosodiphenylamine(1)	1/13	1.00	1.00	4.69	4.42			
Naphthalene	0/13	ND	ND	ND	ND	✓		Naphthalene
Nitrobenzene(NB)	0/13	ND	ND	ND	ND	✓		Nitrobenzene(NB)
Pentachlorophenol	0/13	ND	ND	ND	ND	✓		Pentachlorophenol
Phenanthrene	0/13	ND	ND	ND	ND	✓		Phenanthrene
Phenol	5/13	1.00	3.00	3.69	3.09			
Pyrene	0/13	ND	ND	ND	ND	✓		Pyrene

Note:

(a) - arithmetic mean

✓ - indicates chemicals should be droped.

EXPLOSIVE COC SELECTION PROCESS

Chemical: Explosives	Freq. of Detects	Concentration (ug/L)				Drop Due to Non-Det.	Chemical Dropped
		Min. of Detects	Max. in Detects	Mean(a)	Geo. Mean		
1,3,5-Trinitrobenzene (TNB)	5/123	0.08	0.25	0.08	0.08		
1,3-Dinitrobenzene (DNB)	0/123	ND	ND	ND	ND	✓	1,3-Dinitrobenzene (DNB)
2,4,6-Trinitrotoluene (TNT)	3/123	0.13	0.13	0.13	0.13		
24-Dintrotoluene (2,4-DNT)	1/123	0.25	0.25	0.25	0.25		
2,6-Dinitrotoluene (2,6-DNT)	0/123	ND	ND	ND	ND	✓	2,6-Dinitrotoluene (2,6-DNT)
2-Nitrotoluene (2-NT)	0/123	ND	ND	ND	ND	✓	2-Nitrotoluene (2-NT)
3-Nitrotoluene (3-NT)	0/123	ND	ND	ND	ND	✓	3-Nitrotoluene (3-NT)
4-Nitrotoluene (4-NT)	0/123	ND	ND	ND	ND	✓	4-Nitrotoluene (4-NT)
Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	43/123	0.13	0.13	0.13	0.13		
Methyl-2,4,6-trinitrophenylnitramine (tetryl)	0/123	ND	ND	ND	ND	✓	Methyl-2,4,6-trinitrophenylnitramine (tetryl)
Nitrobenzene (NB)	0/123	ND	ND	ND	ND	✓	Nitrobenzene (NB)
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	12/123	0.00	0.00	0.00	0.00		

Note:
(a) - arithmetic mean
✓ - indicates chemicals should be dropped.

VOC COC SELECTION PROCESS

Chemical: VOC	Freq. of Detects	Concentration(ug/L) Min. of Detects	Max. in Detects	Mean(a)	Geo. Mean	Drop Due to Non-Det.	Chemical Dropped
1,1,1-Trichloroethane	2/134	1.00	2.00	1.77	0.72		
1,1,2,2-Tetrachloroethane	0/134	ND	ND	ND	ND	✓	1,1,2,2-Tetrachloroethane
1,1,2-Trichloroethane	0/134	ND	ND	ND	ND	✓	1,1,2-Trichloroethane
1,1-Dichloroethane	0/134	ND	ND	ND	ND	✓	1,1-Dichloroethane
1,1-Dichloroethene	0/142	ND	ND	ND	ND	✓	1,1-Dichloroethene
1,2-Dibromo-3-chloropropane (DBCP)	0/41	ND	ND	ND	ND	✓	1,2-Dibromo-3-chloropropane (DBCP)
1,2-Dibromoethane (Ethylene dibromide)	0/120	ND	ND	ND	ND	✓	1,2-Dibromoethane (Ethylene dibromide)
1,2-Dichlorobenzene	0/120	ND	ND	ND	ND	✓	1,2-Dichlorobenzene
1,2-Dichloroethane	0/134	ND	ND	ND	ND	✓	1,2-Dichloroethane
1,2-Dichloroethene (Total)	12/134	1.00	10.00	1.86	0.77		
1,2-Dichloropropane	1/134	25.00	25.00	2.00	0.75		
1,3-Dichlorobenzene	0/120	ND	ND	ND	ND	✓	1,3-Dichlorobenzene
1,4-Dichlorobenzene	0/120	ND	ND	ND	ND	✓	1,4-Dichlorobenzene
2-Butanone	0/37	ND	ND	ND	ND	✓	2-Butanone
2-Hexanone	0/37	ND	ND	ND	ND	✓	2-Hexanone
4-Methyl-2-pentanone	0/108	ND	ND	ND	ND	✓	4-Methyl-2-pentanone
Acetone	12/42	2.00	16.00	6.37	4.15		
Benzene	0/134	ND	ND	ND	ND	✓	Benzene
Bromochloromethane	0/120	ND	ND	ND	ND	✓	Bromochloromethane
Bromodichloromethane	0/134	ND	ND	ND	ND	✓	Bromodichloromethane
Bromoform	0/134	ND	ND	ND	ND	✓	Bromoform
Bromomethane	0/134	ND	ND	ND	ND	✓	Bromomethane
Carbon disulfide	0/134	ND	ND	ND	ND	✓	Carbon disulfide
Carbon tetrachloride	0/134	ND	ND	ND	ND	✓	Carbon tetrachloride
Chlorobenzene	0/134	ND	ND	ND	ND	✓	Chlorobenzene
Chloroethane	0/134	ND	ND	ND	ND	✓	Chloroethane
Chloroform	1/134	26.00	26.00	1.94	0.74		
Chloromethane	0/134	ND	ND	ND	ND	✓	Chloromethane
Cis-1,3-Dichloropropene	0/134	ND	ND	ND	ND	✓	Cis-1,3-Dichloropropene
Dibromochloromethane	0/134	ND	ND	ND	ND	✓	Dibromochloromethane
Ethylbenzene	0/134	ND	ND	ND	ND	✓	Ethylbenzene
Methylene chloride	52/134	0.70	43.00	2.10	1.45		

VOC COC SELECTION PROCESS

Chemical: VOC	Freq. of Detects	Concentration(ug/L)				Drop Due to Non-Det.	Chemical Dropped
		Min. of Detects	Max. in Detects	Mean(a)	Geo. Mean		
Styrene	0/134	ND	ND	ND	ND	✓	Styrene
Tetrachloroethene	1/134	3.00	3.00	1.84	0.74		
Toluene	0/134	ND	ND	ND	ND	✓	Toluene
Trans-1,2-Dichloroethene	0/134	ND	ND	ND	ND	✓	Trans-1,2-Dichloroethene
Trans-1,3-Dichloropropene	0/134	ND	ND	ND	ND	✓	Trans-1,3-Dichloropropene
Trichloroethene	28/134	0.90	1800.00	27.05	1.18		
Vinyl chloride	0/134	ND	ND	ND	ND	✓	Vinyl chloride
Xylenes (Total)	0/134	ND	ND	ND	ND	✓	Xylenes (Total)

Note:
(a) - arithmetic mean
✓ - indicates chemicals should be dropped.

B07NE003702-07776

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B07NE003702-07777

APPENDIX B
FOOD CHAIN EFFECTS

1.0 INTRODUCTION

This section describes the potential uptake and bioconcentration of chemicals of concern (COCs) into plants and other food organisms, and the associated potential for the COCs to impact human health. The ability of the COCs to accumulate in plant or animal tissue is discussed qualitatively. Section 2.0 discusses the principles governing uptake of chemicals into plant or animal species; Section 3.0 highlights the key physical and chemical properties affecting uptake; Section 4.0 describes each COC's physical and chemical properties and discusses the potential for uptake of each COC; Section 5.0 summarizes the section and provides general conclusions.

2.0 GENERAL UPTAKE MECHANISMS

A chemical in environmental media (i.e., soil, water, sediment, air) can be taken up by a plant through a variety of mechanisms: absorbed through the plant's outer cell membrane or "peel", absorbed along with soil water, adsorbed into the outer skin of the plant, or directly absorbed through the air (if chemical is in the vapor phase). Retention of chemicals in a plant may be localized (such as retained in the peel), may migrate to other portions of the plant (translocation), or may be excreted, such as in the process of transpiration. Once inside the plant, the chemical may interact with cell constituents and generate metabolite(s) which, too, can be transported to various parts of plants or excreted. The rates of absorption, translocation, metabolism and excretion within plant cells are dependent on the physicochemical properties of the chemical and the nature of the plant.

3.0 FACTORS AFFECTING CHEMICAL UPTAKE

The chemical and physical properties of a chemical largely influence its fate with regard to plant uptake and release. At the same time, this fate can be mitigated by plant properties and environmental factors, such as temperature, soil character, and water content in soil. This section focuses on the chemical and physical characteristics of chemicals that influence the potential for uptake into plants.

3.1 Water And Lipid Solubility

The water and lipid solubility of a chemical affects its tendency to be absorbed and retained by plant tissue. Hydrophilic chemicals (chemicals with a high water solubility, or S) are readily absorbed into the plant along with water, and translocated within the plant structure. Lipophilic chemicals (chemicals with a high octanol/water partition coefficient, or K_{ow}) are less likely to be absorbed by plants through solution, but may be locally absorbed or adsorbed onto a plant's outer skin.

Conversely, lipophilic chemicals are readily absorbed by aquatic and terrestrial organisms, whether introduced to the organism in water or through the food chain. Accumulation or retention of the chemical in terrestrial or aquatic organisms is generally greater with a higher lipophilicity. Water soluble chemicals may be readily absorbed, but are less likely to be retained or accumulated in these organisms.

Bioconcentration describes uptake of a chemical across membrane surfaces from a medium (usually water) into biota tissue, resulting in a higher concentration of the chemical within the tissue than in the medium. Bioconcentration differs from bioaccumulation, which includes dietary transfer of chemicals up the food chain. Bioconcentration is most often discussed relative to aquatic animal species, although the same concepts apply to plant species. In general, chemicals with a high lipophilicity bioconcentrate in plant or animal tissues with a lipid component. However, if the chemical can be metabolized within the host, bioaccumulation may not occur.

3.2 Volatility

Volatilization from soil, water or plant surfaces is a major fate process for many chemicals, and will influence the availability of a chemical for uptake by plants and also retention of the chemical in the plant. Potential volatility of a chemical is related to its vapor pressure (VP). Henry's Law constant (H, essentially an air/water partition coefficient) also describes the propensity of a chemical to volatilize, specifically from water. Chemicals that are volatile may be readily taken up by plants from soil, water or air, but may be just as readily released from plant tissue by transpiration.

B07NE003702-07780

The volatility of a chemical will influence its potential uptake into terrestrial or aquatic organisms in much the same way as plants.

3.3 Degradability

Degradation of chemicals in environmental media affects the degree to which chemicals are available for uptake into plant or animal tissue. Degradation may occur by chemical, photochemical and biochemical reactions in the environmental media. Similar to that which occurs with chemicals that volatilize or leach, chemicals that degrade rapidly may not persist in environmental media long enough for appreciable uptake into plant or animal tissue to occur. Chemicals that are taken up into plant or animal tissue may also "degrade" within the plant or animal, through the process of metabolism. While not affecting uptake of chemicals, the ability of a plant or animal species to metabolize a chemical affects the ability of the chemical to accumulate.

3.4 Adsorption

Adsorption to soil (and sediment) is a mechanism by which chemicals are removed from solution. When adsorbed to soil, a chemical is generally less available for absorption into plant or animal tissue. Adsorbent materials in soils include clay minerals and organic matter. Sorption of metals onto soil is most influenced by the clay content of the soil, and predictive techniques for estimating the degree of metal sorption onto soil are not straightforward. Sorption of organic chemicals onto soil is predominantly influenced by the fraction of total organic carbon in the soil, and can be estimated by the chemical's organic carbon/water partition coefficient (K_{oc}). The higher the K_{oc} value, the stronger the degree of sorption and, generally, the less available is the chemical for uptake into plant or animal tissue.

4.0 PHYSICAL AND CHEMICAL PROPERTIES OF CHEMICALS OF CONCERN

This section describes chemical and physical properties of each COC for OU-2 that influence the potential uptake and bioconcentration by plants or animals.

The COCs identified at the site are:

Metals:	Aluminum
	Lead
	Nickel
	Vanadium
Explosives:	RDX
	HMX
	2,4-Dinitrotoluene (DNT)
	1,3,5-Trinitrobenzene (TNB)
	2,4,6-Trinitrotoluene (TNT)
Volatile Organic Compounds:	Acetone
	Chloroform
	1,2-Dichloroethene (DCE)
	Dichloropropane
	Methylene chloride
	Tetrachloroethene (PCE)
	1,1,1-Trichloroethane (TCA)
	Trichloroethene (TCE)
Semi-volatile Organic Compounds:	Diethylphthalate
	Di-n-butylphthalate
	n-Nitrosodiphenylamine
	Phenol

4.1 Aluminum

Water Solubility:	Form-dependent
Kow:	Not available
Vapor Pressure:	Not available
Koc:	Not available
Fish BCF:	Not available

Aluminum is the third most abundant element in the earth's crust, and as such is commonly detected in many environmental media. It has only one oxidation state, and is found in nature in the form of silicates, complexed with sodium and fluoride, as oxides and hydroxides and other forms. The availability of aluminum compounds to plants is likely to be dependent upon the form of aluminum present in the soil.

Aluminum occurs naturally in many plants at low concentrations, supporting the ability of plants to take up aluminum from soil. However, little information is available on the extent or rate of uptake. In addition, little information is available on the uptake of aluminum by aquatic or terrestrial organisms. Based on this information (or lack thereof), there is no strong evidence that aluminum in soil poses a potential human health threat through the food chain.

4.2 Lead

Water Solubility:	Form-dependent
Kow:	Not available
Vapor Pressure:	Not available
Koc:	Not available
Fish BCF:	Not available

Lead is a heavy metal widely distributed in the earth's crust. It forms compounds with a valence state of +2 and +4. In its natural state, lead is strongly bound to soil or sediment particles, and uptake into plant or animal tissue is minimal. However, if available in processed form (such as organolead compounds in leaded gasoline, lead used in pigments, paints and batteries), the availability of lead may increase.

A review of the available literature suggests that lead does not accumulate appreciably in either plant species or aquatic organisms. Therefore, accumulation of lead in plant or animal tissues is not expected to pose a potential health concern.

4.3 Nickel

Water Solubility:	Form-dependent
Kow:	Not available

B07NE003702-07783

Vapor Pressure:	Not available
Koc:	Not available
Fish BCF:	Not available

Nickel is the 24th element in order of natural abundance in the earth's crust. Nickel exists in five major forms: elemental, inorganic water-soluble, inorganic water-insoluble, organic water-insoluble, and as the carbonyl. Therefore, the potential for nickel to be taken up by plant or animal species will vary with the form being considered. Little information could be found describing the accumulation of nickel in plant or animal tissues; however, the lack of information suggests that nickel uptake and accumulation is not of significant human health concern.

4.4 Vanadium

Water Solubility:	Form-dependent
Kow:	Not available
Vapor Pressure:	Not available
Koc:	Not available
Fish BCF:	Not available

Vanadium is a naturally occurring element that is widely distributed throughout the environment at low levels. Vanadium can exist in the 0, +2, +3, +4, and +5 oxidation states. Elemental vanadium is insoluble in water. However, vanadium usually occurs in an oxidized form; therefore, there are both soluble and insoluble vanadium compounds depending on its oxidation state. Vanadium is a trace element essential for normal human growth and nutrition.

Absorption of vanadium by plants is dependent on the solubility of the vanadium species, with more soluble species having a higher potential to be absorbed than less soluble species. Vanadium concentrations in food reported in the literature differ widely, but were generally report at concentrations in the few parts per billion. Based on the expected low solubilities of vanadium compounds in the soils, the lack of data suggesting a strong potential for vanadium to accumulate to high concentrations in plants or other organisms, and its role as an essential trace element, accumulation of vanadium in plant or animal tissues is not expected to pose a potential health concern.

4.5 RDX

Water Solubility:	45 mg/L
Kow:	7.4
Vapor Pressure:	Not available
Koc:	42-167 L/kg
Fish BCF:	24.8 L/kg

Based on its water solubility and Koc value, RDX would be expected to display moderate mobility when released to soil. This suggests that the availability of RDX to be taken up into plant tissue may be reduced with time. Studies with plants grown to maturity on RDX-amended soils showed RDX-derived metabolites accumulated in all tissues. This information affirms that RDX can be accumulated in plants. However, the concentration of RDX attained in the plant tissue, and any associated human health risk, will depend upon the soil concentration, plant properties and other factors.

The low BCF value for RDX suggests that accumulation into aquatic animal tissue is not likely to be significant.

4.6 HMX

Water solubility:	Not available
Kow:	Not available
Vapor pressure:	Not available
Koc:	Not available
Fish BCF:	Not available

No information was found on the uptake of HMX in plants grown on HMX containing soil. Spanggord et al. (1984) described studies that found photolysis to be the dominant transformation process of HMX in water. This suggests that HMX in soils may also be photo-degraded.

No conclusion can be reached at this time regarding the potential for HMX to accumulate in the tissue of plants or other organisms.

B07NE003702-07785

4.7 2,4-Dinitrotoluene

Water solubility:	240 mg/L
Kow:	100
Vapor pressure:	0.0051 mm Hg
Koc:	45 L/kg
Fish BCF:	3.8 L/kg

2,4-Dinitritoluene's (DNT) high water solubility suggests that DNT may leach from soil to some degree. However, DNT's low vapor pressure, moderate Kow and moderate Koc suggest that some retention in soil is likely. Therefore, there is the potential for DNT to be taken up into plants along with soil water or adsorbed to outer lipophilic membranes. The magnitude of this potential, however, is not known.

The low bioconcentration factor indicates that DNT is not likely to accumulate in animal tissue, suggesting that DNT is not likely to impact human health through the food chain.

4.8 1,3,5-Trinitrobenzene

Water solubility:	350 mg/L
Kow:	Not available
Vapor pressure:	Not available
Koc:	Not available
Fish BCF:	Not available

Very little information could be found on the fate and transport characteristics of 1,3,5-trinitrobenzene (TNB). Its appreciable water solubility suggests that TNB is likely to leach from soils, but without information on its lipophilicity, soil-binding capacity or bioaccumulation potential, no conclusion can be made regarding its potential to impact the human food chain.

4.9 2,4,6-Trinitrotoluene

Water solubility:	130 mg/L
Kow:	Not available

B07NE003702-07786

Vapor Pressure:	0.053 mm Hg (85°C)
Koc:	Not available
Fish BCF:	Not available

2,4,6-Trinitrotoluene's (TNT) high water solubility and low vapor pressure indicate that TNT may leach from soil, but is not likely to volatilize. No information could be found regarding TNT's ability to bind to soil, although Tucker et al. (1985) reported that adsorption in soil is an important process affecting the migration. Estimates of soil half-life for TNT-residues range from 4 to 10 years. This information suggests that TNT may be retained in soils for time periods sufficient to allow accumulation by plants. Studies have indicated that the potential for TNT to accumulate in the tissue of plants is high.

No information could be located regarding the potential for TNT to be accumulated into animal tissue.

4.10 Acetone

Water solubility:	1,000,000 mg/L
Kow:	0.58
Vapor Pressure:	270 mm Hg
Koc	2.2 L/kg
Fish BCF:	Not available

Acetone's high water solubility and vapor pressure and low Kow and Koc indicate that acetone will readily leach and volatilize from soils. These factors suggest that acetone has a limited potential to be retained in soils for time periods sufficient for appreciable plant uptake. The low Kow of acetone further suggests that accumulation in plant or animal tissue is expected to be negligible. Based on these factors, the potential human health risks associated with uptake and accumulation of acetone in plant or animal tissue is anticipated to be low.

4.11 Chloroform

Water solubility:	8,200 mg/L
Kow:	93

B07NE003702-07787

Vapor Pressure:	151 mm Hg
Koc	31 L/kg
Fish BCF:	3.75 L/kg

Chloroform's high water solubility, high vapor pressure, moderate Kow and moderate Koc indicate that chloroform will leach and volatilize from soils, with some limited retention. These factors suggest that chloroform has a limited potential to be retained in soils for time periods sufficient for appreciable plant uptake. The high water solubility and moderate Kow of acetone further suggest that although uptake in plant tissue may occur along with water uptake, accumulation in the plant tissue is expected to be low. Furthermore, since chloroform has a high vapor pressure, transpiration (removal) of chloroform from the plant is likely to occur. Based on these factors, the potential human health risks associated with uptake and accumulation of chloroform in plant tissue is anticipated to be low.

Chloroform's moderate Kow and BCF suggest that chloroform could accumulate in fish tissue to a small degree. However, its volatility is likely to limit retention of chloroform in surface water, limiting exposure of aquatic organisms. Therefore, the potential human health risks associated with uptake and accumulation of chloroform in animal tissue is also anticipated to be low.

4.12 1,2-Dichlorethene

Water solubility:	3,500 - 6,300 mg/L
Kow:	5
Vapor Pressure:	208 mm Hg
Koc:	49 L/kg
Fish BCF:	1.6 L/kg

1,2-Dichloroethene's (DCE) high water solubility, high vapor pressure, low Kow and low Koc suggest that DCE will readily leach and volatilize from soil. These factors suggest that DCE has a low potential to be retained in soils for time periods sufficient for appreciable plant uptake. The high water solubility and low Kow of acetone further suggest that although uptake in plant tissue may occur along with water uptake, accumulation in the plant tissue is expected to be low. Furthermore, since DCE has a high vapor pressure, transpiration (removal) from the plant is

B07NE003702-07788

likely to occur. Based on these factors, the potential human health risks associated with uptake and accumulation of DCE in plant tissue is anticipated to be low.

DCE's low Kow and low BCF suggest that chloroform is unlikely to accumulate in fish tissue. In addition, its volatility is likely to limit retention of DCE in surface water, limiting exposure of aquatic organisms. Therefore, the potential human health risks associated with uptake and accumulation of chloroform in animal tissue is also anticipated to be low.

4.13 Dichloropropane

Water solubility:	270 mg/L
Kow:	100
Vapor Pressure:	42 mm Hg
Koc:	51 L/kg
Fish BCF:	Not available

Dichloropropane's high water solubility, high volatility, moderate Kow and moderate Koc indicate that dichloropropane will leach and volatilize from soils, with some limited retention. These factors suggest that dichloropropane has a limited potential to be retained in soils for time periods sufficient for appreciable plant uptake. The high water solubility and moderate Kow further suggest that although uptake in plant tissue may occur along with water uptake, accumulation in the plant tissue is expected to be low. Furthermore, since dichloropropane has a high vapor pressure, transpiration (removal) from the plant is likely to occur. Based on these factors, the potential human health risks associated with uptake and accumulation of dichloropropane in plant tissue is anticipated to be low.

Dichloropropane's moderate Kow suggest that chloroform could accumulate in fish tissue to a small degree. However, its volatility is likely to limit retention of dichloropropane in surface water, limiting exposure of aquatic organisms. Therefore, the potential human health risks associated with uptake and accumulation of dichloropropane in animal tissue is also anticipated to be low.

B07NE003702-07789

4.14 Tetrachloroethene

Water solubility:	150 mg/L
Kow:	398
Vapor Pressure:	17.8 mm Hg
Koc:	364 L/kg
Fish BCF:	31 L/kg

Tetrachloroethene's (PCE) high water solubility, high volatility, moderate Kow and moderate Koc indicate that PCE will leach and volatilize from soils, with some limited retention. These factors suggest that PCE has a limited potential to be retained in soils for time periods sufficient for appreciable plant uptake. The high water solubility and moderate Kow further suggest that although uptake in plant tissue may occur along with water uptake, accumulation in the plant tissue is expected to be low. Furthermore, since PCE has a high vapor pressure, transpiration (removal) from the plant is likely to occur. Based on these factors, the potential human health risks associated with uptake and accumulation of PCE in plant tissue is anticipated to be low.

PCE's moderate Kow and BCF suggest that PCE could accumulate in fish tissue to a small degree. However, its volatility is likely to limit retention of PCE in surface water, limiting exposure of aquatic organisms. Therefore, the potential human health risks associated with uptake and accumulation of PCE in animal tissue is also anticipated to be low.

4.15 1,1,1-Trichloroethane

Water solubility:	1,500 mg/L
Kow:	316
Vapor Pressure:	123 mm Hg
Koc:	152 L/kg
Fish BCF:	5.6 L/kg

1,1,1-Trichloroethane's (TCA) high water solubility, high volatility, moderate Kow and moderate Koc indicate that TCA will leach and volatilize from soils, with some limited retention. These factors suggest that TCA has a limited potential to be retained in soils for time periods sufficient for appreciable plant uptake. The high water solubility and moderate Kow further suggest that

although uptake in plant tissue may occur along with water uptake, accumulation in the plant tissue is expected to be low. Furthermore, since TCA has a high vapor pressure, transpiration (removal) from the plant is likely to occur. Based on these factors, the potential human health risks associated with uptake and accumulation of TCA in plant tissue is anticipated to be low.

TCA's moderate Kow and BCF suggest that PCE could accumulate in fish tissue to a small degree. However, its volatility is likely to limit retention of TCA in surface water, limiting exposure of aquatic organisms. Therefore, the potential human health risks associated with uptake and accumulation of TCA in animal tissue is also anticipated to be low.

4.17 Trichloroethene

Water solubility:	1,000 mg/L
Kow:	200
Vapor Pressure:	60 mm Hg at 20 C
Koc:	126 L/kg
Fish BCF:	10.6 L/kg

Trichloroethene's (TCE) high water solubility, high vapor pressure, moderate Kow and moderate Koc indicate that TCE will volatilize and leach from soils, with some limited retention. These factors suggest that TCE has a limited potential to be retained in soils for time periods sufficient for appreciable plant uptake. The high water solubility and moderate Kow further suggest that although uptake in plant tissue may occur along with water uptake, accumulation in the plant tissue is expected to be low. Furthermore, since TCE has a high vapor pressure, transpiration (removal) from the plant is likely to occur. Based on these factors, the potential human health risks associated with uptake and accumulation of TCE in plant tissue is anticipated to be low.

The moderate Kow and moderate BCF suggest that TCE could accumulate in fish tissue to a small degree. However, its volatility is likely to limit retention of TCE in surface water, limiting exposure of aquatic organisms. Therefore, the potential human health risks associated with uptake and accumulation of TCE in animal tissue is also anticipated to be low.

4.17 Diethylphthalate

Water solubility:	896 mg/L
Kow:	316
Vapor Pressure:	0.0035 mm Hg
Koc:	142 L/kg
Fish BCF:	117 L/kg

Diethylphthalate's high water solubility indicates that diethyl phthalate may leach from soils to some degree. However, its low vapor pressure, moderate Kow and moderate Koc indicate that diethylphthalate will also show appreciable soil binding capacity. This suggests that diethylphthalate may be taken up into plant tissue along with soil water or adsorb onto outer lipophilic tissue. The magnitude of this uptake potential is not known.

Diethylphthalate's moderate BCF suggests that accumulation in animal tissue may occur. However, many organisms (particularly aquatic) are known to possess the ability to metabolize phthalate esters. Therefore, while taken up into tissue, accumulation does not seem to occur. Based on these factors, the potential for diethylphthalate to impact human health through the animal food chain is low.

4.18 Di-n-butylphthalate

Water solubility:	13 mg/L
Kow:	400,000
Vapor Pressure:	0.00001 mm Hg
Koc:	170,000 L/kg
Fish BCF:	Not available

Di-n-butylphthalate's moderate water solubility, low vapor pressure, high Kow, and high Koc indicate that di-n-butylphthalate is likely to be retained on soil, and less likely to leach to groundwater or volatilize to air. Consequently, di-n-butylphthalate is available to be absorbed into plants along with soil water or, more likely, absorbed into the outer lipophilic plant membrane. The significance of this adsorption potential is not known.

B07NE003702-07792

Di-n-butylphthalate's high Kow suggests that di-n-butylphthalate may be absorbed and retained in animal tissue. However, the ability of many animal species to metabolize phthalate esters limits the accumulation in tissue. Therefore, the potential for di-n-butylphthalate to impact human health through the animal food chain is low.

4.19 n-Nitrosodiphenylamine

Water solubility:	35 mg/L
Kow:	616
Vapor Pressure:	0.1 mm Hg
Koc:	Not available
Fish BCF:	Not available

n-Nitrosodiphenylamine's moderate water solubility, moderate vapor pressure and moderate Kow indicates that n-nitrosodiphenylamine will be retained in soil to a moderate degree, with some volatilization and some leaching. This suggests that n-nitrosodiphenylamine may be taken up into plants along with soil water or adsorbed onto the outer lipophilic membranes of roots. The magnitude of this uptake and the significance for human health is not known.

The moderate KOW for n-nitrosodiphenylamine suggests that this chemical has the ability to be taken up and accumulated into aquatic organisms. It is not known whether this chemical can be metabolized by such organisms, so it is not known whether bioaccumulation does occur. Therefore, the potential impact upon human health is unknown.

4.20 Phenol

Water solubility:	93,000 mg/L
Kow:	28.8
Vapor Pressure:	0.35 mm Hg at 25 °C
Koc:	14.2 L/kg
Fish BCF:	1.4 L/kg

Phenol's high water solubility, moderate vapor pressure, moderate Kow and moderate Koc indicate that phenol will leach from soil, with some minor degree of volatilization and soil

B07NE003702-07793

retention. These factors suggest that phenol has a limited potential to be retained in soils for time periods sufficient for appreciable plant uptake. The high water solubility, moderate Kow and moderate vapor pressure further suggest that although uptake in plant tissue may occur along with water uptake, accumulation in the plant tissue is expected to be low. Based on these factors, the potential human health risks associated with uptake and accumulation of phenol in plant tissue is anticipated to be low.

Phenol's low BCF suggest that phenol is not likely to accumulate in fish tissue. Therefore, the potential human health risks associated with uptake and accumulation of TCA in animal tissue is also anticipated to be low.

5.0 SUMMARY

This section discussed general mechanisms of chemical uptake by plants and other organisms, and reviewed the chemicals of concern for OU-2 with regard to potential uptake. For most chemicals, there is no strong indication that uptake and accumulation in the food chain is a significant exposure pathway. A few chemicals have some information available suggesting that uptake into plants may potentially occur. However, the magnitude of this potential is not known. A few chemicals had no information with which to judge uptake potential. Whether these or any chemicals have the potential to impact the human food chain depends upon a number of factors: some chemical-related, some plant-related and some environment-related. These factors will interact to modify the potential to impact the food chain.

B07NE003702-07794

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C

APPENDIX C
RISK CALCULATIONS

RISK EQUATIONS

CALCULATION OF CHRONIC DAILY INTAKE (CDI)

For soil ingestion:

CDI = (C(X) * IR * EF * ED * CF) / (BW * AT1 or AT2)

For groundwater ingestion:

CDI = (C(X) * IR * EF * ED) / (BW * AT1 or AT2)

For dermal soil contact:

CDI = (C(X) * SA * AD * AB * EF * ED * CF) / (BW * AT1 or AT2)

For inhalation exposure:

CDI = (C(X) * IH * ET * EF * ED) / (BW * AT1 or AT2)

For dermal contact while showering:

CDI = (C(X) * SA * PC * ET * EF * ED * CF) / (BW * AT1 or AT2)

Where:
C(X) = Chemical concentration (mg/kg soil; mg/L water; mg/m3 air)
IR = Ingestion rate (mg/day soil or L/day water)
IH = Inhalation rate (m3/hour)
ET = Exposure time (hours/day)
EF = Exposure frequency (days/year)
ED = Exposure duration (years)
BW = Body weight (kg)
SA = Exposed body surface area (cm2)
AD = Soil adherence to skin (mg/cm2)
AB = Percent chemical absorption across skin (unitless)
PC = Permeability constant (cm2/hour)
CF = Conversion factor (1 L/1000 cm3 dermal water; 10E-6 kg/mg soil ingestion and dermal contact)
AT1 = Averaging time for non-carcinogenic effects (days)
AT2 = Averaging time for carcinogenic effects, based on lifetime (days)

CALCULATION OF CANCER RISK AND HAZARD INDEX

Cancer risk = Slope Factor * CDI

Hazard Index = CDI / Reference dose

TABLE 1
CHEMICAL PARAMETER TABLE FOR RME EXPOSURE SCENARIOS, MW-5B

Chemical	RME Concentration					Reference Dose		Slope Factor		Permeability Constant	Dermal Absorption
	Surface Soil (mg/kg)	Sediment (mg/kg)	Surface Water (mg/L)	Ground Water (mg/L)	Air (mg/m3)	Oral	Inhalation	Oral	Inhalation		(Soil)
RDX				0.098		0.003		0.11		0.000348	0.01
HMX				0.045		0.05				0.000348	0.01
TNB				0.002		5E-05				0.0038	0.01
TNT				0.02		0.0005		0.03		0.0038	0.01
2,4-DNT				0.001		0.002		0.68		0.0038	0.01
Aluminum										0.001	0.001
Nickel						0.02				0.001	0.001
Vanadium						0.007				0.001	0.001
Di-N-Butylphthalate						0.1				0.363	0.01
Diethylphthalate						0.8				0.00502	0.01
Phenol						0.6				0.00554	0.01
N-Nitrosodiphenylamine								0.0049		0.036	
1,2-DCE				0.0005	0.00667	0.009				0.00128	0.01
Acetone				0.005	0.0667	0.1				0.00057	0.01
Methylene Chloride				0.001	0.0133	0.06	0.86	0.0075	0.00165	0.00446	0.01
Trichloroethene				0.0005	0.00667			0.011	0.017	0.0148	0.01
Benzene								0.029	0.029		0.01
1,1,1-Trichloroethane				0.0005	0.00667	0.09	0.29			0.017	0.01
1,2-Dichloropropane				0.0005	0.00667		0.00114	0.068		0.01	0.01
Tetrachloroethene				0.0005	0.00667	0.01		0.052	0.002	0.048	0.01
Chloroform				0.0005	0.00667	0.01		0.0061	0.081	0.0089	0.01

Notebook = ChemData

TABLE 2
ADULT RESIDENT GROUNDWATER INGESTION SCENARIO, RME EXPOSURE WELL MW-5B

chemical	C(x) (mg/L)	IR (L/d)	EF (d/yr)	ED (years)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0.098	2	350	70	70	25550	25550	2.68E-03	0.003	8.95E-01	2.68E-03	0.11	2.95E-04
HMX	0.045	2	350	70	70	25550	25550	1.23E-03	0.05	2.47E-02	1.23E-03	0	0.00E+00
TNB	0.002	2	350	70	70	25550	25550	5.48E-05	5E-05	1.10E+00	5.48E-05	0	0.00E+00
TNT	0.02	2	350	70	70	25550	25550	5.48E-04	0.0005	1.10E+00	5.48E-04	0.03	1.64E-05
2,4-DNT	0.001	2	350	70	70	25550	25550	2.74E-05	0.002	1.37E-02	2.74E-05	0.68	1.86E-05
	0	2	350	70	70	25550	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Aluminum	0	2	350	70	70	25550	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Nickel	0	2	350	70	70	25550	25550	0.00E+00	0.02	0.00E+00	0.00E+00	0	0.00E+00
Vanadium	0	2	350	70	70	25550	25550	0.00E+00	0.007	0.00E+00	0.00E+00	0	0.00E+00
	0	2	350	70	70	25550	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Di-N-Butylphthalate	0	2	350	70	70	25550	25550	0.00E+00	0.1	0.00E+00	0.00E+00	0	0.00E+00
Diethylphthalate	0	2	350	70	70	25550	25550	0.00E+00	0.8	0.00E+00	0.00E+00	0	0.00E+00
Phenol	0	2	350	70	70	25550	25550	0.00E+00	0.6	0.00E+00	0.00E+00	0	0.00E+00
N-Nitrosodiphenylamine	0	2	350	70	70	25550	25550	0.00E+00	0	0.00E+00	0.00E+00	0.0049	0.00E+00
	0	2	350	70	70	25550	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
1,2-DCE	0.0005	2	350	70	70	25550	25550	1.37E-05	0.009	1.52E-03	1.37E-05	0	0.00E+00
Acetone	0.005	2	350	70	70	25550	25550	1.37E-04	0.1	1.37E-03	1.37E-04	0	0.00E+00
Methylene Chloride	0.001	2	350	70	70	25550	25550	2.74E-05	0.06	4.57E-04	2.74E-05	0.0075	2.05E-07
Trichloroethene	0.0005	2	350	70	70	25550	25550	1.37E-05	0	0.00E+00	1.37E-05	0.011	1.51E-07
Benzene	0	2	350	70	70	25550	25550	0.00E+00	0	0.00E+00	0.00E+00	0.029	0.00E+00
1,1,1-Trichloroethane	0.0005	2	350	70	70	25550	25550	1.37E-05	0.09	1.52E-04	1.37E-05	0	0.00E+00
1,2-Dichloropropane	0.0005	2	350	70	70	25550	25550	1.37E-05	0	0.00E+00	1.37E-05	0.068	9.32E-07
Tetrachloroethene	0.0005	2	350	70	70	25550	25550	1.37E-05	0.01	1.37E-03	1.37E-05	0.052	7.12E-07
Chloroform	0.0005	2	350	70	70	25550	25550	1.37E-05	0.01	1.37E-03	1.37E-05	0.0061	8.36E-08
Notebook = Adult70									HI =	3.13E+00		CR =	3.32E-04

TABLE 3
ADULT RESIDENT DERMAL SHOWER SCENARIO, RME EXPOSURE WELL MW-5B

chemical	C(x) (mg/L)	SA (cm2)	PC (cm/hr)	ET (h/d)	EF (d/yr)	ED (years)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0.098	19400	0.00035	0.2	350	70	70	25550	25550	1.81E-06	0.003	6.04E-04	1.813E-06	0.11	1.99E-07
HMX	0.045	19400	0.00035	0.2	350	70	70	25550	25550	8.32E-07	0.05	1.66E-05	8.323E-07	0	0.00E+00
TNB	0.002	19400	0.0038	0.2	350	70	70	25550	25550	4.04E-07	5E-05	8.08E-03	4.039E-07	0	0.00E+00
TNT	0.02	19400	0.0038	0.2	350	70	70	25550	25550	4.04E-06	0.0005	8.08E-03	4.039E-06	0.03	1.21E-07
2,4-DNT	0.001	19400	0.0038	0.2	350	70	70	25550	25550	2.02E-07	0.002	1.01E-04	2.02E-07	0.68	1.37E-07
	0	19400	0	0.2	350	70	70	25550	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Aluminum	0	19400	0.001	0.2	350	70	70	25550	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Nickel	0	19400	0.001	0.2	350	70	70	25550	25550	0.00E+00	0.02	0.00E+00	0	0	0.00E+00
Vanadium	0	19400	0.001	0.2	350	70	70	25550	25550	0.00E+00	0.007	0.00E+00	0	0	0.00E+00
	0	19400	0	0.2	350	70	70	25550	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Di-N-Butylphthalate	0	19400	0.363	0.2	350	70	70	25550	25550	0.00E+00	0.1	0.00E+00	0	0	0.00E+00
Diethylphthalate	0	19400	0.00502	0.2	350	70	70	25550	25550	0.00E+00	0.8	0.00E+00	0	0	0.00E+00
Phenol	0	19400	0.00554	0.2	350	70	70	25550	25550	0.00E+00	0.6	0.00E+00	0	0	0.00E+00
N-Nitrosodiphenylamine	0	19400	0.036	0.2	350	70	70	25550	25550	0.00E+00	0	0.00E+00	0	0.0049	0.00E+00
	0	19400	0	0.2	350	70	70	25550	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
1,2-DCE	0	19400	0.00128	0.2	350	70	70	25550	25550	0.00E+00	0.009	0.00E+00	0	0	0.00E+00
Acetone	0	19400	0.00057	0.2	350	70	70	25550	25550	0.00E+00	0.1	0.00E+00	0	0	0.00E+00
Methylene Chloride	0	19400	0.00446	0.2	350	70	70	25550	25550	0.00E+00	0.06	0.00E+00	0	0.0075	0.00E+00
Trichloroethene	0	19400	0.0148	0.2	350	70	70	25550	25550	0.00E+00	0	0.00E+00	0	0.011	0.00E+00
Benzene	0	19400	0	0.2	350	70	70	25550	25550	0.00E+00	0	0.00E+00	0	0.029	0.00E+00
1,1,1-Trichloroethane	0	19400	0.017	0.2	350	70	70	25550	25550	0.00E+00	0.09	0.00E+00	0	0	0.00E+00
1,2-Dichloropropane	0	19400	0.01	0.2	350	70	70	25550	25550	0.00E+00	0	0.00E+00	0	0.068	0.00E+00
Tetrachloroethene	0	19400	0.048	0.2	350	70	70	25550	25550	0.00E+00	0.01	0.00E+00	0	0.052	0.00E+00
Chloroform	0	19400	0.0089	0.2	350	70	70	25550	25550	0.00E+00	0.01	0.00E+00	0	0.0061	0.00E+00
											HI =	1.69E-02		CR =	4.58E-07

* Assumes 100 percent volatilization of VOCs, so none available for dermal absorption

TABLE 4
ADULT RESIDENT SHOWER INHALATION SCENARIO, RME EXPOSURE WELL MW-5B

chemical	C(x) (mg/m3)	IH (m3/h)	ET (hr/d)	EF (d/yr)	ED (yr)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0	0.83	0.2	350	70	70	25550	25550	0	0	0.00E+00	0	0	0.00E+00
HMX	0	0.83	0.2	350	70	70	25550	25550	0	0	0.00E+00	0	0	0.00E+00
TNB	0	0.83	0.2	350	70	70	25550	25550	0	0	0.00E+00	0	0	0.00E+00
TNT	0	0.83	0.2	350	70	70	25550	25550	0	0	0.00E+00	0	0	0.00E+00
2,4-DNT	0	0.83	0.2	350	70	70	25550	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.2	350	70	70	25550	25550	0	0	0.00E+00	0	0	0.00E+00
Aluminum	0	0.83	0.2	350	70	70	25550	25550	0	0	0.00E+00	0	0	0.00E+00
Nickel	0	0.83	0.2	350	70	70	25550	25550	0	0	0.00E+00	0	0	0.00E+00
Vanadium	0	0.83	0.2	350	70	70	25550	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.2	350	70	70	25550	25550	0	0	0.00E+00	0	0	0.00E+00
Di-N-Butylphthalate	0	0.83	0.2	350	70	70	25550	25550	0	0	0.00E+00	0	0	0.00E+00
Diethylphthalate	0	0.83	0.2	350	70	70	25550	25550	0	0	0.00E+00	0	0	0.00E+00
Phenol	0	0.83	0.2	350	70	70	25550	25550	0	0	0.00E+00	0	0	0.00E+00
N-Nitrosodiphenylamine	0	0.83	0.2	350	70	70	25550	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.2	350	70	70	25550	25550	0	0	0.00E+00	0	0	0.00E+00
1,2-DCE	0.00667	0.83	0.2	350	70	70	25550	25550	1.5167E-05	0	0.00E+00	1.517E-05	0	0.00E+00
Acetone	0.0667	0.83	0.2	350	70	70	25550	25550	0.00015167	0	0.00E+00	0.0001517	0	0.00E+00
Methylene Chloride	0.0133	0.83	0.2	350	70	70	25550	25550	3.0244E-05	0.86	3.52E-05	3.024E-05	0.00165	4.99E-08
Trichloroethene	0.00667	0.83	0.2	350	70	70	25550	25550	1.5167E-05	0	0.00E+00	1.517E-05	0.017	2.58E-07
Benzene	0	0.83	0.2	350	70	70	25550	25550	0	0	0.00E+00	0	0.029	0.00E+00
1,1,1-Trichloroethane	0.00667	0.83	0.2	350	70	70	25550	25550	1.5167E-05	0.29	5.23E-05	1.517E-05	0	0.00E+00
1,2-Dichloropropane	0.00667	0.83	0.2	350	70	70	25550	25550	1.5167E-05	0.00114	1.33E-02	1.517E-05	0	0.00E+00
Tetrachloroethene	0.00667	0.83	0.2	350	70	70	25550	25550	1.5167E-05	0	0.00E+00	1.517E-05	0.002	3.03E-08
Chloroform	0.00667	0.83	0.2	350	70	70	25550	25550	1.5167E-05	0	0.00E+00	1.517E-05	0.081	1.23E-06
										HI =	1.34E-02		CR =	1.57E-06

TABLE 5
CHILD (0-6) RESIDENT GROUNDWATER INGESTION SCENARIO, RME EXPOSURE MW-5B

chemical	C(x) (mg/L)	IR (L/d)	EF (d/yr)	ED (years)	BW (kg)	AT1 non-can	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0.098	1	350	6	15	2190	25550	6.26E-03	0.003	2.09E+00	5.37E-04	0.11	5.91E-05
HMX	0.045	1	350	6	15	2190	25550	2.88E-03	0.05	5.75E-02	2.47E-04	0	0.00E+00
TNB	0.002	1	350	6	15	2190	25550	1.28E-04	5E-05	2.56E+00	1.10E-05	0	0.00E+00
TNT	0.02	1	350	6	15	2190	25550	1.28E-03	0.0005	2.56E+00	1.10E-04	0.03	3.29E-06
2,4-DNT	0.001	1	350	6	15	2190	25550	6.39E-05	0.002	3.20E-02	5.48E-06	0.68	3.73E-06
	0	1	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Aluminum	0	1	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Nickel	0	1	350	6	15	2190	25550	0.00E+00	0.02	0.00E+00	0.00E+00	0	0.00E+00
Vanadium	0	1	350	6	15	2190	25550	0.00E+00	0.007	0.00E+00	0.00E+00	0	0.00E+00
	0	1	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Di-N-Butylphthalate	0	1	350	6	15	2190	25550	0.00E+00	0.1	0.00E+00	0.00E+00	0	0.00E+00
Diethylphthalate	0	1	350	6	15	2190	25550	0.00E+00	0.8	0.00E+00	0.00E+00	0	0.00E+00
Phenol	0	1	350	6	15	2190	25550	0.00E+00	0.6	0.00E+00	0.00E+00	0	0.00E+00
N-Nitrosodiphenylamine	0	1	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0.00E+00	0.0049	0.00E+00
	0	1	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
1,2-DCE	0.0005	1	350	6	15	2190	25550	3.20E-05	0.009	3.55E-03	2.74E-06	0	0.00E+00
Acetone	0.005	1	350	6	15	2190	25550	3.20E-04	0.1	3.20E-03	2.74E-05	0	0.00E+00
Methylene Chloride	0.001	1	350	6	15	2190	25550	6.39E-05	0.06	1.07E-03	5.48E-06	0.0075	4.11E-08
Trichloroethene	0.0005	1	350	6	15	2190	25550	3.20E-05	0	0.00E+00	2.74E-06	0.011	3.01E-08
Benzene	0	1	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0.00E+00	0.029	0.00E+00
1,1,1-Trichloroethane	0.0005	1	350	6	15	2190	25550	3.20E-05	0.09	3.55E-04	2.74E-06	0	0.00E+00
1,2-Dichloropropane	0.0005	1	350	6	15	2190	25550	3.20E-05	0	0.00E+00	2.74E-06	0.068	1.86E-07
Tetrachloroethene	0.0005	1	350	6	15	2190	25550	3.20E-05	0.01	3.20E-03	2.74E-06	0.052	1.42E-07
Chloroform	0.0005	1	350	6	15	2190	25550	3.20E-05	0.01	3.20E-03	2.74E-06	0.0061	1.67E-08
									HI =	7.31E+00		CR =	6.65E-05

Notebook = ChildRME

TABLE 6
CHILD (0-6) RESIDENT DERMAL SHOWER SCENARIO, RME EXPOSURE MW-5B

chemical	C(x) (mg/L)	SA (cm2)	PC (cm/hr)	ET (h/d)	EF (d/yr)	ED (years)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cance	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0.098	6670	0.00035	0.2	350	6	15	2190	25550	2.91E-06	0.003	9.69E-04	2.493E-07	0.11	2.74E-08
HMX	0.045	6670	0.00035	0.2	350	6	15	2190	25550	1.34E-06	0.05	2.67E-05	1.145E-07	0	0.00E+00
TNB	0.002	6670	0.0038	0.2	350	6	15	2190	25550	6.48E-07	5E-05	1.30E-02	5.555E-08	0	0.00E+00
TNT	0.02	6670	0.0038	0.2	350	6	15	2190	25550	6.48E-06	0.0005	1.30E-02	5.555E-07	0.03	1.67E-08
2,4-DNT	0.001	6670	0.0038	0.2	350	6	15	2190	25550	3.24E-07	0.002	1.62E-04	2.778E-08	0.68	1.89E-08
	0	6670	0	0.2	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Aluminum	0	6670	0.001	0.2	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Nickel	0	6670	0.001	0.2	350	6	15	2190	25550	0.00E+00	0.02	0.00E+00	0	0	0.00E+00
Vanadium	0	6670	0.001	0.2	350	6	15	2190	25550	0.00E+00	0.007	0.00E+00	0	0	0.00E+00
	0	6670	0	0.2	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Di-N-Butylphthalate	0	6670	0.363	0.2	350	6	15	2190	25550	0.00E+00	0.1	0.00E+00	0	0	0.00E+00
Diethylphthalate	0	6670	0.00502	0.2	350	6	15	2190	25550	0.00E+00	0.8	0.00E+00	0	0	0.00E+00
Phenol	0	6670	0.00554	0.2	350	6	15	2190	25550	0.00E+00	0.6	0.00E+00	0	0	0.00E+00
N-Nitrosodiphenylamine	0	6670	0.036	0.2	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0.0049	0.00E+00
	0	6670	0	0.2	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
1,2-DCE	0	6670	0.00128	0.2	350	6	15	2190	25550	0.00E+00	0.009	0.00E+00	0	0	0.00E+00
Acetone	0	6670	0.00057	0.2	350	6	15	2190	25550	0.00E+00	0.1	0.00E+00	0	0	0.00E+00
Methylene Chloride	0	6670	0.00446	0.2	350	6	15	2190	25550	0.00E+00	0.06	0.00E+00	0	0.0075	0.00E+00
Trichloroethene	0	6670	0.0148	0.2	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0.011	0.00E+00
Benzene	0	6670	0	0.2	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0.029	0.00E+00
1,1,1-Trichloroethane	0	6670	0.017	0.2	350	6	15	2190	25550	0.00E+00	0.09	0.00E+00	0	0	0.00E+00
1,2-Dichloropropane	0	6670	0.01	0.2	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0.068	0.00E+00
Tetrachloroethene	0	6670	0.048	0.2	350	6	15	2190	25550	0.00E+00	0.01	0.00E+00	0	0.052	0.00E+00
Chloroform	0	6670	0.0089	0.2	350	6	15	2190	25550	0.00E+00	0.01	0.00E+00	0	0.0061	0.00E+00
											HI =	2.71E-02		CR =	6.30E-08

* Assumes 100 percent volatilization of VOCs, so none available for dermal absorption

TABLE 7
CHILD (0-6) RESIDENT SHOWER INHALATION SCENARIO, RME EXPOSURE MW-5B

chemical	C(x) (mg/m3)	IH (m3/h)	ET (hr/d)	EF (d/yr)	ED (yr)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
HMX	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
TNB	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
TNT	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
2,4-DNT	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
Aluminum	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
Nickel	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
Vanadium	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
Di-N-Butylphthalate	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
Diethylphthalate	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
Phenol	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
N-Nitrosodiphenylamine	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
1,2-DCE	0.00667	0.83	0.2	350	6	15	2190	25550	7.078E-05	0	0.00E+00	6.067E-06	0	0.00E+00
Acetone	0.0667	0.83	0.2	350	6	15	2190	25550	0.0007078	0	0.00E+00	6.067E-05	0	0.00E+00
Methylene Chloride	0.0133	0.83	0.2	350	6	15	2190	25550	1.41E-04	0.86	1.64E-04	1.21E-05	0.00165	2.00E-08
Trichloroethene	0.00667	0.83	0.2	350	6	15	2190	25550	7.078E-05	0	0.00E+00	6.067E-06	0.017	1.03E-07
Benzene	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0.029	0.00E+00
1,1,1-Trichloroethane	0.00667	0.83	0.2	350	6	15	2190	25550	7.078E-05	0.29	2.44E-04	6.067E-06	0	0.00E+00
1,2-Dichloropropane	0.00667	0.83	0.2	350	6	15	2190	25550	7.078E-05	0.00114	6.21E-02	6.067E-06	0	0.00E+00
Tetrachloroethene	0.00667	0.83	0.2	350	6	15	2190	25550	7.078E-05	0	0.00E+00	6.067E-06	0.002	1.21E-08
Chloroform	0.00667	0.83	0.2	350	6	15	2190	25550	7.078E-05	0	0.00E+00	6.067E-06	0.081	4.91E-07
										HI =	6.25E-02		CR =	6.27E-07

TABLE 8
ON-SITE WORKER GROUNDWATER INGESTION SCENARIO, RME EXPOSURE MW-5B

chemical	C(x) (mg/L)	IR (L/d)	EF (d/yr)	ED (years)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0.098	1	250	25	70	9125	25550	9.59E-04	0.003	3.20E-01	3.42E-04	0.11	3.77E-05
HMX	0.045	1	250	25	70	9125	25550	4.40E-04	0.05	8.81E-03	1.57E-04	0	0.00E+00
TNB	0.002	1	250	25	70	9125	25550	1.96E-05	5E-05	3.91E-01	6.99E-06	0	0.00E+00
TNT	0.02	1	250	25	70	9125	25550	1.96E-04	0.0005	3.91E-01	6.99E-05	0.03	2.10E-06
2,4-DNT	0.001	1	250	25	70	9125	25550	9.78E-06	0.002	4.89E-03	3.49E-06	0.68	2.38E-06
	0	1	250	25	70	9125	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Aluminum	0	1	250	25	70	9125	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Nickel	0	1	250	25	70	9125	25550	0.00E+00	0.02	0.00E+00	0.00E+00	0	0.00E+00
Vanadium	0	1	250	25	70	9125	25550	0.00E+00	0.007	0.00E+00	0.00E+00	0	0.00E+00
	0	1	250	25	70	9125	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Di-N-Butylphthalate	0	1	250	25	70	9125	25550	0.00E+00	0.1	0.00E+00	0.00E+00	0	0.00E+00
Diethylphthalate	0	1	250	25	70	9125	25550	0.00E+00	0.8	0.00E+00	0.00E+00	0	0.00E+00
Phenol	0	1	250	25	70	9125	25550	0.00E+00	0.6	0.00E+00	0.00E+00	0	0.00E+00
N-Nitrosodiphenylamine	0	1	250	25	70	9125	25550	0.00E+00	0	0.00E+00	0.00E+00	0.0049	0.00E+00
	0	1	250	25	70	9125	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
1,2-DCE	0.0005	1	250	25	70	9125	25550	4.89E-06	0.009	5.44E-04	1.75E-06	0	0.00E+00
Acetone	0.005	1	250	25	70	9125	25550	4.89E-05	0.1	4.89E-04	1.75E-05	0	0.00E+00
Methylene Chloride	0.001	1	250	25	70	9125	25550	9.78E-06	0.06	1.63E-04	3.49E-06	0.0075	2.62E-08
Trichloroethene	0.0005	1	250	25	70	9125	25550	4.89E-06	0	0.00E+00	1.75E-06	0.011	1.92E-08
Benzene	0	1	250	25	70	9125	25550	0.00E+00	0	0.00E+00	0.00E+00	0.029	0.00E+00
1,1,1-Trichloroethane	0.0005	1	250	25	70	9125	25550	4.89E-06	0.09	5.44E-05	1.75E-06	0	0.00E+00
1,2-Dichloropropane	0.0005	1	250	25	70	9125	25550	4.89E-06	0	0.00E+00	1.75E-06	0.068	1.19E-07
Tetrachloroethene	0.0005	1	250	25	70	9125	25550	4.89E-06	0.01	4.89E-04	1.75E-06	0.052	9.09E-08
Chloroform	0.0005	1	250	25	70	9125	25550	4.89E-06	0.01	4.89E-04	1.75E-06	0.0061	1.07E-08
Notebook = AgWorkRME									HI =	1.12E+00		CR =	4.24E-05

TABLE 9
ON-SITE WORKER DERMAL SHOWER SCENARIO, RME EXPOSURE MW-5B

chemical	C(x) (mg/L)	SA (cm2)	PC (cm/hr)	ET (h/d)	EF (d/yr)	ED (years)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0.098	19400	0.000348	0.2	90	25	70	9125	25550	4.66E-07	0.003	1.55E-04	1.66E-07	0.11	1.83E-08
HMX	0.045	19400	0.000348	0.2	90	25	70	9125	25550	2.14E-07	0.05	4.28E-06	7.64E-08	0	0.00E+00
TNB	0.002	19400	0.0038	0.2	90	25	70	9125	25550	1.04E-07	5E-05	2.08E-03	3.71E-08	0	0.00E+00
TNT	0.02	19400	0.0038	0.2	90	25	70	9125	25550	1.04E-06	0.0005	2.08E-03	3.71E-07	0.03	1.11E-08
2,4-DNT	0.001	19400	0.0038	0.2	90	25	70	9125	25550	5.19E-08	0.002	2.60E-05	1.85E-08	0.68	1.26E-08
	0	19400	0	0.2	90	25	70	9125	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Aluminum	0	19400	0.001	0.2	90	25	70	9125	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Nickel	0	19400	0.001	0.2	90	25	70	9125	25550	0.00E+00	0.02	0.00E+00	0	0	0.00E+00
Vanadium	0	19400	0.001	0.2	90	25	70	9125	25550	0.00E+00	0.007	0.00E+00	0	0	0.00E+00
	0	19400	0	0.2	90	25	70	9125	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Di-N-Butylphthalate	0	19400	0.363	0.2	90	25	70	9125	25550	0.00E+00	0.1	0.00E+00	0	0	0.00E+00
Diethylphthalate	0	19400	0.00502	0.2	90	25	70	9125	25550	0.00E+00	0.8	0.00E+00	0	0	0.00E+00
Phenol	0	19400	0.00554	0.2	90	25	70	9125	25550	0.00E+00	0.6	0.00E+00	0	0	0.00E+00
N-Nitrosodiphenylamine	0	19400	0.036	0.2	90	25	70	9125	25550	0.00E+00	0	0.00E+00	0	0.0049	0.00E+00
	0	19400	0	0.2	90	25	70	9125	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
1,2-DCE	0	19400	0.00128	0.2	90	25	70	9125	25550	0.00E+00	0.009	0.00E+00	0	0	0.00E+00
Acetone	0	19400	0.00057	0.2	90	25	70	9125	25550	0.00E+00	0.1	0.00E+00	0	0	0.00E+00
Methylene Chloride	0	19400	0.00446	0.2	90	25	70	9125	25550	0.00E+00	0.06	0.00E+00	0	0.0075	0.00E+00
Trichloroethene	0	19400	0.0148	0.2	90	25	70	9125	25550	0.00E+00	0	0.00E+00	0	0.011	0.00E+00
Benzene	0	19400	0	0.2	90	25	70	9125	25550	0.00E+00	0	0.00E+00	0	0.029	0.00E+00
1,1,1-Trichloroethane	0	19400	0.017	0.2	90	25	70	9125	25550	0.00E+00	0.09	0.00E+00	0	0	0.00E+00
1,2-Dichloropropane	0	19400	0.01	0.2	90	25	70	9125	25550	0.00E+00	0	0.00E+00	0	0.068	0.00E+00
Tetrachloroethene	0	19400	0.048	0.2	90	25	70	9125	25550	0.00E+00	0.01	0.00E+00	0	0.052	0.00E+00
Chloroform	0	19400	0.0089	0.2	90	25	70	9125	25550	0.00E+00	0.01	0.00E+00	0	0.0061	0.00E+00
											HI =	4.34E-03		CR =	4.21E-08

* Assumes 100 percent volatilization of VOCs, so none available for dermal absorption

TABLE 10
ON-SITE WORKER SHOWER INHALATION SCENARIO, RME EXPOSURE MW-5B

chemical	C(x) (mg/m3)	IH (m3/h)	ET (hr/d)	EF (d/yr)	ED (yr)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
HMX	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
TNB	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
TNT	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
2,4-DNT	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
Aluminum	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
Nickel	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
Vanadium	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
Di-N-Butylphthalate	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
Diethylphthalate	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
Phenol	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
N-Nitrosodiphenylamine	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
1,2-DCE	0.00667	0.83	0.2	90	25	70	9125	25550	3.9E-06	0	0.00E+00	1.393E-06	0	0.00E+00
Acetone	0.0667	0.83	0.2	90	25	70	9125	25550	3.9E-05	0	0.00E+00	1.393E-05	0	0.00E+00
Methylene Chloride	0.0133	0.83	0.2	90	25	70	9125	25550	7.777E-06	0.86	9.04E-06	2.777E-06	0.00165	4.58E-09
Trichloroethene	0.00667	0.83	0.2	90	25	70	9125	25550	3.9E-06	0	0.00E+00	1.393E-06	0.017	2.37E-08
Benzene	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0.029	0.00E+00
1,1,1-Trichloroethane	0.00667	0.83	0.2	90	25	70	9125	25550	3.9E-06	0.29	1.34E-05	1.393E-06	0	0.00E+00
1,2-Dichloropropane	0.00667	0.83	0.2	90	25	70	9125	25550	3.9E-06	0.00114	3.42E-03	1.393E-06	0	0.00E+00
Tetrachloroethene	0.00667	0.83	0.2	90	25	70	9125	25550	3.9E-06	0	0.00E+00	1.393E-06	0.002	2.79E-09
Chloroform	0.00667	0.83	0.2	90	25	70	9125	25550	3.9E-06	0	0.00E+00	1.393E-06	0.081	1.13E-07
										HI =	3.44E-03		CR =	1.44E-07

TABLE 11
CONSTRUCTION WORKER DERMAL SHOWER SCENARIO, RME EXPOSURE WELL MW-5B

chemical	C(x) (mg/L)	SA (cm2)	PC (cm/hr)	ET (h/d)	EF (d/yr)	ED (years)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0.098	19400	0.000348	0.2	90	1	70	182	25550	9.35E-07	0.003	3.12E-04	6.6587E-09	0.11	7.32E-10
HMX	0.045	19400	0.000348	0.2	90	1	70	182	25550	4.29E-07	0.05	8.58E-06	3.0576E-09	0	0.00E+00
TNB	0.002	19400	0.0038	0.2	90	1	70	182	25550	2.08E-07	5E-05	4.17E-03	1.4839E-09	0	0.00E+00
TNT	0.02	19400	0.0038	0.2	90	1	70	182	25550	2.08E-06	0.0005	4.17E-03	1.4839E-08	0.03	4.45E-10
2,4-DNT	0.001	19400	0.0038	0.2	90	1	70	182	25550	1.04E-07	0.002	5.21E-05	7.4194E-10	0.68	5.05E-10
	0	19400	0	0.2	90	1	70	182	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Aluminum	0	19400	0.001	0.2	90	1	70	182	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Nickel	0	19400	0.001	0.2	90	1	70	182	25550	0.00E+00	0.02	0.00E+00	0	0	0.00E+00
Vanadium	0	19400	0.001	0.2	90	1	70	182	25550	0.00E+00	0.007	0.00E+00	0	0	0.00E+00
	0	19400	0	0.2	90	1	70	182	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Di-N-Butylphthalate	0	19400	0.363	0.2	90	1	70	182	25550	0.00E+00	0.1	0.00E+00	0	0	0.00E+00
Diethylphthalate	0	19400	0.00502	0.2	90	1	70	182	25550	0.00E+00	0.8	0.00E+00	0	0	0.00E+00
Phenol	0	19400	0.00554	0.2	90	1	70	182	25550	0.00E+00	0.6	0.00E+00	0	0	0.00E+00
N-Nitrosodiphenylamine	0	19400	0.036	0.2	90	1	70	182	25550	0.00E+00	0	0.00E+00	0	0.0049	0.00E+00
	0	19400	0	0.2	90	1	70	182	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
1,2-DCE	0	19400	0.00128	0.2	90	1	70	182	25550	0.00E+00	0.009	0.00E+00	0	0	0.00E+00
Acetone	0	19400	0.00057	0.2	90	1	70	182	25550	0.00E+00	0.1	0.00E+00	0	0	0.00E+00
Methylene Chloride	0	19400	0.00446	0.2	90	1	70	182	25550	0.00E+00	0.06	0.00E+00	0	0.0075	0.00E+00
Trichloroethene	0	19400	0.0148	0.2	90	1	70	182	25550	0.00E+00	0	0.00E+00	0	0.011	0.00E+00
Benzene	0	19400	0	0.2	90	1	70	182	25550	0.00E+00	0	0.00E+00	0	0.029	0.00E+00
1,1,1-Trichloroethane	0	19400	0.017	0.2	90	1	70	182	25550	0.00E+00	0.09	0.00E+00	0	0	0.00E+00
1,2-Dichloropropane	0	19400	0.01	0.2	90	1	70	182	25550	0.00E+00	0	0.00E+00	0	0.068	0.00E+00
Tetrachloroethene	0	19400	0.048	0.2	90	1	70	182	25550	0.00E+00	0.01	0.00E+00	0	0.052	0.00E+00
Chloroform	0	19400	0.0089	0.2	90	1	70	182	25550	0.00E+00	0.01	0.00E+00	0	0.0061	0.00E+00
											HI =	8.70E-03		CR =	1.68E-09

* Assumes 100 percent volatilization of VOCs, so none available for dermal absorption

TABLE 12
CONSTRUCTION WORKER SHOWER INHALATION SCENARIO, RME EXPOSURE WELL MW-5B

chemical	C(x) (mg/m3)	IH (m3/h)	ET (hr/d)	EF (d/yr)	ED (yr)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0	0.83	0.2	90	1	70	182	25550	0	0	0.00E+00	0	0	0.00E+00
HMX	0	0.83	0.2	90	1	70	182	25550	0	0	0.00E+00	0	0	0.00E+00
TNB	0	0.83	0.2	90	1	70	182	25550	0	0	0.00E+00	0	0	0.00E+00
TNT	0	0.83	0.2	90	1	70	182	25550	0	0	0.00E+00	0	0	0.00E+00
2,4-DNT	0	0.83	0.2	90	1	70	182	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.2	90	1	70	182	25550	0	0	0.00E+00	0	0	0.00E+00
Aluminum	0	0.83	0.2	90	1	70	182	25550	0	0	0.00E+00	0	0	0.00E+00
Nickel	0	0.83	0.2	90	1	70	182	25550	0	0	0.00E+00	0	0	0.00E+00
Vanadium	0	0.83	0.2	90	1	70	182	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.2	90	1	70	182	25550	0	0	0.00E+00	0	0	0.00E+00
Di-N-Butylphthalate	0	0.83	0.2	90	1	70	182	25550	0	0	0.00E+00	0	0	0.00E+00
Diethylphthalate	0	0.83	0.2	90	1	70	182	25550	0	0	0.00E+00	0	0	0.00E+00
Phenol	0	0.83	0.2	90	1	70	182	25550	0	0	0.00E+00	0	0	0.00E+00
N-Nitrosodiphenylamine	0	0.83	0.2	90	1	70	182	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.2	90	1	70	182	25550	0	0	0.00E+00	0	0	0.00E+00
1,2-DCE	0.00667	0.83	0.2	90	1	70	182	25550	7.822E-06	0	0.00E+00	5.572E-08	0	0.00E+00
Acetone	0.0667	0.83	0.2	90	1	70	182	25550	7.822E-05	0	0.00E+00	5.572E-07	0	0.00E+00
Methylene Chloride	0.0133	0.83	0.2	90	1	70	182	25550	1.56E-05	0.86	1.81E-05	1.111E-07	0.00165	1.83E-10
Trichloroethene	0.00667	0.83	0.2	90	1	70	182	25550	7.822E-06	0	0.00E+00	5.572E-08	0.017	9.47E-10
Benzene	0	0.83	0.2	90	1	70	182	25550	0	0	0.00E+00	0	0.029	0.00E+00
1,1,1-Trichloroethane	0.00667	0.83	0.2	90	1	70	182	25550	7.822E-06	0.29	2.70E-05	5.572E-08	0	0.00E+00
1,2-Dichloropropane	0.00667	0.83	0.2	90	1	70	182	25550	7.822E-06	0.00114	6.86E-03	5.572E-08	0	0.00E+00
Tetrachloroethene	0.00667	0.83	0.2	90	1	70	182	25550	7.822E-06	0	0.00E+00	5.572E-08	0.002	1.11E-10
Chloroform	0.00667	0.83	0.2	90	1	70	182	25550	7.822E-06	0	0.00E+00	5.572E-08	0.081	4.51E-09
										HI =	6.91E-03		CR =	5.76E-09

TABLE 1
CHEMICAL PARAMETER TABLE FOR RME EXPOSURE SCENARIOS, MW-40B

Chemical	RME Concentration					Reference Dose		Slope Factor		Permeability Constant	Dermal Absorption
	Surface Soil (mg/kg)	Sediment (mg/kg)	Surface Water (mg/L)	Ground Water (mg/L)	Air (mg/m3)	Oral	Inhalatio	Oral	Inhalation		(Soil)
RDX				8E-05		0.003		0.11		0.000348	0.01
HMX				0.00013		0.05				0.000348	0.01
TNB				0.00013		5E-05				0.0038	0.01
TNT				0.00013		0.0005		0.03		0.0038	0.01
2,4-DNT				0.00013		0.002		0.68		0.0038	0.01
Aluminum										0.001	0.001
Nickel						0.02				0.001	0.001
Vanadium						0.007				0.001	0.001
Di-N-Butylphthalate						0.1				0.363	0.01
Diethylphthalate						0.8				0.00502	0.01
Phenol						0.6				0.00554	0.01
N-Nitrosodiphenylamine								0.0049		0.036	
1,2-DCE				0.085	1.13	0.009				0.00128	0.01
Acetone				0.085	1.13	0.1				0.00057	0.01
Methylene Chloride				0.043	0.574	0.06	0.86	0.0075	0.00165	0.00446	0.01
Trichloroethene				1.8	24			0.011	0.017	0.0148	0.01
Benzene								0.029	0.029		0.01
1,1,1-Trichloroethane				0.085	1.13	0.09	0.29			0.017	0.01
1,2-Dichloropropane				0.085	1.13		0.00114	0.068		0.01	0.01
Tetrachloroethene				0.085	1.13	0.01		0.052	0.002	0.048	0.01
Chloroform				0.085	1.13	0.01		0.0061	0.081	0.0089	0.01

Notebook = ChemData

TABLE 2
ADULT RESIDENT GROUNDWATER INGESTION SCENARIO, RME EXPOSURE MW-40B

chemical	C(x) (mg/L)	IR (L/d)	EF (d/yr)	ED (years)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	8E-05	2	350	70	70	25550	25550	2.19E-06	0.003	7.31E-04	2.19E-06	0.11	2.41E-07
HMX	0.00013	2	350	70	70	25550	25550	3.42E-06	0.05	6.85E-05	3.42E-06	0	0.00E+00
TNB	0.00013	2	350	70	70	25550	25550	3.42E-06	5E-05	6.85E-02	3.42E-06	0	0.00E+00
TNT	0.00013	2	350	70	70	25550	25550	3.42E-06	0.0005	6.85E-03	3.42E-06	0.03	1.03E-07
2,4-DNT	0.00013	2	350	70	70	25550	25550	3.42E-06	0.002	1.71E-03	3.42E-06	0.68	2.33E-06
	0	2	350	70	70	25550	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Aluminum	0	2	350	70	70	25550	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Nickel	0	2	350	70	70	25550	25550	0.00E+00	0.02	0.00E+00	0.00E+00	0	0.00E+00
Vanadium	0	2	350	70	70	25550	25550	0.00E+00	0.007	0.00E+00	0.00E+00	0	0.00E+00
	0	2	350	70	70	25550	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Di-N-Butylphthalate	0	2	350	70	70	25550	25550	0.00E+00	0.1	0.00E+00	0.00E+00	0	0.00E+00
Diethylphthalate	0	2	350	70	70	25550	25550	0.00E+00	0.8	0.00E+00	0.00E+00	0	0.00E+00
Phenol	0	2	350	70	70	25550	25550	0.00E+00	0.6	0.00E+00	0.00E+00	0	0.00E+00
N-Nitrosodiphenylamine	0	2	350	70	70	25550	25550	0.00E+00	0	0.00E+00	0.00E+00	0.0049	0.00E+00
	0	2	350	70	70	25550	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
1,2-DCE	0.085	2	350	70	70	25550	25550	2.33E-03	0.009	2.59E-01	2.33E-03	0	0.00E+00
Acetone	0.085	2	350	70	70	25550	25550	2.33E-03	0.1	2.33E-02	2.33E-03	0	0.00E+00
Methylene Chloride	0.043	2	350	70	70	25550	25550	1.18E-03	0.06	1.96E-02	1.18E-03	0.0075	8.84E-06
Trichloroethene	1.8	2	350	70	70	25550	25550	4.93E-02	0	0.00E+00	4.93E-02	0.011	5.42E-04
Benzene	0	2	350	70	70	25550	25550	0.00E+00	0	0.00E+00	0.00E+00	0.029	0.00E+00
1,1,1-Trichloroethane	0.085	2	350	70	70	25550	25550	2.33E-03	0.09	2.59E-02	2.33E-03	0	0.00E+00
1,2-Dichloropropane	0.085	2	350	70	70	25550	25550	2.33E-03	0	0.00E+00	2.33E-03	0.068	1.58E-04
Tetrachloroethene	0.085	2	350	70	70	25550	25550	2.33E-03	0.01	2.33E-01	2.33E-03	0.052	1.21E-04
Chloroform	0.085	2	350	70	70	25550	25550	2.33E-03	0.01	2.33E-01	2.33E-03	0.0061	1.42E-05
Notebook = Adult70									HI =	8.71E-01		CR =	8.48E-04

TABLE 3
ADULT RESIDENT DERMAL SHOWER SCENARIO, RME EXPOSURE MW-40B

chemical	C(x) (mg/L)	SA (cm2)	PC (cm/hr)	ET (h/d)	EF (d/yr)	ED (years)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	8E-05	19400	0.00035	0.2	350	70	70	25550	25550	1.48E-09	0.003	4.93E-07	1.48E-09	0.11	1.63E-10
HMX	0.00013	19400	0.00035	0.2	350	70	70	25550	25550	2.31E-09	0.05	4.62E-08	2.312E-09	0	0.00E+00
TNB	0.00013	19400	0.0038	0.2	350	70	70	25550	25550	2.52E-08	5E-05	5.05E-04	2.525E-08	0	0.00E+00
TNT	0.00013	19400	0.0038	0.2	350	70	70	25550	25550	2.52E-08	0.0005	5.05E-05	2.525E-08	0.03	7.57E-10
2,4-DNT	0.00013	19400	0.0038	0.2	350	70	70	25550	25550	2.52E-08	0.002	1.26E-05	2.525E-08	0.68	1.72E-08
	0	19400	0	0.2	350	70	70	25550	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Aluminum	0	19400	0.001	0.2	350	70	70	25550	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Nickel	0	19400	0.001	0.2	350	70	70	25550	25550	0.00E+00	0.02	0.00E+00	0	0	0.00E+00
Vanadium	0	19400	0.001	0.2	350	70	70	25550	25550	0.00E+00	0.007	0.00E+00	0	0	0.00E+00
	0	19400	0	0.2	350	70	70	25550	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Di-N-Butylphthalate	0	19400	0.363	0.2	350	70	70	25550	25550	0.00E+00	0.1	0.00E+00	0	0	0.00E+00
Diethylphthalate	0	19400	0.00502	0.2	350	70	70	25550	25550	0.00E+00	0.8	0.00E+00	0	0	0.00E+00
Phenol	0	19400	0.00554	0.2	350	70	70	25550	25550	0.00E+00	0.6	0.00E+00	0	0	0.00E+00
N-Nitrosodiphenylamine	0	19400	0.036	0.2	350	70	70	25550	25550	0.00E+00	0	0.00E+00	0	0.0049	0.00E+00
	0	19400	0	0.2	350	70	70	25550	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
1,2-DCE	0	19400	0.00128	0.2	350	70	70	25550	25550	0.00E+00	0.009	0.00E+00	0	0	0.00E+00
Acetone	0	19400	0.00057	0.2	350	70	70	25550	25550	0.00E+00	0.1	0.00E+00	0	0	0.00E+00
Methylene Chloride	0	19400	0.00446	0.2	350	70	70	25550	25550	0.00E+00	0.06	0.00E+00	0	0.0075	0.00E+00
Trichloroethene	0	19400	0.0148	0.2	350	70	70	25550	25550	0.00E+00	0	0.00E+00	0	0.011	0.00E+00
Benzene	0	19400	0	0.2	350	70	70	25550	25550	0.00E+00	0	0.00E+00	0	0.029	0.00E+00
1,1,1-Trichloroethane	0	19400	0.017	0.2	350	70	70	25550	25550	0.00E+00	0.09	0.00E+00	0	0	0.00E+00
1,2-Dichloropropane	0	19400	0.01	0.2	350	70	70	25550	25550	0.00E+00	0	0.00E+00	0	0.068	0.00E+00
Tetrachloroethene	0	19400	0.048	0.2	350	70	70	25550	25550	0.00E+00	0.01	0.00E+00	0	0.052	0.00E+00
Chloroform	0	19400	0.0089	0.2	350	70	70	25550	25550	0.00E+00	0.01	0.00E+00	0	0.0061	0.00E+00
											HI =	5.69E-04		CR =	1.81E-08

* Assumes 100 percent volatilization of VOCs, so none available for dermal absorption

TABLE 4
ADULT RESIDENT SHOWER INHALATION SCENARIO, RME EXPOSURE MW-40B

chemical	C(x) (mg/m3)	IR (m3/h)	ET (hr/d)	EF (d/yr)	ED (yr)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0	0.83	0.2	350	70	70	25550	25550	0	0	0.00E+00	0	0	0.00E+00
HMX	0	0.83	0.2	350	70	70	25550	25550	0	0	0.00E+00	0	0	0.00E+00
TNB	0	0.83	0.2	350	70	70	25550	25550	0	0	0.00E+00	0	0	0.00E+00
TNT	0	0.83	0.2	350	70	70	25550	25550	0	0	0.00E+00	0	0	0.00E+00
2,4-DNT	0	0.83	0.2	350	70	70	25550	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.2	350	70	70	25550	25550	0	0	0.00E+00	0	0	0.00E+00
Aluminum	0	0.83	0.2	350	70	70	25550	25550	0	0	0.00E+00	0	0	0.00E+00
Nickel	0	0.83	0.2	350	70	70	25550	25550	0	0	0.00E+00	0	0	0.00E+00
Vanadium	0	0.83	0.2	350	70	70	25550	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.2	350	70	70	25550	25550	0	0	0.00E+00	0	0	0.00E+00
Di-N-Butylphthalate	0	0.83	0.2	350	70	70	25550	25550	0	0	0.00E+00	0	0	0.00E+00
Diethylphthalate	0	0.83	0.2	350	70	70	25550	25550	0	0	0.00E+00	0	0	0.00E+00
Phenol	0	0.83	0.2	350	70	70	25550	25550	0	0	0.00E+00	0	0	0.00E+00
N-Nitrosodiphenylamine	0	0.83	0.2	350	70	70	25550	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.2	350	70	70	25550	25550	0	0	0.00E+00	0	0	0.00E+00
1,2-DCE	1.13	0.83	0.2	350	70	70	25550	25550	0.00256959	0	0.00E+00	0.0025696	0	0.00E+00
Acetone	1.13	0.83	0.2	350	70	70	25550	25550	0.00256959	0	0.00E+00	0.0025696	0	0.00E+00
Methylene Chloride	0.574	0.83	0.2	350	70	70	25550	25550	0.00130526	0.86	1.52E-03	0.0013053	0.00165	2.15E-06
Trichloroethene	24	0.83	0.2	350	70	70	25550	25550	0.05457534	0	0.00E+00	0.0545753	0.017	9.28E-04
Benzene	0	0.83	0.2	350	70	70	25550	25550	0	0	0.00E+00	0	0.029	0.00E+00
1,1,1-Trichloroethane	1.13	0.83	0.2	350	70	70	25550	25550	0.00256959	0.29	8.86E-03	0.0025696	0	0.00E+00
1,2-Dichloropropane	1.13	0.83	0.2	350	70	70	25550	25550	0.00256959	0.00114	2.25E+00	0.0025696	0	0.00E+00
Tetrachloroethene	1.13	0.83	0.2	350	70	70	25550	25550	0.00256959	0	0.00E+00	0.0025696	0.002	5.14E-06
Chloroform	1.13	0.83	0.2	350	70	70	25550	25550	0.00256959	0	0.00E+00	0.0025696	0.081	2.08E-04
										HI =	2.26E+00		CR =	1.14E-03

TABLE 5
CHILD (0-6) RESIDENT GROUNDWATER INGESTION SCENARIO, RME EXPOSURE MW-40B

chemical	C(x) (mg/L)	IR (L/d)	EF (d/yr)	ED (years)	BW (kg)	AT1 non-can	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	8E-05	1	350	6	15	2190	25550	5.11E-06	0.003	1.70E-03	4.38E-07	0.11	4.82E-08
HMX	0.00013	1	350	6	15	2190	25550	7.99E-06	0.05	1.60E-04	6.85E-07	0	0.00E+00
TNB	0.00013	1	350	6	15	2190	25550	7.99E-06	5E-05	1.60E-01	6.85E-07	0	0.00E+00
TNT	0.00013	1	350	6	15	2190	25550	7.99E-06	0.0005	1.60E-02	6.85E-07	0.03	2.05E-08
2,4-DNT	0.00013	1	350	6	15	2190	25550	7.99E-06	0.002	4.00E-03	6.85E-07	0.68	4.66E-07
	0	1	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Aluminum	0	1	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Nickel	0	1	350	6	15	2190	25550	0.00E+00	0.02	0.00E+00	0.00E+00	0	0.00E+00
Vanadium	0	1	350	6	15	2190	25550	0.00E+00	0.007	0.00E+00	0.00E+00	0	0.00E+00
	0	1	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Di-N-Butylphthalate	0	1	350	6	15	2190	25550	0.00E+00	0.1	0.00E+00	0.00E+00	0	0.00E+00
Diethylphthalate	0	1	350	6	15	2190	25550	0.00E+00	0.8	0.00E+00	0.00E+00	0	0.00E+00
Phenol	0	1	350	6	15	2190	25550	0.00E+00	0.6	0.00E+00	0.00E+00	0	0.00E+00
N-Nitrosodiphenylamine	0	1	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0.00E+00	0.0049	0.00E+00
	0	1	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
1,2-DCE	0.085	1	350	6	15	2190	25550	5.43E-03	0.009	6.04E-01	4.66E-04	0	0.00E+00
Acetone	0.085	1	350	6	15	2190	25550	5.43E-03	0.1	5.43E-02	4.66E-04	0	0.00E+00
Methylene Chloride	0.043	1	350	6	15	2190	25550	2.75E-03	0.06	4.58E-02	2.36E-04	0.0075	1.77E-06
Trichloroethene	1.8	1	350	6	15	2190	25550	1.15E-01	0	0.00E+00	9.86E-03	0.011	1.08E-04
Benzene	0	1	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0.00E+00	0.029	0.00E+00
1,1,1-Trichloroethane	0.085	1	350	6	15	2190	25550	5.43E-03	0.09	6.04E-02	4.66E-04	0	0.00E+00
1,2-Dichloropropane	0.085	1	350	6	15	2190	25550	5.43E-03	0	0.00E+00	4.66E-04	0.068	3.17E-05
Tetrachloroethene	0.085	1	350	6	15	2190	25550	5.43E-03	0.01	5.43E-01	4.66E-04	0.052	2.42E-05
Chloroform	0.085	1	350	6	15	2190	25550	5.43E-03	0.01	5.43E-01	4.66E-04	0.0061	2.84E-06
Notebook = ChildRME									HI =	2.03E+00		CR =	1.70E-04

TABLE 6
CHILD (0-6) RESIDENT DERMAL SHOWER SCENARIO, RME EXPOSURE MW-40B

chemical	C(x) (mg/L)	SA (cm2)	PC (cm/hr)	ET (h/d)	EF (d/yr)	ED (years)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cance	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	8E-05	6670	0.000348	0.2	350	6	15	2190	25550	2.37E-09	0.003	7.91E-07	2.035E-10	0.11	2.24E-11
HMX	0.00013	6670	0.000348	0.2	350	6	15	2190	25550	3.71E-09	0.05	7.42E-08	3.18E-10	0	0.00E+00
TNB	0.00013	6670	0.0038	0.2	350	6	15	2190	25550	4.05E-08	5E-05	8.10E-04	3.472E-09	0	0.00E+00
TNT	0.00013	6670	0.0038	0.2	350	6	15	2190	25550	4.05E-08	0.0005	8.10E-05	3.472E-09	0.03	1.04E-10
2,4-DNT	0.00013	6670	0.0038	0.2	350	6	15	2190	25550	4.05E-08	0.002	2.03E-05	3.472E-09	0.68	2.36E-09
	0	6670	0	0.2	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Aluminum	0	6670	0.001	0.2	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Nickel	0	6670	0.001	0.2	350	6	15	2190	25550	0.00E+00	0.02	0.00E+00	0	0	0.00E+00
Vanadium	0	6670	0.001	0.2	350	6	15	2190	25550	0.00E+00	0.007	0.00E+00	0	0	0.00E+00
	0	6670	0	0.2	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Di-N-Butylphthalate	0	6670	0.363	0.2	350	6	15	2190	25550	0.00E+00	0.1	0.00E+00	0	0	0.00E+00
Diethylphthalate	0	6670	0.00502	0.2	350	6	15	2190	25550	0.00E+00	0.8	0.00E+00	0	0	0.00E+00
Phenol	0	6670	0.00554	0.2	350	6	15	2190	25550	0.00E+00	0.6	0.00E+00	0	0	0.00E+00
N-Nitrosodiphenylamine	0	6670	0.036	0.2	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0.0049	0.00E+00
	0	6670	0	0.2	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
1,2-DCE	0	6670	0.00128	0.2	350	6	15	2190	25550	0.00E+00	0.009	0.00E+00	0	0	0.00E+00
Acetone	0	6670	0.00057	0.2	350	6	15	2190	25550	0.00E+00	0.1	0.00E+00	0	0	0.00E+00
Methylene Chloride	0	6670	0.00446	0.2	350	6	15	2190	25550	0.00E+00	0.06	0.00E+00	0	0.0075	0.00E+00
Trichloroethene	0	6670	0.0148	0.2	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0.011	0.00E+00
Benzene	0	6670	0	0.2	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0.029	0.00E+00
1,1,1-Trichloroethane	0	6670	0.017	0.2	350	6	15	2190	25550	0.00E+00	0.09	0.00E+00	0	0	0.00E+00
1,2-Dichloropropane	0	6670	0.01	0.2	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0.068	0.00E+00
Tetrachloroethene	0	6670	0.048	0.2	350	6	15	2190	25550	0.00E+00	0.01	0.00E+00	0	0.052	0.00E+00
Chloroform	0	6670	0.0089	0.2	350	6	15	2190	25550	0.00E+00	0.01	0.00E+00	0	0.0061	0.00E+00
											HI =	9.12E-04		CR =	2.49E-09

* Assumes 100 percent volatilization of VOCs, so none available for dermal absorption

TABLE 7
CHILD (0-6) RESIDENT SHOWER INHALATION SCENARIO, RME EXPOSURE MW-40B

chemical	C(x) (mg/m3)	IH (m3/h)	ET (hr/d)	EF (d/yr)	ED (yr)	BW (kg)	AT1 non-can	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
HMX	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
TNB	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
TNT	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
2,4-DNT	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
Aluminum	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
Nickel	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
Vanadium	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
Di-N-Butylphthalate	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
Diethylphthalate	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
Phenol	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
N-Nitrosodiphenylamine	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
1,2-DCE	1.13	0.83	0.2	350	6	15	2190	25550	0.01199142	0	0.00E+00	0.00102784	0	0.00E+00
Acetone	1.13	0.83	0.2	350	6	15	2190	25550	0.01199142	0	0.00E+00	0.00102784	0	0.00E+00
Methylene Chloride	0.574	0.83	0.2	350	6	15	2190	25550	0.00609121	0.86	7.08E-03	0.0005221	0.00165	8.61E-07
Trichloroethene	24	0.83	0.2	350	6	15	2190	25550	0.25468493	0	0.00E+00	0.02183014	0.017	3.71E-04
Benzene	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0.029	0.00E+00
1,1,1-Trichloroethane	1.13	0.83	0.2	350	6	15	2190	25550	0.01199142	0.29	4.13E-02	0.00102784	0	0.00E+00
1,2-Dichloropropane	1.13	0.83	0.2	350	6	15	2190	25550	0.01199142	0.00114	1.05E+01	0.00102784	0	0.00E+00
Tetrachloroethene	1.13	0.83	0.2	350	6	15	2190	25550	0.01199142	0	0.00E+00	0.00102784	0.002	2.06E-06
Chloroform	1.13	0.83	0.2	350	6	15	2190	25550	0.01199142	0	0.00E+00	0.00102784	0.081	8.33E-05
										HI =	1.06E+01		CR =	4.57E-04

TABLE 8
ON-SITE WORKER GROUNDWATER INGESTION SCENARIO, RME EXPOSURE MW-40B

chemical	C(x) (mg/L)	IR (L/d)	EF (d/yr)	ED (years)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	8E-05	1	250	25	70	9125	25550	7.83E-07	0.003	2.61E-04	2.80E-07	0.11	3.08E-08
HMX	0.00013	1	250	25	70	9125	25550	1.22E-06	0.05	2.45E-05	4.37E-07	0	0.00E+00
TNB	0.00013	1	250	25	70	9125	25550	1.22E-06	5E-05	2.45E-02	4.37E-07	0	0.00E+00
TNT	0.00013	1	250	25	70	9125	25550	1.22E-06	0.0005	2.45E-03	4.37E-07	0.03	1.31E-08
2,4-DNT	0.00013	1	250	25	70	9125	25550	1.22E-06	0.002	6.12E-04	4.37E-07	0.68	2.97E-07
	0	1	250	25	70	9125	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Aluminum	0	1	250	25	70	9125	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Nickel	0	1	250	25	70	9125	25550	0.00E+00	0.02	0.00E+00	0.00E+00	0	0.00E+00
Vanadium	0	1	250	25	70	9125	25550	0.00E+00	0.007	0.00E+00	0.00E+00	0	0.00E+00
	0	1	250	25	70	9125	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Di-N-Butylphthalate	0	1	250	25	70	9125	25550	0.00E+00	0.1	0.00E+00	0.00E+00	0	0.00E+00
Diethylphthalate	0	1	250	25	70	9125	25550	0.00E+00	0.8	0.00E+00	0.00E+00	0	0.00E+00
Phenol	0	1	250	25	70	9125	25550	0.00E+00	0.6	0.00E+00	0.00E+00	0	0.00E+00
N-Nitrosodiphenylamine	0	1	250	25	70	9125	25550	0.00E+00	0	0.00E+00	0.00E+00	0.0049	0.00E+00
	0	1	250	25	70	9125	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
1,2-DCE	0.085	1	250	25	70	9125	25550	8.32E-04	0.009	9.24E-02	2.97E-04	0	0.00E+00
Acetone	0.085	1	250	25	70	9125	25550	8.32E-04	0.1	8.32E-03	2.97E-04	0	0.00E+00
Methylene Chloride	0.043	1	250	25	70	9125	25550	4.21E-04	0.06	7.01E-03	1.50E-04	0.0075	1.13E-06
Trichloroethene	1.8	1	250	25	70	9125	25550	1.76E-02	0	0.00E+00	6.29E-03	0.011	6.92E-05
Benzene	0	1	250	25	70	9125	25550	0.00E+00	0	0.00E+00	0.00E+00	0.029	0.00E+00
1,1,1-Trichloroethane	0.085	1	250	25	70	9125	25550	8.32E-04	0.09	9.24E-03	2.97E-04	0	0.00E+00
1,2-Dichloropropane	0.085	1	250	25	70	9125	25550	8.32E-04	0	0.00E+00	2.97E-04	0.068	2.02E-05
Tetrachloroethene	0.085	1	250	25	70	9125	25550	8.32E-04	0.01	8.32E-02	2.97E-04	0.052	1.54E-05
Chloroform	0.085	1	250	25	70	9125	25550	8.32E-04	0.01	8.32E-02	2.97E-04	0.0061	1.81E-06
Notebook = AgWorkRME									HI =	3.11E-01		CR =	1.08E-04

TABLE 9
ON-SITE WORKER DERMAL SHOWER SCENARIO, RME EXPOSURE MW-40B

chemical	C(x) (mg/L)	SA (cm2)	PC (cm/hr)	ET (h/d)	EF (d/yr)	ED (years)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	8E-05	19400	0.00035	0.2	90	25	70	9125	25550	3.80E-10	0.003	1.27E-07	1.36E-10	0.11	1.49E-11
HMX	0.00013	19400	0.00035	0.2	90	25	70	9125	25550	5.95E-10	0.05	1.19E-08	2.12E-10	0	0.00E+00
TNB	0.00013	19400	0.0038	0.2	90	25	70	9125	25550	6.49E-09	5E-05	1.30E-04	2.32E-09	0	0.00E+00
TNT	0.00013	19400	0.0038	0.2	90	25	70	9125	25550	6.49E-09	0.0005	1.30E-05	2.32E-09	0.03	6.96E-11
2,4-DNT	0.00013	19400	0.0038	0.2	90	25	70	9125	25550	6.49E-09	0.002	3.25E-06	2.32E-09	0.68	1.58E-09
	0	19400	0	0.2	90	25	70	9125	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Aluminum	0	19400	0.001	0.2	90	25	70	9125	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Nickel	0	19400	0.001	0.2	90	25	70	9125	25550	0.00E+00	0.02	0.00E+00	0	0	0.00E+00
Vanadium	0	19400	0.001	0.2	90	25	70	9125	25550	0.00E+00	0.007	0.00E+00	0	0	0.00E+00
	0	19400	0	0.2	90	25	70	9125	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Di-N-Butylphthalate	0	19400	0.363	0.2	90	25	70	9125	25550	0.00E+00	0.1	0.00E+00	0	0	0.00E+00
Diethylphthalate	0	19400	0.00502	0.2	90	25	70	9125	25550	0.00E+00	0.8	0.00E+00	0	0	0.00E+00
Phenol	0	19400	0.00554	0.2	90	25	70	9125	25550	0.00E+00	0.6	0.00E+00	0	0	0.00E+00
N-Nitrosodiphenylamine	0	19400	0.036	0.2	90	25	70	9125	25550	0.00E+00	0	0.00E+00	0	0.0049	0.00E+00
	0	19400	0	0.2	90	25	70	9125	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
1,[illegible]DCE	0	19400	0.00128	0.2	90	25	70	9125	25550	0.00E+00	0.009	0.00E+00	0	0	0.00E+00
Acetone	0	19400	0.00057	0.2	90	25	70	9125	25550	0.00E+00	0.1	0.00E+00	0	0	0.00E+00
Methylene Chloride	0	19400	0.00446	0.2	90	25	70	9125	25550	0.00E+00	0.06	0.00E+00	0	0.0075	0.00E+00
Trichloroethene	0	19400	0.0148	0.2	90	25	70	9125	25550	0.00E+00	0	0.00E+00	0	0.011	0.00E+00
Benzene	0	19400	0	0.2	90	25	70	9125	25550	0.00E+00	0	0.00E+00	0	0.029	0.00E+00
1,1,1-Trichloroethane	0	19400	0.017	0.2	90	25	70	9125	25550	0.00E+00	0.09	0.00E+00	0	0	0.00E+00
1,2-Dichloropropane	0	19400	0.01	0.2	90	25	70	9125	25550	0.00E+00	0	0.00E+00	0	0.068	0.00E+00
Tetrachloroethene	0	19400	0.048	0.2	90	25	70	9125	25550	0.00E+00	0.01	0.00E+00	0	0.052	0.00E+00
Chloroform	0	19400	0.0089	0.2	90	25	70	9125	25550	0.00E+00	0.01	0.00E+00	0	0.0061	0.00E+00
											HI =	1.46E-04		CR =	1.66E-09

* Assumes 100 percent volatilization of VOCs, so none available for dermal absorption

TABLE 10
ON-SITE WORKER SHOWER INHALATION SCENARIO, RME EXPOSURE MW-40B

chemical	C(x) (mg/m3)	IH (m3/h)	ET (hr/d)	EF (d/yr)	ED (yr)	BW (kg)	AT1 non-can	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0	0.83	0.2	90	25	70	9125	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
HMX	0	0.83	0.2	90	25	70	9125	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
TNB	0	0.83	0.2	90	25	70	9125	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
TNT	0	0.83	0.2	90	25	70	9125	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
2,4-DNT	0	0.83	0.2	90	25	70	9125	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.2	90	25	70	9125	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Aluminum	0	0.83	0.2	90	25	70	9125	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Nickel	0	0.83	0.2	90	25	70	9125	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Vanadium	0	0.83	0.2	90	25	70	9125	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.2	90	25	70	9125	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Di-N-Butylphthalate	0	0.83	0.2	90	25	70	9125	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Diethylphthalate	0	0.83	0.2	90	25	70	9125	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Phenol	0	0.83	0.2	90	25	70	9125	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
N-Nitrosodiphenylamine	0	0.83	0.2	90	25	70	9125	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.2	90	25	70	9125	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
1,2-DCE	1.13	0.83	0.2	90	25	70	9125	25550	6.61E-04	0	0.00E+00	0.000236	0	0.00E+00
Acetone	1.13	0.83	0.2	90	25	70	9125	25550	6.61E-04	0	0.00E+00	0.000236	0	0.00E+00
Methylene Chloride	0.574	0.83	0.2	90	25	70	9125	25550	3.36E-04	0.86	3.90E-04	0.0001199	0.00165	1.98E-07
Trichloroethene	24	0.83	0.2	90	25	70	9125	25550	1.40E-02	0	0.00E+00	0.005012	0.017	8.52E-05
Benzene	0	0.83	0.2	90	25	70	9125	25550	0.00E+00	0	0.00E+00	0	0.029	0.00E+00
1,1,1-Trichloroethane	1.13	0.83	0.2	90	25	70	9125	25550	6.61E-04	0.29	2.28E-03	0.000236	0	0.00E+00
1,2-Dichloropropane	1.13	0.83	0.2	90	25	70	9125	25550	6.61E-04	0.00114	5.80E-01	0.000236	0	0.00E+00
Tetrachloroethene	1.13	0.83	0.2	90	25	70	9125	25550	6.61E-04	0	0.00E+00	0.000236	0.002	4.72E-07
Chloroform	1.13	0.83	0.2	90	25	70	9125	25550	6.61E-04	0	0.00E+00	0.000236	0.081	1.91E-05
										HI =	5.82E-01		CR =	1.05E-04

TABLE 11
CONSTRUCTION WORKER DERMAL SHOWER SCENARIO, RME EXPOSURE WELL MW-40B

chemical	C(x) (mg/L)	SA (cm2)	PC (cm/hr)	ET (h/d)	EF (d/yr)	ED (years)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	8E-05	19400	0.000348	0.2	90	1	70	182	25550	7.63E-10	0.003	2.54E-07	5.436E-12	0.11	5.98E-13
HMX	0.00013	19400	0.000348	0.2	90	1	70	182	25550	1.19E-09	0.05	2.38E-08	8.493E-12	0	0.00E+00
TNB	0.00013	19400	0.0038	0.2	90	1	70	182	25550	1.30E-08	5E-05	2.60E-04	9.274E-11	0	0.00E+00
TNT	0.00013	19400	0.0038	0.2	90	1	70	182	25550	1.30E-08	0.0005	2.60E-05	9.274E-11	0.03	2.78E-12
2,4-DNT	0.00013	19400	0.0038	0.2	90	1	70	182	25550	1.30E-08	0.002	6.51E-06	9.274E-11	0.68	6.31E-11
	0	19400	0	0.2	90	1	70	182	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Aluminum	0	19400	0.001	0.2	90	1	70	182	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Nickel	0	19400	0.001	0.2	90	1	70	182	25550	0.00E+00	0.02	0.00E+00	0	0	0.00E+00
Vanadium	0	19400	0.001	0.2	90	1	70	182	25550	0.00E+00	0.007	0.00E+00	0	0	0.00E+00
	0	19400	0	0.2	90	1	70	182	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Di-N-Butylphthalate	0	19400	0.363	0.2	90	1	70	182	25550	0.00E+00	0.1	0.00E+00	0	0	0.00E+00
Diethylphthalate	0	19400	0.00502	0.2	90	1	70	182	25550	0.00E+00	0.8	0.00E+00	0	0	0.00E+00
Phenol	0	19400	0.00554	0.2	90	1	70	182	25550	0.00E+00	0.6	0.00E+00	0	0	0.00E+00
N-Nitrosodiphenylamine	0	19400	0.036	0.2	90	1	70	182	25550	0.00E+00	0	0.00E+00	0	0.0049	0.00E+00
	0	19400	0	0.2	90	1	70	182	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
1,2-DCE	0	19400	0.00128	0.2	90	1	70	182	25550	0.00E+00	0.009	0.00E+00	0	0	0.00E+00
Acetone	0	19400	0.00057	0.2	90	1	70	182	25550	0.00E+00	0.1	0.00E+00	0	0	0.00E+00
Methylene Chloride	0	19400	0.00446	0.2	90	1	70	182	25550	0.00E+00	0.06	0.00E+00	0	0.0075	0.00E+00
Trichloroethene	0	19400	0.0148	0.2	90	1	70	182	25550	0.00E+00	0	0.00E+00	0	0.011	0.00E+00
Benzene	0	19400	0	0.2	90	1	70	182	25550	0.00E+00	0	0.00E+00	0	0.029	0.00E+00
1,1,1-Trichloroethane	0	19400	0.017	0.2	90	1	70	182	25550	0.00E+00	0.09	0.00E+00	0	0	0.00E+00
1,2-Dichloropropane	0	19400	0.01	0.2	90	1	70	182	25550	0.00E+00	0	0.00E+00	0	0.068	0.00E+00
Tetrachloroethene	0	19400	0.048	0.2	90	1	70	182	25550	0.00E+00	0.01	0.00E+00	0	0.052	0.00E+00
Chloroform	0	19400	0.0089	0.2	90	1	70	182	25550	0.00E+00	0.01	0.00E+00	0	0.0061	0.00E+00
											HI =	2.93E-04		CR =	6.64E-11

* Assumes 100 percent volatilization of VOCs, so none available for dermal absorption

TABLE 12
CONSTRUCTION WORKER SHOWER INHALATION SCENARIO, RME EXPOSURE WELL MW-40B

chemical	C(x) (mg/m3)	IH (m3/h)	ET (hr/d)	EF (d/yr)	ED (yr)	BW (kg)	AT1 non-can	AT2 cancer	CDI non-can	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0	0.83	0.2	90	1	70	182	25550	0	0	0.00E+00	0	0	0.00E+00
HMX	0	0.83	0.2	90	1	70	182	25550	0	0	0.00E+00	0	0	0.00E+00
TNB	0	0.83	0.2	90	1	70	182	25550	0	0	0.00E+00	0	0	0.00E+00
TNT	0	0.83	0.2	90	1	70	182	25550	0	0	0.00E+00	0	0	0.00E+00
2,4-DNT	0	0.83	0.2	90	1	70	182	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.2	90	1	70	182	25550	0	0	0.00E+00	0	0	0.00E+00
Aluminum	0	0.83	0.2	90	1	70	182	25550	0	0	0.00E+00	0	0	0.00E+00
Nickel	0	0.83	0.2	90	1	70	182	25550	0	0	0.00E+00	0	0	0.00E+00
Vanadium	0	0.83	0.2	90	1	70	182	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.2	90	1	70	182	25550	0	0	0.00E+00	0	0	0.00E+00
Di-N-Butylphthalate	0	0.83	0.2	90	1	70	182	25550	0	0	0.00E+00	0	0	0.00E+00
Diethylphthalate	0	0.83	0.2	90	1	70	182	25550	0	0	0.00E+00	0	0	0.00E+00
Phenol	0	0.83	0.2	90	1	70	182	25550	0	0	0.00E+00	0	0	0.00E+00
N-Nitrosodiphenylamine	0	0.83	0.2	90	1	70	182	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.2	90	1	70	182	25550	0	0	0.00E+00	0	0	0.00E+00
1,2-DCE	1.13	0.83	0.2	90	1	70	182	25550	0.0013	0	0.00E+00	9.4393E-06	0	0.00E+00
Acetone	1.13	0.83	0.2	90	1	70	182	25550	0.0013	0	0.00E+00	9.4393E-06	0	0.00E+00
Methylene Chloride	0.574	0.83	0.2	90	1	70	182	25550	0.0007	0.86	7.63E-04	4.7948E-06	0.00165	7.91E-09
Trichloroethene	24	0.83	0.2	90	1	70	182	25550	0.0281	0	0.00E+00	0.00020048	0.017	3.41E-06
Benzene	0	0.83	0.2	90	1	70	182	25550	0	0	0.00E+00	0	0.029	0.00E+00
1,1,1-Trichloroethane	1.13	0.83	0.2	90	1	70	182	25550	0.0013	0.29	4.57E-03	9.4393E-06	0	0.00E+00
1,2-Dichloropropane	1.13	0.83	0.2	90	1	70	182	25550	0.0013	0.00114	1.16E+00	9.4393E-06	0	0.00E+00
Tetrachloroethene	1.13	0.83	0.2	90	1	70	182	25550	0.0013	0	0.00E+00	9.4393E-06	0.002	1.89E-08
Chloroform	1.13	0.83	0.2	90	1	70	182	25550	0.0013	0	0.00E+00	9.4393E-06	0.081	7.65E-07
										HI =	1.17E+00		CR =	4.20E-06

TABLE 1
CHEMICAL PARAMETER TABLE FOR CONSTRUCTION RME EXPOSURE, ATLAS MISSILE AREA

Chemical	RME Concentration					Reference Dose		Slope Factor		Permeability Constant	Dermal Absorption
	Subsurface Soil (mg/kg)	Sediment (mg/kg)	Surface Water (mg/L)	Ground Water (mg/L)	Air (mg/m3)	Oral	Inhalation	Oral	Inhalation		(Soil)
1,2-DCE	0				0.00E+00	0.009				0.00128	0.01
Acetone	0.0202				5.31E-05	1				0.00057	0.01
Methylene Chloride	0				0.00E+00	0.06		0.0075	0.00165	0.00446	0.01
Trichloroethene	0.004				5.48E-04			0.011	0.017	0.0148	0.01
Benzene	0.002				2.58E-04			0.029	0.029		0.01

Notebook = ChemData

* If no subchronic value available, chronic value was used

TABLE 2
CONSTRUCTION WORKER SUBSURFACE SOIL INGESTION SCENARIO, RME EXPOSURE ATLAS MISSILE AREA

chemical	C(x) (mg/kg)	IR (mg/d)	EF (d/y)	ED (yr)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
	0	480	130	1	70	182	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
1,2-DCE	0	480	130	1	70	182	25550	0.00E+00	0.009	0.00E+00	0.00E+00	0	0.00E+00
Acetone	0.0202	480	130	1	70	182	25550	9.89E-08	1	9.89E-08	7.05E-10	0	0.00E+00
Methylene Chloride	0	480	130	1	70	182	25550	0.00E+00	0.06	0.00E+00	0.00E+00	0.0075	0.00E+00
Trichloroethene	0.004	480	130	1	70	182	25550	1.96E-08	0	0.00E+00	1.40E-10	0.011	1.54E-12
Benzene	0.002	480	130	1	70	182	25550	9.80E-09	0	0.00E+00	6.98E-11	0.029	2.02E-12
	0	480	130	1	70	182	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Notebook = ConstrRME									HI =	9.89E-08		CR =	3.56E-12

TABLE 3
CONSTRUCTION WORKER DERMAL SUBSURFACE SOIL CONTACT SCENARIO, RME EXPOSURE ATLAS MISSILE AREA

chemical	C(x) (mg/kg)	SA (cm2)	AD (mg/cm2)	AB unitless	EF (d/y)	ED (yr)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
	0	5300	1	0	130	1	70	182	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
1,2-DCE	0	5300	1	0.01	130	1	70	182	25550	0.00E+00	0.009	0.00E+00	0	0	0.00E+00
Acetone	0.0202	5300	1	0.01	130	1	70	182	25550	1.09E-08	1	1.09E-08	7.782E-11	0	0.00E+00
Methylene Chloride	0	5300	1	0.01	130	1	70	182	25550	0.00E+00	0.06	0.00E+00	0	0.0075	0.00E+00
Trichloroethene	0.004	5300	1	0.01	130	1	70	182	25550	2.16E-09	0	0.00E+00	1.541E-11	0.011	1.70E-13
Benzene	0.002	5300	1	0.01	130	1	70	182	25550	1.08E-09	0	0.00E+00	7.705E-12	0.029	2.23E-13
	0	5300	1	0	130	1	70	182	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Notebook = ConstrRME											HI =	1.09E-08		CR =	3.93E-13

TABLE 4
CONSTRUCTION WORKER INHALATION SCENARIO, RME EXPOSURE ATLAS MISSILE AREA

chemical	C(x) (mg/m3)	IH (m3/h)	ET (h/d)	EF (d/y)	ED (yr)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
	0	2.5	8	130	1	70	182	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
1,2-DCE	0	2.5	8	130	1	70	182	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Acetone	5.31E-05	2.5	8	130	1	70	182	25550	1.08E-05	0	0.00E+00	7.72E-08	0	0.00E+00
Methylene Chloride	0	2.5	8	130	1	70	182	25550	0.00E+00	0	0.00E+00	0.00E+00	0.00165	0.00E+00
Trichloroethene	0.000548	2.5	8	130	1	70	182	25550	1.12E-04	0	0.00E+00	7.97E-07	0.017	1.35E-08
Benzene	0.000258	2.5	8	130	1	70	182	25550	5.27E-05	0	0.00E+00	3.75E-07	0.029	1.09E-08
	0	2.5	8	130	1	70	182	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Notebook = ConstrRME										HI =	0.00E+00		CR =	2.44E-08

TABLE 1
CHEMICAL PARAMETER TABLE FOR CONSTRUCTION RME EXPOSURE, LOAD LINE 1

Chemical	RME Concentration					Reference Dose		Slope Factor		Permeability Constant	Dermal Absorption
	Subsurface Soil (mg/kg)	Sediment (mg/kg)	Surface Water (mg/L)	Ground Water (mg/L)	Air (mg/m3)	Oral	Inhalation	Oral	Inhalation		(Soil)
1,2-DCE	0				0.00E+00	0.009				0.00128	0.01
Acetone	0.0245				6.43E-05	1				0.00057	0.01
Methylene Chloride	0				0.00E+00	0.06		0.0075	0.00165	0.00446	0.01
Trichloroethene	0.0071				9.72E-04			0.011	0.017	0.0148	0.01
Benzene	0							0.029	0.029		0.01

Notebook = ChemData

* PC not available for HMX, value for RDX substituted

TABLE 2
CONSTRUCTION WORKER SUBSURFACE SOIL INGESTION SCENARIO, RME EXPOSURE LOAD LINE 1

chemical	C(x) (mg/kg)	IR (mg/d)	EF (d/y)	ED (yr)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
	0	480	130	1	70	182	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
1,2-DCE	0	480	130	1	70	182	25550	0.00E+00	0.009	0.00E+00	0.00E+00	0	0.00E+00
Acetone	0.0245	480	130	1	70	182	25550	1.20E-07	1	1.20E-07	8.55E-10	0	0.00E+00
Methylene Chloride	0	480	130	1	70	182	25550	0.00E+00	0.06	0.00E+00	0.00E+00	0.0075	0.00E+00
Trichloroethene	0.0071	480	130	1	70	182	25550	3.48E-08	0	0.00E+00	2.48E-10	0.011	2.72E-12
Benzene	0	480	130	1	70	182	25550	0.00E+00	0	0.00E+00	0.00E+00	0.029	0.00E+00
	0	480	130	1	70	182	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Notebook = ConstrRME									HI =	1.20E-07		CR =	2.72E-12

TABLE 3
CONSTRUCTION WORKER DERMAL SUBSURFACE SOIL CONTACT SCENARIO, RME EXPOSURE LOAD LINE 1

chemical	C(x) (mg/kg)	SA (cm2)	AD (mg/cm2)	AB unitless	EF (d/y)	ED (yr)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
	0	5300	1	0	130	1	70	182	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
1,2-DCE	0	5300	1	0.01	130	1	70	182	25550	0.00E+00	0.009	0.00E+00	0	0	0.00E+00
Acetone	0.0245	5300	1	0.01	130	1	70	182	25550	1.33E-08	1	1.33E-08	9.438E-11	0	0.00E+00
Methylene Chloride	0	5300	1	0.01	130	1	70	182	25550	0.00E+00	0.06	0.00E+00	0	0.0075	0.00E+00
Trichloroethene	0.0071	5300	1	0.01	130	1	70	182	25550	3.84E-09	0	0.00E+00	2.735E-11	0.011	3.01E-13
Benzene	0	5300	1	0.01	130	1	70	182	25550	0.00E+00	0	0.00E+00	0	0.029	0.00E+00
	0	5300	1	0	130	1	70	182	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Notebook = ConstrRME											HI =	1.33E-08		CR =	3.01E-13

TABLE 4
CONSTRUCTION WORKER INHALATION SCENARIO, RME EXPOSURE LOAD LINE 1

chemical	C(x) (mg/m3)	IH (m3/h)	ET (h/d)	EF (d/y)	ED (yr)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
	0	2.5	8	130	1	70	182	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
1,2-DCE	0	2.5	8	130	1	70	182	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Acetone	6.43E-05	2.5	8	130	1	70	182	25550	1.31E-05	0	0.00E+00	9.35E-08	0	0.00E+00
Methylene Chloride	0	2.5	8	130	1	70	182	25550	0.00E+00	0	0.00E+00	0.00E+00	0.00165	0.00E+00
Trichloroethene	0.000972	2.5	8	130	1	70	182	25550	1.98E-04	0	0.00E+00	1.41E-06	0.017	2.40E-08
Benzene	0	2.5	8	130	1	70	182	25550	0.00E+00	0	0.00E+00	0.00E+00	0.029	0.00E+00
	0	2.5	8	130	1	70	182	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Notebook = ConstrRME										HI =	0.00E+00		CR =	2.40E-08

D

APPENDIX D
AIR EMISSIONS

The volatile emissions model and the air model used to estimate potential chemical concentrations in the air from soil at the site are described in this appendix. Input parameters and assumptions and model calculations and results are presented in **Tables D-1 through D-7**.

D.1 VOLATILE EMISSIONS MODEL DESCRIPTION

Emissions of chemicals of potential concern (COC) from soil into the atmosphere were estimated using a modified version of the Farmer's Model, which is recommended in the EPA Air/Superfund National Technical Guidance Study Series: Guideline for Predictive Baseline Emissions Estimate Procedures for Superfund Sites (EPA 1992a). The model assumes the source is infinite -- that is, the source does not decay over time. The scenario being modeled is volatile chemical emissions from a ditch being dug by a construction worker.

The emission rate is given by the following equation:

$$E_i = \frac{D_i \ x \ C_v \ x \ Ax \ (nt)^{4/3}}{d_{sc}}$$

where:

E_i	=	Emission rate of chemical i[g/s]
D_i	=	Diffusion coefficient of chemical i in air [cm^2/s]
C_v	=	Vapor concentration of chemical i in the soil pore spaces [g/cm^3]
A	=	Exposed surface area [cm^2]
nt	=	Total soil porosity [dimensionless] (assumes dry soil [worst case scenario])
d_{sc}	=	Depth of emissions [cm] (effective depth of cover)

D.1.1 EMISSIONS MODEL INPUT

Source and material values used for the input variables for the emission equation and physical and chemical properties of COC used in the emissions model are presented in the following tables. Average and reasonable maximum soil concentrations from 6 feet (1.88 meters) to

24 feet (7.50 meters) were used to estimate emissions. No soil samples were collected in the upper six feet of soil. A conservative effective depth of emissions (d_{sc}) of .32 feet (0.1 meters) was used. The exposed surface area (A) of 200 m^2 was used as the area from which chemicals are modeled as being emitted. This number was estimated assuming the dimensions of the ditch are 40 long by 5m wide by 1m deep. Note that the total porosity (nt) was used, thus assuming dry soil. Not accounting for soil moisture (i.e., assuming dry soil) represents a worst case scenario. The vapor phase concentrations (C_v) were obtained by the partitioning process described in Section D.1.2.

D.1.2 PARTITIONING OF SOIL CHEMICAL CONCENTRATIONS

In the unsaturated zone, a chemical may exist in three phases: 1) adsorbed onto soil particles, 2) in the dissolved or liquid phase, and 3) in the vapor phase (assuming that the chemical is not present in its pure form). The liquid phase concentrations act as a source for groundwater contaminant and vapor phase concentrations are potential sources for vapor emissions. Assuming linear partitioning among these three phases, the following relationships for the different soil concentration phases are described below:

$$C_s = K_d \times C_l$$
$$C_v = H' \times C_l$$
$$C_l = Ct\ [((pw \times nw) + pb)/((pb \times K_d) + nw + (nt - nw) \times H')]$$

where:

Ct = Total soil concentration [g/g]
C_s = Chemical concentration in the solid phase [g/g]
C_v = Chemical concentration in the vapor phase [g/cm^3]
C_l = contaminant concentration in the liquid phase [g/cm^3]
K_d = soil water partition coefficient [$(g/g)/(g/cm^3)$]
H' = Henry's law constant [dimensionless]
pw = density of water [g/cm^3]
nw = water content of soil [dimensionless]
nt = total soil porosity [cm^3/cm^3]
pb = bulk density of soil [g/cm^3]

Note H' is expressed as:

$$H' = H \times CF / (R \times T)$$

where:

H	=	Henry's Constant [atm - m^3/mo] - K]
CF	=	conversion factor, converts m^3 to cm^3 equals 1×10^{-6}
R	=	molar gas constant [atm - cm^3/mol]
T	=	temperature [K]

D.1.3 ON-SITE AIR MODEL

Ambient air concentrations for on-site workers were modeled using a typical "box model." This approach assumes volatile emissions from the site are completely mixed within a ventilated volume (a box). The height of the box was estimated to equal the breathing height zone (1.5m). The box model equation used to estimate chemical concentrations in the air for the construction worker is expressed as:

$$Ca = E_i \times CF1/(u \times h \times wth)$$

where:

Ca	=	Chemical concentration in the air [mg/m^3]
E_i	=	Emission rate of chemical [g/s]
CFI	=	Conversion factor to convert grams to milligrams, equal 1×10^{-3}
u	=	Wind speed [m/s]
h	=	Height of box [m]
wth	=	Width of box [m]

Box model parameters, input values, and spreadsheet calculations are presented in the attached tables. Note that the air concentrations predicted with the box model were checked against the air concentrations estimated with another EPA air model developed by Robert Wilson of EPA Region X (EPA Air/Superfund National Technical Guidance Study Series, EPA-450/1-92-002) (EPA 1992a). The model is a polynomial equation based on the modeling results of progressively larger square area sources utilizing the EPA Point Area-Line (PAL) dispersion model. The results from the box model and the polynomial equation were approximately equivalent. Comparison values are presented in **Table D-8**.

B07NE003702-07836

U.S. Environmental Protection Agency (EPA). 1992a. Air/Superfund National Technical Guidance Study Series - Predictive Baseline Emissions Estimation Procedures for Superfund Sites. EPA-450/1-92-002. January.

U.S. Environmental Protection Agency (EPA). 1992b. Air/Superfund National Technical Guidance Study Series - Estimation of Air Impacts for the Excavation of Contaminated Soil. EPA-451/1-092-004. March.

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Woodward-Clyde Consultants. 1993 Average Soil Moisture for Atlas Missile Site, Mead Phase I RFI, samples as determined by CompuChem Laboratories, Research Triangle Park, NC.

TABLE D-1

SOURCE AND MATERIAL PARAMETERS DATA FOR EMISSION MODELING

Parameters	Units	Value	Reference
Soil Porosity	---	0.4	Estimated based on soil type (Walton 1985)
Soil Bulk Density	g/cc	1.4	Estimated based on soil type (EPA 1992b)
Fraction Organic Carbon	---	0.002	Estimated based on soil type (Engineering judgement)
Emission Area (Ditch)	m^2	200	Estimate of typical ditch with length and width dimensions 40m x 5m
Surface Temperature	C	20	Typical value
Depth of Emissions	m	0.1	Conservatively estimated
Chemical Concentration	mg/kg	1×10^{-2} to 1×10^{-3}	Average and RME calculated values based on soil analytical data

TABLE D-2
PHYSICAL AND CHEMICAL PROPERTIES OF COC AND PARAMETERS USED IN THE EMISSIONS MODEL

COMPOUND	Henry's Constant1[1] (atm-m ^ 3/mole)	KOC[2] (cc/g)	Air Diff Coefficient[2] (cm^2/sec)	Vapor Pressure[1] (mm-Hg)	Molecular Weight[1] (g/mole)
Benzene	5.48 E-03	83	0.0932	76	78
Trichlorethene	9.90 E-03	130	0.0790	58	13
Acetone	2.50 E-05	2.2	0.1240	180	58
	Porosity[3]	Soil Bulk Density[4] (g/cc)	Fraction Organic Carbon[5]	Wind Speed[6] (ms/s)	
	0.04	1.4	0.002	4.74	

[1]Groundwater Chemical Desk Reference, Montgomery, John H., Lewis Publishers, Inc. 1989

[2]Basics of Pump and Test Groundwater Remediation Technology, Mercer, Geotrans, inc., for EPA Office of Research and Development

[3]Practical Aspects of Groundwater Modeling, Walton, William C. (1988) Typical Value for Material

[4]Air/Superfund National Technical Guidance Study Series, EPA-450/1-92-004, March 1992 - Typical Value

[5]Typical Value Based on Professional Engineering Judgement

[6]Emission Reduction Options for Floating Roof Tanks. 2nd International Symposium on Above-Ground Store Tanks, Houston, TX 12-1992, Average Annual Wind Speed - Omaha, Nebraska

TABLE D-3 EMISSIONS FOR RI ATLAS MISSILE AREA SOILS
Based on RME Soil Concentrations

1. Site Specific Data

Depth of Emissions Cont. Layer (m)	Temp. (c)
0.1	20

Soil Porosity -	Soil Bulk Density (g/cc)	Fraction Org. Carbon -
0.4	1.4	0.002

2. Receptor Specific Data

Wind Speed (m/s)	Box Width (m)
4.74	5.00

3. Conversions

Emission Area (cm2)	Elev of Mild Cont. Layer (cm)	Absolute Temp. (k)
2.0E+06	10	293

4.1 Chemical Specific Data

Chemical	Mean Soil Conc. (mg/kg)	Henry's Constant (atm-m3/mold)	KOC (cc/g)	Air Coefficient (cm2/sec)
Benzene	2.00E-03	5.48E-03	83	0.0932
Trichloroethene	4.00E-03	9.90E-03	130	0.079
Acetone	2.02E-02	2.50E-05	2.2	0.124

4.2 Saturation

Vapor Pressure (mmHg)	Molecular Weight (g/mol)	Saturated Gas Conc. (g/cc)
76	78	3.24E-04
57.8	131	4.14E-04
180	58	5.71E-04

5.1 Intermediate Calculations

Chemical	Kd (cc/g)	Deff (cm2/sec)	H' -
Benzene	0.166	2.75E-02	2.28E-01
Trichloroethene	0.26	2.33E-02	4.12E-01
Acetone	0.0044	3.66E-02	1.04E-03

5.2 Soil Gas-Water Partition Modeling Results

Chemical	Liquid Phase Conc. (g/cc)	Solid Phase Conc. (g/g)	Vapor Phase Conc (g/cc)
Benzene	7.33E-09	1.22E-09	1.67E-09
Trichloroethene	1.02E-08	2.64E-09	4.18E-09
Acetone	2.48E-07	1.09E-09	2.58E-10

6.1 Farmer Model and Box Model Results

Chemical	Emission Rate (g/sec)	Outside Air Conc. (mg/m3)
Benzene	9.18E-06	2.58E-04
Trichloroethene	1.95E-05	5.48E-04
Acetone	1.89E-06	5.31E-05

TABLE D-4 EMISSIONS FOR MEAD RI LOAD LINE 1 SOILS
Based on RME Soil Concentrations

1. Site Specific Data

Depth of Emissions Cont. Layer (m)	Temp. (c)
0.1	20

Soil Porosity -	Soil Bulk Density (g/cc)	Fraction Org. Carbon -
0.4	1.4	0.002

2. Receptor Specific Data

Wind Speed (m/s)	Box Width (m)
4.74	5.00

3. Conversions

Emission Area (cm2)	Elev of Mild Cont. Layer (cm)	Absolute Temp. (k)
2.0E+06	10	293

4.1 Chemical Specific Data

Chemical	Mean Soil Conc. (mg/kg)	Henry's Constant (atm-m3/mold)	KOC (cc/g)	Air Coefficient (cm2/sec)
Trichloroethene	7.10E-03	9.90E-03	130	0.079
Acetone	2.45E-02	2.50E-05	2.2	0.124

4.2 Saturation

Vapor Pressure (mmHg)	Molecular Weight (g/mol)	Saturated Gas Conc. (g/cc)
57.8	131	4.14E-04
180	58	5.71E-04

5.1 Intermediate Calculations

Chemical	Kd (cc/g)	Deff (cm2/sec)	H' -
Trichloroethene	0.26	2.33E-02	4.12E-01
Acetone	0.0044	3.66E-02	1.04E-03

5.2 Soil Gas-Water Partition Modeling Results

Chemical	Liquid Phase Conc. (g/cc)	Solid Phase Conc. (g/g)	Vapor Phase Conc (g/cc)
Trichloroethene	1.80E-08	4.69E-09	7.42E-09
Acetone	3.01E-07	1.32E-10	3.13E-10

6.1 Farmer Model and Box Model Results

Chemical	Emission Rate (g/sec)	Outside Air Conc. (mg/m3)
Trichloroethene	3.46E-05	9.72E-04
Acetone	2.29E-06	6.43E-05

TABLE D-5 EMISSIONS FOR RI ATLAS MISSILE AREA SOILS
Based on Mean Soil Concentrations

1. Site Specific Data

Depth of Emissions Cont. Layer (m)	Temp. (c)
0.1	20

Soil Porosity -	Soil Bulk Density (g/cc)	Fraction Org. Carbon -
0.4	1.4	0.002

2. Receptor Specific Data

Wind Speed (m/s)	Box Width (m)
4.74	5.00

3. Conversions

Emission Area (cm2)	Elev of Mild Cont. Layer (cm)	Absolute Temp. (k)
2.0E+06	10	293

4.1 Chemical Specific Data

Chemical	Mean Soil Conc. (mg/kg)	Henry's Constant (atm-m3/mold)	KOC (cc/g)	Air Coefficient (cm2/sec)
Benzene	2.00E-03	5.48E-03	83	0.0932
Trichloroethene	4.00E-03	9.90E-03	130	0.079
Acetone	1.65E-02	2.50E-05	2.2	0.124

4.2 Saturation

Vapor Pressure (mmHg)	Molecular Weight (g/mol)	Saturated Gas Conc. (g/cc)
76	78	3.24E-04
57.8	131	4.14E-04
180	58	5.71E-04

5.1 Intermediate Calculations

Chemical	Kd (cc/g)	Deff (cm2/sec)	H' -
Benzene	0.166	2.75E-02	2.28E-01
Trichloroethene	0.26	2.33E-02	4.12E-01
Acetone	0.0044	3.66E-02	1.04E-03

5.2 Soil Gas-Water Partition Modeling Results

Chemical	Liquid Phase Conc. (g/cc)	Solid Phase Conc. (g/g)	Vapor Phase Conc (g/cc)
Benzene	7.33E-09	1.22E-09	1.67E-09
Trichloroethene	1.02E-08	2.64E-09	4.18E-09
Acetone	2.03E-07	8.92E-10	2.11E-10

6.1 Farmer Model and Box Model Results

Chemical	Emission Rate (g/sec)	Outside Air Conc. (mg/m3)
Benzene	9.18E-06	2.58E-04
Trichloroethene	1.95E-05	5.48E-04
Acetone	1.54E-06	4.33E-05

TABLE D-6 EMISSIONS FOR MEAD RI LOAD LINE 1 SOILS
Based on Mean Soil Concentrations

1. Site Specific Data

Depth of Emissions Cont. Layer (m)	Temp. (c)
0.1	20

Soil Porosity -	Soil Bulk Density (g/cc)	Fraction Org. Carbon -
0.4	1.4	0.002

2. Receptor Specific Data

Wind Speed (m/s)	Box Width (m)
4.74	5.00

3. Conversions

Emission Area (cm2)	Elev of Mild Cont. Layer (cm)	Absolute Temp. (k)
2.0E+06	10	293

4.1 Chemical Specific Data

Chemical	Mean Soil Conc. (mg/kg)	Henry's Constant (atm-m3/mold)	KOC (cc/g)	Air Coefficient (cm2/sce)
Trichloroethene	6.30E-03	9.90E-03	130	0.079
Acetone	1.38E-02	2.50E-05	2.2	0.124

4.2 Saturation

Vapor Pressure (mmHg)	Molecular Weight (g/mol)	Saturated Gas Conc. (g/cc)
57.8	131	4.14E-04
180	58	5.71E-04

5.1 Intermediate Calculations

Chemical	Kd (cc/g)	Deff (cm2/sec)	H' -
Trichloroethene	0.26	2.33E-02	4.12E-01
Acetone	0.0044	3.66E-02	1.04E-03

5.2 Soil Gas-Water Partition Modeling Results

Chemical	Liquid Phase Conc. (g/cc)	Solid Phase Conc. (g/g)	Vapor Phase Conc (g/cc)
Trichloroethene	1.60E-08	4.16E-09	6.58E-09
Acetone	1.70E-07	7.46E-10	1.76E-10

6.1 Farmer Model and Box Model Results

Chemical	Emission Rate (g/sec)	Outside Air Conc. (mg/m3)
Trichloroethene	3.07E-05	8.63E-04
Acetone	1.29E-06	3.62E-05

TABLE D-7

BOX MODEL INPUT PARAMETERS

Parameters	Units	Value	Reference
Emission Rate (E_i)	g/s	chemical specific, see Tables D-3 and D-4	Calculated
Wind Speed (u)	m/s	4.74	Average annual wind speed for Omaha, Nebraska
Height of Box (h)	m	1.5	Breathing Zone Height
Width of Box (wth)	m	5	Typical Ditch Width

TABLE D-8

COMPARISON OF CALCULATED AIR CONCENTRATIONS WITH PAL MODEL AND BOX MODEL

Chemical	Surface [m2]	Calculated Emissions Qt [g/s]	ln(X)	ln(C/Qt)	C/Qt	Cpal [mg/m3]	Cbox [mg/m3]
Benzene	200	9.18E-06	2.65	10.85	51418.9	4.72E-04	2.58E-04
TCE	200	1.95E-05	2.65	10.85	51418.9	1.00E-03	5.48E-04
Acetone	200	1.89E-06	2.65	10.85	51418.9	9.72E-05	4.33E-05

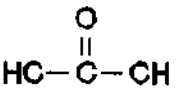
E

APPENDIX E
TOXICITY PROFILES

LIST OF TOXICITY PROFILES

ACETONE
BENZENE
CHLOROFORM
DICHLOROETHENE
1,2-DICHLOROPROPANE
2,4-DINITROTOLUENE
RDX
METHYLENE CHLORIDE
HMX
NICKEL
PHENOL
PHTHALATE DIESTERS
TETRACHLOROETHENE
1,1,1-TRICHLOROETHANE
TRICHLOROETHENE
TRINITROBENZENE
TRINITROTOLUENE
VANADIUM

ACETONE



Acetone

Acetone is a common industrial solvent which is relatively non-toxic. At the present time there is no evidence to suggest that acetone is a carcinogen. The primary routes of uptake of this compound include ingestion and inhalation. Because acetone is highly volatile, dermal contact does not constitute a major uptake route in most circumstances. However, since it is highly lipid soluble, extended dermal contact may cause defatting of the skin, and thus increase the permeability of the skin to other contaminants. Once absorbed, acetone distributes rapidly throughout the body (e.g., body water). Approximately 20 percent of absorbed acetone is excreted via the lungs. and an additional 30 percent is excreted via the kidneys. The remainder of absorbed acetone is metabolized.

When assessing the toxicity of acetone, it should be noted that not all acetone found in the body is derived from the environment. Acetone occurs naturally as a product of fat metabolism, and high concentrations are commonly found in the blood of diabetics. During diabetic Ketoacidosis, blood levels of acetone may reach 10 to 70 mg/dl (Sulway and Malius, 1970). At these elevated concentrations, acetone can be readily detected on the breath of affected individuals.

The acute toxic effects of acetone exposure are relatively minor, and no fatalities have been reported in industrial settings. Ingestion of 15 to 20 gm/day for several days is reported to be non-toxic, while ingestion of 200 to 400 ml causes central nervous system depression, but no long-term effects (Gildson et al., 1966). Symptoms of acetone intoxication are similar to those produced by ethanol, although the anaesthetic properties of acetone are greater. Symptoms include lethargy, ataxia, headache, nausea, vomiting, light-headedness and incoherent speech.

Acetone has been identified as a compound which may potentiate (e.g., enhance) the toxic effects of several common environmental contaminants when co-exposure occurs. In particular, a number of halogenated compounds (1,1-DCE, TCE, bromodichloromethane, chloroform, etc.) are reported to display enhanced hepatotoxicity (liver necrosis) in the presence of acetone (Hewitt et al., 1983).

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Chronic exposure to acetone does not appear to produce serious target organ effects. Chronic skin contact may produce a scaly dermatitis, while chronic ingestion has been linked to slight increases in liver and kidney weight and mild nephrotoxicity.

B07NE003702-07850

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Sulway, M.J., and Malius, J.M. 1970. Acetone in diabetic Ketoacidosis. Lancet 2:736-740

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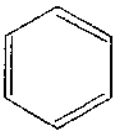
BENZENE



Benzene

Benzene is a relatively non-toxic compound which was previously a major component of gasoline. The major potential routes of uptake are via inhalation or ingestion. Approximately 50 percent of inhaled benzene and virtually all ingested benzene is absorbed. In contrast, dermal absorption is extremely low, and dermal contact is not considered a major route of uptake. Because of its volatility, inhalation is the primary uptake route for benzene under most circumstances. Benzene is lipid soluble and the majority absorbed into the body partitions into the adipose tissue, bone marrow, and liver.

Acute lethal concentrations of benzene have been determined for both animals and humans. Sandmeyer (1981) reported that a 5- to 10-minute inhalation exposure to 19,000 to 20,000 ppm was fatal in humans. Lethality appears to be related to either central nervous system (CNS) depression, asphyxiation, respiratory arrest, or cardiac arrhythmia (ATSDR, 1989). The LD_{50} value for a 4-hour inhalation exposure in rats has been reported at 13,700 ppm (Drew and Fouts, 1974). Lethal oral doses in humans have been reported at 8.8 grams (Thienes and Haley, 1972), 9 to 12 grams (Von Oettingen, 1940), and 30 grams (Moeschlin, 1975). On a weight equivalent basis, these doses range from 128 to 428 mg/kg. The lethal dose is apparently higher in rodents, with a reported LD_{50} in rats of 930 mg/kg (Cornish and Ryan, 1965), and in mice at 4,700 mg/kg (Savchenko, 1967).

The major target organs for benzene, other than those reported for acute lethality, appear to be the hematopoietic and immune systems. Immune suppression occurs because of damage to the pluripotent stem cells, where damage has been reported for both erythroid and myeloid cell types (Toft et al., 1982; Green et al., 1981). This type of injury can occur with short-term exposure to benzene concentrations as low as 10 ppm, and may be due to the buildup of benzene metabolites in the bone marrow (Rickert et al., 1979). Depressed leukocyte counts have been reported in rats exposed to 50 ppm, 8-hours per day, for 7 days (Li et al., 1986), and red blood cell counts are depressed at 100 ppm (Rosenthal and Snyder, 1985).

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Some CNS effects have been reported in humans exposed to benzene. Relatively low concentrations (50 to 150 ppm for 5 hours) are sufficient to cause headache, dizziness, and lassitude. Relatively high doses (7,500 ppm) are required to produce signs of overt toxicity (Sandmeyer, 1981).

Benzene has been reported to be a developmental toxicant. The major developmental effect of low level benzene exposure appears to be a reduction in fetal weight. Significant weight reduction has been reported for concentrations as low as 50 ppm in rats (Kuna and Kapp, 1981), 156 ppm in mice, and 313 ppm in rabbits (Ungvary and Tatvai, 1985). Increases in the number of fetal resorptions have been reported from ingestion studies (Nawrot and Staples, 1979), but only at concentrations which were overtly toxic to the mother (0.5 mg/kg/day). At the present time, there is no evidence to suggest that benzene is a teratogen.

Reproductive effects of benzene exposure have been reported from animal studies only. A concentration of 2,300 ppm is sufficient to cause histopathologic changes in the ovaries of mice, primarily as ovarian cysts. In addition, this concentration has been shown to cause degeneration of the testes, decreases in sperm mobility, sperm count, and the percentage of abnormal sperm (Ward et al., 1985).

Numerous studies have investigated the mutagenicity of benzene. (See IARC, 1982 for review.) Epidemiological studies demonstrate a strong correlation of chromosomal aberrations in human lymphocytes in response to occupational exposure. These abnormalities may persist for years after exposure has been terminated (Dean, 1985). Mutagenicity has also been confirmed in numerous in vivo and in vito studies. Of particular interest is a study by Tice et al. (1980) in which exposure to 28 ppm for 4 hours was sufficient to cause sister chromatic exchanges in mouse lymphocytes.

Epidemiological studies provide strong evidence for the role of benzene as a human carcinogen. Statistically significant increases in the incidence of leukemia have been demonstrated in populations occupationally exposed to benzene (Ott et al., 1978; Infante et al., 1977; Rinsky et al., 1981). Animal studies tend to support the human data. Maltoni et al. (1985) have shown that benzene increases the incidence of several types of tumors in rats. Increases in the number of lymphomas have also been reported

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in mice (Cronkite et al., 1985). While the majority of the studies have focused on carcinogenicity via benzene inhalation, research now indicates that ingestion of benzene produces similar effects (Maltoni; 1983). USEPA has classified benzene as a Class A carcinogen based upon extensive epidemiological evidence.

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B07NE003702-07856

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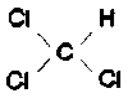
CHLOROFORM



Chloroform

Chloroform is a clear, colorless, volatile organic compound with numerous industrial applications. Typically chloroform has been used as a solvent, an intermediate in the synthesis of numerous organic compounds, and in the manufacture of pesticides. In addition, chloroform was used in the past as a surgical anesthetic prior to the recognition of its toxic effects. Chloroform can be readily absorbed via ingestion or inhalation and, to a lesser extent, via direct dermal contact. Because of its volatility, inhalation represents the most common exposure route. Once absorbed, chloroform is rapidly eliminated, with the majority being cleared through the lungs within 24 hours of exposure.

Chloroform is a potent, fast-acting central nervous system (CNS) depressant at high atmospheric concentrations. Symptoms typically include nausea, light headedness, malaise, stupor, and coma. Most CNS effects are transient, and do not persist once chloroform has been eliminated from the body. In a few instances, more persistent CNS effects have been reported, including gait abnormalities and tremor. These effects may take as long as 2 weeks to disappear (Storms, 1973). Onset of CNS effects have been reported to occur with exposure to concentrations as low as 920 ppm for 3 minutes (Lehman and Schmidt-Kehl, 1936), while anesthetic effects typically require exposure to 20,000 to 40,000 ppm (NIOSH, 1974). Other target organs of acute chloroform exposure include the liver, kidneys, and lungs. Liver effects include elevation in liver function tests and blood enzyme levels; kidney effects include proteinuria, hematuria, and the production of cellular casts; and respiratory effects include the induction of a chemical pneumonitis.

Chronic exposure to chloroform has been associated with liver and kidney damage. In one study, rats exposed to 25 ppm (7 hours per day, 5 days per week for 6 months) developed cloudy swelling of the kidney and lobular granular degeneration and necrosis of the liver (Torkelson et al., 1976). Epidemiological studies among occupationally exposed individuals have demonstrated an increased incidence of toxic hepatitis and

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liver enlargement among some populations (Bomski et al., 1967), but not others (Challen et al., 1958).

Animal studies indicate that chloroform may be a developmental toxicant. Pregnant rats exposed to 100 ppm produce pups with increased incidence of missing ribs, imperforate anus, subcutaneous edema, and delayed ossification. At 300 ppm, additional effects are produced, including abnormalities of the skull and sternum, decreased numbers of live fetuses, and an increase in the number of resorptions (Schwetz et al., 1974).

The role of chloroform as a reproductive toxicant has not been well characterized. In one study, mice exposed to 400 to 800 ppm for 4 hours per day for 5 days were found to have an increased incidence of abnormal sperm, although their reproductive fitness was not evaluated (Land et al., 1981).

Chloroform is not mutagenic in most assays (see ATSDR, 1989 for review), although it has tested positive for sister chromatic exchange (SCE) induction in cultured human lymphocytes (Morimoto and Koizumi, 1983). Animal studies indicate that chloroform can induce hepatocellular carcinomas (NCI, 1976) and kidney tumors in mice and rats (Roe et al., 1979; Jorgenson et al., 1985). Epidemiological studies among individuals occupationally exposed to chloroform have not demonstrated any carcinogenic effects in man. The U.S. Environmental Protection Agency (EPA) classifies chloroform as a Class B2 probable human carcinogen, based on animal studies.

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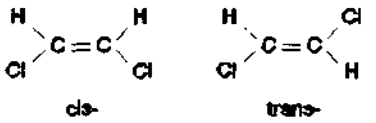
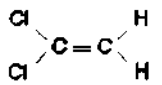


1,2-Dichloroethene



1,1-Dichloroethene

Dichloroethene (DCE) is a major degradation product of trichloroethylene (TCE), and is also used in the manufacture of certain plastics. There are three forms of this compound, cis-1,2-DCE, trans-1,2-DCE, and 1,1-DCE (also known as vinylidene chloride). All of these forms are toxic at relatively high concentrations. In addition, 1,1-DCE is classified by USEPA as a class B2 (probable human) carcinogen based on animal studies (HEAST, FY 1992). The physicochemical properties of DCE are similar to those of TCE, as are the absorption characteristics. Because of the volatility of DCE, inhalation is expected to be the major route of uptake under most circumstances, although uptake via ingestion may also be significant. DCE absorption in the body is fairly rapid and complete. Dallas et al. (1983) have reported that 75 to 90 percent of inhaled DCE is absorbed, and studies by Reichart et al. (1979) suggest that oral absorption may be practically complete, ranging from 81 to 99.8 percent. Dermal exposure is generally considered a minor route of entry for DCE, although its physicochemical properties suggest that it could be absorbed dermally.

Acute toxicity has been investigated for all three forms of DCE, although most work has emphasized trans-1,2-DCE and 1,1-DCE. In general, the 1,2-DCE isomers are less toxic than 1,1-DCE. One human fatality has been reported (Hamilton, 1934) in response to exposure to a mixture of DCE isomers at unknown concentration. The LC_{50} for trans-1,2-DCE in mice has been reported to be quite high at 21,723 ppm (Gradiski et al., 1978). The oral toxicity of 1,2-DCE is also relatively high, ranging from 1,275 to 7,900 mg/kg in rats (Freundt et al., 1977; Hays et al., 1987) and from 1,000 to 2,200 mg/kg in mice (Kallman et al., 1983; Munson et al., 1982; Barnes et al., 1985). The lethality of 1,1-DCE appears to be more variable than 1,2-DCE, although this is probably because 1,1-DCE has been more extensively characterized in more species than 1,2-DCE. Rats appear to be relatively resistant to 1,1-DCE having LC_{50} values ranging from 6,000 to 15,000 ppm for inhalation exposures (Henschler, 1979; Siegel et

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al., 1971; Zeller et al., 1979a, 1979b). Mice are a much more sensitive species having an LC_{50} in the range of 100 to 200 ppm (Henschler, 1979). When fasted animals are exposed to 1,1,-DCE, the sensitivity increases dramatically. The LC_{50} for fasting rats is reported at 400 ppm (Zeller et al., 1979b) and for mice is 40 to 115 ppm (Henschler, 1979). The marked difference in toxicity is due to the depletion of glutathione that occurs in response to starvation. Conjugation with glutathione is believed to be a primary detoxication route for DCE.

The oral toxicity of 1,1-DCE is similar to its inhalation toxicity. Mice are much more sensitive to 1,1-DCE than rats. The LD_{50} values reported for mice is 200 mg/kg (Jones and Hathaway, 1978) and 1,500 mg/kg for rats (Jenkins et al., 1972).

The major target organs for sublethal doses of DCE are the liver and kidneys with some involvement of the CNS, heart, and lungs. Central nervous system effects in man have been reported for acute exposure to trans-1,2-DCE (Lehmann and Schmidt-Kehl, 1936) and for 1,1-DCE (Henschler et al., 1970; Tierney et al., 1979). Effects were similar for both compounds and included CNS depression, fatigue, drowsiness, and nausea. The CNS effects appear to be reversible. The CNS and cardiovascular effects in animals have only been reported for acute exposures to very high doses of 1,1-DCE (Zeller et al., 1979b) or trans-1,2-DCE (Freundt et al., 1977). The involvement of the lung is minor and appears to be a non-specific irritation in response to respiratory exposure (Prendergast et al., 1967).

The kidney appears to be a primary target organ of 1,1-DCE, but not of 1,2-DCE. One study by Hayes et al. (1987) reported that trans-1,2-DCE caused an increase in kidney organ weight without any associated histological changes. In contrast, numerous acute and chronic studies have demonstrated substantial effects of 1,1-DCE on the kidney. These effects include changes in enzyme activities (Oesch et al., 1983), organ weight (Quast et al., 1986), and tubular swelling, degeneration, and necrosis (Jackson and Conolly, 1985; Lee et al., 1977).

The liver is also a primary target organ of all three isomers of DCE. Human exposure to 1,1-DCE has been reported to cause liver enzyme dysfunction (Tierney et al., 1979). Numerous animal studies have demonstrated histological changes and changes in liver

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enzymes in response to 1,1-DCE and trans-1,2-DCE (Tierney et al., 1979; Jaeger, 1977; Jackson and Conolly, 1985; Freundt et al. 1977; Barnes et al., 1985). Histological changes are typically characterized by fatty changes in the liver. In addition to those degenerative changes, Reynolds et al., (1980) have reported massive necrosis in response to 1,1-DCE in glutathione-depleted rats (i.e., fasted rats).

Few studies have addressed the reproductive or teratogenic effects of DCE exposure. No reproductive effects were seen in response to 1,1-DCE exposure in either rats (Short et al., 1977a) or mice (Anderson et al., 1977). Short et al., (1977b) have reported that inhalation of 1,1-DCE (15 to 449 ppm) has a teratogenic effect on mice and rabbits causing a slight increase in skeletal anomalies and fetal resorptions.

Some evidence exists to suggest that DCE is a mutagen. Exposure to cis-1,2-DCE, but not trans 1,2-DCE, was shown to induce chromosomal abnormalities in mouse bone marrow (Cerna and Kypenova, 1977) and was also mutagenic in two host-mediate assays (Cerna and Kypenova, 1977; Bronzetti et al., 1984). Reitz et al., (1980) have demonstrated that exposure to 1,1-DCE may cause DNA damage in mouse kidney, as evidenced by increased DNA repair rates.

Carcinogenicity data on cis- and trans-1,2-DCE are lacking. Epidemiological studies on the carcinogenicity of 1,1-DCE have not demonstrated any increased cancer rates in humans (Waxweiler, 1981; Ott et al., 1976; Theiss et al., 1979). One animal study by Maltoni et al., (1985) has indicated that chronic exposure to 1,1-DCE may induce renal adenocarcinomas in male mice, but not female. Increases in mammary tumors and leukemias were also reported in this study.

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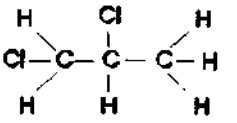
1,2-DICHLOROPROPANE

The compound, 1,2-dichloropropane, is a volatile organic compound which has been used in the past in a number of agricultural and industrial applications. Common uses included as a component of paint strippers, varnishes and furniture finish removers, as an industrial solvent, and as a chemical intermediate. Prior to the early 1980s, it was also used as a soil fumigant. Use of this compound has decreased dramatically in the past decade.



1,2-Dichloropropane

Absorption of 1,2-dichloropropane may occur via ingestion or inhalation, but is unlikely to occur via direct dermal contact because of its volatility. Once absorbed, 1,2-dichloropropane is readily metabolized to less toxic compounds and is excreted in the urine, feces, and in expired air.

1,2-Dichloropropane has been implicated in a number of human deaths, usually as the result of accidental ingestion of solvents. The primary organ systems which appear to be affected include the central nervous system (CNS), liver and kidneys, and death is usually the result of either cardiac arrest or septic shock (Pozzi et al., 1985). While the lethal dose in man has not been established, animal studies indicate that the oral LD_{50} is approximately 2,000 mg/kg (Smyth et al., 1969). The LC_{50} (inhalation) for 1,2-dichloropropane is reported to range from 480 ppm in mice (DOW Chemical, 1982) to 2,000 ppm in rats (Carpenter et al., 1949), and the dermal LD_{50} is reported to be 8.75 ml/kg in both rabbits (Smyth et al., 1969) and rats (Kodak, 1982).

The CNS is the major target of 1,2-dichloropropane toxicity. Systemic effects of CNS poisoning in man include dizziness, disorientation, and coma (Perbellini et al., 1985). In addition, death due to cardiac failure is also thought to be a CNS effect. Other major target organs include the liver and kidneys. Liver damage, characterized by increased serum enzyme levels and fatty degeneration and necrosis of the liver, has been reported as a high dose response to 1,2-dichloropropane (Highman and Heppel, 1946; NTP, 1986). Kidney effects include renal failure and fatty degeneration (Pozzi et al., 1985; Highman and Heppel, 1946). 1,2-Dichloropropane also has been linked to

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hemolytic anemia (Pozzi et al., 1985), and is reported to be an irritant to the gastrointestinal and respiratory tracts and to the eyes (Rubin, 1988; Pozzi et al., 1985). The toxicity of 1,2-dichloropropane does not appear to be increased by repeated exposure, and chronic treatment (250 mg/kg/day, 5 days per week for 103 days) is reported to produce no toxic effects in any of the target organ systems (NTP, 1986).

There is no evidence to suggest that 1,2-dichloropropane is a developmental or reproductive toxicant. NTP (1986) demonstrated that the reproductive organs are not target organs of 1,2-dichloropropane toxicity, although it should be noted that reproductive fitness was not tested.

1,2-dichloropropane is mutagenic in several in vito assays (Principe et al., 1981), in Drosophila (Woodruff et al., 1985), and produces sister chromatid exchanges (SCEs) in Chinese hamster ovary cells (Tennant et al., 1987). In a study by NTP (1986), 1,2-dichloropropane was shown to produce an increased incidence of liver tumors in mice and mammary gland tumors in rats. The U.S. Environmental Protection Agency (EPA) has classified 1,2-dichloropropane as a Class B2 potential human carcinogen, based upon the NTP (1986) study.

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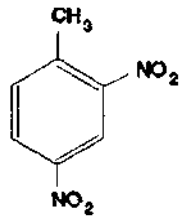
2,4-DINITROTOLUENE



2,4-Dinitrotoluene

The compound 2,4-dinitrotoluene (2,4-DNT), along with 2,6-dinitrotoluene (2,6-DNT), is an isomer of dinitrotoluene (DNT). Common uses include as an intermediate in the production of polyurethane foam for beds and furniture and in the manufacture of dyes. It is also used in the production of explosives, as a gelatinizing and waterproofing agent (Fishbein, 1979). There are no natural sources of DNT. While it is usually produced by mixing toluene with nitric acid, small amounts of the two isomers may also occur as a by-product in the production of trinitrotoluene. Both isomers can be found in soils, surface waters, and groundwater in association with munition wastes. Although dinitrotoluene does not readily volatilize, it does not persist in the environment, being readily degraded by sunlight and microbial action (ATSDR, 1988)

Absorption of 2,4-DNT can occur via ingestion and inhalation. While no studies have evaluated dermal absorption of 2,4-DNT, technical grade DNT can be absorbed via dermal contact (Levin et al, 1985; Woolen et al, 1985).

The lethal doses of 2,4-DNT have been estimated for several animal species, including dogs, rats and mice. The reported LD_{50} values range from 270 mg/kg for rats to 1630 mg/kg for mice (Vernot et al. 1977).

Chronic exposure to 2,4-DNT has been shown to affect a number of target organs, including the blood, nervous system, liver, kidney, and gonads. Ingestion of 2,4-DNT for 13 weeks is reported to induce a hemotoxic response in dogs, rats, and mice (Lee et al. 1978). In the same study, 2,4-DNT was shown to be neurotoxic, producing tremors, convulsions, ataxia and paralysis. Chronic human exposure to DNT has been associated with heart disease, hematological and neurological effects. Workers exposed

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via inhalation to 98% pure 2,4-DNT were reported to have a significant increase in death rates due to ischemic heart disease and residual diseases of the circulatory system (Levine et al. 1986). Pallor, cyanosis, and anemia was reported for munitions workers exposed to technical grade DNT (76% 2,4-DNT). Other common complaints reported were unpleasant taste in mouth, muscular weakness, headache, appetite loss, giddiness, dizziness, nausea, insomnia, and tingling pain in the extremities. In addition, reduced tolerance to alcohol was reported by these workers (McGee et al. 1942). Cyanosis was also reported for DNT exposed workers by Perkins (1919) and Floret (1929). However, it should be noted that the manufacturing conditions reported by these three studies probably resulted in higher exposures than would be likely to occur in modern facilities, and it is likely that individuals were exposed to other toxic chemicals in addition to 2,4-DNT. Other weaknesses in these studies include small sample population size, lack of individual medical histories, and an inadequate determination of exposure concentrations.

Several animal and human studies suggest that 2,4-DNT may be a reproductive toxicant. Decreased fertility was noted in several animal studies on oral exposure to 2,4-DNT at concentrations ranging from 25 to 180 mg/kg/day. Male reproductive effects included decreased sperm production, testicular atrophy, changes in sertoli cell morphology, and degenerated seminiferous tubules (Bloch et al. 1988; Ellis et al. 1979; Lane et al. 1985; Lee et al. 1976, 1978). Epidemiological studies have found a reduction in sperm count and normal sperm morphology among workers exposed to technical grade DNT (Ahrenholz 1980).

Animal studies indicate that both isomers of DNT may be carcinogenic at relatively high doses. The 2,6 isomer is considered to be the more potent carcinogen, and is primarily responsible for the carcinogenicity of the DNT isomer mixtures (ORNL 1987). Exposure to 98% pure 2,4-DNT produced renal tumors in male mice fed 97 mg/kg/day for two years, and liver tumors were significantly increased in rats fed 40 mg/kg/day over the same period (Ellis et al. 1979). Epidemiological studies of DNT exposed workers have not reported any significant increases in cancer mortalities. These studies were limited and are not conclusive with respect to carcinogenicity (ATSDR 1988). The USEPA classifies 2,4-DNT as a class B2 (probable human carcinogen), based on sufficient evidence of carcinogenicity in animals but lack of data in humans.

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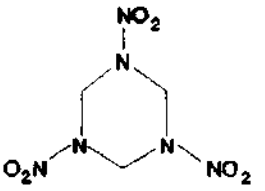
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE (RDX)

Hexahydro-1,3,5-trinitro-1,3,5-triazine, commonly known as RDX or cyclonite, is a white crystalline solid extensively used by the military as an explosive. RDX is slightly soluble in water and apolar organic solvents and readily soluble in polar organic solvents (Etnier, 1986; Sax and Lewis, 1987).



RDX

In humans and laboratory animals, RDX is slowly absorbed from the gastrointestinal tract after ingestion and from the lungs after inhalation; absorption through the skin apparently has not been demonstrated (Etnier, 1986; U.S. EPA, 1989). In rats, the absorption from the gastrointestinal tract is nearly complete (U.S. EPA, 1989). Once absorbed, RDX distributes primarily to the kidneys, brain, heart, and liver. Continued exposure to RDX does not result in significant accumulation in any tissue (U.S. EPA, 1989). RDX is primarily excreted in the urine or exhaled as carbon dioxide.

Toxic symptoms have been observed in military personnel after ingestion of C-4, a plastic explosive containing 91% RDX. Generalized convulsions, muscular twitching, hyperactive reflexes, headaches, severe nausea and vomiting, hematuria, and loss of memory were seen within several hours of ingesting 25-180 g C-4. Although serum AST (aspartate aminotransferase) was elevated, liver function tests were normal. Other abnormal laboratory findings included leukocytosis, increased blood urea nitrogen, proteinuria, and hematuria. There were no fatalities and recovery was complete within 1-2 months (Stone et al., 1969). CNS effects (convulsions) have been observed in a child following ingestion of approximately 1.23 g RDX. The estimated fatal dose of RDX in humans ranges from 5 to 500 mg/kg (U.S. EPA, 1989).

Similar symptoms occur in laboratory animals following acute exposure, with central nervous system excitation (clonic/tonic convulsions) as the most prominent effect. Other toxic manifestations include gasping and labored breathing. Pathological changes at necropsy consist of congestion of various organs, including kidney, liver, and lungs. Oral LD_{50} values range from 44 to 300 mg/kg for rats, indicating that RDX is moderately to

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highly toxic to animals following acute exposures (Etnier, 1986). The acute oral toxicity of RDX is dependent on the physical form and also on the method used to dissolve or suspend it (Schneider et al., 1977).

RDX chronic and subchronic toxicity has been investigated in several animal studies. In one study, RDX was administered daily to F344 rats at dietary doses of 0, 10, 30, 100, 300, or 600 mg/kg/day for 13 weeks. The RDX contained 3-10% HMX (octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine). All rats administered 300 or 600 mg/kg/day died within 1.5 weeks of dosing; high mortality was also seen in rats dosed with 100 mg/kg/day. All animals receiving lethal doses of RDX exhibited hyperactivity and tremors/convulsions. In rhesus monkeys, daily oral doses of 0, 0.1, 1.0, or 10 mg RDX/kg/day for 13 weeks caused signs of CNS toxicity, usually involving clonic convulsions at the highest dose. Except for frequent episodes of vomiting, no other clinical signs of toxicity were observed (Litton Bionetics, 1974).

Compound-related toxicity also has been seen among rats fed RDX (containing 3-10% HMX) at 40.0 mg/kg/day for 24 months (Levine et al., 1984). Reported effects included increased mortality, hypoglycemia, weight loss, anemia with secondary splenic lesions, hepatotoxicity, possible CNS involvement, cataracts, and urogenital lesions. In contrast to the results of Levine et al. (1984) and Lish et al. (1984), no evidence of significant toxicity was found in Sprague-Dawley rats ingesting dietary levels up to 10 mg RDX/kg/day for 2 years (Hart, 1976).

Based on animal studies, RDX does not appear to be teratogenic. However, high dose exposure at concentrations that produce maternal toxicity (primarily neurotoxicity) and mortality is also embryotoxic. Reproductive effects have also been seen in rats at maternally toxic doses (50 mg/kg/day), and include decreased number of pregnancies and poor survival of offspring (Cholakis et al., 1980).

EPA classifies RDX as a group C compound or possible human carcinogen. Animal studies indicate that RDX is a potential carcinogen.Groups of 85 male and female B6C3F1 mice were fed doses of 0, 1.5, 7.0, 35.0, or 100.0 mg/kg/day RDX (containing 3-10% HMX) for 24 months (Lish et al., 1984). There was a significant increase of hepatocellular carcinomas and adenomas (combined) in females receiving doses ≥ 7.0

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mg/kg/day compared with controls. The incidence of combined hepatocellular adenomas and carcinomas was also increased in high dose males, but the increase was not significant. In contrast, Levine et al. (1984) found no evidence of carcinogenicity in F344 rats fed dietary concentrations up to 40 mg RDX/kg/day for 24 months. RDX gave consistently negative responses in in vitro genotoxicity assays (U.S. EPA, 1989).

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METHYLENE CHLORIDE

H_2CCl_2

Methylene chloride

Methylene chloride is widely used in paint removers, degreasing agents, and aerosol propellants; as a blowing agent in flexible urethane foams; as a process solvent in the manufacture of pharmaceuticals and food products, including the decaffeination of coffee; and as a fumigant for grains and fruits. An estimated 1 million workers are potentially exposed to methylene chloride or to products that contain this chemical (NIOSH 1986).

In humans, direct contact with methylene chloride produces eye, respiratory tract, and skin irritation (EPA 1985). Mild poisonings due to inhalation exposure produce somnolence, lassitude, numbness and tingling of the limbs, anorexia, and light headedness, followed by rapid and complete recovery. More severe poisonings generally involve corresponding greater disturbances of the central and peripheral nervous system. Methylene chloride also has acute toxic effects on the heart, including the induction of arrhythmia. Fatalities reportedly due to methylene chloride exposure have been attributed to cardiac injury and heart failure. Methylene chloride is metabolized to carbon monoxide in vivo, and levels of carboxyhemoglobin in the blood are elevated following acute exposures. In experimental animals, methylene chloride is reported to cause kidney and liver damage, convulsions, and distal paresis. An oral LD_{50} value of 2,136 mg/kg, and an inhalation of LC_{50} value of 80,000 mg/m^3/30 min are reported for the rat.

Methylene chloride is reported to be mutagenic in bacterial test systems. It has also produced positive results in the Fischer rat embryo cell transformation test. However, it has been suggested that the observed cell-transforming capability may have been due to impurities in the test material. There is no conclusive evidence that methylene chloride exposure produces teratogenic effects.

Methylene chloride is currently under review by the National Toxicology Program (NTP 1984, EPA 1985). Preliminary results indicate that it produced an increased incidence of lung and liver tumors in mice and mammary tumors in female and male rats. In a chronic inhalation study, male rats exhibited an increased incidence of sarcomas in the

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ventral neck region (Burek et al. 1984); however, the authors suggest that the relevance and toxicological significance of this finding is uncertain in light of available toxicity data. Methylene chloride has been classified in EPA's Group B2 (probable human carcinogen), based upon positive results in animal studies and inadequate evidence in humans (EPA 1985b).

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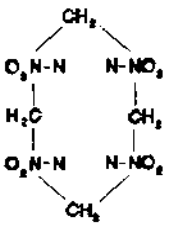
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE (HMX)

Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine, also known as HMX (High Melting Explosive) is a colorless crystalline solid used to implode fissionable material in nuclear devices. It is also used as solid-fuel rocket propellant, in military munitions and as a component of plastic-bonded explosives (Sullivan et al., 1979; Kitchens et al., 1979). HMX is soluble in organic solvents, but has limited solubility in water (Sullivan et al., 1979).



HMX

Direct human exposure can occur during the manufacture and loading of HMX into munitions or secondarily through contact with contaminated wastewater. Generation of contaminated wastewater occurs from recrystallization processes during HMX manufacture or from the washdown of operation areas, explosive melting and the steam cleaning of rejected warheads during the "load, assemble and pack" (LAP) operation. Wastewater discharged from HMX manufacturing or LAP facilities has the potential to contaminate surface, ground and public drinking water supplies.

Animal studies indicate that oral absorption of HMX may be poor, with approximately 97% of ingested HMX being excreted unmetabolized in the feces (Cameron, 1986). Studies of HMX absorption following inhalation exposure were not identified in the available literature.

The acute oral toxicity of HMX has been studied in several animal species. In rats, HMX-related clinical signs of toxicity include piloerection, hyperkinesia and ataxia, while in rabbits clinical signs are indicative of central nervous system toxicity and included hypokinesia, hyperkinesia, clonic convulsions, miosis and mydriasis. The LD_{50} for rats has been reported to be 6250 mg/kg, and in mice at 2300 mg/kg (Cuthbert et al., 1985). Cuthbert also studied the acute oral toxicity of HMX in rabbits. Because each treatment group consisted of only two rabbits, an LD_{50} could not be determined, however all rabbits treated with ≥250 mg/kg dry HMX died prior to the end of the study.

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The subchronic oral toxicity of HMX was studied in F344 rats at doses ranging from 0 to 4000 mg/kg (Everett et al., 1985). After 13 weeks of treatment, the rats were killed, necropsied and histopathological analysis conducted on the liver and kidney. No signs of clinical toxicity in any of the treatment groups were observed during the study. Following histological examination of the liver and kidney, a sex-related difference in HMX target organ toxicity was apparent. Male rats treated with ≥150 mg/kg HMX had hepatic necrosis, sinusoidal dilation and centrilobular hypertrophy, but low incidence of kidney effects. In contrast to the male-dominated liver effects, the kidneys of HMX-treated female rats treated with ≥115 mg/kg HMX contained areas of focal atrophy and tubular dilation, but there was little liver involvement. On the basis of this study, a no-observed-adverse-effect-level (NOAEL) of 50 mg/kg/day for male and 115 mg/kg/day for female rats and a lowest-observed-adverse-effect-level (LOAEL) of 150 mg/kg/day for male rats (liver effects) and 270 mg/kg/day for female rats (kidney effects) were estimated.

No studies were located regarding potential reproductive, teratogenic or carcinogenic effects of HMX exposure. EPA classifies HMX as a class D compound, not classifiable as to human carcinogenicity.

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NICKEL

Nickel is a silver-white elemental metal capable of forming a wide variety of compounds. Nickel is used in the manufacture of batteries, electrodes, metal alloys such as stainless steel and brass, and in electroplating. It is also used to make fuel and to hydrogenate vegetable oils.

Nickel and nickel compounds can be grouped according to their solubility in water. Examples of soluble nickel compounds include nickel chlorides, sulfate and nitrate hexahydrates, and acetates. Metallic nickel, nickel subsulfide, nickel carbonyl, and nickel oxide are relatively insoluble in water. Soluble nickel compounds generally have a higher degree of bioavailability (i.e., exhibit greater potential for uptake in living tissue) than the insoluble forms (NAS, 1975). Nonetheless, some insoluble nickel compounds are considered human carcinogens, possibly due to their refractory nature within the body.

The general population is exposed to nickel primarily through the ambient air and drinking water and from other natural sources. Nutritional studies indicate that it is an essential trace metal. Anthropogenic sources such as the burning of fuel oil and sewage waste, the use of nickel-containing fertilizers, and land application of sewage sludge contribute to overall nickel exposure. A majority of nickel exposure, however, probably occurs through the diet and from exposure to certain nickel-containing consumer products. Individuals predisposed to ischemic myocardial injury, stroke victims, and pregnant women may be particularly sensitive to nickel toxicity.

Ingested nickel is poorly absorbed through the gastrointestinal tract. It is transported in the plasma bound to albumin or other carrier proteins. Nickel deposition is greater in the lungs, with lesser concentrations in the kidneys, liver, and brain. Nickel is excreted in the urine, and elimination of the majority of absorbed nickel occurs in approximately four to five days following exposure.

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Nickel dermatitis is a prevalent adverse effect associated with exposure to nickel and nickel-containing compounds. Contact dermatitis (inflammation of the skin) and other dermatological effects of nickel exposure have been reported in refinery workers and in the general population.

The majority of toxicological information concerning nickel exposure in humans is based on occupational exposures during mining and smelting operations. The lung is the target organ of nickel toxicity in these industries. Acute inhalation of nickel fumes may result in irritation of the mucous membranes and respiratory tract, with the potential for both delayed-onset pneumonitis and pulmonary edema.

Chronic exposure to nickel fumes may result in anosmia (loss of the sense of smell) and severe nasal injury (e.g., nasal perforation). Chronic ingestion and inhalation of nickel compounds may adversely affect the immune system, the kidneys, and the hematological (blood) and hematopoietic (blood forming) systems (EPA, 1986).

Studies regarding the teratogenicity, fetotoxicity, or reproductive toxicity of nickel in humans are unavailable. However, nickel has been reported to cross the placental barrier (IRIS, 1988). Statistically significant effects on fetal development and birth rates have been observed following ingestion of nickel salts in pregnant experimental animals.

The association of occupational inhalation of nickel refinery dust with the development of lung and nasal cancers is well-documented (Magnus et al., 1984; Chovil et al., 1981; Enterline and Marsh, 1982). Experimental studies indicate that some nickel refinery dusts are carcinogenic when introduced via inhalation or intramuscular injection in rats. The carcinogenic potency of nickel refinery dust has been attributed to constituent nickel subsulfide and other insoluble nickel salts. There are no data supporting the carcinogenicity of soluble nickel salts. Since nickel refinery dust is a mixture of several nickel compounds, the actual carcinogenic species remains to be determined. Nickel carbonyl is a suspected human carcinogen, although environmental exposures to this compound are considered unlikely due to its instability in air (the half-life for nickel carbonyl is approximately 100 seconds). The available data regarding the carcinogenicity of ingested nickel are inconclusive (EPA, 1986).

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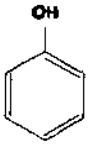
PHENOL



Phenol

Pure phenol is a colorless to white solid, but the commonly used commercial products usually are liquid solutions. The major use of phenol is in the production of phenolic resins (Thurman, 1982). Phenol is also an intermediate in the manufacture of many other organic materials, including 2,4-D, adipic acid, salicylic acid, phenolphthalein, pentachlorophenol, picric acid, germicidal paints, pharmaceuticals, dyes, and indicators (Hawley, 1981). Phenol is a slimicide and has been used as a general disinfectant in solution or mixed with slaked lime for toilets, stables, cesspools, floors, drains and other areas (Hawley, 1981; Windholz et al., 1983). Phenol is also used in medicinal preparations including ointments, ear and nose drops, cold sore lotions, mouthwashes, gargles, toothache drops, analgesic rubs (Douglas, 1972), throat lozenges (EPA, 1980), and antiseptic lotions (Musto et al., 1977).

Phenol is released primarily to the air and water as result of its manufacture, use, and because of woodburning and auto exhaust. Phenol mainly enters the water from industrial effluent discharges. Phenol disappears rapidly in air by gas-phase hydroxyl radical reaction, with an estimated half-life of 14.6 hours (Hendry and Kenley, 1979), but may persist in water for a somewhat longer period. Half-lives for biodegradation range from less than 1 day in samples of lake water to 9 days in estuarine water. A typical half-life for photooxidation by photochemically produced peroxyl radicals is approximately 19 hours (Mill and Mabey, 1985). In soil, phenol will generally biodegrade rapidly; however, biodegradation of phenol in water or soil may be hindered or precluded by the presence of high, toxic concentrations of phenol or other chemicals, or by other factors such as a lack of nutrients or microorganisms that can degrade phenol (Baker and Mayfield, 1980). Absorption of phenol may occur via ingestion, inhalation, or dermal exposure.

The acute toxic effects of phenol exposure have been reported in many animal and human case studies. Acute high dose exposure to phenol solution can be fatal. Griffiths (1973) described a situation in which death occurred within 10 minutes after about 25% of the individual's body surface was exposed to liquid phenol. In

another case, an individual died after painting himself with a brush that had been soaked in a solution of phenol (Lewin and Cleary, 1982). The lethality associated with dermal exposure to phenol is greatly influenced by the surface area exposed, the length of time skin contact, and the concentration of the applied solution. Conning and Hayes (1970) reported 0.625 ml/kg of molten phenol liquid as a dermal LD_{50} in the rat; however, application of 0.5 ml phenol/kg as a 66% solution in water resulted in 100% lethality. These results indicate that pure phenol may be less absorbable than concentrated aqueous solution.

Acute oral exposure to high concentrations of phenol have been reported in numerous suicide attempts. Bruce et al. (1987) summarized human oral lethality data from numerous case reports, and estimated 140 mg/kg to be the minimal dose at which death occurred. The oral LD_{50} has been determined in rats treated by gavage with phenol in water; the LD_{50} was found to decrease with increasing concentration of phenol in the gavage fluid. The LD_{50} was reported as 340 mg/kg in rats gavaged with a solution of 200,000 ppm phenol and 530 mg/kg in rats gavaged with a solution of 20,000 ppm phenol (Deichmann and Witherup 1944). The oral LD_{50} of phenol has been estimated as 300 mg/kg in mice (Von Oettingen and Sharpless 1946) and 400-600 mg/kg in rabbits (Deichmann and Witherup 1944). Regardless of route of exposure, the sequence of events leading to death appeared to be similar in a variety of animal species: muscle weakness, tremors, loss of coordination, paralysis, convulsions, coma, and respiratory arrest. These symptoms implicate central or peripheral nervous system toxicity as a major cause of death.

In humans, systemic effects attributed to phenol include gastrointestinal irritation (Baker et al. 1978), dermal necrosis, and cardiac arrhythmias (Truppman and Ellenby 1979). An epidemiological study indicated gastrointestinal symptoms, including mouth sores and diarrhea, are associated with drinking water contaminated with phenol (Baker et al, 1978). Application of phenol solution (> 5%) to the skin results in inflammation and necrosis at the site of application (Truppman and Ellenby, 1979). Cardiac arrhythmias have been reported for human dermal exposure to concentrated (>50%) phenol. Cardiac arrhythmias have also been demonstrated in rabbits dermally exposed to 300 mg/kg (Waxler et al., 1984). One case report described elevated liver enzymes in serum, suggesting the possibility of liver injury

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(Merliss 1972). Other effects on the heart, kidney, liver, and lung have been demonstrated in animals exposed to relatively high doses or concentrations of phenol, and are of questionable relevance to humans exposed to environmental levels of phenol.

No studies were located regarding reproductive effects in humans following oral exposure to phenol. Heller and Pursell (1938) reported the results of multigeneration phenol exposure in rats. No evidence of impaired reproduction was found in animals exposed to phenol at levels in drinking water ≈ 5000 ppm (estimated 686 mg/kg/day) for 3 generations or levels ≈ 1000 ppm (estimated 137 mg/kg/day) for 5 generations.

No studies were located regarding genotoxic effects in humans following exposure to phenol. In pregnant mice that received 265 mg/kg phenol by gavage, Ciranni et al. (1988) found no evidence of fetal cellular toxicity, as measured by a reduction in the polychromatic erythrocyte/normochromatic erythrocyte ratio (PCE/NCE), or micronuclei induction in the fetus. In the dams, however, there was a 1- to 3-fold increase over control values for micronuclei induction and a 30-60% reduction in the PCE/NCE ratio.

In a multigeneration study, Bulsiewicz (1977) indicate that phenol ingestion may cause chromosomal aberration in some male reproductive cells (spermatogonia and primary spermatocytes). The number of chromosomal aberrations increased in successive generations. In some mice, there was an absence of primary and secondary spermatocytes, spermatids, and spermatozoa. This study focused on chromosome aberrations and testicular histology; no information on the reproductive success, teratogenicity, or any other health effects in the exposed mice was reported.

The carcinogenicity of orally administered phenol was examined in rats and mice in a study reported by the National Cancer Institute (NCI, 1980). Rats and mice received 0, 2500, 5000 ppm in drinking water for 103 weeks. Since cancer occurred only in males of one of the two species tested and a positive dose-response relationship could not be established, these results are inconclusive regarding the carcinogenic potential of orally administered phenol. Phenol may be a cancer

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promoter and possibly a complete carcinogen (i.e., promoter and initiator) in mice when applied to the skin (Boutwell and Bosch, 1959; Salaman and Glendenning, 1957). The USEPA classifies phenol as a class D non-carcinogen.

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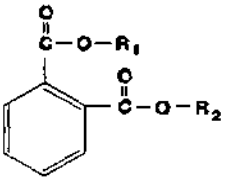
PHTHALATE DIESTERS



Phthalate Diesters

Di-n-butyl phthalate (DBP), Di-n-octyl phthalate (DOP), Diethyl phthalate (DEP), and Di(2-ethylhexyl)phthalate (DEHP) are closely related compounds that are known collectively as phthalate diesters. Phthalate diesters are commonly used as plasticizers to impart flexibility in consumer products and medical devices, such as polyvinylchloride bags. The phthalate diesters have also been used in cosmetic products and as defoaming agents in paper manufacturing (Austian, 1973). The wide production of phthalate diesters and their different use have resulted in their widespread prevalence in the environment (Lawrence, 1978), where they are now considered ubiquitous contaminants. Phthalate diesters can be absorbed via inhalation, ingestion, and direct skin contact exposure (Albro, 1989; Elsisi et al., 1989).

The acute toxicity of the most commonly encountered phthalates is relatively low. In subchronic and chronic studies, phthalate diesters have been shown to induce both morphological and biochemical changes in the liver. These include inhibition of electron transport and energy production, liver necrosis, inflammatory cell infiltration to the liver, peroxisome proliferation, and liver cancer (Seth, 1982; Melvick and Schiller, 1982, Kevy and Jacobson, 1982; Warren et al., 1982; Gangolli, 1982). For example, guinea pigs were fed diets containing 0.04% or 0.13% DEHP for one year (Carpenter, et al. 1953, as cited in NRC 1986). Liver weights were significantly increased in females at both doses. In contrast, the same investigators reported that after two years of dietary administration of DEHP to rats at doses of 0.04%, 0.13%, and 0.4%, there were no treatment-related effects. In a much more extensive study, rats were fed DEHP in the diet at levels of 50, 200, or 1,000 mg/kg/day (Mitchell et al. 1985) and sacrificed at various times up to 9 months. Early compound-related effects included morphologic changes in the bile canaliculi, periportal fat accumulation, induction of peroxisomal enzymes, and induction of the P-450 isoenzyme. Later changes included hepatocyte hypertrophy, centrilobular glycogen loss, and decreased serum glucose-6-phosphatase activity.

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Reproductive toxicity of phthalate diesters has been extensively studied. Some phthalate diesters have been shown to cause testicular atrophy in rodents at high doses (Albro, 1987). Specifically, testicular atrophy has been shown to result from the administration of dibutyl, dipentyl, dihexyl, and diethylhexyl phthalate to rats, whereas phthalate diesters of shorter and longer alkyl chain length (e.g., diethyl, diheptyl, and dioctyl phthalate) do not affect reproduction in vivo (Foster et al., 1980; Gray and Butterworth, 1980; Gangolli, 1982; Oishi and Hiraga, 1980; Gray et al., 1982; Creasy et al, 1987; Lindstrom et al., 1988). Similar results are reported in mouse studies (Lamb, et al., 1987; Heindel, et al, 1989). The most prominent effects are decreased testicle weight, tubular atrophy, and histological changes in the seminiferous tubules (NRC 1986).

There are significant species differences in the testicular toxicity of the phthalate diesters (Gray et al., 1982). Rats and guinea pigs develop severe atrophy after treatment with DBP (2 g/kg/day for 7 or 9 days), while mice developed only focal atrophy, and hamster are not affected. Adverse effects are not observed after DEP exposure in rats (Foster et al., 1980). Further, the sensitivity of the testis to these effects seems to be age-dependent, with developing males more susceptible to the effects of DEHP than mature males (Gray and Butterworth 1980). In addition to testicular effects, female rodent fertility appears to be inhibited by some phthalate diesters as well (Lamb, et al., 1987; Heindel, et al, 1989). When DEHP was fed to both male and female mice, the lysomal enzyme activity was significantly elevated in testes and ovaries compared to control animals (Agarwal, et al., 1989).

The developmental toxicity of phthalate diesters has been extensively studied. Both DBP and DEHP caused adverse effects on fetal development and increased resorption when given in the diet of pregnant mice and caused an increase in the incidence of external abnormalities in the offspring (Shiota and Nishimura, 1982).

Numerous critical reviews of the extensive in vitro and in vivo mutagenicity test data for DEHP have concluded that this compound and its metabolites are not mutagenic (Butterworth, 1987; Griesemer, et al., 1985; Turnbull and Rodricks, 1985). However, some phthalates have been shown to be carcinogenic, possibly as a result of liver toxicity. EPA has classified DEHP as a probable human carcinogen based on the

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results of laboratory animal data. In a National Toxicology Program study (NTP 1982), male and female Fisher rats were fed diets containing 6,000 or 12,000 ppm DEHP for 103 weeks. Mice (B6C3F1) were fed DEHP in the diet at 3,000 or 6,000 ppm. There was a significant dose-related increase in hepatocellular carcinomas in female rats and mice of both sexes. It has been suggested that DEHP-induced liver carcinogenesis is due to peroxisome proliferation (NRC 1986; Warrwn, et al, 1982).

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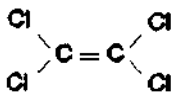
TETRACHLOROETHENE



Tetrachloroethene

Tetrachloroethene, also known as perchloroethylene (PCE), is used as a grain fumigant in agriculture, and industrially as a dry cleaning solvent and a degreasing agent for metals. Although exposure to tetrachloroethane may occur via inhalation, ingestion, or dermal contact, inhalation represents the primary uptake route in most situations, primarily because of its high volatility and poor dermal absorption. Tetrachloroethene is highly fat soluble, and once absorbed, it tends to partition to the body fat. Elimination from the body is relatively slow, with a biological half-life of approximately 65 hours.

Systemic effects of overexposure to tetrachloroethane in humans and animals include central nervous system (CNS) depression (Rowe et al., 1952), fatty infiltration of the liver and kidney (Ogata et al., 1968), and increases in serum enzyme levels (Fujii, 1975; Cornish et al., 1973). The CNS effects are similar to those produced by ethanol intoxication and are produced at atmospheric concentrations of 200 to 500 ppm (McMullan, 1976). CNS effects result in headache, blurred vision, light-headedness, nausea, vomiting, confusion, slurred speech, loss of coordination, and memory impairment. In a few cases, coma and death have been reported as a result of inhalation of tetrachloroethane at, or near, saturation levels. Ingestion of tetrachloroethane as a medicinal agent (e.g. treatment of hookworm) has been associated with acute side effects, including irritation of the gastrointestinal mucosa, cramps, nausea, and vomiting.

Chronic inhalation exposure of laboratory animals to tetrachloroethane at concentrations ranging from 1.5 to 470 ppm for 5 to 11 months produces congestion and swelling of the kidney and liver, changes in serum enzyme levels, and CNS effects (Carpenter, 1937; Rowe et al., 1952). Because of its defatting action, repeated dermal contact may result in a dry, scaly, fissured dermatitis, predisposing the skin in infection.

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Tetrachloroethene has proven negative as a mutagen in most assays. Carcinogenicity assays indicate that it is a potential carcinogen in rodents. In a major bioassay study (NCI, 1977), exposure of rodents to tetrachloroethane at 386 to 1,072 mg/kg/day for 78 weeks was reported to cause an increase in the incidence of hepatocellular carcinomas in mice, but not rats. In an inhalation study by the National Toxicology Program (NTP, 1986), exposure of mice and rats to tetrachloroethane for 6 hours per day, 5 days per week for 103 weeks caused an increase in several tumor types including mononuclear cell leukemia, hepatocellular adenomas and carcinomas, and renal tubular cell neoplasms. In analyzing the results of these studies, it should be noted that hepatic carcinomas are very rare in human populations, but quite common in rodents, and thus may not be an appropriate indicator of potential human carcinogenicity.

Epidemiological studies among workers in the dry-cleaning industry have not shown any long-term effects of tetrachloroethane on the CNS, liver, or kidneys (Lauwerys et al., 1983). A slight increased incidence of lung and cervical cancers was noted in a second study which focussed on the cause of death among occupationally-exposed individuals (CDC, 1983). The U.S. Environmental Protection Agency (EPA) classifies tetrachloroethane as a Class B2 probable human carcinogen based on animal studies.

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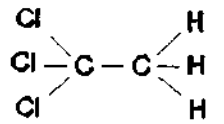
1,1,1-TRICHLOROETHANE



1,1,1-Trichloroethane

The compound 1,1,1-trichloroethane (1,1,1-TCA) is a chlorinated aliphatic hydrocarbon. This compound is used primarily in industry as a cold cleaning solvent for plastic molds, electric motors, generators and electronic equipment. A high purity grade of 1,1,1-TCA has been used for cleaning semi-conductors, high vacuum equipment and missile parts. Agricultural uses of 1,1,1-TCA include the degreening of citrus fruits and the post harvest fumigation of strawberries. Absorption of 1,1,1-TCA may occur via ingestion or inhalation, but is unlikely to occur via direct dermal contact because of its volatility.

Inhalation exposure to 1,1,1-TCA has been implicated in a number of human deaths (MacDougall et al. 1987). The estimated lethal concentration of 1,1,1-TCA ranges from 6000 to 20,000 ppm in the air (Droz et al., 1982). A single report of oral exposure of humans to 1,1,1-TCA was found in the literature. A man survived accidently drinking a single dose of 1,1,1-TCA (Stewart and Andrews, 1966). Acute exposure of humans to 1,1,1-TCA has resulted in nausea, vomiting, diarrhea, CNS depression and disorientation, liver, spleen, kidney and brain congestion, and death at high concentrations. Death in humans following acute exposure to high concentrations of 1,1,1-TCA is usually attributed to either central nervous system depression, which results in respiratory arrest (Jones and Winter, 1983), or sensitization of the heart, which results in severe cardiac arrythmia (Macdougall et al., 1987). Eye irritation, dermatitis and epidermal delipidation have also been observed in humans following acute dermal or vapor exposure.

In laboratory animals, symptoms of acute 1,1,1-TCA exposure include central nervous system depression, liver and kidney damage, and cardiac effects. When dogs were exposed to 2700 $\mu g/l$ or more there were decreases in leukocyte counts which were reversible following cessation of treatments. There was also a decrease in arterial blood pressure in dogs exposed to 1,1,1-TCA. Dermal exposure of guinea pigs resulted in body weight loss (Wahlberg, and Boman, 1979) and pathologic

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alterations (karyopyknosis, karyolysis, junctional separation, etc.) at the site of application (Wahlberg, 1984). Following inhalation exposure to 1,1,1-TCA mice experienced decreased concentrations of cGMP of the cerebellum, brain stem and cerebral cortex. For rats, mice, rabbits and guinea pigs reported oral LD_{50}s ranged from 10.3-14.3, 9.7-11.2, 5.7-10.5, and 8.6-9.5 gm/kg body weights, respectively. Inhalation LC_{50}s ranged from 56,000 to 135,000 ug/l following 1 to 6 hours exposure to rats and mice. At 4-hour inhalation LC_{50} of 97,200 ug/l has been reported for rats.

Chronic exposure of humans to 1,1,1-TCA has resulted in neurological, hepatic, gastrointestinal, cardiovascular and hematologic disorders. Eye irritation, fatigue and death have also been reported. In laboratory animals, chronic exposure to 1,1,1-TCA has caused CNS depression, liver and kidney damage, body weight loss or reduced weight gain, and death. Rats dermally exposed to 280 mg/kg had reduced weight gain and liver damage (Viola et al., 1981). Guinea pigs lost weight at 530 mg/kg/day (inhalation) and astrogliomas, indicative of brain tissue damage, was induced at 1300 mg/kg/day (Adams et al, 1950). Monkeys (Adams et al., 1950) and dogs (Herd et al., 1974) suffered liver damage at 640 and 900 mg/kg/day (inhalation), respectively.

Studies in several animal species found no evidence that 1,1,1-TCA has reproductive effects (Adams et al. 1950; Truffert, et al., 1977). Studies of the developmental toxicity of 1,1,1-TCA in animals have reported no effects at moderate concentrations and mild effects at high concentrations. Schwetz et al. (1975) exposed pregnant female rats and mice to moderate concentrations (875 ppm) of 1,1,1-TCA on days 6 through 15 of gestation. The only significant finding was an increase in maternal liver weight. York et al. (1982) exposed female rats to high concentrations (2100 ppm) of 1,1,1-TCA for 2 weeks prior to mating and/or through pregnancy. There were no signs of maternal toxicity in any test group. A significant decrease in total and male fetal body weight was observed in all 1,1,1-TCA exposed groups. A significant increase in the incidence of delayed ossification and soft-tissue anomalies was observed only in the group that was exposed during both the pre-mating period and gestation.

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The mutagenic effects of 1,1,1-TCA have been studied extensively. Although most tests of mutagenicity in the Ames Salmonella assay produced negative results, those conducted in a desiccator, to minimize evaporation and maximize exposure, were positive (Nestmann et al., 1984; Gocke et al, 1981; Simon et al, 1977). These results indicate that the negative results in most mutagenicity tests may be attributable to the high volatility of the compound. Most assays of mutagenicity in mammalian cells were negative, but 1,1,1-TCA did produce chrosomal aberration in Chinese Hamster Ovary cells in vitro (Galloway et al., 1987).

The carcinogenic effects of 1,1,1-TCA have been studied in several animal assays. A 1977 bioassay conducted by the National Cancer Institute with Osborne-Mandel rats and B6C3F1 mice was inconclusive for both species due to excessive mortality (NCI, 1977). When rats and mice were exposed to moderate to high concentration (150 to 1500 ppm) of 1,1,1-TCA via inhalation, no significant differences in survival, growth, or incidence of nonneoplastic lesions were observed between groups. Some tumors were noted, but are not attributed to the test compound by the authors (Quast et al., 1988). An increase in leukemias was observed following daily dosing of rats with 500 mg/kg, but the design of the experiment did not allow definite conclusions to be made (Maltoni et al., 1986).

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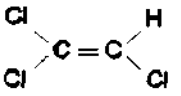
TRICHLOROETHENE

Trichloroethene (TCE), also known as trichloroethylene, is an industrial solvent which is potentially toxic at relatively high concentrations. Because of its volatility, inhalation is the primary uptake route for TCE under most circumstances. Oral uptake may also occur when groundwater supplies are contaminated. Dermal absorption of TCE is generally poor, although the defatting action of TCE can enhance its uptake.



Trichloroethene

Several studies have investigated the acute toxicity of TCE. Inhalation studies suggest that the LC_{50} for a single 4-hour inhalation exposure to TCE is about 12,500 ppm for rats (Siegel et al., 1971) and 8,450 ppm for mice (Kylin et al., 1962). Human data are more limited and have been collected from reported accidental deaths in industrial settings. Kleinfeld and Tabershaw (1954) reported one incident where five workers died after acute exposure to TCE at concentrations estimated to be in the range of 200 to 8,000 ppm. Death was thought to be due to ventricular fibrillation or related cardiac effects. Bell (1951) reported that another worker died after an acute exposure to 2,900 ppm. Acute oral lethality of TCE has also been investigated. Oral LD_{50} values have been reported for dogs (5,680 mg/kg; Christensen et al, 1974), cats (5,864 mg/kg; NIOSH, 1984), rats (4,920 mg/kg; Smyth et al., 1969), and mice (2,400 mg/kg; Tucker et al., 1982). One incident has been reported where a human death was attributed to an oral dose of 1,043 mg/kg (Lazarev and Gadaskina, 1977).

A large body of literature exists on the sublethal effects of TCE. The primary target organs include the central nervous system (CNS), liver, and kidney, as well as heme synthesis. In addition, heme synthesis may be affected . The most sensitive target organ appears to be the CNS. In the human, inhalation exposures to concentrations as low as 27 ppm are reported to cause headaches (Nomiyama and Nomiyama, 1977). Concentrations of 110 ppm for 8 hours may affect perception, memory, and dexterity (Salvini et al., 1971), while higher concentrations (956 to 2,000 ppm) for shorter time periods (2 to 2.5 hours) have no apparent CNS effects (Vernon and

Ferguson, 1969; Ettema et al., 1975; Konietzko et al., 1974). Animal studies have demonstrated behavioral changes in rats exposed to TCE at 100 ppm for 5 days (Silverman and Williams, 1975), and changes in brain RNA concentrations when rats are exposed to 200 ppm for 5 days (Savolainen et al., 1977). The CNS effects of TCE appear to be reversible.

Kjellstrand et al. (1981, 1983) have reported that low dose inhalation exposure (150 ppm for 2 to 9 days) causes an increase in liver and kidney weight. The cellular changes associated with the weight increase in the liver include hepatocellular hypertrophy and vacuolization, but do not appear to be associated with injury.

Other low dose effects on animals include alterations of enzymes involved in heme synthesis (Fujita et al., 1984), decreases in leukocyte count (Hobara et al., 1984), and effects on hemoglobin, hematocrit, and erythroblasts (Nomiyama et al., 1986). Relatively high oral doses have been reported to cause kidney damage (500 mg/kg) and liver necrosis (2,400 mg/kg) (Stott et al., 1982).

There is some evidence that inhalation of high levels of TCE may affect the reproductive system. Land et al. (1979, 1981) have reported that 2,000 ppm causes an increase in the number of sperm abnormalities. Several developmental effects have also been reported for TCE. Exposure levels of 100 ppm during pregnancy have been reported to cause decreases in fetal weight, increases in fetal resorptions, and incomplete bone ossification in the rat (Healy et al., 1982). However, epidemiological studies of women exposed to TCE in the work place have failed to demonstrate any developmental or reproductive effects in humans (Tola et al., 1980).

Some evidence exists that TCE may be a weak mutagen (USEPA, 1985). However, this work was based on commercial grade TCE, and co-contaminants present may be responsible for the observed effects. The evidence USEPA uses to classify TCE as a B2 (potential human) carcinogen is based on animal studies. Maltoni et al. (1986, 1988) have reported that inhalation of TCE causes increased incidences of testicular carcinomas in rats and lung adenomas and hepatomas in mice. Oral exposure has

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been related to hepatocellular carcinomas in mice (NCI, 1976), renal adenocarcinomas (NTP, 1986), and leukemia (Maltoni et al., 1986) in rats.

Despite numerous epidemiological studies, no increases in cancer have been observed in connection with either occupational inhalation exposure (Axelson et al., 1978; Tola et al., 1980; Malek et al., 1979) or residential well water exposures (Lagakos et al., 1986). The lack of evidence in humans for carcinogenicity is significant given the extensive history of TCE usage in industry.

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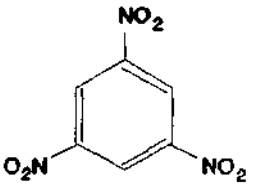

1,3,5-Trinitrobenzene

The compound 1,3,5-trinitrobenzene (1,3,5-TNB) is a nitroaromatic compound closely related to the explosive 2,4,6-trinitrotoluene (TNT). This compound is commonly found in wastewater streams originating from munitions facilities where TNT is manufactured, or from TNT waste disposal sites, and has been shown to be a photochemical transformation product of TNT in the environment. Relatively little information is available on the absorption, metabolism or excretion of this compound, although animal studies indicate that 1,3,5-TNB may be absorbed via oral or dermal exposure (Fogleman et al., 1955; HSDB, 1992). Calculations based on the log octanol/water partition coefficient indicate that 1,3,5-TNB could potentially bioconcentrate to a slight degree in plant and animal tissues (estimated bioconcentration factors of 5 to 23; HSDB, 1992).

Very few studies were located on the acute toxicity of 1,3,5-TNB. Aquatic testing has shown this compound to elicit behavioral effects in fish at concentrations as low as 100 μg/L. Effects include irritability/excitability and respiratory distress. Higher concentrations (1000-10,000 μg/L) are reported to elicit violent reactions in swimming behavior (HSDB, 1992). Dermal exposure has been reported to cause contact irritation/inflammation in mice (USEPA, 1989), and an oral LD_{50} of 450 mg/kg has been reported for rats (RTECS, 1983).

Studies in mice, rats and guinea pigs have shown that chronic exposure to 1,3,5-TNB can induce methemoglobinemia (Fogleman, 1955), as well as a number of unspecified effects on the liver and central nervous system (Korolev et al., 1977). Human data are quite limited, and are based on studies among munitions workers who have been exposed to numerous compounds in addition to 1,3,5-TNB. Common symptoms of chronic exposure to munitions compounds in humans include optic neuritis and amblyopia, and yellowing of the conjunctiva or sclera (HSDB, 1992), although it is not known whether these effects are related to 1,3,5-TNB. Because of the lack of detailed toxicity information on this compound, the USEPA

(IRIS, 1992) has derived a reference dose for 1,3,5-TNB based on analogy to the structurally-related compound, 1,3-dinitrobenzene (1,3-DNB), for which detailed toxicity data are available. However, it is important to note that 1,3-DNB is more toxic than 1,3,5-TNB (i.e., the LD_{50} for 1,3-DNB is 83 mg/kg vs 450 mg/kg for 1,3,5-TNB). Chronic exposure to 1,3-DNB in drinking water is reported to cause a number of toxic effects in rats. Concentrations of 20 ppm cause decreased weight gain, decreased hemoglobin levels, testicular atrophy, and spleen enlargement with hemosideric deposits. Lower concentrations (8 ppm) have been correlated to increased spleen weight, while 3 ppm causes behavioral changes (Cody et al., 1981).

There is no information available on the potential carcinogenicity of 1,3,5-TNB, although it has been shown to be mutagenic in vitro in a bacterial assay (Salmonella typhimurium assay; McGregor et al., 1980). The USEPA has classified 1,3,5-TNB as a class D compound, not classifiable as to human carcinogenicity based on lack of data.

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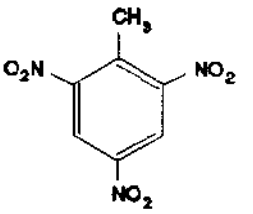

2,4,6-Trinitrotoluene

In humans, exposure to 2,4,6-trinitrotoluene (TNT) has been reported to produce relatively mild effects such as respiratory irritation, skin lesions, and gastrointestinal disorders and progressing to more severe symptoms such as methemoglobinemia, jaundice, aplastic anemia, cataract formation, menstrual disorders, neurological dysfunction, and nephrotoxicity (Zakhari and Villaume, 1978). Of these disorders, the most consistently observed are hepatitis and aplastic anemia (Zakhari and Villaume, 1978).

Acute oral LD_{50} values ranging from 500 to 1,850 mg/kg have been reported in several animal species. Toxic signs following acute administration include lassitude, cyanosis, occasional muscular twitching, convulsions, and discolored urine. When applied to the skin of rabbits, TNT produced mild dermal irritation (NIOSH, 1988).

In animals, significant and consistent findings following oral administration of TNT include hemolytic anemia with compensatory responses such as reticulocytosis, methemoglobinemia, and increased spleen weight usually associated with hemosiderosis. In lifetime studies, the most consistent signs are congestion and extramedullary hematopoiesis, increased liver weight associated with hyperplasia, and hepatocytomegaly (Dilley et al., 1978; Levine, et al., 1981, 1983; Furedi et al., 1984a, b). Testicular atrophy and hyperplasia have been observed in rats treated with 160 mg/kg/day of TNT for up to 13 weeks (Dilley et al., 1978) and similar effects were seen in rats fed 125 to 300 mg/kg/day in the diet (Levine et al., 1981).

Trinitrotoluene is mutagenic to Salmonella typhimurium strains TA-98, TA-1538, and TA-1537, indicating it is a frameshift mutagen (Ellis et al., 1980). Similar results were reported by Dilley et al. (1978) in Salmonella strains TA-1537, TA-1538, and TA-100.

The carcinogenic potential of TNT was evaluated in 24-month studies in Fischer 344 rats and in hybrid B6C3F1 mice (Furedi et al., 1984a, b). In the rat study, the animals were administered 0.0, 0.4, 2.0, 10.0 or 50.0 mg/kg/day of TNT in the diet. In females, treatment produced an increase in the incidence and severity of hyperplastic, preneoplastic, and neoplastic lesions of the mucosal epithelium of the urinary bladder. In the mouse study, the animals were administered 0.0, 1.5, 10.0 or 70.0 mg/kg/day of TNT. Microscopic examination of the spleens revealed a statistically significant increase in the incidence of leukemia and malignant lymphoma in the high dose females. The lesions were described as systemic reticuloendothelial neoplasias involving the adrenals, bone marrow, brain, GI tract, eyes, kidneys, liver, lungs, and the lymph nodes. The USEPA classifies lead as a C possible human carcinogen based on limited evidence from animal studies.

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VANADIUM

Vanadium is a naturally occurring element that is widely distributed throughout the environment, although usually at very low concentrations. Elevated levels may be found in certain metal ores or in some crude petroleum deposits. The primary use of vanadium is as an alloy in steel, where it is particularly useful in the production of jet engine parts. Other uses include as a catalyst for the chemical industry, as a drying agent in paints and varnishes, as a corrosion inhibitor, in the production of photographic developers, and as a coloring agent for glass. Because of the ubiquitous nature of this element in the environment, vanadium is commonly found at low levels in most foods.

Experimental evidence suggests that soluble forms of vanadium such as vanadium chloride can be readily absorbed via inhalation, with near 100 percent absorption within the first few hours of exposure. Under most circumstances ingestion appears to be a minor uptake route. Studies in rats suggest that insoluble forms such as vanadium pentoxide are poorly absorbed, with less than 3 percent being absorbed after 3 days exposure (Conklin et al;., 1982). Absorption is higher in young animals, presumably because of increased intestinal permeability (Edel et al., 1984). Absorbed vanadium is distributed to adipose tissue, with some deposition occurring in the bone and teeth (Carson et al., 1986). As with most metals, vanadium exhibits very poor dermal absorption. Vanadium is excreted in the urine.

Vanadium is a relatively non-toxic chemical, and there are no reported cases of deaths in humans as a result of vanadium exposure. Animal studies have shown that most lethal responses require exposure to high doses. Inhalation of airborne concentrations of 60 mg/m^3 are required to cause death in rabbits, and the oral LD_{50} in rats is reported to be 41 mg/kg. The LD_{50} for intraperitoneal exposure is substantially less (0.11-0.13 mg/kg), but this exposure route is not relevant to human exposure (Chanh, 1965). Acute exposure to vanadium is reported to cause few target organ effects. The primary target is the respiratory system, and inhalation of dust containing vanadium pentoxide may produce moderate respiratory distress and mucosal irritation. The respiratory effects appear to be due to damage to the

B07NE003702-07924

alveolar macrophages during clearance of dust particles from the alveoli (Castronova et al., 1984). Minor eye irritation may also occur as a result of exposure to vanadium dust.

Few adverse health effects have been reported for chronic exposure to vanadium. Animal studies have shown that vanadium may accumulate in the kidney, and that minor effects such as increased lipid peroxidation and decreased tubular resorption may occur as a result of chronic ingestion (Donaldson et al., 1985; Westenfelder et al., 1981). None of these effects have been seen among workers occupationally exposed to vanadium (Kiviluoto et al., 1981). Other chronic effects seen in animals include slight weight loss (Mountain et al., 1953) and a slight inhibition of immunologic function (Cohen et al., 1986). Schroeder and Balassa (1967) reported that chronic ingestion does not produce any histopathologic effects in rats.

Vanadium exposure has been reported to cause minor developmental effects in animals, but not man. Developmental effects include fetal hemorrhage, alterations in collagen metabolism in the lung, and minor skeletal anomalies (Paternain et al., 1987; Wide, 1984). Reproductive studies in rats indicate that vanadium has no negative effects on either fertility or reproduction (Domingo et al., 1986).

Vanadium has been reported to be potentially genotoxic in several in vitro studies, and reported effects include induction of gene mutation, unscheduled DNA synthesis and DNA strand breaks (Birnboim, 1988). There is no evidence to suggest that vanadium is carcinogenic in either animals or humans. The USEPA has classified vanadium as a class D compound, not classifiable as to human carcinogenicity.

B07NE003702-07925

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F

APPENDIX F
SHOWER MODEL

An estimation of volatile chemical air concentrations achieved during showering can be derived by application of a one-compartment air model. Such a model, as presented in Wadden and Scheff (1983), can be modified to address specific showering factors. The model presented in Wadden and Scheff is based on a mass balance of chemical flow into and out of an indoor air volume. The model contains components applicable to rooms which have air control apparatus, such as filters and air supply and exhaust systems. In its full form, the model is:

$$V \frac{dCi}{dt} = k\, q_o\, C_0\, (1-F_0) + k\, q_1\, C_i\, (1-F_1) + k\, q_2\, C_o - K(q_0 + q_1 + q_2)\, C_i + S - R$$

where:

C_i	=	indoor air concentration;
C_o	=	outdoor air concentration;
t	=	time;
q_0	=	volumetric flow rate for makeup air;
q_1	=	volumetric flow rate for recirculation;
q_2	=	volumetric flow rate for infiltration;
q_3	=	volumetric flow rate for exfiltration;
q_4	=	volumetric flow rate for exhaust;
F_o	=	filter efficiency for makeup air;
F_1	=	filter efficiency for recirculation air;
V	=	room volume;
S	=	indoor source emission rate;
R	=	indoor sink removal rate;
k	=	mixing factor.

The solution for this equation for changes in C_i with t, holding all other factors constant and with boundary values $C_i = C_s$ at time = t is:

$$C_i = \frac{k[q_o\,(1-F_o) + q_2]\, C_0 + S - R}{k(q_0 + q_1\, F_1 + q_2)}\, [1 - e^{-(k/V)(q_0 + q_1 F_1 + q_2)t}] + C_S\, e^{-(k/V)\,(q_0 + q_1 F_1 + q_2)t}$$

B07NE003702-07930

For showering, it is assumed that bathrooms have no filters or air delivery systems; therefore, the following parameters are assigned a value of zero:

q_0 = volumetric flow rate for makeup air;
q_1 = volumetric flow rate for recirculation;
q_4 = volumetric flow rate for exhaust;
F_o = filter efficiency for makeup air;
F_1 = filter efficiency for recirculation.

All air movement in the shower is assumed to be from infiltration and exfiltration, which are further assumed to be equal ($q_2 = q_3 = q$). Outdoor air concentrations (C_o) are assumed to be zero, and no removal mechanism (e.g., sorption onto materials) is assumed to occur. Applying these assumptions, the above equation reduces to:

$$C_a = \frac{S}{k\,q}\,[1 - e^{-(k/V)(q)t}] + C_s\,e^{-(k/V)(q)t}$$

where:

C_a = Air concentration (mg/m^3) (same as C_i);
S = Chemical emission rate (mg/min);
K = Mixing Factor (assumed to be 1.0);
Q_a = Air flow rate in shower (m^3/min);
V = Volume of shower stall (m^3);
t = Time (min); and
C_s = Air concentration (C_a) at time (t-1).

The emission rate, S, is estimated by the following expression:

$$S = Q_w\,C_w\,F$$

where:

Q_w = Water flow during the shower (L/min);
C_w = Concentration of chemical in the water (mg/L); and
F = Fraction of chemical volatilized (dimensionless).

The air flow rate, Q_a, in m^3/min, was estimated by the following expression:

$$Q_a = V\ (ACM)$$

where:

V = The volume of the shower stall (m^3); and
ACM = Air changes per minute.

These equations estimate the air concentrations of volatile chemicals in the shower stall at given times.

Default values which are applied to this model are presented below.

C_a = Calculated value

C_s = The estimated air concentration (C_a) at time = (t-1).

S = Chemical emission rate, calculated as $S = Q_w\ C_w\ F$

Q_w = is the water flow rate during the shower. A default value of 9.5 L/min as been adopted. This value (= 2.5 gal/min) was adopted from the 1984 Chicago Building Code (1984) as the minimum flow rate for bathtub and shower faucets (all new repairs require a <u>maximum</u> flow rate of 3 gallons per minute for shower heads)

C_w = Chemical concentration in water, measured of modeled from site data.

F = The fraction of chemical which volatilizes during the shower. Chemical-specific values can be obtained from the literature. In research performed by Andelman et al. (University of Pittsburgh), volatilization rates for TCE and chloroform in an experimental shower system ranged from 50-90%, varying with temperature and other shower conditions. For the current BRA, 100 percent was conservatively assumed for all VOCs.

K = Mixing Factor (assumed to be 1.0). Actual mixing in a room will depend on the degree of ventilation, air temperature and perhaps other factors. The lower the K value, the less well mixed is the chemical. With good mixing, K values close to 1.0 are anticipated. In a bathroom with a shower going, air mixing is anticipated to be thorough, hence the assumption of K = 1.0.

Q_a = Air flow rate in shower (m^3/min); calculated as $Q_a = V_d$ ACM

V = The volume of the shower stall (m^3). For a small shower stall, a reasonable approximate volume is 3' (0.91 m) x 3' (0.91 m) x 8' (2.43 m) = 72 ft^3 (2.0 m^3). A "bathtub" shower volume would be in the vicinity of 3' wide by 6' long by 8' high (0.91 m x 1.83 m x 2.43 m = 4.1 m^3. This latter value was applied in the BRA.

ACM = Air changes per minute. A value of 0.03 acm (approximately equal to 2 air changes per hour) has been applied. This is analogous to the air ventilation rate of an entrance hallway (a value of 0.5 to 1 is typically applied to indoor buildings)

t = Time (min). The calculations are integrated over a one minute period to derive the average air concentration within that one minute period. The number of numerical integrations can be as long as the showering period assumed.

C_s = Air concentration (C_a) at time (t-1). Calculated.

Spreadsheet Calculations for volatile groundwater COC, RME, PME and average concentrations are attached.

MEAD FORMER NOP
CONCENTRATION IN
SHOWER OF VOLATILE
CHEMICALS IN
GROUNDWATER - INHALATION DCE MW-5B RME Conc.
(CHEMICAL NOT DETECTED IN MW-5B, CALCULATED VALUE BASED ON HALF DETECTION LIMIT)

Assumptions

Water flow rate (Qw) = 9 5 L/min (approx 2 5 gal/min)
Volume of shower (Vd) = 4 1 m3 (approx 3 ft x 6ft x 8ft)
Fraction volatilized (F) = 100%
Air change rate of room (ach) = 0.03/min (approx 2 changes per hour)
Mixing factor (K) = 1
Time (t) = one minute time intervals

$$C(i) = [(Qw \times Cw \times F) / (K \times Vd \times ach)] (1-e^{-(K)(ach)(t)}) + Cs (e^{-(K)(ach)(t)})$$

|----------C(a)----------| ----C(b)-----|

C(i) = Indoor Air Concentration
S = Emission Rate (= Qw x Cw x F)
K = Mixing Rate
V = Volume of room
Q = Air flow rate in and out of room
t = time interval
C(s) = C(i) at time = (t-1)

First part of equation is constant

C(a) (mg/m3)	Qw (L/min)	Cw (mg/L)	F (unitless)	K (unitless)	Vd (m3)	ach (min^-1_)	t (min)
0 001141	9 500000	0 000500	1 000000	1.000000	4.100000	0 030000	1 000000

Second part of equation is dependent on C(i) at t-1

$$Cb = Cs (e^{-(K)(ach)(t)})$$

where C(s) = C(i) at (t-1)

	C(b) (mg/m3)	Cs (mg/m3)	K (unitless)	ach (min^-1)	t (min)
0-1 min	0 000000	0 000000	1.000000	0.030000	**1.000000**
1-2 min	0 001108	0 001141	1 000000	0.030000	**1.000000**
2-3 min	0 002182	0 002249	1 000000	0 030000	**1.000000**
3-4 min	0 003226	0 003324	1 000000	0.030000	**1.000000**
4-5 min	0 004238	0 004367	1 000000	0.030000	**1.000000**
5-6 min	0 005220	0 005379	1 000000	0 030000	**1.000000**
6-7 min	0 006174	0 006362	1 000000	0.030000	**1.000000**
7-8 min	0 007099	0 007315	1 000000	0 030000	**1.000000**
8-9 min	0 007996	0 008240	1 000000	0 030000	**1.000000**
9-10 min	0 008868	0 009138	1 000000	0 030000	**1.000000**
10-11 min	0 009713	0 010009	1 000000	0.030000	**1.000000**
11-12 min	**0.010534**	**0.010855**	**1.000000**	**0.030000**	**1.000000**

Third part of equation is dependent on above two

C(i) = C(a) + C(b)

	C(i) (mg/m3)	C(a) (mg/m3)	C(b) (mg/m3)
0-1 min	0 001141	0 001141	**0.000000**
1-2 min	0 002249	0 001141	**0.001108**
2-3 min	0 003324	0 001141	**0.002182**
3-4 min	0 004367	0 001141	**0.003226**
4-5 min	0 005379	0.001141	**0.004238**
5-6 min	0 006362	0 001141	**0.005220**
6-7 min	0 007315	0 001141	**0.006174**
7-8 min	0 008240	0 001141	**0.007099**
8-9 min	0 009138	0 001141	**0.007996**
9-10 min	0 010009	0 001141	**0.008868**
10-11 min	0 010855	0 001141	**0.009713**
11-12 min	**0.011675**	**0.001141**	**0.010534**

Average Concentration = 6 67E-03 (mg/m3)

MEAD FORMER NOP
CONCENTRATION IN
SHOWER OF VOLATILE
CHEMICALS IN
GROUNDWATER - INHALATION DCE MW-5B RME Conc.
(CHEMICAL NOT DETECTED IN MW-5B, CALCULATED VALUE BASED ON HALF DETECTION LIMIT)

Assumptions:

Water flow rate (Qw) = 9.5 L/min (approx. 2.5 gal/min)
Volume of shower (Vd) = 4.1 m3 (approx 3 ft x 6ft x 8ft)
Fraction volatilized (F) = 100%
Air change rate of room (ach) = 0.03/min (approx 2 changes per hour)
Mixing factor (K) = 1
Time (t) = one minute time intervals

$$C(i) = [(Qw \times Cw \times F) / (K \times Vd \times ach)] (1-e^{-(K)(ach)(t)}) + Cs\,(e^{-(K)(ach)(t)})$$

|----------C(a)----------| ----C(b)----|

C(i) = Indoor Air Concentration
S = Emission Rate (= Qw x Cw x F)
K = Mixing Rate
V = Volume of room
Q = Air flow rate in and out of room
t = time interval
C(s) = C(i) at time = (t-1)

First part of equation is constant:

C(a) (mg/m3)	Qw (L/min)	Cw (mg/L)	F (unitless)	K (unitless)	Vd (m3)	ach (min^-1_)	t (min)
0.001141	9.500000	0.000500	1.000000	1.000000	4.100000	0.030000	1.000000

Second part of equation is dependent on C(i) at t-1.

$$Cb = Cs\,(e^{-(K)(ach)(t)})$$

where C(s) = C(i) at (t-1)

	C(b) (mg/m3)	Cs (mg/m3)	K (unitless)	ach (min^-1)	t (min)
0-1 min	0.000000	0.000000	1.000000	0.030000	**1.000000**
1-2 min	0.001108	0.001141	1.000000	0.030000	**1.000000**
2-3 min	0.002182	0.002249	1.000000	0.030000	**1.000000**
3-4 min	0.003226	0.003324	1.000000	0.030000	**1.000000**
4-5 min	0.004238	0.004367	1.000000	0.030000	**1.000000**
5-6 min	0.005220	0.005379	1.000000	0.030000	**1.000000**
6-7 min	0.006174	0.006362	1.000000	0.030000	**1.000000**
7-8 min	0.007099	0.007315	1.000000	0.030000	**1.000000**
8-9 min	0.007996	0.008240	1.000000	0.030000	**1.000000**
9-10 min	0.008868	0.009138	1.000000	0.030000	**1.000000**
10-11 min	0.009713	0.010009	1.000000	0.030000	**1.000000**
11-12 min	**0.010534**	**0.010855**	**1.000000**	**0.030000**	**1.000000**

Third part of equation is dependent on above two:

C(i) = C(a) + C(b)

	C(i) (mg/m3)	C(a) (mg/m3)	C(b) (mg/m3)
0-1 min	0.001141	0.001141	**0.000000**
1-2 min	0.002249	0.001141	**0.001108**
2-3 min	0.003324	0.001141	**0.002182**
3-4 min	0.004367	0.001141	**0.003226**
4-5 min	0.005379	0.001141	**0.004238**
5-6 min	0.006362	0.001141	**0.005220**
6-7 min	0.007315	0.001141	**0.006174**
7-8 min	0.008240	0.001141	**0.007099**
8-9 min	0.009138	0.001141	**0.007996**
9-10 min	0.010009	0.001141	**0.008868**
10-11 min	0.010855	0.001141	**0.009713**
11-12 min	**0.011675**	**0.001141**	**0.010534**

Average Concentration = 6.67E-03 (mg/m3)

MEAD FORMER NOP
CONCENTRATION IN
SHOWER OF VOLATILE
CHEMICALS IN
GROUNDWATER - INHALATION Acetone MW-5B RME Conc.

Assumptions.

Water flow rate (Qw) = 9 5 L/min (approx 2 5 gal/min)
Volume of shower (Vd) = 4 1 m3 (approx 3 ft x 6ft x 8ft)
Fraction volatilized (F) = 100%
Air change rate of room (ach) = 0 03/min (approx 2 changes per hour)
Mixing factor (K) = 1
Time (t) = one minute time intervals

$$C(i) = [(Qw \times Cw \times F) / (K \times Vd \times ach)](1-e^{-(K)(ach)(t)}) + Cs(e^{-(K)(ach)(t)})$$

|----------C(a)----------| ----C(b)----|

C(i) = Indoor Air Concentration
S = Emission Rate (= Qw x Cw x F)
K = Mixing Rate
V = Volume of room
Q = Air flow rate in and out of room
t = time interval
C(s) = C(i) at time = (t-1)

First part of equation is constant

C(a) (mg/m3)	Qw (L/min)	Cw (mg/L)	F (unitless)	K (unitless)	Vd (m3)	ach (min^-1_)	t (min)
0 011413	9 500000	0 005000	1 000000	1 000000	4.100000	0.030000	1 000000

Second part of equation is dependent on C(i) at t-1

$$Cb = Cs(e^{-(K)(ach)(t)})$$

where C(s) = C(i) at (t-1)

	C(b) (mg/m3)	Cs (mg/m3)	K (unitless)	ach (min^-1)	t (min)
0-1 min	0 000000	0.000000	1 000000	0 030000	**1.000000**
1-2 min	0 011076	0 011413	1 000000	0 030000	**1.000000**
2-3 min	0 021825	0 022489	1 000000	0 030000	**1.000000**
3-4 min	0 032256	0 033238	1 000000	0 030000	**1.000000**
4-5 min	0 042378	0 043669	1 000000	0 030000	**1.000000**
5-6 min	0 052202	0 053792	1.000000	0.030000	**1.000000**
6-7 min	0 061735	0 063615	1 000000	0 030000	**1.000000**
7-8 min	0 070986	0.073148	1.000000	0.030000	**1.000000**
8-9 min	0 079965	0 082400	1 000000	0 030000	**1.000000**
9-10 min	0 088677	0 091378	1 000000	0.030000	**1.000000**
10-11 min	0 097132	0.100091	1 000000	0 030000	**1.000000**
11-12 min	**0.105338**	**0.108546**	**1.000000**	**0.030000**	**1.000000**

Third part of equation is dependent on above two

C(i) = C(a) + C(b)

	C(i) (mg/m3)	C(a) (mg/m3)	C(b) (mg/m3)
0-1 min	0 011413	0 011413	**0.000000**
1-2 min	0 022489	0 011413	**0.011076**
2-3 min	0 033238	0 011413	**0.021825**
3-4 min	0 043669	0 011413	**0.032256**
4-5 min	0 053792	0 011413	**0.042378**
5-6 min	0 063615	0.011413	**0.052202**
6-7 min	0 073148	0 011413	**0.061735**
7-8 min	0 082400	0 011413	**0.070986**
8-9 min	0 091378	0 011413	**0.079965**
9-10 min	0 100091	0.011413	**0.088677**
10-11 min	0 108546	0 011413	**0.097132**
11-12 min	**0.116751**	**0.011413**	**0.105338**

Average Concentration = 6 67E-02 (mg/m3)

MEAD FORMER NOP
CONCENTRATION IN
SHOWER OF VOLATILE
CHEMICALS IN
GROUNDWATER - INHALATION Acetone MW-5B RME Conc.

Assumptions.

Water flow rate (Qw) = 9.5 L/min (approx. 2 5 gal/min)
Volume of shower (Vd) = 4 1 m3 (approx 3 ft x 6ft x 8ft)
Fraction volatilized (F) = 100%
Air change rate of room (ach) = 0 03/min (approx 2 changes per hour)
Mixing factor (K) = 1
Time (t) = one minute time intervals

$$C(i) = [(Qw \times Cw \times F) / (K \times Vd \times ach)] (1-e^{-(K)(ach)(t)}) + Cs (e^{-(K)(ach)(t)})$$

|----------C(a)----------| ----C(b)----|

C(i) = Indoor Air Concentration
S = Emission Rate (= Qw x Cw x F)
K = Mixing Rate
V = Volume of room
Q = Air flow rate in and out of room
t = time interval
C(s) = C(i) at time = (t-1)

First part of equation is constant:

C(a) (mg/m3)	Qw (L/min)	Cw (mg/L)	F (unitless)	K (unitless)	Vd (m3)	ach (min^-1_)	t (min)
0 011413	9.500000	0.005000	1 000000	1.000000	4.100000	0.030000	1.000000

Second part of equation is dependent on C(i) at t-1:

$$Cb = Cs (e^{-(K)(ach)(t)})$$

where C(s) = C(i) at (t-1)

	C(b) (mg/m3)	Cs (mg/m3)	K (unitless)	ach (min^-1)	t (min)
0-1 min	0.000000	0.000000	1 000000	0.030000	1.000000
1-2 min	0.011076	0.011413	1.000000	0.030000	1.000000
2-3 min	0.021825	0.022489	1 000000	0.030000	1.000000
3-4 min	0.032256	0.033238	1 000000	0.030000	1.000000
4-5 min	0.042378	0.043669	1.000000	0.030000	1.000000
5-6 min	0.052202	0.053792	1 000000	0.030000	1.000000
6-7 min	0.061735	0 063615	1.000000	0.030000	1.000000
7-8 min	0 070986	0.073148	1.000000	0 030000	1.000000
8-9 min	0.079965	0.082400	1.000000	0.030000	1.000000
9-10 min	0.088677	0.091378	1.000000	0.030000	1.000000
10-11 min	0 097132	0 100091	1.000000	0.030000	1.000000
11-12 min	0.105338	0.108546	1.000000	0.030000	1.000000

Third part of equation is dependent on above two:

C(i) = C(a) + C(b)

	C(i) (mg/m3)	C(a) (mg/m3)	C(b) (mg/m3)
0-1 min	0 011413	0 011413	0.000000
1-2 min	0 022489	0 011413	0.011076
2-3 min	0 033238	0.011413	0.021825
3-4 min	0 043669	0 011413	0.032256
4-5 min	0 053792	0 011413	0.042378
5-6 min	0 063615	0.011413	0.052202
6-7 min	0 073148	0 011413	0.061735
7-8 min	0.082400	0.011413	0.070986
8-9 min	0 091378	0 011413	0.079965
9-10 min	0.100091	0 011413	0.088677
10-11 min	0.108546	0.011413	0.097132
11-12 min	0.116751	0.011413	0.105338

Average Concentration = 6 67E-02 (mg/m3)

MEAD FORMER NOP
CONCENTRATION IN
SHOWER OF VOLATILE
CHEMICALS IN
GROUNDWATER - INHALATION Methylene Chloride MW-5B RME Conc.
(CHEMICAL NOT DETECTED IN MW-5B, CALCULATED VALUE BASED ON HALF DETECTION LIMIT)

Assumptions

Water flow rate (Qw) = 9 5 L/min (approx. 2 5 gal/min)
Volume of shower (Vd) = 4 1 m3 (approx 3 ft x 6ft x 8ft)
Fraction volatilized (F) = 100%
Air change rate of room (ach) = 0 03/min (approx 2 changes per hour)
Mixing factor (K) = 1
Time (t) = one minute time intervals

$$C(i) = [(Qw \times Cw \times F) / (K \times Vd \times ach)](1-e^{-(K)(ach)(t)}) + Cs(e^{-(K)(ach)(t)})$$

|----------C(a)----------| ----C(b)----|

C(i) = Indoor Air Concentration
S = Emission Rate (= Qw x Cw x F)
K = Mixing Rate
V = Volume of room
Q = Air flow rate in and out of room
t = time interval
C(s) = C(i) at time = (t-1)

First part of equation is constant

C(a) (mg/m3)	Qw (L/min)	Cw (mg/L)	F (unitless)	K (unitless)	Vd (m3)	ach (min^-1_)	t (min)
0 002283	9 500000	0 001000	1 000000	1 000000	4 100000	0 030000	1 000000

Second part of equation is dependent on C(i) at t-1

$$Cb = Cs(e^{-(K)(ach)(t)})$$

where C(s) = C(i) at (t-1)

	C(b) (mg/m3)	Cs (mg/m3)	K (unitless)	ach (min^-1)	t (min)
0-1 min	0.000000	0 000000	1 000000	0 030000	**1.000000**
1-2 min	0.002215	0 002283	1.000000	0 030000	**1.000000**
2-3 min	0.004365	0.004498	1.000000	0 030000	**1.000000**
3-4 min	0 006451	0.006648	1 000000	0 030000	**1.000000**
4-5 min	0.008476	0 008734	1.000000	0 030000	**1.000000**
5-6 min	0.010440	0 010758	1 000000	0 030000	**1.000000**
6-7 min	0 012347	0.012723	1 000000	0.030000	**1.000000**
7-8 min	0 014197	0 014630	1.000000	0.030000	**1.000000**
8-9 min	0 015993	0.016480	1 000000	0.030000	**1.000000**
9-10 min	0.017735	0 018276	1 000000	0.030000	**1.000000**
10-11 min	0.019426	0 020018	1.000000	0.030000	**1.000000**
11-12 min	**0.021068**	**0.021709**	**1.000000**	**0.030000**	**1.000000**

Third part of equation is dependent on above two

C(i) = C(a) + C(b)

	C(i) (mg/m3)	C(a) (mg/m3)	C(b) (mg/m3)
0-1 min	0 002283	0 002283	**0.000000**
1-2 min	0 004498	0 002283	**0.002215**
2-3 min	0 006648	0 002283	**0.004365**
3-4 min	0 008734	0 002283	**0.006451**
4-5 min	0 010758	0 002283	**0.008476**
5-6 min	0 012723	0 002283	**0.010440**
6-7 min	0 014630	0 002283	**0.012347**
7-8 min	0 016480	0 002283	**0.014197**
8-9 min	0 018276	0 002283	**0.015993**
9-10 min	0 020018	0 002283	**0.017735**
10-11 min	0.021709	0 002283	**0.019426**
11-12 min	**0.023350**	**0.002283**	**0.021068**

Average Concentration = 1 33E-02 (mg/m3)

MEAD FORMER NOP
CONCENTRATION IN
SHOWER OF VOLATILE
CHEMICALS IN
GROUNDWATER - INHALATION Methylene Chloride MW-5B RME Conc.
(CHEMICAL NOT DETECTED IN MW-5B, CALCULATED VALUE BASED ON HALF DETECTION LIMIT)

Assumptions

Water flow rate (Qw) = 9 5 L/min (approx 2 5 gal/min)
Volume of shower (Vd) = 4.1 m3 (approx 3 ft x 6ft x 8ft)
Fraction volatilized (F) = 100%
Air change rate of room (ach) = 0 03/min (approx 2 changes per hour)
Mixing factor (K) = 1
Time (t) = one minute time intervals

$$C(i) = [(Qw \times Cw \times F) / (K \times Vd \times ach)](1-e^{-(K)(ach)(t)}) + Cs(e^{-(K)(ach)(t)})$$

|----------C(a)----------| ----C(b)----|

C(i) = Indoor Air Concentration
S = Emission Rate (= Qw x Cw x F)
K = Mixing Rate
V = Volume of room
Q = Air flow rate in and out of room
t = time interval
C(s) = C(i) at time = (t-1)

First part of equation is constant

C(a) (mg/m3)	Qw (L/min)	Cw (mg/L)	F (unitless)	K (unitless)	Vd (m3)	ach (min^-1_)	t (min)
0.002283	9 500000	0 001000	1 000000	1.000000	4.100000	0.030000	1.000000

Second part of equation is dependent on C(i) at t-1:

$$Cb = Cs(e^{-(K)(ach)(t)})$$

where C(s) = C(i) at (t-1)

	C(b) (mg/m3)	Cs (mg/m3)	K (unitless)	ach (min^-1)	t (min)
0-1 min	0.000000	0.000000	1 000000	0.030000	**1.000000**
1-2 min	0.002215	0.002283	1 000000	0 030000	**1.000000**
2-3 min	0.004365	0 004498	1 000000	0.030000	**1.000000**
3-4 min	0.006451	0 006648	1 000000	0 030000	**1.000000**
4-5 min	0.008476	0.008734	1 000000	0.030000	**1.000000**
5-6 min	0.010440	0.010758	1.000000	0.030000	**1.000000**
6-7 min	0.012347	0.012723	1.000000	0.030000	**1.000000**
7-8 min	0.014197	0.014630	1.000000	0.030000	**1.000000**
8-9 min	0.015993	0.016480	1 000000	0 030000	**1.000000**
9-10 min	0 017735	0.018276	1 000000	0 030000	**1.000000**
10-11 min	0.019426	0.020018	1.000000	0 030000	**1.000000**
11-12 min	**0.021068**	**0.021709**	**1.000000**	**0.030000**	**1.000000**

Third part of equation is dependent on above two:

C(i) = C(a) + C(b)

	C(i) (mg/m3)	C(a) (mg/m3)	C(b) (mg/m3)
0-1 min	0 002283	0 002283	**0.000000**
1-2 min	0.004498	0 002283	**0.002215**
2-3 min	0.006648	0.002283	**0.004365**
3-4 min	0.008734	0.002283	**0.006451**
4-5 min	0 010758	0.002283	**0.008476**
5-6 min	0.012723	0.002283	**0.010440**
6-7 min	0.014630	0.002283	**0.012347**
7-8 min	0 016480	0 002283	**0.014197**
8-9 min	0.018276	0.002283	**0.015993**
9-10 min	0 020018	0 002283	**0.017735**
10-11 min	0 021709	0 002283	**0.019426**
11-12 min	**0.023350**	**0.002283**	**0.021068**

Average Concentration = 1 33E-02 (mg/m3)

MEAD FORMER NOP
CONCENTRATION IN
SHOWER OF VOLATILE
CHEMICALS IN
GROUNDWATER - INHALATION Trichloroethene MW-5B RME Conc.
(CHEMICAL NOT DETECTED IN MW-5B, CALCULATED VALUE BASED ON HALF DETECTION LIMIT)

Assumptions

Water flow rate (Qw) = 9 5 L/min (approx. 2 5 gal/min)
Volume of shower (Vd) = 4 1 m3 (approx 3 ft x 6ft x 8ft)
Fraction volatilized (F) = 100%
Air change rate of room (ach) = 0 03/min (approx 2 changes per hour)
Mixing factor (K) = 1
Time (t) = one minute time intervals

$$C(i) = [(Qw \times Cw \times F) / (K \times Vd \times ach)] (1-e^{-(K)(ach)(t)}) + Cs (e^{-(K)(ach)(t)})$$

|----------C(a)----------| -----C(b)-----|

C(i) = Indoor Air Concentration
S = Emission Rate (= Qw x Cw x F)
K = Mixing Rate
V = Volume of room
Q = Air flow rate in and out of room
t = time interval
C(s) = C(i) at time = (t-1)

First part of equation is constant.

C(a) (mg/m3)	Qw (L/min)	Cw (mg/L)	F (unitless)	K (unitless)	Vd (m3)	ach (min^-1)	t (min)
0 001141	9 500000	0.000500	1 000000	1 000000	4 100000	0 030000	1 000000

Second part of equation is dependent on C(i) at t-1

$$Cb = Cs (e^{-(K)(ach)(t)})$$

where C(s) = C(i) at (t-1)

	C(b) (mg/m3)	Cs (mg/m3)	K (unitless)	ach (min^-1)	t (min)
0-1 min	0 000000	0 000000	1 000000	0 030000	1.000000
1-2 min	0 001108	0 001141	1 000000	0 030000	1.000000
2-3 min	0 002182	0 002249	1 000000	0 030000	1.000000
3-4 min	0 003226	0 003324	1 000000	0 030000	1.000000
4-5 min	0 004238	0 004367	1 000000	0 030000	1.000000
5-6 min	0 005220	0 005379	1 000000	0 030000	1.000000
6-7 min	0 006174	0 006362	1 000000	0 030000	1.000000
7-8 min	0 007099	0.007315	1.000000	0 030000	1.000000
8-9 min	0 007996	0.008240	1 000000	0 030000	1.000000
9-10 min	0 008868	0.009138	1 000000	0 030000	1.000000
10-11 min	0 009713	0.010009	1 000000	0 030000	1.000000
11-12 min	0.010534	0.010855	1.000000	0.030000	1.000000

Third part of equation is dependent on above two:

C(i) = C(a) + C(b)

	C(i) (mg/m3)	C(a) (mg/m3)	C(b) (mg/m3)
0-1 min	0 001141	0 001141	0.000000
1-2 min	0 002249	0 001141	0.001108
2-3 min	0 003324	0 001141	0.002182
3-4 min	0 004367	0 001141	0.003226
4-5 min	0 005379	0 001141	0.004238
5-6 min	0 006362	0 001141	0.005220
6-7 min	0 007315	0 001141	0.006174
7-8 min	0 008240	0 001141	0.007099
8-9 min	0 009138	0 001141	0.007996
9-10 min	0 010009	0 001141	0.008868
10-11 min	0 010855	0 001141	0.009713
11-12 min	0.011675	0.001141	0.010534

Average Concentration = 6 67E-03 (mg/m3)

MEAD FORMER NOP
CONCENTRATION IN
SHOWER OF VOLATILE
CHEMICALS IN
GROUNDWATER - INHALATION Trichloroethene MW-5B RME Conc.
(CHEMICAL NOT DETECTED IN MW-5B, CALCULATED VALUE BASED ON HALF DETECTION LIMIT)

Assumptions

Water flow rate (Qw) = 9 5 L/min (approx. 2 5 gal/min)
Volume of shower (Vd) = 4 1 m3 (approx 3 ft x 6ft x 8ft)
Fraction volatilized (F) = 100%
Air change rate of room (ach) = 0 03/min (approx 2 changes per hour)
Mixing factor (K) = 1
Time (t) = one minute time intervals

$$C(i) = [(Qw \times Cw \times F) / (K \times Vd \times ach)] (1-e^{-(K)(ach)(t)}) + Cs\,(e^{-(K)(ach)(t)})$$

|----------C(a)----------| -----C(b)----|

C(i) = Indoor Air Concentration
S = Emission Rate (= Qw x Cw x F)
K = Mixing Rate
V = Volume of room
Q = Air flow rate in and out of room
t = time interval
C(s) = C(i) at time = (t-1)

First part of equation is constant

C(a) (mg/m3)	Qw (L/min)	Cw (mg/L)	F (unitless)	K (unitless)	Vd (m3)	ach (min^-1_)	t (min)
0.001141	9 500000	0.000500	1.000000	1.000000	4.100000	0.030000	1.000000

Second part of equation is dependent on C(i) at t-1:

$$Cb = Cs\,(e^{-(K)(ach)(t)})$$

where C(s) = C(i) at (t-1)

	C(b) (mg/m3)	Cs (mg/m3)	K (unitless)	ach (min^-1)	t (min)
0-1 min	0 000000	0.000000	1.000000	0.030000	**1.000000**
1-2 min	0 001108	0.001141	1.000000	0 030000	**1.000000**
2-3 min	0 002182	0.002249	1.000000	0 030000	**1.000000**
3-4 min	0 003226	0.003324	1.000000	0.030000	**1.000000**
4-5 min	0.004238	0.004367	1 000000	0.030000	**1.000000**
5-6 min	0.005220	0 005379	1.000000	0.030000	**1.000000**
6-7 min	0.006174	0.006362	1.000000	0.030000	**1.000000**
7-8 min	0.007099	0 007315	1.000000	0.030000	**1.000000**
8-9 min	0.007996	0.008240	1.000000	0.030000	**1.000000**
9-10 min	0.008868	0.009138	1.000000	0.030000	**1.000000**
10-11 min	0.009713	0.010009	1.000000	0.030000	**1.000000**
11-12 min	**0.010534**	**0.010855**	**1.000000**	**0.030000**	**1.000000**

Third part of equation is dependent on above two:

C(i) = C(a) + C(b)

	C(i) (mg/m3)	C(a) (mg/m3)	C(b) (mg/m3)
0-1 min	0 001141	0 001141	**0.000000**
1-2 min	0 002249	0 001141	**0.001108**
2-3 min	0 003324	0 001141	**0.002182**
3-4 min	0 004367	0 001141	**0.003226**
4-5 min	0 005379	0.001141	**0.004238**
5-6 min	0 006362	0 001141	**0.005220**
6-7 min	0 007315	0 001141	**0.006174**
7-8 min	0 008240	0 001141	**0.007099**
8-9 min	0 009138	0 001141	**0.007996**
9-10 min	0 010009	0 001141	**0.008868**
10-11 min	0 010855	0 001141	**0.009713**
11-12 min	**0.011675**	**0.001141**	**0.010534**

Average Concentration = 6 67E-03 (mg/m3) .

MEAD FORMER NOP
CONCENTRATION IN
SHOWER OF VOLATILE
CHEMICALS IN
GROUNDWATER - INHALATION 1,1,1-Trichloroethane MW-5B RME Conc.
(CHEMICAL NOT DETECTED IN MW-5B, CALCULATED VALUE BASED ON HALF DETECTION LIMIT)

Assumptions

Water flow rate (Qw) = 9.5 L/min (approx. 2.5 gal/min)
Volume of shower (Vd) = 4.1 m3 (approx 3 ft x 6ft x 8ft)
Fraction volatilized (F) = 100%
Air change rate of room (ach) = 0.03/min (approx 2 changes per hour)
Mixing factor (K) = 1
Time (t) = one minute time intervals

$$C(i) = [(Qw \times Cw \times F) / (K \times Vd \times ach)](1-e^{-(K)(ach)(t)}) + Cs\,(e^{-(K)(ach)(t)})$$

|----------C(a)----------| ----C(b)----|

C(i) = Indoor Air Concentration
S = Emission Rate (= Qw x Cw x F)
K = Mixing Rate
V = Volume of room
Q = Air flow rate in and out of room
t = time interval
C(s) = C(i) at time = (t-1)

First part of equation is constant

C(a) (mg/m3)	Qw (L/min)	Cw (mg/L)	F (unitless)	K (unitless)	Vd (m3)	ach (min^-1)	t (min)
0.001141	9.500000	0.000500	1.000000	1.000000	4.100000	0.030000	1.000000

Second part of equation is dependent on C(i) at t-1

$$Cb = Cs\,(e^{-(K)(ach)(t)})$$

where C(s) = C(i) at (t-1)

	C(b) (mg/m3)	Cs (mg/m3)	K (unitless)	ach (min^-1)	t (min)
0-1 min	0.000000	0.000000	1.000000	0.030000	**1.000000**
1-2 min	0.001108	0.001141	1.000000	0.030000	**1.000000**
2-3 min	0.002182	0.002249	1.000000	0.030000	**1.000000**
3-4 min	0.003226	0.003324	1.000000	0.030000	**1.000000**
4-5 min	0.004238	0.004367	1.000000	0.030000	**1.000000**
5-6 min	0.005220	0.005379	1.000000	0.030000	**1.000000**
6-7 min	0.006174	0.006362	1.000000	0.030000	**1.000000**
7-8 min	0.007099	0.007315	1.000000	0.030000	**1.000000**
8-9 min	0.007996	0.008240	1.000000	0.030000	**1.000000**
9-10 min	0.008868	0.009138	1.000000	0.030000	**1.000000**
10-11 min	0.009713	0.010009	1.000000	0.030000	**1.000000**
11-12 min	**0.010534**	**0.010855**	**1.000000**	**0.030000**	**1.000000**

Third part of equation is dependent on above two

C(i) = C(a) + C(b)

	C(i) (mg/m3)	C(a) (mg/m3)	C(b) (mg/m3)
0-1 min	0.001141	0.001141	**0.000000**
1-2 min	0.002249	0.001141	**0.001108**
2-3 min	0.003324	0.001141	**0.002182**
3-4 min	0.004367	0.001141	**0.003226**
4-5 min	0.005379	0.001141	**0.004238**
5-6 min	0.006362	0.001141	**0.005220**
6-7 min	0.007315	0.001141	**0.006174**
7-8 min	0.008240	0.001141	**0.007099**
8-9 min	0.009138	0.001141	**0.007996**
9-10 min	0.010009	0.001141	**0.008868**
10-11 min	0.010855	0.001141	**0.009713**
11-12 min	**0.011675**	**0.001141**	**0.010534**

Average Concentration 6.67E-03 (mg/m3)

MEAD FORMER NOP
CONCENTRATION IN
SHOWER OF VOLATILE
CHEMICALS IN
GROUNDWATER - INHALATION 1,1,1-Trichloroethane MW-5B RME Conc.
(CHEMICAL NOT DETECTED IN MW-5B, CALCULATED VALUE BASED ON HALF DETECTION LIMIT)

Assumptions

Water flow rate (Qw) = 9.5 L/min (approx. 2.5 gal/min)
Volume of shower (Vd) = 4.1 m3 (approx 3 ft x 6ft x 8ft)
Fraction volatilized (F) = 100%
Air change rate of room (ach) = 0.03/min (approx 2 changes per hour)
Mixing factor (K) = 1
Time (t) = one minute time intervals

$$C(i) = [(Qw \times Cw \times F) / (K \times Vd \times ach)](1-e^{-(K)(ach)(t)}) + Cs(e^{-(K)(ach)(t)})$$

|----------C(a)----------| ----C(b)----|

C(i) = Indoor Air Concentration
S = Emission Rate (= Qw x Cw x F)
K = Mixing Rate
V = Volume of room
Q = Air flow rate in and out of room
t = time interval
C(s) = C(i) at time = (t-1)

First part of equation is constant:

C(a) (mg/m3)	Qw (L/min)	Cw (mg/L)	F (unitless)	K (unitless)	Vd (m3)	ach (min^-1_)	t (min)
0.001141	9.500000	0.000500	1.000000	1.000000	4.100000	0.030000	1.000000

Second part of equation is dependent on C(i) at t-1:

$$Cb = Cs(e^{-(K)(ach)(t)})$$

where C(s) = C(i) at (t-1)

	C(b) (mg/m3)	Cs (mg/m3)	K (unitless)	ach (min^-1)	t (min)
0-1 min	0.000000	0.000000	1.000000	0.030000	**1.000000**
1-2 min	0.001108	0.001141	1.000000	0.030000	**1.000000**
2-3 min	0.002182	0.002249	1.000000	0.030000	**1.000000**
3-4 min	0.003226	0.003324	1.000000	0.030000	**1.000000**
4-5 min	0.004238	0.004367	1.000000	0.030000	**1.000000**
5-6 min	0.005220	0.005379	1.000000	0.030000	**1.000000**
6-7 min	0.006174	0.006362	1.000000	0.030000	**1.000000**
7-8 min	0.007099	0.007315	1.000000	0.030000	**1.000000**
8-9 min	0.007996	0.008240	1.000000	0.030000	**1.000000**
9-10 min	0.008868	0.009138	1.000000	0.030000	**1.000000**
10-11 min	0.009713	0.010009	1.000000	0.030000	**1.000000**
11-12 min	**0.010534**	**0.010855**	**1.000000**	**0.030000**	**1.000000**

Third part of equation is dependent on above two:

C(i) = C(a) + C(b)

	C(i) (mg/m3)	C(a) (mg/m3)	C(b) (mg/m3)
0-1 min	0.001141	0.001141	**0.000000**
1-2 min	0.002249	0.001141	**0.001108**
2-3 min	0.003324	0.001141	**0.002182**
3-4 min	0.004367	0.001141	**0.003226**
4-5 min	0.005379	0.001141	**0.004238**
5-6 min	0.006362	0.001141	**0.005220**
6-7 min	0.007315	0.001141	**0.006174**
7-8 min	0.008240	0.001141	**0.007099**
8-9 min	0.009138	0.001141	**0.007996**
9-10 min	0.010009	0.001141	**0.008868**
10-11 min	0.010855	0.001141	**0.009713**
11-12 min	**0.011675**	**0.001141**	**0.010534**

Average Concentration 6.67E-03 (mg/m3)

MEAD FORMER NOP
CONCENTRATION IN
SHOWER OF VOLATILE
CHEMICALS IN
GROUNDWATER - INHALATION 1,2-Dichloropropane MW-5B RME Conc.
(CHEMICAL NOT DETECTED IN MW-5B, CALCULATED VALUE BASED ON HALF DETECTION LIMIT)

Assumptions

Water flow rate (Qw) = 9 5 L/min (approx. 2.5 gal/min)
Volume of shower (Vd) = 4 1 m3 (approx 3 ft x 6ft x 8ft)
Fraction volatilized (F) = 100%
Air change rate of room (ach) = 0 03/min (approx 2 changes per hour)
Mixing factor (K) = 1
Time (t) = one minute time intervals

$$C(i) = [(Qw \times Cw \times F) / (K \times Vd \times ach)](1-e^{-(K)(ach)(t)}) + Cs(e^{-(K)(ach)(t)})$$

|----------C(a)----------| ----C(b)----|

C(i) = Indoor Air Concentration
S = Emission Rate (= Qw x Cw x F)
K = Mixing Rate
V = Volume of room
Q = Air flow rate in and out of room
t = time interval
C(s) = C(i) at time = (t-1)

First part of equation is constant:

C(a) (mg/m3)	Qw (L/min)	Cw (mg/L)	F (unitless)	K (unitless)	Vd (m3)	ach (min^-1)	t (min)
0.001141	9 500000	0 000500	1.000000	1 000000	4 100000	0 030000	1.000000

Second part of equation is dependent on C(i) at t-1

$$Cb = Cs(e^{-(K)(ach)(t)})$$

where C(s) = C(i) at (t-1)

	C(b) (mg/m3)	Cs (mg/m3)	K (unitless)	ach (min^-1)	t (min)
0-1 min	0 000000	0 000000	1 000000	0 030000	1.000000
1-2 min	0 001108	0 001141	1 000000	0 030000	1.000000
2-3 min	0 002182	0 002249	1 000000	0.030000	1.000000
3-4 min	0.003226	0 003324	1 000000	0 030000	1.000000
4-5 min	0 004238	0 004367	1.000000	0.030000	1.000000
5-6 min	0 005220	0 005379	1.000000	0.030000	1.000000
6-7 min	0 006174	0 006362	1 000000	0 030000	1.000000
7-8 min	0 007099	0 007315	1 000000	0 030000	1.000000
8-9 min	0 007996	0 008240	1.000000	0 030000	1.000000
9-10 min	0.008868	0 009138	1 000000	0 030000	1.000000
10-11 min	0.009713	0 010009	1 000000	0 030000	1.000000
11-12 min	0.010534	0.010855	1.000000	0.030000	1.000000

Third part of equation is dependent on above two

C(i) = C(a) + C(b)

	C(i) (mg/m3)	C(a) (mg/m3)	C(b) (mg/m3)
0-1 min	0 001141	0 001141	0.000000
1-2 min	0 002249	0 001141	0.001108
2-3 min	0 003324	0 001141	0.002182
3-4 min	0 004367	0 001141	0.003226
4-5 min	0 005379	0 001141	0.004238
5-6 min	0 006362	0 001141	0.005220
6-7 min	0 007315	0 001141	0.006174
7-8 min	0.008240	0 001141	0.007099
8-9 min	0 009138	0 001141	0.007996
9-10 min	0 010009	0.001141	0.008868
10-11 min	0 010855	0 001141	0.009713
11-12 min	0.011675	0.001141	0.010534

Average Concentration = 6 67E-03 (mg/m3)

MEAD FORMER NOP
CONCENTRATION IN
SHOWER OF VOLATILE
CHEMICALS IN
GROUNDWATER - INHALATION 1,2-Dichloropropane MW-5B RME Conc.
(CHEMICAL NOT DETECTED IN MW-5B, CALCULATED VALUE BASED ON HALF DETECTION LIMIT)

Assumptions:

Water flow rate (Qw) = 9.5 L/min (approx. 2.5 gal/min)
Volume of shower (Vd) = 4.1 m3 (approx 3 ft x 6ft x 8ft)
Fraction volatilized (F) = 100%
Air change rate of room (ach) = 0.03/min (approx 2 changes per hour)
Mixing factor (K) = 1
Time (t) = one minute time intervals

$$C(i) = [(Qw \times Cw \times F) / (K \times Vd \times ach)](1-e^{-(K)(ach)(t)}) + Cs(e^{-(K)(ach)(t)})$$

|----------C(a)----------| ----C(b)----|

C(i) = Indoor Air Concentration
S = Emission Rate (= Qw x Cw x F)
K = Mixing Rate
V = Volume of room
Q = Air flow rate in and out of room
t = time interval
C(s) = C(i) at time = (t-1)

First part of equation is constant:

C(a) (mg/m3)	Qw (L/min)	Cw (mg/L)	F (unitless)	K (unitless)	Vd (m3)	ach (min^-1)	t (min)
0.001141	9.500000	0.000500	1.000000	1.000000	4.100000	0.030000	1.000000

Second part of equation is dependent on C(i) at t-1.

$$Cb = Cs(e^{-(K)(ach)(t)})$$

where C(s) = C(i) at (t-1)

	C(b) (mg/m3)	Cs (mg/m3)	K (unitless)	ach (min^-1)	t (min)
0-1 min	0.000000	0.000000	1.000000	0.030000	1.000000
1-2 min	0.001108	0.001141	1.000000	0.030000	1.000000
2-3 min	0.002182	0.002249	1.000000	0.030000	1.000000
3-4 min	0.003226	0.003324	1.000000	0.030000	1.000000
4-5 min	0.004238	0.004367	1.000000	0.030000	1.000000
5-6 min	0.005220	0.005379	1.000000	0.030000	1.000000
6-7 min	0.006174	0.006362	1.000000	0.030000	1.000000
7-8 min	0.007099	0.007315	1.000000	0.030000	1.000000
8-9 min	0.007996	0.008240	1.000000	0.030000	1.000000
9-10 min	0.008868	0.009138	1.000000	0.030000	1.000000
10-11 min	0.009713	0.010009	1.000000	0.030000	1.000000
11-12 min	0.010534	0.010855	1.000000	0.030000	1.000000

Third part of equation is dependent on above two:

C(i) = C(a) + C(b)

	C(i) (mg/m3)	C(a) (mg/m3)	C(b) (mg/m3)
0-1 min	0.001141	0.001141	0.000000
1-2 min	0.002249	0.001141	0.001108
2-3 min	0.003324	0.001141	0.002182
3-4 min	0.004367	0.001141	0.003226
4-5 min	0.005379	0.001141	0.004238
5-6 min	0.006362	0.001141	0.005220
6-7 min	0.007315	0.001141	0.006174
7-8 min	0.008240	0.001141	0.007099
8-9 min	0.009138	0.001141	0.007996
9-10 min	0.010009	0.001141	0.008868
10-11 min	0.010855	0.001141	0.009713
11-12 min	0.011675	0.001141	0.010534

Average Concentration = 6.67E-03 (mg/m3)

MEAD FORMER NOP
CONCENTRATION IN
SHOWER OF VOLATILE
CHEMICALS IN
GROUNDWATER - INHALATION Tetrachloroethene MW-5B RME Conc.
(CHEMICAL NOT DETECTED IN MW-5B, CALCULATED VALUE BASED ON HALF DETECTION LIMIT)

Assumptions

Water flow rate (Qw) = 9 5 L/min (approx 2 5 gal/min)
Volume of shower (Vd) = 4.1 m3 (approx 3 ft x 6ft x 8ft)
Fraction volatilized (F) = 100%
Air change rate of room (ach) = 0 03/min (approx 2 changes per hour)
Mixing factor (K) = 1
Time (t) = one minute time intervals

$$C(i) = [(Qw \times Cw \times F) / (K \times Vd \times ach)](1-e^{-(K)(ach)(t)}) + Cs(e^{-(K)(ach)(t)})$$

|----------C(a)----------| ----C(b)----|

C(i) = Indoor Air Concentration
S = Emission Rate (= Qw x Cw x F)
K = Mixing Rate
V = Volume of room
Q = Air flow rate in and out of room
t = time interval
C(s) = C(i) at time = (t-1)

First part of equation is constant.

C(a) (mg/m3)	Qw (L/min)	Cw (mg/L)	F (unitless)	K (unitless)	Vd (m3)	ach (min^-1_)	t (min)
0 001141	9 500000	0 000500	1 000000	1.000000	4 100000	0 030000	1 000000

Second part of equation is dependent on C(i) at t-1

$$Cb = Cs(e^{-(K)(ach)(t)})$$

where C(s) = C(i) at (t-1)

	C(b) (mg/m3)	Cs (mg/m3)	K (unitless)	ach (min^-1)	t (min)
0-1 min	0.000000	0 000000	1.000000	0 030000	1.000000
1-2 min	0 001108	0 001141	1 000000	0.030000	1.000000
2-3 min	0 002182	0 002249	1 000000	0.030000	1.000000
3-4 min	0 003226	0 003324	1 000000	0 030000	1.000000
4-5 min	0 004238	0 004367	1 000000	0 030000	1.000000
5-6 min	0 005220	0 005379	1 000000	0 030000	1.000000
6-7 min	0 006174	0 006362	1 000000	0.030000	1.000000
7-8 min	0 007099	0.007315	1 000000	0 030000	1.000000
8-9 min	0.007996	0.008240	1.000000	0 030000	1.000000
9-10 min	0.008868	0 009138	1 000000	0 030000	1.000000
10-11 min	0 009713	0 010009	1.000000	0 030000	1.000000
11-12 min	0.010534	0.010855	1.000000	0.030000	1.000000

Third part of equation is dependent on above two.

C(i) = C(a) + C(b)

	C(i) (mg/m3)	C(a) (mg/m3)	C(b) (mg/m3)
0-1 min	0 001141	0 001141	0.000000
1-2 min	0 002249	0 001141	0.001108
2-3 min	0 003324	0 001141	0.002182
3-4 min	0 004367	0 001141	0.003226
4-5 min	0 005379	0 001141	0.004238
5-6 min	0 006362	0 001141	0.005220
6-7 min	0 007315	0 001141	0.006174
7-8 min	0 008240	0 001141	0.007099
8-9 min	0.009138	0 001141	0.007996
9-10 min	0 010009	0 001141	0.008868
10-11 min	0 010855	0 001141	0.009713
11-12 min	0.011675	0.001141	0.010534

Average Concentration = 6 67E-03 (mg/m3)

MEAD FORMER NOP
CONCENTRATION IN
SHOWER OF VOLATILE
CHEMICALS IN
GROUNDWATER - INHALATION Tetrachloroethene MW-5B RME Conc.
(CHEMICAL NOT DETECTED IN MW-5B, CALCULATED VALUE BASED ON HALF DETECTION LIMIT)

Assumptions

Water flow rate (Qw) = 9.5 L/min (approx 2.5 gal/min)
Volume of shower (Vd) = 4.1 m3 (approx 3 ft x 6ft x 8ft)
Fraction volatilized (F) = 100%
Air change rate of room (ach) = 0.03/min (approx 2 changes per hour)
Mixing factor (K) = 1
Time (t) = one minute time intervals

$$C(i) = [(Qw \times Cw \times F) / (K \times Vd \times ach)](1-e^{-(K)(ach)(t)}) + Cs(e^{-(K)(ach)(t)})$$

|----------C(a)----------| -----C(b)-----|

C(i) = Indoor Air Concentration
S = Emission Rate (= Qw x Cw x F)
K = Mixing Rate
V = Volume of room
Q = Air flow rate in and out of room
t = time interval
C(s) = C(i) at time = (t-1)

First part of equation is constant:

C(a) (mg/m3)	Qw (L/min)	Cw (mg/L)	F (unitless)	K (unitless)	Vd (m3)	ach (min^-1)	t (min)
0.001141	9.500000	0.000500	1.000000	1.000000	4.100000	0.030000	1.000000

Second part of equation is dependent on C(i) at t-1:

$$Cb = Cs(e^{-(K)(ach)(t)})$$

where C(s) = C(i) at (t-1)

	C(b) (mg/m3)	Cs (mg/m3)	K (unitless)	ach (min^-1)	t (min)
0-1 min	0.000000	0.000000	1.000000	0.030000	**1.000000**
1-2 min	0.001108	0.001141	1.000000	0.030000	**1.000000**
2-3 min	0.002182	0.002249	1.000000	0.030000	**1.000000**
3-4 min	0.003226	0.003324	1.000000	0.030000	**1.000000**
4-5 min	0.004238	0.004367	1.000000	0.030000	**1.000000**
5-6 min	0.005220	0.005379	1.000000	0.030000	**1.000000**
6-7 min	0.006174	0.006362	1.000000	0.030000	**1.000000**
7-8 min	0.007099	0.007315	1.000000	0.030000	**1.000000**
8-9 min	0.007996	0.008240	1.000000	0.030000	**1.000000**
9-10 min	0.008868	0.009138	1.000000	0.030000	**1.000000**
10-11 min	0.009713	0.010009	1.000000	0.030000	**1.000000**
11-12 min	**0.010534**	**0.010855**	**1.000000**	**0.030000**	**1.000000**

Third part of equation is dependent on above two:

C(i) = C(a) + C(b)

	C(i) (mg/m3)	C(a) (mg/m3)	C(b) (mg/m3)
0-1 min	0.001141	0.001141	**0.000000**
1-2 min	0.002249	0.001141	**0.001108**
2-3 min	0.003324	0.001141	**0.002182**
3-4 min	0.004367	0.001141	**0.003226**
4-5 min	0.005379	0.001141	**0.004238**
5-6 min	0.006362	0.001141	**0.005220**
6-7 min	0.007315	0.001141	**0.006174**
7-8 min	0.008240	0.001141	**0.007099**
8-9 min	0.009138	0.001141	**0.007996**
9-10 min	0.010009	0.001141	**0.008868**
10-11 min	0.010855	0.001141	**0.009713**
11-12 min	**0.011675**	**0.001141**	**0.010534**

Average Concentration = 6.67E-03 (mg/m3)

MEAD FORMER NOP
CONCENTRATION IN
SHOWER OF VOLATILE
CHEMICALS IN
GROUNDWATER - INHALATION Chloroform MW-5B RME Conc.
(CHEMICAL NOT DETECTED IN MW-5B, CALCULATED VALUE BASED ON HALF DETECTION LIMIT)

Assumptions

Water flow rate (Qw) = 9 5 L/min (approx. 2.5 gal/min)
Volume of shower (Vd) = 4 1 m3 (approx 3 ft x 6ft x 8ft)
Fraction volatilized (F) = 100%
Air change rate of room (ach) = 0 03/min (approx 2 changes per hour)
Mixing factor (K) = 1
Time (t) = one minute time intervals

$$C(i) = [(Qw \times Cw \times F) / (K \times Vd \times ach)](1-e^{-(K)(ach)(t)}) + Cs(e^{-(K)(ach)(t)})$$

|----------C(a)----------| ----C(b)----|

C(i) = Indoor Air Concentration
S = Emission Rate (= Qw x Cw x F)
K = Mixing Rate
V = Volume of room
Q = Air flow rate in and out of room
t = time interval
C(s) = C(i) at time = (t-1)

First part of equation is constant:

C(a) (mg/m3)	Qw (L/min)	Cw (mg/L)	F (unitless)	K (unitless)	Vd (m3)	ach (min^-1_)	t (min)
0 001141	9 500000	0 000500	1.000000	1 000000	4 100000	0 030000	1 000000

Second part of equation is dependent on C(i) at t-1

$$Cb = Cs(e^{-(K)(ach)(t)})$$

where C(s) = C(i) at (t-1)

	C(b) (mg/m3)	Cs (mg/m3)	K (unitless)	ach (min^-1)	t (min)
0-1 min	0 000000	0 000000	1 000000	0.030000	**1.000000**
1-2 min	0 001108	0 001141	1 000000	0.030000	**1.000000**
2-3 min	0.002182	0 002249	1 000000	0 030000	**1.000000**
3-4 min	0 003226	0 003324	1 000000	0.030000	**1.000000**
4-5 min	0 004238	0 004367	1 000000	0.030000	**1.000000**
5-6 min	0 005220	0 005379	1 000000	0.030000	**1.000000**
6-7 min	0.006174	0 006362	1 000000	0.030000	**1.000000**
7-8 min	0.007099	0 007315	1.000000	0 030000	**1.000000**
8-9 min	0.007996	0 008240	1 000000	0 030000	**1.000000**
9-10 min	0 008868	0 009138	1 000000	0.030000	**1.000000**
10-11 min	0 009713	0 010009	1 000000	0.030000	**1.000000**
11-12 min	**0.010534**	**0.010855**	**1.000000**	**0.030000**	**1.000000**

Third part of equation is dependent on above two

C(i) = C(a) + C(b)

	C(i) (mg/m3)	C(a) (mg/m3)	C(b) (mg/m3)
0-1 min	0 001141	0 001141	**0.000000**
1-2 min	0 002249	0 001141	**0.001108**
2-3 min	0 003324	0 001141	**0.002182**
3-4 min	0.004367	0 001141	**0.003226**
4-5 min	0 005379	0 001141	**0.004238**
5-6 min	0 006362	0 001141	**0.005220**
6-7 min	0.007315	0 001141	**0.006174**
7-8 min	0.008240	0 001141	**0.007099**
8-9 min	0.009138	0 001141	**0.007996**
9-10 min	0 010009	0 001141	**0.008868**
10-11 min	0.010855	0 001141	**0.009713**
11-12 min	**0.011675**	**0.001141**	**0.010534**

Average Concentration = 6 67E-03 (mg/m3)

MEAD FORMER NOP
CONCENTRATION IN
SHOWER OF VOLATILE
CHEMICALS IN
GROUNDWATER - INHALATION Chloroform MW-5B RME Conc.
(CHEMICAL NOT DETECTED IN MW-5B, CALCULATED VALUE BASED ON HALF DETECTION LIMIT)

Assumptions.

Water flow rate (Qw) = 9.5 L/min (approx 2.5 gal/min)
Volume of shower (Vd) = 4.1 m3 (approx 3 ft x 6ft x 8ft)
Fraction volatilized (F) = 100%
Air change rate of room (ach) = 0.03/min (approx 2 changes per hour)
Mixing factor (K) = 1
Time (t) = one minute time intervals

$$C(i) = [\{Qw \times Cw \times F\} / \{K \times Vd \times ach\}] (1-e^{-(K)(ach)(t)}) + Cs\,(e^{-(K)(ach)(t)})$$

|----------C(a)----------| ----C(b)----|

C(i) = Indoor Air Concentration
S = Emission Rate (= Qw x Cw x F)
K = Mixing Rate
V = Volume of room
Q = Air flow rate in and out of room
t = time interval
C(s) = C(i) at time = (t-1)

First part of equation is constant:

C(a) (mg/m3)	Qw (L/min)	Cw (mg/L)	F (unitless)	K (unitless)	Vd (m3)	ach (min^-1_)	t (min)
0.001141	9.500000	0.000500	1.000000	1.000000	4.100000	0.030000	1.000000

Second part of equation is dependent on C(i) at t-1:

$$Cb = Cs\,(e^{-(K)(ach)(t)})$$

where C(s) = C(i) at (t-1)

	C(b) (mg/m3)	Cs (mg/m3)	K (unitless)	ach (min^-1)	t (min)
0-1 min	0.000000	0.000000	1.000000	0.030000	**1.000000**
1-2 min	0.001108	0.001141	1.000000	0.030000	**1.000000**
2-3 min	0.002182	0.002249	1.000000	0.030000	**1.000000**
3-4 min	0.003226	0.003324	1.000000	0.030000	**1.000000**
4-5 min	0.004238	0.004367	1.000000	0.030000	**1.000000**
5-6 min	0.005220	0.005379	1.000000	0.030000	**1.000000**
6-7 min	0.006174	0.006362	1.000000	0.030000	**1.000000**
7-8 min	0.007099	0.007315	1.000000	0.030000	**1.000000**
8-9 min	0.007996	0.008240	1.000000	0.030000	**1.000000**
9-10 min	0.008868	0.009138	1.000000	0.030000	**1.000000**
10-11 min	0.009713	0.010009	1.000000	0.030000	**1.000000**
11-12 min	**0.010534**	**0.010855**	**1.000000**	**0.030000**	**1.000000**

Third part of equation is dependent on above two.

C(i) = C(a) + C(b)

	C(i) (mg/m3)	C(a) (mg/m3)	C(b) (mg/m3)
0-1 min	0.001141	0.001141	**0.000000**
1-2 min	0.002249	0.001141	**0.001108**
2-3 min	0.003324	0.001141	**0.002182**
3-4 min	0.004367	0.001141	**0.003226**
4-5 min	0.005379	0.001141	**0.004238**
5-6 min	0.006362	0.001141	**0.005220**
6-7 min	0.007315	0.001141	**0.006174**
7-8 min	0.008240	0.001141	**0.007099**
8-9 min	0.009138	0.001141	**0.007996**
9-10 min	0.010009	0.001141	**0.008868**
10-11 min	0.010855	0.001141	**0.009713**
11-12 min	**0.011675**	**0.001141**	**0.010534**

Average Concentration = 6.67E-03 (mg/m3)

MEAD FORMER NOP
CONCENTRATION IN
SHOWER OF VOLATILE
CHEMICALS IN
GROUNDWATER - INHALATION DCE MW-40B RME Conc.
(CHEMICAL NOT DETECTED IN MW-40B, CALCULATED VALUE BASED ON HALF DETECTION LIMIT)

Assumptions

Water flow rate (Qw) = 9.5 L/min (approx. 2.5 gal/min)
Volume of shower (Vd) = 4.1 m3 (approx 3 ft x 6ft x 8ft)
Fraction volatilized (F) = 100%
Air change rate of room (ach) = 0.03/min (approx 2 changes per hour)
Mixing factor (K) = 1
Time (t) = one minute time intervals

$$C(i) = [(Qw \times Cw \times F) / (K \times Vd \times ach)](1-e^{-(K)(ach)(t)}) + Cs(e^{-(K)(ach)(t)})$$

|----------C(a)----------| ----C(b)----|

C(i) = Indoor Air Concentration
S = Emission Rate (= Qw x Cw x F)
K = Mixing Rate
V = Volume of room
Q = Air flow rate in and out of room
t = time interval
C(s) = C(i) at time = (t-1)

First part of equation is constant:

C(a) (mg/m3)	Qw (L/min)	Cw (mg/L)	F (unitless)	K (unitless)	Vd (m3)	ach (min^-1_)	t (min)
0.194026	9.500000	0.085000	1.000000	1.000000	4.100000	0.030000	1.000000

Second part of equation is dependent on C(i) at t-1:

$$Cb = Cs(e^{-(K)(ach)(t)})$$

where C(s) = C(i) at (t-1)

	C(b) (mg/m3)	Cs (mg/m3)	K (unitless)	ach (min^-1)	t (min)
0-1 min	0.000000	0.000000	1.000000	0.030000	**1.000000**
1-2 min	0.188292	0.194026	1.000000	0.030000	**1.000000**
2-3 min	0.371019	0.382318	1.000000	0.030000	**1.000000**
3-4 min	0.548346	0.565045	1.000000	0.030000	**1.000000**
4-5 min	0.720432	0.742372	1.000000	0.030000	**1.000000**
5-6 min	0.887431	0.914458	1.000000	0.030000	**1.000000**
6-7 min	1.049496	1.081458	1.000000	0.030000	**1.000000**
7-8 min	1.206770	1.243522	1.000000	0.030000	**1.000000**
8-9 min	1.359397	1.400797	1.000000	0.030000	**1.000000**
9-10 min	1.507513	1.553423	1.000000	0.030000	**1.000000**
10-11 min	1.651251	1.701539	1.000000	0.030000	**1.000000**
11-12 min	**1.790741**	**1.845277**	**1.000000**	**0.030000**	**1.000000**

Third part of equation is dependent on above two:

C(i) = C(a) + C(b)

	C(i) (mg/m3)	C(a) (mg/m3)	C(b) (mg/m3)
0-1 min	0.194026	0.194026	**0.000000**
1-2 min	0.382318	0.194026	**0.188292**
2-3 min	0.565045	0.194026	**0.371019**
3-4 min	0.742372	0.194026	**0.548346**
4-5 min	0.914458	0.194026	**0.720432**
5-6 min	1.081458	0.194026	**0.887431**
6-7 min	1.243522	0.194026	**1.049496**
7-8 min	1.400797	0.194026	**1.206770**
8-9 min	1.553423	0.194026	**1.359397**
9-10 min	1.701539	0.194026	**1.507513**
10-11 min	1.845277	0.194026	**1.651251**
11-12 min	**1.984767**	**0.194026**	**1.790741**

Average Concentration = 1.13E+00 (mg/m3)

MEAD FORMER NOP
CONCENTRATION IN
SHOWER OF VOLATILE
CHEMICALS IN
GROUNDWATER - INHALATION Acetone MW-40B RME Conc.

Assumptions:

Water flow rate (Qw) = 9.5 L/min (approx. 2.5 gal/min)
Volume of shower (Vd) = 4.1 m3 (approx 3 ft x 6ft x 8ft)
Fraction volatilized (F) = 100%
Air change rate of room (ach) = 0.03/min (approx 2 changes per hour)
Mixing factor (K) = 1
Time (t) = one minute time intervals

$$C(i) = [(Qw \times Cw \times F) / (K \times Vd \times ach)](1-e^{-(K)(ach)(t)}) + Cs(e^{-(K)(ach)(t)})$$

|----------C(a)----------| ----C(b)----|

C(i) = Indoor Air Concentration
S = Emission Rate (= Qw x Cw x F)
K = Mixing Rate
V = Volume of room
Q = Air flow rate in and out of room
t = time interval
C(s) = C(i) at time = (t-1)

First part of equation is constant:

C(a) (mg/m3)	Qw (L/min)	Cw (mg/L)	F (unitless)	K (unitless)	Vd (m3)	ach (min^-1)	t (min)
0.194026	9.500000	0.085000	1.000000	1.000000	4.100000	0.030000	1.000000

Second part of equation is dependent on C(i) at t-1:

$$Cb = Cs(e^{-(K)(ach)(t)})$$

where C(s) = C(i) at (t-1)

	C(b) (mg/m3)	Cs (mg/m3)	K (unitless)	ach (min^-1)	t (min)
0-1 min	0.000000	0.000000	1.000000	0.030000	**1.000000**
1-2 min	0.188292	0.194026	1.000000	0.030000	**1.000000**
2-3 min	0.371019	0.382318	1.000000	0.030000	**1.000000**
3-4 min	0.548346	0.565045	1.000000	0.030000	**1.000000**
4-5 min	0.720432	0.742372	1.000000	0.030000	**1.000000**
5-6 min	0.887431	0.914458	1.000000	0.030000	**1.000000**
6-7 min	1.049496	1.081458	1.000000	0.030000	**1.000000**
7-8 min	1.206770	1.243522	1.000000	0.030000	**1.000000**
8-9 min	1.359397	1.400797	1.000000	0.030000	**1.000000**
9-10 min	1.507513	1.553423	1.000000	0.030000	**1.000000**
10-11 min	1.651251	1.701539	1.000000	0.030000	**1.000000**
11-12 min	**1.790741**	**1.845277**	**1.000000**	**0.030000**	**1.000000**

Third part of equation is dependent on above two:

C(i) = C(a) + C(b)

	C(i) (mg/m3)	C(a) (mg/m3)	C(b) (mg/m3)
0-1 min	0.194026	0.194026	**0.000000**
1-2 min	0.382318	0.194026	**0.188292**
2-3 min	0.565045	0.194026	**0.371019**
3-4 min	0.742372	0.194026	**0.548346**
4-5 min	0.914458	0.194026	**0.720432**
5-6 min	1.081458	0.194026	**0.887431**
6-7 min	1.243522	0.194026	**1.049496**
7-8 min	1.400797	0.194026	**1.206770**
8-9 min	1.553423	0.194026	**1.359397**
9-10 min	1.701539	0.194026	**1.507513**
10-11 min	1.845277	0.194026	**1.651251**
11-12 min	**1.984767**	**0.194026**	**1.790741**

Average Concentration = 1.13E+00 (mg/m3)

MEAD FORMER NOP
CONCENTRATION IN
SHOWER OF VOLATILE
CHEMICALS IN
GROUNDWATER - INHALATION Methylene Chloride MW-40B RME Conc.

Assumptions:

Water flow rate (Qw) = 9.5 L/min (approx. 2.5 gal/min)
Volume of shower (Vd) = 4.1 m3 (approx 3 ft x 6ft x 8ft)
Fraction volatilized (F) = 100%
Air change rate of room (ach) = 0.03/min (approx 2 changes per hour)
Mixing factor (K) = 1
Time (t) = one minute time intervals

$$C(i) = [(Qw \times Cw \times F) / (K \times Vd \times ach)](1-e^{-(K)(ach)(t)}) + Cs(e^{-(K)(ach)(t)})$$

|----------C(a)----------| ----C(b)----|

C(i) = Indoor Air Concentration
S = Emission Rate (= Qw x Cw x F)
K = Mixing Rate
V = Volume of room
Q = Air flow rate in and out of room
t = time interval
C(s) = C(i) at time = (t-1)

First part of equation is constant:

C(a) (mg/m3)	Qw (L/min)	Cw (mg/L)	F (unitless)	K (unitless)	Vd (m3)	ach (min^-1_)	t (min)
0.098154	9.500000	0.043000	1.000000	1.000000	4.100000	0.030000	1.000000

Second part of equation is dependent on C(i) at t-1:

$$Cb = Cs(e^{-(K)(ach)(t)})$$

where C(s) = C(i) at (t-1)

	C(b) (mg/m3)	Cs (mg/m3)	K (unitless)	ach (min^-1)	t (min)
0-1 min	0.000000	0.000000	1.000000	0.030000	**1.000000**
1-2 min	0.095254	0.098154	1.000000	0.030000	**1.000000**
2-3 min	0.187692	0.193408	1.000000	0.030000	**1.000000**
3-4 min	0.277398	0.285846	1.000000	0.030000	**1.000000**
4-5 min	0.364454	0.375553	1.000000	0.030000	**1.000000**
5-6 min	0.448936	0.462608	1.000000	0.030000	**1.000000**
6-7 min	0.530921	0.547090	1.000000	0.030000	**1.000000**
7-8 min	0.610484	0.629076	1.000000	0.030000	**1.000000**
8-9 min	0.687695	0.708638	1.000000	0.030000	**1.000000**
9-10 min	0.762624	0.785849	1.000000	0.030000	**1.000000**
10-11 min	0.835339	0.860779	1.000000	0.030000	**1.000000**
11-12 min	**0.905904**	**0.933493**	**1.000000**	**0.030000**	**1.000000**

Third part of equation is dependent on above two:

C(i) = C(a) + C(b)

	C(i) (mg/m3)	C(a) (mg/m3)	C(b) (mg/m3)
0-1 min	0.098154	0.098154	**0.000000**
1-2 min	0.193408	0.098154	**0.095254**
2-3 min	0.285846	0.098154	**0.187692**
3-4 min	0.375553	0.098154	**0.277398**
4-5 min	0.462608	0.098154	**0.364454**
5-6 min	0.547090	0.098154	**0.448936**
6-7 min	0.629076	0.098154	**0.530921**
7-8 min	0.708638	0.098154	**0.610484**
8-9 min	0.785849	0.098154	**0.687695**
9-10 min	0.860779	0.098154	**0.762624**
10-11 min	0.933493	0.098154	**0.835339**
11-12 min	**1.004059**	**0.098154**	**0.905904**

Average Concentration = 5.74E-01 (mg/m3)

MEAD FORMER NOP
CONCENTRATION IN
SHOWER OF VOLATILE
CHEMICALS IN
GROUNDWATER - INHALATION Trichloroethene MW-40B RME Conc.

Assumptions

Water flow rate (Qw) = 9 5 L/min (approx 2.5 gal/min)
Volume of shower (Vd) = 4 1 m3 (approx 3 ft x 6ft x 8ft)
Fraction volatilized (F) = 100%
Air change rate of room (ach) = 0 03/min (approx 2 changes per hour)
Mixing factor (K) = 1
Time (t) = one minute time intervals

$$C(i) = [(Qw \times Cw \times F) / (K \times Vd \times ach)]\,(1-e^{-(K)(ach)(t)}) + Cs\,(e^{-(K)(ach)(t)})$$

|----------C(a)----------| -----C(b)-----|

C(i) = Indoor Air Concentration
S = Emission Rate (= Qw x Cw x F)
K = Mixing Rate
V = Volume of room
Q = Air flow rate in and out of room
t = time interval
C(s) = C(i) at time = (t-1)

First part of equation is constant:

C(a) (mg/m3)	Qw (L/min)	Cw (mg/L)	F (unitless)	K (unitless)	Vd (m3)	ach (min^-1_)	t (min)
4.108792	9 500000	1.800000	1.000000	1 000000	4.100000	0.030000	1 000000

Second part of equation is dependent on C(i) at t-1.

$$Cb = Cs\,(e^{-(K)(ach)(t)})$$

where C(s) = C(i) at (t-1)

	C(b) (mg/m3)	Cs (mg/m3)	K (unitless)	ach (min^-1)	t (min)
0-1 min	0 000000	0 000000	1 000000	0.030000	**1.000000**
1-2 min	3 987359	4 108792	1.000000	0.030000	**1.000000**
2-3 min	7 856873	8 096150	1 000000	0 030000	**1.000000**
3-4 min	11 612026	11 965664	1.000000	0 030000	**1.000000**
4-5 min	15 256197	15 720617	1.000000	0 030000	**1.000000**
5-6 min	18 792667	19.364989	1.000000	0 030000	**1.000000**
6-7 min	22 224618	22 901458	1.000000	0 030000	**1.000000**
7-8 min	25.555140	26 333410	1 000000	0 030000	**1.000000**
8-9 min	28.787230	29 663932	1 000000	0.030000	**1.000000**
9-10 min	31 923797	32 896022	1.000000	0 030000	**1.000000**
10-11 min	34 967665	36 032589	1 000000	0 030000	**1.000000**
11-12 min	**37.921573**	**39.076457**	**1.000000**	**0.030000**	**1.000000**

Third part of equation is dependent on above two.

C(i) = C(a) + C(b)

	C(i) (mg/m3)	C(a) (mg/m3)	C(b) (mg/m3)
0-1 min	4 108792	4 108792	**0.000000**
1-2 min	8 096150	4 108792	**3.987359**
2-3 min	11 965664	4 108792	**7.856873**
3-4 min	15 720617	4 108792	**11.612026**
4-5 min	19 364989	4 108792	**15.256197**
5-6 min	22 901458	4 108792	**18.792667**
6-7 min	26 333410	4 108792	**22.224618**
7-8 min	29 663932	4 108792	**25.555140**
8-9 min	32 896022	4 108792	**28.787230**
9-10 min	36 032589	4 108792	**31.923797**
10-11 min	39 076457	4 108792	**34.967665**
11-12 min	**42.030364**	**4.108792**	**37.921573**

Average Concentration = 2 40E+01 (mg/m3)

MEAD FORMER NOP
CONCENTRATION IN
SHOWER OF VOLATILE
CHEMICALS IN
GROUNDWATER - INHALATION 1,1,1-Trichloroethane MW-40B RME Conc.
(CHEMICAL NOT DETECTED IN MW-40B, CALCULATED VALUE BASED ON HALF DETECTION LIMIT)

Assumptions

Water flow rate (Qw) = 9.5 L/min (approx. 2.5 gal/min)
Volume of shower (Vd) = 4.1 m3 (approx 3 ft x 6ft x 8ft)
Fraction volatilized (F) = 100%
Air change rate of room (ach) = 0.03/min (approx 2 changes per hour)
Mixing factor (K) = 1
Time (t) = one minute time intervals

$$C(i) = [(Qw \times Cw \times F) / (K \times Vd \times ach)](1-e^{-(K)(ach)(t)}) + Cs\,(e^{-(K)(ach)(t)})$$

|----------C(a)----------| -----C(b)-----|

C(i) = Indoor Air Concentration
S = Emission Rate (= Qw x Cw x F)
K = Mixing Rate
V = Volume of room
Q = Air flow rate in and out of room
t = time interval
C(s) = C(i) at time = (t-1)

First part of equation is constant:

C(a) (mg/m3)	Qw (L/min)	Cw (mg/L)	F (unitless)	K (unitless)	Vd (m3)	ach (min^-1_)	t (min)
0.194026	9.500000	0.085000	1.000000	1.000000	4.100000	0.030000	1.000000

Second part of equation is dependent on C(i) at t-1.

$$Cb = Cs\,(e^{-(K)(ach)(t)})$$

where C(s) = C(i) at (t-1)

	C(b) (mg/m3)	Cs (mg/m3)	K (unitless)	ach (min^-1)	t (min)
0-1 min	0.000000	0.000000	1.000000	0.030000	**1.000000**
1-2 min	0.188292	0.194026	1.000000	0.030000	**1.000000**
2-3 min	0.371019	0.382318	1.000000	0.030000	**1.000000**
3-4 min	0.548346	0.565045	1.000000	0.030000	**1.000000**
4-5 min	0.720432	0.742372	1.000000	0.030000	**1.000000**
5-6 min	0.887431	0.914458	1.000000	0.030000	**1.000000**
6-7 min	1.049496	1.081458	1.000000	0.030000	**1.000000**
7-8 min	1.206770	1.243522	1.000000	0.030000	**1.000000**
8-9 min	1.359397	1.400797	1.000000	0.030000	**1.000000**
9-10 min	1.507513	1.553423	1.000000	0.030000	**1.000000**
10-11 min	1.651251	1.701539	1.000000	0.030000	**1.000000**
11-12 min	**1.790741**	**1.845277**	**1.000000**	**0.030000**	**1.000000**

Third part of equation is dependent on above two:

C(i) = C(a) + C(b)

	C(i) (mg/m3)	C(a) (mg/m3)	C(b) (mg/m3)
0-1 min	0.194026	0.194026	**0.000000**
1-2 min	0.382318	0.194026	**0.188292**
2-3 min	0.565045	0.194026	**0.371019**
3-4 min	0.742372	0.194026	**0.548346**
4-5 min	0.914458	0.194026	**0.720432**
5-6 min	1.081458	0.194026	**0.887431**
6-7 min	1.243522	0.194026	**1.049496**
7-8 min	1.400797	0.194026	**1.206770**
8-9 min	1.553423	0.194026	**1.359397**
9-10 min	1.701539	0.194026	**1.507513**
10-11 min	1.845277	0.194026	**1.651251**
11-12 min	**1.984767**	**0.194026**	**1.790741**

Average Concentration 1.13E+00 (mg/m3)

MEAD FORMER NOP
CONCENTRATION IN
SHOWER OF VOLATILE
CHEMICALS IN
GROUNDWATER - INHALATION 1,2-Dichloropropane MW-40B RME Conc.
(CHEMICAL NOT DETECTED IN MW-40B, CALCULATED VALUE BASED ON HALF DETECTION LIMIT)

Assumptions:

Water flow rate (Qw) = 9 5 L/min (approx 2 5 gal/min)
Volume of shower (Vd) = 4 1 m3 (approx 3 ft x 6ft x 8ft)
Fraction volatilized (F) = 100%
Air change rate of room (ach) = 0.03/min (approx 2 changes per hour)
Mixing factor (K) = 1
Time (t) = one minute time intervals

$$C(i) = [(Qw \times Cw \times F) / (K \times Vd \times ach)](1-e^{-(K)(ach)(t)}) + Cs(e^{-(K)(ach)(t)})$$

|----------C(a)----------| ----C(b)----|

C(i) = Indoor Air Concentration
S = Emission Rate (= Qw x Cw x F)
K = Mixing Rate
V = Volume of room
Q = Air flow rate in and out of room
t = time interval
C(s) = C(i) at time = (t-1)

First part of equation is constant:

C(a) (mg/m3)	Qw (L/min)	Cw (mg/L)	F (unitless)	K (unitless)	Vd (m3)	ach (min^-1_)	t (min)
0.194026	9 500000	0 085000	1.000000	1.000000	4.100000	0 030000	1.000000

Second part of equation is dependent on C(i) at t-1:

$$Cb = Cs(e^{-(K)(ach)(t)})$$

where C(s) = C(i) at (t-1)

	C(b) (mg/m3)	Cs (mg/m3)	K (unitless)	ach (min^-1)	t (min)
0-1 min	0 000000	0.000000	1.000000	0 030000	**1.000000**
1-2 min	0 188292	0 194026	1.000000	0.030000	**1.000000**
2-3 min	0 371019	0 382318	1 000000	0.030000	**1.000000**
3-4 min	0 548346	0 565045	1 000000	0.030000	**1.000000**
4-5 min	0 720432	0 742372	1 000000	0 030000	**1.000000**
5-6 min	0 887431	0 914458	1 000000	0 030000	**1.000000**
6-7 min	1 049496	1 081458	1.000000	0.030000	**1.000000**
7-8 min	1 206770	1 243522	1.000000	0.030000	**1.000000**
8-9 min	1 359397	1.400797	1 000000	0.030000	**1.000000**
9-10 min	1 507513	1 553423	1 000000	0.030000	**1.000000**
10-11 min	1.651251	1 701539	1 000000	0.030000	**1.000000**
11-12 min	**1.790741**	**1.845277**	**1.000000**	**0.030000**	**1.000000**

Third part of equation is dependent on above two.

C(i) = C(a) + C(b)

	C(i) (mg/m3)	C(a) (mg/m3)	C(b) (mg/m3)
0-1 min	0 194026	0 194026	**0.000000**
1-2 min	0 382318	0 194026	**0.188292**
2-3 min	0 565045	0 194026	**0.371019**
3-4 min	0 742372	0 194026	**0.548346**
4-5 min	0 914458	0 194026	**0.720432**
5-6 min	1.081458	0 194026	**0.887431**
6-7 min	1.243522	0 194026	**1.049496**
7-8 min	1 400797	0 194026	**1.206770**
8-9 min	1 553423	0 194026	**1.359397**
9-10 min	1 701539	0 194026	**1.507513**
10-11 min	1 845277	0 194026	**1.651251**
11-12 min	**1.984767**	**0.194026**	**1.790741**

Average Concentration = 1 13E+00 (mg/m3)

MEAD FORMER NOP
CONCENTRATION IN
SHOWER OF VOLATILE
CHEMICALS IN
GROUNDWATER - INHALATION Tetrachloroethene MW-40B RME Conc.
(CHEMICAL NOT DETECTED IN MW-40B, CALCULATED VALUE BASED ON HALF DETECTION LIMIT)

Assumptions:

Water flow rate (Qw) = 9.5 L/min (approx. 2.5 gal/min)
Volume of shower (Vd) = 4.1 m3 (approx 3 ft x 6ft x 8ft)
Fraction volatilized (F) = 100%
Air change rate of room (ach) = 0.03/min (approx 2 changes per hour)
Mixing factor (K) = 1
Time (t) = one minute time intervals

$$C(i) = [(Qw \times Cw \times F) / (K \times Vd \times ach)](1-e^{-(K)(ach)(t)}) + Cs\,(e^{-(K)(ach)(t)})$$

|----------C(a)----------| ----C(b)----|

C(i) = Indoor Air Concentration
S = Emission Rate (= Qw x Cw x F)
K = Mixing Rate
V = Volume of room
Q = Air flow rate in and out of room
t = time interval
C(s) = C(i) at time = (t-1)

First part of equation is constant:

C(a) (mg/m3)	Qw (L/min)	Cw (mg/L)	F (unitless)	K (unitless)	Vd (m3)	ach (min^-1_)	t (min)
0.194026	9.500000	0.085000	1.000000	1.000000	4.100000	0.030000	1.000000

Second part of equation is dependent on C(i) at t-1:

$$Cb = Cs\,(e^{-(K)(ach)(t)})$$

where C(s) = C(i) at (t-1)

	C(b) (mg/m3)	Cs (mg/m3)	K (unitless)	ach (min^-1)	t (min)
0-1 min	0.000000	0.000000	1.000000	0.030000	1.000000
1-2 min	0.188292	0.194026	1.000000	0.030000	1.000000
2-3 min	0.371019	0.382318	1.000000	0.030000	1.000000
3-4 min	0.548346	0.565045	1.000000	0.030000	1.000000
4-5 min	0.720432	0.742372	1.000000	0.030000	1.000000
5-6 min	0.887431	0.914458	1.000000	0.030000	1.000000
6-7 min	1.049496	1.081458	1.000000	0.030000	1.000000
7-8 min	1.206770	1.243522	1.000000	0.030000	1.000000
8-9 min	1.359397	1.400797	1.000000	0.030000	1.000000
9-10 min	1.507513	1.553423	1.000000	0.030000	1.000000
10-11 min	1.651251	1.701539	1.000000	0.030000	1.000000
11-12 min	1.790741	1.845277	1.000000	0.030000	1.000000

Third part of equation is dependent on above two:

C(i) = C(a) + C(b)

	C(i) (mg/m3)	C(a) (mg/m3)	C(b) (mg/m3)
0-1 min	0.194026	0.194026	0.000000
1-2 min	0.382318	0.194026	0.188292
2-3 min	0.565045	0.194026	0.371019
3-4 min	0.742372	0.194026	0.548346
4-5 min	0.914458	0.194026	0.720432
5-6 min	1.081458	0.194026	0.887431
6-7 min	1.243522	0.194026	1.049496
7-8 min	1.400797	0.194026	1.206770
8-9 min	1.553423	0.194026	1.359397
9-10 min	1.701539	0.194026	1.507513
10-11 min	1.845277	0.194026	1.651251
11-12 min	1.984767	0.194026	1.790741

Average Concentration = 1.13E+00 (mg/m3)

MEAD FORMER NOP
CONCENTRATION IN
SHOWER OF VOLATILE
CHEMICALS IN
GROUNDWATER - INHALATION Chloroform MW-40B RME Conc.
(CHEMICAL NOT DETECTED IN MW-40B, CALCULATED VALUE BASED ON HALF DETECTION LIMIT)

Assumptions

Water flow rate (Qw) = 9 5 L/min (approx. 2.5 gal/min)
Volume of shower (Vd) = 4 1 m3 (approx 3 ft x 6ft x 8ft)
Fraction volatilized (F) = 100%
Air change rate of room (ach) = 0.03/min (approx 2 changes per hour)
Mixing factor (K) = 1
Time (t) = one minute time intervals

$$C(i) = [(Qw \times Cw \times F) / (K \times Vd \times ach)](1-e^{-(K)(ach)(t)}) + Cs(e^{-(K)(ach)(t)})$$

|----------C(a)----------| ----C(b)----|

C(i) = Indoor Air Concentration
S = Emission Rate (= Qw x Cw x F)
K = Mixing Rate
V = Volume of room
Q = Air flow rate in and out of room
t = time interval
C(s) = C(i) at time = (t-1)

First part of equation is constant

C(a) (mg/m3)	Qw (L/min)	Cw (mg/L)	F (unitless)	K (unitless)	Vd (m3)	ach (min^-1_)	t (min)
0.194026	9.500000	0.085000	1.000000	1.000000	4.100000	0 030000	1 000000

Second part of equation is dependent on C(i) at t-1

$$Cb = Cs(e^{-(K)(ach)(t)})$$

where C(s) = C(i) at (t-1)

	C(b) (mg/m3)	Cs (mg/m3)	K (unitless)	ach (min^-1)	t (min)
0-1 min	0 000000	0.000000	1 000000	0 030000	**1.000000**
1-2 min	0 188292	0 194026	1 000000	0 030000	**1.000000**
2-3 min	0 371019	0 382318	1.000000	0 030000	**1.000000**
3-4 min	0.548346	0.565045	1 000000	0.030000	**1.000000**
4-5 min	0 720432	0 742372	1 000000	0 030000	**1.000000**
5-6 min	0 887431	0 914458	1.000000	0.030000	**1.000000**
6-7 min	1 049496	1.081458	1 000000	0.030000	**1.000000**
7-8 min	1 206770	1 243522	1 000000	0 030000	**1.000000**
8-9 min	1.359397	1 400797	1 000000	0.030000	**1.000000**
9-10 min	1 507513	1 553423	1 000000	0 030000	**1.000000**
10-11 min	1 651251	1.701539	1 000000	0.030000	**1.000000**
11-12 min	**1.790741**	**1.845277**	**1.000000**	**0.030000**	**1.000000**

Third part of equation is dependent on above two:

C(i) = C(a) + C(b)

	C(i) (mg/m3)	C(a) (mg/m3)	C(b) (mg/m3)
0-1 min	0 194026	0 194026	**0.000000**
1-2 min	0 382318	0 194026	**0.188292**
2-3 min	0 565045	0 194026	**0.371019**
3-4 min	0 742372	0 194026	**0.548346**
4-5 min	0 914458	0 194026	**0.720432**
5-6 min	1 081458	0 194026	**0.887431**
6-7 min	1 243522	0 194026	**1.049496**
7-8 min	1 400797	0 194026	**1.206770**
8-9 min	1 553423	0 194026	**1.359397**
9-10 min	1 701539	0 194026	**1.507513**
10-11 min	1 845277	0 194026	**1.651251**
11-12 min	**1.984767**	**0.194026**	**1.790741**

Average Concentration = 1 13E+00 (mg/m3)

G

APPENDIX G
CHEMICAL DATA

CHEMICAL DATA
WELL MW-47A
(all in µg/L)

Chemical Group	Chemical Name	POS RESULT	D.L	QUAL.	POS. RES. OR 1/2 ND
PEST	4,4'-DDD		0.1	U	0.05
PEST	4,4'-DDE		0.1	U	0.05
PEST	4,4'-DDT		0.1	U	0.05
PEST	Aldrin		0.05	U	0.025
PEST	Alpha chlordane		0.05	U	0.025
PEST	Alpha-BHC		0.05	U	0.025
PEST	Beta-BHC		0.05	U	0.025
PEST	Delta-BHC		0.05	U	0.025
PEST	Dieldrin		0.1	U	0.05
PEST	Endosulfan I		0.05	U	0.025
PEST	Endosulfan II		0.1	U	0.05
PEST	Endosulfan sulfate		0.1	U	0.05
PEST	Endrin		0.1	U	0.05
PEST	Endrin aldehyde		0.1	U	0.05
PEST	Endrin ketone		0.1	U	0.05
PEST	Gamma chlordane		0.05	U	0.025
PEST	Gamma-BHC (Lindane)		0.05	U	0.025
PEST	Heptachlor		0.05	U	0.025
PEST	Heptachlor epoxide		0.05	U	0.025
PEST	p,p'-Methoxychlor		0.5	U	0.25
PEST	PCB-1016		1	U	0.5
PEST	PCB-1221		2	U	1
PEST	PCB-1232		1	U	0.5
PEST	PCB-1242		1	U	0.5
PEST	PCB-1248		1	U	0.5
PEST	PCB-1254		1	U	0.5
PEST	PCB-1260		1	U	0.5
PEST	Toxaphene		5	U	2.5
EXPL	1,3,5-Trinitrobenzene (TNB)		0.25	U	0.125
EXPL	1,3-Dinitrobenzene (DNB)		0.25	U	0.125
EXPL	2,4,6-Trinitrotoluene (TNT)		0.25	U	0.125
EXPL	2,4-Dinitrotoluene (24DNT)		0.25	U	0.125
EXPL	2,6-Dinitrotoluene (26DNT)		0.5	U	0.25
EXPL	2-Nitrotoluene (2NT)		0.5	U	0.25
EXPL	3-Nitrotoluene (3NT)		0.5	U	0.25
EXPL	4-Nitrotoluene (4NT)		0.5	U	0.25
EXPL	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)		0.15	U	0.075
EXPL	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)		0.5	U	0.25
EXPL	Nitrobenzene (NB)		0.25	U	0.125

CHEMICAL DATA
WELL MW-47A
(all in µg/L)

Chemical Group	Chemical Name	POS RESULT	D.L	QUAL.	POS. RES. OR 1/2 ND
EXPL	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)		0.25	U	0.125
SVOC	1,2,4-Trichlorobenzene		10	U	5
SVOC	1,2-Dichlorobenzene		10	U	5
SVOC	1,3-Dichlorobenzene		10	U	5
SVOC	1,4-Dichlorobenzene		10	U	5
SVOC	2,2'-Oxybis(1-chloropropane)		10	U	5
SVOC	2,4,5-Trichlorophenol		25	U	12.5
SVOC	2,4,6-Trichlorophenol		10	U	5
SVOC	2,4-Dichlorophenol		10	U	5
SVOC	2,4-Dimethylphenol		10	U	5
SVOC	2,4-Dinitrophenol		25	U	12.5
SVOC	2,4-Dinitrotoluene (24DNT)		10	U	5
SVOC	2,6-Dinitrotoluene (26DNT)			NA	0
SVOC	2-Chloronaphthalene		10	U	5
SVOC	2-Chlorophenol		10	U	5
SVOC	2-Methylnaphthalene		10	U	5
SVOC	2-Methylphenol		10	U	5
SVOC	2-Nitroaniline		25	U	12.5
SVOC	2-Nitrophenol		10	U	5
SVOC	3,3'-Dichlorobenzidine		10	U	5
SVOC	3-Nitroaniline		25	U	12.5
SVOC	4,6-Dinitro-2-methylphenol		25	U	12.5
SVOC	4-Bromophenyl phenyl ether		10	U	5
SVOC	4-Chloro-3-methylphenol		10	U	5
SVOC	4-Chloroaniline		10	U	5
SVOC	4-Chlorophenyl phenyl ether		10	U	5
SVOC	4-Methylphenol		10	U	5
SVOC	4-Nitroaniline		25	U	12.5
SVOC	4-Nitrophenol		25	U	12.5
SVOC	Acenaphthene		10	U	5
SVOC	Acenaphthylene		10	U	5
SVOC	Anthracene		10	U	5
SVOC	Benzo(a)anthracene		10	U	5
SVOC	Benzo(a)pyrene		10	U	5
SVOC	Benzo(b)fluoranthene		10	U	5
SVOC	Benzo(g,h,i)perylene		10	U	5
SVOC	Benzo(k)fluoranthene		10	U	5
SVOC	bis(2-Chloroethoxy)methane		10	U	5
SVOC	bis(2-Chloroethyl)ether		10	U	5

CHEMICAL DATA
WELL MW-47A
(all in µg/L)

Chemical Group	Chemical Name	POS RESULT	D.L	QUAL.	POS. RES. OR 1/2 ND
SVOC	bis(2-Ethylhexyl)phthalate	3		BJ	3
SVOC	Butyl benzyl phthalate		10	U	5
SVOC	Carbazole		10	U	5
SVOC	Chrysene		10	U	5
SVOC	Di-n-butyl phthalate		10	U	5
SVOC	Di-n-octyl phthalate		10	U	5
SVOC	Dibenzo(a,h)anthracene		10	U	5
SVOC	Dibenzofuran		10	U	5
SVOC	Diethyl phthalate		10	U	5
SVOC	Dimethyl phthalate		10	U	5
SVOC	Fluoranthene		10	U	5
SVOC	Fluorene		10	U	5
SVOC	Hexachlorobenzene		10	U	5
SVOC	Hexachlorobutadiene		10	U	5
SVOC	Hexachlorocyclopentadiene		10	U	5
SVOC	Hexachloroethane		10	U	5
SVOC	Indeno(1,2,3-cd)pyrene		10	U	5
SVOC	Isophorone		10	U	5
SVOC	N-Nitroso-di-n-propylamine		10	U	5
SVOC	N-Nitrosodiphenylamine(1)		10	U	5
SVOC	Naphthalene		10	U	5
SVOC	Nitrobenzene (NB)		10	U	5
SVOC	Pentachlorophenol		25	U	12.5
SVOC	Phenanthrene		10	U	5
SVOC	Phenol		10	U	5
SVOC	Pyrene		10	U	5
VOC	1,1,1-Trichloroethane		1	U	0.5
VOC	1,1,2,2-Tetrachloroethane		1	U	0.5
VOC	1,1,2-Trichloroethane		1	U	0.5
VOC	1,1-Dichloroethane		1	U	0.5
VOC	1,1-Dichloroethene		1	U	0.5
VOC	1,2-Dibromo-3-chloropropane (DBCP)		1	U	0.5
VOC	1,2-Dibromoethane (Ethylene dibromide)		1	U	0.5
VOC	1,2-Dichlorobenzene		1	U	0.5
VOC	1,2-Dichloroethane		1	U	0.5
VOC	1,2-Dichloroethene(Total)			NA	0
VOC	1,2-Dichloropropane		1	U	0.5
VOC	1,3-Dichlorobenzene		1	U	0.5
VOC	1,4-Dichlorobenzene		1	U	0.5

CHEMICAL DATA
WELL MW-47A
(all in µg/L)

Chemical Group	Chemical Name	POS RESULT	D.L	QUAL.	POS. RES. OR 1/2 ND
VOC	2-Butanone		5	U	2.5
VOC	2-Hexanone		5	U	2.5
VOC	4-Methyl-2-pentanone		5	U	2.5
VOC	Acetone		5	U	2.5
VOC	Benzene		1	U	0.5
VOC	Bromochloromethane		1	U	0.5
VOC	Bromodichloromethane		1	U	0.5
VOC	Bromoform		1	U	0.5
VOC	Bromomethane		1	U	0.5
VOC	Carbon disulfide		1	U	0.5
VOC	Carbon tetrachloride		1	U	0.5
VOC	Chlorobenzene		1	U	0.5
VOC	Chloroethane		1	U	0.5
VOC	Chloroform		1	U	0.5
VOC	Chloromethane		1	U	0.5
VOC	Cis-1,2-Dichloroethene		1	U	0.5
VOC	Cis-1,3-Dichloropropene		1	U	0.5
VOC	Dibromochloromethane		1	U	0.5
VOC	Ethylbenzene		1	U	0.5
VOC	Methylene chloride		2	U	1
VOC	Styrene		1	U	0.5
VOC	Tetrachloroethene		1	U	0.5
VOC	Toluene		1	U	0.5
VOC	Trans-1,2-Dichloroethene		1	U	0.5
VOC	Trans-1,3-Dichloropropene		1	U	0.5
VOC	Trichloroethene		1	U	0.5
VOC	Vinyl chloride		1	U	0.5
VOC	Xylenes (Total)		1	U	0.5
DMET	Aluminum	64.5		B	64.5
DMET	Antimony		39	U	19.5
DMET	Arsenic	15.7			15.7
DMET	Barium	134		B	134
DMET	Beryllium		1	U	0.5
DMET	Cadmium		5	U	2.5
DMET	Calcium	81000			81000
DMET	Chromium		6	U	3
DMET	Cobalt		6	U	3
DMET	Copper		4	U	2
DMET	Iron	1280			1280

CHEMICAL DATA
WELL MW-47A
(all in µg/L)

Chemical Group	Chemical Name	POS RESULT	D.L	QUAL.	POS. RES. OR 1/2 ND
DMET	Lead		2	UWN	1
DMET	Magnesium	14900			14900
DMET	Manganese	428			428
DMET	Mercury		0.2	UN	0.1
DMET	Nickel		10	U	5
DMET	Potassium	11200			11200
DMET	Selenium		4	UW	2
DMET	Silver		6	U	3
DMET	Sodium	48200			48200
DMET	Thallium		2	UWN	1
DMET	Vanadium		5	U	2.5
DMET	Zinc	6.4		B	6.4
TMET	Aluminum	168		B*	168
TMET	Antimony		39	U	19.5
TMET	Arsenic	15.5			15.5
TMET	Barium	127		B	127
TMET	Beryllium		1	U	0.5
TMET	Cadmium		5	U	2.5
TMET	Calcium	78900			78900
TMET	Chromium		6	U	3
TMET	Cobalt		6	U	3
TMET	Copper		4	U	2
TMET	Cyanide		10	U	5
TMET	Iron	1310		*	1310
TMET	Lead		2	UW	1
TMET	Magnesium	14500			14500
TMET	Manganese	416			416
TMET	Mercury		0.2	U	0.1
TMET	Nickel		10	U	5
TMET	Potassium	10900			10900
TMET	Selenium		4	UWN	2
TMET	Silver		6	U	3
TMET	Sodium	46700		E	46700
TMET	Thallium		2	UW	1
TMET	Vanadium		5	U	2.5
TMET	Zinc	4.9		B	4.9

CHEMICAL DATA
WELL MW-47B
(all in µg/L)

Chemical Group	Chemical Name	POS RESULT	D.L	QUAL.	POS. RES. OR 1/2 ND
PEST	4,4'-DDD		0.1	U	0.05
PEST	4,4'-DDE		0.1	U	0.05
PEST	4,4'-DDT		0.1	U	0.05
PEST	Aldrin		0.05	U	0.025
PEST	Alpha chlordane		0.05	U	0.025
PEST	Alpha-BHC		0.05	U	0.025
PEST	Beta-BHC		0.05	U	0.025
PEST	Delta-BHC		0.05	U	0.025
PEST	Dieldrin		0.1	U	0.05
PEST	Endosulfan I		0.05	U	0.025
PEST	Endosulfan II		0.1	U	0.05
PEST	Endosulfan sulfate		0.1	U	0.05
PEST	Endrin		0.1	U	0.05
PEST	Endrin aldehyde		0.1	U	0.05
PEST	Endrin ketone		0.1	U	0.05
PEST	Gamma chlordane		0.05	U	0.025
PEST	Gamma-BHC (Lindane)		0.05	U	0.
PEST	Heptachlor		0.05	U	0.0
PEST	Heptachlor epoxide		0.05	U	0.025
PEST	p,p'-Methoxychlor		0.5	U	0.25
PEST	PCB-1016		1	U	0.5
PEST	PCB-1221		2	U	1
PEST	PCB-1232		1	U	0.5
PEST	PCB-1242		1	U	0.5
PEST	PCB-1248		1	U	0.5
PEST	PCB-1254		1	U	0.5
PEST	PCB-1260		1	U	0.5
PEST	Toxaphene		5	U	2.5
EXPL	1,3,5-Trinitrobenzene (TNB)		0.25	U	0.125
EXPL	1,3-Dinitrobenzene (DNB)		0.25	U	0.125
EXPL	2,4,6-Trinitrotoluene (TNT)		0.25	U	0.125
EXPL	2,4-Dinitrotoluene (24DNT)		0.25	U	0.125
EXPL	2,6-Dinitrotoluene (26DNT)		0.5	U	0.25
EXPL	2-Nitrotoluene (2NT)		0.5	U	0.25
EXPL	3-Nitrotoluene (3NT)		0.5	U	0.25
EXPL	4-Nitrotoluene (4NT)		0.5	U	0.25
EXPL	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)		0.15	U	0.075
EXPL	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)		0.5	U	0.
EXPL	Nitrobenzene (NB)		0.25	U	0.1

CHEMICAL DATA
WELL MW-47B
(all in µg/L)

Chemical Group	Chemical Name	POS RESULT	D.L	QUAL.	POS. RES. OR 1/2 ND
EXPL	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)		0.25	U	0.125
SVOC	1,2,4-Trichlorobenzene		10	U	5
SVOC	1,2-Dichlorobenzene		10	U	5
SVOC	1,3-Dichlorobenzene		10	U	5
SVOC	1,4-Dichlorobenzene		10	U	5
SVOC	2,2'-Oxybis(1-chloropropane)		10	U	5
SVOC	2,4,5-Trichlorophenol		25	U	12.5
SVOC	2,4,6-Trichlorophenol		10	U	5
SVOC	2,4-Dichlorophenol		10	U	5
SVOC	2,4-Dimethylphenol		10	U	5
SVOC	2,4-Dinitrophenol		25	U	12.5
SVOC	2,4-Dinitrotoluene (24DNT)		10	U	5
SVOC	2,6-Dinitrotoluene (26DNT)			NA	0
SVOC	2-Chloronaphthalene		10	U	5
SVOC	2-Chlorophenol		10	U	5
SVOC	2-Methylnaphthalene		10	U	5
SVOC	2-Methylphenol		10	U	5
SVOC	2-Nitroaniline		25	U	12.5
SVOC	2-Nitrophenol		10	U	5
SVOC	3,3'-Dichlorobenzidine		10	U	5
SVOC	3-Nitroaniline		25	U	12.5
SVOC	4,6-Dinitro-2-methylphenol		25	U	12.5
SVOC	4-Bromophenyl phenyl ether		10	U	5
SVOC	4-Chloro-3-methylphenol		10	U	5
SVOC	4-Chloroaniline		10	U	5
SVOC	4-Chlorophenyl phenyl ether		10	U	5
SVOC	4-Methylphenol		10	U	5
SVOC	4-Nitroaniline		25	U	12.5
SVOC	4-Nitrophenol		25	U	12.5
SVOC	Acenaphthene		10	U	5
SVOC	Acenaphthylene		10	U	5
SVOC	Anthracene		10	U	5
SVOC	Benzo(a)anthracene		10	U	5
SVOC	Benzo(a)pyrene		10	U	5
SVOC	Benzo(b)fluoranthene		10	U	5
SVOC	Benzo(g,h,i)perylene		10	U	5
SVOC	Benzo(k)fluoranthene		10	U	5
SVOC	bis(2-Chloroethoxy)methane		10	U	5
SVOC	bis(2-Chloroethyl)ether		10	U	5

CHEMICAL DATA
WELL MW-47B
(all in µg/L)

Chemical Group	Chemical Name	POS RESULT	D.L	QUAL.	POS. RES. OR 1/2 ND
SVOC	bis(2-Ethylhexyl)phthalate	15		B	15
SVOC	Butyl benzyl phthalate		10	U	5
SVOC	Carbazole		10	U	5
SVOC	Chrysene		10	U	5
SVOC	Di-n-butyl phthalate	1		J	1
SVOC	Di-n-octyl phthalate		10	U	5
SVOC	Dibenzo(a,h)anthracene		10	U	5
SVOC	Dibenzofuran		10	U	5
SVOC	Diethyl phthalate	2		BJ	2
SVOC	Dimethyl phthalate		10	U	5
SVOC	Fluoranthene		10	U	5
SVOC	Fluorene		10	U	5
SVOC	Hexachlorobenzene		10	U	5
SVOC	Hexachlorobutadiene		10	U	5
SVOC	Hexachlorocyclopentadiene		10	U	5
SVOC	Hexachloroethane		10	U	5
SVOC	Indeno(1,2,3-cd)pyrene		10	U	[illegible]
SVOC	Isophorone		10	U	[illegible]
SVOC	N-Nitroso-di-n-propylamine		10	U	5
SVOC	N-Nitrosodiphenylamine(1)		10	U	5
SVOC	Naphthalene		10	U	5
SVOC	Nitrobenzene (NB)		10	U	5
SVOC	Pentachlorophenol		25	U	12.5
SVOC	Phenanthrene		10	U	5
SVOC	Phenol	3		J	3
SVOC	Pyrene		10	U	5
VOC	1,1,1-Trichloroethane		1	U	0.5
VOC	1,1,2,2-Tetrachloroethane		1	U	0.5
VOC	1,1,2-Trichloroethane		1	U	0.5
VOC	1,1-Dichloroethane		1	U	0.5
VOC	1,1-Dichloroethene		1	U	0.5
VOC	1,2-Dibromo-3-chloropropane (DBCP)		1	U	0.5
VOC	1,2-Dibromoethane (Ethylene dibromide)		1	U	0.5
VOC	1,2-Dichlorobenzene		1	U	0.5
VOC	1,2-Dichloroethane		1	U	0.5
VOC	1,2-Dichloroethene(Total)			NA	0
VOC	1,2-Dichloropropane		1	U	0.5
VOC	1,3-Dichlorobenzene		1	U	0.5
VOC	1,4-Dichlorobenzene		1	U	0.[illegible]

CHEMICAL DATA
WELL MW-47B
(all in µg/L)

Chemical Group	Chemical Name	POS RESULT	D.L	QUAL.	POS. RES. OR 1/2 ND
VOC	2-Butanone		5	U	2.5
VOC	2-Hexanone		5	U	2.5
VOC	4-Methyl-2-pentanone		5	U	2.5
VOC	Acetone		5	U	2.5
VOC	Benzene		1	U	0.5
VOC	Bromochloromethane		1	U	0.5
VOC	Bromodichloromethane		1	U	0.5
VOC	Bromoform		1	U	0.5
VOC	Bromomethane		1	U	0.5
VOC	Carbon disulfide		1	U	0.5
VOC	Carbon tetrachloride		1	U	0.5
VOC	Chlorobenzene		1	U	0.5
VOC	Chloroethane		1	U	0.5
VOC	Chloroform		1	U	0.5
VOC	Chloromethane		1	U	0.5
VOC	Cis-1,2-Dichloroethene		1	U	0.5
VOC	Cis-1,3-Dichloropropene		1	U	0.5
VOC	Dibromochloromethane		1	U	0.5
VOC	Ethylbenzene		1	U	0.5
VOC	Methylene chloride	0.8		BJ	0.8
VOC	Styrene		1	U	0.5
VOC	Tetrachloroethene		1	U	0.5
VOC	Toluene		1	U	0.5
VOC	Trans-1,2-Dichloroethene		1	U	0.5
VOC	Trans-1,3-Dichloropropene		1	U	0.5
VOC	Trichloroethene		1	U	0.5
VOC	Vinyl chloride		1	U	0.5
VOC	Xylenes (Total)		1	U	0.5
DMET	Aluminum	45.5		B	45.5
DMET	Antimony		39	U	19.5
DMET	Arsenic	15		S	15
DMET	Barium	147		B	147
DMET	Beryllium		1	U	0.5
DMET	Cadmium		5	U	2.5
DMET	Calcium	89700			89700
DMET	Chromium		6	U	3
DMET	Cobalt		6	U	3
DMET	Copper		4	U	2
DMET	Iron	1770			1770

CHEMICAL DATA
WELL MW-47B
(all in µg/L)

Chemical Group	Chemical Name	POS RESULT	D.L	QUAL.	POS RES. OR [illegible] ND
DMET	Lead		2	UWN	1
DMET	Magnesium	17300			17300
DMET	Manganese	391			391
DMET	Mercury		0.2	UN	0.1
DMET	Nickel		10	U	5
DMET	Potassium	10900			10900
DMET	Selenium		4	UW	2
DMET	Silver		6	U	3
DMET	Sodium	24400			24400
DMET	Thallium		2	UWN	1
DMET	Vanadium		5	U	2.5
DMET	Zinc	7.1		B	7.1
TMET	Aluminum	416		*	416
TMET	Antimony		39	U	19.5
TMET	Arsenic	18			18
TMET	Barium	140		B	140
TMET	Beryllium		1	U	0
TMET	Cadmium		5	U	2.
TMET	Calcium	85200			85200
TMET	Chromium		6	U	3
TMET	Cobalt		6	U	3
TMET	Copper		4	U	2
TMET	Cyanide		10	U	5
TMET	Iron	1840		*	1840
TMET	Lead		2	UW	1
TMET	Magnesium	16400			16400
TMET	Manganese	373			373
TMET	Mercury		0.2	U	0.1
TMET	Nickel		10	U	5
TMET	Potassium	10400			10400
TMET	Selenium		20	UWN	10
TMET	Silver		6	U	3
TMET	Sodium	23500		E	23500
TMET	Thallium		2	U	1
TMET	Vanadium		5	U	2.5
TMET	Zinc	4.3		B	4.3

CHEMICAL DATA
WELL MW-5B
(all in µg/L)

Chemical Name	POS RESULT	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND
1,3,5-Trinitrobenzene (TNB)	2				2
1,3-Dinitrobenzene (DNB)		0.25	ND	U	0.125
2,4,6-Trinitrotoluene (TNT)	20				20
2,4-Dinitrotoluene (24DNT)	0.97				0.97
2,6-Dinitrotoluene (26DNT)		0.5	ND	U	0.25
2-Nitrotoluene (2NT)		0.5	ND	U	0.25
3-Nitrotoluene (3NT)		0.5	ND	U	0.25
4-Nitrotoluene (4NT)		0.5	ND	U	0.25
Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	98				98
Methyl-2,4,6-trinitrophenylnitramine (Tetryl)		0.5	ND	U	0.25
Nitrobenzene (NB)		0.3	ND	U	0.125
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	45				45
1,1,1-Trichloroethane		1	ND	U	0.5
1,1,2,2-Tetrachloroethane		1	ND	U	0.5
1,1,2-Trichloroethane		1	ND	U	0.5
1,1-Dichloroethane		1	ND	U	0.5
1,1-Dichloroethene		1	ND	U	0.5
1,2-Dibromo-3-chloropropane (DBCP)		1	ND	U	0.5
1,2-Dibromoethane (Ethylene dibromide)		1	ND	U	0.5
1,2-Dichlorobenzene		1	ND	U	0.5
1,2-Dichloroethane		1	ND	U	0.5
1,2-Dichloropropane		1	ND	U	0.5
1,3-Dichlorobenzene		1	ND	U	0.5
1,4-Dichlorobenzene		1	ND	U	0.5
4-Methyl-2-pentanone		5	ND	U	2.5
Benzene		1	ND	U	0.5
Bromochloromethane		1	ND	U	0.5
Bromodichloromethane		1	ND	U	0.5
Bromoform		1	ND	U	0.5
Bromomethane		1	ND	U	0.5
Carbon disulfide		1	ND	U	0.5
Carbon tetrachloride		1	ND	U	0.5
Chlorobenzene		1	ND	U	0.5
Chloroethane		1	ND	U	0.5
Chloroform		1	ND	U	0.5
Chloromethane		1	ND	U	0.5
Cis-1,2-Dichloroethene		1	ND	U	0.5
Cis-1,3-Dichloropropene		1	ND	U	0.5
Dibromochloromethane		1	ND	U	0.5
Ethylbenzene		1	ND	U	0.5
Methylene chloride		2	ND	UBJ	1
Styrene		1	ND	U	0.5
Tetrachloroethene		1	ND	U	0.5
Toluene		1	ND	U	0.5
Trans-1,2-Dichloroethene		1	ND	U	0.5
Trans-1,3-Dichloropropene		1	ND	U	0.5
Trichloroethene		1	ND	U	0.5
Vinyl chloride		1	ND	U	0.5
Xylenes (Total)		1	ND	U	0.5

CHEMICAL DATA
WELL MW-40B
(all in µg/L)

Chemical Name	POS RESULT	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND
1,3,5-Trinitrobenzene (TNB)		0.25	ND	U	0.125
1,3-Dinitrobenzene (DNB)		0.25	ND	U	0.125
2,4,6-Trinitrotoluene (TNT)		0.25	ND	U	0.125
2,4-Dinitrotoluene (24DNT)		0.25	ND	U	0.125
2,6-Dinitrotoluene (26DNT)		0.5	ND	U	0.250
2-Nitrotoluene (2NT)		0.5	ND	U	0.250
3-Nitrotoluene (3NT)		0.5	ND	U	0.250
4-Nitrotoluene (4NT)		0.5	ND	U	0.250
Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)		0.15	ND	U	0.075
Methyl-2,4,6-trinitrophenylnitramine (Tetryl)		0.5	ND	U	0.250
Nitrobenzene (NB)		0.25	ND	U	0.125
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)		0.25	ND	U	0.125
1,1,1-Trichloroethane		170	ND	U	85
1,1,2,2-Tetrachloroethane		170	ND	U	85
1,1,2-Trichloroethane		170	ND	U	85
1,1-Dichloroethane		170	ND	U	85
1,1-Dichloroethene		170	ND	U	85
1,2-Dichloroethane		170	ND	U	85
1,2-Dichloroethene(Total)		170	ND	U	85
1,2-Dichloropropane		170	ND	U	85
2-Butanone		170	ND	U	85
2-Hexanone		170	ND	U	85
4-Methyl-2-pentanone		170	ND	U	85
Acetone		170	ND	U	85
Benzene		170	ND	U	85
Bromodichloromethane		170	ND	U	85
Bromoform		170	ND	U	85
Bromomethane		170	ND	U	85
Carbon disulfide		170	ND	U	85
Carbon tetrachloride		170	ND	U	85
Chlorobenzene		170	ND	U	85
Chloroethane		170	ND	U	85
Chloroform		170	ND	U	85
Chloromethane		170	ND	U	85
Cis-1,3-Dichloropropene		170	ND	U	85
Dibromochloromethane		170	ND	U	85
Ethylbenzene		170	ND	U	85
Methylene chloride	43			BJ	43
Styrene		170	ND	U	85
Tetrachloroethene		170	ND	U	85
Toluene		170	ND	U	85
Trans-1,3-Dichloropropene		170	ND	U	85
Trichloroethene	1800				1800
Vinyl chloride		170	ND	U	85
Xylenes (Total)		170	ND	U	85

H

APPENDIX H
W TEST RESULTS

An described by Gilbert (1987), the W test developed by Shapiro and Wilk (1965) is an effective method for testing whether data exhibits normal distribution. Furthermore, by conducting the test on the logarithms of the data, it is an equally effective way of evaluating the hypothesis of lognormal distributing of the data. In the Baseline Risk Assessment, log normal distribution was confirmed for the primary groundwater Chemicals of Concern (COCs), RDX and TCE, using the W-test (Gilbert, 1987). Log normal distribution was assumed for all COCs.

DISTRIBUTION PATTERN OF TRICHLOROETHENE DATA
IN MEAD GROUNDWATER
(W - TEST)

28 out of 134 VOC samples have detectable concentrations of trichloroethene.

The Null Hypothesis (Ho) : The population has a log normal distribution
The alternate hypothesis (Ha) : The population does not have a log normal distribution

Step 1. Compute the denominator D of the W test statistic, using the following formula:

$$d = \sum_{i=1}^{n} (LN (Xi) - \text{Mean of } LN (X i))^2$$

N = 28
SUM(LN(X))2 = 415.27
SUM(LN(X)) = 95.10
1/n(SUM(LN(X))2 = 323.01
d = 92.26

Step 2. Order the Ln (X) data from smallest to largest to obtain the sample order statistics

Step 3. Compute k, Where k = N / 2 (if N is even) or (N-1) / 2 (if N is odd).

k = 14

Step 4. Check the coefficients ai for the Shapiro-Mike W test for Normality
(Table A6 in Gilbert (1978))

Step 5. Then compute W value with following formula:

$$W = 1 / d * \left[\sum_{i=1}^{k} ai (Ln (X)n-i+1 - Ln(X)i) \right]^2$$

$$W = (1/92.26) \left[\sum_{i=1}^{k} ai (Ln (X)n-i+1 - Ln(X)i) \right]^2$$

$$= 0.96$$

Step 6. Check the quantiles of the Shapiro-Wilk W test for Normality
(Table A7 in Gilbert (1978))

For N = 28

W0.01 =	0.896
W0.02 =	0.908
W 0.05 =	0.924
W0.10 =	0.936
W0.50 =	0.966

The calculated W is greater than the 0.05 quantile 0.924. Hence we cannot reject Ho.

DISTRIBUTION PATTERN OF TRICHLOROETHENE DATA
IN MEAD GROUNDWATER
(W - TEST)

28 out of 134 VOC samples have detectable concentrations of trichloroethene.

The Null Hypothesis (Ho) : The population has a log normal distribution
The alternate hypothesis (Ha) : The population does not have a log normal distribution

NO.	WELL NAME	X (µg/L)	Ln(X)	(LN(X))2	Ln(X)n-i+1	(Ln (X)n-i+1 - Ln(X)i)	ai	ai * (Ln (X)n-i+1 - Ln(X)i)
1	MW-024A	0.9	-0.11	0.01	7.50	7.60	0.4328	3.2897
2	MW-033A	1	0.00	0.00	5.70	5.70	0.2992	1.7066
3	MW-052B	1	0.00	0.00	5.39	5.39	0.2510	1.3538
4	MW-052A	3	1.10	1.21	5.19	4.09	0.2151	0.8807
5	MW-005A	4	1.39	1.92	4.94	3.56	0.1857	0.6602
6	MW-044D	7	1.95	3.79	4.87	2.92	0.1601	0.4678
7	MW-053A	8	2.08	4.32	4.87	2.79	0.1372	0.3825
8	MW-002B	11	2.40	5.75	4.60	2.20	0.1162	0.2553
9	MW-056B	11	2.40	5.75	4.57	2.18	0.0965	0.2101
10	MW-040A	22	3.09	9.55	4.57	1.48	0.0778	0.1154
11	MW-036A	25	3.22	10.36	4.33	1.11	0.0598	0.0665
12	MW-036B	25	3.22	10.36	3.91	0.69	0.0424	0.0294
13	MW-045A	26	3.26	10.62	3.83	0.57	0.0253	0.0144
14	MW-012A	30	3.40	11.57	3.43	0.03	0.0084	0.0003
15	MW-009B	31	3.43	11.79	3.40	-	-	-
16	MW-043B	46	3.83	14.66	3.26	-	-	-
17	MW-045D	50	3.91	15.30	3.22	-	-	-
18	MW-018C	76	4.33	18.76	3.22	-	-	-
19	MW-023B	97	4.57	20.93	3.09	-	-	-
20	MW-053B	97	4.57	20.93	2.40	-	-	-
21	MW-045B	99	4.60	21.12	2.40	-	-	-
22	MW-058B	130	4.87	23.69	2.08	-	-	-
23	MW-002A	130	4.87	23.69	1.95	-	-	-
24	MW-021B	140	4.94	24.42	1.39	-	-	-
25	MW-044A	180	5.19	26.97	1.10	-	-	-
26	MW-009D	220	5.39	29.09	0.00	-	-	-
27	MW-009A	300	5.70	32.53	0.00	-	-	-
28	MW-040B	1800	7.50	56.18	-0.11	-	-	-
								9.4326

DISTRIBUTION PATTERN OF RDX DATA
IN MEAD GROUNDWATER
(W - TEST)

44 out of 125 explosive samples have detectable concentrations of RDX.

The Null Hypothesis (Ho) : The population has a log normal distribution
The alternate hypothesis (Ha) : The population does not have a log normal distribution

NO.	WELL NAME	X (µg/L)	Ln(X)	(LN(X))2	Ln(X)n-i+1	(Ln (X)n-i+1 - Ln(X)i)	ai	ai * (Ln (X)n-i+1 - Ln(X)i)
1	MW-004A	0.16	-1.83	3.36	4.58	6.42	0.3872	2.4849
2	MW-032B	0.16	-1.83	3.36	3.50	5.33	0.2667	1.4213
3	MW-017A	0.16	-1.83	3.36	2.89	4.72	0.2323	1.0971
4	MW-002A	0.17	-1.77	3.14	2.30	4.07	0.2072	0.8442
5	MW-007A	0.18	-1.71	2.94	2.22	3.93	0.1868	0.7349
6	MW-055B	0.24	-1.43	2.04	1.90	3.33	0.1695	0.5643
7	MW-022B	0.25	-1.39	1.92	1.57	2.95	0.1542	0.4556
8	MW-003B	0.26	-1.35	1.81	1.55	2.89	0.1405	0.4067
9	MW-042B	0.26	-1.35	1.81	1.55	2.89	0.1278	0.3699
10	MW-035A	0.34	-1.08	1.16	1.50	2.58	0.1160	0.2996
11	MW-052B	0.37	-0.99	0.99	1.48	2.48	0.1409	0.3488
12	MW-045D	0.44	-0.82	0.67	1.44	2.26	0.0943	0.2127
13	MW-024B	0.46	-0.78	0.60	1.36	2.14	0.0842	0.1800
14	MW-003A	0.48	-0.73	0.54	1.13	1.87	0.0745	0.1390
15	MW-055A	0.52	-0.65	0.43	0.64	1.30	0.0651	0.0844
16	MW-056B	0.67	-0.40	0.16	0.64	1.04	0.0560	0.0584
17	MW-045A	0.67	-0.40	0.16	0.59	0.99	0.0471	0.0465
18	MW-032D	0.72	-0.33	0.11	0.47	0.80	0.0383	0.0306
19	MW-042A	0.73	-0.31	0.10	0.18	0.50	0.0296	0.0147
20	MW-044A	0.73	-0.31	0.10	-0.09	0.22	0.0211	0.0047
21	MW-045B	0.79	-0.24	0.06	-0.09	0.14	0.0126	0.0018
22	MW-016C	0.91	-0.09	0.01	-0.09	0.00	0.0042	0.0000
23	MW-054A	0.91	-0.09	0.01	-0.09	-	-	-
24	MW-056A	0.91	-0.09	0.01	-0.24	-	-	-
25	MW-034B	0.91	-0.09	0.01	-0.31	-	-	-
26	MW-042D	1.2	0.18	0.03	-0.31	-	-	-
27	MW-044B	1.6	0.47	0.22	-0.33	-	-	-
28	MW-033B	1.8	0.59	0.35	-0.40	-	-	-
29	MW-007B	1.9	0.64	0.41	-0.40	-	-	-
30	MW-018C	1.9	0.64	0.41	-0.65	-	-	-
31	MW-052A	3.1	1.13	1.28	-0.73	-	-	-
32	MW-032A	3.9	1.36	1.85	-0.78	-	-	-
33	MW-053B	4.2	1.44	2.06	-0.82	-	-	-
34	MW-029B	4.4	1.48	2.20	-0.99	-	-	-
35	MW-004B	4.5	1.50	2.26	-1.08	-	-	-
36	MW-008B	4.7	1.55	2.39	-1.35	-	-	-
37	MW-031B	4.7	1.55	2.39	-1.35	-	-	-
38	MW-053B	4.8	1.57	2.46	-1.39	-	-	-
39	MW-002B	6.7	1.90	3.62	-1.43	-	-	-
40	MW-033A	9.2	2.22	4.92	-1.71	-	-	-
41	MW-021B	10	2.30	5.30	-1.77	-	-	-
42	MW-043B	18	2.89	8.35	-1.83	-	-	-
43	MW-011A	33	3.50	12.23	-1.83	-	-	-
44	MW-005B	98	4.58	21.02	-1.83	-	-	-

DISTRIBUTION PATTERN OF RDX DATA
IN MEAD GROUNDWATER
(W - TEST)

44 out of 125 explosive samples have detectable concentrations of RDX.

The Null Hypothesis (Ho) : The population has a log normal distribution
The alternate hypothesis (Ha) : The population does not have a log normal distribution

Step 1. Compute the denominator D of the W test statistic, using the following formula:

$$d = \sum_{i=1}^{n} (LN(Xi) - \text{Mean of } LN(X\,i))^2$$

N = 44
SUM(LN(X))2 = 102.63
SUM(LN(X)) = 9.57
1/n(SUM(LN(X))2 = 2.08
d = 100.54

Step 2. Order the Ln (X) data from smallest to largest to obtain the sample order statistics

Step 3. Compute k, Where k = N / 2 (if N is even) or (N-1) / 2 (if N is odd).

k = 22

Step 4. Check the coefficients ai for the Shapiro-Mike W test for Normality
(Table A6 in Gilbert (1978))

Step 5. Then compute W value with following formula:

$$W = 1/d * \left[\sum_{i=1}^{k} ai\,(Ln\,(X)n\text{-}i\text{+}1 - Ln(X)i\,) \right]^2$$

$$W = (1/100.54) \left[\sum_{i=1}^{k} ai\,(Ln\,(X)n\text{-}i\text{+}1 - Ln(X)i\,) \right]^2$$

$$= 0.96$$

Step 6. Check the quantiles of the Shapiro-Wilk W test for Normality
(Table A7 in Gilbert (1978))

For N = 44

W0.01 = 0.924
W0.02 = 0.933
W 0.05 = 0.944
W0.10 = 0.952
W0.50 = 0.973

The calculated W is greater than the 0.05 quantile 0.944. Hence we cannot reject Ho.

FINAL

BASELINE RISK ASSESSMENT OPERABLE UNIT NO. 2 (GROUNDWATER) FOR FORMER NEBRASKA ORDNANCE PLANT MEAD, NEBRASKA

DACA 41-92-C-0023

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Woodward-Clyde Consultants
10975 El Monte, Suite 100
Overland Park, Kansas 66211

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VOLUME II OF II

APPENDIX I BASELINE RISK ASSESSMENT BASED ON THE PLUME MAXIMUM EXPOSURE APPROACH
APPENDIX J BASELINE RISK ASSESSMENT BASED ON THE REASONABLE AVERAGE EXPOSURE APPROACH

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APPENDIX I
BASELINE RISK ASSESSMENT
BASED ON THE PLUME MAXIMUM EXPOSURE APPROACH

TABLE OF CONTENTS FOR APPENDIX I

Section		Page
I.1	SUBSITES EVALUATED IN THE PLUME MAXIMUM EXPOSURE BRA	I-1
I.2	EVALUATION OF POTENTIAL EXPOSURE PARAMETERS	I-2
I.3	ESTIMATION OF EXPOSURE POINT CONCENTRATIONS	I-3
I.4	RISK CHARACTERIZATION	I-4
I.4.1	Plume 1	I-4
I.4.1.1	Summary of Potential Non-Carcinogenic Health Hazards	I-4
I.4.1.2	Summary of Potential Cancer Risk	I-5
I.4.2	Plume 2	I-5
I.4.2.1	Summary of Potential Non-Carcinogenic Health Hazards	I-5
I.4.2.2	Summary of Potential Cancer Risk	I-5
I.4.3	Plume 3	I-6
I.4.3.1	Summary of Potential Non-Carcinogenic Health Hazards	I-6
I.4.3.2	Summary of Potential Cancer Risk	I-6
I.4.4	Plume 4	I-6
I.4.4.1	Summary of Potential Non-Carcinogenic Health Hazards	I-6
I.4.4.2	Summary of Potential Cancer Risk	I-7
I.5	CUMULATIVE RISKS FOR SOIL AND GROUNDWATER PATHWAYS	I-7
I.5.1	Summary of Cumulative Potential Non-Carcinogenic Health Hazards	I-7
I.5.2	Summary of Cumulative Potential Cancer Risks	I-8

LIST OF TABLES

TABLE I-1 MONITORING WELLS EVALUATED ON OU2 BASELINE RISK ASSESSMENT (PLUME MAXIMUM EXPOSURE APPROACH)
TABLE I-2 PLUME MAXIMUM EXPOSURE PARAMETERS FOR ESTIMATION OF CHEMICAL INTAKE BY INGESTION OF GROUNDWATER
TABLE I-3 PLUME MAXIMUM PARAMETERS FOR ESTIMATION OF CHEMICAL INTAKE BY DERMAL EXPOSURE WHILE SHOWERING
TABLE I-4 PLUME MAXIMUM EXPOSURE PARAMETERS FOR ESTIMATION OF CHEMICAL INTAKE BY INHALATION EXPOSURE TO VOLATILIZED CHEMICALS DURING SHOWERING
TABLE I-5 PLUME MAXIMUM EXPOSURE BY PARAMETERS FOR ESTIMATION OF CHEMICAL INTAKE BY INGESTION OF SUBSURFACE SOIL
TABLE I-6 PLUME MAXIMUM EXPOSURE PARAMETERS FOR ESTIMATION OF CHEMICAL INTAKE BY DERMAL CONTACT WITH SUBSURFACE SOIL
TABLE I-7 PLUME MAXIMUM EXPOSURE PARAMETERS FOR ESTIMATION OF CHEMICAL INTAKE BY INHALATION OF VOLATILIZED CHEMICALS FROM SUBSURFACE SOIL
TABLE I-8 EXPOSURE POINT CONCENTRATIONS IN GROUNDWATER - PLUME 1
TABLE I-9 EXPOSURE POINT CONCENTRATIONS IN GROUNDWATER - PLUME 2
TABLE I-10 EXPOSURE POINT CONCENTRATIONS IN GROUNDWATER - PLUME 3
TABLE I-11 EXPOSURE POINT CONCENTRATIONS IN GROUNDWATER - PLUME 4
TABLE I-12 AIR VOC EXPOSURE POINT CONCENTRATIONS IN SHOWER (PME APPROACH)
TABLE I-13 EXPOSURE POINT CONCENTRATIONS IN SUBSURFACE SOIL (PME APPROACH)
TABLE I-14 AIR EXPOSURE POINT CONCENTRATIONS - SUBSURFACE SOIL
TABLE I-15 POTENTIAL CANCER RISK AND NON-CARCINOGENIC HAZARD INDICES (HIs) - PLUME 1
TABLE I-16 POTENTIAL CANCER RISK AND NON-CARCINOGENIC HAZARD INDICES (HIs) - PLUME 2
TABLE I-17 POTENTIAL CANCER RISK AND NON-CARCINOGENIC HAZARD INDICES (HIs) - PLUME 3
TABLE I-18 POTENTIAL CANCER RISK AND NON-CARCINOGENIC HAZARD INDICES (HIs) - PLUME 4
TABLE I-19 SUMMARY OF CUMULATIVE CANCER RISKS AND HAZARD INDICES FOR SOIL (OU1) AND GROUNDWATER (OU2) PATHWAYS (PME EXPOSURE)

B07NE003702-07984

LIST OF FIGURES

FIGURE I-1 CONTAMINANT PLUMES FOR GROUNDWATER

LIST OF ATTACHMENTS

ATTACHMENT IA PME RISK CALCULATIONS
ATTACHMENT IB PME SHOWER MODEL CALCULATIONS
ATTACHMENT IC PME CHEMICAL DATA

B07NE003702-07985

Based on the delineation of contaminant plumes identified in the Remedial Investigation (RI) Report (WCC, 1993), four lists of monitoring well clusters were developed for use in Plume Maximum Exposure (PME) Baseline Risk Assessment (BRA) calculations. USACE prepared this PME approach to evaluate risks based on the upper 95 percent confidence limit of the arithmetic mean concentration in the contaminant plumes, using EPA standard default exposure parameters which are intended to represent upper bound exposure. The purpose of evaluating upper bound exposure for individual plumes is to provide an estimate of risks associated with identified areas of contamination (instead of the entire Site), using standard EPA exposure assumptions. Using that approach, groundwater risks are assumed only to exist for wells placed on portions of the Site overlying a contaminant plume. In contrast, the Reasonable Maximum Exposure (RME) approach discussed in the main body of this document is based on the assumption that risks calculated from the most-contaminated wells are applicable to all areas of the Site, including areas several miles upgradient from the identified plumes. The Reasonable Average Exposure (RAE) approach (**Appendix J**) addresses risks for individual areas using exposure assumptions that are thought to be representative of the "average man" (i.e., reasonable average instead of upper bound exposure assumptions). The potential cancer risks and non-carcinogenic hazards calculated for the PME approach assume the same exposure scenarios discussed in Section 3.0 of this BRA.

I.1 SUBSITES EVALUATED IN THE PLUME MAXIMUM EXPOSURE BRA

The definition of a contaminant plume used in the BRA differs slightly from that used in the RI Report (WCC, 1993). The RI Report identified three individual plumes based on assumed source areas (one TCE plume and two explosive plumes), with significant overlap occurring between the TCE plume and one of the explosive plumes. Because this overlap area contains a larger suite of chemicals than found in the individual plumes, it was evaluated as a separate "plume" in the PME approach (e.g., risks were calculated for four plume areas; see **Figure I-1**). The following assumptions were used to identify the plumes:

- Monitoring well clusters are assigned to no more than one plume. For example, a well cluster may be assigned to the TCE plume or the overlap plume, but not both.

- Only analytical data presented in the OU2 RI Report were used.

Plumes are defined by the perimeter of all well clusters which contained detectable concentrations of the plume contaminants (TCE and/or explosives) in any well within the cluster. Well lists were developed for the following BRA plumes:

- Plume 1 is downgradient from Load Line 1 and consists of well clusters containing TCE and/or explosives.

- Plume 2 is downgradient from the Atlas Missile Area and consists of well clusters containing only TCE. (MW-15 is included because it is within the plume boundary even though TCE was not detected.)

- Plume 3 is downgradient from Load Lines 2, 3, and 4 and consists of clusters containing only explosives.

- Plume 4 is considered as the overlapping area of Plume 2 and Plume 3. It is downgradient from the Atlas Missile Area and Load Lines 2, 3 and 4 and consists of well clusters containing TCE and explosives.

The monitoring well samples associated with each area are listed in **Table I-1**.

I.2 EVALUATION OF POTENTIAL EXPOSURE PARAMETERS

With the exception of the exposure duration for adult resident, the PME approach uses the same exposure parameters used in the RME approach (see Section 3.4). Instead of assuming lifelong exposure duration (70 years), adult residents are assumed to have an upper bound exposure duration of 30 years based on the upper 90th percentile value for time spent in a single residence (Exposure Factors Handbook; EPA, 1989a) which is the standard default value recommended by EPA. The exposure parameters use in the PME approach are summarized in **Tables I-2, I-3, I-4, I-5, I-6,** and **I-7.**

I.3 ESTIMATION OF EXPOSURE POINT CONCENTRATIONS

Exposure point concentrations are the chemical concentrations to which a receptor is exposed when contact is made with a specific environmental medium. The PME approach uses the same set of chemicals of concern (COCs) discussed in the Section 2.0 of this BRA.

For ingestion and dermal contact with groundwater and soil, exposure point concentrations are based on current groundwater and soil concentrations as identified in the RI Report (WCC, 1993). Arithmetic mean chemical concentrations were calculated for all COCs found within each plume. For samples in which a chemical was reported as not detected, the chemical was assumed to be present at one-half the sample quantification limit, in accordance with RAGS. Exposure point concentrations for all media were calculated as the upper 95 percent confidence limit (UCL) values of the arithmetic mean concentration assuming lognormal distribution, using the approach recommended by EPA (OSWER 9285.7-080, 1992d), as shown below:

$$UCL = e^{\left(M + 0.5S^2 + \frac{SH}{\sqrt{n-1}}\right)}$$

where:

UCL = upper 95 percent confidence level
e = constant (base of natural log (ln), equal to 2.718)
M = mean of ln-transformed data
S = Standard Deviation of the ln-transformed data
n = number of samples
H = H-statistic (from table published in Gilbert, 1987)

As presented in **Appendix H,** log normal distribution was confirmed for the primary groundwater COCs, (RDX and TCE), using the W-test (Gilbert, 1987). Log normal distribution was assumed for all COCs. The concentration associated with the 95 percent UCL or the maximum concentration detected, whichever was lower, was adopted as the PME point concentration. Use of the maximum concentration, if less than the upper bound value, is allowed by RAGS (EPA, 1989b), and supported by the observation that the 95 percent UCL may exceed the maximum reported concentration in instances where the variation of data is large, or when detection limits (above detected concentrations) strongly influence calculation of 95 percent UCL values.

B07NE003702-07988

Comparisons of maximum detected values, UCL concentrations, and PME concentrations are presented in **Tables I-8, I-9, I-10**, and **I-11**.

Potential exposure to VOCs as a result of volatilization from groundwater was evaluated for a shower scenario using the approach described in **Appendix F** (Shower Model). The calculations for air exposure point concentrations for showering are presented in **Attachment IB**, and summarized in **Table I-12**.

Subsurface soil COC concentrations for the Load Line 1 Area (Plume 1 Area) and Atlas Missile Area (Plume 2 Area), the only areas found to contain measurable concentrations of VOCs, are presented in **Table I-13**. Potential exposure of construction workers to volatilized VOCs emitted from subsurface soil was evaluated using the emissions model (Farmer's Model) described in **Appendix D**. The results are presented in **Table I-14.**

I.4 RISK CHARACTERIZATION

The PME risks associated with exposure to the COCs are summarized in **Tables I-15, I-16, I-17** and **I-18.**

I.4.1 Plume 1

I.4.1.1 Summary of Potential Non-Carcinogenic Health Hazards

As can be seen in **Table I-15**, hazard indices (HIs) for all potentially exposed populations in the Plume 1 Area are below the threshold value of 1, indicating that exposure to groundwater in this area is not likely to result in any non-carcinogenic toxic effects. HIs for various receptor populations were 0.7 (child resident), 0.3 (adult resident), 0.1 (on-site worker) and 0.001 (construction worker). Ingestion of groundwater was the greatest contributor to potential non-carcinogenic hazards, and TNB was the chemical contributing the greatest proportion of overall hazard from groundwater in this area.

B07NE003702-07989

I.4.1.2 Summary of Potential Cancer Risk

A summary of potential cancer risks associated with groundwater in Plume 1 Area is presented in **Table I-15**. As can be seen in this table, potential risks associated with groundwater in this area are very low, ranging from 4×10^{-5} (child resident), 6×10^{-5} (adult resident), 1×10^{-5} (on-site worker) and 3×10^{-7} (construction worker). These values are within (or below) the EPA's acceptable risk range of 1×10^{-4} to 1×10^{-6}. Ingestion of groundwater and inhalation of volatilized chemicals during showering were the greatest contributor to potential cancer risks, with TCE contributing the majority of overall cancer risk from groundwater in this area.

I.4.2 Plume 2

I.4.2.1 Summary of Potential Non-Carcinogenic Health Hazards

As can be seen in **Table I-16**, HIs for all potentially exposed populations in Plume 2 Area are below the threshold value of 1, indicating that exposure to groundwater and subsurface soils in this area is not likely to result in any non-carcinogenic toxic effects. HIs for various receptor populations were 0.2 (child resident), 0.09 (adult resident), 0.03 (on-site worker) and 0.0006 (construction worker). Ingestion of groundwater was the primary contributor to potential non-carcinogenic hazard from groundwater, with 1,2-DCE contributing significantly to potential groundwater hazard in this area.

I.4.2.2 Summary of Potential Cancer Risk

A summary of potential cancer risks associated with groundwater in the Plume 2 Area is presented in **Table I-16**. As can be seen in this table, potential risks associated with groundwater in this area are within the range of 1×10^{-4} to 1×10^{-6} for the construction worker scenario (4×10^{-6}). Risks were above 10^{-4} for all other scenarios: 5×10^{-4} (child resident), 6×10^{-4} (adult resident), and 2×10^{-4} (on-site worker). Inhalation of groundwater volatile constituents contributed significantly to potential cancer risks, and TCE was the chemical contributing the greatest proportion of overall risk from groundwater in this area.

I.4.3 Plume 3

I.4.3.1 Summary of Potential Non-Carcinogenic Health Hazards

As can be seen in **Table I-17**, HIs for all potentially exposed populations in the Plume 3 Area are below the threshold value of 1, indicating that exposure to groundwater in this area is not likely to result in any non-carcinogenic toxic effects. HIs for various receptor populations were 0.7 (child resident), 0.3 (adult resident), and 0.1 (on-site worker). Ingestion of groundwater contributed significantly to potential non-carcinogenic hazard, with RDX contributing significantly to the overall hazard from groundwater in this area.

I.4.3.2 Summary of Potential Cancer Risk

A summary of potential cancer risks associated with groundwater in the Plume 3 Area is presented in **Table I-17**. As can be seen in this table, potential risks associated with groundwater in this area are within the EPA range of 1×10^{-4} to 1×10^{-6}: 1×10^{-5} (child resident), 3×10^{-5} (adult resident), and 8×10^{-6} (on-site worker). Ingestion of groundwater contributed significantly to potential cancer risks, and RDX was the chemical contributing the greatest proportion of overall risk from groundwater in this area.

I.4.4 Plume 4

I.4.4.1 Summary of Potential Non-Carcinogenic Health Hazards

As can be seen in **Table I-18**, HIs for all potentially exposed populations in the Plume 4 Area are below the threshold value of 1, indicating that exposure to groundwater in this area is not likely to result in any non-carcinogenic toxic effects. HIs for various receptor populations were 0.3 (child resident), 0.1 (adult resident), and 0.05 (on-site worker). Ingestion of groundwater contributed significantly to potential non-carcinogenic hazard, with RDX contributing significantly to the overall hazard from groundwater in this area.

B07NE003702-07991

I.4.4.2 Summary of Potential Cancer Risk

A summary of potential cancer risks associated with groundwater in the Plume 4 Area is presented in **Table I-18**. Potential cancer risks for exposure scenarios associated with exposure to groundwater in the Plume 4 Area are within the EPA acceptable risk range of 1×10^{-4} to 1×10^{-6}: 6×10^{-5} (child resident), 8×10^{-5} (adult resident), and 2×10^{-5} (on-site worker). Inhalation of volatilized chemicals during showering and ingestion both contributed significantly to potential cancer risks, and TCE was the chemical contributing the greatest proportion of overall risk from groundwater in this area.

I.5 CUMULATIVE RISKS FOR SOIL AND GROUNDWATER PATHWAYS

The purpose of this section is to integrate the results of the OU1 and OU2 BRAs. To address risks from multiple pathways, it is assumed that the risks/hazards that were reported for Site soils in the OU1 BRA are directly additive to the risks/hazards calculated for groundwater in the OU2 BRA in areas where plumes and contaminated soils overlap.

Potential cancer risks and non-carcinogenic health hazards were evaluated for surface soils in the OU1 BRA (SEC Donohue, 1993b). In the OU1 BRA, surface soil areas were subdivided to better identify areas of greatest potential concern. To estimate the maximum site related risks for residential scenarios, the RME cancer risks and RME HIs associated with soil ingestion and garden vegetables (summarized in OU1 Table 5-13 of the OU1 BRA, SEC Donohue, 1993b) were added to the OU2 groundwater results from equivalent contaminant plume areas. For on-site workers, the potential cancer risks and HIs summarized in the OU1 BRA OU1 Table 5-4 and OU1 Table 5-9 (SEC Donohue, 1993b) were added to the results of equivalent OU2 groundwater contaminant plume areas. The cumulative cancer risks and health hazards are presented in **Table I-19**.

I.5.1 Summary of Cumulative Potential Non-Carcinogenic Health Hazards

Although the HIs associated with PME groundwater exposure in the OU2 contaminant plumes (presented in **Tables I-15, I-16, I-17** and **I-18**) are below the threshold value of 1.0 for all scenarios, cumulative soil/groundwater HIs were as large as 5,000 (child resident), 2,000 (adult

B07NE003702-07992

resident) and 4.0 (on-site worker), indicating that this area presents a potential non-carcinogenic health hazard. These HIs were primarily a result of exposure to explosives in soils.

I.5.2 Summary of Cumulative Potential Cancer Risks

The cumulative cancer risks for soils (OU1) and groundwater (OU2) were also driven by the soil exposures (**Table I-19**). Cumulative soil/groundwater cancer risks were estimated to be as high as 5×10^{-2} (adult residents) and 2×10^{-4} (on-site workers), and were due primarily to exposures to chemicals found in Site soils (adult residents) and VOCs in groundwater (on-site workers).

TABLES FOR APPENDIX I

TABLE I-1

MONITORING WELLS EVALUATED IN OU-2 BASELINE RISK ASSESSMENT (PLUME MAXIMUM EXPOSURE APPROACH)

BACKGROUND WELLS: MW-47A and MW-47B

PLUME 1 - Located downgradient from Load Line 1, consisting of well clusters containing TCE and/or explosives

"A" Wells	"B" Wells	"C" Wells	"D" Wells
MW-02A	MW-02B		
MW-03A	MW-03B		
MW-12A			
	MW-16B	MW-16C	
MW-21A	MW-21B		MW-21D
MW-22A	MW-22B		
MW-23A	MW-23B		
MW-24A	MW-24B		

PLUME 2 - Located downgradient from Atlas Missile Area, consisting of well clusters containing only TCE. MW-15 is included because it is within the BRA plume boundary even though TCE was not detected

"A" Wells	"B" Wells	"C" Wells	"D" Wells
MW-09A	MW-09B		MW-09D
MW-15A			
MW-40A	MW-40B		
MW-58A	MW-58B		

TABLE I-1 (Cont.)

MONITORING WELLS EVALUATED IN OU-2 BASELINE RISK ASSESSMENT (PLUME MAXIMUM EXPOSURE APPROACH)

PLUME 3 - Located downgradient from Load Lines 2, 3, and 4, consisting of clusters containing only explosives

"A" Wells	"B" Wells	"C" Wells	"D" Wells
MW-04A	MW-04B		
MW-05A	MW-05B		
MW-07A	MW-07B		
MW-08A	MW-08B		
MW-29A	MW-29B		
MW-31A	MW-31B		
MW-32A	MW-32B		MW-32D
MW-33A	MW-33B		MW-33D
MW-34A	MW-34B		MW-34D
MW-42A	MW-42B		MW-42D

PLUME 4 - Located downgradient from the atlas missile area and load lines 2, 3 and 4 and consists of well clusters containing tce and explosives

"A" Wells	"B" Wells	"C" Wells	"D" Wells
MW-11A			
MW-18A	MW-18B	MW-18C	
MW-36A	MW-36B		MW-36D
MW-43A	MW-43B		MW-43D
MW-44A	MW-44B		MW-44D
MW45A	MW45B		MW45D
MW-52A	MW-52B		
MW-53A	MW-53B		
MW-54A	MW-54B		
MW-55A	MW-55B		
MW-56A	MW-56B		MW46D

TABLE I-2

PLUME MAXIMUM EXPOSURE PARAMETERS FOR ESTIMATION OF CHEMICAL INTAKE BY INGESTION OF GROUNDWATER (a

Parameter	Residential		On-site Worker
	Child (b	Adult	
(IR) Ingestion Rate (liters/day)	1.0 (c	2.0 (c	1.0 (c
(EF)Exposure Frequency (days/year)	350 (d	350 (d	250 (e
(ED) Exposure Duration (years)	6 (f	30 (g	25 (h
(BW) Body Weight (kg)	15 (i	70 (j	70 (j
(AT1) Averaging Time - Non-carcinogenic Effects (days)	2,190 (k	10,950 (k	9,125 (k
(AT2) Averaging Time - Cancer Effects (days)	25,550 (l	25,550 (l	25,550 (l

Notes:

a) Plume Maximum Exposure (PME) is defined as reasonable upperbound exposure among potentially exposed population using EPA standard default values. b) Assumes a 0- to 6- year old child.

c) Ingestion rates are based on the data presented for maximum intake in Exposure Factors Handbook (EPA, 1989b).

d) Residents are assumed to have an exposure frequency of 350 days per year (Standard Default Exposure Factors; EPA, 1991b).

e) Based on a 5-day working week for 50 weeks per year (Standard Default Exposure Factors; EPA, 1991b).

f) Child residents are assumed to spend first 6 years of life on Site.

g) Adult residents are assumed to have an upperbound exposure duration of 30 years (Exposure Factors Handbook; EPA, 1989b).

h) The default value recommended by Standard Default Exposure Factors (EPA, 1991b).

i) Body weights for 0- to 6- year old children are based on time-weighted average values from Exposure Factors Handbook (EPA, 1989a).

j) Body weight for adults based on Standard Default Exposure Factors (EPA, 1991b).

k) Averaging time for non-carcinogenic effects based on the exposure duration.

l) Averaging time for carcinogenic effects based on lifetime of 70 years, as identified in Standard Default Exposure Factors (EPA, 1991b).

TABLE I-3

PLUME MAXIMUM EXPOSURE PARAMETERS FOR ESTIMATION OF CHEMICAL INTAKE BY DERMAL EXPOSURE WHILE SHOWERING (a

Parameter	Residential		On-site Worker	Construction Worker
	Child (b	Adult		
(SA) Skin Surface Area Available for Contact (cm2)	6,670 (c	19,400 (c	19,400 (c	19,400 (c
(PC) Chemical-specific Dermal Permeability Constant (cm/hr)	Chemical Specific (d			
(ET) Exposure Time (hours/day)	0.20 (e	0.20 (e	0.20 (e	0.20 (e
(EF) Exposure Frequency (days/year)	350 (f	350 (f	90 (g	90 (g
(ED) Exposure Duration (years)	6 (h	30 (i	25 (j	1 (o
(BW) Body Weight (kg)	15 (k	70 (l	70 (l	70 (l
(AT1) Averaging Time - Non-carcinogenic Effects (days)	2,190 (m	10,950 (m	9,125 (m	182 (o
(AT2) Averaging Time - Cancer Effects (days)	25,550 (n	25,550 (n	25,550 (n	25,550 (n

Notes:

a) Plume Maximum Exposure (PME) is defined as reasonable upperbound exposure among potentially exposed population using EPA standard default values.

b) Assumes a 0- to 6- year old child.

c) Surface area based on whole body exposure. Values calculated from Exposure Factors Handbook (EPA, 1989a).

d) Permeability constants are chemical specific values used to estimate chemical uptake across skin.

e) An exposure time of 12 minutes/day is based on RME exposure presented in RAGS (EPA, 1989b).

f) Residents are assumed to have an exposure frequency of 350 days per year (Standard Default Exposure Factors; EPA. 1991b).

g) Assume to take a shower everyday in summer, based on reported shower use at the Agronomy building.

h) Child residents are assumed to spend first 6 years of life on Site.

i) Adult residents are assumed to have an upperbound exposure duration of 30 years (Exposure Factors Handbook; EPA, 1989b).

j) The default value recommended by Standard Default Exposure Factors (EPA, 1991b).

k) Body weights for 0- to 6- year old children are based on time-weighted average values from Exposure Factors Handbook (EPA, 1989a).

l) Body weight for adults based on Standard Default Exposure Factors (EPA, 1991b).

m) Averaging time for non-carcinogenic effects based on the exposure duration.

n) Averaging time for carcinogenic effects based on lifetime of 70 years, as identified in Standard Default Exposure Factors (EPA, 1991b).

o) For construction workers, a construction period duration of 6 months is assumed .

TABLE I-4

PLUME MAXIMUM EXPOSURE PARAMETERS FOR ESTIMATINO OF CHEMICAL INTAKE BY INHALATION EXPOSURE TO VOLATILIZED CHEMICALS DURING SHOWERING (a

Parameter	Residential		On-site Worker	Construction Worker (n
	Child (b	Adult		
(IR) Inhalation Rate (m3/hour)	0.83 (c	0.83 (c	0.83 (c	0.83 (c
(ET) Exposure Time (hours/day)	0.20 (d	0.20 (d	0.20 (d	0.20 (d
(EF) Exposure Frequency (days/year)	350 (e	350 (e	90 (f	90 (f
(ED) Exposure Duration (years)	6 (g	30 (h	25 (i	1 (n
(BW) Body Weight (kg)	15 (j	70 (k	70 (k	70 (k
(AT1) Averaging Time - Non-carcinogenic Effects (days)	2,190 (l	10,950 (l	9,125 (l	182 (n
(AT2) Averaging Time - Cancer Effects (days)	25,550 (m	25,550 (m	25,550 (m	25,550 (m

Notes:

a) Plume Maximum Exposure (PME) is defined as reasonable upperbound exposure among potentially exposed populations using EPA standard default values.

b) Assumes a 0- to 6- year old child.

c) The default value, 20 m3/day, recommended by Standard Default Exposure Factors (EPA, 1991b) for normal activity levels.

d. An exposure time of 12 minutes/day is based on RME exposure presented in RAGS (EPA, 1989a).

e) Residents are assumed to have an exposure frequency of 350 days per year (Standard Default Exposure Factors; EPA. 1991b).

f) Assume to take a shower everyday in summer, based on reported shower use at the Agronomy building.

g) Child residents are assumed to spend first 6 years of life on Site.

h) Adult residents are assumed to have an upperbound exposure duration of 30 years (Exposure Factors Handbook; EPA, 1989b).

i) The default value recommended by Standard Default Exposure Factors (EPA, 1991b).

j) Body weights for 0- to 6- year old children are based on time-weighted average values from Exposure Factors Handbook (EPA, 1989a).

k) Body weight for adults based on Standard Default Exposure Factors (EPA, 1991b).

l) Averaging time for non-carcinogenic effects based on the exposure duration.

m) Averaging time for carcinogenic effects based on lifetime of 70 years, as identified in Standard Default Exposure Factors (EPA, 1991b).

n) For construction worker, a construction period duration of 6 months is assumed

TABLE I-5

PLUME MAXIMUM EXPOSURE PARAMETERS FOR ESTIMATION OF CHEMICAL INTAKE BY INGESTION OF SUBSURFACE SOIL (a

Parameter	Construction Worker (h
(IR) Ingestion Rate (mg soil /day)	480 (b
(EF)Exposure Frequency (days/year)	130 (c
(ED) Exposure Duration (years)	1.0 (d
(BW) Body Weight (kg)	70 (e
(AT1) Averaging Time - Non-carcinogenic Effects (days)	182 (f
(AT2) Averaging Time - Cancer Effects (days)	25,550 (g

Notes:

a) Plume Maximum Exposure (PME) is defined by as a reasonable upperbound exposure among potentially exposed populations using EPA standard default values.

b) For conservatism, the upperbound soil ingestion rate from Standard Default Exposure Factors (EPA, 1991b) was assumed.

c) Based on 5 working days per week for 6 months..

d) Construction activity was assumed to occur for 6 months.

e) Body weight for adults based on Standard Default Exposure Factors (EPA, 1991b).

f) Averaging time for non-carcinogenic effects based on the exposure duration.

g) Averaging time for carcinogenic effects based on lifetime of 70 years, as identified in Standard Default Exposure Factors (EPA, 1991b).

h) Exposure to subsurface soil was evaluated for the Atlas Missle Area and Load Line 1 area only.

TABLE I-6

PLUME MAXIMUM EXPOSURE PARAMETERS FOR ESTIMATION ON CHEMICAL INTAKE BY DERMAL CONTACT WITH SUBSURFACE SOIL [a]

Parameter	Construction Worker [j]
(SA) Exposed Surface Area (cm2)	5,300 [b]
(AD) Dermal Soil Adherence (mg/cm2)	1.0 [c]
(ABS) Absorption Factor (Unitless)	Chemical Specific [d]
(EF) Exposure Frequency (days/year)	130 [e]
(ED) Exposure Duration (years)	1.0 [f]
(BW) Body Weight (kg)	70 [g]
(AT1) Averaging Time - Non-carcinogenic Effects (days)	182 [h]
(AT2) Averaging Time - Cancer Effects (days)	25,550 [i]

Notes:

a. Plume Maximum Exposure (PME) is defined by as a reasonable upperbound exposure among potentially exposed populations using EPA standard default values.

b. The value is based on hands, head, forearms, and 1/2 legs (Exposure Factors Handbook; EPA, 1989a).

c. Based on the values recommended in Dermal Exposure Assessment: Principles and Applications (EPA, 1992a).

d. Based on the EPA Region IV Guidance (Feb.11, 1992), 1.0% is used as the absorption factor for organics and 0.1% is used for inorganics.

e. Based on 5 working days per week for 6 months.

f. Construction activity was assumed to occur for 6 months.

g. Body weight for adults based on Standard Default Exposure Factors (EPA, 1991b).

h. Averaging time for non-carcinogenic effects based on the exposure duration.

i. Averaging time for carcinogenic effects based on lifetime of 70 years, as identified in Standard Default Exposure Factors (EPA, 1991b).

j. Exposure to subsurface soil was evaluated for the Atlas Missle Area and Load Line 1 area only.

TABLE I-7

PLUME MAXIMUM EXPOSURE PARAMETERS FOR ESTIMATION OF CHEMICAL INTAKE BY INHALATION OF VOLATILIZED CHEMICALS FROM SUBSURFACE SOIL (a

Parameter	Construction Worker (i
(IR) Inhalation Rate (m3/hour)	2.50 (b
(ET)Exposure Time (hours/day)	8.0 (c
(EF) Exposure Frequency (days/year)	130 (d
(ED) Exposure Duration (years)	1.0 (e
(BW) Body Weight (kg)	70 (f
(AT1) Averaging Time - Non-carcinogenic Effects (days)	182 (g
(AT2) Averaging Time - Cancer Effects (days)	25,550 (h

Notes:

a. Plume Maximum Exposure (PME) is defined by as a reasonable upperbound exposure among potentially exposed populations using EPA standard default values.

b. The default value, 20 m3/day, recommended by Standard Default Exposure Factors (EPA, 1991b).

c. For RME, assumes 8 working hours per day.

d. Based on 5 working days per week for 6 months.

e. Construction activity was assumed to occur for 6 months.

f. Body weight for adults based on Standard Default Exposure Factors (EPA, 1991b).

g. Averaging time for non-carcinogenic effects based on the exposure duration.

h. Averaging time for carcinogenic effects based on lifetime of 70 years, as identified in Standard Default Exposure Factors (EPA, 1991b).

i. Exposure to subsurface soil was evaluated for the Atlas Missle Area and Load Line 1 area only.

TABLE I - 8

EXPOSURE POINT CONCENTRATIONS IN GROUNDWATER
PLUME 1

Group	Chemicals of Concern (COCs)	Frequency of Detection	Concentration (µg/L)		
			Maximum Detected	UCL	PME
VOCS	1,1,1-Trichloroethane	0/16	ND	NA	NA
	1,2-Dichloroethene (total)	0/4	ND	NA	NA
	1,2-Dichloropropane	0/16	ND	NA	NA
	Acetone	2/6	6.00	7.21	6.00
	Chloroform	0/16	ND	NA	NA
	Methylene chloride	8/16	2.00	1.58	1.58
	Tetrachloroethene	1/16	3.00	3.66	3.00
	Trichloroethene	6/16	140.00	636.28	140.00
SVOCS	Diethyl phthalate	-	NA	NA	NA
	Di-n-butyl phthalate	-	NA	NA	NA
	N-Nitrosodiphenylamine	-	NA	NA	NA
	Phenol	-	NA	NA	NA
EXPLOSIVE	1,3,5-Trinitrobenzene (TNB)	3/16	2.20	0.40	0.40
	2,4,6-Trinitrotoluene (TNT)	1/16	6.50	0.52	0.52
	2,4-Dinitrotoluene (2,4-DNT)	0/16	ND	NA	NA
	Hexahydro-1,3,5-trinitro-1,3-5-triazine (RDX)	8/16	10.00	4.23	4.23
	Octahydro-1,3,5,7--tetranitro-1,3,5,7-tetrazocine (HMX)	1/16	0.94	0.21	0.21
METAL	Aluminum	-	NA	NA	NA
	Lead	-	NA	NA	NA
	Nickel	-	NA	NA	NA
	Vanadium	-	NA	NA	NA

Notes

NA - Not applicable

ND - Not detected

UCL - the 95%UCL of the mean concentration.

PME - Plume Maximum Exposure PME is base on the 95%UCL of the data or the maximum detected concentration, whichever is lower

TABLE I-9

EXPOSURE POINT CONCENTRATIONS IN GROUNDWATER
PLUME 2

Group	Chemicals of Concern (COCs)	Frequency of Detection	Concentration (µg/L)		
			Maximum Detected	UCL	PME
VOCS	1,1,1-Trichloroethane	0/8	ND	NA	NA
	1,2-Dichloroethene (total)	2/8	2.00	968.39	2.00
	1,2-Dichloropropane	0/8	ND	NA	NA
	Acetone	0/8	ND	NA	NA
	Chloroform	1/8	26.00	1238.58	26.00
	Methylene chloride	5/8	43.00	33.63	33.63
	Tetrachloroethene	0/8	ND	NA	NA
	Trichloroethene	6/8	1800.00	7.55E+07	1800.00
SVOCS	Diethyl phthalate	-	NA	NA	NA
	Di-n-butyl phthalate	-	NA	NA	NA
	N-Nitrosodiphenylamine	-	NA	NA	NA
	Phenol	-	NA	NA	NA
EXPLOSIVE	1,3,5-Trinitrobenzene (TNB)	0/8	ND	NA	NA
	2,4,6-Trinitrotoluene (TNT)	0/8	ND	NA	NA
	2,4-Dinitrotoluene (24DNT)	0/8	ND	NA	NA
	Hexahydro-1,3,5-trinitro-1,3-5-triazine (RDX)	0/8	ND	NA	NA
	Octahydro-1,3,5,7--tetranitro-1,3,5,7-tetrazocine (HMX)	0/8	ND	NA	NA
METAL	Aluminum	-	NA	NA	NA
	Lead	-	NA	NA	NA
	Nickel	-	NA	NA	NA
	Vanadium	-	NA	NA	NA

Notes:

NA - Not applicable

ND - Not detected

UCL - the 95%UCL of the mean concentration

PME - Plume Maximum Exposure. PME is base on the 95%UCL of the data or the maximum detected concentration, whichever is lower.

TABLE I-10

EXPOSURE POINT CONCENTRATIONS IN GROUNDWATER
PLUME 3

Group	Chemicals of Concern (COCs)	Frequency of Detection	Concentration (µg/L)		
			Maximum Detected	UCL	PME
VOCS	1,1,1-Trichloroethane	0/24	ND	NA	NA
	1,2-Dichloroethene (total)	0/24	NA	NA	NA
	1,2-Dichloropropane	0/24	ND	NA	NA
	Acetone	4/12	16.00	7.63	7.63
	Chloroform	0/24	ND	NA	NA
	Methylene chloride	10/24	6.00	1.89	1.89
	Tetrachloroethene	0/24	ND	NA	NA
	Trichloroethene	2/24	4.00	0.74	0.74
SVOCS	Diethyl phthalate	-	NA	NA	NA
	Di-n-butyl phthalate	-	NA	NA	NA
	N-Nitrosodiphenylamine	-	NA	NA	NA
	Phenol	-	NA	NA	NA
EXPLOSIVE	1,3,5-Trinitrobenzene (TNB)	1/26	2.00	0.20	0.20
	2,4,6-Trinitrotoluene (TNT)	1/26	20.00	0.41	0.41
	2,4-Dinitrotoluene (2,4-DNT)	1/26	0.97	0.17	0.17
	Hexahydro-1,3,5-trinitro-1,3-5-triazine (RDX)	17/26	98.00	18.78	18.78
	Octahydro-1,3,5,7--tetranitro-1,3,5,7-tetrazocine (HMX)	3/26	45.00	0.89	0.89
METAL	Aluminum	-	NA	NA	NA
	Lead	-	NA	NA	NA
	Nickel	-	NA	NA	NA
	Vanadium	-	NA	NA	NA

Notes:

NA - Not applicable

ND - Not detected

UCL - the 95%UCL of the mean concentration.

PME - Plume Maximum Exposure PME is base on the 95%UCL of the data or the maximum detected concentration, whichever is lower

TABLE I-11

EXPOSURE POINT CONCENTRATIONS IN GROUNDWATER
PLUME 4

Group	Chemicals of Concern (COCs)	Frequency of Detection	Concentration (µg/L)		
			Maximum Detected	UCL	PME
VOCS	1,1,1-Trichloroethane	2/26	2.00	3.44	2.00
	1,2-Dichloroethene (total)	7/10	10.00	8.03	8.03
	1,2-Dichloropropane	0/26	ND	NA	NA
	Acetone	2/8	7.00	6.62	6.62
	Chloroform	0/26	ND	NA	NA
	Methylene chloride	9/26	18.00	2.53	2.53
	Tetrachloroethene	0/26	ND	NA	NA
	Trichloroethene	14/26	180.00	304.15	180.00
SVOCS	Diethyl phthalate	2/10	1	8.09	1.00
	Di-n-butyl phthalate	2/10	1	8.09	1.00
	N-Nitrosodiphenylamine	1/10	1	7.06	1.00
	Phenol	4/10	2	7.39	2.00
EXPLOSIVE	1,3,5-Trinitrobenzene (TNB)	0/26	ND	NA	NA
	2,4,6-Trinitrotoluene (TNT)	0/26	ND	NA	NA
	2,4-Dinitrotoluene (2,4-DNT)	0/26	ND	NA	NA
	Hexahydro-1,3,5-trinitro-1,3-5-triazine (RDX)	17/26	33.00	9.39	9.39
	Octahydro-1,3,5,7--tetranitro-1,3,5,7-tetrazocine (HMX)	8/26	3.80	0.81	0.81
METAL	Aluminum	1/10	1820	494.61	494.61
	Lead	1/10	2.6	1.41	1.41
	Nickel	1/10	11.1	6.57	6.57
	Vanadium	1/10	5.5	3.28	3.28

Notes:

NA - Not applicable

ND - Not detected

UCL - the 95%UCL of the mean concentration.

PME - Plume Maximum Exposure. PME is base on the 95%UCL of the data or the maximum detected concentration, whichever is lower

TABLE I-12

AIR VOC EXPOSURE POINT CONCENTRATIONS IN SHOWER (PME APPROACH)

Chemical Name	Plume 1 (mg/m3)	Plume 2 (mg/m3)	Plume 3 (mg/m3)	Plume 4 (mg/m3)
1,1,1-Trichloroethane	NA	NA	NA	2.67E-02
1,2-Dichloroethene (total)	NA	2.67E-02	NA	1.07E-01
1,2-Dichloropropane	NA	NA	NA	NA
Acetone	8.01E-02	NA	1.02E-01	8.83E-02
Chloroform	NA	3.47E-01	NA	NA
Methylene chloride	2.11E-02	4.49E-01	2.52E-02	3.37E-02
Tetrachloroethene	4.00E-02	NA	NA	NA
Trichloroethene	1.87E+00	2.40E+01	9.87E-03	2.40E+00

Notes:

NA - Not applicable

100% volatilization was assumed .

TABLE I-13

EXPOSURE POINT CONCENTRATIONS IN SUBSURFACE SOIL (PME APPROACH)

Group	Chemicals of Concern (COCs)	Frequency of Detection	Concentration (µg/kg)			
			Maximum Detected	Mean	UCL	PME
Plume 1 (Load Line 1 Area)						
VOCS	Acetone	3/13	53	13.80	24.50	24.50
	Trichloroethene	2/13	10	6.30	7.10	7.10
Plume 2 (Atlas Missile Area)						
VOCS	Benzene	10/24	2	4.30	5.50	2.00
	Acetone	3/24	130	16.50	20.20	20.20
	Trichloroethene	2/24	4	5.60	5.90	4.00

Notes:

VOCs were the only class of chemicals analyzed.

Mean - Arithmetic mean concentration, assuming one half detection limit for non-detects.

UCL - Upper 95% confidence limit of the mean concentration.

RME - Reasonable Maximum Exposure. RME is based on the 95%UCL of the data or the maximum detected concentration, whichever is lower

TABLE I-14

AIR EXPOSURE POINT CONCENTRATIONS
SUBSURFACE SOIL

Group	Chemicals of Concern (COCs)	PME Air Concentration (mg/m3)
Plume 1 (Load Line 1 Area)		
VOCS	Acetone	6.43E-05
	Trichloroethene	9.72E-04
Plume 2 (Atlas Missile Area)		
VOCS	Acetone	5.31E-05
	Benzene	2.58E-04
	Trichloroethene	5.48E-04

Notes:

Air concentrations are based on subsurface soil exposure point concentrations presented in Table I-13, using the Farmer's Model presented in Appendix D.

TABLE I-15

SUMMARY OF PME
POTENTIAL CANCER RISKS AND NON-CARCINOGENIC HAZARD INDICES (HIs)
PLUME 1

Receptor Route	Hazard Index (HI)	Cancer Risk
Adult Resident [a]		
Groundwater Ingestion	0.3	3E-05
Shower Dermal	0.002	5E-09
Shower Inhalation	0.00006	3E-05
TOTAL	**0.3**	**6E-05**
Child Resident		
Groundwater Ingestion	0.7	1E-05
Shower Dermal	0.003	2E-09
Shower Inhalation	0.0003	3E-05
TOTAL	**0.7**	**4E-05**
On-site Worker		
Groundwater Ingestion	0.1	8E-06
Shower Dermal	0.0005	1E-09
Shower Inhalation	0.00001	7E-06
TOTAL	**0.1**	**1E-05**
Construction Worker (Load Line 1 Area)		
Shower Dermal	0.001	4E-11
Shower Inhalation	0.00003	3E-07
Groundwater Total	0.001	3E-07
Subsurface Soil Ingestion	0.0000001	3E-12
Subsurface Soil Dermal Contact	0.00000001	3E-13
Subsurface Soil VOC inhalation	0.00 [b]	2E-08
Subsurface Soil Total	0.0000001	2E-08
TOTAL	**0.001**	**3E-07**

Note:

a) 30 year exposure is assumed.

b) No inhalation Reference Dose (RfD) for chemicals of concern in the subsurface soil.

TABLE I-16

SUMMARY OF PME
POTENTIAL CANCER RISKS AND NON-CARCINOGENIC HAZARD INDICES (HIs)
PLUME 2

Receptor Route	Hazard Index (HI)	Cancer Risk
Adult Resident [a]		
Groundwater Ingestion	0.09	2E-04
Shower Dermal [b]	0.00	0E+00
Shower Inhalation	0.001	4E-04
TOTAL	**0.09**	**6E-04**
Child Resident		
Groundwater Ingestion	0.2	1E-04
Shower Dermal [b]	0.00	0E+00
Shower Inhalation	0.006	4E-04
TOTAL	**0.21**	**5E-04**
On-site Worker		
Groundwater Ingestion	0.03	7E-05
Shower Dermal	0.00	0E+00
Shower Inhalation	0.0003	9E-05
TOTAL	**0.03**	**2E-04**
Construction Worker (Atlas Missile Area)		
Shower Dermal [b]	0.00	0E+00
Shower Inhalation	0.0006	4E-06
Groundwater Total	0.0006	4E-06
Subsurface Soil Ingestion	0.0000001	4E-12
Subsurface Soil Dermal Contact	0.00000001	4E-13
Subsurface Soil VOC inhalation	0.00 (c	2E-08
Subsurface Soil Total	0.0000001	2E-08
TOTAL	**0.0006**	**4E-06**

Notes:

a) 30 year exposure is assumed.

b) All volatile components in groundwater assumed volatilize in shower; no chemicals of concern remain for dermal exposure.

c) No inhalation Reference Dose (RfD) for chemicals of concerns in the subsurface soil.

TABLE I-17

SUMMARY OF PME
POTENTIAL CANCER RISKS AND NON-CARCINOGENIC HAZARD INDICES (HIs)
PLUME 3

Receptor	Route	Hazard Index (HI)	Cancer Risk
Adult Resident [a]			
	Groundwater Ingestion	0.3	3E-05
	Shower Dermal	0.001	3E-08
	Shower Inhalation	0.00007	2E-07
	TOTAL	**0.3**	**3E-05**
Child Resident			
	Groundwater Ingestion	0.7	1E-05
	Shower Dermal	0.002	9E-09
	Shower Inhalation	0.0003	2E-07
	TOTAL	**0.7**	**1E-05**
On-site Worker			
	Groundwater Ingestion	0.1	8E-06
	Shower Dermal	0.0003	6E-09
	Shower Inhalation	0.00002	4E-08
	TOTAL	**0.1**	**8E-06**

Note:

a) 30 year exposure is assumed.

TABLE I-18

SUMMARY OF PME
POTENTIAL CANCER RISKS AND NON-CARCINOGENIC HAZARD INDICES (HIs)
PLUME 4

Receptor	Route	Hazard Index (HI)	Cancer Risk
Adult Resident [a]			
	Groundwater Ingestion	0.1	4E-05
	Shower Dermal	0.0003	1E-08
	Shower Inhalation	0.0003	4E-05
	TOTAL	**0.1**	**8E-05**
Child Resident			
	Groundwater Ingestion	0.3	2E-05
	Shower Dermal	0.0005	4E-09
	Shower Inhalation	0.001	4E-05
	TOTAL	**0.3**	**6E-05**
On-site Worker			
	Groundwater Ingestion	0.05	1E-05
	Shower Dermal	0.00008	3E-09
	Shower Inhalation	0.00008	9E-06
	TOTAL	**0.05**	**2E-05**

Note:

a) 30 year exposure is assumed.

TABLE I-19

SUMMARY OF CUMULATIVE CANCER RISKS AND HAZARD INDICES FOR SOIL (OU1) AND GROUNDWATER (OU2) PATHWAYS (PME EXPOSURE)

OU1 Source Area	OU2 Plume Area	Receptor	Hazard Indices OU1	Hazard Indices OU2	Hazard Indices Total	Cancer Risk OU1	Cancer Risk OU2	Cancer Risk Total
LL1 A	Plume 1	Child	45	0.7	45	NA	4E-05	--
		Adult	22	0.3	22	4E-04	6E-05	5E-04
		On-site Worker	0.2	0.1	0.3	1E-06	1E-05	1E-05
LL1B	Plume 1	Child	3,400	0.7	3,401	NA	4E-05	-
		Adult	1,070	0.3	1070	2E-02	6E-05	2E-02
		On-site Worker	2	0.1	2	1E-05	1E-05	2E-05
LL1C	Plume 1	Child	3,400	0.7	3,401	NA	4E-05	-
		Adult	1,060	0.3	1,060	2E-02	6E-05	2E-02
		On-site Worker	2	0.1	2	1E-05	1E-05	2E-05
LL1D	Plume 1	Child	220	0.7	221	NA	4E-05	-
		Adult	84	0.3	84	1E-03	6E-05	1E-03
		On-site Worker	0.3	0.1	0.4	1E-06	1E-05	1E-05
LL1E	Plume 1	Child	670	0.7	671	NA	4E-05	-
		Adult	310	0.3	310	4E-03	6E-05	4E-03
		On-site Worker	0.1	0.1	0.2	6E-07	1E-05	1E-05
LL1F	Plume 1	Child	22	0.7	23	NA	4E-05	-
		Adult	8	0.3	8	1E-04	6E-05	2E-04
		On-site Worker	0.01	0.1	0.1	4E-08	1E-05	1E-05
LL1G	Plume 1	Child	220	0.7	221	NA	4E-05	-
		Adult	73	0.3	73	1E-03	6E-05	1E-03
		On-site Worker	0.06	0.1	0.2	3E-07	1E-05	1E-05
LL2A	Plume 3	Child	1,100	0.7	1,101	NA	1E-05	-
		Adult	420	0.3	420	5E-02	3E-05	5E-02
		On-site Worker	3	0.1	3	6E-05	8E-06	7E-05
LL2B	Plume 3	Child	5,150	0.7	5,151	NA	1E-05	-
		Adult	2,100	0.3	2,100	5E-02	3E-05	5E-02
		On-site Worker	4.0	0.1	4	3E-05	8E-06	4E-05
LL2C	Plume 3	Child	210	0.7	211	NA	1E-05	-
		Adult	84	0.3	84	2E-02	3E-05	2E-02
		On-site Worker	0.3	0.1	0.4	8E-06	8E-06	2E-05
LL2D	Plume 3	Child	5	0.7	6	NA	1E-05	-
		Adult	2	0.3	2	7E-04	3E-05	7E-04
		On-site Worker	0.003	0.1	0.1	2E-07	8E-06	8E-06
LL3A	Plume 3	Child	27	0.1	27	NA	1E-05	-
		Adult	11	0.3	11	2E-04	3E-05	2E-04
		On-site Worker	0.01	0.1	0.1	5E-08	8E-06	8E-06

Notes:

NA - Not applicable, cancer risk evaluated for adult residents only.

OU1 Hazard Indices and Cancer risk values from Tables 5-4 and 5-9 (Site workers) and 5-13 (resident).

OU1 Burning/Proving Grounds areas (BPGA, BPGB, and BPGC) are close to both Plume 2 and Plume 4 overlap areas, the cumulative cancer risks and non-carcinogenic Hazard Indices for both Plume areas are calculated.

OU1 Bomb Booster assembly Area (BBA) did not overlap with any of the groundwater contaminant plumes.

TABLE I-19 (Continued)

SUMMARY OF CUMULATIVE CANCER RISKS AND HAZARD INDICES FOR SOIL (OU1) AND GROUNDWATER (OU2) PATHWAYS (PME EXPOSURE)

OU1	OU2		HAZARD INDICES			CANCER RISK		
Source Area	Plume Area	Receptor	OU1	OU2	TOTAL	OU1	OU2	TOTAL
LL3B	Plume 3	Child	1,100	0.7	1,101	NA	1E-05	-
		Adult	420	0.3	420	7E-03	3E-05	7E-03
		On-site Worker	1	0.1	1	5E-06	8E-06	1E-05
LL3C	Plume 3	Child	4	0.7	5	NA	1E-05	-
		Adult	2	0.3	2	2E-05	3E-05	5E-05
		On-site Worker	0.01	0.1	0.1	3E-08	8E-06	8E-06
LL3D	Plume 3	Child	73	0.7	74	NA	1E-05	-
		Adult	32	0.3	32	5E-04	3E-05	5E-04
		On-site Worker	0.04	0.1	0.1	2E-07	8E-06	8E-06
LL4A	Plume 2	Child	27	0.2	27	NA	5E-04	-
		Adult	11	0.09	11	3E-04	6E-04	9E-04
		On-site Worker	0.02	0.03	0.05	2E-07	2E-04	2E-04
LL4B	Plume 2	Child	0.7	0.2	0.9	NA	5E-04	-
		Adult	0.3	0.09	0.4	4E-06	6E-04	6E-04
		On-site Worker	0.0001	0.03	0.03	6E-10	2E-04	2E-04
BPGA	Plume 2	Child	66	0.2	66	NA	5E-04	-
		Adult	34	0.09	34	5E-03	6E-04	6E-03
		On-site Worker	1.0	0.03	1.0	9E-06	2E-04	2E-04
BPGB	Plume 2	Child	3.4	0.2	3.6	NA	5E-04	-
		Adult	1.1	0.09	1.2	5E-05	6E-04	7E-04
		On-site Worker	0.01	0.03	0.04	2E-07	2E-04	2E-04
BPGC	Plume 2	Child	0.3	0.2	0.5	NA	5E-04	-
		Adult	0.1	0.09	0.2	3E-05	6E-04	6E-04
		On-site Worker	0.001	0.03	0.03	5E-08	2E-04	2E-04
BPGA	Plume 4	Child	66	0.3	66	NA	6E-05	-
		Adult	34	0.1	34	5E-03	8E-05	5E-03
		On-site Worker	1	0.05	1	9E-06	2E-05	3E-05
BPGB	Plume 4	Child	3	0.3	3	NA	6E-05	-
		Adult	1	0.1	1	5E-05	8E-05	1E-04
		On-site Worker	0.01	0.05	0.06	2E-07	2E-05	2E-05
BPGC	Plume 4	Child	0.3	0.3	0.6	NA	6E-05	-
		Adult	0.1	0.1	0.2	3E-05	8E-05	1E-04
		On-site Worker	0.001	0.05	0.05	5E-08	2E-05	2E-05
BBA	--	Child	1	--	--	NA	--	--
		Adult	1	--	--	5E-06	--	--
		On-site Worker	0.01	--	--	7E-10	--	--

Notes:

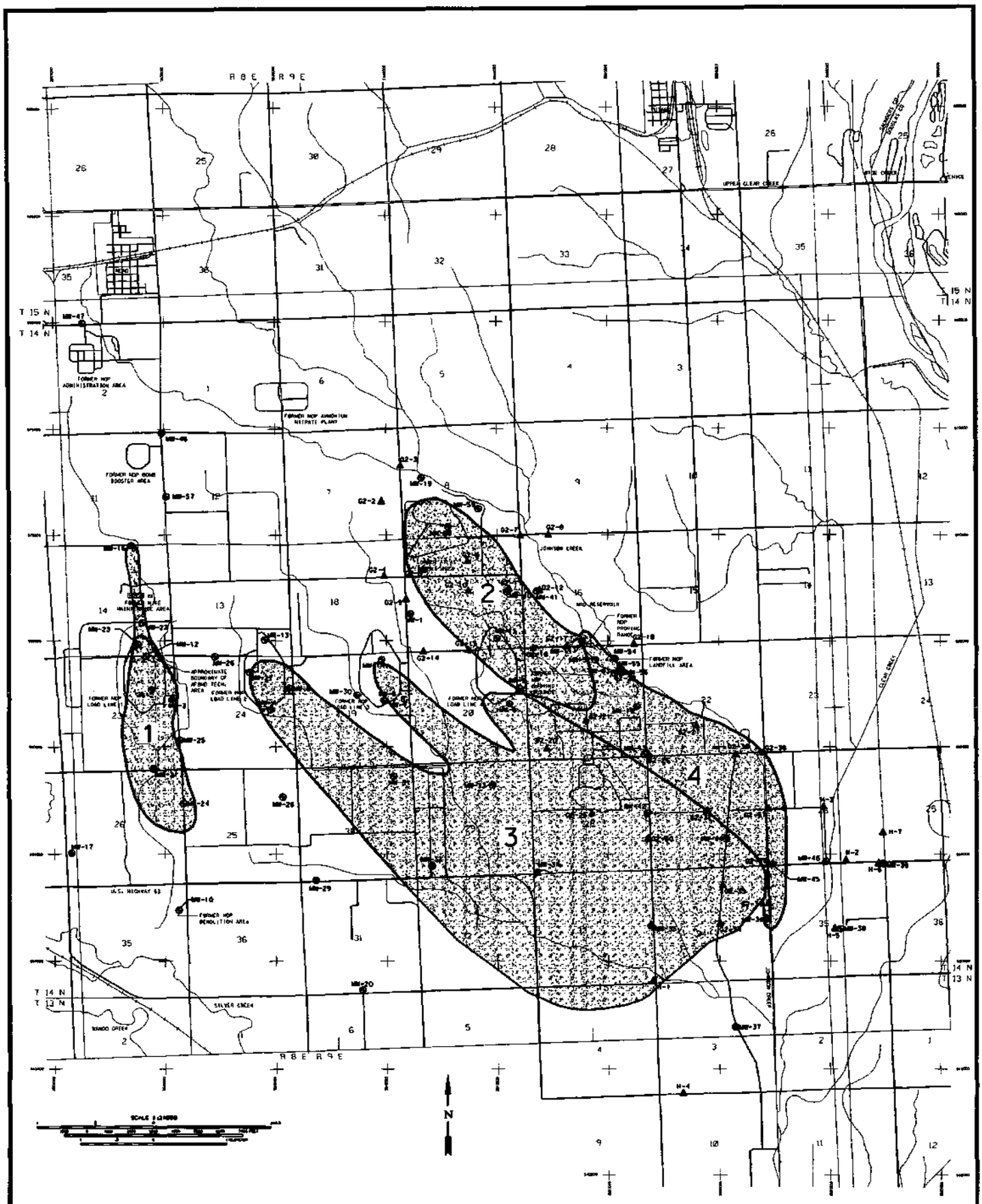
NA - Not applicable, cancer risk evaluated for adult residents only.

OU1 Hazard Indices and Cancer risk values from Tables 5-4 and 5-9 (Site workers) and 5-13 (resident).

OU1 Burning/Proving Grounds areas (BPGA, BPGB, and BPGC) are close to both Plume 2 and Plume 4 overlap areas, the cumulative cancer risks and non-carcinogenic Hazard Indices for both Plume areas are calculated.

OU1 Bomb Booster assembly Area (BBA) did not overlap with any of the groundwater contaminant plumes.

FIGURES FOR APPENDIX I



LEGEND:

2	APPROXIMATE BOUNDARY AND I.D. NUMBER OF PLUME
MW-10	GROUNDWATER MONITORING WELL CLUSTER LOCATION
G2-30	GROUNDWATER HEADSPACE SCREENING LOCATION
36	SECTION
T 14 N	TOWNSHIP 14 NORTH
R 9 E	RANGE 9 EAST

NOTES:

1. PLUMES SHOWN ON THIS DRAWING REPRESENT AUGUST 1992 GROUNDWATER SAMPLING DATA.
2. DETECTION LIMIT (ND) FOR TCE IS 1.0 µg/L. DETECTION LIMIT (ND) FOR RDX IS 0.15 µg/L. DETECTION LIMIT (ND) FOR TNT IS 0.25 µg/L.
3. NORTHING AND EASTING LINES ARE TIED TO NEBRASKA STATE PLANAR COORDINATES.

SOURCE: USGS 7.5 MIN QUADRANGLES (1969) FOR MEAD, ASHLAND EAST, ASHLAND WEST, AND WANN 1927 NAD, 1929 NGVD

Revisions			
Symbol	Descriptions	Date	Apprv'd

Woodward-Clyde Consultants
Overland Park, Kansas

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

Designed by: A.C.E.
Drawn by: M.A.L.
Checked by: R.F.S.
Submitted by:

U.S. Army Corps of Engineers

BASELINE RISK ASSESSMENT
FOR OPERABLE UNIT NO. 2 - GROUNDWATER
FMR NEBRASKA ORDNANCE PLANT - MEAD, NE

CONTAMINANT PLUMES FOR GROUNDWATER

Scale: AS NOTED
Date: APRIL, 1994
Figure No.: I-1
Sheet number: 1

MCS FILE: MD-FS-1

B07NE003702-08017

ATTACHMENTS FOR APPENDIX I

ATTACHMENT IA
PME RISK CALCULATIONS

RISK EQUATIONS

CALCULATION OF CHRONIC DAILY INTAKE (CDI)

For soil ingestion:

CDI = (C(X) * IR * EF * ED * CF) / (BW * AT1 or AT2)

For groundwater ingestion:

CDI = (C(X) * IR * EF * ED) / (BW * AT1 or AT2)

For dermal soil contact:

CDI = (C(X) * SA * AD * AB * EF * ED * CF) / (BW * AT1 or AT2)

For inhalation exposure:

CDI = (C(X) * IH * ET * EF * ED) / (BW * AT1 or AT2)

For dermal contact while showering:

CDI = (C(X) * SA * PC * ET * EF * ED * CF) / (BW * AT1 or AT2)

Where:
C(X) = Chemical concentration (mg/kg soil; mg/L water; mg/m3 air)
IR = Ingestion rate (mg/day soil or L/day water)
IH = Inhalation rate (m3/hour)
ET = Exposure time (hours/day)
EF = Exposure frequency (days/year)
ED = Exposure duration (years)
BW = Body weight (kg)
SA = Exposed body surface area (cm2)
AD = Soil adherence to skin (mg/cm2)
AB = Percent chemical absorption across skin (unitless)
PC = Permeability constant (cm2/hour)
CF = Conversion factor (1 L/1000 cm3 dermal water; 10E-6 kg/mg soil ingestion and dermal contact)
AT1 = Averaging time for non-carcinogenic effects (days)
AT2 = Averaging time for carcinogenic effects, based on lifetime (days)

CALCULATION OF CANCER RISK AND HAZARD INDEX

Cancer risk = Slope Factor * CDI

Hazard Index = CDI / Reference dose

TABLE 1
CHEMICAL PARAMETER TABLE FOR PLUME 1

Chemical	RME Concentration					Reference Dose		Slope Factor		Permeability Constant	Dermal Absorption
	Surface Soil (mg/kg)	Sediment (mg/kg)	Surface Water (mg/L)	Ground Water (mg/L)	Air (mg/m3)	Oral	Inhalation	Oral	Inhalation		(Soil)
RDX				0.00423		0.003		0.11		0.000348	0.01
HMX				0.00021		0.05				0.000348	0.01
TNB				0.0004		5E-05				0.0038	0.01
TNT				0.00052		0.0005		0.03		0.0038	0.01
2,4-DNT						0.002		0.68		0.0038	0.01
Aluminum										0.001	0.001
Nickel						0.02				0.001	0.001
Vanadium						0.007				0.001	0.001
Di-N-Butylphthalate						0.1				0.363	0.01
Diethylphthalate						0.8				0.00502	0.01
Phenol						0.6				0.00554	0.01
N-Nitrosodiphenylamine								0.0049		0.036	
1,2-DCE						0.009				0.00128	0.01
Acetone				0.006	0.0801	0.1				0.00057	0.01
Methylene Chloride				0.00158	0.0211	0.06	0.86	0.0075	0.00165	0.00446	0.01
Trichloroethene				0.14	1.87			0.011	0.017	0.0148	0.01
Benzene								0.029	0.029		0.01
1,1,1-Trichloroethane						0.09	0.29			0.017	0.01
1,2-Dichloropropane							0.00114	0.068		0.01	0.01
Tetrachloroethene				0.003	0.04	0.01		0.052	0.002	0.048	0.01
Chloroform						0.01		0.0061	0.081	0.0089	0.01

Notebook = ChemData

TABLE 2
ADULT RESIDENT GROUNDWATER INGESTION SCENARIO, PLUME 1

chemical	C(x) (mg/L)	IR (L/d)	EF (d/yr)	ED (years)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0.00423	2	350	30	70	10950	25550	1.16E-04	0.003	3.86E-02	4.97E-05	0.11	5.46E-06
HMX	0.00021	2	350	30	70	10950	25550	5.75E-06	0.05	1.15E-04	2.47E-06	0	0.00E+00
TNB	0.0004	2	350	30	70	10950	25550	1.10E-05	5E-05	2.19E-01	4.70E-06	0	0.00E+00
TNT	0.00052	2	350	30	70	10950	25550	1.42E-05	0.0005	2.85E-02	6.11E-06	0.03	1.83E-07
2,4-DNT	0	2	350	30	70	10950	25550	0.00E+00	0.002	0.00E+00	0.00E+00	0.68	0.00E+00
	0	2	350	30	70	10950	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Aluminum	0	2	350	30	70	10950	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Nickel	0	2	350	30	70	10950	25550	0.00E+00	0.02	0.00E+00	0.00E+00	0	0.00E+00
Vanadium	0	2	350	30	70	10950	25550	0.00E+00	0.007	0.00E+00	0.00E+00	0	0.00E+00
	0	2	350	30	70	10950	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Di-N-Butylphthalate	0	2	350	30	70	10950	25550	0.00E+00	0.1	0.00E+00	0.00E+00	0	0.00E+00
Diethylphthalate	0	2	350	30	70	10950	25550	0.00E+00	0.8	0.00E+00	0.00E+00	0	0.00E+00
Phenol	0	2	350	30	70	10950	25550	0.00E+00	0.6	0.00E+00	0.00E+00	0	0.00E+00
N-Nitrosodiphenylamine	0	2	350	30	70	10950	25550	0.00E+00	0	0.00E+00	0.00E+00	0.0049	0.00E+00
	0	2	350	30	70	10950	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
1,2-DCE	0	2	350	30	70	10950	25550	0.00E+00	0.009	0.00E+00	0.00E+00	0	0.00E+00
Acetone	0.006	2	350	30	70	10950	25550	1.64E-04	0.1	1.64E-03	7.05E-05	0	0.00E+00
Methylene Chloride	0.00158	2	350	30	70	10950	25550	4.33E-05	0.06	7.21E-04	1.86E-05	0.0075	1.39E-07
Trichloroethene	0.14	2	350	30	70	10950	25550	3.84E-03	0	0.00E+00	1.64E-03	0.011	1.81E-05
Benzene	0	2	350	30	70	10950	25550	0.00E+00	0	0.00E+00	0.00E+00	0.029	0.00E+00
1,1,1-Trichloroethane	0	2	350	30	70	10950	25550	0.00E+00	0.09	0.00E+00	0.00E+00	0	0.00E+00
1,2-Dichloropropane	0	2	350	30	70	10950	25550	0.00E+00	0	0.00E+00	0.00E+00	0.068	0.00E+00
Tetrachloroethene	0.003	2	350	30	70	10950	25550	8.22E-05	0.01	8.22E-03	3.52E-05	0.052	1.83E-06
Chloroform	0	2	350	30	70	10950	25550	0.00E+00	0.01	0.00E+00	0.00E+00	0.0061	0.00E+00
Notebook = AdultRME									HI =	2.97E-01		CR =	2.57E-05

TABLE 3
ADULT RESIDENT DERMAL SHOWER SCENARIO, PLUME 1

chemical	C(x) (mg/L)	SA (cm2)	PC (cm/hr)	ET (h/d)	EF (d/yr)	ED (years)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0.00423	19400	0.000348	0.2	350	30	70	10950	25550	7.82E-08	0.003	2.61E-05	3.35E-08	0.11	3.69E-09
HMX	0.00021	19400	0.000348	0.2	350	30	70	10950	25550	3.88E-09	0.05	7.77E-08	1.66E-09	0	0.00E+00
TNB	0.0004	19400	0.0038	0.2	350	30	70	10950	25550	8.08E-08	5E-05	1.62E-03	3.46E-08	0	0.00E+00
TNT	0.00052	19400	0.0038	0.2	350	30	70	10950	25550	1.05E-07	0.0005	2.10E-04	4.5E-08	0.03	1.35E-09
2,4-DNT	0	19400	0.0038	0.2	350	30	70	10950	25550	0.00E+00	0.002	0.00E+00	0	0.68	0.00E+00
	0	19400	0	0.2	350	30	70	10950	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Aluminum	0	19400	0.001	0.2	350	30	70	10950	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Nickel	0	19400	0.001	0.2	350	30	70	10950	25550	0.00E+00	0.02	0.00E+00	0	0	0.00E+00
Vanadium	0	19400	0.001	0.2	350	30	70	10950	25550	0.00E+00	0.007	0.00E+00	0	0	0.00E+00
	0	19400	0	0.2	350	30	70	10950	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Di-N-Butylphthalate	0	19400	0.363	0.2	350	30	70	10950	25550	0.00E+00	0.1	0.00E+00	0	0	0.00E+00
Diethylphthalate	0	19400	0.00502	0.2	350	30	70	10950	25550	0.00E+00	0.8	0.00E+00	0	0	0.00E+00
Phenol	0	19400	0.00554	0.2	350	30	70	10950	25550	0.00E+00	0.6	0.00E+00	0	0	0.00E+00
N-Nitrosodiphenylamine	0	19400	0.036	0.2	350	30	70	10950	25550	0.00E+00	0	0.00E+00	0	0.0049	0.00E+00
	0	19400	0	0.2	350	30	70	10950	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
1,2-DCE	0	19400	0.00128	0.2	350	30	70	10950	25550	0.00E+00	0.009	0.00E+00	0	0	0.00E+00
Acetone	0	19400	0.00057	0.2	350	30	70	10950	25550	0.00E+00	0.1	0.00E+00	0	0	0.00E+00
Methylene Chloride	0	19400	0.00446	0.2	350	30	70	10950	25550	0.00E+00	0.06	0.00E+00	0	0.0075	0.00E+00
Trichloroethene	0	19400	0.0148	0.2	350	30	70	10950	25550	0.00E+00	0	0.00E+00	0	0.011	0.00E+00
Benzene	0	19400	0	0.2	350	30	70	10950	25550	0.00E+00	0	0.00E+00	0	0.029	0.00E+00
1,1,1-Trichloroethane	0	19400	0.017	0.2	350	30	70	10950	25550	0.00E+00	0.09	0.00E+00	0	0	0.00E+00
1,2-Dichloropropane	0	19400	0.01	0.2	350	30	70	10950	25550	0.00E+00	0	0.00E+00	0	0.068	0.00E+00
Tetrachloroethene	0	19400	0.048	0.2	350	30	70	10950	25550	0.00E+00	0.01	0.00E+00	0	0.052	0.00E+00
Chloroform	0	19400	0.0089	0.2	350	30	70	10950	25550	0.00E+00	0.01	0.00E+00	0	0.0061	0.00E+00
											HI =	1.85E-03		CR =	5.04E-09

* Assumes 100 percent volatilization of VOCs, so none available for dermal absorption

TABLE 4
ADULT RESIDENT SHOWER INHALATION SCENARIO, PLUME 1.

chemical	C(x) (mg/m3)	IH (m3/h)	ET (hr/d)	EF (d/yr)	ED (yr)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0	0.83	0.2	350	30	70	10950	25550	0	0	0.00E+00	0	0	0.00E+00
HMX	0	0.83	0.2	350	30	70	10950	25550	0	0	0.00E+00	0	0	0.00E+00
TNB	0	0.83	0.2	350	30	70	10950	25550	0	0	0.00E+00	0	0	0.00E+00
TNT	0	0.83	0.2	350	30	70	10950	25550	0	0	0.00E+00	0	0	0.00E+00
2,4-DNT	0	0.83	0.2	350	30	70	10950	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.2	350	30	70	10950	25550	0	0	0.00E+00	0	0	0.00E+00
Aluminum	0	0.83	0.2	350	30	70	10950	25550	0	0	0.00E+00	0	0	0.00E+00
Nickel	0	0.83	0.2	350	30	70	10950	25550	0	0	0.00E+00	0	0	0.00E+00
Vanadium	0	0.83	0.2	350	30	70	10950	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.2	350	30	70	10950	25550	0	0	0.00E+00	0	0	0.00E+00
Di-N-Butylphthalate	0	0.83	0.2	350	30	70	10950	25550	0	0	0.00E+00	0	0	0.00E+00
Diethylphthalate	0	0.83	0.2	350	30	70	10950	25550	0	0	0.00E+00	0	0	0.00E+00
Phenol	0	0.83	0.2	350	30	70	10950	25550	0	0	0.00E+00	0	0	0.00E+00
N-Nitrosodiphenylamine	0	0.83	0.2	350	30	70	10950	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.2	350	30	70	10950	25550	0	0	0.00E+00	0	0	0.00E+00
1,2-DCE	0	0.83	0.2	350	30	70	10950	25550	0	0	0.00E+00	0	0	0.00E+00
Acetone	0.0801	0.83	0.2	350	30	70	10950	25550	0.00018215	0	0.00E+00	7.806E-05	0	0.00E+00
Methylene Chloride	0.0211	0.83	0.2	350	30	70	10950	25550	4.798E-05	0.86	5.58E-05	2.056E-05	0.00165	3.39E-08
Trichloroethene	1.87	0.83	0.2	350	30	70	10950	25550	0.00425233	0	0.00E+00	0.0018224	0.017	3.10E-05
Benzene	0	0.83	0.2	350	30	70	10950	25550	0	0	0.00E+00	0	0.029	0.00E+00
1,1,1-Trichloroethane	0	0.83	0.2	350	30	70	10950	25550	0	0.29	0.00E+00	0	0	0.00E+00
1,2-Dichloropropane	0	0.83	0.2	350	30	70	10950	25550	0	0.00114	0.00E+00	0	0	0.00E+00
Tetrachloroethene	0.04	0.83	0.2	350	30	70	10950	25550	9.096E-05	0	0.00E+00	3.898E-05	0.002	7.80E-08
Chloroform	0	0.83	0.2	350	30	70	10950	25550	0	0	0.00E+00	0	0.081	0.00E+00
										HI =	5.58E-05		CR =	3.11E-05

TABLE 5
CHILD (0-6 YEAR) RESIDENT GROUNDWATER INGESTION SCENARIO, PLUME 1

chemical	C(x) (mg/L)	IR (L/d)	EF (d/yr)	ED (years)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0.00423	1	350	6	15	2190	25550	2.70E-04	0.003	9.01E-02	2.32E-05	0.11	2.55E-06
HMX	0.00021	1	350	6	15	2190	25550	1.34E-05	0.05	2.68E-04	1.15E-06	0	0.00E+00
TNB	0.0004	1	350	6	15	2190	25550	2.56E-05	5E-05	5.11E-01	2.19E-06	0	0.00E+00
TNT	0.00052	1	350	6	15	2190	25550	3.32E-05	0.0005	6.65E-02	2.85E-06	0.03	8.55E-08
2,4-DNT	0	1	350	6	15	2190	25550	0.00E+00	0.002	0.00E+00	0.00E+00	0.68	0.00E+00
	0	1	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Aluminum	0	1	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Nickel	0	1	350	6	15	2190	25550	0.00E+00	0.02	0.00E+00	0.00E+00	0	0.00E+00
Vanadium	0	1	350	6	15	2190	25550	0.00E+00	0.007	0.00E+00	0.00E+00	0	0.00E+00
	0	1	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Di-N-Butylphthalate	0	1	350	6	15	2190	25550	0.00E+00	0.1	0.00E+00	0.00E+00	0	0.00E+00
Diethylphthalate	0	1	350	6	15	2190	25550	0.00E+00	0.8	0.00E+00	0.00E+00	0	0.00E+00
Phenol	0	1	350	6	15	2190	25550	0.00E+00	0.6	0.00E+00	0.00E+00	0	0.00E+00
N-Nitrosodiphenylamine	0	1	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0.00E+00	0.0049	0.00E+00
	0	1	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
1,2-DCE	0	1	350	6	15	2190	25550	0.00E+00	0.009	0.00E+00	0.00E+00	0	0.00E+00
Acetone	0.006	1	350	6	15	2190	25550	3.84E-04	0.1	3.84E-03	3.29E-05	0	0.00E+00
Methylene Chloride	0.00158	1	350	6	15	2190	25550	1.01E-04	0.06	1.68E-03	8.66E-06	0.0075	6.49E-08
Trichloroethene	0.14	1	350	6	15	2190	25550	8.95E-03	0	0.00E+00	7.67E-04	0.011	8.44E-06
Benzene	0	1	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0.00E+00	0.029	0.00E+00
1,1,1-Trichloroethane	0	1	350	6	15	2190	25550	0.00E+00	0.09	0.00E+00	0.00E+00	0	0.00E+00
1,2-Dichloropropane	0	1	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0.00E+00	0.068	0.00E+00
Tetrachloroethene	0.003	1	350	6	15	2190	25550	1.92E-04	0.01	1.92E-02	1.64E-05	0.052	8.55E-07
Chloroform	0	1	350	6	15	2190	25550	0.00E+00	0.01	0.00E+00	0.00E+00	0.0061	0.00E+00
									HI =	6.93E-01		CR =	1.20E-05

Notebook = ChildRME

TABLE 6
CHILD (0-6 YEAR) RESIDENT DERMAL SHOWER SCENARIO, PLUME 1

chemical	C(x) (mg/L)	SA (cm2)	PC (cm/hr)	ET (h/d)	EF (d/yr)	ED (years)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0.00423	6670	0.00035	0.2	350	6	15	2190	25550	1.26E-07	0.003	4.18E-05	1.076E-08	0.11	1.18E-09
HMX	0.00021	6670	0.00035	0.2	350	6	15	2190	25550	6.23E-09	0.05	1.25E-07	5.342E-10	0	0.00E+00
TNB	0.0004	6670	0.0038	0.2	350	6	15	2190	25550	1.30E-07	5E-05	2.59E-03	1.111E-08	0	0.00E+00
TNT	0.00052	6670	0.0038	0.2	350	6	15	2190	25550	1.69E-07	0.0005	3.37E-04	1.444E-08	0.03	4.33E-10
2,4-DNT	0	6670	0.0038	0.2	350	6	15	2190	25550	0.00E+00	0.002	0.00E+00	0	0.68	0.00E+00
	0	6670	0	0.2	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Aluminum	0	6670	0.001	0.2	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Nickel	0	6670	0.001	0.2	350	6	15	2190	25550	0.00E+00	0.02	0.00E+00	0	0	0.00E+00
Vanadium	0	6670	0.001	0.2	350	6	15	2190	25550	0.00E+00	0.007	0.00E+00	0	0	0.00E+00
	0	6670	0	0.2	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Di-N-Butylphthalate	0	6670	0.363	0.2	350	6	15	2190	25550	0.00E+00	0.1	0.00E+00	0	0	0.00E+00
Diethylphthalate	0	6670	0.00502	0.2	350	6	15	2190	25550	0.00E+00	0.8	0.00E+00	0	0	0.00E+00
Phenol	0	6670	0.00554	0.2	350	6	15	2190	25550	0.00E+00	0.6	0.00E+00	0	0	0.00E+00
N-Nitrosodiphenylamine	0	6670	0.036	0.2	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0.0049	0.00E+00
	0	6670	0	0.2	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
1,2-DCE	0	6670	0.00128	0.2	350	6	15	2190	25550	0.00E+00	0.009	0.00E+00	0	0	0.00E+00
Acetone	0	6670	0.00057	0.2	350	6	15	2190	25550	0.00E+00	0.1	0.00E+00	0	0	0.00E+00
Methylene Chloride	0	6670	0.00446	0.2	350	6	15	2190	25550	0.00E+00	0.06	0.00E+00	0	0.0075	0.00E+00
Trichloroethene	0	6670	0.0148	0.2	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0.011	0.00E+00
Benzene	0	6670	0	0.2	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0.029	0.00E+00
1,1,1-Trichloroethane	0	6670	0.017	0.2	350	6	15	2190	25550	0.00E+00	0.09	0.00E+00	0	0	0.00E+00
1,2-Dichloropropane	0	6670	0.01	0.2	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0.068	0.00E+00
Tetrachloroethene	0	6670	0.048	0.2	350	6	15	2190	25550	0.00E+00	0.01	0.00E+00	0	0.052	0.00E+00
Chloroform	0	6670	0.0089	0.2	350	6	15	2190	25550	0.00E+00	0.01	0.00E+00	0	0.0061	0.00E+00
											HI =	2.97E-03		CR =	1.62E-09

* Assumes 100 percent volatilization of VOCs, so none available for dermal absorption

TABLE 7
CHILD (0-6 YEAR) RESIDENT SHOWER INHALATION SCENARIO, PLUME 1

chemical	C(x) (mg/m3)	IR (m3/h)	ET (hr/d)	EF (d/yr)	ED (yr)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
HMX	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
TNB	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
TNT	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
2,4-DNT	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
Aluminum	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
Nickel	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
Vanadium	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
Di-N-Butylphthalate	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
Diethylphthalate	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
Phenol	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
N-Nitrosodiphenylamine	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
1,2-DCE	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
Acetone	0.0801	0.83	0.2	350	6	15	2190	25550	0.00085001	0	0.00E+00	7.286E-05	0	0.00E+00
Methylene Chloride	0.0211	0.83	0.2	350	6	15	2190	25550	0.00022391	0.86	2.60E-04	1.919E-05	0.00165	3.17E-08
Trichloroethene	1.87	0.83	0.2	350	6	15	2190	25550	0.0198442	0	0.00E+00	0.0017009	0.017	2.89E-05
Benzene	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0.029	0.00E+00
1,1,1-Trichloroethane	0	0.83	0.2	350	6	15	2190	25550	0	0.29	0.00E+00	0	0	0.00E+00
1,2-Dichloropropane	0	0.83	0.2	350	6	15	2190	25550	0	0.00114	0.00E+00	0	0	0.00E+00
Tetrachloroethene	0.04	0.83	0.2	350	6	15	2190	25550	0.00042447	0	0.00E+00	3.638E-05	0.002	7.28E-08
Chloroform	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0.081	0.00E+00
										HI =	2.60E-04		CR =	2.90E-05

TABLE 8
ON-SITE WORKER GROUNDWATER INGESTION SCENARIO, PLUME 1

chemical	C(x) (mg/L)	IR (L/d)	EF (d/yr)	ED (years)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0.00423	1	250	25	70	9125	25550	4.14E-05	0.003	1.38E-02	1.48E-05	0.11	1.63E-06
HMX	0.00021	1	250	25	70	9125	25550	2.05E-06	0.05	4.11E-05	7.34E-07	0	0.00E+00
TNB	0.0004	1	250	25	70	9125	25550	3.91E-06	5E-05	7.83E-02	1.40E-06	0	0.00E+00
TNT	0.00052	1	250	25	70	9125	25550	5.09E-06	0.0005	1.02E-02	1.82E-06	0.03	5.45E-08
2,4-DNT	0	1	250	25	70	9125	25550	0.00E+00	0.002	0.00E+00	0.00E+00	0.68	0.00E+00
	0	1	250	25	70	9125	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Aluminum	0	1	250	25	70	9125	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Nickel	0	1	250	25	70	9125	25550	0.00E+00	0.02	0.00E+00	0.00E+00	0	0.00E+00
Vanadium	0	1	250	25	70	9125	25550	0.00E+00	0.007	0.00E+00	0.00E+00	0	0.00E+00
	0	1	250	25	70	9125	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Di-N-Butylphthalate	0	1	250	25	70	9125	25550	0.00E+00	0.1	0.00E+00	0.00E+00	0	0.00E+00
Diethylphthalate	0	1	250	25	70	9125	25550	0.00E+00	0.8	0.00E+00	0.00E+00	0	0.00E+00
Phenol	0	1	250	25	70	9125	25550	0.00E+00	0.6	0.00E+00	0.00E+00	0	0.00E+00
N-Nitrosodiphenylamine	0	1	250	25	70	9125	25550	0.00E+00	0	0.00E+00	0.00E+00	0.0049	0.00E+00
	0	1	250	25	70	9125	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
1,2-DCE	0	1	250	25	70	9125	25550	0.00E+00	0.009	0.00E+00	0.00E+00	0	0.00E+00
Acetone	0.006	1	250	25	70	9125	25550	5.87E-05	0.1	5.87E-04	2.10E-05	0	0.00E+00
Methylene Chloride	0.00158	1	250	25	70	9125	25550	1.55E-05	0.06	2.58E-04	5.52E-06	0.0075	4.14E-08
Trichloroethene	0.14	1	250	25	70	9125	25550	1.37E-03	0	0.00E+00	4.89E-04	0.011	5.38E-06
Benzene	0	1	250	25	70	9125	25550	0.00E+00	0	0.00E+00	0.00E+00	0.029	0.00E+00
1,1,1-Trichloroethane	0	1	250	25	70	9125	25550	0.00E+00	0.09	0.00E+00	0.00E+00	0	0.00E+00
1,2-Dichloropropane	0	1	250	25	70	9125	25550	0.00E+00	0	0.00E+00	0.00E+00	0.068	0.00E+00
Tetrachloroethene	0.003	1	250	25	70	9125	25550	2.94E-05	0.01	2.94E-03	1.05E-05	0.052	5.45E-07
Chloroform	0	1	250	25	70	9125	25550	0.00E+00	0.01	0.00E+00	0.00E+00	0.0061	0.00E+00
Notebook = WorkRME									HI =	1.06E-01		CR =	7.65E-06

TABLE 9
ON-SITE WORKER DERMAL SHOWER SCENARIO, PLUME 1

chemical	C(x) (mg/L)	SA (cm2)	PC (cm/hr)	ET (h/d)	EF (d/yr)	ED (years)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0.00423	19400	0.000348	0.2	90	25	70	9125	25550	2.01E-08	0.003	6.71E-06	7.19E-09	0.11	7.90E-10
HMX	0.00021	19400	0.000348	0.2	90	25	70	9125	25550	9.99E-10	0.05	2.00E-08	3.57E-10	0	0.00E+00
TNB	0.0004	19400	0.0038	0.2	90	25	70	9125	25550	2.08E-08	5E-05	4.15E-04	7.42E-09	0	0.00E+00
TNT	0.00052	19400	0.0038	0.2	90	25	70	9125	25550	2.70E-08	0.0005	5.40E-05	9.65E-09	0.03	2.89E-10
2,4-DNT	0	19400	0.0038	0.2	90	25	70	9125	25550	0.00E+00	0.002	0.00E+00	0	0.68	0.00E+00
	0	19400	0	0.2	90	25	70	9125	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Aluminum	0	19400	0.001	0.2	90	25	70	9125	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Nickel	0	19400	0.001	0.2	90	25	70	9125	25550	0.00E+00	0.02	0.00E+00	0	0	0.00E+00
Vanadium	0	19400	0.001	0.2	90	25	70	9125	25550	0.00E+00	0.007	0.00E+00	0	0	0.00E+00
	0	19400	0	0.2	90	25	70	9125	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Di-N-Butylphthalate	0	19400	0.363	0.2	90	25	70	9125	25550	0.00E+00	0.1	0.00E+00	0	0	0.00E+00
Diethylphthalate	0	19400	0.00502	0.2	90	25	70	9125	25550	0.00E+00	0.8	0.00E+00	0	0	0.00E+00
Phenol	0	19400	0.00554	0.2	90	25	70	9125	25550	0.00E+00	0.6	0.00E+00	0	0	0.00E+00
N-Nitrosodiphenylamine	0	19400	0.036	0.2	90	25	70	9125	25550	0.00E+00	0	0.00E+00	0	0.0049	0.00E+00
	0	19400	0	0.2	90	25	70	9125	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
1,2-DCE	0	19400	0.00128	0.2	90	25	70	9125	25550	0.00E+00	0.009	0.00E+00	0	0	0.00E+00
Acetone	0	19400	0.00057	0.2	90	25	70	9125	25550	0.00E+00	0.1	0.00E+00	0	0	0.00E+00
Methylene Chloride	0	19400	0.00446	0.2	90	25	70	9125	25550	0.00E+00	0.06	0.00E+00	0	0.0075	0.00E+00
Trichloroethene	0	19400	0.0148	0.2	90	25	70	9125	25550	0.00E+00	0	0.00E+00	0	0.011	0.00E+00
Benzene	0	19400	0	0.2	90	25	70	9125	25550	0.00E+00	0	0.00E+00	0	0.029	0.00E+00
1,1,1-Trichloroethane	0	19400	0.017	0.2	90	25	70	9125	25550	0.00E+00	0.09	0.00E+00	0	0	0.00E+00
1,2-Dichloropropane	0	19400	0.01	0.2	90	25	70	9125	25550	0.00E+00	0	0.00E+00	0	0.068	0.00E+00
Tetrachloroethene	0	19400	0.048	0.2	90	25	70	9125	25550	0.00E+00	0.01	0.00E+00	0	0.052	0.00E+00
Chloroform	0	19400	0.0089	0.2	90	25	70	9125	25550	0.00E+00	0.01	0.00E+00	0	0.0061	0.00E+00
											HI =	4.76E-04		CR =	1.08E-09

* Assumes 100 percent volatilization of VOCs, so none available for dermal absorption

TABLE 10
ON-SITE WORKER SHOWER INHALATION SCENARIO, PLUME 1

chemical	C(x) (mg/m3)	IH (m3/h)	ET (hr/d)	EF (d/yr)	ED (yr)	BW (kg)	AT1 non-can	AT2 cancer	CDI non-can	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
HMX	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
TNB	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
TNT	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
2,4-DNT	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
Aluminum	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
Nickel	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
Vanadium	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
Di-N-Butylphthalate	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
Diethylphthalate	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
Phenol	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
N-Nitrosodiphenylamine	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
1,2-DCE	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
Acetone	0.0801	0.83	0.2	90	25	70	9125	25550	4.7E-05	0	0.00E+00	1.67E-05	0	0.00E+00
Methylene Chloride	0.0211	0.83	0.2	90	25	70	9125	25550	1.2E-05	0.86	1.43E-05	4.41E-06	0.00165	7.27E-09
Trichloroethene	1.87	0.83	0.2	90	25	70	9125	25550	0.0011	0	0.00E+00	0.0003905	0.017	6.64E-06
Benzene	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0.029	0.00E+00
1,1,1-Trichloroethane	0	0.83	0.2	90	25	70	9125	25550	0	0.29	0.00E+00	0	0	0.00E+00
1,2-Dichloropropane	0	0.83	0.2	90	25	70	9125	25550	0	0.00114	0.00E+00	0	0	0.00E+00
Tetrachloroethene	0.04	0.83	0.2	90	25	70	9125	25550	2.3E-05	0	0.00E+00	8.35E-06	0.002	1.67E-08
Chloroform	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0.081	0.00E+00
										HI =	1.43E-05		CR =	6.65E-06

TABLE 11
CONSTRUCTION WORKER DERMAL SHOWER SCENARIO, PLUME 1

chemical	C(x) (mg/L)	SA (cm2)	PC (cm/hr)	ET (h/d)	EF (d/yr)	ED (years)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0.00423	19400	0.000348	0.2	90	1	70	182	25550	4.03E-08	0.003	1.34E-05	2.874E-10	0.11	3.16E-11
HMX	0.00021	19400	0.000348	0.2	90	1	70	182	25550	2.00E-09	0.05	4.01E-08	1.427E-11	0	0.00E+00
TNB	0.0004	19400	0.0038	0.2			70	182	25550	4.17E-08	5E-05	8.33E-04	2.968E-10	0	0.00E+00
TNT	0.00052	19400	0.0038	0.2			70	182	25550	5.42E-08	0.0005	1.08E-04	3.858E-10	0.03	1.16E-11
2,4-DNT	0	19400	0.0038	0.2	90	1	70	182	25550	0.00E+00	0.002	0.00E+00	0	0.68	0.00E+00
	0	19400	0	0.2	90	1	70	182	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Aluminum	0	19400	0.001	0.2	90	1	70	182	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Nickel	0	19400	0.001	0.2	90	1	70	182	25550	0.00E+00	0.02	0.00E+00	0	0	0.00E+00
Vanadium	0	19400	0.001	0.2	90	1	70	182	25550	0.00E+00	0.007	0.00E+00	0	0	0.00E+00
	0	19400	0	0.2	90	1	70	182	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Di-N-Butylphthalate	0	19400	0.363	0.2	90	1	70	182	25550	0.00E+00	0.1	0.00E+00	0	0	0.00E+00
Diethylphthalate	0	19400	0.00502	0.2	90	1	70	182	25550	0.00E+00	0.8	0.00E+00	0	0	0.00E+00
Phenol	0	19400	0.00554	0.2	90	1	70	182	25550	0.00E+00	0.6	0.00E+00	0	0	0.00E+00
N-Nitrosodiphenylamine	0	19400	0.036	0.2	90	1	70	182	25550	0.00E+00	0	0.00E+00	0	0.0049	0.00E+00
	0	19400	0	0.2	90	1	70	182	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
1,2-DCE	0	19400	0.00128	0.2	90	1	70	182	25550	0.00E+00	0.009	0.00E+00	0	0	0.00E+00
Acetone	0	19400	0.00057	0.2	90	1	70	182	25550	0.00E+00	0.1	0.00E+00	0	0	0.00E+00
Methylene Chloride	0	19400	0.00446	0.2	90	1	70	182	25550	0.00E+00	0.06	0.00E+00	0	0.0075	0.00E+00
Trichloroethene	0	19400	0.0148	0.2	90	1	70	182	25550	0.00E+00	0	0.00E+00	0	0.011	0.00E+00
Benzene	0	19400	0	0.2	90	1	70	182	25550	0.00E+00	0	0.00E+00	0	0.029	0.00E+00
1,1,1-Trichloroethane	0	19400	0.017	0.2	90	1	70	182	25550	0.00E+00	0.09	0.00E+00	0	0	0.00E+00
1,2-Dichloropropane	0	19400	0.01	0.2	90	1	70	182	25550	0.00E+00	0	0.00E+00	0	0.068	0.00E+00
Tetrachloroethene	0	19400	0.048	0.2	90	1	70	182	25550	0.00E+00	0.01	0.00E+00	0	0.052	0.00E+00
Chloroform	0	19400	0.0089	0.2	90	1	70	182	25550	0.00E+00	0.01	0.00E+00	0	0.0061	0.00E+00
											HI =	9.55E-04		CR =	4.32E-11

* Assumes 100 percent volatilization of VOCs, so none available for dermal absorption

TABLE 12
CONSTRUCTION WORKER SHOWER INHALATION SCENARIO, PLUME 1

chemical	C(x) (mg/m3)	IH (m3/h)	ET (hr/d)	EF (d/yr)	ED (yr)	BW (kg)	AT1 non-can	AT2 cancer	CDI non-can	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0	0.83	0.2	90	1	70	182	25550	0	0	0.00E+00	0	0	0.00E+00
HMX	0	0.83	0.2	90	1	70	182	25550	0	0	0.00E+00	0	0	0.00E+00
TNB	0	0.83	0.2	90	1	70	182	25550	0	0	0.00E+00	0	0	0.00E+00
TNT	0	0.83	0.2	90	1	70	182	25550	0	0	0.00E+00	0	0	0.00E+00
2,4-DNT	0	0.83	0.2	90	1	70	182	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.2	90	1	70	182	25550	0	0	0.00E+00	0	0	0.00E+00
Aluminum	0	0.83	0.2	90	1	70	182	25550	0	0	0.00E+00	0	0	0.00E+00
Nickel	0	0.83	0.2	90	1	70	182	25550	0	0	0.00E+00	0	0	0.00E+00
Vanadium	0	0.83	0.2	90	1	70	182	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.2	90	1	70	182	25550	0	0	0.00E+00	0	0	0.00E+00
Di-N-Butylphthalate	0	0.83	0.2	90	1	70	182	25550	0	0	0.00E+00	0	0	0.00E+00
Diethylphthalate	0	0.83	0.2	90	1	70	182	25550	0	0	0.00E+00	0	0	0.00E+00
Phenol	0	0.83	0.2	90	1	70	182	25550	0	0	0.00E+00	0	0	0.00E+00
N-Nitrosodiphenylamine	0	0.83	0.2	90	1	70	182	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.2	90	1	70	182	25550	0	0	0.00E+00	0	0	0.00E+00
1,2-DCE	0	0.83	0.2	90	1	70	182	25550	0	0	0.00E+00	0	0	0.00E+00
Acetone	0.0801	0.83	0.2	90	1	70	182	25550	9.4E-05	0	0.00E+00	6.691E-07	0	0.00E+00
Methylene Chloride	0.0211	0.83	0.2	90	1	70	182	25550	2.5E-05	0.86	2.88E-05	1.7626E-07	0.00165	2.91E-10
Trichloroethene	1.87	0.83	0.2	90	1	70	182	25550	0.0022	0	0.00E+00	1.5621E-05	0.017	2.66E-07
Benzene	0	0.83	0.2	90	1	70	182	25550	0	0	0.00E+00	0	0.029	0.00E+00
1,1,1-Trichloroethane	0	0.83	0.2	90	1	70	182	25550	0	0.29	0.00E+00	0	0	0.00E+00
1,2-Dichloropropane	0	0.83	0.2	90	1	70	182	25550	0	0.00114	0.00E+00	0	0	0.00E+00
Tetrachloroethene	0.04	0.83	0.2	90	1	70	182	25550	4.7E-05	0	0.00E+00	3.3413E-07	0.002	6.68E-10
Chloroform	0	0.83	0.2	90	1	70	182	25550	0	0	0.00E+00	0	0.081	0.00E+00
										HI =	2.88E-05		CR =	2.67E-07

TABLE 1
CHEMICAL PARAMETER TABLE FOR PLUME 2

Chemical	RME Concentration					Reference Dose		Slope Factor		Permeability Constant	Dermal Absorption
	Surface Soil (mg/kg)	Sediment (mg/kg)	Surface Water (mg/L)	Ground Water (mg/L)	Air (mg/m3)	Oral	Inhalation	Oral	Inhalation		(Soil)
RDX						0.003		0.11		0.000348	0.01
HMX						0.05				0.000348	0.01
TNB						5E-05				0.0038	0.01
TNT						0.0005		0.03		0.0038	0.01
2,4-DNT						0.002		0.68		0.0038	0.01
Aluminum										0.001	0.001
Nickel						0.02				0.001	0.001
Vanadium						0.007				0.001	0.001
Di-N-Butylphthalate						0.1				0.363	0.01
Diethylphthalate						0.8				0.00502	0.01
Phenol						0.6				0.00554	0.01
N-Nitrosodiphenylamine								0.0049		0.036	
1,2-DCE				0.002	0.0267	0.009				0.00128	0.01
Acetone						0.1				0.00057	0.01
Methylene Chloride				0.03363	0.449	0.06	0.86	0.0075	0.00165	0.00446	0.01
Trichloroethene				1.8	24			0.011	0.017	0.0148	0.01
Benzene								0.029	0.029		0.01
1,1,1-Trichloroethane						0.09	0.29			0.017	0.01
1,2-Dichloropropane							0.00114	0.068		0.01	0.01
Tetrachloroethene						0.01		0.052	0.002	0.048	0.01
Chloroform				0.026	0.347	0.01		0.0061	0.081	0.0089	0.01

Notebook = ChemData

TABLE 2
ADULT RESIDENT GROUNDWATER INGESTION SCENARIO, PLUME 2

chemical	C(x) (mg/L)	IR (L/d)	EF (d/yr)	ED (years)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0	2	350	30	70	10950	25550	0.00E+00	0.003	0.00E+00	0.00E+00	0.11	0.00E+00
HMX	0	2	350	30	70	10950	25550	0.00E+00	0.05	0.00E+00	0.00E+00	0	0.00E+00
TNB	0	2	350	30	70	10950	25550	0.00E+00	5E-05	0.00E+00	0.00E+00	0	0.00E+00
TNT	0	2	350	30	70	10950	25550	0.00E+00	0.0005	0.00E+00	0.00E+00	0.03	0.00E+00
2,4-DNT	0	2	350	30	70	10950	25550	0.00E+00	0.002	0.00E+00	0.00E+00	0.68	0.00E+00
	0	2	350	30	70	10950	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Aluminum	0	2	350	30	70	10950	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Nickel	0	2	350	30	70	10950	25550	0.00E+00	0.02	0.00E+00	0.00E+00	0	0.00E+00
Vanadium	0	2	350	30	70	10950	25550	0.00E+00	0.007	0.00E+00	0.00E+00	0	0.00E+00
	0	2	350	30	70	10950	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Di-N-Butylphthalate	0	2	350	30	70	10950	25550	0.00E+00	0.1	0.00E+00	0.00E+00	0	0.00E+00
Diethylphthalate	0	2	350	30	70	10950	25550	0.00E+00	0.8	0.00E+00	0.00E+00	0	0.00E+00
Phenol	0	2	350	30	70	10950	25550	0.00E+00	0.6	0.00E+00	0.00E+00	0	0.00E+00
N-Nitrosodiphenylamine	0	2	350	30	70	10950	25550	0.00E+00	0	0.00E+00	0.00E+00	0.0049	0.00E+00
	0	2	350	30	70	10950	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
1,2-DCE	0.002	2	350	30	70	10950	25550	5.48E-05	0.009	6.09E-03	2.35E-05	0	0.00E+00
Acetone	0	2	350	30	70	10950	25550	0.00E+00	0.1	0.00E+00	0.00E+00	0	0.00E+00
Methylene Chloride	0.03363	2	350	30	70	10950	25550	9.21E-04	0.06	1.54E-02	3.95E-04	0.0075	2.96E-06
Trichloroethene	1.8	2	350	30	70	10950	25550	4.93E-02	0	0.00E+00	2.11E-02	0.011	2.32E-04
Benzene	0	2	350	30	70	10950	25550	0.00E+00	0	0.00E+00	0.00E+00	0.029	0.00E+00
1,1,1-Trichloroethane	0	2	350	30	70	10950	25550	0.00E+00	0.09	0.00E+00	0.00E+00	0	0.00E+00
1,2-Dichloropropane	0	2	350	30	70	10950	25550	0.00E+00	0	0.00E+00	0.00E+00	0.068	0.00E+00
Tetrachloroethene	0	2	350	30	70	10950	25550	0.00E+00	0.01	0.00E+00	0.00E+00	0.052	0.00E+00
Chloroform	0.026	2	350	30	70	10950	25550	7.12E-04	0.01	7.12E-02	3.05E-04	0.0061	1.86E-06
Notebook = AdultRME									HI =	9.27E-02		CR =	2.37E-04

TABLE 3
ADULT · ENT DERMAL SHOWER SCENARIO, PLUME 2

chemical	C(x) (mg/L)	SA (cm2)	PC (cm/hr)	ET (h/d)	EF (d/yr)	ED (years)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0	19400	0.000348	0.2	350	30	70	10950	25550	0.00E+00	0.003	0.00E+00	0	0.11	0.00E+00
HMX	0	19400	0.000348	0.2	350	30	70	10950	25550	0.00E+00	0.05	0.00E+00	0	0	0.00E+00
TNB	0	19400	0.0038	0.2	350	30	70	10950	25550	0.00E+00	5E-05	0.00E+00	0	0	0.00E+00
TNT	0	19400	0.0038	0.2	350	30	70	10950	25550	0.00E+00	0.0005	0.00E+00	0	0.03	0.00E+00
2,4-DNT	0	19400	0.0038	0.2	350	30	70	10950	25550	0.00E+00	0.002	0.00E+00	0	0.68	0.00E+00
	0	19400	0	0.2	350	30	70	10950	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Aluminum	0	19400	0.001	0.2	350	30	70	10950	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Nickel	0	19400	0.001	0.2	350	30	70	10950	25550	0.00E+00	0.02	0.00E+00	0	0	0.00E+00
Vanadium	0	19400	0.001	0.2	350	30	70	10950	25550	0.00E+00	0.007	0.00E+00	0	0	0.00E+00
	0	19400	0	0.2	350	30	70	10950	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Di-N-Butylphthalate	0	19400	0.363	0.2	350	30	70	10950	25550	0.00E+00	0.1	0.00E+00	0	0	0.00E+00
Diethylphthalate	0	19400	0.00502	0.2	350	30	70	10950	25550	0.00E+00	0.8	0.00E+00	0	0	0.00E+00
Phenol	0	19400	0.00554	0.2	350	30	70	10950	25550	0.00E+00	0.6	0.00E+00	0	0	0.00E+00
N-Nitrosodiphenylamine	0	19400	0.036	0.2	350	30	70	10950	25550	0.00E+00	0	0.00E+00	0	0.0049	0.00E+00
	0	19400	0	0.2	350	30	70	10950	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
1,2-DCE	0	19400	0.00128	0.2	350	30	70	10950	25550	0.00E+00	0.009	0.00E+00	0	0	0.00E+00
Acetone	0	19400	0.00057	0.2	350	30	70	10950	25550	0.00E+00	0.1	0.00E+00	0	0	0.00E+00
Methylene Chloride	0	19400	0.00446	0.2	350	30	70	10950	25550	0.00E+00	0.06	0.00E+00	0	0.0075	0.00E+00
Trichloroethene	0	19400	0.0148	0.2	350	30	70	10950	25550	0.00E+00	0	0.00E+00	0	0.011	0.00E+00
Benzene	0	19400	0	0.2	350	30	70	10950	25550	0.00E+00	0	0.00E+00	0	0.029	0.00E+00
1,1,1-Trichloroethane	0	19400	0.017	0.2	350	30	70	10950	25550	0.00E+00	0.09	0.00E+00	0	0	0.00E+00
1,2-Dichloropropane	0	19400	0.01	0.2	350	30	70	10950	25550	0.00E+00	0	0.00E+00	0	0.068	0.00E+00
Tetrachloroethene	0	19400	0.048	0.2	350	30	70	10950	25550	0.00E+00	0.01	0.00E+00	0	0.052	0.00E+00
Chloroform	0	19400	0.0089	0.2	350	30	70	10950	25550	0.00E+00	0.01	0.00E+00	0	0.0061	0.00E+00
											HI =	0.00E+00		CR =	0.00E+00

* Assumes 100 percent volatilization of VOCs, so none available for dermal absorption

TABLE 4
ADULT RESIDENT SHOWER INHALATION SCENARIO, PLUME 2.

chemical	C(x) (mg/m3)	IH (m3/h)	ET (hr/d)	EF (d/yr)	ED (yr)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0	0.83	0.2	350	30	70	10950	25550	0	0	0.00E+00	0	0	0.00E+00
HMX	0	0.83	0.2	350	30	70	10950	25550	0	0	0.00E+00	0	0	0.00E+00
TNB	0	0.83	0.2	350	30	70	10950	25550	0	0	0.00E+00	0	0	0.00E+00
TNT	0	0.83	0.2	350	30	70	10950	25550	0	0	0.00E+00	0	0	0.00E+00
2,4-DNT	0	0.83	0.2	350	30	70	10950	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.2	350	30	70	10950	25550	0	0	0.00E+00	0	0	0.00E+00
Aluminum	0	0.83	0.2	350	30	70	10950	25550	0	0	0.00E+00	0	0	0.00E+00
Nickel	0	0.83	0.2	350	30	70	10950	25550	0	0	0.00E+00	0	0	0.00E+00
Vanadium	0	0.83	0.2	350	30	70	10950	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.2	350	30	70	10950	25550	0	0	0.00E+00	0	0	0.00E+00
Di-N-Butylphthalate	0	0.83	0.2	350	30	70	10950	25550	0	0	0.00E+00	0	0	0.00E+00
Diethylphthalate	0	0.83	0.2	350	30	70	10950	25550	0	0	0.00E+00	0	0	0.00E+00
Phenol	0	0.83	0.2	350	30	70	10950	25550	0	0	0.00E+00	0	0	0.00E+00
N-Nitrosodiphenylamine	0	0.83	0.2	350	30	70	10950	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.2	350	30	70	10950	25550	0	0	0.00E+00	0	0	0.00E+00
1,2-DCE	0.0267	0.83	0.2	350	30	70	10950	25550	6.072E-05	0	0.00E+00	2.602E-05	0	0.00E+00
Acetone	0	0.83	0.2	350	30	70	10950	25550	0	0	0.00E+00	0	0	0.00E+00
Methylene Chloride	0.449	0.83	0.2	350	30	70	10950	25550	0.00102101	0.86	1.19E-03	0.0004376	0.00165	7.22E-07
Trichloroethene	24	0.83	0.2	350	30	70	10950	25550	0.05457534	0	0.00E+00	0.0233894	0.017	3.98E-04
Benzene	0	0.83	0.2	350	30	70	10950	25550	0	0	0.00E+00	0	0.029	0.00E+00
1,1,1-Trichloroethane	0	0.83	0.2	350	30	70	10950	25550	0	0.29	0.00E+00	0	0	0.00E+00
1,2-Dichloropropane	0	0.83	0.2	350	30	70	10950	25550	0	0.00114	0.00E+00	0	0	0.00E+00
Tetrachloroethene	0	0.83	0.2	350	30	70	10950	25550	0	0	0.00E+00	0	0.002	0.00E+00
Chloroform	0.347	0.83	0.2	350	30	70	10950	25550	0.00078907	0	0.00E+00	0.0003382	0.081	2.74E-05
										HI =	1.19E-03		CR =	4.26E-04

TABLE 5
CHILD (0-6 YEAR) RESIDENT GROUNDWATER INGESTION SCENARIO, PLUME 2

chemical	C(x) (mg/L)	IR (L/d)	EF (d/yr)	ED (years)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0	1	350	6	15	2190	25550	0.00E+00	0.003	0.00E+00	0.00E+00	0.11	0.00E+00
HMX	0	1	350	6	15	2190	25550	0.00E+00	0.05	0.00E+00	0.00E+00	0	0.00E+00
TNB	0	1	350	6	15	2190	25550	0.00E+00	5E-05	0.00E+00	0.00E+00	0	0.00E+00
TNT	0	1	350	6	15	2190	25550	0.00E+00	0.0005	0.00E+00	0.00E+00	0.03	0.00E+00
2,4-DNT	0	1	350	6	15	2190	25550	0.00E+00	0.002	0.00E+00	0.00E+00	0.68	0.00E+00
	0	1	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Aluminum	0	1	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Nickel	0	1	350	6	15	2190	25550	0.00E+00	0.02	0.00E+00	0.00E+00	0	0.00E+00
Vanadium	0	1	350	6	15	2190	25550	0.00E+00	0.007	0.00E+00	0.00E+00	0	0.00E+00
	0	1	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Di-N-Butylphthalate	0	1	350	6	15	2190	25550	0.00E+00	0.1	0.00E+00	0.00E+00	0	0.00E+00
Diethylphthalate	0	1	350	6	15	2190	25550	0.00E+00	0.8	0.00E+00	0.00E+00	0	0.00E+00
Phenol	0	1	350	6	15	2190	25550	0.00E+00	0.6	0.00E+00	0.00E+00	0	0.00E+00
N-Nitrosodiphenylamine	0	1	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0.00E+00	0.0049	0.00E+00
	0	1	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
1,2-DCE	0.002	1	350	6	15	2190	25550	1.28E-04	0.009	1.42E-02	1.10E-05	0	0.00E+00
Acetone	0	1	350	6	15	2190	25550	0.00E+00	0.1	0.00E+00	0.00E+00	0	0.00E+00
Methylene Chloride	0.03363	1	350	6	15	2190	25550	2.15E-03	0.06	3.58E-02	1.84E-04	0.0075	1.38E-06
Trichloroethene	1.8	1	350	6	15	2190	25550	1.15E-01	0	0.00E+00	9.86E-03	0.011	1.08E-04
Benzene	0	1	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0.00E+00	0.029	0.00E+00
1,1,1-Trichloroethane	0	1	350	6	15	2190	25550	0.00E+00	0.09	0.00E+00	0.00E+00	0	0.00E+00
1,2-Dichloropropane	0	1	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0.00E+00	0.068	0.00E+00
Tetrachloroethene	0	1	350	6	15	2190	25550	0.00E+00	0.01	0.00E+00	0.00E+00	0.052	0.00E+00
Chloroform	0.026	1	350	6	15	2190	25550	1.66E-03	0.01	1.66E-01	1.42E-04	0.0061	8.69E-07
Notebook = ChildRME									HI =	2.16E-01		CR =	1.11E-04

TABLE 6
CHILD (0-6 YEAR) RESIDENT DERMAL SHOWER SCENARIO, PLUME 2

chemical	C(x) (mg/L)	SA (cm2)	PC (cm/hr)	ET (h/d)	EF (d/yr)	ED (years)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0	6670	0.00035	0.2	350	6	15	2190	25550	0.00E+00	0.003	0.00E+00	0	0.11	0.00E+00
HMX	0	6670	0.00035	0.2	350	6	15	2190	25550	0.00E+00	0.05	0.00E+00	0	0	0.00E+00
TNB	0	6670	0.0038	0.2	350	6	15	2190	25550	0.00E+00	5E-05	0.00E+00	0	0	0.00E+00
TNT	0	6670	0.0038	0.2	350	6	15	2190	25550	0.00E+00	0.0005	0.00E+00	0	0.03	0.00E+00
2,4-DNT	0	6670	0.0038	0.2	350	6	15	2190	25550	0.00E+00	0.002	0.00E+00	0	0.68	0.00E+00
	0	6670	0	0.2	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Aluminum	0	6670	0.001	0.2	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Nickel	0	6670	0.001	0.2	350	6	15	2190	25550	0.00E+00	0.02	0.00E+00	0	0	0.00E+00
Vanadium	0	6670	0.001	0.2	350	6	15	2190	25550	0.00E+00	0.007	0.00E+00	0	0	0.00E+00
	0	6670	0	0.2	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Di-N-Butylphthalate	0	6670	0.363	0.2	350	6	15	2190	25550	0.00E+00	0.1	0.00E+00	0	0	0.00E+00
Diethylphthalate	0	6670	0.00502	0.2	350	6	15	2190	25550	0.00E+00	0.8	0.00E+00	0	0	0.00E+00
Phenol	0	6670	0.00554	0.2	350	6	15	2190	25550	0.00E+00	0.6	0.00E+00	0	0	0.00E+00
N-Nitrosodiphenylamine	0	6670	0.036	0.2	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0.0049	0.00E+00
	0	6670	0	0.2	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
1,2-DCE	0	6670	0.00128	0.2	350	6	15	2190	25550	0.00E+00	0.009	0.00E+00	0	0	0.00E+00
Acetone	0	6670	0.00057	0.2	350	6	15	2190	25550	0.00E+00	0.1	0.00E+00	0	0	0.00E+00
Methylene Chloride	0	6670	0.00446	0.2	350	6	15	2190	25550	0.00E+00	0.06	0.00E+00	0	0.0075	0.00E+00
Trichloroethene	0	6670	0.0148	0.2	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0.011	0.00E+00
Benzene	0	6670	0	0.2	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0.029	0.00E+00
1,1,1-Trichloroethane	0	6670	0.017	0.2	350	6	15	2190	25550	0.00E+00	0.09	0.00E+00	0	0	0.00E+00
1,2-Dichloropropane	0	6670	0.01	0.2	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0.068	0.00E+00
Tetrachloroethene	0	6670	0.048	0.2	350	6	15	2190	25550	0.00E+00	0.01	0.00E+00	0	0.052	0.00E+00
Chloroform	0	6670	0.0089	0.2	350	6	15	2190	25550	0.00E+00	0.01	0.00E+00	0	0.0061	0.00E+00
											HI =	0.00E+00		CR =	0.00E+00

* Assumes 100 percent volatilization of VOCs, so none available for dermal absorption

TABLE 7
CHILD (0-6 YEAR) RESIDENT SHOWER INHALATION SCENARIO, PLUME 2

chemical	C(x) (mg/m3)	IR (m3/h)	ET (hr/d)	EF (d/yr)	ED (yr)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
HMX	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
TNB	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
TNT	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
2,4-DNT	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
Aluminum	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
Nickel	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
Vanadium	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
Di-N-Butylphthalate	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
Diethylphthalate	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
Phenol	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
N-Nitrosodiphenylamine	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
1,2-DCE	0.0267	0.83	0.2	350	6	15	2190	25550	0.00028334	0	0.00E+00	2.429E-05	0	0.00E+00
Acetone	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
Methylene Chloride	0.449	0.83	0.2	350	6	15	2190	25550	0.00476473	0.86	5.54E-03	0.0004084	0.00165	6.74E-07
Trichloroethene	24	0.83	0.2	350	6	15	2190	25550	0.25468493	0	0.00E+00	0.0218301	0.017	3.71E-04
Benzene	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0.029	0.00E+00
1,1,1-Trichloroethane	0	0.83	0.2	350	6	15	2190	25550	0	0.29	0.00E+00	0	0	0.00E+00
1,2-Dichloropropane	0	0.83	0.2	350	6	15	2190	25550	0	0.00114	0.00E+00	0	0	0.00E+00
Tetrachloroethene	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0.002	0.00E+00
Chloroform	0.347	0.83	0.2	350	6	15	2190	25550	0.00368232	0	0.00E+00	0.0003156	0.081	2.56E-05
										HI =	5.54E-03		CR =	3.97E-04

TABLE 8
ON-SITE WORKER GROUNDWATER INGESTION SCENARIO, PLUME 2

chemical	C(x) (mg/L)	IR (L/d)	EF (d/yr)	ED (years)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0	1	250	25	70	9125	25550	0.00E+00	0.003	0.00E+00	0.00E+00	0.11	0.00E+00
HMX	0	1	250	25	70	9125	25550	0.00E+00	0.05	0.00E+00	0.00E+00	0	0.00E+00
TNB	0	1	250	25	70	9125	25550	0.00E+00	5E-05	0.00E+00	0.00E+00	0	0.00E+00
TNT	0	1	250	25	70	9125	25550	0.00E+00	0.0005	0.00E+00	0.00E+00	0.03	0.00E+00
2,4-DNT	0	1	250	25	70	9125	25550	0.00E+00	0.002	0.00E+00	0.00E+00	0.68	0.00E+00
	0	1	250	25	70	9125	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Aluminum	0	1	250	25	70	9125	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Nickel	0	1	250	25	70	9125	25550	0.00E+00	0.02	0.00E+00	0.00E+00	0	0.00E+00
Vanadium	0	1	250	25	70	9125	25550	0.00E+00	0.007	0.00E+00	0.00E+00	0	0.00E+00
	0	1	250	25	70	9125	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Di-N-Butylphthalate	0	1	250	25	70	9125	25550	0.00E+00	0.1	0.00E+00	0.00E+00	0	0.00E+00
Diethylphthalate	0	1	250	25	70	9125	25550	0.00E+00	0.8	0.00E+00	0.00E+00	0	0.00E+00
Phenol	0	1	250	25	70	9125	25550	0.00E+00	0.6	0.00E+00	0.00E+00	0	0.00E+00
N-Nitrosodiphenylamine	0	1	250	25	70	9125	25550	0.00E+00	0	0.00E+00	0.00E+00	0.0049	0.00E+00
	0	1	250	25	70	9125	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
1,2-DCE	0.002	1	250	25	70	9125	25550	1.96E-05	0.009	2.17E-03	6.99E-06	0	0.00E+00
Acetone	0	1	250	25	70	9125	25550	0.00E+00	0.1	0.00E+00	0.00E+00	0	0.00E+00
Methylene Chloride	0.03363	1	250	25	70	9125	25550	3.29E-04	0.06	5.48E-03	1.18E-04	0.0075	8.81E-07
Trichloroethene	1.8	1	250	25	70	9125	25550	1.76E-02	0	0.00E+00	6.29E-03	0.011	6.92E-05
Benzene	0	1	250	25	70	9125	25550	0.00E+00	0	0.00E+00	0.00E+00	0.029	0.00E+00
1,1,1-Trichloroethane	0	1	250	25	70	9125	25550	0.00E+00	0.09	0.00E+00	0.00E+00	0	0.00E+00
1,2-Dichloropropane	0	1	250	25	70	9125	25550	0.00E+00	0	0.00E+00	0.00E+00	0.068	0.00E+00
Tetrachloroethene	0	1	250	25	70	9125	25550	0.00E+00	0.01	0.00E+00	0.00E+00	0.052	0.00E+00
Chloroform	0.026	1	250	25	70	9125	25550	2.54E-04	0.01	2.54E-02	9.09E-05	0.0061	5.54E-07
Notebook = WorkRME									HI =	3.31E-02		CR =	7.06E-05

TABLE 9
ON-SITE WORKER DERMAL SHOWER SCENARIO, PLUME 2

chemical	C(x) (mg/L)	SA (cm2)	PC (cm/hr)	ET (h/d)	EF (d/yr)	ED (years)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0	19400	0.000348	0.2	90	25	70	9125	25550	0.00E+00	0.003	0.00E+00	0	0.11	0.00E+00
HMX	0	19400	0.000348	0.2	90	25	70	9125	25550	0.00E+00	0.05	0.00E+00	0	0	0.00E+00
TNB	0	19400	0.0038	0.2	90	25	70	9125	25550	0.00E+00	5E-05	0.00E+00	0	0	0.00E+00
TNT	0	19400	0.0038	0.2	90	25	70	9125	25550	0.00E+00	0.0005	0.00E+00	0	0.03	0.00E+00
2,4-DNT	0	19400	0.0038	0.2	90	25	70	9125	25550	0.00E+00	0.002	0.00E+00	0	0.68	0.00E+00
	0	19400	0	0.2	90	25	70	9125	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Aluminum	0	19400	0.001	0.2	90	25	70	9125	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Nickel	0	19400	0.001	0.2	90	25	70	9125	25550	0.00E+00	0.02	0.00E+00	0	0	0.00E+00
Vanadium	0	19400	0.001	0.2	90	25	70	9125	25550	0.00E+00	0.007	0.00E+00	0	0	0.00E+00
	0	19400	0	0.2	90	25	70	9125	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Di-N-Butylphthalate	0	19400	0.363	0.2	90	25	70	9125	25550	0.00E+00	0.1	0.00E+00	0	0	0.00E+00
Diethylphthalate	0	19400	0.00502	0.2	90	25	70	9125	25550	0.00E+00	0.8	0.00E+00	0	0	0.00E+00
Phenol	0	19400	0.00554	0.2	90	25	70	9125	25550	0.00E+00	0.6	0.00E+00	0	0	0.00E+00
N-Nitrosodiphenylamine	0	19400	0.036	0.2	90	25	70	9125	25550	0.00E+00	0	0.00E+00	0	0.0049	0.00E+00
	0	19400	0	0.2	90	25	70	9125	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
1,2-DCE	0	19400	0.00128	0.2	90	25	70	9125	25550	0.00E+00	0.009	0.00E+00	0	0	0.00E+00
Acetone	0	19400	0.00057	0.2	90	25	70	9125	25550	0.00E+00	0.1	0.00E+00	0	0	0.00E+00
Methylene Chloride	0	19400	0.00446	0.2	90	25	70	9125	25550	0.00E+00	0.06	0.00E+00	0	0.0075	0.00E+00
Trichloroethene	0	19400	0.0148	0.2	90	25	70	9125	25550	0.00E+00	0	0.00E+00	0	0.011	0.00E+00
Benzene	0	19400	0	0.2	90	25	70	9125	25550	0.00E+00	0	0.00E+00	0	0.029	0.00E+00
1,1,1-Trichloroethane	0	19400	0.017	0.2	90	25	70	9125	25550	0.00E+00	0.09	0.00E+00	0	0	0.00E+00
1,2-Dichloropropane	0	19400	0.01	0.2	90	25	70	9125	25550	0.00E+00	0	0.00E+00	0	0.068	0.00E+00
Tetrachloroethene	0	19400	0.048	0.2	90	25	70	9125	25550	0.00E+00	0.01	0.00E+00	0	0.052	0.00E+00
Chloroform	0	19400	0.0089	0.2	90	25	70	9125	25550	0.00E+00	0.01	0.00E+00	0	0.0061	0.00E+00
											HI =	0.00E+00		CR =	0.00E+00

* Assumes 100 percent volatilization of VOCs, so none available for dermal absorption

TABLE 10
ON-SITE WORKER SHOWER INHALATION SCENARIO, PLUME 2

chemical	C(x) (mg/m3)	IH (m3/h)	ET (hr/d)	EF (d/yr)	ED (yr)	BW (kg)	AT1 non-can	AT2 cancer	CDI non-can	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
HMX	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
TNB	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
TNT	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
2,4-DNT	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
Aluminum	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
Nickel	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
Vanadium	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
Di-N-Butylphthalate	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
Diethylphthalate	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
Phenol	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
N-Nitrosodiphenylamine	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
1,2-DCE	0.0267	0.83	0.2	90	25	70	9125	25550	1.6E-05	0	0.00E+00	5.58E-06	0	0.00E+00
Acetone	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
Methylene Chloride	0.449	0.83	0.2	90	25	70	9125	25550	0.0003	0.86	3.05E-04	9.38E-05	0.00165	1.55E-07
Trichloroethene	24	0.83	0.2	90	25	70	9125	25550	0.014	0	0.00E+00	0.005012	0.017	8.52E-05
Benzene	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0.029	0.00E+00
1,1,1-Trichloroethane	0	0.83	0.2	90	25	70	9125	25550	0	0.29	0.00E+00	0	0	0.00E+00
1,2-Dichloropropane	0	0.83	0.2	90	25	70	9125	25550	0	0.00114	0.00E+00	0	0	0.00E+00
Tetrachloroethene	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0.002	0.00E+00
Chloroform	0.347	0.83	0.2	90	25	70	9125	25550	0.0002	0	0.00E+00	7.25E-05	0.081	5.87E-06
										HI =	3.05E-04		CR =	9.12E-05

TABLE 11
CONSTRUCTION WORKER DERMAL SHOWER SCENARIO, PLUME 2

chemical	C(x) (mg/L)	SA (cm2)	PC (cm/hr)	ET (h/d)	EF (d/yr)	ED (years)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0	19400	0.000348	0.2	90	1	70	182	25550	0.00E+00	0.003	0.00E+00	0	0.11	0.00E+00
HMX	0	19400	0.000348	0.2	90	1	70	182	25550	0.00E+00	0.05	0.00E+00	0	0	0.00E+00
TNB	0	19400	0.0038	0.2	90	1	70	182	25550	0.00E+00	5E-05	0.00E+00	0	0	0.00E+00
TNT	0	19400	0.0038	0.2	90	1	70	182	25550	0.00E+00	0.0005	0.00E+00	0	0.03	0.00E+00
2,4-DNT	0	19400	0.0038	0.2	90	1	70	182	25550	0.00E+00	0.002	0.00E+00	0	0.68	0.00E+00
	0	19400	0	0.2	90	1	70	182	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Aluminum	0	19400	0.001	0.2	90	1	70	182	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Nickel	0	19400	0.001	0.2	90	1	70	182	25550	0.00E+00	0.02	0.00E+00	0	0	0.00E+00
Vanadium	0	19400	0.001	0.2	90	1	70	182	25550	0.00E+00	0.007	0.00E+00	0	0	0.00E+00
	0	19400	0	0.2	90	1	70	182	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Di-N-Butylphthalate	0	19400	0.363	0.2	90	1	70	182	25550	0.00E+00	0.1	0.00E+00	0	0	0.00E+00
Diethylphthalate	0	19400	0.00502	0.2	90	1	70	182	25550	0.00E+00	0.8	0.00E+00	0	0	0.00E+00
Phenol	0	19400	0.00554	0.2	90	1	70	182	25550	0.00E+00	0.6	0.00E+00	0	0	0.00E+00
N-Nitrosodiphenylamin	0	19400	0.036	0.2	90	1	70	182	25550	0.00E+00	0	0.00E+00	0	0.0049	0.00E+00
	0	19400	0	0.2	90	1	70	182	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
1,2-DCE	0	19400	0.00128	0.2	90	1	70	182	25550	0.00E+00	0.009	0.00E+00	0	0	0.00E+00
Acetone	0	19400	0.00057	0.2	90	1	70	182	25550	0.00E+00	0.1	0.00E+00	0	0	0.00E+00
Methylene Chloride	0	19400	0.00446	0.2	90	1	70	182	25550	0.00E+00	0.06	0.00E+00	0	0.0075	0.00E+00
Trichloroethene	0	19400	0.0148	0.2	90	1	70	182	25550	0.00E+00	0	0.00E+00	0	0.011	0.00E+00
Benzene	0	19400	0	0.2	90	1	70	182	25550	0.00E+00	0	0.00E+00	0	0.029	0.00E+00
1,1,1-Trichloroethane	0	19400	0.017	0.2	90	1	70	182	25550	0.00E+00	0.09	0.00E+00	0	0	0.00E+00
1,2-Dichloropropane	0	19400	0.01	0.2	90	1	70	182	25550	0.00E+00	0	0.00E+00	0	0.068	0.00E+00
Tetrachloroethene	0	19400	0.048	0.2	90	1	70	182	25550	0.00E+00	0.01	0.00E+00	0	0.052	0.00E+00
Chloroform	0	19400	0.0069	0.2	90	1	70	182	25550	0.00E+00	0.01	0.00E+00	0	0.0061	0.00E+00
											HI =	0.00E+00		CR =	0.00E+00

* Assumes 100 percent volatilization of VOCs, so none available for dermal absorption

TABLE 12
CONSTRUCTION WORKER SHOWER INHALATION SCENARIO, PLUME 2

chemical	C(x) (mg/m3)	IH (m3/h)	ET (hr/d)	EF (d/yr)	ED (yr)	BW (kg)	AT1 non-can	AT2 cancer	CDI non-can	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0	0.83	0.2	90	1	70	182	25550	0	0	0.00E+00	0	0	0.00E+00
HMX	0	0.83	0.2	90	1	70	182	25550	0	0	0.00E+00	0	0	0.00E+00
TNB	0	0.83	0.2	90	1	70	182	25550	0	0	0.00E+00	0	0	0.00E+00
TNT	0	0.83	0.2	90	1	70	182	25550	0	0	0.00E+00	0	0	0.00E+00
2,4-DNT	0	0.83	0.2	90	1	70	182	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.2	90	1	70	182	25550	0	0	0.00E+00	0	0	0.00E+00
Aluminum	0	0.83	0.2	90	1	70	182	25550	0	0	0.00E+00	0	0	0.00E+00
Nickel	0	0.83	0.2	90	1	70	182	25550	0	0	0.00E+00	0	0	0.00E+00
Vanadium	0	0.83	0.2	90	1	70	182	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.2	90	1	70	182	25550	0	0	0.00E+00	0	0	0.00E+00
Di-N-Butylphthalate	0	0.83	0.2	90	1	70	182	25550	0	0	0.00E+00	0	0	0.00E+00
Diethylphthalate	0	0.83	0.2	90	1	70	182	25550	0	0	0.00E+00	0	0	0.00E+00
Phenol	0	0.83	0.2	90	1	70	182	25550	0	0	0.00E+00	0	0	0.00E+00
N-Nitrosodiphenylamin	0	0.83	0.2	90	1	70	182	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.2	90	1	70	182	25550	0	0	0.00E+00	0	0	0.00E+00
1,2-DCE	0.0267	0.83	0.2	90	1	70	182	25550	3.1E-05	0	0.00E+00	2.2303E-07	0	0.00E+00
Acetone	0	0.83	0.2	90	1	70	182	25550	0	0	0.00E+00	0	0	0.00E+00
Methylene Chloride	0.449	0.83	0.2	90	1	70	182	25550	0.0005	0.86	6.12E-04	3.7507E-06	0.00165	6.19E-09
Trichloroethene	24	0.83	0.2	90	1	70	182	25550	0.0281	0	0.00E+00	0.00020048	0.017	3.41E-06
Benzene	0	0.83	0.2	90	1	70	182	25550	0	0	0.00E+00	0	0.029	0.00E+00
1,1,1-Trichloroethane	0	0.83	0.2	90	1	70	182	25550	0	0.29	0.00E+00	0	0	0.00E+00
1,2-Dichloropropane	0	0.83	0.2	90	1	70	182	25550	0	0.00114	0.00E+00	0	0	0.00E+00
Tetrachloroethene	0	0.83	0.2	90	1	70	182	25550	0	0	0.00E+00	0	0.002	0.00E+00
Chloroform	0.347	0.83	0.2	90	1	70	182	25550	0.0004	0	0.00E+00	2.6986E-06	0.081	2.35E-07
										HI =	6.12E-04		CR =	3.65E-06

TABLE 1
CHEMICAL PARAMETER TABLE FOR PLUME 3

Chemical	RME Concentration					Reference Dose		Slope Factor		Permeability Constant	Dermal Absorption
	Surface Soil (mg/kg)	Sediment (mg/kg)	Surface Water (mg/L)	Ground Water (mg/L)	Air (mg/m3)	Oral	Inhalation	Oral	Inhalation		(Soil)
RDX				0.01878		0.003		0.11		0.000348	0.01
HMX				0.00089		0.05				0.000348	0.01
TNB				0.0002		5E-05				0.0038	0.01
TNT				0.00041		0.0005		0.03		0.0038	0.01
2,4-DNT				0.00017		0.002		0.68		0.0038	0.01
Aluminum										0.001	0.001
Nickel						0.02				0.001	0.001
Vanadium						0.007				0.001	0.001
Di-N-Butylphthalate						0.1				0.363	0.01
Diethylphthalate						0.8				0.00502	0.01
Phenol						0.6				0.00554	0.01
N-Nitrosodiphenylamine								0.0049		0.036	
1,2-DCE						0.009				0.00128	0.01
Acetone				0.00763	0.102	0.1				0.00057	0.01
Methylene Chloride				0.00189	0.0252	0.06	0.86	0.0075	0.00165	0.00446	0.01
Trichloroethene				0.00074	0.00987			0.011	0.017	0.0148	0.01
Benzene								0.029	0.029		0.01
1,1,1-Trichloroethane						0.09	0.29			0.017	0.01
1,2-Dichloropropane							0.00114	0.068		0.01	0.01
Tetrachloroethene						0.01		0.052	0.002	0.048	0.01
Chloroform						0.01		0.0061	0.081	0.0089	0.01

Notebook = ChemData

TABLE 2
ADULT RESIDENT GROUNDWATER INGESTION SCENARIO, PLUME 3

chemical	C(x) (mg/L)	IR (L/d)	EF (d/yr)	ED (years)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0.01878	2	350	30	70	10950	25550	5.15E-04	0.003	1.72E-01	2.21E-04	0.11	2.43E-05
HMX	0.00089	2	350	30	70	10950	25550	2.44E-05	0.05	4.88E-04	1.05E-05	0	0.00E+00
TNB	0.0002	2	350	30	70	10950	25550	5.48E-06	5E-05	1.10E-01	2.35E-06	0	0.00E+00
TNT	0.00041	2	350	30	70	10950	25550	1.12E-05	0.0005	2.25E-02	4.81E-06	0.03	1.44E-07
2,4-DNT	0.00017	2	350	30	70	10950	25550	4.66E-06	0.002	2.33E-03	2.00E-06	0.68	1.36E-06
	0	2	350	30	70	10950	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Aluminum	0	2	350	30	70	10950	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Nickel	0	2	350	30	70	10950	25550	0.00E+00	0.02	0.00E+00	0.00E+00	0	0.00E+00
Vanadium	0	2	350	30	70	10950	25550	0.00E+00	0.007	0.00E+00	0.00E+00	0	0.00E+00
	0	2	350	30	70	10950	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Di-N-Butylphthalate	0	2	350	30	70	10950	25550	0.00E+00	0.1	0.00E+00	0.00E+00	0	0.00E+00
Diethylphthalate	0	2	350	30	70	10950	25550	0.00E+00	0.8	0.00E+00	0.00E+00	0	0.00E+00
Phenol	0	2	350	30	70	10950	25550	0.00E+00	0.6	0.00E+00	0.00E+00	0	0.00E+00
N-Nitrosodiphenylamine	0	2	350	30	70	10950	25550	0.00E+00	0	0.00E+00	0.00E+00	0.0049	0.00E+00
	0	2	350	30	70	10950	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
1,2-DCE	0	2	350	30	70	10950	25550	0.00E+00	0.009	0.00E+00	0.00E+00	0	0.00E+00
Acetone	0.00763	2	350	30	70	10950	25550	2.09E-04	0.1	2.09E-03	8.96E-05	0	0.00E+00
Methylene Chloride	0.00189	2	350	30	70	10950	25550	5.18E-05	0.06	8.63E-04	2.22E-05	0.0075	1.66E-07
Trichloroethene	0.00074	2	350	30	70	10950	25550	2.03E-05	0	0.00E+00	8.69E-06	0.011	9.56E-08
Benzene	0	2	350	30	70	10950	25550	0.00E+00	0	0.00E+00	0.00E+00	0.029	0.00E+00
1,1,1-Trichloroethane	0	2	350	30	70	10950	25550	0.00E+00	0.09	0.00E+00	0.00E+00	0	0.00E+00
1,2-Dichloropropane	0	2	350	30	70	10950	25550	0.00E+00	0	0.00E+00	0.00E+00	0.068	0.00E+00
Tetrachloroethene	0	2	350	30	70	10950	25550	0.00E+00	0.01	0.00E+00	0.00E+00	0.052	0.00E+00
Chloroform	0	2	350	30	70	10950	25550	0.00E+00	0.01	0.00E+00	0.00E+00	0.0061	0.00E+00
Notebook = AdultRME									HI =	3.09E-01		CR =	2.60E-05

TABLE 3
ADULT RESIDENT DERMAL SHOWER SCENARIO, PLUME 3

chemical	C(x) (mg/L)	SA (cm2)	PC (cm/hr)	ET (h/d)	EF (d/yr)	ED (years)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0.01876	19400	0.000348	0.2	350	30	70	10950	25550	3.47E-07	0.003	1.16E-04	1.49E-07	0.11	1.64E-08
HMX	0.00069	19400	0.000348	0.2	350	30	70	10950	25550	1.65E-08	0.05	3.29E-07	7.06E-09	0	0.00E+00
TNB	0.0002	19400	0.0038	0.2	350	30	70	10950	25550	4.04E-08	5E-05	8.08E-04	1.73E-08	0	0.00E+00
TNT	0.00041	19400	0.0038	0.2	350	30	70	10950	25550	8.28E-08	0.0005	1.66E-04	3.55E-08	0.03	1.06E-09
2,4-DNT	0.00017	19400	0.0038	0.2	350	30	70	10950	25550	3.43E-08	0.002	1.72E-05	1.47E-08	0.68	1.00E-08
	0	19400	0	0.2	350	30	70	10950	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Aluminum	0	19400	0.001	0.2	350	30	70	10950	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Nickel	0	19400	0.001	0.2	350	30	70	10950	25550	0.00E+00	0.02	0.00E+00	0	0	0.00E+00
Vanadium	0	19400	0.001	0.2	350	30	70	10950	25550	0.00E+00	0.007	0.00E+00	0	0	0.00E+00
	0	19400	0	0.2	350	30	70	10950	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Di-N-Butylphthalate	0	19400	0.363	0.2	350	30	70	10950	25550	0.00E+00	0.1	0.00E+00	0	0	0.00E+00
Diethylphthalate	0	19400	0.00502	0.2	350	30	70	10950	25550	0.00E+00	0.8	0.00E+00	0	0	0.00E+00
Phenol	0	19400	0.00554	0.2	350	30	70	10950	25550	0.00E+00	0.6	0.00E+00	0	0	0.00E+00
N-Nitrosodiphenylamine	0	19400	0.036	0.2	350	30	70	10950	25550	0.00E+00	0	0.00E+00	0	0.0049	0.00E+00
	0	19400	0	0.2	350	30	70	10950	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
1,2-DCE	0	19400	0.00128	0.2	350	30	70	10950	25550	0.00E+00	0.009	0.00E+00	0	0	0.00E+00
Acetone	0	19400	0.00057	0.2	350	30	70	10950	25550	0.00E+00	0.1	0.00E+00	0	0	0.00E+00
Methylene Chloride	0	19400	0.00446	0.2	350	30	70	10950	25550	0.00E+00	0.06	0.00E+00	0	0.0075	0.00E+00
Trichloroethene	0	19400	0.0146	0.2	350	30	70	10950	25550	0.00E+00	0	0.00E+00	0	0.011	0.00E+00
Benzene	0	19400	0	0.2	350	30	70	10950	25550	0.00E+00	0	0.00E+00	0	0.029	0.00E+00
1,1,1-Trichloroethane	0	19400	0.017	0.2	350	30	70	10950	25550	0.00E+00	0.09	0.00E+00	0	0	0.00E+00
1,2-Dichloropropane	0	19400	0.01	0.2	350	30	70	10950	25550	0.00E+00	0	0.00E+00	0	0.068	0.00E+00
Tetrachloroethene	0	19400	0.048	0.2	350	30	70	10950	25550	0.00E+00	0.01	0.00E+00	0	0.052	0.00E+00
Chloroform	0	19400	0.0089	0.2	350	30	70	10950	25550	0.00E+00	0.01	0.00E+00	0	0.0061	0.00E+00
											HI =	1.11E-03		CR =	2.74E-08

* Assumes 100 percent volatilization of VOCs, so none available for dermal absorption

TABLE 4
ADULT RESIDENT SHOWER INHALATION SCENARIO, PLUME 3.

chemical	C(x) (mg/m3)	IH (m3/h)	ET (hr/d)	EF (d/yr)	ED (yr)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0	0.83	0.2	350	30	70	10950	25550	0	0	0.00E+00	0	0	0.00E+00
HMX	0	0.83	0.2	350	30	70	10950	25550	0	0	0.00E+00	0	0	0.00E+00
TNB	0	0.83	0.2	350	30	70	10950	25550	0	0	0.00E+00	0	0	0.00E+00
TNT	0	0.83	0.2	350	30	70	10950	25550	0	0	0.00E+00	0	0	0.00E+00
2,4-DNT	0	0.83	0.2	350	30	70	10950	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.2	350	30	70	10950	25550	0	0	0.00E+00	0	0	0.00E+00
Aluminum	0	0.83	0.2	350	30	70	10950	25550	0	0	0.00E+00	0	0	0.00E+00
Nickel	0	0.83	0.2	350	30	70	10950	25550	0	0	0.00E+00	0	0	0.00E+00
Vanadium	0	0.83	0.2	350	30	70	10950	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.2	350	30	70	10950	25550	0	0	0.00E+00	0	0	0.00E+00
Di-N-Butylphthalate	0	0.83	0.2	350	30	70	10950	25550	0	0	0.00E+00	0	0	0.00E+00
Diethylphthalate	0	0.83	0.2	350	30	70	10950	25550	0	0	0.00E+00	0	0	0.00E+00
Phenol	0	0.83	0.2	350	30	70	10950	25550	0	0	0.00E+00	0	0	0.00E+00
N-Nitrosodiphenylamine	0	0.83	0.2	350	30	70	10950	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.2	350	30	70	10950	25550	0	0	0.00E+00	0	0	0.00E+00
1,2-DCE	0	0.83	0.2	350	30	70	10950	25550	0	0	0.00E+00	0	0	0.00E+00
Acetone	0.102	0.83	0.2	350	30	70	10950	25550	0.00023195	0	0.00E+00	9.941E-05	0	0.00E+00
Methylene Chloride	0.0252	0.83	0.2	350	30	70	10950	25550	5.73E-05	0.86	6.66E-05	2.456E-05	0.00165	4.05E-08
Trichloroethene	0.00987	0.83	0.2	350	30	70	10950	25550	2.244E-05	0	0.00E+00	9.619E-06	0.017	1.64E-07
Benzene	0	0.83	0.2	350	30	70	10950	25550	0	0	0.00E+00	0	0.029	0.00E+00
1,1,1-Trichloroethane	0	0.83	0.2	350	30	70	10950	25550	0	0.29	0.00E+00	0	0	0.00E+00
1,2-Dichloropropane	0	0.83	0.2	350	30	70	10950	25550	0	0.00114	0.00E+00	0	0	0.00E+00
Tetrachloroethene	0	0.83	0.2	350	30	70	10950	25550	0	0	0.00E+00	0	0.002	0.00E+00
Chloroform	0	0.83	0.2	350	30	70	10950	25550	0	0	0.00E+00	0	0.081	0.00E+00
										HI =	6.66E-05		CR =	2.04E-07

TABLE 5
CHILD (0-6 YEAR) RESIDENT GROUNDWATER INGESTION SCENARIO, PLUME 3

chemical	C(x) (mg/L)	IR (L/d)	EF (d/yr)	ED (years)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0.01878	1	350	6	15	2190	25550	1.20E-03	0.003	4.00E-01	1.03E-04	0.11	1.13E-05
HMX	0.00089	1	350	6	15	2190	25550	5.69E-05	0.05	1.14E-03	4.88E-06	0	0.00E+00
TNB	0.0002	1	350	6	15	2190	25550	1.28E-05	5E-05	2.56E-01	1.10E-06	0	0.00E+00
TNT	0.00041	1	350	6	15	2190	25550	2.62E-05	0.0005	5.24E-02	2.25E-06	0.03	6.74E-08
2,4-DNT	0.00017	1	350	6	15	2190	25550	1.09E-05	0.002	5.43E-03	9.32E-07	0.68	6.33E-07
	0	1	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Aluminum	0	1	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Nickel	0	1	350	6	15	2190	25550	0.00E+00	0.02	0.00E+00	0.00E+00	0	0.00E+00
Vanadium	0	1	350	6	15	2190	25550	0.00E+00	0.007	0.00E+00	0.00E+00	0	0.00E+00
	0	1	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Di-N-Butylphthalate	0	1	350	6	15	2190	25550	0.00E+00	0.1	0.00E+00	0.00E+00	0	0.00E+00
Diethylphthalate	0	1	350	6	15	2190	25550	0.00E+00	0.8	0.00E+00	0.00E+00	0	0.00E+00
Phenol	0	1	350	6	15	2190	25550	0.00E+00	0.6	0.00E+00	0.00E+00	0	0.00E+00
N-Nitrosodiphenylamine	0	1	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0.00E+00	0.0049	0.00E+00
	0	1	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
1,2-DCE	0	1	350	6	15	2190	25550	0.00E+00	0.009	0.00E+00	0.00E+00	0	0.00E+00
Acetone	0.00763	1	350	6	15	2190	25550	4.88E-04	0.1	4.88E-03	4.18E-05	0	0.00E+00
Methylene Chloride	0.00189	1	350	6	15	2190	25550	1.21E-04	0.06	2.01E-03	1.04E-05	0.0075	7.77E-08
Trichloroethene	0.00074	1	350	6	15	2190	25550	4.73E-05	0	0.00E+00	4.05E-06	0.011	4.46E-08
Benzene	0	1	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0.00E+00	0.029	0.00E+00
1,1,1-Trichloroethane	0	1	350	6	15	2190	25550	0.00E+00	0.09	0.00E+00	0.00E+00	0	0.00E+00
1,2-Dichloropropane	0	1	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0.00E+00	0.068	0.00E+00
Tetrachloroethene	0	1	350	6	15	2190	25550	0.00E+00	0.01	0.00E+00	0.00E+00	0.052	0.00E+00
Chloroform	0	1	350	6	15	2190	25550	0.00E+00	0.01	0.00E+00	0.00E+00	0.0061	0.00E+00
Notebook = ChildRME									HI =	7.22E-01		CR =	1.21E-05

TABLE 6
CHILD (0-6 YEAR) RESIDENT DERMAL SHOWER SCENARIO, PLUME 3

chemical	C(x) (mg/L)	SA (cm2)	PC (cm/hr)	ET (h/d)	EF (d/yr)	ED (years)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0.01876	6670	0.00035	0.2	350	6	15	2190	25550	5.57E-07	0.003	1.86E-04	4.777E-08	0.11	5.25E-09
HMX	0.00069	6670	0.00035	0.2	350	6	15	2190	25550	2.64E-08	0.05	5.28E-07	2.264E-09	0	0.00E+00
TNB	0.0002	6670	0.0038	0.2	350	6	15	2190	25550	6.48E-08	5E-05	1.30E-03	5.555E-09	0	0.00E+00
TNT	0.00041	6670	0.0038	0.2	350	6	15	2190	25550	1.33E-07	0.0005	2.66E-04	1.139E-08	0.03	3.42E-10
2,4-DNT	0.00017	6670	0.0038	0.2	350	6	15	2190	25550	5.51E-08	0.002	2.75E-05	4.722E-09	0.68	3.21E-09
	0	6670	0	0.2	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Aluminum	0	6670	0.001	0.2	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Nickel	0	6670	0.001	0.2	350	6	15	2190	25550	0.00E+00	0.02	0.00E+00	0	0	0.00E+00
Vanadium	0	6670	0.001	0.2	350	6	15	2190	25550	0.00E+00	0.007	0.00E+00	0	0	0.00E+00
	0	6670	0	0.2	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Di-N-Butylphthalate	0	6670	0.363	0.2	350	6	15	2190	25550	0.00E+00	0.1	0.00E+00	0	0	0.00E+00
Diethylphthalate	0	6670	0.00502	0.2	350	6	15	2190	25550	0.00E+00	0.8	0.00E+00	0	0	0.00E+00
Phenol	0	6670	0.00554	0.2	350	6	15	2190	25550	0.00E+00	0.6	0.00E+00	0	0	0.00E+00
N-Nitrosodiphenylamine	0	6670	0.036	0.2	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0.0049	0.00E+00
	0	6670	0	0.2	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
1,2-DCE	0	6670	0.00128	0.2	350	6	15	2190	25550	0.00E+00	0.009	0.00E+00	0	0	0.00E+00
Acetone	0	6670	0.00057	0.2	350	6	15	2190	25550	0.00E+00	0.1	0.00E+00	0	0	0.00E+00
Methylene Chloride	0	6670	0.00446	0.2	350	6	15	2190	25550	0.00E+00	0.06	0.00E+00	0	0.0075	0.00E+00
Trichloroethene	0	6670	0.0148	0.2	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0.011	0.00E+00
Benzene	0	6670	0	0.2	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0.029	0.00E+00
1,1,1-Trichloroethane	0	6670	0.017	0.2	350	6	15	2190	25550	0.00E+00	0.09	0.00E+00	0	0	0.00E+00
1,2-Dichloropropane	0	6670	0.01	0.2	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0.068	0.00E+00
Tetrachloroethene	0	6670	0.048	0.2	350	6	15	2190	25550	0.00E+00	0.01	0.00E+00	0	0.052	0.00E+00
Chloroform	0	6670	0.0089	0.2	350	6	15	2190	25550	0.00E+00	0.01	0.00E+00	0	0.0061	0.00E+00
											HI =	1.78E-03		CR =	8.81E-09

* Assumes 100 percent volatilization of VOCs, so none available for dermal absorption

TABLE 7
CHILD (0-6 YEAR) RESIDENT SHOWER INHALATION SCENARIO, PLUME 3

chemical	C(x) (mg/m3)	IR (m3/h)	ET (hr/d)	EF (d/yr)	ED (yr)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
HMX	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
TNB	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
TNT	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
2,4-DNT	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
Aluminum	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
Nickel	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
Vanadium	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
Di-N-Butylphthalate	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
Diethylphthalate	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
Phenol	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
N-Nitrosodiphenylamine	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
1,2-DCE	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
Acetone	0.102	0.83	0.2	350	6	15	2190	25550	0.00108241	0	0.00E+00	9.278E-05	0	0.00E+00
Methylene Chloride	0.0252	0.83	0.2	350	6	15	2190	25550	0.00026742	0.86	3.11E-04	2.292E-05	0.00165	3.78E-08
Trichloroethene	0.00987	0.83	0.2	350	6	15	2190	25550	0.00010474	0	0.00E+00	8.978E-06	0.017	1.53E-07
Benzene	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0.029	0.00E+00
1,1,1-Trichloroethane	0	0.83	0.2	350	6	15	2190	25550	0	0.29	0.00E+00	0	0	0.00E+00
1,2-Dichloropropane	0	0.83	0.2	350	6	15	2190	25550	0	0.00114	0.00E+00	0	0	0.00E+00
Tetrachloroethene	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0.002	0.00E+00
Chloroform	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0.081	0.00E+00
										HI =	3.11E-04		CR =	1.90E-07

TABLE 8
ON-SITE WORKER GROUNDWATER INGESTION SCENARIO, PLUME 3

chemical	C(x) (mg/L)	IR (L/d)	EF (d/yr)	ED (years)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0.01878	1	250	25	70	9125	25550	1.84E-04	0.003	6.13E-02	6.56E-05	0.11	7.22E-06
HMX	0.00089	1	250	25	70	9125	25550	8.71E-06	0.05	1.74E-04	3.11E-06	0	0.00E+00
TNB	0.0002	1	250	25	70	9125	25550	1.96E-06	5E-05	3.91E-02	6.99E-07	0	0.00E+00
TNT	0.00041	1	250	25	70	9125	25550	4.01E-06	0.0005	8.02E-03	1.43E-06	0.03	4.30E-08
2,4-DNT	0.00017	1	250	25	70	9125	25550	1.66E-06	0.002	8.32E-04	5.94E-07	0.68	4.04E-07
	0	1	250	25	70	9125	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Aluminum	0	1	250	25	70	9125	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Nickel	0	1	250	25	70	9125	25550	0.00E+00	0.02	0.00E+00	0.00E+00	0	0.00E+00
Vanadium	0	1	250	25	70	9125	25550	0.00E+00	0.007	0.00E+00	0.00E+00	0	0.00E+00
	0	1	250	25	70	9125	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Di-N-Butylphthalate	0	1	250	25	70	9125	25550	0.00E+00	0.1	0.00E+00	0.00E+00	0	0.00E+00
Diethylphthalate	0	1	250	25	70	9125	25550	0.00E+00	0.8	0.00E+00	0.00E+00	0	0.00E+00
Phenol	0	1	250	25	70	9125	25550	0.00E+00	0.6	0.00E+00	0.00E+00	0	0.00E+00
N-Nitrosodiphenylamine	0	1	250	25	70	9125	25550	0.00E+00	0	0.00E+00	0.00E+00	0.0049	0.00E+00
	0	1	250	25	70	9125	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
1,2-DCE	0	1	250	25	70	9125	25550	0.00E+00	0.009	0.00E+00	0.00E+00	0	0.00E+00
Acetone	0.00763	1	250	25	70	9125	25550	7.47E-05	0.1	7.47E-04	2.67E-05	0	0.00E+00
Methylene Chloride	0.00189	1	250	25	70	9125	25550	1.85E-05	0.06	3.08E-04	6.60E-06	0.0075	4.95E-08
Trichloroethene	0.00074	1	250	25	70	9125	25550	7.24E-06	0	0.00E+00	2.59E-06	0.011	2.84E-08
Benzene	0	1	250	25	70	9125	25550	0.00E+00	0	0.00E+00	0.00E+00	0.029	0.00E+00
1,1,1-Trichloroethane	0	1	250	25	70	9125	25550	0.00E+00	0.09	0.00E+00	0.00E+00	0	0.00E+00
1,2-Dichloropropane	0	1	250	25	70	9125	25550	0.00E+00	0	0.00E+00	0.00E+00	0.068	0.00E+00
Tetrachloroethene	0	1	250	25	70	9125	25550	0.00E+00	0.01	0.00E+00	0.00E+00	0.052	0.00E+00
Chloroform	0	1	250	25	70	9125	25550	0.00E+00	0.01	0.00E+00	0.00E+00	0.0061	0.00E+00
Notebook = WorkRME									HI =	1.10E-01		CR =	7.74E-06

TABLE 9
ON-SITE WORKER DERMAL SHOWER SCENARIO, PLUME 3

chemical	C(x) (mg/L)	SA (cm2)	PC (cm/hr)	ET (h/d)	EF (d/yr)	ED (years)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0.01878	19400	0.000348	0.2	90	25	70	9125	25550	8.93E-08	0.003	2.98E-05	3.19E-08	0.11	3.51E-09
HMX	0.00089	19400	0.000348	0.2	90	25	70	9125	25550	4.23E-09	0.05	8.47E-08	1.51E-09	0	0.00E+00
TNB	0.0002	19400	0.0038	0.2	90	25	70	9125	25550	1.04E-08	5E-05	2.08E-04	3.71E-09	0	0.00E+00
TNT	0.00041	19400	0.0038	0.2	90	25	70	9125	25550	2.13E-08	0.0005	4.26E-05	7.6E-09	0.03	2.28E-10
2,4-DNT	0.00017	19400	0.0038	0.2	90	25	70	9125	25550	8.83E-09	0.002	4.41E-06	3.15E-09	0.68	2.14E-09
	0	19400	0	0.2	90	25	70	9125	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Aluminum	0	19400	0.001	0.2	90	25	70	9125	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Nickel	0	19400	0.001	0.2	90	25	70	9125	25550	0.00E+00	0.02	0.00E+00	0	0	0.00E+00
Vanadium	0	19400	0.001	0.2	90	25	70	9125	25550	0.00E+00	0.007	0.00E+00	0	0	0.00E+00
	0	19400	0	0.2	90	25	70	9125	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Di-N-Butylphthalate	0	19400	0.363	0.2	90	25	70	9125	25550	0.00E+00	0.1	0.00E+00	0	0	0.00E+00
Diethylphthalate	0	19400	0.00502	0.2	90	25	70	9125	25550	0.00E+00	0.8	0.00E+00	0	0	0.00E+00
Phenol	0	19400	0.00554	0.2	90	25	70	9125	25550	0.00E+00	0.6	0.00E+00	0	0	0.00E+00
N-Nitrosodiphenylamine	0	19400	0.036	0.2	90	25	70	9125	25550	0.00E+00	0	0.00E+00	0	0.0049	0.00E+00
	0	19400	0	0.2	90	25	70	9125	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
1,2-DCE	0	19400	0.00128	0.2	90	25	70	9125	25550	0.00E+00	0	[illegible]E+00	0	0	0.00E+00
Acetone	0	19400	0.00057	0.2	90	25	70	9125	25550	0.00E+00	[illegible]	[illegible]+00	0	0	0.00E+00
Methylene Chloride	0	19400	0.00446	0.2	90	25	70	9125	25550	0.00E+00	[illegible]	0.00E+00	0	0.0075	0.00E+00
Trichloroethene	0	19400	0.0148	0.2	90	25	70	9125	25550	0.00E+00	0	0.00E+00	0	0.011	0.00E+00
Benzene	0	19400	0	0.2	90	25	70	9125	25550	0.00E+00	0	0.00E+00	0	0.029	0.00E+00
1,1,1-Trichloroethane	0	19400	0.017	0.2	90	25	70	9125	25550	0.00E+00	0.09	0.00E+00	0	0	0.00E+00
1,2-Dichloropropane	0	19400	0.01	0.2	90	25	70	9125	25550	0.00E+00	0	0.00E+00	0	0.068	0.00E+00
Tetrachloroethene	0	19400	0.048	0.2	90	25	70	9125	25550	0.00E+00	0.01	0.00E+00	0	0.052	0.00E+00
Chloroform	0	19400	0.0089	0.2	90	25	70	9125	25550	0.00E+00	0.01	0.00E+00	0	0.0061	0.00E+00
											HI =	2.85E-04		CR =	5.88E-09

* Assumes 100 percent volatilization of VOCs, so none available for dermal absorption

TABLE 10
ON-SITE WORKER SHOWER INHALATION SCENARIO, PLUME 3.

chemical	C(x) (mg/m3)	IH (m3/h)	ET (hr/d)	EF (d/yr)	ED (yr)	BW (kg)	AT1 non-canc	AT2 cancer	CDI non-canc	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
HMX	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
TNB	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
TNT	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
2,4-DNT	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
Aluminum	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
Nickel	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
Vanadium	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
Di-N-Butylphthalate	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
Diethylphthalate	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
Phenol	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
N-Nitrosodiphenylamine	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
1,2-DCE	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
Acetone	0.102	0.83	0.2	90	25	70	9125	25550	6E-05	0	0.00E+00	2.13E-05	0	0.00E+00
Methylene Chloride	0.0252	0.83	0.2	90	25	70	9125	25550	1.5E-05	0.86	1.71E-05	5.263E-06	0.00165	8.68E-09
Trichloroethene	0.00987	0.83	0.2	90	25	70	9125	25550	5.8E-06	0	0.00E+00	2.061E-06	0.017	3.50E-08
Benzene	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0.029	0.00E+00
1,1,1-Trichloroethane	0	0.83	0.2	90	25	70	9125	25550	0	0.29	0.00E+00	0	0	0.00E+00
1,2-Dichloropropane	0	0.83	0.2	90	25	70	9125	25550	0	0.00114	0.00E+00	0	0	0.00E+00
Tetrachloroethene	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0.002	0.00E+00
Chloroform	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0.061	0.00E+00
										HI =	1.71E-05		CR =	4.37E-08

TABLE 1
CHEMICAL PARAMETER TABLE FOR PLUME 4

Chemical	RME Concentration					Reference Dose		Slope Factor		Permeability Constant	Dermal Absorption
	Surface Soil (mg/kg)	Sediment (mg/kg)	Surface Water (mg/L)	Ground Water (mg/L)	Air (mg/m3)	Oral	Inhalation	Oral	Inhalation		(Soil)
RDX				0.00939		0.003		0.11		0.000348	0.01
HMX				0.00081		0.05				0.000348	0.01
TNB						5E-05				0.0038	0.01
TNT						0.0005		0.03		0.0038	0.01
2,4-DNT						0.002		0.68		0.0038	0.01
Aluminum				0.4946						0.001	0.001
Nickel				0.00657		0.02				0.001	0.001
Vanadium				0.00328		0.007				0.001	0.001
Di-N-Butylphthalate				0.001		0.1				0.363	0.01
Diethylphthalate				0.001		0.8				0.00502	0.01
Phenol				0.002		0.6				0.00554	0.01
N-Nitrosodiphenylamine				0.001				0.0049		0.036	
1,2-DCE				0.00803	0.107	0.009				0.00128	0.01
Acetone				0.00662	0.0883	0.1				0.00057	0.01
Methylene Chloride				0.00253	0.0337	0.06	0.86	0.0075	0.00165	0.00446	0.01
Trichloroethene				0.18	2.4			0.011	0.017	0.0148	0.01
Benzene								0.029	0.029		0.01
1,1,1-Trichloroethane				0.002	0.0267	0.09	0.29			0.017	0.01
1,2-Dichloropropane							0.00114	0.068		0.01	0.01
Tetrachloroethene						0.01		0.052	0.002	0.048	0.01
Chloroform						0.01		0.0061	0.081	0.0089	0.01

Notebook = ChemData

TABLE 2
ADULT RESIDENT GROUNDWATER INGESTION SCENARIO, PLUME 4

chemical	C(x) (mg/L)	IR (L/d)	EF (d/yr)	ED (years)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0.00939	2	350	30	70	10950	25550	2.57E-04	0.003	8.58E-02	1.10E-04	0.11	1.21E-05
HMX	0.00081	2	350	30	70	10950	25550	2.22E-05	0.05	4.44E-04	9.51E-06	0	0.00E+00
TNB	0	2	350	30	70	10950	25550	0.00E+00	5E-05	0.00E+00	0.00E+00	0	0.00E+00
TNT	0	2	350	30	70	10950	25550	0.00E+00	0.0005	0.00E+00	0.00E+00	0.03	0.00E+00
2,4-DNT	0	2	350	30	70	10950	25550	0.00E+00	0.002	0.00E+00	0.00E+00	0.68	0.00E+00
	0	2	350	30	70	10950	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Aluminum	0.4946	2	350	30	70	10950	25550	1.36E-02	0	0.00E+00	5.81E-03	0	0.00E+00
Nickel	0.00657	2	350	30	70	10950	25550	1.80E-04	0.02	9.00E-03	7.71E-05	0	0.00E+00
Vanadium	0.00328	2	350	30	70	10950	25550	8.99E-05	0.007	1.28E-02	3.85E-05	0	0.00E+00
	0	2	350	30	70	10950	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Di-N-Butylphthalate	0.001	2	350	30	70	10950	25550	2.74E-05	0.1	2.74E-04	1.17E-05	0	0.00E+00
Diethylphthalate	0.001	2	350	30	70	10950	25550	2.74E-05	0.8	3.42E-05	1.17E-05	0	0.00E+00
Phenol	0.002	2	350	30	70	10950	25550	5.48E-05	0.6	9.13E-05	2.35E-05	0	0.00E+00
N-Nitrosodiphenylamine	0.001	2	350	30	70	10950	25550	2.74E-05	0	0.00E+00	1.17E-05	0.0049	5.75E-08
	0	2	350	30	70	10950	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
1,2-DCE	0.00803	2	350	30	70	10950	25550	2.20E-04	0.009	2.44E-02	9.43E-05	0	0.00E+00
Acetone	0.00662	2	350	30	70	10950	25550	1.81E-04	0.1	1.81E-03	7.77E-05	0	0.00E+00
Methylene Chloride	0.00253	2	350	30	70	10950	25550	6.93E-05	0.06	1.16E-03	2.97E-05	0.0075	2.23E-07
Trichloroethene	0.18	2	350	30	70	10950	25550	4.93E-03	0	0.00E+00	2.11E-03	0.011	2.32E-05
Benzene	0	2	350	30	70	10950	25550	0.00E+00	0	0.00E+00	0.00E+00	0.029	0.00E+00
1,1,1-Trichloroethane	0.002	2	350	30	70	10950	25550	5.48E-05	0.09	6.09E-04	2.35E-05	0	0.00E+00
1,2-Dichloropropane	0	2	350	30	70	10950	25550	0.00E+00	0	0.00E+00	0.00E+00	0.068	0.00E+00
Tetrachloroethene	0	2	350	30	70	10950	25550	0.00E+00	0.01	0.00E+00	0.00E+00	0.052	0.00E+00
Chloroform	0	2	350	30	70	10950	25550	0.00E+00	0.01	0.00E+00	0.00E+00	0.0061	0.00E+00
Notebook = AdultRME									HI =	1.36E-01		CR =	3.57E-05

TABLE 3
ADULT RESIDENT DERMAL SHOWER SCENARIO, PLUME 4

chemical	C(x) (mg/L)	SA (cm2)	PC (cm/hr)	ET (h/d)	EF (d/yr)	ED (years)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0.00939	19400	0.000348	0.2	350	30	70	10950	25550	1.74E-07	0.003	5.79E-05	7.44E-08	0.11	8.19E-09
HMX	0.00081	19400	0.000348	0.2	350	30	70	10950	25550	1.50E-08	0.05	3.00E-07	6.42E-09	0	0.00E+00
TNB	0	19400	0.0038	0.2	350	30	70	10950	25550	0.00E+00	5E-05	0.00E+00	0	0	0.00E+00
TNT	0	19400	0.0038	0.2	350	30	70	10950	25550	0.00E+00	0.0005	0.00E+00	0	0.03	0.00E+00
2,4-DNT	0	19400	0.0038	0.2	350	30	70	10950	25550	0.00E+00	0.002	0.00E+00	0	0.68	0.00E+00
	0	19400	0	0.2	350	30	70	10950	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Aluminum	0.4946	19400	0.001	0.2	350	30	70	10950	25550	2.63E-05	0	0.00E+00	1.13E-05	0	0.00E+00
Nickel	0.00657	19400	0.001	0.2	350	30	70	10950	25550	3.49E-07	0.02	1.75E-05	1.5E-07	0	0.00E+00
Vanadium	0.00328	19400	0.001	0.2	350	30	70	10950	25550	1.74E-07	0.007	2.49E-05	7.47E-08	0	0.00E+00
	0	19400	0	0.2	350	30	70	10950	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Di-N-Butylphthalate	0.001	19400	0.363	0.2	350	30	70	10950	25550	1.93E-05	0.1	1.93E-04	8.27E-06	0	0.00E+00
Diethylphthalate	0.001	19400	0.00502	0.2	350	30	70	10950	25550	2.67E-07	0.8	3.34E-07	1.14E-07	0	0.00E+00
Phenol	0.002	19400	0.00554	0.2	350	30	70	10950	25550	5.89E-07	0.6	9.82E-07	2.52E-07	0	0.00E+00
N-Nitrosodiphenylamine	0.001	19400	0.036	0.2	350	30	70	10950	25550	1.91E-06	0	0.00E+00	8.2E-07	0.0049	4.02E-09
	0	19400	0	0.2	350	30	70	10950	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
1,2-DCE	0	19400	0.00128	0.2	350	30	70	10950	25550	0.00E+00	0.009	0.00E+00	0	0	0.00E+00
Acetone	0	19400	0.00057	0.2	350	30	70	10950	25550	0.00E+00	0.1	0.00E+00	0	0	0.00E+00
Methylene Chloride	0	19400	0.00446	0.2	350	30	70	10950	25550	0.00E+00	0.06	0.00E+00	0	0.0075	0.00E+00
Trichloroethene	0	19400	0.0148	0.2	350	30	70	10950	25550	0.00E+00	0	0.00E+00	0	0.011	0.00E+00
Benzene	0	19400	0	0.2	350	30	70	10950	25550	0.00E+00	0	0.00E+00	0	0.029	0.00E+00
1,1,1-Trichloroethane	0	19400	0.017	0.2	350	30	70	10950	25550	0.00E+00	0.09	0.00E+00	0	0	0.00E+00
1,2-Dichloropropane	0	19400	0.01	0.2	350	30	70	10950	25550	0.00E+00	0	0.00E+00	0	0.068	0.00E+00
Tetrachloroethene	0	19400	0.048	0.2	350	30	70	10950	25550	0.00E+00	0.01	0.00E+00	0	0.052	0.00E+00
Chloroform	0	19400	0.0089	0.2	350	30	70	10950	25550	0.00E+00	0.01	0.00E+00	0	0.0061	0.00E+00
											HI =	2.95E-04		CR =	1.22E-08

* Assumes 100 percent volatilization of VOCs, so none available for dermal absorption

TABLE 4
ADULT RESIDENT SHOWER INHALATION SCENARIO, PLUME 4.

chemical	C(x) (mg/m3)	IH (m3/h)	ET (hr/d)	EF (d/yr)	ED (yr)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0	0.83	0.2	350	30	70	10950	25550	0	0	0.00E+00	0	0	0.00E+00
HMX	0	0.83	0.2	350	30	70	10950	25550	0	0	0.00E+00	0	0	0.00E+00
TNB	0	0.83	0.2	350	30	70	10950	25550	0	0	0.00E+00	0	0	0.00E+00
TNT	0	0.83	0.2	350	30	70	10950	25550	0	0	0.00E+00	0	0	0.00E+00
2,4-DNT	0	0.83	0.2	350	30	70	10950	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.2	350	30	70	10950	25550	0	0	0.00E+00	0	0	0.00E+00
Aluminum	0	0.83	0.2	350	30	70	10950	25550	0	0	0.00E+00	0	0	0.00E+00
Nickel	0	0.83	0.2	350	30	70	10950	25550	0	0	0.00E+00	0	0	0.00E+00
Vanadium	0	0.83	0.2	350	30	70	10950	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.2	350	30	70	10950	25550	0	0	0.00E+00	0	0	0.00E+00
Di-N-Butylphthalate	0	0.83	0.2	350	30	70	10950	25550	0	0	0.00E+00	0	0	0.00E+00
Diethylphthalate	0	0.83	0.2	350	30	70	10950	25550	0	0	0.00E+00	0	0	0.00E+00
Phenol	0	0.83	0.2	350	30	70	10950	25550	0	0	0.00E+00	0	0	0.00E+00
N-Nitrosodiphenylamine	0	0.83	0.2	350	30	70	10950	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.2	350	30	70	10950	25550	0	0	0.00E+00	0	0	0.00E+00
1,2-DCE	0.107	0.83	0.2	350	30	70	10950	25550	0.00024332	0	0.00E+00	0.0001043	0	0.00E+00
Acetone	0.0883	0.83	0.2	350	30	70	10950	25550	0.00020079	0	0.00E+00	8.605E-05	0	0.00E+00
Methylene Chloride	0.0337	0.83	0.2	350	30	70	10950	25550	7.663E-05	0.86	8.91E-05	3.284E-05	0.00165	5.42E-08
Trichloroethene	2.4	0.83	0.2	350	30	70	10950	25550	0.00545753	0	0.00E+00	0.0023389	0.017	3.98E-05
Benzene	0	0.83	0.2	350	30	70	10950	25550	0	0	0.00E+00	0	0.029	0.00E+00
1,1,1-Trichloroethane	0.0267	0.83	0.2	350	30	70	10950	25550	6.072E-05	0.29	2.09E-04	2.602E-05	0	0.00E+00
1,2-Dichloropropane	0	0.83	0.2	350	30	70	10950	25550	0	0.00114	0.00E+00	0	0	0.00E+00
Tetrachloroethene	0	0.83	0.2	350	30	70	10950	25550	0	0	0.00E+00	0	0.002	0.00E+00
Chloroform	0	0.83	0.2	350	30	70	10950	25550	0	0	0.00E+00	0	0.081	0.00E+00
										HI =	2.98E-04		CR =	3.98E-05

TABLE 5
CHILD (0-6 YEAR) RESIDENT GROUNDWATER INGESTION SCENARIO, PLUME 4

chemical	C(x) (mg/L)	IR (L/d)	EF (d/yr)	ED (years)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0.00939	1	350	6	15	2190	25550	6.00E-04	0.003	2.00E-01	5.15E-05	0.11	5.66E-06
HMX	0.00081	1	350	6	15	2190	25550	5.18E-05	0.05	1.04E-03	4.44E-06	0	0.00E+00
TNB	0	1	350	6	15	2190	25550	0.00E+00	5E-05	0.00E+00	0.00E+00	0	0.00E+00
TNT	0	1	350	6	15	2190	25550	0.00E+00	0.0005	0.00E+00	0.00E+00	0.03	0.00E+00
2,4-DNT	0	1	350	6	15	2190	25550	0.00E+00	0.002	0.00E+00	0.00E+00	0.68	0.00E+00
	0	1	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Aluminum	0.4946	1	350	6	15	2190	25550	3.16E-02	0	0.00E+00	2.71E-03	0	0.00E+00
Nickel	0.00657	1	350	6	15	2190	25550	4.20E-04	0.02	2.10E-02	3.60E-05	0	0.00E+00
Vanadium	0.00328	1	350	6	15	2190	25550	2.10E-04	0.007	3.00E-02	1.80E-05	0	0.00E+00
	0	1	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Di-N-Butylphthalate	0.001	1	350	6	15	2190	25550	6.39E-05	0.1	6.39E-04	5.48E-06	0	0.00E+00
Diethylphthalate	0.001	1	350	6	15	2190	25550	6.39E-05	0.8	7.99E-05	5.48E-06	0	0.00E+00
Phenol	0.002	1	350	6	15	2190	25550	1.28E-04	0.6	2.13E-04	1.10E-05	0	0.00E+00
N-Nitrosodiphenylamine	0.001	1	350	6	15	2190	25550	6.39E-05	0	0.00E+00	5.48E-06	0.0049	2.68E-08
	0	1	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
1,2-DCE	0.00803	1	350	6	15	2190	25550	5.13E-04	0.009	5.70E-02	4.40E-05	0	0.00E+00
Acetone	0.00662	1	350	6	15	2190	25550	4.23E-04	0.1	4.23E-03	3.63E-05	0	0.00E+00
Methylene Chloride	0.00253	1	350	6	15	2190	25550	1.62E-04	0.06	2.70E-03	1.39E-05	0.0075	1.04E-07
Trichloroethene	0.18	1	350	6	15	2190	25550	1.15E-02	0	0.00E+00	9.86E-04	0.011	1.08E-05
Benzene	0	1	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0.00E+00	0.029	0.00E+00
1,1,1-Trichloroethane	0.002	1	350	6	15	2190	25550	1.28E-04	0.09	1.42E-03	1.10E-05	0	0.00E+00
1,2-Dichloropropane	0	1	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0.00E+00	0.068	0.00E+00
Tetrachloroethene	0	1	350	6	15	2190	25550	0.00E+00	0.01	0.00E+00	0.00E+00	0.052	0.00E+00
Chloroform	0	1	350	6	15	2190	25550	0.00E+00	0.01	0.00E+00	0.00E+00	0.0061	0.00E+00
Notebook = ChildRME									HI =	3.18E-01		CR =	1.66E-05

TABLE 6
CHILD (0-6 YEAR) RESIDENT DERMAL SHOWER SCENARIO, PLUME 4

chemical	C(x) (mg/L)	SA (cm2)	PC (cm/hr)	ET (h/d)	EF (d/yr)	ED (years)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0.00939	6670	0.00035	0.2	350	6	15	2190	25550	2.79E-07	0.003	9.29E-05	2.389E-08	0.11	2.63E-09
HMX	0.00081	6670	0.00035	0.2	350	6	15	2190	25550	2.40E-08	0.05	4.81E-07	2.06E-09	0	0.00E+00
TNB	0	6670	0.0038	0.2	350	6	15	2190	25550	0.00E+00	5E-05	0.00E+00	0	0	0.00E+00
TNT	0	6670	0.0038	0.2	350	6	15	2190	25550	0.00E+00	0.0005	0.00E+00	0	0.03	0.00E+00
2,4-DNT	0	6670	0.0038	0.2	350	6	15	2190	25550	0.00E+00	0.002	0.00E+00	0	0.68	0.00E+00
	0	6670	0	0.2	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Aluminum	0.4946	6670	0.001	0.2	350	6	15	2190	25550	4.22E-05	0	0.00E+00	3.615E-06	0	0.00E+00
Nickel	0.00657	6670	0.001	0.2	350	6	15	2190	25550	5.60E-07	0.02	2.80E-05	4.802E-08	0	0.00E+00
Vanadium	0.00328	6670	0.001	0.2	350	6	15	2190	25550	2.80E-07	0.007	4.00E-05	2.398E-08	0	0.00E+00
	0	6670	0	0.2	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Di-N-Butylphthalate	0.001	6670	0.363	0.2	350	6	15	2190	25550	3.10E-05	0.1	3.10E-04	2.653E-06	0	0.00E+00
Diethylphthalate	0.001	6670	0.00502	0.2	350	6	15	2190	25550	4.28E-07	0.8	5.35E-07	3.669E-08	0	0.00E+00
Phenol	0.002	6670	0.00554	0.2	350	6	15	2190	25550	9.45E-07	0.6	1.57E-06	8.099E-08	0	0.00E+00
N-Nitrosodiphenylamine	0.001	6670	0.036	0.2	350	6	15	2190	25550	3.07E-06	0	0.00E+00	2.631E-07	0.0049	1.29E-09
	0	6670	0	0.2	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
1,2-DCE	0	6670	0.00128	0.2	350	6	15	2190	25550	0.00E+00	0.009	0.00E+00	0	0	0.00E+00
Acetone	0	6670	0.00057	0.2	350	6	15	2190	25550	0.00E+00	0.1	0.00E+00	0	0	0.00E+00
Methylene Chloride	0	6670	0.00446	0.2	350	6	15	2190	25550	0.00E+00	0.06	0.00E+00	0	0.0075	0.00E+00
Trichloroethene	0	6670	0.0148	0.2	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0.011	0.00E+00
Benzene	0	6670	0	0.2	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0.029	0.00E+00
1,1,1-Trichloroethane	0	6670	0.017	0.2	350	6	15	2190	25550	0.00E+00	0.09	0.00E+00	0	0	0.00E+00
1,2-Dichloropropane	0	6670	0.01	0.2	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0.068	0.00E+00
Tetrachloroethene	0	6670	0.048	0.2	350	6	15	2190	25550	0.00E+00	0.01	0.00E+00	0	0.052	0.00E+00
Chloroform	0	6670	0.0089	0.2	350	6	15	2190	25550	0.00E+00	0.01	0.00E+00	0	0.0061	0.00E+00
											HI =	4.73E-04		CR =	3.92E-09

* Assumes 100 percent volatilization of VOCs, so none available for dermal absorption

TABLE 7
CHILD (0-6 YEAR) RESIDENT SHOWER INHALATION SCENARIO, PLUME 4

chemical	C(x) (mg/m3)	IH (m3/h)	ET (hr/d)	EF (d/yr)	ED (yr)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
HMX	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
TNB	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
TNT	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
2,4-DNT	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
Aluminum	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
Nickel	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
Vanadium	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
Di-N-Butylphthalate	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
Diethylphthalate	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
Phenol	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
N-Nitrosodiphenylamine	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
1,2-DCE	0.107	0.83	0.2	350	6	15	2190	25550	0.00113547	0	0.00E+00	9.733E-05	0	0.00E+00
Acetone	0.0883	0.83	0.2	350	6	15	2190	25550	0.00093703	0	0.00E+00	8.032E-05	0	0.00E+00
Methylene Chloride	0.0337	0.83	0.2	350	6	15	2190	25550	0.00035762	0.86	4.16E-04	3.065E-05	0.00165	5.06E-08
Trichloroethene	2.4	0.83	0.2	350	6	15	2190	25550	0.02546849	0	0.00E+00	0.002183	0.017	3.71E-05
Benzene	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0.029	0.00E+00
1,1,1-Trichloroethane	0.0267	0.83	0.2	350	6	15	2190	25550	0.00028334	0.29	9.77E-04	2.429E-05	0	0.00E+00
1,2-Dichloropropane	0	0.83	0.2	350	6	15	2190	25550	0	0.00114	0.00E+00	0	0	0.00E+00
Tetrachloroethene	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0.002	0.00E+00
Chloroform	0	0.83	0.2	350	6	15	2190	25550	0	0	0.00E+00	0	0.081	0.00E+00
										HI =	1.39E-03		CR =	3.72E-05

TABLE 8
ON-SITE WORKER GROUNDWATER INGESTION SCENARIO, PLUME 4

chemical	C(x) (mg/L)	IR (L/d)	EF (d/yr)	ED (years)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0.00939	1	250	25	70	9125	25550	9.19E-05	0.003	3.06E-02	3.28E-05	0.11	3.61E-06
HMX	0.00081	1	250	25	70	9125	25550	7.93E-06	0.05	1.59E-04	2.83E-06	0	0.00E+00
TNB	0	1	250	25	70	9125	25550	0.00E+00	5E-05	0.00E+00	0.00E+00	0	0.00E+00
TNT	0	1	250	25	70	9125	25550	0.00E+00	0.0005	0.00E+00	0.00E+00	0.03	0.00E+00
2,4-DNT	0	1	250	25	70	9125	25550	0.00E+00	0.002	0.00E+00	0.00E+00	0.68	0.00E+00
	0	1	250	25	70	9125	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Aluminum	0.4946	1	250	25	70	9125	25550	4.84E-03	0	0.00E+00	1.73E-03	0	0.00E+00
Nickel	0.00657	1	250	25	70	9125	25550	6.43E-05	0.02	3.21E-03	2.30E-05	0	0.00E+00
Vanadium	0.00328	1	250	25	70	9125	25550	3.21E-05	0.007	4.58E-03	1.15E-05	0	0.00E+00
	0	1	250	25	70	9125	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Di-N-Butylphthalate	0.001	1	250	25	70	9125	25550	9.78E-06	0.1	9.78E-05	3.49E-06	0	0.00E+00
Diethylphthalate	0.001	1	250	25	70	9125	25550	9.78E-06	0.8	1.22E-05	3.49E-06	0	0.00E+00
Phenol	0.002	1	250	25	70	9125	25550	1.96E-05	0.6	3.26E-05	6.99E-06	0	0.00E+00
N-Nitrosodiphenylamine	0.001	1	250	25	70	9125	25550	9.78E-06	0	0.00E+00	3.49E-06	0.0049	1.71E-08
	0	1	250	25	70	9125	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
1,2-DCE	0.00803	1	250	25	70	9125	25550	7.86E-05	0.009	8.73E-03	2.81E-05	0	0.00E+00
Acetone	0.00662	1	250	25	70	9125	25550	6.48E-05	0.1	6.48E-04	2.31E-05	0	0.00E+00
Methylene Chloride	0.00253	1	250	25	70	9125	25550	2.48E-05	0.06	4.13E-04	8.84E-06	0.0075	6.63E-08
Trichloroethene	0.18	1	250	25	70	9125	25550	1.76E-03	0	0.00E+00	6.29E-04	0.011	6.92E-06
Benzene	0	1	250	25	70	9125	25550	0.00E+00	0	0.00E+00	0.00E+00	0.029	0.00E+00
1,1,1-Trichloroethane	0.002	1	250	25	70	9125	25550	1.96E-05	0.09	2.17E-04	6.99E-06	0	0.00E+00
1,2-Dichloropropane	0	1	250	25	70	9125	25550	0.00E+00	0	0.00E+00	0.00E+00	0.068	0.00E+00
Tetrachloroethene	0	1	250	25	70	9125	25550	0.00E+00	0.01	0.00E+00	0.00E+00	0.052	0.00E+00
Chloroform	0	1	250	25	70	9125	25550	0.00E+00	0.01	0.00E+00	0.00E+00	0.0061	0.00E+00
Notebook = WorkRME									HI =	4.87E-02		CR =	1.06E-05

TABLE 9
ON-SITE WORKER DERMAL SHOWER SCENARIO, PLUME 4

chemical	C(x) (mg/L)	SA (cm2)	PC (cm/hr)	ET (h/d)	EF (d/yr)	ED (years)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0.00939	19400	0.000348	0.2	90	25	70	9125	25550	4.47E-08	0.003	1.49E-05	1.6E-08	0.11	1.75E-09
HMX	0.00081	19400	0.000348	0.2	90	25	70	9125	25550	3.85E-09	0.05	7.71E-08	1.38E-09	0	0.00E+00
TNB	0	19400	0.0038	0.2	90	25	70	9125	25550	0.00E+00	5E-05	0.00E+00	0	0	0.00E+00
TNT	0	19400	0.0038	0.2	90	25	70	9125	25550	0.00E+00	0.0005	0.00E+00	0	0.03	0.00E+00
2,4-DNT	0	19400	0.0038	0.2	90	25	70	9125	25550	0.00E+00	0.002	0.00E+00	0	0.68	0.00E+00
	0	19400	0	0.2	90	25	70	9125	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Aluminum	0.4946	19400	0.001	0.2	90	25	70	9125	25550	6.76E-06	0	0.00E+00	2.41E-06	0	0.00E+00
Nickel	0.00657	19400	0.001	0.2	90	25	70	9125	25550	8.98E-08	0.02	4.49E-06	3.21E-08	0	0.00E+00
Vanadium	0.00328	19400	0.001	0.2	90	25	70	9125	25550	4.48E-08	0.007	6.40E-06	1.6E-08	0	0.00E+00
	0	19400	0	0.2	90	25	70	9125	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Di-N-Butylphthalate	0.001	19400	0.363	0.2	90	25	70	9125	25550	4.96E-06	0.1	4.96E-05	1.77E-06	0	0.00E+00
Diethylphthalate	0.001	19400	0.00502	0.2	90	25	70	9125	25550	6.66E-08	0.8	8.58E-08	2.45E-08	0	0.00E+00
Phenol	0.002	19400	0.00554	0.2	90	25	70	9125	25550	1.51E-07	0.6	2.52E-07	5.41E-08	0	0.00E+00
N-Nitrosodiphenylamine	0.001	19400	0.036	0.2	90	25	70	9125	25550	4.92E-07	0	0.00E+00	1.76E-07	0.0049	8.61E-10
	0	19400	0	0.2	90	25	70	9125	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
1,2-DCE	0	19400	0.00128	0.2	90	25	70	9125	25550	0.00E+00	0.009	0.00E+00	0	0	0.00E+00
Acetone	0	19400	0.00057	0.2	90	25	70	9125	25550	0.00E+00	0.1	0.00E+00	0	0	0.00E+00
Methylene Chloride	0	19400	0.00446	0.2	90	25	70	9125	25550	0.00E+00	0.06	0.00E+00	0	0.0075	0.00E+00
Trichloroethene	0	19400	0.0148	0.2	90	25	70	9125	25550	0.00E+00	0	0.00E+00	0	0.011	0.00E+00
Benzene	0	19400	0	0.2	90	25	70	9125	25550	0.00E+00	0	0.00E+00	0	0.029	0.00E+00
1,1,1-Trichloroethane	0	19400	0.017	0.2	90	25	70	9125	25550	0.00E+00	0.09	0.00E+00	0	0	0.00E+00
1,2-Dichloropropane	0	19400	0.01	0.2	90	25	70	9125	25550	0.00E+00	0	0.00E+00	0	0.068	0.00E+00
Tetrachloroethene	0	19400	0.048	0.2	90	25	70	9125	25550	0.00E+00	0.01	0.00E+00	0	0.052	0.00E+00
Chloroform	0	19400	0.0089	0.2	90	25	70	9125	25550	0.00E+00	0.01	0.00E+00	0	0.0061	0.00E+00
											HI =	7.58E-05		CR =	2.62E-09

* Assumes 100 percent volatilization of VOCs, so none available for dermal absorption

TABLE 10
ON-SITE WORKER SHOWER INHALATION SCENARIO, PLUME 4.

chemical	C(x) (mg/m3)	IH (m3/h)	ET (hr/d)	EF (d/yr)	ED (yr)	BW (kg)	AT1 non-can	AT2 cancer	CDI non-can	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
HMX	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
TNB	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
TNT	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
2,4-DNT	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
Aluminum	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
Nickel	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
Vanadium	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
Di-N-Butylphthalate	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
Diethylphthalate	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
Phenol	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
N-Nitrosodiphenylamine	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0	0.00E+00
1,2-DCE	0.107	0.83	0.2	90	25	70	9125	25550	6.3E-05	0	0.00E+00	2.23E-05	0	0.00E+00
Acetone	0.0883	0.83	0.2	90	25	70	9125	25550	5.2E-05	0	0.00E+00	1.84E-05	0	0.00E+00
Methylene Chloride	0.0337	0.83	0.2	90	25	70	9125	25550	2E-05	0.86	2.29E-05	7.04E-06	0.00165	1.16E-08
Trichloroethene	2.4	0.83	0.2	90	25	70	9125	25550	0.0014	0	0.00E+00	0.0005012	0.017	8.52E-06
Benzene	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0.029	0.00E+00
1,1,1-Trichloroethane	0.0267	0.83	0.2	90	25	70	9125	25550	1.6E-05	0.29	5.38E-05	5.58E-06	0	0.00E+00
1,2-Dichloropropane	0	0.83	0.2	90	25	70	9125	25550	0	0.00114	0.00E+00	0	0	0.00E+00
Tetrachloroethene	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0.002	0.00E+00
Chloroform	0	0.83	0.2	90	25	70	9125	25550	0	0	0.00E+00	0	0.081	0.00E+00
										HI =	7.67E-05		CR =	8.53E-06

TABLE 1
CHEMICAL PARAMETER TABLE FOR CONSTRUCTION PME EXPOSURE, ATLAS MISSILE AREA

Chemical	RME Concentration					Reference Dose		Slope Factor		Permeability Constant	Dermal Absorption
	Subsurface Soil (mg/kg)	Sediment (mg/kg)	Surface Water (mg/L)	Ground Water (mg/L)	Air (mg/m3)	Oral	Inhalation	Oral	Inhalation		(Soil)
1,2-DCE	0				0.00E+00	0.009				0.00128	0.01
Acetone	0.0202				5.31E-05	1				0.00057	0.01
Methylene Chloride	0				0.00E+00	0.06		0.0075	0.00165	0.00446	0.01
Trichloroethene	0.004				5.48E-04			0.011	0.017	0.0148	0.01
Benzene	0.002				2.58E-04			0.029	0.029		0.01

Notebook = ChemData

* When subchronic values were not available, chronic values were substituted

TABLE 2
CONSTRUCTION WORKER SUBSURFACE SOIL INGESTION SCENARIO, PME EXPOSURE ATLAS MISSILE AREA

chemical	C(x) (mg/kg)	IR (mg/d)	EF (d/y)	ED (yr)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
	0	480	130	1	70	182	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
1,2-DCE	0	480	130	1	70	182	25550	0.00E+00	0.009	0.00E+00	0.00E+00	0	0.00E+00
Acetone	0.0202	480	130	1	70	182	25550	9.89E-08	1	9.89E-08	7.05E-10	0	0.00E+00
Methylene Chloride	0	480	130	1	70	182	25550	0.00E+00	0.06	0.00E+00	0.00E+00	0.0075	0.00E+00
Trichloroethene	0.004	480	130	1	70	182	25550	1.96E-08	0	0.00E+00	1.40E-10	0.011	1.54E-12
Benzene	0.002	480	130	1	70	182	25550	9.80E-09	0	0.00E+00	6.98E-11	0.029	2.02E-12
	0	480	130	1	70	182	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Notebook = ConstrRME									HI =	9.89E-08		CR =	3.56E-12

TABLE 3
CONSTRUCTION WORKER DERMAL SUBSURFACE SOIL CONTACT SCENARIO, PME EXPOSURE ATLAS MISSILE AREA

chemical	C(x) (mg/kg)	SA (cm2)	AD (mg/cm2)	AB unitless	EF (d/y)	ED (yr)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
	0	5300	1	0	130	1	70	182	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
1,2-DCE	0	5300	1	0.01	130	1	70	182	25550	0.00E+00	0.009	0.00E+00	0	0	0.00E+00
Acetone	0.0202	5300	1	0.01	130	1	70	182	25550	1.09E-08	1	1.09E-08	7.782E-11	0	0.00E+00
Methylene Chloride	0	5300	1	0.01	130	1	70	182	25550	0.00E+00	0.06	0.00E+00	0	0.0075	0.00E+00
Trichloroethene	0.004	5300	1	0.01	130	1	70	182	25550	2.16E-09	0	0.00E+00	1.541E-11	0.011	1.70E-13
Benzene	0.002	5300	1	0.01	130	1	70	182	25550	1.08E-09	0	0.00E+00	7.705E-12	0.029	2.23E-13
	0	5300	1	0	130	1	70	182	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Notebook = ConstrRME											HI =	1.09E-08		CR =	3.93E-13

TABLE 4
CONSTRUCTION WORKER INHALATION SCENARIO, PME EXPOSURE ATLAS MISSILE AREA

chemical	C(x) (mg/m3)	IH (m3/h)	ET (h/d)	EF (d/y)	ED (yr)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
	0	2.5	8	130	1	70	182	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
1,2-DCE	0	2.5	8	130	1	70	182	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Acetone	5.31E-05	2.5	8	130	1	70	182	25550	1.08E-05	0	0.00E+00	7.72E-08	0	0.00E+00
Methylene Chloride	0	2.5	8	130	1	70	182	25550	0.00E+00	0	0.00E+00	0.00E+00	0.00165	0.00E+00
Trichloroethene	0.000548	2.5	8	130	1	70	182	25550	1.12E-04	0	0.00E+00	7.97E-07	0.017	1.35E-08
Benzene	0.000258	2.5	8	130	1	70	182	25550	5.27E-05	0	0.00E+00	3.75E-07	0.029	1.09E-08
	0	2.5	8	130	1	70	182	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Notebook = ConstrRME										HI =	0.00E+00		CR =	2.44E-08

TABLE 1
CHEMICAL PARAMETER TABLE FOR CONSTRUCTION PME EXPOSURE, LOAD LINE 1

Chemical	RME Concentration					Reference Dose		Slope Factor		Permeability Constant	Dermal Absorption
	Subsurface Soil (mg/kg)	Sediment (mg/kg)	Surface Water (mg/L)	Ground Water (mg/L)	Air (mg/m3)	Oral	Inhalation	Oral	Inhalation		(Soil)
1,2-DCE	0				0.00E+00	0.009				0.00128	0.01
Acetone	0.0245				6.43E-05	1				0.00057	0.01
Methylene Chloride	0				0.00E+00	0.06		0.0075	0.00165	0.00446	0.01
Trichloroethene	0.0071				9.72E-04			0.011	0.017	0.0148	0.01
Benzene	0							0.029	0.029		0.01

Notebook = ChemData

* Where subchronic values were not available, chronic values were substituted

TABLE 2
CONSTRUCTION WORKER SUBSURFACE SOIL INGESTION SCENARIO, PME EXPOSURE LOAD LINE 1

chemical	C(x) (mg/kg)	IR (mg/d)	EF (d/y)	ED (yr)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
	0	480	130	1	70	182	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
1,2-DCE	0	480	130	1	70	182	25550	0.00E+00	0.009	0.00E+00	0.00E+00	0	0.00E+00
Acetone	0.0245	480	130	1	70	182	25550	1.20E-07	1	1.20E-07	8.55E-10	0	0.00E+00
Methylene Chloride	0	480	130	1	70	182	25550	0.00E+00	0.06	0.00E+00	0.00E+00	0.0075	0.00E+00
Trichloroethene	0.0071	480	130	1	70	182	25550	3.48E-08	0	0.00E+00	2.48E-10	0.011	2.72E-12
Benzene	0	480	130	1	70	182	25550	0.00E+00	0	0.00E+00	0.00E+00	0.029	0.00E+00
	0	480	130	1	70	182	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Notebook = ConstrRME									HI =	1.20E-07		CR =	2.72E-12

TABLE 3
CONSTRUCTION WORKER DERMAL SUBSURFACE SOIL CONTACT SCENARIO, PME EXPOSURE LOAD LINE 1

chemical	C(x) (mg/kg)	SA (cm2)	AD (mg/cm2)	AB unitless	EF (d/y)	ED (yr)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
	0	5300	1	0	130	1	70	182	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
1,2-DCE	0	5300	1	0.01	130	1	70	182	25550	0.00E+00	0.009	0.00E+00	0	0	0.00E+00
Acetone	0.0245	5300	1	0.01	130	1	70	182	25550	1.33E-08	1	1.33E-08	9.438E-11	0	0.00E+00
Methylene Chloride	0	5300	1	0.01	130	1	70	182	25550	0.00E+00	0.06	0.00E+00	0	0.0075	0.00E+00
Trichloroethene	0.0071	5300	1	0.01	130	1	70	182	25550	3.84E-09	0	0.00E+00	2.735E-11	0.011	3.01E-13
Benzene	0	5300	1	0.01	130	1	70	182	25550	0.00E+00	0	0.00E+00	0	0.029	0.00E+00
	0	5300	1	0	130	1	70	182	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Notebook = ConstrRME											HI =	1.33E-08		CR =	3.01E-13

TABLE 4
CONSTRUCTION WORKER INHALATION SCENARIO, PME EXPOSURE LOAD LINE 1

chemical	C(x) (mg/m3)	IH (m3/h)	ET (h/d)	EF (d/y)	ED (yr)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
	0	2.5	8	130	1	70	182	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
1,2-DCE	0	2.5	8	130	1	70	182	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Acetone	6.43E-05	2.5	8	130	1	70	182	25550	1.31E-05	0	0.00E+00	9.35E-08	0	0.00E+00
Methylene Chloride	0	2.5	8	130	1	70	182	25550	0.00E+00	0	0.00E+00	0.00E+00	0.00165	0.00E+00
Trichloroethene	0.000972	2.5	8	130	1	70	182	25550	1.98E-04	0	0.00E+00	1.41E-06	0.017	2.40E-08
Benzene	0	2.5	8	130	1	70	182	25550	0.00E+00	0	0.00E+00	0.00E+00	0.029	0.00E+00
	0	2.5	8	130	1	70	182	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Notebook = ConstrRME										HI =	0.00E+00		CR =	2.40E-08

ATTACHMENT IB
PME SHOWER MODEL CALCULATIONS

MEAD FORMER NOP
CONCENTRATION IN
SHOWER OF VOLATILE
CHEMICALS IN
GROUNDWATER - INHALATION Acetone PLUME 1

Assumptions

Water flow rate (Qw) = 9.5 L/min (approx 2.5 gal/min)
Volume of shower (Vd) = 4.1 m3 (approx 3 ft x 6ft x 8ft)
Fraction volatilized (F) = 100%
Air change rate of room (ach) = 0 03/min (approx 2 changes per hour)
Mixing factor (K) = 1
Time (t) = one minute time intervals

$$C(i) = [(Qw \times Cw \times F) / (K \times Vd \times ach)](1-e^{-(K)(ach)(t)}) + Cs(e^{-(K)(ach)(t)})$$

|----------C(a)----------| ----C(b)----|

C(i) = Indoor Air Concentration
S = Emission Rate (= Qw x Cw x F)
K = Mixing Rate
V = Volume of room
Q = Air flow rate in and out of room
t = time interval
C(s) = C(i) at time = (t-1)

First part of equation is constant

C(a) (mg/m3)	Qw (L/min)	Cw (mg/L)	F (unitless)	K (unitless)	Vd (m3)	ach (min^-1)	t (min)
0 013696	9 500000	0 006000	1 000000	1 000000	4.100000	0.030000	1.000000

Second part of equation is dependent on C(i) at t-1

$$Cb = Cs(e^{-(K)(ach)(t)})$$

where C(s) = C(i) at (t-1)

	C(b) (mg/m3)	Cs (mg/m3)	K (unitless)	ach (min^-1)	t (min)
0-1 min	0 000000	0 000000	1 000000	0 030000	**1.000000**
1-2 min	0 013291	0 013696	1 000000	0 030000	**1.000000**
2-3 min	0 026190	0 026987	1 000000	0 030000	**1.000000**
3-4 min	0 038707	0 039886	1 000000	0 030000	**1.000000**
4-5 min	0 050854	0 052403	1 000000	0 030000	**1.000000**
5-6 min	0 062642	0 064550	1 000000	0 030000	**1.000000**
6-7 min	0 074082	0 076338	1 000000	0 030000	**1.000000**
7-8 min	0 085184	0 087778	1 000000	0 030000	**1.000000**
8-9 min	0 095957	0 098880	1 000000	0 030000	**1.000000**
9-10 min	0 106413	0.109653	1 000000	0 030000	**1.000000**
10-11 min	0 116559	0 120109	1 000000	0 030000	**1.000000**
11-12 min	**0.126405**	**0.130255**	**1.000000**	**0.030000**	**1.000000**

Third part of equation is dependent on above two.

C(i) = C(a) + C(b)

	C(i) (mg/m3)	C(a) (mg/m3)	C(b) (mg/m3)
0-1 min	0 013696	0 013696	**0.000000**
1-2 min	0 026987	0 013696	**0.013291**
2-3 min	0 039886	0 013696	**0.026190**
3-4 min	0 052403	0 013696	**0.038707**
4-5 min	0 064550	0 013696	**0.050854**
5-6 min	0 076338	0 013696	**0.062642**
6-7 min	0 087778	0 013696	**0.074082**
7-8 min	0 098880	0 013696	**0.085184**
8-9 min	0.109653	0 013696	**0.095957**
9-10 min	0 120109	0 013696	**0.106413**
10-11 min	0 130255	0.013696	**0.116559**
11-12 min	**0.140101**	**0.013696**	**0.126405**

Average Concentration = 8.01E-02 (mg/m3)

MEAD FORMER NOP
CONCENTRATION IN
SHOWER OF VOLATILE
CHEMICALS IN
GROUNDWATER - INHALATION Methylene Chloride PLUME 1.

Assumptions

Water flow rate (Qw) = 9 5 L/min (approx 2 5 gal/min)
Volume of shower (Vd) = 4 1 m3 (approx 3 ft x 6ft x 8ft)
Fraction volatilized (F) = 100%
Air change rate of room (ach) = 0 03/min (approx 2 changes per hour)
Mixing factor (K) = 1
Time (t) = one minute time intervals

$$C(i) = [(Qw \times Cw \times F) / (K \times Vd \times ach)](1-e^{-(K)(ach)(t)}) + Cs(e^{-(K)(ach)(t)})$$

|----------C(a)----------| ----C(b)----|

C(i) = Indoor Air Concentration
S = Emission Rate (= Qw x Cw x F)
K = Mixing Rate
V = Volume of room
Q = Air flow rate in and out of room
t = time interval
C(s) = C(i) at time = (t-1)

First part of equation is constant:

C(a) (mg/m3)	Qw (L/min)	Cw (mg/L)	F (unitless)	K (unitless)	Vd (m3)	ach (min^-1_)	t (min)
0 003607	9 500000	0 001580	1 000000	1 000000	4 100000	0 030000	1 000000

Second part of equation is dependent on C(i) at t-1

$$Cb = Cs(e^{-(K)(ach)(t)})$$

where C(s) = C(i) at (t-1)

	C(b) (mg/m3)	Cs (mg/m3)	K (unitless)	ach (min^-1)	t (min)
0-1 min	0.000000	0.000000	1 000000	0 030000	**1.000000**
1-2 min	0 003500	0 003607	1.000000	0 030000	**1.000000**
2-3 min	0 006897	0 007107	1 000000	0 030000	**1.000000**
3-4 min	0 010193	0 010503	1 000000	0 030000	**1.000000**
4-5 min	0 013392	0 013799	1 000000	0 030000	**1.000000**
5-6 min	0 016496	0 016998	1 000000	0 030000	**1.000000**
6-7 min	0 019508	0 020102	1 000000	0 030000	**1.000000**
7-8 min	0 022432	0 023115	1 000000	0.030000	**1.000000**
8-9 min	0 025269	0.026038	1 000000	0 030000	**1.000000**
9-10 min	0.028022	0 028875	1 000000	0 030000	**1.000000**
10-11 min	0 030694	0 031629	1 000000	0.030000	**1.000000**
11-12 min	**0.033287**	**0.034300**	**1.000000**	**0.030000**	**1.000000**

Third part of equation is dependent on above two.

C(i) = C(a) + C(b)

	C(i) (mg/m3)	C(a) (mg/m3)	C(b) (mg/m3)
0-1 min	0 003607	0 003607	**0.000000**
1-2 min	0 007107	0 003607	**0.003500**
2-3 min	0 010503	0 003607	**0.006897**
3-4 min	0 013799	0 003607	**0.010193**
4-5 min	0 016998	0.003607	**0.013392**
5-6 min	0 020102	0 003607	**0.016496**
6-7 min	0 023115	0 003607	**0.019508**
7-8 min	0 026038	0 003607	**0.022432**
8-9 min	0 028875	0 003607	**0.025269**
9-10 min	0 031629	0 003607	**0.028022**
10-11 min	0 034300	0.003607	**0.030694**
11-12 min	**0.036893**	**0.003607**	**0.033287**

Average Concentration = 2.11E-02 (mg/m3)

MEAD FORMER NOP
CONCENTRATION IN
SHOWER OF VOLATILE
CHEMICALS IN
GROUNDWATER - INHALATION Trichloroethene PLUME 1

Assumptions

Water flow rate (Qw) = 9 5 L/min (approx 2.5 gal/min)
Volume of shower (Vd) = 4.1 m3 (approx 3 ft x 6ft x 8ft)
Fraction volatilized (F) = 100%
Air change rate of room (ach) = 0 03/min (approx 2 changes per hour)
Mixing factor (K) = 1
Time (t) = one minute time intervals

$$C(i) = [(Qw \times Cw \times F) / (K \times Vd \times ach)] (1-e^{-(K)(ach)(t)}) + Cs (e^{-(K)(ach)(t)})$$

]----------C(a)----------| ----C(b)----|

C(i) = Indoor Air Concentration
S = Emission Rate (= Qw x Cw x F)
K = Mixing Rate
V = Volume of room
Q = Air flow rate in and out of room
t = time interval
C(s) = C(i) at time = (t-1)

First part of equation is constant.

C(a) (mg/m3)	Qw (L/min)	Cw (mg/L)	F (unitless)	K (unitless)	Vd (m3)	ach (min^-1_)	t (min)
0 319573	9 500000	0 140000	1.000000	1 000000	4 100000	0 030000	1 000000

Second part of equation is dependent on C(i) at t-1:

$$Cb = Cs (e^{-(K)(ach)(t)})$$

where C(s) = C(i) at (t-1)

	C(b) (mg/m3)	Cs (mg/m3)	K (unitless)	ach (min^-1)	t (min)
0-1 min	0 000000	0 000000	1 000000	0 030000	1.000000
1-2 min	0 310128	0 319573	1 000000	0 030000	1.000000
2-3 min	0 611090	0 629701	1 000000	0 030000	1.000000
3-4 min	0 903158	0 930663	1 000000	0.030000	1.000000
4-5 min	1.186593	1 222730	1 000000	0 030000	1.000000
5-6 min	1 461652	1 506166	1 000000	0 030000	1.000000
6-7 min	1 728581	1 781225	1 000000	0 030000	1.000000
7-8 min	1 987622	2 048154	1 000000	0 030000	1.000000
8-9 min	2 239007	2 307195	1 000000	0 030000	1.000000
9-10 min	2 482962	2 558579	1 000000	0 030000	1.000000
10-11 min	2 719707	2 802535	1 000000	0.030000	1.000000
11-12 min	2.949456	3.039280	1.000000	0.030000	1.000000

Third part of equation is dependent on above two:

C(i) = C(a) + C(b)

	C(i) (mg/m3)	C(a) (mg/m3)	C(b) (mg/m3)
0-1 min	0 319573	0 319573	0.000000
1-2 min	0 629701	0 319573	0.310128
2-3 min	0 930663	0 319573	0.611090
3-4 min	1 222730	0 319573	0.903158
4-5 min	1 506166	0 319573	1.186593
5-6 min	1 781225	0 319573	1.461652
6-7 min	2 048154	0 319573	1.728581
7-8 min	2 307195	0 319573	1.987622
8-9 min	2 558579	0 319573	2.239007
9-10 min	2 802535	0 319573	2.482962
10-11 min	3 039280	0 319573	2.719707
11-12 min	3.269028	0.319573	2.949456

Average Concentration = 1.87E+00 (mg/m3)

MEAD FORMER NOP
CONCENTRATION IN
SHOWER OF VOLATILE
CHEMICALS IN
GROUNDWATER - INHALATION Tetrachloroethene PLUME 1

Assumptions

Water flow rate (Qw) = 9 5 L/min (approx. 2 5 gal/min)
Volume of shower (Vd) = 4.1 m3 (approx 3 ft x 6ft x 8ft)
Fraction volatilized (F) = 100%
Air change rate of room (ach) = 0 03/min (approx 2 changes per hour)
Mixing factor (K) = 1
Time (t) = one minute time intervals

$$C(i) = [\,(Qw \times Cw \times F) / (K \times Vd \times ach)\,]\,(1-e^{-(K)(ach)(t)}) + Cs\,(e^{-(K)(ach)(t)})$$

|----------C(a)----------] -----C(b)-----|

C(i) = Indoor Air Concentration
S = Emission Rate (= Qw x Cw x F)
K = Mixing Rate
V = Volume of room
Q = Air flow rate in and out of room
t = time interval
C(s) = C(i) at time = (i-1)

First part of equation is constant:

C(a) (mg/m3)	Qw (L/min)	Cw (mg/L)	F (unitless)	K (unitless)	Vd (m3)	ach (min^-1)	t (min)
0 006848	9.500000	0 003000	1 000000	1 000000	4 100000	0 030000	1.000000

Second part of equation is dependent on C(i) at t-1:

$$Cb = Cs\,(e^{-(K)(ach)(t)})$$

where C(s) = C(i) at (t-1)

	C(b) (mg/m3)	Cs (mg/m3)	K (unitless)	ach (min^-1)	t (min)
0-1 min	0 000000	0 000000	1 000000	0 030000	1.000000
1-2 min	0 006646	0 006848	1 000000	0 030000	1.000000
2-3 min	0 013095	0 013494	1 000000	0 030000	1.000000
3-4 min	0.019353	0 019943	1 000000	0 030000	1.000000
4-5 min	0 025427	0 026201	1 000000	0 030000	1.000000
5-6 min	0 031321	0 032275	1 000000	0 030000	1.000000
6-7 min	0 037041	0 038169	1.000000	0 030000	1.000000
7-8 min	0 042592	0 043889	1 000000	0 030000	1.000000
8-9 min	0 047979	0 049440	1.000000	0 030000	1.000000
9-10 min	0 053206	0.054827	1 000000	0 030000	1.000000
10-11 min	0 058279	0 060054	1 000000	0 030000	1.000000
11-12 min	0.063203	0.065127	1.000000	0.030000	1.000000

Third part of equation is dependent on above two:

C(i) = C(a) + C(b)

	C(i) (mg/m3)	C(a) (mg/m3)	C(b) (mg/m3)
0-1 min	0 006848	0 006848	0.000000
1-2 min	0 013494	0 006848	0.006646
2-3 min	0 019943	0 006848	0.013095
3-4 min	0 026201	0 006848	0.019353
4-5 min	0 032275	0 006848	0.025427
5-6 min	0 038169	0.006848	0.031321
6-7 min	0 043889	0 006848	0.037041
7-8 min	0 049440	0 006848	0.042592
8-9 min	0 054827	0 006848	0.047979
9-10 min	0 060054	0 006848	0.053206
10-11 min	0 065127	0 006848	0.058279
11-12 min	0.070051	0.006848	0.063203

Average Concentration = 4 00E-02 (mg/m3)

MEAD FORMER NOP
CONCENTRATION IN
SHOWER OF VOLATILE
CHEMICALS IN
GROUNDWATER - INHALATION DCE PLUME 2

Assumptions:

Water flow rate (Qw) = 9.5 L/min (approx. 2.5 gal/min)
Volume of shower (Vd) = 4.1 m3 (approx 3 ft x 6ft x 8ft)
Fraction volatilized (F) = 100%
Air change rate of room (ach) = 0.03/min (approx 2 changes per hour)
Mixing factor (K) = 1
Time (t) = one minute time intervals

$$C(i) = [(Qw \times Cw \times F) / (K \times Vd \times ach)](1-e^{-(K)(ach)(t)}) + Cs(e^{-(K)(ach)(t)})$$

|----------C(a)----------| ----C(b)----|

C(i) = Indoor Air Concentration
S = Emission Rate (= Qw x Cw x F)
K = Mixing Rate
V = Volume of room
Q = Air flow rate in and out of room
t = time interval
C(s) = C(i) at time = (t-1)

First part of equation is constant:

C(a) (mg/m3)	Qw (L/min)	Cw (mg/L)	F (unitless)	K (unitless)	Vd (m3)	ach (min^-1)	t (min)
0.004565	9.500000	0.002000	1.000000	1.000000	4.100000	0.030000	1.000000

Second part of equation is dependent on C(i) at t-1

$$Cb = Cs(e^{-(K)(ach)(t)})$$

where C(s) = C(i) at (t-1)

	C(b) (mg/m3)	Cs (mg/m3)	K (unitless)	ach (min^-1)	t (min)
0-1 min	0.000000	0.000000	1.000000	0.030000	**1.000000**
1-2 min	0.004430	0.004565	1.000000	0.030000	**1.000000**
2-3 min	0.008730	0.008996	1.000000	0.030000	**1.000000**
3-4 min	0.012902	0.013295	1.000000	0.030000	**1.000000**
4-5 min	0.016951	0.017468	1.000000	0.030000	**1.000000**
5-6 min	0.020881	0.021517	1.000000	0.030000	**1.000000**
6-7 min	0.024694	0.025446	1.000000	0.030000	**1.000000**
7-8 min	0.028395	0.029259	1.000000	0.030000	**1.000000**
8-9 min	0.031986	0.032960	1.000000	0.030000	**1.000000**
9-10 min	0.035471	0.036551	1.000000	0.030000	**1.000000**
10-11 min	0.038853	0.040036	1.000000	0.030000	**1.000000**
11-12 min	**0.042135**	**0.043418**	**1.000000**	**0.030000**	**1.000000**

Third part of equation is dependent on above two

C(i) = C(a) + C(b)

	C(i) (mg/m3)	C(a) (mg/m3)	C(b) (mg/m3)
0-1 min	0.004565	0.004565	**0.000000**
1-2 min	0.008996	0.004565	**0.004430**
2-3 min	0.013295	0.004565	**0.008730**
3-4 min	0.017468	0.004565	**0.012902**
4-5 min	0.021517	0.004565	**0.016951**
5-6 min	0.025446	0.004565	**0.020881**
6-7 min	0.029259	0.004565	**0.024694**
7-8 min	0.032960	0.004565	**0.028395**
8-9 min	0.036551	0.004565	**0.031986**
9-10 min	0.040036	0.004565	**0.035471**
10-11 min	0.043418	0.004565	**0.038853**
11-12 min	**0.046700**	**0.004565**	**0.042135**

Average Concentration = 2.67E-02 (mg/m3)

MEAD FORMER NOP
CONCENTRATION IN
SHOWER OF VOLATILE
CHEMICALS IN
GROUNDWATER - INHALATION Methylene Chloride PLUME 2

Assumptions:

Water flow rate (Qw) = 9 5 L/min (approx 2 5 gal/min)
Volume of shower (Vd) = 4 1 m3 (approx 3 ft x 6ft x 8ft)
Fraction volatilized (F) = 100%
Air change rate of room (ach) = 0 03/min (approx 2 changes per hour)
Mixing factor (K) = 1
Time (t) = one minute time intervals

$$C(i) = [(Qw \times Cw \times F) / (K \times Vd \times ach)](1-e^{-(K)(ach)(t)}) + Cs(e^{-(K)(ach)(t)})$$

|----------C(a)----------| ---C(b)---|

C(i) = Indoor Air Concentration
S = Emission Rate (= Qw x Cw x F)
K = Mixing Rate
V = Volume of room
Q = Air flow rate in and out of room
t = time interval
C(s) = C(i) at time = (t-1)

First part of equation is constant:

C(a) (mg/m3)	Qw (L/min)	Cw (mg/L)	F (unitless)	K (unitless)	Vd (m3)	ach (min^-1_)	t (min)
0 076766	9 500000	0 033630	1 000000	1 000000	4 100000	0 030000	1 000000

Second part of equation is dependent on C(i) at t-1

$$Cb = Cs(e^{-(K)(ach)(t)})$$

where C(s) = C(i) at (t-1)

	C(b) (mg/m3)	Cs (mg/m3)	K (unitless)	ach (min^-t)	t (min)
0-1 min	0 000000	0 000000	1 000000	0 030000	**1.000000**
1-2 min	0 074497	0 076766	1 000000	0 030000	**1.000000**
2-3 min	0 146793	0 151263	1 000000	0 030000	**1.000000**
3-4 min	0 216951	0 223558	1 000000	0 030000	**1.000000**
4-5 min	0 285037	0 293717	1 000000	0 030000	**1.000000**
5-6 min	0 351110	0 361803	1 000000	0 030000	**1.000000**
6-7 min	0 415230	0 427876	1 000000	0 030000	**1.000000**
7-8 min	0 477455	0 491996	1 000000	0 030000	**1.000000**
8-9 min	0 537841	0 554221	1 000000	0.030000	**1.000000**
9-10 min	0 596443	0 614607	1 000000	0 030000	**1.000000**
10-11 min	0 653313	0 673209	1.000000	0 030000	**1.000000**
11-12 min	**0.708501**	**0.730078**	**1.000000**	**0.030000**	**1.000000**

Third part of equation is dependent on above two

C(i) = C(a) + C(b)

	C(i) (mg/m3)	C(a) (mg/m3)	C(b) (mg/m3)
0-1 min	0 076766	0 076766	**0.000000**
1-2 min	0 151263	0 076766	**0.074497**
2-3 min	0 223558	0 076766	**0.146793**
3-4 min	0 293717	0 076766	**0.216951**
4-5 min	0 361803	0 076766	**0.285037**
5-6 min	0 427876	0 076766	**0.351110**
6-7 min	0 491996	0 076766	**0.415230**
7-8 min	0 554221	0 076766	**0.477455**
8-9 min	0 614607	0 076766	**0.537841**
9-10 min	0 673209	0 076766	**0.596443**
10-11 min	0.730078	0 076766	**0.653313**
11-12 min	**0.785267**	**0.076766**	**0.708501**

Average Concentration = 4.49E-01 (mg/m3)

MEAD FORMER NOP
CONCENTRATION IN
SHOWER OF VOLATILE
CHEMICALS IN
GROUNDWATER - INHALATION Chloroform PLUME 2

Assumptions:

Water flow rate (Qw) = 9 5 L/min (approx 2 5 gal/min)
Volume of shower (Vd) = 4 1 m3 (approx 3 ft x 6ft x 8ft)
Fraction volatilized (F) = 100%
Air change rate of room (ach) = 0 03/min (approx 2 changes per hour)
Mixing factor (K) = 1
Time (t) = one minute time intervals

$$C(i) = [\,(Qw \times Cw \times F) / (K \times Vd \times ach)\,]\,(1-e^{-(K)(ach)(t)}) + Cs\,(e^{-(K)(ach)(t)})$$

|----------C(a)----------| -----C(b)----|

C(i) = Indoor Air Concentration
S = Emission Rate (= Qw x Cw x F)
K = Mixing Rate
V = Volume of room
Q = Air flow rate in and out of room
t = time interval
C(s) = C(i) at time = (t-1)

First part of equation is constant

C(a) (mg/m3)	Qw (L/min)	Cw (mg/L)	F (unitless)	K (unitless)	Vd (m3)	ach (min^-1_)	t (min)
0 059349	9 500000	0 026000	1 000000	1 000000	4 100000	0.030000	1 000000

Second part of equation is dependent on C(i) at t-1

$$Cb = Cs\,(e^{-(K)(ach)(t)})$$

where C(s) = C(i) at (t-1)

	C(b) (mg/m3)	Cs (mg/m3)	K (unitless)	ach (min^-1)	t (min)
0-1 mi	0 000000	0 000000	1 000000	0 030000	1.000000
1-2 mi	0 057595	0 059349	1 000000	0 030000	1.000000
2-3 mi	0 113488	0 116944	1 000000	0 030000	1.000000
3-4 mi	0 167729	0 172837	1 000000	0 030000	1.000000
4-5 mi	0 220367	0 227078	1 000000	0 030000	1.000000
5-6 mi	0 271450	0 279717	1 000000	0 030000	1.000000
6-7 mi	0 321022	0 330799	1 000000	0 030000	1.000000
7-8 mi	0 369130	0 380371	1 000000	0 030000	1.000000
8-9 mi	0 415816	0 428479	1 000000	0 030000	1.000000
9-10 m	0 461122	0.475165	1.000000	0 030000	1.000000
10-11	0 505088	0 520471	1.000000	0 030000	1.000000
11-12	0.547756	0.564438	1.000000	0.030000	1.000000

Third part of equation is dependent on above two

C(i) = C(a) + C(b)

	C(i) (mg/m3)	C(a) (mg/m3)	C(b) (mg/m3)
0-1 mi	0 059349	0 059349	0.000000
1-2 mi	0 116944	0 059349	0.057595
2-3 mi	0.172837	0 059349	0.113488
3-4 mi	0 227078	0 059349	0.167729
4-5 mi	0 279717	0 059349	0.220367
5-6 mi	0.330799	0 059349	0.271450
6-7 mi	0 380371	0 059349	0.321022
7-8 mi	0 428479	0 059349	0.369130
8-9 mi	0.475165	0 059349	0.415816
9-10 m	0 520471	0.059349	0.461122
10-11	0 564438	0 059349	0.505088
11-12	0.607105	0.059349	0.547756

Average 3 47E-01 (mg/m3)

MEAD FORMER NOP
CONCENTRATION IN
SHOWER OF VOLATILE
CHEMICALS IN
GROUNDWATER - INHALATION Trichloroethene PLUME 2

Assumptions:

Water flow rate (Qw) = 9 5 L/min (approx 2.5 gal/min)
Volume of shower (Vd) = 4.1 m3 (approx 3 ft x 6ft x 8ft)
Fraction volatilized (F) = 100%
Air change rate of room (ach) = 0 03/min (approx 2 changes per hour)
Mixing factor (K) = 1
Time (t) = one minute time intervals

$$C(i) = [(Qw \times Cw \times F) / (K \times Vd \times ach)](1-e^{-(K)(ach)(t)}) + Cs(e^{-(K)(ach)(t)})$$

|·····C(a)·····| ·····C(b)·····|

C(i) = Indoor Air Concentration
S = Emission Rate (= Qw x Cw x F)
K = Mixing Rate
V = Volume of room
Q = Air flow rate in and out of room
t = time interval
C(s) = C(i) at time = (t-1)

First part of equation is constant:

C(a) (mg/m3)	Qw (L/min)	Cw (mg/L)	F (unitless)	K (unitless)	Vd (m3)	ach (min^-1_)	t (min)
4 108792	9 500000	1 800000	1 000000	1 000000	4 100000	0.030000	1 000000

Second part of equation is dependent on C(i) at (t-1)

$$Cb = Cs(e^{-(K)(ach)(t)})$$

where C(s) = C(i) at (t-1)

	C(b) (mg/m3)	Cs (mg/m3)	K (unitless)	ach (min^-1)	t (min)
0-1 min	0.000000	0 000000	1.000000	0 030000	**1.000000**
1-2 min	3 987359	4 108792	1 000000	0 030000	**1.000000**
2-3 min	7 856873	8 096150	1 000000	0 030000	**1.000000**
3-4 min	11 612026	11 965664	1.000000	0 030000	**1.000000**
4-5 min	15 256197	15 720817	1 000000	0 030000	**1.000000**
5-6 min	18 792667	19 364989	1.000000	0 030000	**1.000000**
6-7 min	22.224618	22 901458	1 000000	0.030000	**1.000000**
7-8 min	25 555140	26 333410	1 000000	0.030000	**1.000000**
8-9 min	28 787230	29 663932	1 000000	0.030000	**1.000000**
9-10 min	31.923797	32 896022	1 000000	0 030000	**1.000000**
10-11 min	34 967665	36.032589	1.000000	0.030000	**1.000000**
11-12 min	**37.921573**	**39.076457**	**1.000000**	**0.030000**	**1.000000**

Third part of equation is dependent on above two:

C(i) = C(a) + C(b)

	C(i) (mg/m3)	C(a) (mg/m3)	C(b) (mg/m3)
0-1 min	4 108792	4 108792	**0.000000**
1-2 min	8.096150	4 108792	**3.987359**
2-3 min	11 965664	4 108792	**7.856873**
3-4 min	15 720817	4 108792	**11.612026**
4-5 min	19 364989	4.108792	**15.256197**
5-6 min	22 901458	4 108792	**18.792667**
6-7 min	26 333410	4 108792	**22.224618**
7-8 min	29 663932	4 108792	**25.555140**
8-9 min	32 896022	4.108792	**28.787230**
9-10 min	36 032589	4.108792	**31.923797**
10-11 min	39 076457	4.108792	**34.967665**
11-12 min	**42.030364**	**4.108792**	**37.921573**

Average Concentration = 2 40E+01 (mg/m3)

MEAD FORMER NOP
CONCENTRATION IN
SHOWER OF VOLATILE
CHEMICALS IN
GROUNDWATER - INHALATION Acetone PLUME 3

Assumptions:

Water flow rate (Qw) = 9.5 L/min (approx. 2.5 gal/min)
Volume of shower (Vd) = 4.1 m3 (approx 3 ft x 6ft x 8ft)
Fraction volatilized (F) = 100%
Air change rate of room (ach) = 0.03/min (approx 2 changes per hour)
Mixing factor (K) = 1
Time (t) = one minute time intervals

$$C(i) = [(Qw \times Cw \times F) / (K \times Vd \times ach)](1-e^{-(K)(ach)(t)}) + Cs(e^{-(K)(ach)(t)})$$

|----------C(a)----------| -----C(b)-----|

C(i) = Indoor Air Concentration
S = Emission Rate (= Qw x Cw x F)
K = Mixing Rate
V = Volume of room
Q = Air flow rate in and out of room
t = time interval
C(s) = C(i) at time = (t-1)

First part of equation is constant:

C(a) (mg/m3)	Qw (L/min)	Cw (mg/L)	F (unitless)	K (unitless)	Vd (m3)	ach (min^-1)	t (min)
0.017417	9.500000	0.007630	1.000000	1.000000	4.100000	0.030000	1.000000

Second part of equation is dependent on C(i) at t-1:

$$Cb = Cs(e^{-(K)(ach)(t)})$$

where C(s) = C(i) at (t-1)

	C(b) (mg/m3)	Cs (mg/m3)	K (unitless)	ach (min^-1)	t (min)
0-1 min	0.000000	0.000000	1.000000	0.030000	1.000000
1-2 min	0.016902	0.017417	1.000000	0.030000	1.000000
2-3 min	0.033304	0.034319	1.000000	0.030000	1.000000
3-4 min	0.049222	0.050721	1.000000	0.030000	1.000000
4-5 min	0.064669	0.066639	1.000000	0.030000	1.000000
5-6 min	0.079660	0.082086	1.000000	0.030000	1.000000
6-7 min	0.094208	0.097077	1.000000	0.030000	1.000000
7-8 min	0.108325	0.111624	1.000000	0.030000	1.000000
8-9 min	0.122026	0.125742	1.000000	0.030000	1.000000
9-10 min	0.135321	0.139443	1.000000	0.030000	1.000000
10-11 min	0.148224	0.152738	1.000000	0.030000	1.000000
11-12 min	0.160745	0.165641	1.000000	0.030000	1.000000

Third part of equation is dependent on above two:

C(i) = C(a) + C(b)

	C(i) (mg/m3)	C(a) (mg/m3)	C(b) (mg/m3)
0-1 min	0.017417	0.017417	0.000000
1-2 min	0.034319	0.017417	0.016902
2-3 min	0.050721	0.017417	0.033304
3-4 min	0.066639	0.017417	0.049222
4-5 min	0.082086	0.017417	0.064669
5-6 min	0.097077	0.017417	0.079660
6-7 min	0.111624	0.017417	0.094208
7-8 min	0.125742	0.017417	0.108325
8-9 min	0.139443	0.017417	0.122026
9-10 min	0.152738	0.017417	0.135321
10-11 min	0.165641	0.017417	0.148224
11-12 min	0.178162	0.017417	0.160745

Average Concentration = 1.02E-01 (mg/m3)

MEAD FORMER NOP
CONCENTRATION IN
SHOWER OF VOLATILE
CHEMICALS IN
GROUNDWATER - INHALATION Methylene Chloride PLUME 3

Assumptions:

Water flow rate (Qw) = 9 5 L/min (approx. 2.5 gal/min)
Volume of shower (Vd) = 4.1 m3 (approx 3 ft x 6ft x 8ft)
Fraction volatilized (F) = 100%
Air change rate of room (ach) = 0.03/min (approx 2 changes per hour)
Mixing factor (K) = 1
Time (t) = one minute time intervals

$$C(i) = [(Qw \times Cw \times F) / (K \times Vd \times ach)]\,(1-e^{-(K)(ach)(t)}) + Cs\,(e^{-(K)(ach)(t)})$$

|----------C(a)----------| -----C(b)-----|

C(i) = Indoor Air Concentration
S = Emission Rate (= Qw x Cw x F)
K = Mixing Rate
V = Volume of room
Q = Air flow rate in and out of room
t = time interval
C(s) = C(i) at time = (t-1)

First part of equation is constant:

C(a) (mg/m3)	Qw (L/min)	Cw (mg/L)	F (unitless)	K (unitless)	Vd (m3)	ach (min^-1_)	t (min)
0 004314	9 500000	0 001890	1.000000	1.000000	4 100000	0 030000	1 000000

Second part of equation is dependent on C(i) at t-1:

$$Cb = Cs\,(e^{-(K)(ach)(t)})$$

where C(s) = C(i) at (t-1)

	C(b) (mg/m3)	Cs (mg/m3)	K (unitless)	ach (min^-1)	t (min)
0-1 min	0 000000	0 000000	1 000000	0 030000	**1.000000**
1-2 min	0 004187	0 004314	1.000000	0.030000	**1.000000**
2-3 min	0 008250	0 008501	1 000000	0.030000	**1.000000**
3-4 min	0 012193	0 012564	1.000000	0 030000	**1.000000**
4-5 min	0 016019	0 016507	1.000000	0.030000	**1.000000**
5-6 min	0 019732	0 020333	1.000000	0 030000	**1.000000**
6-7 min	0 023336	0 024047	1 000000	0 030000	**1.000000**
7-8 min	0 026833	0 027650	1 000000	0.030000	**1.000000**
8-9 min	0 030227	0.031147	1 000000	0 030000	**1.000000**
9-10 min	0 033520	0 034541	1.000000	0.030000	**1.000000**
10-11 min	0 036716	0.037834	1 000000	0.030000	**1.000000**
11-12 min	**0.039818**	**0.041030**	**1.000000**	**0.030000**	**1.000000**

Third part of equation is dependent on above two:

C(i) = C(a) + C(b)

	C(i) (mg/m3)	C(a) (mg/m3)	C(b) (mg/m3)
0-1 min	0 004314	0.004314	**0.000000**
1-2 min	0 008501	0 004314	**0.004187**
2-3 min	0.012564	0 004314	**0.008250**
3-4 min	0 016507	0 004314	**0.012193**
4-5 min	0 020333	0 004314	**0.016019**
5-6 min	0.024047	0.004314	**0.019732**
6-7 min	0 027650	0 004314	**0.023336**
7-8 min	0 031147	0 004314	**0.026833**
8-9 min	0 034541	0 004314	**0.030227**
9-10 min	0.037834	0 004314	**0.033520**
10-11 min	0 041030	0 004314	**0.036716**
11-12 min	**0.044132**	**0.004314**	**0.039818**

Average Concentration = 2.52E-02 (mg/m3)

MEAD FORMER NOP
CONCENTRATION IN
SHOWER OF VOLATILE
CHEMICALS IN
GROUNDWATER - INHALATION Trichloroethene PLUME 3

Assumptions:

Water flow rate (Qw) = 9.5 L/min (approx. 2.5 gal/min)
Volume of shower (Vd) = 4.1 m3 (approx 3 ft x 6ft x 8ft)
Fraction volatilized (F) = 100%
Air change rate of room (ach) = 0.03/min (approx 2 changes per hour)
Mixing factor (K) = 1
Time (t) = one minute time intervals

$$C(i) = [(Qw \times Cw \times F) / (K \times Vd \times ach)](1-e^{-(K)(ach)(t)}) + Cs(e^{-(K)(ach)(t)})$$

|----------C(a)----------| ----C(b)----|

C(i) = Indoor Air Concentration
S = Emission Rate (= Qw x Cw x F)
K = Mixing Rate
V = Volume of room
Q = Air flow rate in and out of room
t = time interval
C(s) = C(i) at time = (t-1)

First part of equation is constant.

C(a) (mg/m3)	Qw (L/min)	Cw (mg/L)	F (unitless)	K (unitless)	Vd (m3)	ach (min^-1_)	t (min)
0.001689	9.500000	0.000740	1.000000	1.000000	4.100000	0.030000	1.000000

Second part of equation is dependent on C(i) at t-1:

$$Cb = Cs(e^{-(K)(ach)(t)})$$

where C(s) = C(i) at (t-1)

	C(b) (mg/m3)	Cs (mg/m3)	K (unitless)	ach (min^-1)	t (min)
0-1 min	0.000000	0.000000	1.000000	0.030000	1.000000
1-2 min	0.001639	0.001689	1.000000	0.030000	1.000000
2-3 min	0.003230	0.003328	1.000000	0.030000	1.000000
3-4 min	0.004774	0.004919	1.000000	0.030000	1.000000
4-5 min	0.006272	0.006463	1.000000	0.030000	1.000000
5-6 min	0.007726	0.007961	1.000000	0.030000	1.000000
6-7 min	0.009137	0.009415	1.000000	0.030000	1.000000
7-8 min	0.010506	0.010826	1.000000	0.030000	1.000000
8-9 min	0.011835	0.012195	1.000000	0.030000	1.000000
9-10 min	0.013124	0.013524	1.000000	0.030000	1.000000
10-11 min	0.014376	0.014813	1.000000	0.030000	1.000000
11-12 min	0.015590	0.016065	1.000000	0.030000	1.000000

Third part of equation is dependent on above two:

C(i) = C(a) + C(b)

	C(i) (mg/m3)	C(a) (mg/m3)	C(b) (mg/m3)
0-1 min	0.001689	0.001689	0.000000
1-2 min	0.003328	0.001689	0.001639
2-3 min	0.004919	0.001689	0.003230
3-4 min	0.006463	0.001689	0.004774
4-5 min	0.007961	0.001689	0.006272
5-6 min	0.009415	0.001689	0.007726
6-7 min	0.010826	0.001689	0.009137
7-8 min	0.012195	0.001689	0.010506
8-9 min	0.013524	0.001689	0.011835
9-10 min	0.014813	0.001689	0.013124
10-11 min	0.016065	0.001689	0.014376
11-12 min	0.017279	0.001689	0.015590

Average Concentration = 9.87E-03 (mg/m3)

MEAD FORMER NOP
CONCENTRATION IN
SHOWER OF VOLATILE
CHEMICALS IN
GROUNDWATER - INHALATION DCE PLUME 4

Assumptions:

Water flow rate (Qw) = 9.5 L/min (approx. 2 5 gal/min)
Volume of shower (Vd) = 4.1 m3 (approx 3 ft x 6ft x 8ft)
Fraction volatilized (F) = 100%
Air change rate of room (ach) = 0.03/min (approx 2 changes per hour)
Mixing factor (K) = 1
Time (t) = one minute time intervals

$$C(i) = [(Qw \times Cw \times F) / (K \times Vd \times ach)]\,(1-e^{-(K)(ach)(t)}) + Cs\,(e^{-(K)(ach)(t)})$$

|----------C(a)----------| -----C(b)-----|

C(i) = Indoor Air Concentration
S = Emission Rate (= Qw x Cw x F)
K = Mixing Rate
V = Volume of room
Q = Air flow rate in and out of room
t = time interval
C(s) = C(i) at time = (t-1)

First part of equation is constant:

C(a) (mg/m3)	Qw (L/min)	Cw (mg/L)	F (unitless)	K (unitless)	Vd (m3)	ach (min^-1)	t (min)
0 018330	9 500000	0.008030	1.000000	1.000000	4.100000	0 030000	1 000000

Second part of equation is dependent on C(i) at t-1

$$Cb = Cs\,(e^{-(K)(ach)(t)})$$

where C(s) = C(i) at (t-1)

	C(b) (mg/m3)	Cs (mg/m3)	K (unitless)	ach (min^-1)	t (min)
0-1 min	0 000000	0 000000	1.000000	0 030000	1.000000
1-2 min	0 017788	0 018330	1.000000	0 030000	1.000000
2-3 min	0 035050	0 036118	1.000000	0 030000	1.000000
3-4 min	0 051803	0.053380	1 000000	0 030000	1.000000
4-5 min	0 068060	0.070132	1.000000	0 030000	1.000000
5-6 min	0.083836	0.086389	1.000000	0.030000	1.000000
6-7 min	0 099146	0.102166	1.000000	0 030000	1.000000
7-8 min	0.114004	0.117476	1.000000	0.030000	1.000000
8-9 min	0.128423	0.132334	1.000000	0.030000	1.000000
9-10 min	0.142416	0.146753	1 000000	0.030000	1.000000
10-11 min	0 155995	0 160745	1.000000	0.030000	1.000000
11-12 min	0.169172	0.174324	1.000000	0.030000	1.000000

Third part of equation is dependent on above two:

C(i) = C(a) + C(b)

	C(i) (mg/m3)	C(a) (mg/m3)	C(b) (mg/m3)
0-1 min	0 018330	0 018330	0.000000
1-2 min	0 036118	0 018330	0.017788
2-3 min	0 053380	0 018330	0.035050
3-4 min	0 070132	0 018330	0.051803
4-5 min	0 086389	0.018330	0.068060
5-6 min	0 102166	0 018330	0.083836
6-7 min	0 117476	0 018330	0.099146
7-8 min	0 132334	0 018330	0.114004
8-9 min	0 146753	0.018330	0.128423
9-10 min	0 160745	0.018330	0.142416
10-11 min	0.174324	0 018330	0.155995
11-12 min	0.187502	0.018330	0.169172

Average Concentration = 1 07E-01 (mg/m3)

MEAD FORMER NOP
CONCENTRATION IN
SHOWER OF VOLATILE
CHEMICALS IN
GROUNDWATER - INHALATION Acetone PLUME 4

Assumptions:

Water flow rate (Qw) = 9.5 L/min (approx. 2.5 gal/min)
Volume of shower (Vd) = 4.1 m3 (approx 3 ft x 6ft x 8ft)
Fraction volatilized (F) = 100%
Air change rate of room (ach) = 0.03/min (approx 2 changes per hour)
Mixing factor (K) = 1
Time (t) = one minute time intervals

$$C(i) = [(Qw \times Cw \times F) / (K \times Vd \times ach)]\,(1-e^{-(K)(ach)(t)}) + Cs\,(e^{-(K)(ach)(t)})$$

|----------C(a)----------| ----C(b)----|

C(i) = Indoor Air Concentration
S = Emission Rate (= Qw x Cw x F)
K = Mixing Rate
V = Volume of room
Q = Air flow rate in and out of room
t = time interval
C(s) = C(i) at time = (t-1)

First part of equation is constant:

C(a) (mg/m3)	Qw (L/min)	Cw (mg/L)	F (unitless)	K (unitless)	Vd (m3)	ach (min^-1_)	t (min)
0.015111	9.500000	0.006620	1.000000	1.000000	4.100000	0.030000	1.000000

Second part of equation is dependent on C(i) at t-1

$$Cb = Cs\,(e^{-(K)(ach)(t)})$$

where C(s) = C(i) at (t-1)

	C(b) (mg/m3)	Cs (mg/m3)	K (unitless)	ach (min^-1)	t (min)
0-1 min	0.000000	0.000000	1.000000	0.030000	1.000000
1-2 min	0.014665	0.015111	1.000000	0.030000	1.000000
2-3 min	0.028896	0.029776	1.000000	0.030000	1.000000
3-4 min	0.042706	0.044007	1.000000	0.030000	1.000000
4-5 min	0.056109	0.057818	1.000000	0.030000	1.000000
5-6 min	0.069115	0.071220	1.000000	0.030000	1.000000
6-7 min	0.081737	0.084226	1.000000	0.030000	1.000000
7-8 min	0.093986	0.096848	1.000000	0.030000	1.000000
8-9 min	0.105873	0.109097	1.000000	0.030000	1.000000
9-10 min	0.117409	0.120964	1.000000	0.030000	1.000000
10-11 min	0.128603	0.132520	1.000000	0.030000	1.000000
11-12 min	**0.139467**	**0.143715**	**1.000000**	**0.030000**	**1.000000**

Third part of equation is dependent on above two:

C(i) = C(a) + C(b)

	C(i) (mg/m3)	C(a) (mg/m3)	C(b) (mg/m3)
0-1 min	0.015111	0.015111	**0.000000**
1-2 min	0.029776	0.015111	**0.014665**
2-3 min	0.044007	0.015111	**0.028896**
3-4 min	0.057818	0.015111	**0.042706**
4-5 min	0.071220	0.015111	**0.056109**
5-6 min	0.084226	0.015111	**0.069115**
6-7 min	0.096848	0.015111	**0.081737**
7-8 min	0.109097	0.015111	**0.093986**
8-9 min	0.120964	0.015111	**0.105873**
9-10 min	0.132520	0.015111	**0.117409**
10-11 min	0.143715	0.015111	**0.128603**
11-12 min	**0.154578**	**0.015111**	**0.139467**

Average Concentration = 8.83E-02 (mg/m3)

MEAD FORMER NOP
CONCENTRATION IN
SHOWER OF VOLATILE
CHEMICALS IN
GROUNDWATER - INHALATION Methylene Chloride PLUME 4

Assumptions:

Water flow rate (Qw) = 9 5 L/min (approx. 2.5 gal/min)
Volume of shower (Vd) = 4 1 m3 (approx 3 ft x 6ft x 8ft)
Fraction volatilized (F) = 100%
Air change rate of room (ach) = 0.03/min (approx 2 changes per hour)
Mixing factor (K) = 1
Time (t) = one minute time intervals

$$C(i) = [(Qw \times Cw \times F) / (K \times Vd \times ach)](1-e^{-(K)(ach)(t)}) + Cs(e^{-(K)(ach)(t)})$$

|----------C(a)----------| ----C(b)----|

C(i) = Indoor Air Concentration
S = Emission Rate (= Qw x Cw x F)
K = Mixing Rate
V = Volume of room
Q = Air flow rate in and out of room
t = time interval
C(s) = C(i) at time = (t-1)

First part of equation is constant:

C(a) (mg/m3)	Qw (L/min)	Cw (mg/L)	F (unitless)	K (unitless)	Vd (m3)	ach (min^-1_)	t (min)
0 005775	9 500000	0.002530	1.000000	1 000000	4.100000	0.030000	1 000000

Second part of equation is dependent on C(i) at t-1.

$$Cb = Cs(e^{-(K)(ach)(t)})$$

where C(s) = C(i) at (t-1)

	C(b) (mg/m3)	Cs (mg/m3)	K (unitless)	ach (min^-1)	t (min)
0-1 min	0.000000	0.000000	1 000000	0.030000	1.000000
1-2 min	0.005604	0 005775	1 000000	0.030000	1.000000
2-3 min	0.011043	0 011380	1 000000	0 030000	1.000000
3-4 min	0.016321	0.016818	1 000000	0 030000	1.000000
4-5 min	0 021443	0 022096	1 000000	0 030000	1.000000
5-6 min	0 026414	0 027219	1.000000	0.030000	1.000000
6-7 min	0.031238	0 032189	1 000000	0 030000	1.000000
7-8 min	0.035919	0.037013	1.000000	0.030000	1.000000
8-9 min	0.040462	0.041694	1.000000	0.030000	1.000000
9-10 min	0.044871	0.046237	1.000000	0.030000	1.000000
10-11 min	0.049149	0.050646	1.000000	0.030000	1.000000
11-12 min	0.053301	0.054924	1.000000	0.030000	1.000000

Third part of equation is dependent on above two:

C(i) = C(a) + C(b)

	C(i) (mg/m3)	C(a) (mg/m3)	C(b) (mg/m3)
0-1 min	0.005775	0 005775	0.000000
1-2 min	0 011380	0.005775	0.005604
2-3 min	0.016818	0 005775	0.011043
3-4 min	0 022096	0 005775	0.016321
4-5 min	0 027219	0.005775	0.021443
5-6 min	0.032189	0 005775	0.026414
6-7 min	0.037013	0 005775	0.031238
7-8 min	0 041694	0 005775	0.035919
8-9 min	0.046237	0.005775	0.040462
9-10 min	0.050646	0.005775	0.044871
10-11 min	0.054924	0 005775	0.049149
11-12 min	0.059076	0.005775	0.053301

Average Concentration = 3 38E-02 (mg/m3)

MEAD FORMER NOP
CONCENTRATION IN
SHOWER OF VOLATILE
CHEMICALS IN
GROUNDWATER - INHALATION Trichloroethene PLUME 4

Assumptions:

Water flow rate (Qw) = 9.5 L/min (approx. 2.5 gal/min)
Volume of shower (Vd) = 4.1 m3 (approx 3 ft x 6ft x 8ft)
Fraction volatilized (F) = 100%
Air change rate of room (ach) = 0 03/min (approx 2 changes per hour)
Mixing factor (K) = 1
Time (t) = one minute time intervals

$$C(i) = [(Qw \times Cw \times F) / (K \times Vd \times ach)](1-e^{-(K)(ach)(t)}) + Cs(e^{-(K)(ach)(t)})$$

|----------C(a)----------| ----C(b)----|

C(i) = Indoor Air Concentration
S = Emission Rate (= Qw x Cw x F)
K = Mixing Rate
V = Volume of room
Q = Air flow rate in and out of room
t = time interval
C(s) = C(i) at time = (t-1)

First part of equation is constant:

C(a) (mg/m3)	Qw (L/min)	Cw (mg/L)	F (unitless)	K (unitless)	Vd (m3)	ach (min^-1_)	t (min)
0.410879	9.500000	0 160000	1 000000	1 000000	4.100000	0.030000	1 000000

Second part of equation is dependent on C(i) at t-1

$$Cb = Cs(e^{-(K)(ach)(t)})$$

where C(s) = C(i) at (t-1)

	C(b) (mg/m3)	Cs (mg/m3)	K (unitless)	ach (min^-1)	t (min)
0-1 min	0.000000	0 000000	1.000000	0 030000	**1.000000**
1-2 min	0 398736	0 410879	1.000000	0 030000	**1.000000**
2-3 min	0.785687	0 809615	1.000000	0.030000	**1.000000**
3-4 min	1.161203	1.196566	1 000000	0 030000	**1.000000**
4-5 min	1.525620	1 572082	1.000000	0.030000	**1.000000**
5-6 min	1.879267	1.936499	1.000000	0.030000	**1.000000**
6-7 min	2.222462	2.290146	1 000000	0 030000	**1.000000**
7-8 min	2.555514	2.633341	1.000000	0 030000	**1.000000**
8-9 min	2.878723	2.966393	1.000000	0.030000	**1.000000**
9-10 min	3.192380	3.289602	1.000000	0.030000	**1.000000**
10-11 min	3.496766	3.603259	1.000000	0.030000	**1.000000**
11-12 min	**3.792157**	**3.907646**	**1.000000**	**0.030000**	**1.000000**

Third part of equation is dependent on above two:

C(i) = C(a) + C(b)

	C(i) (mg/m3)	C(a) (mg/m3)	C(b) (mg/m3)
0-1 min	0.410879	0 410879	**0.000000**
1-2 min	0 809615	0 410879	**0.398736**
2-3 min	1 196566	0.410879	**0.785687**
3-4 min	1 572082	0 410879	**1.161203**
4-5 min	1.936499	0.410879	**1.525620**
5-6 min	2.290146	0.410879	**1.879267**
6-7 min	2.633341	0 410879	**2.222462**
7-8 min	2.966393	0 410879	**2.555514**
8-9 min	3 289602	0 410879	**2.878723**
9-10 min	3.603259	0 410879	**3.192380**
10-11 min	3.907646	0.410879	**3.496766**
11-12 min	**4.203036**	**0.410879**	**3.792157**

Average Concentration = 2 40E+00 (mg/m3)

MEAD FORMER NOP
CONCENTRATION IN
SHOWER OF VOLATILE
CHEMICALS IN
GROUNDWATER - INHALATION 1,1,1-Trichloroethane PLUME 4

Assumptions:

Water flow rate (Qw) = 9.5 L/min (approx. 2.5 gal/min)
Volume of shower (Vd) = 4.1 m3 (approx 3 ft x 6ft x 8ft)
Fraction volatilized (F) = 100%
Air change rate of room (ach) = 0 03/min (approx 2 changes per hour)
Mixing factor (K) = 1
Time (t) = one minute time intervals

$$C(i) = [(Qw \times Cw \times F) / (K \times Vd \times ach)](1-e^{-(K)(ach)(t)}) + Cs(e^{-(K)(ach)(t)})$$

|----------C(a)----------| ----C(b)----|

C(i) = Indoor Air Concentration
S = Emission Rate (= Qw x Cw x F)
K = Mixing Rate
V = Volume of room
Q = Air flow rate in and out of room
t = time interval
C(s) = C(i) at time = (t-1)

First part of equation is constant:

C(a) (mg/m3)	Qw (L/min)	Cw (mg/L)	F (unitless)	K (unitless)	Vd (m3)	ach (min^-1_)	t (min)
0.004565	9 500000	0 002000	1 000000	1.000000	4.100000	0.030000	1.000000

Second part of equation is dependent on C(i) at t-1.

$$Cb = Cs(e^{-(K)(ach)(t)})$$

where C(s) = C(i) at (t-1)

	C(b) (mg/m3)	Cs (mg/m3)	K (unitless)	ach (min^-1)	t (min)
0-1 min	0.000000	0 000000	1.000000	0.030000	**1.000000**
1-2 min	0.004430	0.004565	1 000000	0.030000	**1.000000**
2-3 min	0.008730	0.008996	1.000000	0.030000	**1.000000**
3-4 min	0 012902	0 013295	1.000000	0.030000	**1.000000**
4-5 min	0 016951	0 017468	1 000000	0.030000	**1.000000**
5-6 min	0.020881	0.021517	1.000000	0.030000	**1.000000**
6-7 min	0.024694	0 025446	1.000000	0.030000	**1.000000**
7-8 min	0 028395	0 029259	1.000000	0.030000	**1.000000**
8-9 min	0.031986	0.032960	1.000000	0.030000	**1.000000**
9-10 min	0.035471	0.036551	1.000000	0.030000	**1.000000**
10-11 min	0.038853	0.040036	1.000000	0.030000	**1.000000**
11-12 min	**0.042135**	**0.043418**	**1.000000**	**0.030000**	**1.000000**

Third part of equation is dependent on above two:

C(i) = C(a) + C(b)

	C(i) (mg/m3)	C(a) (mg/m3)	C(b) (mg/m3)
0-1 min	0.004565	0.004565	**0.000000**
1-2 min	0 008996	0.004565	**0.004430**
2-3 min	0 013295	0.004565	**0.008730**
3-4 min	0.017468	0.004565	**0.012902**
4-5 min	0.021517	0.004565	**0.016951**
5-6 min	0.025446	0.004565	**0.020881**
6-7 min	0 029259	0 004565	**0.024694**
7-8 min	0.032960	0.004565	**0.028395**
8-9 min	0.036551	0.004565	**0.031986**
9-10 min	0.040036	0 004565	**0.035471**
10-11 min	0 043418	0.004565	**0.038853**
11-12 min	**0.046700**	**0.004565**	**0.042135**

Average Concentration = 2.67E-02 (mg/m3)

ATTACHMENT IC
PME CHEMICAL DATA

EXPLOSIVE CONCENTRATION CALCULATION
PLUME 1
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-002-082	0.25	ND	U	0.125	-2.079441542
AMW-003-082	0.25	ND	U	0.125	-2.079441542
AMW-012-082	0.25	ND	U	0.125	-2.079441542
AMW-021-082	0.25	ND	U	0.125	-2.079441542
AMW-022-082	0.25	ND	U	0.125	-2.079441542
AMW-023-082	0.25	ND	U	0.125	-2.079441542
AMW-024-082	0.25	ND	U	0.125	-2.079441542
BMW-002-082				2.2	0.78845736
BMW-003-082	0.25	ND	U	0.125	-2.079441542
BMW-016-082	0.25	ND	U	0.125	-2.079441542
BMW-021-082				0.57	-0.562118918
BMW-022-082	0.25	ND	U	0.125	-2.079441542
BMW-023-082	0.25	ND	U	0.125	-2.079441542
BMW-024-082				0.32	-1.139434283
CMW-016-082	0.25	ND	U	0.125	-2.079441542
DMW-021-082	0.25	ND	U	0.125	-2.079441542

1,3,5-Trinitrobenzene (TNB)

MEAN =	0.2946875
GEOMEAN =	0.17436321
MEAN OF LN=	-1.746614743
N=	16
S=	0.801596193
H=	2.419
UCL=	3.97E-01
MIN =	0.32
MAX =	2.2
NO. OF DET=	3

AMW-002-082	0.25	ND	U	0.125	-2.079441542
AMW-003-082	0.25	ND	U	0.125	-2.079441542
AMW-012-082	0.25	ND	U	0.125	-2.079441542
AMW-021-082	0.25	ND	U	0.125	-2.079441542
AMW-022-082	0.25	ND	U	0.125	-2.079441542
AMW-023-082	0.25	ND	U	0.125	-2.079441542
AMW-024-082	0.25	ND	U	0.125	-2.079441542
BMW-002-082	0.25	ND	U	0.125	-2.079441542
BMW-003-082	0.25	ND	U	0.125	-2.079441542
BMW-016-082	0.25	ND	U	0.125	-2.079441542
BMW-021-082	0.25	ND	U	0.125	-2.079441542
BMW-022-082	0.25	ND	U	0.125	-2.079441542
BMW-023-082	0.25	ND	U	0.125	-2.079441542
BMW-024-082	0.25	ND	U	0.125	-2.079441542
CMW-016-082	0.25	ND	U	0.125	-2.079441542
DMW-021-082	0.25	ND	U	0.125	-2.079441542

1,3-Dinitrobenzene (DNB)

MEAN =	0.125
GEOMEAN =	0.125
MEAN OF LN=	-2.079441542
N=	16
S=	0.00
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

EXPLOSIVE CONCENTRATION CALCULATION
PLUME 1
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-002-082	0.25	ND	U	0.125	-2.079441542
AMW-003-082	0.25	ND	U	0.125	-2.079441542
AMW-012-082	0.25	ND	U	0.125	-2.079441542
AMW-021-082	0.25	ND	U	0.125	-2.079441542
AMW-022-082	0.25	ND	U	0.125	-2.079441542
AMW-023-082	0.25	ND	U	0.125	-2.079441542
AMW-024-082	0.25	ND	U	0.125	-2.079441542
BMW-002-082				6.5	1.871802177
BMW-003-082	0.25	ND	U	0.125	-2.079441542
BMW-016-082	0.25	ND	U	0.125	-2.079441542
BMW-021-082	0.25	ND	U	0.125	-2.079441542
BMW-022-082	0.25	ND	U	0.125	-2.079441542
BMW-023-082	0.25	ND	U	0.125	-2.079441542
BMW-024-082	0.25	ND	U	0.125	-2.079441542
CMW-016-082	0.25	ND	U	0.125	-2.079441542
DMW-021-082	0.25	ND	U	0.125	-2.079441542

2,4,6-Trinitrotoluene (TNT)

MEAN =	0.5234375
GEOMEAN =	0.160014825
MEAN OF LN=	-1.832488809
N=	16
S=	0.98781093
H=	2.713
UCL=	5.21E-01
MIN =	6.5
MAX =	6.5
NO. OF DET=	1

AMW-002-082	0.25	ND	U	0.125	-2.079441542
AMW-003-082	0.25	ND	U	0.125	-2.079441542
AMW-012-082	0.25	ND	U	0.125	-2.079441542
AMW-021-082	0.25	ND	U	0.125	-2.079441542
AMW-022-082	0.25	ND	U	0.125	-2.079441542
AMW-023-082	0.25	ND	U	0.125	-2.079441542
AMW-024-082	0.25	ND	U	0.125	-2.079441542
BMW-002-082	0.25	ND	U	0.125	-2.079441542
BMW-003-082	0.25	ND	U	0.125	-2.079441542
BMW-016-082	0.25	ND	U	0.125	-2.079441542
BMW-021-082	0.25	ND	U	0.125	-2.079441542
BMW-022-082	0.25	ND	U	0.125	-2.079441542
BMW-023-082	0.25	ND	U	0.125	-2.079441542
BMW-024-082	0.25	ND	U	0.125	-2.079441542
CMW-016-082	0.25	ND	U	0.125	-2.079441542
DMW-021-082	0.25	ND	U	0.125	-2.079441542

2,4-Dinitrotoluene (24DNT)

MEAN =	0.125
GEOMEAN =	0.125
MEAN OF LN=	-2.079441542
N=	16
S=	4.35291E-08
H=	2.713
UCL=	1.25E-01
MIN =	0
MAX =	0
NO. OF DET=	0

EXPLOSIVE CONCENTRATION CALCULATION
PLUME I
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-002-082	0.5	ND	U	0.25	-1.386294361
AMW-003-082	0.5	ND	U	0.25	-1.386294361
AMW-012-082	0.5	ND	U	0.25	-1.386294361
AMW-021-082	0.5	ND	U	0.25	-1.386294361
AMW-022-082	0.5	ND	U	0.25	-1.386294361
AMW-023-082	0.5	ND	U	0.25	-1.386294361
AMW-024-082	0.5	ND	U	0.25	-1.386294361
BMW-002-082	0.5	ND	U	0.25	-1.386294361
BMW-003-082	0.5	ND	U	0.25	-1.386294361
BMW-016-082	0.5	ND	U	0.25	-1.386294361
BMW-021-082	0.5	ND	U	0.25	-1.386294361
BMW-022-082	0.5	ND	U	0.25	-1.386294361
BMW-023-082	0.5	ND	U	0.25	-1.386294361
BMW-024-082	0.5	ND	U	0.25	-1.386294361
CMW-016-082	0.5	ND	U	0.25	-1.386294361
DMW-021-082	0.5	ND	U	0.25	-1.386294361

2,6-Dinitrotoluene (26DNT)

MEAN =	0.25
GEOMEAN =	0.25
MEAN OF LN=	-1.386294361
N=	16
S=	0.00
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

AMW-002-082	0.5	ND	U	0.25	-1.386294361
AMW-003-082	0.5	ND	U	0.25	-1.386294361
AMW-012-082	0.5	ND	U	0.25	-1.386294361
AMW-021-082	0.5	ND	U	0.25	-1.386294361
AMW-022-082	0.5	ND	U	0.25	-1.386294361
AMW-023-082	0.5	ND	U	0.25	-1.386294361
AMW-024-082	0.5	ND	U	0.25	-1.386294361
BMW-002-082	0.5	ND	U	0.25	-1.386294361
BMW-003-082	0.5	ND	U	0.25	-1.386294361
BMW-016-082	0.5	ND	U	0.25	-1.386294361
BMW-021-082	0.5	ND	U	0.25	-1.386294361
BMW-022-082	0.5	ND	U	0.25	-1.386294361
BMW-023-082	0.5	ND	U	0.25	-1.386294361
BMW-024-082	0.5	ND	U	0.25	-1.386294361
CMW-016-082	0.5	ND	U	0.25	-1.386294361
DMW-021-082	0.5	ND	U	0.25	-1.386294361

2-Nitrotoluene (2NT)

MEAN =	0.25
GEOMEAN =	0.25
MEAN OF LN=	-1.386294361
N=	16
S=	0.00
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

EXPLOSIVE CONCENTRATION CALCULATION
PLUME 1
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-002-082	0.5	ND	U	0.25	-1.386294361
AMW-003-082	0.5	ND	U	0.25	-1.386294361
AMW-012-082	0.5	ND	U	0.25	-1.386294361
AMW-021-082	0.5	ND	U	0.25	-1.386294361
AMW-022-082	0.5	ND	U	0.25	-1.386294361
AMW-023-082	0.5	ND	U	0.25	-1.386294361
AMW-024-082	0.5	ND	U	0.25	-1.386294361
BMW-002-082	0.5	ND	U	0.25	-1.386294361
BMW-003-082	0.5	ND	U	0.25	-1.386294361
BMW-016-082	0.5	ND	U	0.25	-1.386294361
BMW-021-082	0.5	ND	U	0.25	-1.386294361
BMW-022-082	0.5	ND	U	0.25	-1.386294361
BMW-023-082	0.5	ND	U	0.25	-1.386294361
BMW-024-082	0.5	ND	U	0.25	-1.386294361
CMW-016-082	0.5	ND	U	0.25	-1.386294361
DMW-021-082	0.5	ND	U	0.25	-1.386294361

3-Nitrotoluene (3NT)

MEAN =	0.25
GEOMEAN =	0.25
MEAN OF LN=	-1.386294361
N=	16
S=	0.00
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

AMW-002-082	0.5	ND	U	0.25	-1.386294361
AMW-003-082	0.5	ND	U	0.25	-1.386294361
AMW-012-082	0.5	ND	U	0.25	-1.386294361
AMW-021-082	0.5	ND	U	0.25	-1.386294361
AMW-022-082	0.5	ND	U	0.25	-1.386294361
AMW-023-082	0.5	ND	U	0.25	-1.386294361
AMW-024-082	0.5	ND	U	0.25	-1.386294361
BMW-002-082	0.5	ND	U	0.25	-1.386294361
BMW-003-082	0.5	ND	U	0.25	-1.386294361
BMW-016-082	0.5	ND	U	0.25	-1.386294361
BMW-021-082	0.5	ND	U	0.25	-1.386294361
BMW-022-082	0.5	ND	U	0.25	-1.386294361
BMW-023-082	0.5	ND	U	0.25	-1.386294361
BMW-024-082	0.5	ND	U	0.25	-1.386294361
CMW-016-082	0.5	ND	U	0.25	-1.386294361
DMW-021-082	0.5	ND	U	0.25	-1.386294361

4-Nitrotoluene (4NT)

MEAN =	0.25
GEOMEAN =	0.25
MEAN OF LN=	-1.386294361
N=	16
S=	0.00
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

EXPLOSIVE CONCENTRATION CALCULATION
PLUME 1
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-002-082				0.17	-1.771956842
AMW-003-082				0.48	-0.733969175
AMW-012-082	0.15	ND	U	0.075	-2.590267165
AMW-021-082	0.15	ND	U	0.075	-2.590267165
AMW-022-082	0.15	ND	U	0.075	-2.590267165
AMW-023-082	0.15	ND	U	0.075	-2.590267165
AMW-024-082	0.15	ND	U	0.075	-2.590267165
BMW-002-082				6.7	1.902107526
BMW-003-082				0.26	-1.347073648
BMW-016-082	0.15	ND	U	0.075	-2.590267165
BMW-021-082				10	2.302585093
BMW-022-082				0.25	-1.386294361
BMW-023-082	0.15	ND	U	0.075	-2.590267165
BMW-024-082				0.46	-0.776528789
CMW-016-082				0.91	-0.094310679
DMW-021-082	0.15	ND	U	0.075	-2.590267165

Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)

MEAN =	1.239375
GEOMEAN =	0.243114285
MEAN OF LN=	-1.414223637
N=	16
S=	1.604622071
H=	3.787
UCL=	4.23E+00
MIN =	0.17
MAX =	10
NO. OF DET=	8

AMW-002-082	0.5	ND	U	0.25	-1.386294361
AMW-003-082	0.5	ND	U	0.25	-1.386294361
AMW-012-082	0.5	ND	U	0.25	-1.386294361
AMW-021-082	0.5	ND	U	0.25	-1.386294361
AMW-022-082	0.5	ND	U	0.25	-1.386294361
AMW-023-082	0.5	ND	U	0.25	-1.386294361
AMW-024-082	0.5	ND	U	0.25	-1.386294361
BMW-002-082	0.5	ND	U	0.25	-1.386294361
BMW-003-082	0.5	ND	U	0.25	-1.386294361
BMW-016-082	0.5	ND	U	0.25	-1.386294361
BMW-021-082	0.5	ND	U	0.25	-1.386294361
BMW-022-082	0.5	ND	U	0.25	-1.386294361
BMW-023-082	0.5	ND	U	0.25	-1.386294361
BMW-024-082	0.5	ND	U	0.25	-1.386294361
CMW-016-082	0.5	ND	U	0.25	-1.386294361
DMW-021-082	0.5	ND	U	0.25	-1.386294361

Methyl-2,4,6-trinitrophenylnitramine (Tetryl)

MEAN =	0.25
GEOMEAN =	0.25
MEAN OF LN=	-1.386294361
N=	16
S=	0.00
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO OF DET=	0

EXPLOSIVE CONCENTRATION CALCULATION
PLUME 1
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-002-082	0.25	ND	U	0.125	-2.079441542
AMW-003-082	0.25	ND	U	0.125	-2.079441542
AMW-012-082	0.25	ND	U	0.125	-2.079441542
AMW-021-082	0.25	ND	U	0.125	-2.079441542
AMW-022-082	0.25	ND	U	0.125	-2.079441542
AMW-023-082	0.25	ND	U	0.125	-2.079441542
AMW-024-082	0.25	ND	U	0.125	-2.079441542
BMW-002-082	0.25	ND	U	0.125	-2.079441542
BMW-003-082	0.25	ND	U	0.125	-2.079441542
BMW-016-082	0.25	ND	U	0.125	-2.079441542
BMW-021-082	0.25	ND	U	0.125	-2.079441542
BMW-022-082	0.25	ND	U	0.125	-2.079441542
BMW-023-082	0.25	ND	U	0.125	-2.079441542
BMW-024-082	0.25	ND	U	0.125	-2.079441542
CMW-016-082	0.25	ND	U	0.125	-2.079441542
DMW-021-082	0.25	ND	U	0.125	-2.079441542

Nitrobenzene (NB)

MEAN =	0.125
GEOMEAN =	0.125
MEAN OF LN=	-2.079441542
N=	16
S=	0.00
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

AMW-002-082	0.25	ND	U	0.125	-2.079441542
AMW-003-082	0.25	ND	U	0.125	-2.079441542
AMW-012-082	0.25	ND	U	0.125	-2.079441542
AMW-021-082	0.25	ND	U	0.125	-2.079441542
AMW-022-082	0.25	ND	U	0.125	-2.079441542
AMW-023-082	0.25	ND	U	0.125	-2.079441542
AMW-024-082	0.25	ND	U	0.125	-2.079441542
BMW-002-082	0.25	ND	U	0.125	-2.079441542
BMW-003-082	0.25	ND	U	0.125	-2.079441542
BMW-016-082	0.25	ND	U	0.125	-2.079441542
BMW-021-082				0.94	-0.061875404
BMW-022-082	0.25	ND	U	0.125	-2.079441542
BMW-023-082	0.25	ND	U	0.125	-2.079441542
BMW-024-082	0.25	ND	U	0.125	-2.079441542
CMW-016-082	0.25	ND	U	0.125	-2.079441542
DMW-021-082	0.25	ND	U	0.125	-2.079441542

Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)

MEAN =	0.1759375
GEOMEAN =	0.14179915
MEAN OF LN=	-1.953343658
N=	16
S=	0.50
H=	2.054
UCL=	2.10E-01
MIN =	0.94
MAX =	0.94
NO. OF DET=	1

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EXPLOSIVE CONCENTRATION CALCULATION
PLUME 2
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-009-082	0.25	ND	U	0.125	-2.079441542
AMW-015-082	0.25	ND	U	0.125	-2.079441542
AMW-040-082	0.25	ND	U	0.125	-2.079441542
AMW-058-082	0.25	ND	U	0.125	-2.079441542
BMW-009-082	0.25	ND	U	0.125	-2.079441542
BMW-040-082	0.25	ND	U	0.125	-2.079441542
BMW-058-082	0.25	ND	U	0.125	-2.079441542
DMW-009-082	0.25	ND	U	0.125	-2.079441542
			1,3,5-Trinitrobenzene (TNB)		
			MEAN =	0.125	
			GEOMEAN =	0.125	
			MEAN OF LN=	-2.079441542	
			N=	8	
			S=	0	
			H=	NA	
			UCL=	NA	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-009-082	0.25	ND	U	0.125	-2.079441542
AMW-015-082	0.25	ND	U	0.125	-2.079441542
AMW-040-082	0.25	ND	U	0.125	-2.079441542
AMW-058-082	0.25	ND	U	0.125	-2.079441542
BMW-009-082	0.25	ND	U	1.25E-01	-2.079441542
BMW-040-082	0.25	ND	U	0.125	-2.079441542
BMW-058-082	0.25	ND	U	0.125	-2.079441542
DMW-009-082	0.25	ND	U	0.125	-2.079441542
			1,3-Dinitrobenzene (DNB)		
			MEAN =	0.125	
			GEOMEAN =	0.125	
			MEAN OF LN=	-2.079441542	
			N=	8	
			S=	0	
			H=	NA	
			UCL=	NA	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-009-082	0.25	ND	U	0.125	-2.079441542
AMW-015-082	0.25	ND	U	0.125	-2.079441542
AMW-040-082	0.25	ND	U	0.125	-2.079441542
AMW-058-082	0.25	ND	U	0.125	-2.079441542
BMW-009-082	0.25	ND	U	0.125	-2.079441542
BMW-040-082	0.25	ND	U	0.125	-2.079441542
BMW-058-082	0.25	ND	U	0.125	-2.079441542
DMW-009-082	0.25	ND	U	0.125	-2.079441542
			2,4,6-Trinitrotoluene (TNT)		
			MEAN =	0.125	
			GEOMEAN =	0.13	
			MEAN OF LN=	-2.079441542	
			N=	8	
			S=	0	
			H=	NA	
			UCL=	NA	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

EXPLOSIVE CONCENTRATION CALCULATION
PLUME 2
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-009-082	0.25	ND	U	0.125	-2.079441542
AMW-015-082	0.25	ND	U	0.125	-2.079441542
AMW-040-082	0.25	ND	U	0.125	-2.079441542
AMW-058-082	0.25	ND	U	0.125	-2.079441542
BMW-009-082	0.25	ND	U	0.125	-2.079441542
BMW-040-082	0.25	ND	U	0.125	-2.079441542
BMW-058-082	0.25	ND	U	0.125	-2.079441542
DMW-009-082	0.25	ND	U	0.125	-2.079441542
			2,4-Dinitrotoluene (24DNT)		
			MEAN =	0.125	
			GEOMEAN =	0.13	
			MEAN OF LN=	-2.079441542	
			N=	8	
			S=	0	
			H=	NA	
			UCL=	NA	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-009-082	0.5	ND	U	0.25	-1.386294361
AMW-015-082	0.5	ND	U	0.25	-1.386294361
AMW-040-082	0.5	ND	U	0.25	-1.386294361
AMW-058-082	0.5	ND	U	0.25	-1.386294361
BMW-009-082	0.5	ND	U	0.25	-1.386294361
BMW-040-082	0.5	ND	U	0.25	-1.386294361
BMW-058-082	0.5	ND	U	0.25	-1.386294361
DMW-009-082	0.5	ND	U	0.25	-1.386294361
			2,6-Dinitrotoluene (26DNT)		
			MEAN =	0.25	
			GEOMEAN =	0.25	
			MEAN OF LN=	-1.39E+00	
			N=	8	
			S=	1.593E-08	
			H=	NA	
			UCL=	NA	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-009-082	0.5	ND	U	0.25	-1.386294361
AMW-015-082	0.5	ND	U	0.25	-1.386294361
AMW-040-082	0.5	ND	U	0.25	-1.386294361
AMW-058-082	0.5	ND	U	0.25	-1.386294361
BMW-009-082	0.5	ND	U	0.25	-1.386294361
BMW-040-082	0.5	ND	U	0.25	-1.386294361
BMW-058-082	0.5	ND	U	0.25	-1.386294361
DMW-009-082	0.5	ND	U	0.25	-1.386294361
			2-Nitrotoluene (2NT)		
			MEAN =	0.25	
			GEOMEAN =	0.25	
			MEAN OF LN=	-1.39E+00	
			N=	8	
			S=	1.593E-08	
			H=	NA	
			UCL=	NA	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

EXPLOSIVE CONCENTRATION CALCULATION
PLUME 2
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-009-082	0.5	ND	U	0.25	-1.386294361
AMW-015-082	0.5	ND	U	0.25	-1.386294361
AMW-040-082	0.5	ND	U	0.25	-1.386294361
AMW-058-082	0.5	ND	U	0.25	-1.386294361
BMW-009-082	0.5	ND	U	0.25	-1.386294361
BMW-040-082	0.5	ND	U	0.25	-1.386294361
BMW-058-082	0.5	ND	U	0.25	-1.386294361
DMW-009-082	0.5	ND	U	0.25	-1.386294361

3-Nitrotoluene (3NT)

MEAN =	0.25
GEOMEAN =	0.25
MEAN OF LN=	-1.386294361
N=	8
S=	1.593E-08
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

AMW-009-082	0.5	ND	U	0.25	-1.386294361
AMW-015-082	0.5	ND	U	0.25	-1.386294361
AMW-040-082	0.5	ND	U	0.25	-1.386294361
AMW-058-082	0.5	ND	U	0.25	-1.386294361
BMW-009-082	0.5	ND	U	2.50E-01	-1.386294361
BMW-040-082	0.5	ND	U	0.25	-1.386294361
BMW-058-082	0.5	ND	U	0.25	-1.386294361
DMW-009-082	0.5	ND	U	0.25	-1.386294361

4-Nitrotoluene (4NT)

MEAN =	0.25
GEOMEAN =	0.25
MEAN OF LN=	-1.386294361
N=	8
S=	1.593E-08
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

AMW-009-082	0.15	ND	U	0.075	-2.590267165
AMW-015-082	0.15	ND	U	0.075	-2.590267165
AMW-040-082	0.15	ND	U	0.075	-2.590267165
AMW-058-082	0.15	ND	U	0.075	-2.590267165
BMW-009-082	0.15	ND	U	0.075	-2.590267165
BMW-040-082	0.15	ND	U	0.075	-2.590267165
BMW-058-082	0.15	ND	U	0.075	-2.590267165
DMW-009-082	0.15	ND	U	0.075	-2.590267165

Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)

MEAN =	0.075
GEOMEAN =	0.08
MEAN OF LN=	-2.590267165
N=	8
S=	0
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

EXPLOSIVE CONCENTRATION CALCULATION
PLUME 2
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-009-082	0.5	ND	U	0.25	-1.386294361
AMW-015-082	0.5	ND	U	0.25	-1.386294361
AMW-040-082	0.5	ND	U	0.25	-1.386294361
AMW-058-082	0.5	ND	U	0.25	-1.386294361
BMW-009-082	0.5	ND	U	0.25	-1.386294361
BMW-040-082	0.5	ND	U	0.25	-1.386294361
BMW-058-082	0.5	ND	U	0.25	-1.386294361
DMW-009-082	0.5	ND	U	0.25	-1.386294361

Methyl-2,4,6-trinitrophenylnitramine (Tetryl)

MEAN =	0.25
GEOMEAN =	0.25
MEAN OF LN=	-1.386294361
N=	8
S=	1.593E-08
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

AMW-009-082	0.25	ND	U	1.25E-01	-2.079441542
AMW-015-082	0.25	ND	U	0.125	-2.079441542
AMW-040-082	0.25	ND	U	0.125	-2.079441542
AMW-058-082	0.25	ND	U	0.125	-2.079441542
BMW-009-082	0.25	ND	U	0.125	-2.079441542
BMW-040-082	0.25	ND	U	0.125	-2.079441542
BMW-058-082	0.25	ND	U	0.125	-2.079441542
DMW-009-082	0.25	ND	U	0.125	-2.079441542

Nitrobenzene (NB)

MEAN =	0.125
GEOMEAN =	0.125
MEAN OF LN=	-2.079441542
N=	8
S=	0
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

AMW-009-082	0.25	ND	U	0.125	-2.079441542
AMW-015-082	0.25	ND	U	0.125	-2.079441542
AMW-040-082	0.25	ND	U	0.125	-2.079441542
AMW-058-082	0.25	ND	U	0.125	-2.079441542
BMW-009-082	0.25	ND	U	0.125	-2.079441542
BMW-040-082	0.25	ND	U	0.125	-2.079441542
BMW-058-082	0.25	ND	U	0.13	-2.079441542
DMW-009-082	0.25	ND	U	0.125	-2.079441542

Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)

MEAN =	0.125
GEOMEAN =	0.125
MEAN OF LN=	-2.079441542
N=	8
S=	0
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

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EXPLOSIVE CONCENTRATION CALCULATION
PLUME 3
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-004-082	0.25	ND	U	0.125	-2.079441542
AMW-005-082	0.25	ND	U	0.125	-2.079441542
AMW-007-082	0.25	ND	U	0.125	-2.079441542
AMW-008-082	0.25	ND	U	0.125	-2.079441542
AMW-029-082	0.25	ND	U	0.125	-2.079441542
AMW-031-082	0.25	ND	U	0.125	-2.079441542
AMW-032-082	0.25	ND	U	0.125	-2.079441542
AMW-033-082	0.25	ND	U	0.125	-2.079441542
AMW-034-082	0.25	ND	U	0.125	-2.079441542
AMW-035-082	0.25	ND	U	0.125	-2.079441542
AMW-042-082	0.25	ND	U	0.125	-2.079441542
BMW-004-082	0.25	ND	U	0.125	-2.079441542
BMW-005-082				2	0.693147181
BMW-008-082	0.25	ND	U	0.125	-2.079441542
BMW-029-082	0.25	ND	U	0.125	-2.079441542
BMW-031-082	0.25	ND	U	0.125	-2.079441542
BMW-032-082	0.25	ND	U	0.125	-2.079441542
BMW-033-082	0.25	ND	U	0.125	-2.079441542
BMW-034-082	0.25	ND	U	0.125	-2.079441542
BMW-035-082	0.25	ND	U	0.125	-2.079441542
BMW-042-082	0.25	ND	U	0.125	-2.079441542
DMW-032-082	0.25	ND	U	0.125	-2.079441542
DMW-033-082	0.25	ND	U	0.125	-2.079441542
DMW-034-082	0.25	ND	U	0.125	-2.079441542
DMW-035-082	0.25	ND	U	0.125	-2.079441542
DMW-042-082	0.25	ND	U	0.125	-2.079441542

1,3,5-Trinitrobenzene (TNB)

MEAN =	0.197115385
GEOMEAN =	0.139066435
MEAN OF LN=	-1.972803514
N=	26
S=	0.54
H=	2
UCL=	0.200393556
MIN =	2
MAX =	2
NO. OF DET=	1

AMW-004-082	0.25	ND	U	0.125	-2.079441542
AMW-005-082	0.25	ND	U	0.125	-2.079441542
AMW-007-082	0.25	ND	U	0.125	-2.079441542
AMW-008-082	0.25	ND	U	0.125	-2.079441542
AMW-029-082	0.25	ND	U	0.125	-2.079441542
AMW-031-082	0.25	ND	U	0.125	-2.079441542
AMW-032-082	0.25	ND	U	0.125	-2.079441542
AMW-033-082	0.25	ND	U	0.125	-2.079441542
AMW-034-082	0.25	ND	U	0.125	-2.079441542
AMW-035-082	0.25	ND	U	0.125	-2.079441542

EXPLOSIVE CONCENTRATION CALCULATION
PLUME 3
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-042-082	0.25	ND	U	0.125	-2.079441542
BMW-004-082	0.25	ND	U	0.125	-2.079441542
BMW-005-082	0.25	ND	U	0.125	-2.079441542
BMW-008-082	0.25	ND	U	0.125	-2.079441542
BMW-029-082	0.25	ND	U	0.125	-2.079441542
BMW-031-082	0.25	ND	U	0.125	-2.079441542
BMW-032-082	0.25	ND	U	0.125	-2.079441542
BMW-033-082	0.25	ND	U	0.125	-2.079441542
BMW-034-082	0.25	ND	U	0.125	-2.079441542
BMW-035-082	0.25	ND	U	0.125	-2.079441542
BMW-042-082	0.25	ND	U	0.125	-2.079441542
DMW-032-082	0.25	ND	U	0.125	-2.079441542
DMW-033-082	0.25	ND	U	0.125	-2.079441542
DMW-034-082	0.25	ND	U	0.125	-2.079441542
DMW-035-082	0.25	ND	U	0.125	-2.079441542
DMW-042-082	0.25	ND	U	0.125	-2.079441542

1,3-Dinitrobenzene (DNB)

MEAN =	0.125
GEOMEAN =	0.125
MEAN OF LN=	-2.079441542
N=	26
S=	0.00
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

AMW-004-082	0.25	ND	U	0.125	-2.079441542
AMW-005-082	0.25	ND	U	0.125	-2.079441542
AMW-007-082	0.25	ND	U	0.125	-2.079441542
AMW-008-082	0.25	ND	U	0.125	-2.079441542
AMW-029-082	0.25	ND	U	0.125	-2.079441542
AMW-031-082	0.25	ND	U	0.125	-2.079441542
AMW-032-082	0.25	ND	U	0.125	-2.079441542
AMW-033-082	0.25	ND	U	0.125	-2.079441542
AMW-034-082	0.25	ND	U	0.125	-2.079441542
AMW-035-082	0.25	ND	U	0.125	-2.079441542
AMW-042-082	0.25	ND	U	0.125	-2.079441542
BMW-004-082	0.25	ND	U	0.125	-2.079441542
BMW-005-082				20	2.995732274
BMW-008-082	0.25	ND	U	0.125	-2.079441542
BMW-029-082	0.25	ND	U	0.125	-2.079441542
BMW-031-082	0.25	ND	U	0.125	-2.079441542
BMW-032-082	0.25	ND	U	0.125	-2.079441542
BMW-033-082	0.25	ND	U	0.125	-2.079441542
BMW-034-082	0.25	ND	U	0.125	-2.079441542

EXPLOSIVE CONCENTRATION CALCULATION
PLUME 3
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
BMW-035-082	0.25	ND	U	0.125	-2.079441542
BMW-042-082	0.25	ND	U	0.125	-2.079441542
DMW-032-082	0.25	ND	U	0.125	-2.079441542
DMW-033-082	0.25	ND	U	0.125	-2.079441542
DMW-034-082	0.25	ND	U	0.125	-2.079441542
DMW-035-082	0.25	ND	U	0.125	-2.079441542
DMW-042-082	0.25	ND	U	0.125	-2.079441542

2,4,6-Trinitrotoluene (TNT)

MEAN =	0.889423077
GEOMEAN =	0.151944106
MEAN OF LN=	-1.884242549
N=	26
S=	1.00
H=	2.49
UCL=	0.409328589
MIN =	20
MAX =	20
NO. OF DET=	1

EXPLOSIVE CONCENTRATION CALCULATION
PLUME 3
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-004-082	0.25	ND	U	0.125	-2.079441542
AMW-005-082	0.25	ND	U	0.125	-2.079441542
AMW-007-082	0.25	ND	U	0.125	-2.079441542
AMW-008-082	0.25	ND	U	0.125	-2.079441542
AMW-029-082	0.25	ND	U	0.125	-2.079441542
AMW-031-082	0.25	ND	U	0.125	-2.079441542
AMW-032-082	0.25	ND	U	0.125	-2.079441542
AMW-033-082	0.25	ND	U	0.125	-2.079441542
AMW-034-082	0.25	ND	U	0.125	-2.079441542
AMW-035-082	0.25	ND	U	0.125	-2.079441542
AMW-042-082	0.25	ND	U	0.125	-2.079441542
BMW-004-082	0.25	ND	U	0.125	-2.079441542
BMW-005-082				0.97	-0.030459207
BMW-008-082	0.25	ND	U	0.125	-2.079441542
BMW-029-082	0.25	ND	U	0.125	-2.079441542
BMW-031-082	0.25	ND	U	0.125	-2.079441542
BMW-032-082	0.25	ND	U	0.125	-2.079441542
BMW-033-082	0.25	ND	U	0.125	-2.079441542
BMW-034-082	0.25	ND	U	0.125	-2.079441542
BMW-035-082	0.25	ND	U	0.125	-2.079441542
BMW-042-082	0.25	ND	U	0.125	-2.079441542
DMW-032-082	0.25	ND	U	0.125	-2.079441542
DMW-033-082	0.25	ND	U	0.125	-2.079441542
DMW-034-082	0.25	ND	U	0.125	-2.079441542
DMW-035-082	0.25	ND	U	0.125	-2.079441542
DMW-042-082	0.25	ND	U	0.125	-2.079441542

2,4-Dinitrotoluene (24DNT)

MEAN =	0.1575
GEOMEAN =	0.135249436
MEAN OF LN=	-2.000634529
N=	26
S=	0.40
H=	1.879
UCL=	0.170522755
MIN =	0.97
MAX =	0.97
NO. OF DET=	1

AMW-004-082	0.5	ND	U	0.25	-1.386294361
AMW-005-082	0.5	ND	U	0.25	-1.386294361
AMW-007-082	0.5	ND	U	0.25	-1.386294361
AMW-008-082	0.5	ND	U	0.25	-1.386294361
AMW-029-082	0.5	ND	U	0.25	-1.386294361
AMW-031-082	0.5	ND	U	0.25	-1.386294361
AMW-032-082	0.5	ND	U	0.25	-1.386294361
AMW-033-082	0.5	ND	U	0.25	-1.386294361
AMW-034-082	0.5	ND	U	0.25	-1.386294361

EXPLOSIVE CONCENTRATION CALCULATION
PLUME 3
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-035-082	0.5	ND	U	0.25	-1.386294361
AMW-042-082	0.5	ND	U	0.25	-1.386294361
BMW-004-082	0.5	ND	U	0.25	-1.386294361
BMW-005-082	0.5	ND	U	0.25	-1.386294361
BMW-008-082	0.5	ND	U	0.25	-1.386294361
BMW-029-082	0.5	ND	U	0.25	-1.386294361
BMW-031-082	0.5	ND	U	0.25	-1.386294361
BMW-032-082	0.5	ND	U	0.25	-1.386294361
BMW-033-082	0.5	ND	U	0.25	-1.386294361
BMW-034-082	0.5	ND	U	0.25	-1.386294361
BMW-035-082	0.5	ND	U	0.25	-1.386294361
BMW-042-082	0.5	ND	U	0.25	-1.386294361
DMW-032-082	0.5	ND	U	0.25	-1.386294361
DMW-033-082	0.5	ND	U	0.25	-1.386294361
DMW-034-082	0.5	ND	U	0.25	-1.386294361
DMW-035-082	0.5	ND	U	0.25	-1.386294361
DMW-042-082	0.5	ND	U	0.25	-1.386294361

2,6-Dinitrotoluene (26DNT)

MEAN =	0.25
GEOMEAN =	0.25
MEAN OF LN=	-1.386294361
N=	26
S=	0.00
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

AMW-004-082	0.5	ND	U	0.25	-1.386294361
AMW-005-082	0.5	ND	U	0.25	-1.386294361
AMW-007-082	0.5	ND	U	0.25	-1.386294361
AMW-008-082	0.5	ND	U	0.25	-1.386294361
AMW-029-082	0.5	ND	U	0.25	-1.386294361
AMW-031-082	0.5	ND	U	0.25	-1.386294361
AMW-032-082	0.5	ND	U	0.25	-1.386294361
AMW-033-082	0.5	ND	U	0.25	-1.386294361
AMW-034-082	0.5	ND	U	0.25	-1.386294361
AMW-035-082	0.5	ND	U	0.25	-1.386294361
AMW-042-082	0.5	ND	U	0.25	-1.386294361
BMW-004-082	0.5	ND	U	0.25	-1.386294361
BMW-005-082	0.5	ND	U	0.25	-1.386294361
BMW-008-082	0.5	ND	U	0.25	-1.386294361
BMW-029-082	0.5	ND	U	0.25	-1.386294361
BMW-031-082	0.5	ND	U	0.25	-1.386294361
BMW-032-082	0.5	ND	U	0.25	-1.386294361
BMW-033-082	0.5	ND	U	0.25	-1.386294361

EXPLOSIVE CONCENTRATION CALCULATION
PLUME 3
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
BMW-034-082	0.5	ND	U	0.25	-1.386294361
BMW-035-082	0.5	ND	U	0.25	-1.386294361
BMW-042-082	0.5	ND	U	0.25	-1.386294361
DMW-032-082	0.5	ND	U	0.25	-1.386294361
DMW-033-082	0.5	ND	U	0.25	-1.386294361
DMW-034-082	0.5	ND	U	0.25	-1.386294361
DMW-035-082	0.5	ND	U	0.25	-1.386294361
DMW-042-082	0.5	ND	U	0.25	-1.386294361
			2-Nitrotoluene (2NT)		
			MEAN =	0.25	
			GEOMEAN =	0.25	
			MEAN OF LN=	-1.386294361	
			N=	26	
			S=	0.00	
			H=	NA	
			UCL=	NA	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-004-082	0.5	ND	U	0.25	-1.386294361
AMW-005-082	0.5	ND	U	0.25	-1.386294361
AMW-007-082	0.5	ND	U	0.25	-1.386294361
AMW-008-082	0.5	ND	U	0.25	-1.386294361
AMW-029-082	0.5	ND	U	0.25	-1.386294361
AMW-031-082	0.5	ND	U	0.25	-1.386294361
AMW-032-082	0.5	ND	U	0.25	-1.386294361
AMW-033-082	0.5	ND	U	0.25	-1.386294361
AMW-034-082	0.5	ND	U	0.25	-1.386294361
AMW-035-082	0.5	ND	U	0.25	-1.386294361
AMW-042-082	0.5	ND	U	0.25	-1.386294361
BMW-004-082	0.5	ND	U	0.25	-1.386294361
BMW-005-082	0.5	ND	U	0.25	-1.386294361
BMW-008-082	0.5	ND	U	0.25	-1.386294361
BMW-029-082	0.5	ND	U	0.25	-1.386294361
BMW-031-082	0.5	ND	U	0.25	-1.386294361
BMW-032-082	0.5	ND	U	0.25	-1.386294361
BMW-033-082	0.5	ND	U	0.25	-1.386294361
BMW-034-082	0.5	ND	U	0.25	-1.386294361
BMW-035-082	0.5	ND	U	0.25	-1.386294361
BMW-042-082	0.5	ND	U	0.25	-1.386294361
DMW-032-082	0.5	ND	U	0.25	-1.386294361
DMW-033-082	0.5	ND	U	0.25	-1.386294361
DMW-034-082	0.5	ND	U	0.25	-1.386294361
DMW-035-082	0.5	ND	U	0.25	-1.386294361
DMW-042-082	0.5	ND	U	0.25	-1.386294361
			3-Nitrotoluene (3NT)		
			MEAN =	0.25	

EXPLOSIVE CONCENTRATION CALCULATION
PLUME 3
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
			GEOMEAN =	0.25	
			MEAN OF LN=	-1.386294361	
			N=	26	
			S=	0.00	
			H=	NA	
			UCL=	NA	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-004-082	0.5	ND	U	0.25	-1.386294361
AMW-005-082	0.5	ND	U	0.25	-1.386294361
AMW-007-082	0.5	ND	U	0.25	-1.386294361
AMW-008-082	0.5	ND	U	0.25	-1.386294361
AMW-029-082	0.5	ND	U	0.25	-1.386294361
AMW-031-082	0.5	ND	U	0.25	-1.386294361
AMW-032-082	0.5	ND	U	0.25	-1.386294361
AMW-033-082	0.5	ND	U	0.25	-1.386294361
AMW-034-082	0.5	ND	U	0.25	-1.386294361
AMW-035-082	0.5	ND	U	0.25	-1.386294361
AMW-042-082	0.5	ND	U	0.25	-1.386294361
BMW-004-082	0.5	ND	U	0.25	-1.386294361
BMW-005-082	0.5	ND	U	0.25	-1.386294361
BMW-008-082	0.5	ND	U	0.25	-1.386294361
BMW-029-082	0.5	ND	U	0.25	-1.386294361
BMW-031-082	0.5	ND	U	0.25	-1.386294361
BMW-032-082	0.5	ND	U	0.25	-1.386294361
BMW-033-082	0.5	ND	U	0.25	-1.386294361
BMW-034-082	0.5	ND	U	0.25	-1.386294361
BMW-035-082	0.5	ND	U	0.25	-1.386294361
BMW-042-082	0.5	ND	U	0.25	-1.386294361
DMW-032-082	0.5	ND	U	0.25	-1.386294361
DMW-033-082	0.5	ND	U	0.25	-1.386294361
DMW-034-082	0.5	ND	U	0.25	-1.386294361
DMW-035-082	0.5	ND	U	0.25	-1.386294361
DMW-042-082	0.5	ND	U	0.25	-1.386294361
			4-Nitrotoluene (4NT)		
			MEAN =	0.25	
			GEOMEAN =	0.25	
			MEAN OF LN=	-1.386294361	
			N=	26	
			S=	0.00	
			H=	NA	
			UCL=	NA	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

EXPLOSIVE CONCENTRATION CALCULATION
PLUME 3
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-004-082				0.16	-1.832581464
AMW-005-082	0.15	ND	U	0.075	-2.590267165
AMW-007-082				0.18	-1.714798428
AMW-008-082	0.15	ND	U	0.075	-2.590267165
AMW-029-082				4.4	1.481604541
AMW-031-082	0.15	ND	U	0.075	-2.590267165
AMW-032-082				3.9	1.360976553
AMW-033-082				9.2	2.219203484
AMW-034-082	0.15	ND	U	0.075	-2.590267165
AMW-035-082				0.34	-1.078809661
AMW-042-082				0.73	-0.314710745
BMW-004-082				4.5	1.504077397
BMW-005-082				98	4.584967479
BMW-008-082				4.7	1.547562509
BMW-029-082	0.15	ND	U	0.075	-2.590267165
BMW-031-082				4.7	1.547562509
BMW-032-082				0.16	-1.832581464
BMW-033-082				1.8	0.587786665
BMW-034-082				0.91	-0.094310679
BMW-035-082	0.15	ND	U	0.075	-2.590267165
BMW-042-082				0.26	-1.347073648
DMW-032-082				0.72	-0.328504067
DMW-033-082	0.15	ND	U	0.075	-2.590267165
DMW-034-082	0.15	ND	U	0.075	-2.590267165
DMW-035-082	0.15	ND	U	0.075	-2.590267165
DMW-042-082				1.20E+00	0.182321557

Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)

MEAN =	5.251346154
GEOMEAN =	0.523257686
MEAN OF LN=	-0.647681229
N=	26
S=	2.00
H=	3.968
UCL=	18.77786962
MIN =	0.16
MAX =	98
NO. OF DET=	17

AMW-004-082	0.5	ND	U	0.25	-1.386294361
AMW-005-082	0.5	ND	U	0.25	-1.386294361
AMW-007-082	0.5	ND	U	0.25	-1.386294361
AMW-008-082	0.5	ND	U	0.25	-1.386294361
AMW-029-082	0.5	ND	U	0.25	-1.386294361
AMW-031-082	0.5	ND	U	0.25	-1.386294361
AMW-032-082	0.5	ND	U	0.25	-1.386294361

EXPLOSIVE CONCENTRATION CALCULATION
PLUME 3
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-033-082	0.5	ND	U	0.25	-1.386294361
AMW-034-082	0.5	ND	U	0.25	-1.386294361
AMW-035-082	0.5	ND	U	0.25	-1.386294361
AMW-042-082	0.5	ND	U	0.25	-1.386294361
BMW-004-082	0.5	ND	U	0.25	-1.386294361
BMW-005-082	0.5	ND	U	0.25	-1.386294361
BMW-008-082	0.5	ND	U	0.25	-1.386294361
BMW-029-082	0.5	ND	U	0.25	-1.386294361
BMW-031-082	0.5	ND	U	0.25	-1.386294361
BMW-032-082	0.5	ND	U	0.25	-1.386294361
BMW-033-082	0.5	ND	U	0.25	-1.386294361
BMW-034-082	0.5	ND	U	0.25	-1.386294361
BMW-035-082	0.5	ND	U	0.25	-1.386294361
BMW-042-082	0.5	ND	U	0.25	-1.386294361
DMW-032-082	0.5	ND	U	0.25	-1.386294361
DMW-033-082	0.5	ND	U	0.25	-1.386294361
DMW-034-082	0.5	ND	U	0.25	-1.386294361
DMW-035-082	0.5	ND	U	0.25	-1.386294361
DMW-042-082	0.5	ND	U	0.25	-1.386294361

Methyl-2,4,6-trinitrophenylnitramine (Tetryl)

MEAN =	0.25
GEOMEAN =	0.25
MEAN OF LN=	-1.386294361
N=	26
S=	0.00
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

AMW-004-082	0.25	ND	U	0.125	-2.079441542
AMW-005-082	0.25	ND	U	0.125	-2.079441542
AMW-007-082	0.25	ND	U	0.125	-2.079441542
AMW-008-082	0.25	ND	U	0.125	-2.079441542
AMW-029-082	0.25	ND	U	0.125	-2.079441542
AMW-031-082	0.25	ND	U	0.125	-2.079441542
AMW-032-082	0.25	ND	U	0.125	-2.079441542
AMW-033-082	0.25	ND	U	0.125	-2.079441542
AMW-034-082	0.25	ND	U	0.125	-2.079441542
AMW-035-082	0.25	ND	U	0.125	-2.079441542
AMW-042-082	0.25	ND	U	0.125	-2.079441542
BMW-004-082	0.25	ND	U	0.125	-2.079441542
BMW-005-082	0.25	ND	U	0.125	-2.079441542
BMW-008-082	0.25	ND	U	0.125	-2.079441542
BMW-029-082	0.25	ND	U	0.125	-2.079441542
BMW-031-082	0.25	ND	U	0.125	-2.079441542

EXPLOSIVE CONCENTRATION CALCULATION
PLUME 3
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
BMW-032-082	0.25	ND	U	0.125	-2.079441542
BMW-033-082	0.25	ND	U	0.125	-2.079441542
BMW-034-082	0.25	ND	U	0.125	-2.079441542
BMW-035-082	0.25	ND	U	0.125	-2.079441542
BMW-042-082	0.25	ND	U	0.125	-2.079441542
DMW-032-082	0.25	ND	U	0.125	-2.079441542
DMW-033-082	0.25	ND	U	0.125	-2.079441542
DMW-034-082	0.25	ND	U	0.125	-2.079441542
DMW-035-082	0.25	ND	U	0.125	-2.079441542
DMW-042-082	0.25	ND	U	0.125	-2.079441542
			Nitrobenzene (NB)		
			MEAN =	0.125	
			GEOMEAN =	0.125	
			MEAN OF LN=	-2.079441542	
			N=	26	
			S=	0.00	
			H=	NA	
			UCL=	NA	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-004-082	0.25	ND	U	0.125	-2.079441542
AMW-005-082	0.25	ND	U	0.125	-2.079441542
AMW-007-082	0.25	ND	U	0.125	-2.079441542
AMW-008-082	0.25	ND	U	0.125	-2.079441542
AMW-029-082	0.25	ND	U	0.125	-2.079441542
AMW-031-082	0.25	ND	U	0.125	-2.079441542
AMW-032-082	0.25	ND	U	0.125	-2.079441542
AMW-033-082				0.98	-0.020202707
AMW-034-082	0.25	ND	U	0.125	-2.079441542
AMW-035-082	0.25	ND	U	0.125	-2.079441542
AMW-042-082	0.25	ND	U	0.125	-2.079441542
BMW-004-082				1.3	0.262364264
BMW-005-082				45	3.80666249
BMW-008-082	0.25	ND	U	0.125	-2.079441542
BMW-029-082	0.25	ND	U	0.125	-2.079441542
BMW-031-082	0.25	ND	U	0.125	-2.079441542
BMW-032-082	0.25	ND	U	0.125	-2.079441542
BMW-033-082	0.25	ND	U	0.125	-2.079441542
BMW-034-082	0.25	ND	U	0.125	-2.079441542
BMW-035-082	0.25	ND	U	0.125	-2.079441542
BMW-042-082	0.25	ND	U	0.125	-2.079441542
DMW-032-082	0.25	ND	U	0.125	-2.079441542
DMW-033-082	0.25	ND	U	0.125	-2.079441542
DMW-034-082	0.25	ND	U	0.125	-2.079441542
DMW-035-082	0.25	ND	U	0.125	-2.079441542

EXPLOSIVE CONCENTRATION CALCULATION
PLUME 3
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
DMW-042-082	0.25	ND	U	0.125	-2.079441542

Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)

MEAN =	1.929038462
GEOMEAN =	0.185670445
MEAN OF LN=	-1.683781977
N=	26
S=	1.27
H=	3.003
UCL=	0.891172581
MIN =	0.98
MAX =	45
NO. OF DET=	3

EXPLOSIVE CONCENTRATION CALCULATION
PLUME 4
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-011-082	0.25	ND	U	0.125	-2.079441542
AMW-018-082	0.25	ND	U	0.125	-2.079441542
AMW-036-082	0.25	ND	U	0.125	-2.079441542
AMW-043-082	0.25	ND	U	0.125	-2.079441542
AMW-044-082	0.25	ND	U	0.125	-2.079441542
AMW-045-082	0.25	ND	U	0.125	-2.079441542
AMW-052-082	0.25	ND	U	0.125	-2.079441542
AMW-053-082	0.25	ND	U	0.125	-2.079441542
AMW-054-082	0.25	ND	U	0.125	-2.079441542
AMW-055-082	0.25	ND	U	0.125	-2.079441542
AMW-056-082	0.25	ND	U	0.125	-2.079441542
BMW-018-082	0.25	ND	U	0.125	-2.079441542
BMW-036-082	0.25	ND	U	0.125	-2.079441542
BMW-043-082	0.25	ND	U	0.125	-2.079441542
BMW-044-082	0.25	ND	U	0.125	-2.079441542
BMW-045-082	0.25	ND	U	0.125	-2.079441542
BMW-052-082	0.25	ND	U	0.125	-2.079441542
BMW-053-082	0.25	ND	U	0.125	-2.079441542
BMW-054-082	0.25	ND	U	0.125	-2.079441542
BMW-055-082	0.25	ND	U	0.125	-2.079441542
BMW-056-082	0.25	ND	U	0.125	-2.079441542
CMW-018-082	0.25	ND	U	0.125	-2.079441542
DMW-036-082	0.25	ND	U	0.125	-2.079441542
DMW-043-082	0.25	ND	U	0.125	-2.079441542
DMW-044-082	0.25	ND	U	0.125	-2.079441542
DMW-045-082	0.25	ND	U	0.125	-2.079441542

1,3,5-Trinitrobenzene (TNB)

MEAN =	0.125
GEOMEAN =	0.125
MEAN OF LN=	-2.079441542
N=	26
S=	0.00
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

AMW-011-082	0.25	ND	U	0.125	-2.079441542
AMW-018-082	0.25	ND	U	0.125	-2.079441542
AMW-036-082	0.25	ND	U	0.125	-2.079441542
AMW-043-082	0.25	ND	U	0.125	-2.079441542
AMW-044-082	0.25	ND	U	0.125	-2.079441542
AMW-045-082	0.25	ND	U	0.125	-2.079441542
AMW-052-082	0.25	ND	U	0.125	-2.079441542
AMW-053-082	0.25	ND	U	0.125	-2.079441542
AMW-054-082	0.25	ND	U	0.125	-2.079441542
AMW-055-082	0.25	ND	U	0.125	-2.079441542
AMW-056-082	0.25	ND	U	0.125	-2.079441542
BMW-018-082	0.25	ND	U	0.125	-2.079441542
BMW-036-082	0.25	ND	U	0.125	-2.079441542
BMW-043-082	0.25	ND	U	0.125	-2.079441542
BMW-044-082	0.25	ND	U	0.125	-2.079441542
BMW-045-082	0.25	ND	U	0.125	-2.079441542
BMW-052-082	0.25	ND	U	0.125	-2.079441542
BMW-053-082	0.25	ND	U	0.125	-2.079441542
BMW-054-082	0.25	ND	U	0.125	-2.079441542
BMW-055-082	0.25	ND	U	0.125	-2.079441542
BMW-056-082	0.25	ND	U	0.125	-2.079441542

EXPLOSIVE CONCENTRATION CALCULATION
PLUME 4
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
CMW-018-082	0.25	ND	U	0.125	-2.079441542
DMW-036-082	0.25	ND	U	0.125	-2.079441542
DMW-043-082	0.25	ND	U	0.125	-2.079441542
DMW-044-082	0.25	ND	U	0.125	-2.079441542
DMW-045-082	0.25	ND	U	0.125	-2.079441542
			1,3-Dinitrobenzene (DNB)		
			MEAN =	0.125	
			GEOMEAN =	0.125	
			MEAN OF LN=	-2.079441542	
			N=	26	
			S=	0.00	
			H=	NA	
			UCL=	NA	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-011-082	0.25	ND	U	0.125	-2.079441542
AMW-018-082	0.25	ND	U	0.125	-2.079441542
AMW-036-082	0.25	ND	U	0.125	-2.079441542
AMW-043-082	0.25	ND	U	0.125	-2.079441542
AMW-044-082	0.25	ND	U	0.125	-2.079441542
AMW-045-082	0.25	ND	U	0.125	-2.079441542
AMW-052-082	0.25	ND	U	0.125	-2.079441542
AMW-053-082	0.25	ND	U	0.125	-2.079441542
AMW-054-082	0.25	ND	U	0.125	-2.079441542
AMW-055-082	0.25	ND	U	0.125	-2.079441542
AMW-056-082	0.25	ND	U	0.125	-2.079441542
BMW-018-082	0.25	ND	U	0.125	-2.079441542
BMW-036-082	0.25	ND	U	0.125	-2.079441542
BMW-043-082	0.25	ND	U	0.125	-2.079441542
BMW-044-082	0.25	ND	U	0.125	-2.079441542
BMW-045-082	0.25	ND	U	0.125	-2.079441542
BMW-052-082	0.25	ND	U	0.125	-2.079441542
BMW-053-082	0.25	ND	U	0.125	-2.079441542
BMW-054-082	0.25	ND	U	0.125	-2.079441542
BMW-055-082	0.25	ND	U	0.125	-2.079441542
BMW-056-082	0.25	ND	U	0.125	-2.079441542
CMW-018-082	0.25	ND	U	0.125	-2.079441542
DMW-036-082	0.25	ND	U	0.125	-2.079441542
DMW-043-082	0.25	ND	U	0.125	-2.079441542
DMW-044-082	0.25	ND	U	0.125	-2.079441542
DMW-045-082	0.25	ND	U	0.125	-2.079441542
			2,4,6-Trinitrotoluene (TNT)		
			MEAN =	0.125	
			GEOMEAN =	0.125	
			MEAN OF LN=	-2.079441542	
			N=	26	
			S=	0.00	
			H=	NA	
			UCL=	NA	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

EXPLOSIVE CONCENTRATION CALCULATION
PLUME 4
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-011-082	0.25	ND	U	0.125	-2.079441542
AMW-018-082	0.25	ND	U	0.125	-2.079441542
AMW-036-082	0.25	ND	U	0.125	-2.079441542
AMW-043-082	0.25	ND	U	0.125	-2.079441542
AMW-044-082	0.25	ND	U	0.125	-2.079441542
AMW-045-082	0.25	ND	U	0.125	-2.079441542
AMW-052-082	0.25	ND	U	0.125	-2.079441542
AMW-053-082	0.25	ND	U	0.125	-2.079441542
AMW-054-082	0.25	ND	U	0.125	-2.079441542
AMW-055-082	0.25	ND	U	0.125	-2.079441542
AMW-056-082	0.25	ND	U	0.125	-2.079441542
BMW-018-082	0.25	ND	U	0.125	-2.079441542
BMW-036-082	0.25	ND	U	0.125	-2.079441542
BMW-043-082	0.25	ND	U	0.125	-2.079441542
BMW-044-082	0.25	ND	U	0.125	-2.079441542
BMW-045-082	0.25	ND	U	0.125	-2.079441542
BMW-052-082	0.25	ND	U	0.125	-2.079441542
BMW-053-082	0.25	ND	U	0.125	-2.079441542
BMW-054-082	0.25	ND	U	0.125	-2.079441542
BMW-055-082	0.25	ND	U	0.125	-2.079441542
BMW-056-082	0.25	ND	U	0.125	-2.079441542
CMW-018-082	0.25	ND	U	0.125	-2.079441542
DMW-036-082	0.25	ND	U	0.125	-2.079441542
DMW-043-082	0.25	ND	U	0.125	-2.079441542
DMW-044-082	0.25	ND	U	0.125	-2.079441542
DMW-045-082	0.25	ND	U	0.125	-2.079441542

2,4-Dinitrotoluene (24DNT)

MEAN =	0.125
GEOMEAN =	0.125
MEAN OF LN=	-2.079441542
N=	26
S=	0.00
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

AMW-011-082	0.50	ND	U	0.25	-1.386294361
AMW-018-082	0.50	ND	U	0.25	-1.386294361
AMW-036-082	0.50	ND	U	0.25	-1.386294361
AMW-043-082	0.50	ND	U	0.25	-1.386294361
AMW-044-082	0.50	ND	U	0.25	-1.386294361
AMW-045-082	0.50	ND	U	0.25	-1.386294361
AMW-052-082	0.50	ND	U	0.25	-1.386294361
AMW-053-082	0.50	ND	U	0.25	-1.386294361
AMW-054-082	0.50	ND	U	0.25	-1.386294361
AMW-055-082	0.50	ND	U	0.25	-1.386294361
AMW-056-082	0.50	ND	U	0.25	-1.386294361
BMW-018-082	0.50	ND	U	0.25	-1.386294361
BMW-036-082	0.50	ND	U	0.25	-1.386294361
BMW-043-082	0.50	ND	U	0.25	-1.386294361
BMW-044-082	0.50	ND	U	0.25	-1.386294361
BMW-045-082	0.50	ND	U	0.25	-1.386294361
BMW-052-082	0.50	ND	U	0.25	-1.386294361
BMW-053-082	0.50	ND	U	0.25	-1.386294361
BMW-054-082	0.50	ND	U	0.25	-1.386294361
BMW-055-082	0.50	ND	U	0.25	-1.386294361

EXPLOSIVE CONCENTRATION CALCULATION
PLUME 4
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
BMW-056-082	0.50	ND	U	0.25	-1.386294361
CMW-018-082	0.50	ND	U	0.25	-1.386294361
DMW-036-082	0.50	ND	U	0.25	-1.386294361
DMW-043-082	0.50	ND	U	0.25	-1.386294361
DMW-044-082	0.50	ND	U	0.25	-1.386294361
DMW-045-082	0.50	ND	U	0.25	-1.386294361
			2,6-Dinitrotoluene (26DNT)		
			MEAN =	0.25	
			GEOMEAN =	0.25	
			MEAN OF LN=	-1.386294361	
			N=	26	
			S=	0.00	
			H=	NA	
			UCL=	NA	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-011-082	0.50	ND	U	0.25	-1.386294361
AMW-018-082	0.50	ND	U	0.25	-1.386294361
AMW-036-082	0.50	ND	U	0.25	-1.386294361
AMW-043-082	0.50	ND	U	0.25	-1.386294361
AMW-044-082	0.50	ND	U	0.25	-1.386294361
AMW-045-082	0.50	ND	U	0.25	-1.386294361
AMW-052-082	0.50	ND	U	0.25	-1.386294361
AMW-053-082	0.50	ND	U	0.25	-1.386294361
AMW-054-082	0.50	ND	U	0.25	-1.386294361
AMW-055-082	0.50	ND	U	0.25	-1.386294361
AMW-056-082	0.50	ND	U	0.25	-1.386294361
BMW-018-082	0.50	ND	U	0.25	-1.386294361
BMW-036-082	0.50	ND	U	0.25	-1.386294361
BMW-043-082	0.50	ND	U	0.25	-1.386294361
BMW-044-082	0.50	ND	U	0.25	-1.386294361
BMW-045-082	0.50	ND	U	0.25	-1.386294361
BMW-052-082	0.50	ND	U	0.25	-1.386294361
BMW-053-082	0.50	ND	U	0.25	-1.386294361
BMW-054-082	0.50	ND	U	0.25	-1.386294361
BMW-055-082	0.50	ND	U	0.25	-1.386294361
BMW-056-082	0.50	ND	U	0.25	-1.386294361
CMW-018-082	0.50	ND	U	0.25	-1.386294361
DMW-036-082	0.50	ND	U	0.25	-1.386294361
DMW-043-082	0.50	ND	U	0.25	-1.386294361
DMW-044-082	0.50	ND	U	0.25	-1.386294361
DMW-045-082	0.50	ND	U	0.25	-1.386294361
			2-Nitrotoluene (2NT)		
			MEAN =	0.25	
			GEOMEAN =	0.25	
			MEAN OF LN=	-1.39E+00	
			N=	26	
			S=	0.00	
			H=	NA	
			UCL=	NA	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

EXPLOSIVE CONCENTRATION CALCULATION
PLUME 4
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-011-082	0.50	ND	U	0.25	-1.386294361
AMW-018-082	0.50	ND	U	0.25	-1.386294361
AMW-036-082	0.50	ND	U	0.25	-1.386294361
AMW-043-082	0.50	ND	U	0.25	-1.386294361
AMW-044-082	0.50	ND	U	0.25	-1.386294361
AMW-045-082	0.50	ND	U	0.25	-1.386294361
AMW-052-082	0.50	ND	U	0.25	-1.386294361
AMW-053-082	0.50	ND	U	0.25	-1.386294361
AMW-054-082	0.50	ND	U	0.25	-1.386294361
AMW-055-082	0.50	ND	U	0.25	-1.386294361
AMW-056-082	0.50	ND	U	0.25	-1.386294361
BMW-018-082	0.50	ND	U	0.25	-1.386294361
BMW-036-082	0.50	ND	U	0.25	-1.386294361
BMW-043-082	0.50	ND	U	0.25	-1.386294361
BMW-044-082	0.50	ND	U	0.25	-1.386294361
BMW-045-082	0.50	ND	U	0.25	-1.386294361
BMW-052-082	0.50	ND	U	0.25	-1.386294361
BMW-053-082	0.50	ND	U	0.25	-1.386294361
BMW-054-082	0.50	ND	U	0.25	-1.386294361
BMW-055-082	0.50	ND	U	0.25	-1.386294361
BMW-056-082	0.50	ND	U	0.25	-1.386294361
CMW-018-082	0.50	ND	U	0.25	-1.386294361
DMW-036-082	0.50	ND	U	0.25	-1.386294361
DMW-043-082	0.50	ND	U	0.25	-1.386294361
DMW-044-082	0.50	ND	U	0.25	-1.386294361
DMW-045-082	0.50	ND	U	0.25	-1.386294361

3-Nitrotoluene (3NT)

MEAN =	0.25
GEOMEAN =	0.25
MEAN OF LN=	-1.386294361
N=	26
S=	0.00
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

AMW-011-082	0.50	ND	U	0.25	-1.386294361
AMW-018-082	0.50	ND	U	0.25	-1.386294361
AMW-036-082	0.50	ND	U	0.25	-1.386294361
AMW-043-082	0.50	ND	U	0.25	-1.386294361
AMW-044-082	0.50	ND	U	0.25	-1.386294361
AMW-045-082	0.50	ND	U	0.25	-1.386294361
AMW-052-082	0.50	ND	U	0.25	-1.386294361
AMW-053-082	0.50	ND	U	0.25	-1.386294361
AMW-054-082	0.50	ND	U	0.25	-1.386294361
AMW-055-082	0.50	ND	U	0.25	-1.386294361
AMW-056-082	0.50	ND	U	0.25	-1.386294361
BMW-018-082	0.50	ND	U	0.25	-1.386294361
BMW-036-082	0.50	ND	U	0.25	-1.386294361
BMW-043-082	0.50	ND	U	0.25	-1.386294361
BMW-044-082	0.50	ND	U	0.25	-1.386294361
BMW-045-082	0.50	ND	U	0.25	-1.386294361
BMW-052-082	0.50	ND	U	0.25	-1.386294361
BMW-053-082	0.50	ND	U	0.25	-1.386294361
BMW-054-082	0.50	ND	U	0.25	-1.386294361

EXPLOSIVE CONCENTRATION CALCULATION
PLUME 4
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
BMW-055-082	0.50	ND	U	0.25	-1.386294361
BMW-056-082	0.50	ND	U	0.25	-1.386294361
CMW-018-082	0.50	ND	U	0.25	-1.386294361
DMW-036-082	0.50	ND	U	0.25	-1.386294361
DMW-043-082	0.50	ND	U	0.25	-1.386294361
DMW-044-082	0.50	ND	U	0.25	-1.386294361
DMW-045-082	0.50	ND	U	0.25	-1.386294361

4-Nitrotoluene (4NT)

MEAN =	0.25
GEOMEAN =	0.25
MEAN OF LN=	-1.386294361
N=	26
S=	0.00
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0.00E+00

AMW-011-082				33	3.496507561
AMW-018-082	0.15	ND	U	0.075	-2.590267165
AMW-036-082	0.15	ND	U	0.075	-2.590267165
AMW-043-082	0.15	ND	U	0.075	-2.590267165
AMW-044-082				0.73	-0.314710745
AMW-045-082				0.67	-0.400477567
AMW-052-082				3.1	1.131402111
AMW-053-082				4.8	1.568615918
AMW-054-082				0.91	-0.094310679
AMW-055-082				0.52	-0.653926467
AMW-056-082				0.91	-0.094310679
BMW-018-082	0.15	ND	U	0.075	-2.590267165
BMW-036-082	0.15	ND	U	0.075	-2.590267165
BMW-043-082				18	2.890371758
BMW-044-082				1.6	0.470003629
BMW-045-082				0.79	-0.235722334
BMW-052-082				0.37	-0.994252273
BMW-053-082				4.2	1.435084525
BMW-054-082	0.15	ND	U	0.075	-2.590267165
BMW-055-082				0.24	-1.427116356
BMW-056-082				0.67	-0.400477567
CMW-018-082				1.9	0.641853886
DMW-036-082	0.15	ND	U	0.075	-2.590267165
DMW-043-082	0.15	ND	U	0.075	-2.590267165
DMW-044-082	0.15	ND	U	0.075	-2.590267165
DMW-045-082				0.44	-0.820980552

Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)

MEAN =	2.827884615
GEOMEAN =	0.51774964
MEAN OF LN=	-0.658263474
N=	26
S=	1.80
H=	3.57
UCL=	9.393415912
MIN =	0.24
MAX =	33
NO. OF DET=	17

EXPLOSIVE CONCENTRATION CALCULATION
PLUME 4
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-011-082	0.50	ND	U	0.25	-1.386294361
AMW-018-082	0.50	ND	U	0.25	-1.386294361
AMW-036-082	0.50	ND	U	0.25	-1.386294361
AMW-043-082	0.50	ND	U	0.25	-1.386294361
AMW-044-082	0.50	ND	U	0.25	-1.386294361
AMW-045-082	0.50	ND	U	0.25	-1.386294361
AMW-052-082	0.50	ND	U	0.25	-1.386294361
AMW-053-082	0.50	ND	U	0.25	-1.386294361
AMW-054-082	0.50	ND	U	0.25	-1.386294361
AMW-055-082	0.50	ND	U	0.25	-1.386294361
AMW-056-082	0.50	ND	U	0.25	-1.386294361
BMW-018-082	0.50	ND	U	0.25	-1.386294361
BMW-036-082	0.50	ND	U	0.25	-1.386294361
BMW-043-082	0.50	ND	U	0.25	-1.386294361
BMW-044-082	0.50	ND	U	0.25	-1.386294361
BMW-045-082	0.50	ND	U	0.25	-1.386294361
BMW-052-082	0.50	ND	U	0.25	-1.386294361
BMW-053-082	0.50	ND	U	0.25	-1.386294361
BMW-054-082	0.50	ND	U	0.25	-1.386294361
BMW-055-082	0.50	ND	U	0.25	-1.386294361
BMW-056-082	0.50	ND	U	0.25	-1.386294361
CMW-018-082	0.50	ND	U	0.25	-1.386294361
DMW-036-082	0.50	ND	U	0.25	-1.386294361
DMW-043-082	0.50	ND	U	0.25	-1.386294361
DMW-044-082	0.50	ND	U	0.25	-1.386294361
DMW-045-082	0.50	ND	U	0.25	-1.386294361

Methyl-2,4,6-trinitrophenylnitramine (Tetryl)

MEAN =	0.25
GEOMEAN =	0.25
MEAN OF LN=	-1.386294361
N=	26
S=	0.00
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

AMW-011-082	0.25	ND	U	0.125	-2.079441542
AMW-018-082	0.25	ND	U	0.125	-2.079441542
AMW-036-082	0.25	ND	U	0.125	-2.079441542
AMW-043-082	0.25	ND	U	0.125	-2.079441542
AMW-044-082	0.25	ND	U	0.125	-2.079441542
AMW-045-082	0.25	ND	U	0.125	-2.079441542
AMW-052-082	0.25	ND	U	0.125	-2.079441542
AMW-053-082	0.25	ND	U	0.125	-2.079441542
AMW-054-082	0.25	ND	U	0.125	-2.079441542
AMW-055-082	0.25	ND	U	0.125	-2.079441542
AMW-056-082	0.25	ND	U	0.125	-2.079441542
BMW-018-082	0.25	ND	U	0.125	-2.079441542
BMW-036-082	0.25	ND	U	0.125	-2.079441542
BMW-043-082	0.25	ND	U	0.125	-2.079441542
BMW-044-082	0.25	ND	U	0.125	-2.079441542
BMW-045-082	0.25	ND	U	0.125	-2.079441542
BMW-052-082	0.25	ND	U	0.125	-2.079441542
BMW-053-082	0.25	ND	U	0.125	-2.079441542
BMW-054-082	0.25	ND	U	0.125	-2.079441542

EXPLOSIVE CONCENTRATION CALCULATION
PLUME 4
(all in µg/L)

WELL NAME	D.L.	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
BMW-055-082	0.25	ND	U	0.125	-2.079441542
BMW-056-082	0.25	ND	U	0.125	-2.079441542
CMW-018-082	0.25	ND	U	0.125	-2.079441542
DMW-036-082	0.25	ND	U	0.125	-2.079441542
DMW-043-082	0.25	ND	U	0.125	-2.079441542
DMW-044-082	0.25	ND	U	0.125	-2.079441542
DMW-045-082	0.25	ND	U	0.125	-2.079441542

Nitrobenzene (NB)

MEAN =	0.125
GEOMEAN =	0.125
MEAN OF LN=	-2.079441542
N=	26
S=	0.00
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

AMW-011-082				3.7	1.30833282
AMW-018-082	0.25	ND	U	0.125	-2.079441542
AMW-036-082	0.25	ND	U	0.125	-2.079441542
AMW-043-082	0.25	ND	U	0.125	-2.079441542
AMW-044-082	0.25	ND	U	0.125	-2.079441542
AMW-045-082	0.25	ND	U	0.125	-2.079441542
AMW-052-082				0.92	-0.083381609
AMW-053-082				1.9	0.641853886
AMW-054-082	0.25	ND	U	0.125	-2.079441542
AMW-055-082	0.25	ND	U	0.125	-2.079441542
AMW-056-082	0.25	ND	U	0.125	-2.079441542
BMW-018-082	0.25	ND	U	0.125	-2.079441542
BMW-036-082	0.25	ND	U	0.125	-2.079441542
BMW-043-082				3.8	1.335001067
BMW-044-082	0.25	ND	U	0.125	-2.079441542
BMW-045-082	0.25	ND	U	0.125	-2.079441542
BMW-052-082				0.48	-0.733969175
BMW-053-082				0.91	-0.094310679
BMW-054-082	0.25	ND	U	0.125	-2.079441542
BMW-055-082	0.25	ND	U	0.125	-2.079441542
BMW-056-082				0.43	-0.84397007
CMW-018-082				0.26	-1.347073648
DMW-036-082	0.25	ND	U	0.125	-2.079441542
DMW-043-082	0.25	ND	U	0.125	-2.079441542
DMW-044-082	0.25	ND	U	0.125	-2.079441542
DMW-045-082	0.25	ND	U	0.125	-2.079441542

Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)

MEAN =	0.563461538
GEOMEAN =	0.238688765
MEAN OF LN=	-1.432594814
N=	26
S=	1.12
H=	2.642
UCL=	0.810068421
MIN =	0.26
MAX =	3.8
NO. OF DET=	8

VOC CONCENTRATION CALCULATION
PLUME 1
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-002-082	10	ND	U	5	1.609437912
AMW-003-082	1	ND	U	0.5	-0.693147181
AMW-012-082	10	ND	U	5	1.609437912
AMW-021-082	1	ND	U	0.5	-0.693147181
AMW-022-082	1	ND	U	0.5	-0.693147181
AMW-023-082	1	ND	U	0.5	-0.693147181
AMW-024-082	1	ND	U	0.5	-0.693147181
BMW-002-082	1	ND	U	0.5	-0.693147181
BMW-003-082	1	ND	U	0.5	-0.693147181
BMW-016-082	1	ND	U	0.5	-0.693147181
BMW-021-082	10	ND	U	5	1.609437912
BMW-022-082	1	ND	U	0.5	-0.693147181
BMW-023-082	10	ND	U	5	1.609437912
BMW-024-082	1	ND	U	0.5	-0.693147181
CMW-016-082	1	ND	U	0.5	-0.693147181
DMW-021-082	1	ND	U	0.5	-0.693147181

1,1,1-Trichloroethane

MEAN =	1.625
GEOMEAN =	0.889139705
MEAN OF LN=	-0.117500907
N=	16
S=	1.029747358
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

AMW-002-082	10	ND	U	5	1.609437912
AMW-003-082	1	ND	U	0.5	-0.693147181
AMW-012-082	10	ND	U	5	1.609437912
AMW-021-082	1	ND	U	0.5	-0.693147181
AMW-022-082	1	ND	U	0.5	-0.693147181
AMW-023-082	1	ND	U	0.5	-0.693147181
AMW-024-082	1	ND	U	0.5	-0.693147181
BMW-002-082	1	ND	U	0.5	-0.693147181
BMW-003-082	1	ND	U	0.5	-0.693147181
BMW-016-082	1	ND	U	0.5	-0.693147181
BMW-021-082	10	ND	U	5	1.609437912
BMW-022-082	1	ND	U	0.5	-0.693147181
BMW-023-082	10	ND	U	5	1.609437912
BMW-024-082	1	ND	U	0.5	-0.693147181
CMW-016-082	1	ND	U	0.5	-0.693147181
DMW-021-082	1	ND	U	0.5	-0.693147181

1,1,2,2-Tetrachloroethane

MEAN =	1.625
GEOMEAN =	0.889139705
MEAN OF LN=	-0.117500907
N=	16
S=	1.029747358
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

VOC CONCENTRATION CALCULATION
PLUME 1
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-002-082	10	ND	U	5	1.609437912
AMW-003-082	1	ND	U	0.5	-0.693147181
AMW-012-082	10	ND	U	5	1.609437912
AMW-021-082	1	ND	U	0.5	-0.693147181
AMW-022-082	1	ND	U	0.5	-0.693147181
AMW-023-082	1	ND	U	0.5	-0.693147181
AMW-024-082	1	ND	U	0.5	-0.693147181
BMW-002-082	1	ND	U	0.5	-0.693147181
BMW-003-082	1	ND	U	0.5	-0.693147181
BMW-016-082	1	ND	U	0.5	-0.693147181
BMW-021-082	10	ND	U	5	1.609437912
BMW-022-082	1	ND	U	0.5	-0.693147181
BMW-023-082	10	ND	U	5	1.609437912
BMW-024-082	1	ND	U	0.5	-0.693147181
CMW-016-082	1	ND	U	0.5	-0.693147181
DMW-021-082	1	ND	U	0.5	-0.693147181

1,1,2-Trichloroethane

MEAN =	1.625
GEOMEAN =	0.889139705
MEAN OF LN=	-0.117500907
N=	16
S=	1.029747358
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

AMW-002-082	10	ND	U	5	1.609437912
AMW-003-082	1	ND	U	0.5	-0.693147181
AMW-012-082	10	ND	U	5	1.609437912
AMW-021-082	1	ND	U	0.5	-0.693147181
AMW-022-082	1	ND	U	0.5	-0.693147181
AMW-023-082	1	ND	U	0.5	-0.693147181
AMW-024-082	1	ND	U	0.5	-0.693147181
BMW-002-082	1	ND	U	0.5	-0.693147181
BMW-003-082	1	ND	U	0.5	-0.693147181
BMW-016-082	1	ND	U	0.5	-0.693147181
BMW-021-082	10	ND	U	5	1.609437912
BMW-022-082	1	ND	U	0.5	-0.693147181
BMW-023-082	10	ND	U	5	1.609437912
BMW-024-082	1	ND	U	0.5	-0.693147181
CMW-016-082	1	ND	U	0.5	-0.693147181
DMW-021-082	1	ND	U	0.5	-0.693147181

1,1-Dichloroethane

MEAN =	1.625
GEOMEAN =	0.889139705
MEAN OF LN=	-0.117500907
N=	16
S=	1.029747358
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

VOC CONCENTRATION CALCULATION
PLUME 1
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-002-082	10	ND	U	5	1.609437912
AMW-003-082	1	ND	U	0.5	-0.693147181
AMW-012-082	10	ND	U	5	1.609437912
AMW-021-082	1	ND	U	0.5	-0.693147181
AMW-022-082	1	ND	U	0.5	-0.693147181
AMW-023-082	1	ND	U	0.5	-0.693147181
AMW-024-082	1	ND	U	0.5	-0.693147181
BMW-002-082	1	ND	U	0.5	-0.693147181
BMW-003-082	1	ND	U	0.5	-0.693147181
BMW-016-082	1	ND	U	0.5	-0.693147181
BMW-021-082	10	ND	U	5	1.609437912
BMW-022-082	1	ND	U	0.5	-0.693147181
BMW-023-082	10	ND	U	5	1.609437912
BMW-024-082	1	ND	U	0.5	-0.693147181
CMW-016-082	1	ND	U	0.5	-0.693147181
DMW-021-082	1	ND	U	0.5	-0.693147181

1,1-Dichloroethene

MEAN =	1.625
GEOMEAN =	0.889139705
MEAN OF LN=	-0.117500907
N=	16
S=	1.029747358
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

AMW-002-082	10	ND	U	5	1.609437912
AMW-012-082	10	ND	U	5	1.609437912
BMW-021-082	10	ND	U	5	1.609437912
BMW-023-082	10	ND	U	5	1.609437912

1,2-Dichloroethene(Total)

MEAN =	5
GEOMEAN =	5
MEAN OF LN=	1.609437912
N=	4
S=	0
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

AMW-002-082	10	ND	U	5	1.609437912
AMW-003-082	1	ND	U	0.5	-0.693147181
AMW-012-082	10	ND	U	5	1.609437912
AMW-021-082	1	ND	U	0.5	-0.693147181
AMW-022-082	1	ND	U	0.5	-0.693147181
AMW-023-082	1	ND	U	0.5	-0.693147181
AMW-024-082	1	ND	U	0.5	-0.693147181
BMW-002-082	1	ND	U	0.5	-0.693147181
BMW-003-082	1	ND	U	0.5	-0.693147181
BMW-016-082	1	ND	U	0.5	-0.693147181
BMW-021-082	10	ND	U	5	1.609437912
BMW-022-082	1	ND	U	0.5	-0.693147181
BMW-023-082	10	ND	U	5	1.609437912
BMW-024-082	1	ND	U	0.5	-0.693147181

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VOC CONCENTRATION CALCULATION
PLUME 1
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
CMW-016-082	1	ND	U	0.5	-0.693147181
DMW-021-082	1	ND	U	0.5	-0.693147181
			1,2-Dichloropropane		
			MEAN =	1.625	
			GEOMEAN =	0.889139705	
			MEAN OF LN=	-0.117500907	
			N=	16	
			S=	1.029747358	
			H=	NA	
			UCL=	NA	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-002-082	10	ND	U	5	1.609437912
AMW-003-082			J	2	0.693147181
AMW-012-082	10	ND	U	5	1.609437912
BMW-003-082				6	1.791759469
BMW-021-082	10	ND	U	5	1.609437912
BMW-023-082	10	ND	U	5	1.609437912
			Acetone		
			MEAN =	4.666666667	
			GEOMEAN =	4.424289571	
			MEAN OF LN=	1.487109717	
			N=	6	
			S=	0.40	
			H=	2.318	
			UCL=	7.211326901	
			MIN =	2	
			MAX =	6	
			NO. OF DET=	2	
AMW-002-082	10	ND	U	5	1.609437912
AMW-003-082	1	ND	U	0.5	-0.693147181
AMW-012-082	10	ND	U	5	1.609437912
AMW-021-082	1	ND	U	0.5	-0.693147181
AMW-022-082	1	ND	U	0.5	-0.693147181
AMW-023-082	1	ND	U	0.5	-0.693147181
AMW-024-082	1	ND	U	0.5	-0.693147181
BMW-002-082	1	ND	U	0.5	-0.693147181
BMW-003-082	1	ND	U	0.5	-0.693147181
BMW-016-082	1	ND	U	0.5	-0.693147181
BMW-021-082	10	ND	U	5	1.609437912
BMW-022-082	1	ND	U	0.5	-0.693147181
BMW-023-082	10	ND	U	5	1.609437912
BMW-024-082	1	ND	U	0.5	-0.693147181
CMW-016-082	1	ND	U	0.5	-0.693147181
DMW-021-082	1	ND	U	0.5	-0.693147181
			Chloroform		
			MEAN =	1.625	
			GEOMEAN =	0.889139705	
			MEAN OF LN=	-0.117500907	
			N=	16	
			S=	1.029747358	
			H=	NA	
			UCL=	NA	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

VOC CONCENTRATION CALCULATION
PLUME 1
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-003-082	1	ND	U	0.5	-0.693147181
AMW-021-082	1	ND	U	0.5	-0.693147181
AMW-022-082	1	ND	U	0.5	-0.693147181
AMW-023-082	1	ND	U	0.5	-0.693147181
AMW-024-082	1	ND	U	0.5	-0.693147181
BMW-002-082	1	ND	U	0.5	-0.693147181
BMW-003-082	1	ND	U	0.5	-0.693147181
BMW-016-082	1	ND	U	0.5	-0.693147181
BMW-022-082	1	ND	U	0.5	-0.693147181
BMW-024-082	1	ND	U	0.5	-0.693147181
CMW-016-082	1	ND	U	0.5	-0.693147181
DMW-021-082	1	ND	U	0.5	-0.693147181

Cis-1,2-Dichloroethene

MEAN =	0.5
GEOMEAN =	0.5
MEAN OF LN=	-0.693147181
N=	12
S=	0.00
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

AMW-002-082	10	ND	U	5	1.609437912
AMW-003-082			BJ	1	0
AMW-012-082	5		BJ	1	0
AMW-021-082	2	ND	UB	1	0
AMW-022-082	2	ND	UBJ	1	0
AMW-023-082			BJ	1	0
AMW-024-082	2	ND	U	1	0
BMW-002-082	2	ND	U	1	0
BMW-003-082			BJ	1	0
BMW-016-082			BJ	1	0
BMW-021-082			BJ	2	0.693147181
BMW-022-082	2	ND	UB	1	0
BMW-023-082			BJ	1	0
BMW-024-082	2	ND	UBJ	1	0
CMW-016-082	2	ND	UB	1	0
DMW-021-082			BJ	1	0

Methylene chloride

MEAN =	1.3125
GEOMEAN =	1.154781985
MEAN OF LN=	0.143911568
N=	16
S=	0.43
H=	2.004
UCL=	1.578296622
MIN =	1
MAX =	2
NO. OF DET=	8

VOC CONCENTRATION CALCULATION
PLUME 1
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-002-082	10	ND	U	5	1.609437912
AMW-003-082	1	ND	U	0.5	-0.693147181
AMW-012-082	10	ND	U	5	1.609437912
AMW-021-082	1	ND	U	0.5	-0.693147181
AMW-022-082	1	ND	U	0.5	-0.693147181
AMW-023-082	1	ND	U	0.5	-0.693147181
AMW-024-082	1	ND	U	0.5	-0.693147181
BMW-002-082	1	ND	U	0.5	-0.693147181
BMW-003-082	1	ND	U	0.5	-0.693147181
BMW-016-082				3	1.098612289
BMW-021-082	10	ND	U	5	1.609437912
BMW-022-082	1	ND	U	0.5	-0.693147181
BMW-023-082	10	ND	U	5	1.609437912
BMW-024-082	1	ND	U	0.5	-0.693147181
CMW-016-082	1	ND	U	0.5	-0.693147181
DMW-021-082	1	ND	U	0.5	-0.693147181

Tetrachloroethene

MEAN =	1.78125
GEOMEAN =	0.994499244
MEAN OF LN=	-0.00551594
N=	16
S=	1.06
H=	2.713
UCL=	3.664640121
MIN =	3
MAX =	3
NO. OF DET=	1

AMW-002-082				130	4.86753445
AMW-003-082	1	ND	U	0.5	-0.693147181
AMW-012-082				30	3.401197382
AMW-021-082	1	ND	U	0.5	-0.693147181
AMW-022-082	1	ND	U	0.5	-0.693147181
AMW-023-082	1	ND	U	0.5	-0.693147181
AMW-024-082			J	0.9	-0.105360516
BMW-002-082				11	2.397895273
BMW-003-082	1	ND	U	0.5	-0.693147181
BMW-016-082	1	ND	U	0.5	-0.693147181
BMW-021-082				140	4.941642423
BMW-022-082	1	ND	U	0.5	-0.693147181
BMW-023-082				97	4.574710979
BMW-024-082	1	ND	U	0.5	-0.693147181
CMW-016-082	1	ND	U	0.5	-0.693147181
DMW-021-082	1	ND	U	0.5	-0.693147181

Trichloroethene

MEAN =	25.86875
GEOMEAN =	2.274213462
MEAN OF LN=	0.821634262
N=	16
S=	2.31
H=	4.944
UCL=	636.2767499
MIN =	0.9
MAX =	140
NO. OF DET=	6

VOC CONCENTRATION CALCULATION
PLUME 2
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-009-082	17	ND	U	8.5	2.140066163
AMW-015-082	1	ND	U	0.5	-0.693147181
AMW-040-082	10	ND	U	5	1.609437912
AMW-058-082	1	ND	U	0.5	-0.693147181
BMW-009-082	10	ND	U	5	1.609437912
BMW-040-082	170	ND	U	85	4.442651256
BMS-058B-082	10	ND	U	5	1.609437912
DMW-009-082-RE	16	ND	U	8	2.079441542

1,1,1-Trichloroethane

MEAN =	14.6875
GEOMEAN =	4.540432593
MEAN OF LN=	1.513022292
N=	8
S=	1.650064763
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

AMW-009-082	17	ND	U	8.5	2.140066163
AMW-015-082	1	ND	U	0.5	-0.693147181
AMW-040-082	10	ND	U	5	1.609437912
AMW-058-082	1	ND	U	0.5	-0.693147181
BMW-009-082	10	ND	U	5	1.609437912
BMW-040-082	170	ND	U	85	4.442651256
BMW-058-082	10	ND	U	5	1.609437912
DMW-009-082-RE	16	ND	U	8	2.079441542

1,1,2,2-Tetrachloroethane

MEAN =	14.6875
GEOMEAN =	4.540432593
MEAN OF LN=	1.513022292
N=	8
S=	1.65
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

AMW-009-082	17	ND	U	8.5	2.140066163
AMW-015-082	1	ND	U	0.5	-0.693147181
AMW-040-082	10	ND	U	5	1.609437912
AMW-058-082	1	ND	U	0.5	-0.693147181
BMW-009-082	10	ND	U	5	1.609437912

VOC CONCENTRATION CALCULATION
PLUME 2
(all in µg/L)

WELL NAME	D.L.	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
BMW-040-082	170	ND	U	85	4.442651256
BMW-058-082	10	ND	U	5	1.609437912
DMW-009-082-RE	16	ND	U	8	2.079441542
			1,1,2-Trichloroethane		
			MEAN =	14.6875	
			GEOMEAN =	4.540432593	
			MEAN OF LN=	1.513022292	
			N=	8	
			S=	1.65	
			H=	NA	
			UCL=	NA	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-009-082	17	ND	U	8.5	2.140066163
AMW-015-082	1	ND	U	0.5	-0.693147181
AMW-040-082	10	ND	U	5	1.609437912
AMW-058-082	1	ND	U	0.5	-0.693147181
BMW-009-082	10	ND	U	5	1.609437912
BMW-040-082	170	ND	U	85	4.442651256
BMW-058-082	10	ND	U	5	1.609437912
DMW-009-082-RE	16	ND	U	8	2.079441542
			1,1-Dichloroethane		
			MEAN =	14.6875	
			GEOMEAN =	4.540432593	
			MEAN OF LN=	1.513022292	
			N=	8	
			S=	1.65	
			H=	NA	
			UCL=	NA	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-009-082	17	ND	U	8.5	2.140066163
AMW-015-082	1	ND	U	0.5	-0.693147181
AMW-040-082	10	ND	U	5	1.609437912
AMW-058-082	1	ND	U	0.5	-0.693147181
BMW-009-082	10	ND	U	5	1.609437912
BMW-040-082	170	ND	U	85	4.442651256
BMW-058-082	10	ND	U	5	1.609437912
DMW-009-082-RE	16	ND	U	8	2.079441542
			1,1-Dichloroethene		
			MEAN =	14.6875	
			GEOMEAN =	4.540432593	
			MEAN OF LN=	1.513022292	
			N=	8	
			S=	1.65	

VOC CONCENTRATION CALCULATION
PLUME 2
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
			H=	NA	
			UCL=	NA	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-009-082			J	2	0.693147181
AMW-040-082	10	ND	U	5	1.609437912
BMW-009-082	10	ND	U	5	1.609437912
BMW-040-082	170	ND	U	85	4.442651256
BMW-058-082			J	1	0
DMW-009-082-RE	16	ND	U	8	2.079441542
			1,2-Dichloroethene(Total)		
			MEAN =	17.66666667	
			GEOMEAN =	5.69175878	
			MEAN OF LN=	1.739019301	
			N=	6	
			S=	1.52	
			H=	5.847	
			UCL=	968.39	
			MIN =	1	
			MAX =	2	
			NO. OF DET=	2	
AMW-009-082	17	ND	U	8.5	2.140066163
AMW-015-082	1	ND	U	0.5	-0.693147181
AMW-040-082	10	ND	U	5	1.609437912
AMW-058-082	1	ND	U	0.5	-0.693147181
BMW-009-082	10	ND	U	5	1.609437912
BMW-040-082	170	ND	U	85	4.442651256
BMW-058-082	10	ND	U	5	1.609437912
DMW-009-082-RE	16	ND	U	8	2.079441542
			1,2-Dichloropropane		
			MEAN =	14.6875	
			GEOMEAN =	4.540432593	
			MEAN OF LN=	1.513022292	
			N=	8	
			S=	1.65	
			H=	NA	
			UCL=	NA	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-009-082	17	ND	U	8.5	2.140066163
AMW-040-082	10	ND	U	5	1.609437912
BMW-009-082	10	ND	U	5	1.609437912

VOC CONCENTRATION CALCULATION
PLUME 2
(all in µg/L)

WELL NAME	D.L.	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
BMW-040-082	170	ND	U	85	4.442651256
BMW-058-082	10	ND	U	5	1.609437912
DMW-009-082-RE	16	ND	U	8	2.079441542
			Acetone		
			MEAN =	19.41666667	
			GEOMEAN =	9.472682372	
			MEAN OF LN=	2.248412116	
			N=	6	
			S=	1.10	
			H=	NA	
			UCL=	NA	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-009-082	17	ND	U	8.5	2.140066163
AMW-015-082	1	ND	U	0.5	-0.693147181
AMW-040-082	10	ND	U	5	1.609437912
AMW-058-082	1	ND	U	0.5	-0.693147181
BMW-009-082	26			26	3.258096538
BMW-040-082	170	ND	U	85	4.442651256
BMW-058-082	10	ND	U	5	1.609437912
DMW-009-082-RE	16	ND	U	8	2.079441542
			Chloroform		
			MEAN =	17.3125	
			GEOMEAN =	5.57[illegible]29	
			MEAN OF LN=	1.7[illegible]2	
			N=		
			S=	1.76	
			H=	5.776	
			UCL=	1238.580855	
			MIN =	26	
			MAX =	26	
			NO. OF DET=	1	
AMW-015-082	1	ND	U	0.5	-0.693147181
AMW-058-082	1	ND	U	0.5	-0.693147181
			Cis-1,2-Dichloroethene		
			MEAN =	0.5	
			GEOMEAN =	0.5	
			MEAN OF LN=	-0.693147181	
			N=	2	
			S=	0.00	
			H=	NA	
			UCL=	NA	

VOC CONCENTRATION CALCULATION
PLUME 2
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-009-082	5		UBJ	2.5	0.916290732
AMW-015-082			B	5	1.609437912
AMW-040-082			BJ	5	1.609437912
AMW-058-082	2		UB	1	0
BMW-009-082	2		BJ	2	0.693147181
BMW-040-082	43		BJ	43	3.761200116
BMW-058-082	2		BJ	2	0.693147181
DMW-009-082-RE	5		UBDJ	2.5	0.916290732
			Methylene chloride		
			MEAN =	7.875	
			GEOMEAN =	3.578232526	
			MEAN OF LN=	1.274868971	
			N=	8	
			S=	1.13	
			H=	3.741	
			UCL=	33.62888633	
			MIN =	2	
			MAX =	43	
			NO. OF DET=	5	
AMW-009-082	17	ND	U	8.5	2.140066163
AMW-015-082	1	ND	U	0.5	-0.693147181
AMW-040-082	10	ND	U	5	1.609437912
AMW-058-082	1	ND	U	0.5	-0.693147181
BMW-009-082	10	ND	U	5	1.609437912
BMW-040-082	170	ND	U	85	4.442651256
BMW-058-082	10	ND	U	5	1.609437912
DMW-009-082-RE	16	ND	U	8	2.079441542
			Tetrachloroethene		
			MEAN =	14.6875	
			GEOMEAN =	4.540432593	
			MEAN OF LN=	1.513022292	
			N=	8	
			S=	1.65	
			H=	NA	
			UCL=	NA	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

VOC CONCENTRATION CALCULATION

PLUME 2

(all in µg/L)

WELL NAME	D.L.	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-009-082				300	5.703782475
AMW-015-082	1	ND	U	0.5	-0.693147181
AMW-040-082				22	3.091042453
AMW-058-082	1	ND	U	0.5	-0.693147181
BMW-009-082	31			31	3.433987204
BMW-040-082	1800			1800	7.495541944
BMW-058-082	130			130	4.86753445
DMW-009-082-RE			D	220	5.393627546

Trichloroethene

MEAN =	313
GEOMEAN =	35.6911484
MEAN OF LN=	3.574902714
N=	8
S=	2.97
H=	9.07
UCL=	75495176.09
MIN =	22
MAX =	1800
NO. OF DET=	6

VOC CONCENTRATION CALCULATION
PLUME 3
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-004-082	1	ND	U	0.5	-0.693147181
AMW-005-082	1	ND	U	0.5	-0.693147181
AMW-007-082	1	ND	U	0.5	-0.693147181
AMW-008-082	1	ND	U	0.5	-0.693147181
AMW-029-082	1	ND	U	0.5	-0.693147181
AMW-031-082	1	ND	U	0.5	-0.693147181
AMW-032-082	1	ND	U	0.5	-0.693147181
AMW-033-082	1	ND	U	0.5	-0.693147181
AMW-034-082	1	ND	U	0.5	-0.693147181
AMW-042-082	1	ND	U	0.5	-0.693147181
BMW-004-082	1	ND	U	0.5	-0.693147181
BMW-005-082	1	ND	U	0.5	-0.693147181
BMW-007-082	1	ND	U	0.5	-0.693147181
BMW-008-082	1	ND	U	0.5	-0.693147181
BMW-029-082	1	ND	U	0.5	-0.693147181
BMW-031-082	1	ND	U	0.5	-0.693147181
BMW-032-082	1	ND	U	0.5	-0.693147181
BMW-033-082	1	ND	U	0.5	-0.693147181
BMW-034-082	1	ND	U	0.5	-0.693147181
BMW-042-082	1	ND	U	0.5	-0.693147181
DMW-032-082	1	ND	U	0.5	-0.693147181
DMW-033-082	1	ND	U	0.5	-0.693147181
DMW-034-082	1	ND	U	0.5	-0.693147181
DMW-042-082	1	ND	U	0.5	-0.693147181

1,1,1-Trichloroethane

MEAN =	0.5
GEOMEAN =	0.5
MEAN OF LN=	-0.693147181
N=	24
S=	0.00
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

AMW-004-082	1	ND	U	0.5	-0.693147181
AMW-005-082	1	ND	U	0.5	-0.693147181
AMW-007-082	1	ND	U	0.5	-0.693147181
AMW-008-082	1	ND	U	0.5	-0.693147181
AMW-029-082	1	ND	U	0.5	-0.693147181
AMW-031-082	1	ND	U	0.5	-0.693147181
AMW-032-082	1	ND	U	0.5	-0.693147181
AMW-033-082	1	ND	U	0.5	-0.693147181
AMW-034-082	1	ND	U	0.5	-0.693147181
AMW-042-082	1	ND	U	0.5	-0.693147181
BMW-004-082	1	ND	U	0.5	-0.693147181
BMW-005-082	1	ND	U	0.5	-0.693147181
BMW-007-082	1	ND	U	0.5	-0.693147181
BMW-008-082	1	ND	U	0.5	-0.693147181
BMW-029-082	1	ND	U	0.5	-0.693147181
BMW-031-082	1	ND	U	0.5	-0.693147181
BMW-032-082	1	ND	U	0.5	-0.693147181

VOC CONCENTRATION CALCULATION
PLUME 3
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
BMW-033-082	1	ND	U	0.5	-0.693147181
BMW-034-082	1	ND	U	0.5	-0.693147181
BMW-042-082	1	ND	U	0.5	-0.693147181
DMW-032-082	1	ND	U	0.5	-0.693147181
DMW-033-082	1	ND	U	0.5	-0.693147181
DMW-034-082	1	ND	U	0.5	-0.693147181
DMW-042-082	1	ND	U	0.5	-0.693147181
			1,1,2,2-Tetrachloroethane		
			MEAN =	0.5	
			GEOMEAN =	0.5	
			MEAN OF LN=	-0.693147181	
			N=	24	
			S=	0.00	
			H=	NA	
			UCL=	NA	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-004-082	1	ND	U	0.5	-0.693147181
AMW-005-082	1	ND	U	0.5	-0.693147181
AMW-007-082	1	ND	U	0.5	-0.693147181
AMW-008-082	1	ND	U	0.5	-0.693147181
AMW-029-082	1	ND	U	0.5	-0.693147181
AMW-031-082	1	ND	U	0.5	-0.693147181
AMW-032-082	1	ND	U	0.5	-0.693147181
AMW-033-082	1	ND	U	0.5	-0.693147181
AMW-034-082	1	ND	U	0.5	-0.693147181
AMW-042-082	1	ND	U	0.5	-0.693147181
BMW-004-082	1	ND	U	0.5	-0.693147181
BMW-005-082	1	ND	U	0.5	-0.693147181
BMW-007-082	1	ND	U	0.5	-0.693147181
BMW-008-082	1	ND	U	0.5	-0.693147181
BMW-029-082	1	ND	U	0.5	-0.693147181
BMW-031-082	1	ND	U	0.5	-0.693147181
BMW-032-082	1	ND	U	0.5	-0.693147181
BMW-033-082	1	ND	U	0.5	-0.693147181
BMW-034-082	1	ND	U	0.5	-0.693147181
BMW-042-082	1	ND	U	0.5	-0.693147181
DMW-032-082	1	ND	U	0.5	-0.693147181
DMW-033-082	1	ND	U	0.5	-0.693147181
DMW-034-082	1	ND	U	0.5	-0.693147181
DMW-042-082	1	ND	U	0.5	-0.693147181
			1,1,2-Trichloroethane		
			MEAN =	0.5	
			GEOMEAN =	0.5	
			MEAN OF LN=	-0.693147181	
			N=	24	
			S=	0.00	
			H=	NA	
			UCL=	NA	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

VOC CONCENTRATION CALCULATION
PLUME 3
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-004-082	1	ND	U	0.5	-0.693147181
AMW-005-082	1	ND	U	0.5	-0.693147181
AMW-007-082	1	ND	U	0.5	-0.693147181
AMW-008-082	1	ND	U	0.5	-0.693147181
AMW-029-082	1	ND	U	0.5	-0.693147181
AMW-031-082	1	ND	U	0.5	-0.693147181
AMW-032-082	1	ND	U	0.5	-0.693147181
AMW-033-082	1	ND	U	0.5	-0.693147181
AMW-034-082	1	ND	U	0.5	-0.693147181
AMW-042-082	1	ND	U	0.5	-0.693147181
BMW-004-082	1	ND	U	0.5	-0.693147181
BMW-005-082	1	ND	U	0.5	-0.693147181
BMW-007-082	1	ND	U	0.5	-0.693147181
BMW-008-082	1	ND	U	0.5	-0.693147181
BMW-029-082	1	ND	U	0.5	-0.693147181
BMW-031-082	1	ND	U	0.5	-0.693147181
BMW-032-082	1	ND	U	0.5	-0.693147181
BMW-033-082	1	ND	U	0.5	-0.693147181
BMW-034-082	1	ND	U	0.5	-0.693147181
BMW-042-082	1	ND	U	0.5	-0.693147181
DMW-032-082	1	ND	U	0.5	-0.693147181
DMW-033-082	1	ND	U	0.5	-0.693147181
DMW-034-082	1	ND	U	0.5	-0.693147181
DMW-042-082	1	ND	U	0.5	-0.693147181
			1,1-Dichloroethan		
			MEAN =	0.5	
			GEOMEAN =	0.5	
			MEAN OF LN=	-0.693147181	
			N=	24	
			S=	0.00	
			H=	NA	
			UCL=	NA	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-004-082	1	ND	U	0.5	-0.693147181
AMW-005-082	1	ND	U	0.5	-0.693147181
AMW-007-082	1	ND	U	0.5	-0.693147181
AMW-008-082	1	ND	U	0.5	-0.693147181
AMW-029-082	1	ND	U	0.5	-0.693147181
AMW-031-082	1	ND	U	0.5	-0.693147181
AMW-032-082	1	ND	U	0.5	-0.693147181
AMW-033-082	1	ND	U	0.5	-0.693147181
AMW-034-082	1	ND	U	0.5	-0.693147181
AMW-042-082	1	ND	U	0.5	-0.693147181
BMW-004-082	1	ND	U	0.5	-0.693147181
BMW-005-082	1	ND	U	0.5	-0.693147181
BMW-007-082	1	ND	U	0.5	-0.693147181
BMW-008-082	1	ND	U	0.5	-0.693147181
BMW-029-082	1	ND	U	0.5	-0.693147181
BMW-031-082	1	ND	U	0.5	-0.693147181
BMW-032-082	1	ND	U	0.5	-0.693147181

VOC CONCENTRATION CALCULATION
PLUME 3
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
BMW-033-082	1	ND	U	0.5	-0.693147181
BMW-034-082	1	ND	U	0.5	-0.693147181
BMW-042-082	1	ND	U	0.5	-0.693147181
DMW-032-082	1	ND	U	0.5	-0.693147181
DMW-033-082	1	ND	U	0.5	-0.693147181
DMW-034-082	1	ND	U	0.5	-0.693147181
DMW-042-082	1	ND	U	0.5	-0.693147181

1,1-Dichloroethene

MEAN =	0.5
GEOMEAN =	0.5
MEAN OF LN=	-0.693147181
N=	24
S=	0.00
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

AMW-004-082	1	ND	U	0.5	-0.693147181
AMW-005-082	1	ND	U	0.5	-0.693147181
AMW-007-082	1	ND	U	0.5	-0.693147181
AMW-008-082	1	ND	U	0.5	-0.693147181
AMW-029-082	1	ND	U	0.5	-0.693147181
AMW-031-082	1	ND	U	0.5	-0.693147181
AMW-032-082	1	ND	U	0.5	-0.693147181
AMW-033-082	1	ND	U	0.5	-0.693147181
AMW-034-082	1	ND	U	0.5	-0.693147181
AMW-042-082	1	ND	U	0.5	-0.693147181
BMW-004-082	1	ND	U	0.5	-0.693147181
BMW-005-082	1	ND	U	0.5	-0.693147181
BMW-007-082	1	ND	U	0.5	-0.693147181
BMW-008-082	1	ND	U	0.5	-0.693147181
BMW-029-082	1	ND	U	0.5	-0.693147181
BMW-031-082	1	ND	U	0.5	-0.693147181
BMW-032-082	1	ND	U	0.5	-0.693147181
BMW-033-082	1	ND	U	0.5	-0.693147181
BMW-034-082	1	ND	U	0.5	-0.693147181
BMW-042-082	1	ND	U	0.5	-0.693147181
DMW-032-082	1	ND	U	0.5	-0.693147181
DMW-033-082	1	ND	U	0.5	-0.693147181
DMW-034-082	1	ND	U	0.5	-0.693147181
DMW-042-082	1	ND	U	0.5	-0.693147181

1,2-Dichloropropane

MEAN =	0.5
GEOMEAN =	0.5
MEAN OF LN=	-0.693147181
N=	24
S=	0.00
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

VOC CONCENTRATION CALCULATION
PLUME 3
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-031-082			J	4	1.386294361
AMW-033-082	5	ND	U	2.5	0.916290732
BMW-004-082	5	ND	U	2.5	0.916290732
BMW-005-082	5			2.5	0.916290732
BMW-007-082				12	2.48490665
BMW-008-082	5	ND	U	2.5	0.916290732
BMW-029-082				6	1.791759469
BMW-031-082				16	2.772588722
BMW-032-082	5	ND	U	2.5	0.916290732
BMW-033-082	5	ND	U	2.5	0.916290732
BMW-034-082	5	ND	U	2.5	0.916290732
BMW-042-082	5	ND	U	2.5	0.916290732
			Acetone		
			MEAN =	4.833333333	
			GEOMEAN =	3.72036924	
			MEAN OF LN=	1.313822921	
			N=	12	
			S=	0.67	
			H=	2.414	
			UCL=	7.62598757	
			MIN =	4	
			MAX =	16	
			NO. OF DET=	4	

AMW-004-082	1	ND	U	0.5	-0.693147181
AMW-005-082	1	ND	U	0.5	-0.693147181
AMW-007-082	1	ND	U	0.5	-0.693147181
AMW-008-082	1	ND	U	0.5	-0.693147181
AMW-029-082	1	ND	U	0.5	-0.693147181
AMW-031-082	1	ND	U	0.5	-0.693147181
AMW-032-082	1	ND	U	0.5	-0.693147181
AMW-033-082	1	ND	U	0.5	-0.693147181
AMW-034-082	1	ND	U	0.5	-0.693147181
AMW-042-082	1	ND	U	0.5	-0.693147181
BMW-004-082	1	ND	U	0.5	-0.693147181
BMW-005-082	1	ND	U	0.5	-0.693147181
BMW-007-082	1	ND	U	0.5	-0.693147181
BMW-008-082	1	ND	U	0.5	-0.693147181
BMW-029-082	1	ND	U	0.5	-0.693147181
BMW-031-082	1	ND	U	0.5	-0.693147181
BMW-032-082	1	ND	U	0.5	-0.693147181
BMW-033-082	1	ND	U	0.5	-0.693147181
BMW-034-082	1	ND	U	0.5	-0.693147181
BMW-042-082	1	ND	U	0.5	-0.693147181
DMW-032-082	1	ND	U	0.5	-0.693147181
DMW-033-082	1	ND	U	0.5	-0.693147181
DMW-034-082	1	ND	U	0.5	-0.693147181
DMW-042-082	1	ND	U	0.5	-0.693147181
			Chloroform		

VOC CONCENTRATION CALCULATION
PLUME 3
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
			MEAN =	0.5	
			GEOMEAN =	0.5	
			MEAN OF LN=	-0.693147181	
			N=	24	
			S=	0.00	
			H=	NA	
			UCL=	NA	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-004-082	1	ND	U	0.5	-0.693147181
AMW-005-082	1	ND	U	0.5	-0.693147181
AMW-007-082	1	ND	U	0.5	-0.693147181
AMW-008-082	1	ND	U	0.5	-0.693147181
AMW-029-082	1	ND	U	0.5	-0.693147181
AMW-031-082	1	ND	U	0.5	-0.693147181
AMW-032-082	1	ND	U	0.5	-0.693147181
AMW-033-082	1	ND	U	0.5	-0.693147181
AMW-034-082	1	ND	U	0.5	-0.693147181
AMW-042-082	1	ND	U	0.5	-0.693147181
BMW-004-082	1	ND	U	0.5	-0.693147181
BMW-005-082	1	ND	U	0.5	-0.693147181
BMW-007-082	1	ND	U	0.5	-0.693147181
BMW-008-082	1	ND	U	0.5	-0.693147181
BMW-029-082	1	ND	U	0.5	-0.693147181
BMW-031-082	1	ND	U	0.5	-0.693147181
BMW-032-082	1	ND	U	0.5	-0.693147181
BMW-033-082	1	ND	U	0.5	-0.693147181
BMW-034-082	1	ND	U	0.5	-0.693147181
BMW-042-082	1	ND	U	0.5	-0.693147181
DMW-032-082	1	ND	U	0.5	-0.693147181
DMW-033-082	1	ND	U	0.5	-0.693147181
DMW-034-082	1	ND	U	0.5	-0.693147181
DMW-042-082	1	ND	U	0.5	-0.693147181
			Cis-1,2-Dichloroethene		
			MEAN =	0.5	
			GEOMEAN =	0.5	
			MEAN OF LN=	-0.693147181	
			N=	24	
			S=	0.00	
			H=	NA	
			UCL=	NA	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-004-082	2		UBJ	1	0
AMW-005-082	2		UB	1	0
AMW-007-082	2		UBJ	1	0
AMW-008-082	2		UBJ	1	0
AMW-029-082	2		UB	1	0
AMW-031-082	2		UBJ	1	0
AMW-032-082	2		UB	1	0
AMW-033-082	5		UBJ	2.5	0.916290732
AMW-034-082	2		UBJ	1	0

VOC CONCENTRATION CALCULATION
PLUME 3
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-042-082	5		UBJ	2.5	0.916290732
BMW-004-082	1		B	6	1.791759469
BMW-005-082	1		BJ	1	0
BMW-007-082	1		BJ	1	0
BMW-008-082	1		BJ	1	0
BMW-029-082	1		B	2	0.693147181
BMW-031-082	1		BJ	1	0
BMW-032-082	1	ND	U	0.5	-0.693147181
BMW-033-082	1		BJ	1	0
BMW-034-082	1		BJ	1	0
BMW-042-082	1		B	2	0.693147181
DMW-032-082	2		UB	1	0
DMW-033-082			B	3	1.098612289
DMW-034-082	2		UBJ	1	0
DMW-042-082	5		UBJ	2.5	0.916290732

Methylene chloride

MEAN =	1.541666667
GEOMEAN =	1.301932411
MEAN OF LN=	0.263849631
N=	24
S=	0.54
H=	2.014
UCL=	1.889697598
MIN =	1
MAX =	6
NO. OF DET=	10

AMW-004-082	1	ND	U	0.5	-0.693147181
AMW-005-082	1	ND	U	0.5	-0.693147181
AMW-007-082	1	ND	U	0.5	-0.693147181
AMW-008-082	1	ND	U	0.5	-0.693147181
AMW-029-082	1	ND	U	0.5	-0.693147181
AMW-031-082	1	ND	U	0.5	-0.693147181
AMW-032-082	1	ND	U	0.5	-0.693147181
AMW-033-082	1	ND	U	0.5	-0.693147181
AMW-034-082	1	ND	U	0.5	-0.693147181
AMW-042-082	1	ND	U	0.5	-0.693147181
BMW-004-082	1	ND	U	0.5	-0.693147181
BMW-005-082	1	ND	U	0.5	-0.693147181
BMW-007-082	1	ND	U	0.5	-0.693147181
BMW-008-082	1	ND	U	0.5	-0.693147181
BMW-029-082	1	ND	U	0.5	-0.693147181
BMW-031-082	1	ND	U	0.5	-0.693147181
BMW-032-082	1	ND	U	0.5	-0.693147181
BMW-033-082	1	ND	U	0.5	-0.693147181
BMW-034-082	1	ND	U	0.5	-0.693147181
BMW-042-082	1	ND	U	0.5	-0.693147181
DMW-032-082	1	ND	U	0.5	-0.693147181
DMW-033-082	1	ND	U	0.5	-0.693147181
DMW-034-082	1	ND	U	0.5	-0.693147181
DMW-042-082	1	ND	U	0.5	-0.693147181

Tetrachloroethene

MEAN =	0.5
GEOMEAN =	0.5
MEAN OF LN=	-0.693147181

VOC CONCENTRATION CALCULATION
PLUME 3
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
			N=	24	
			S=	0.00	
			H=	NA	
			UCL=	NA	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-004-082	1	ND	U	0.5	-0.693147181
AMW-005-082				4	1.386294361
AMW-007-082	1	ND	U	0.5	-0.693147181
AMW-008-082	1	ND	U	0.5	-0.693147181
AMW-029-082	1	ND	U	0.5	-0.693147181
AMW-031-082	1	ND	U	0.5	-0.693147181
AMW-032-082	1	ND	U	0.5	-0.693147181
AMW-033-082				1	0
AMW-034-082	1	ND	U	0.5	-0.693147181
AMW-042-082	1	ND	U	0.5	-0.693147181
BMW-004-082	1	ND	U	0.5	-0.693147181
BMW-005-082	1	ND	U	0.5	-0.693147181
BMW-007-082	1	ND	U	0.5	-0.693147181
BMW-008-082	1	ND	U	0.5	-0.693147181
BMW-029-082	1	ND	U	0.5	-0.693147181
BMW-031-082	1	ND	U	0.5	-0.693147181
BMW-032-082	1	ND	U	0.5	-0.693147181
BMW-033-082	1	ND	U	0.5	-0.693147181
BMW-034-082	1	ND	U	0.5	-0.693147181
BMW-042-082	1	ND	U	0.5	-0.693147181
DMW-032-082	1	ND	U	0.5	-0.693147181
DMW-033-082	1	ND	U	0.5	-0.693147181
DMW-034-082	1	ND	U	0.5	-0.693147181
DMW-042-082	1	ND	U	0.5	-0.693147181

Trichloroethene

MEAN =	0.666666667
GEOMEAN =	0.561231024
MEAN OF LN=	-0.57762265
N=	24
S=	0.44
H=	1.928
UCL=	0.738872916
MIN =	1
MAX =	4
NO. OF DET=	2

VOC CONCENTRATION CALCULATION
PLUME 4
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-011-082	1	ND	U	0.5	-0.693147181
AMW-018-082	1	ND	U	0.5	-0.693147181
AMW-036-082	10	ND	U	5	1.609437912
AMW-043-082	1	ND	U	0.5	-0.693147181
AMW-044-082	10	ND	U	5	1.609437912
AMW-045-082	10	ND	U	5	1.609437912
AMW-052-082	1	ND	U	0.5	-0.693147181
AMW-053-082	1	ND	U	0.5	-0.693147181
AMW-054-082	1	ND	U	0.5	-0.693147181
AMW-055-082	1	ND	U	0.5	-0.693147181
AMW-056-082	1	ND	U	0.5	-0.693147181
BMW-018-082	1	ND	U	0.5	-0.693147181
BMW-036-082	10	ND	U	5	1.609437912
BMW-043-082			J	2	0.693147181
BMW-044-082	1	ND	U	0.5	-0.693147181
BMW-045-082			J	1	0
BMW-052-082	1	ND	U	0.5	-0.693147181
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	1	ND	U	0.5	-0.693147181
BMW-055-082	1	ND	U	0.5	-0.693147181
BMW-056-082	10	ND	U	5	1.609437912
CMW-018-082	10	ND	U	5	1.609437912
DMW-036-082	1	ND	U	0.5	-0.693147181
DMW-043-082	1	ND	U	0.5	-0.693147181
DMW-044-082	1	ND	U	0.5	-0.693147181
DMW-045-082	10	ND	U	5	1.609437912

1,1,1-Trichloroethane

MEAN =	1.961538462
GEOMEAN =	1.10000977
MEAN OF LN=	0.095319061
N=	26
S=	1.07
H=	2.642
UCL=	3.435257833
MIN =	1
MAX =	2
NO. OF DET=	2

AMW-011-082	1	ND	U	0.5	-0.693147181
AMW-018-082	1	ND	U	0.5	-0.693147181
AMW-036-082	10	ND	U	5	1.609437912
AMW-043-082	1	ND	U	0.5	-0.693147181
AMW-044-082	10	ND	U	5	1.609437912
AMW-045-082	10	ND	U	5	1.609437912
AMW-052-082	1	ND	U	0.5	-0.693147181
AMW-053-082	1	ND	U	0.5	-0.693147181
AMW-054-082	1	ND	U	0.5	-0.693147181
AMW-055-082	1	ND	U	0.5	-0.693147181
AMW-056-082	1	ND	U	0.5	-0.693147181
BMW-018-082	1	ND	U	0.5	-0.693147181
BMW-036-082	10	ND	U	5	1.609437912
BMW-043-082	10	ND	U	5	1.609437912
BMW-044-082	1	ND	U	0.5	-0.693147181
BMW-045-082	10	ND	U	5	1.609437912
BMW-052-082	1	ND	U	0.5	-0.693147181
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	1	ND	U	0.5	-0.693147181
BMW-055-082	1	ND	U	0.5	-0.693147181
BMW-056-082	10	ND	U	5	1.609437912
CMW-018-082	10	ND	U	5	1.609437912
DMW-036-082	1	ND	U	0.5	-0.693147181

VOC CONCENTRATION CALCULATION
PLUME 4
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
DMW-043-082	1	ND	U	0.5	-0.693147181
DMW-044-082	1	ND	U	0.5	-0.693147181
DMW-045-082	10	ND	U	5	1.609437912
			1,1,2,2-Tetrachloroethane		
			MEAN =	2.230769231	
			GEOMEAN =	1.212231009	
			MEAN OF LN=	0.192462471	
			N=	26	
			S=	1.14	
			H=	NA	
			UCL=	NA	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-011-082	1	ND	U	0.5	-0.693147181
AMW-018-082	1	ND	U	0.5	-0.693147181
AMW-036-082	10	ND	U	5	1.609437912
AMW-043-082	1	ND	U	0.5	-0.693147181
AMW-044-082	10	ND	U	5	1.609437912
AMW-045-082	10	ND	U	5	1.609437912
AMW-052-082	1	ND	U	0.5	-0.693147181
AMW-053-082	1	ND	U	0.5	-0.693147181
AMW-054-082	1	ND	U	0.5	-0.693147181
AMW-055-082	1	ND	U	0.5	-0.693147181
AMW-056-082	1	ND	U	0.5	-0.693147181
BMW-018-082	1	ND	U	0.5	-0.693147181
BMW-036-082	10	ND	U	5	1.609437912
BMW-043-082	10	ND	U	5	1.609437912
BMW-044-082	1	ND	U	0.5	-0.693147181
BMW-045-082	10	ND	U	5	1.609437912
BMW-052-082	1	ND	U	0.5	-0.693147181
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	1	ND	U	0.5	-0.693147181
BMW-055-082	1	ND	U	0.5	-0.693147181
BMW-056-082	10	ND	U	5	1.609437912
CMW-018-082	10	ND	U	5	1.609437912
DMW-036-082	1	ND	U	0.5	-0.693147181
DMW-043-082	1	ND	U	0.5	-0.693147181
DMW-044-082	1	ND	U	0.5	-0.693147181
DMW-045-082	10	ND	U	5	1.609437912
			1,1,2-Trichloroethane		
			MEAN =	2.230769231	
			GEOMEAN =	1.212231009	
			MEAN OF LN=	0.192462471	
			N=	26	
			S=	1.14	
			H=	NA	
			UCL=	NA	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

VOC CONCENTRATION CALCULATION
PLUME 4
(all in µg/L)

WELL NAME	D.L.	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-011-082	1	ND	U	0.5	-0.693147181
AMW-018-082	1	ND	U	0.5	-0.693147181
AMW-036-082	10	ND	U	5	1.609437912
AMW-043-082	1	ND	U	0.5	-0.693147181
AMW-044-082	10	ND	U	5	1.609437912
AMW-045-082	10	ND	U	5	1.609437912
AMW-052-082	1	ND	U	0.5	-0.693147181
AMW-053-082	1	ND	U	0.5	-0.693147181
AMW-054-082	1	ND	U	0.5	-0.693147181
AMW-055-082	1	ND	U	0.5	-0.693147181
AMW-056-082	1	ND	U	0.5	-0.693147181
BMW-018-082	1	ND	U	0.5	-0.693147181
BMW-036-082	10	ND	U	5	1.609437912
BMW-043-082	10	ND	U	5	1.609437912
BMW-044-082	1	ND	U	0.5	-0.693147181
BMW-045-082	10	ND	U	5	1.609437912
BMW-052-082	1	ND	U	0.5	-0.693147181
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	1	ND	U	0.5	-0.693147181
BMW-055-082	1	ND	U	0.5	-0.693147181
BMW-056-082	10	ND	U	5	1.609437912
CMW-018-082	10	ND	U	5	1.609437912
DMW-036-082	1	ND	U	0.5	-0.693147181
DMW-043-082	1	ND	U	0.5	-0.693147181
DMW-044-082	1	ND	U	0.5	-0.693147181
DMW-045-082	10	ND	U	5	1.609437912

1,1-Dichloroethane

MEAN =	2.230769231
GEOMEAN =	1.212231009
MEAN OF LN=	0.192462471
N=	26
S=	1.14
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

AMW-011-082	1	ND	U	0.5	-0.693147181
AMW-018-082	1	ND	U	0.5	-0.693147181
AMW-036-082	10	ND	U	5	1.609437912
AMW-043-082	1	ND	U	0.5	-0.693147181
AMW-044-082	10	ND	U	5	1.609437912
AMW-045-082	10	ND	U	5	1.609437912
AMW-052-082	1	ND	U	0.5	-0.693147181
AMW-053-082	1	ND	U	0.5	-0.693147181
AMW-054-082	1	ND	U	0.5	-0.693147181
AMW-055-082	1	ND	U	0.5	-0.693147181
AMW-056-082	1	ND	U	0.5	-0.693147181
BMW-018-082	1	ND	U	0.5	-0.693147181
BMW-036-082	10	ND	U	5	1.609437912
BMW-043-082	10	ND	U	5	1.609437912
BMW-044-082	1	ND	U	0.5	-0.693147181
BMW-045-082	10	ND	U	5	1.609437912
BMW-052-082	1	ND	U	0.5	-0.693147181
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	1	ND	U	0.5	-0.693147181
BMW-055-082	1	ND	U	0.5	-0.693147181
BMW-056-082	10	ND	U	5	1.609437912
CMW-018-082	10	ND	U	5	1.609437912

VOC CONCENTRATION CALCULATION
PLUME 4
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
DMW-036-082	1	ND	U	0.5	-0.693147181
DMW-043-082	1	ND	U	0.5	-0.693147181
DMW-044-082	1	ND	U	0.5	-0.693147181
DMW-045-082	10	ND	U	5	1.609437912
			1,1-Dichloroethene		
			MEAN =	2.230769231	
			GEOMEAN =	1.212231009	
			MEAN OF LN=	0.192462471	
			N=	26	
			S=	1.14	
			H=	NA	
			UCL=	NA	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-036-082			J	1	0
AMW-044-082			J	1	0
AMW-045-082	10	ND	U	5	1.609437912
BMW-036-082			J	1	0
BMW-043-082			J	2	0.693147181
BMW-045-082			J	1	0
BMW-053-082				10	2.302585093
BMW-056-082	10	ND	U	5	1.609437912
CMW-018-082			J	3	1.098612289
DMW-045-082	10	ND	U	5	1.609437912
			1,2-Dichloroethene(Total)		
			MEAN =	3.4	
			GEOMEAN =	2.440653497	
			MEAN OF LN=	0.89226583	
			N=	10	
			S=	0.87	
			H=	2.805	
			UCL=	8.025557153	
			MIN =	1	
			MAX =	10	
			NO. OF DET=	7	
AMW-011-082	1	ND	U	0.5	-0.693147181
AMW-018-082	1	ND	U	0.5	-0.693147181
AMW-036-082	10	ND	U	5	1.609437912
AMW-043-082	1	ND	U	0.5	-0.693147181
AMW-044-082	10	ND	U	5	1.609437912
AMW-045-082	10	ND	U	5	1.609437912
AMW-052-082	1	ND	U	0.5	-0.693147181
AMW-053-082	1	ND	U	0.5	-0.693147181
AMW-054-082	1	ND	U	0.5	-0.693147181
AMW-055-082	1	ND	U	0.5	-0.693147181
AMW-056-082	1	ND	U	0.5	-0.693147181
BMW-018-082	1	ND	U	0.5	-0.693147181
BMW-036-082	10	ND	U	5	1.609437912
BMW-043-082	10	ND	U	5	1.609437912
BMW-044-082	1	ND	U	0.5	-0.693147181
BMW-045-082	10	ND	U	5	1.609437912
BMW-052-082	1	ND	U	0.5	-0.693147181
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	1	ND	U	0.5	-0.693147181
BMW-055-082	1	ND	U	0.5	-0.693147181
BMW-056-082	10	ND	U	5	1.609437912
CMW-018-082	10	ND	U	5	1.609437912

VOC CONCENTRATION CALCULATION
PLUME 4
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
DMW-036-082	1	ND	U	0.5	-0.693147181
DMW-043-082	1	ND	U	0.5	-0.693147181
DMW-044-082	1	ND	U	0.5	-0.693147181
DMW-045-082	10	ND	U	5	1.609437912
			1,2-Dichloropropane		
			MEAN =	2.230769231	
			GEOMEAN =	1.212231009	
			MEAN OF LN=	0.192462471	
			N=	26	
			S=	1.14	
			H=	NA	
			UCL=	NA	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-011-082				7	1.945910149
AMW-018-082	5	ND	U	2.5	0.916290732
AMW-044-082	10	ND	U	5	1.609437912
BMW-018-082	5	ND	U	2.5	0.916290732
BMW-053-082	10	ND	U	5	1.609437912
BMW-055-082				6	1.791759469
BMW-056-082	10	ND	U	5	1.609437912
CMW-018-082	10	ND	U	5	1.609437912
			Acetone		
			MEAN =	4.75	
			GEOMEAN =	4.486174533	
			MEAN OF LN=	1.501000341	
			N=	8	
			S=	0.38	
			H=	2.201	
			UCL=	6.618637279	
			MIN =	6	
			MAX =	7	
			NO. OF DET=	2	
AMW-011-082	1	ND	U	0.5	-0.693147181
AMW-018-082	1	ND	U	0.5	-0.693147181
AMW-036-082	10	ND	U	5	1.609437912
AMW-043-082	1	ND	U	0.5	-0.693147181
AMW-044-082	10	ND	U	5	1.609437912
AMW-045-082	10	ND	U	5	1.609437912
AMW-052-082	1	ND	U	0.5	-0.693147181
AMW-053-082	1	ND	U	0.5	-0.693147181
AMW-054-082	1	ND	U	0.5	-0.693147181
AMW-055-082	1	ND	U	0.5	-0.693147181
AMW-056-082	1	ND	U	0.5	-0.693147181
BMW-018-082	1	ND	U	0.5	-0.693147181
BMW-036-082	10	ND	U	5	1.609437912
BMW-043-082	10	ND	U	5	1.609437912
BMW-044-082	1	ND	U	0.5	-0.693147181
BMW-045-082	10	ND	U	5	1.609437912
BMW-052-082	1	ND	U	0.5	-0.693147181
BMW-053-082	5	ND	UJ	2.5	0.916290732
BMW-054-082	1	ND	U	0.5	-0.693147181
BMW-055-082	1	ND	U	0.5	-0.693147181
BMW-056-082	10	ND	U	5	1.609437912
CMW-018-082	5	ND	U	2.5	0.916290732
DMW-036-082	1	ND	U	0.5	-0.693147181
DMW-043-082	1	ND	U	0.5	-0.693147181

VOC CONCENTRATION CALCULATION
PLUME 4
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
DMW-044-082	1	ND	U	0.5	-0.693147181
DMW-045-082	10	ND	U	5	1.609437912
			Chloroform		
			MEAN =	2.038461538	
			GEOMEAN =	1.149288961	
			MEAN OF LN=	0.139143457	
			N=	26	
			S=	1.09	
			H=	NA	
			UCL=	NA	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-011-082	1	ND	U	0.5	-0.693147181
AMW-018-082	1	ND	U	0.5	-0.693147181
AMW-043-082	1	ND	U	0.5	-0.693147181
AMW-052-082				2	0.693147181
AMW-053-082				2	0.693147181
AMW-054-082	1	ND	U	0.5	-0.693147181
AMW-055-082	1	ND	U	0.5	-0.693147181
AMW-056-082	1	ND	U	0.5	-0.693147181
BMW-018-082	1	ND	U	0.5	-0.693147181
BMW-044-082	1	ND	U	0.5	-0.693147181
BMW-052-082				2	0.693147181
BMW-054-082	1	ND	U	0.5	-0.693147181
BMW-055-082	1	ND	U	0.5	-0.693147181
DMW-036-082	1	ND	U	0.5	-0.693147181
DMW-043-082	1	ND	U	0.5	-0.693147181
DMW-044-082	1	ND	U	0.5	-0.693147181
			Cis-1,2-Dichloroethene		
			MEAN =	0.78125	
			GEOMEAN =	0.648419777	
			MEAN OF LN=	-0.433216988	
			N=	16	
			S=	0.56	
			H=	2.108	
			UCL=	1.027464128	
			MIN =	2	
			MAX =	2	
			NO. OF DET=	3	
AMW-011-082	2		BJ	1	0
AMW-018-082			BJ	1	0
AMW-036-082	5	ND	UBJ	2.5	0.916290732
AMW-043-082	2	ND	UB	1	0
AMW-044-082			BJ	3	1.098612289
AMW-045-082			B	18	2.890371758
AMW-052-082	2	ND	UBJ	1	0
AMW-053-082	2	ND	UBJ	1	0
AMW-054-082			BJ	1	0
AMW-055-082	2	ND	UBJ	1	0
AMW-056-082	2		UJ	1	0
BMW-018-082			BJ	1	0
BMW-036-082	5	ND	UBJ	2.5	0.916290732
BMW-043-082			BJ	3	1.098612289
BMW-044-082	2	ND	UB	1	0
BMW-045-082	5	ND	UBJ	2.5	0.916290732
BMW-052-082	2	ND	U	1	0

VOC CONCENTRATION CALCULATION
PLUME 4
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
BMW-053-082	5	ND	UBJ	2.5	0.916290732
BMW-054-082	2	ND	UBJ	1	0
BMW-055-082	2	ND	UBJ	1	0
BMW-056-082	2		BJ	1	0
CMW-018-082			BJ	1	0
DMW-036-082	5	ND	UBJ	2.5	0.916290732
DMW-043-082	2	ND	UB	1	0
DMW-044-082	2	ND	UBJ	1	0
DMW-045-082	5	ND	UBJ	2.5	0.916290732

Methylene chloride

MEAN =	2.153846154
GEOMEAN =	1.502497148
MEAN OF LN=	0.407128489
N=	26
S=	0.68
H=	2.144
UCL=	2.529007669
MIN =	1
MAX =	18
NO. OF DET=	9

AMW-011-082	1	ND	U	0.5	-0.693147181
AMW-018-082	1	ND	U	0.5	-0.693147181
AMW-036-082	10	ND	U	5	1.609437912
AMW-043-082	1	ND	U	0.5	-0.693147181
AMW-044-082	10	ND	U	5	1.609437912
AMW-045-082	10	ND	U	5	1.609437912
AMW-052-082	1	ND	U	0.5	-0.693147181
AMW-053-082	1	ND	U	0.5	-0.693147181
AMW-054-082	1	ND	U	0.5	-0.693147181
AMW-055-082	1	ND	U	0.5	-0.693147181
AMW-056-082	1	ND	U	0.5	-0.693147181
BMW-018-082	1	ND	U	0.5	-0.693147181
BMW-036-082	10	ND	U	5	1.609437912
BMW-043-082	10	ND	U	5	1.609437912
BMW-044-082	1	ND	U	0.5	-0.693147181
BMW-045-082	10	ND	U	5	1.609437912
BMW-052-082	1	ND	U	0.5	-0.693147181
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	1	ND	U	0.5	-0.693147181
BMW-055-082	1	ND	U	0.5	-0.693147181
BMW-056-082	10	ND	U	5	1.609437912
CMW-018-082	10	ND	U	5	1.609437912
DMW-036-082	1	ND	U	0.5	-0.693147181
DMW-043-082	1	ND	U	0.5	-0.693147181
DMW-044-082	1	ND	U	0.5	-0.693147181
DMW-045-082	10	ND	U	5	1.609437912

Tetrachloroethene

MEAN =	2.230769231
GEOMEAN =	1.212231009
MEAN OF LN=	0.192462471
N=	26
S=	1.14
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

VOC CONCENTRATION CALCULATION
PLUME 4
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-011-082	1	ND	U	0.5	-0.693147181
AMW-018-082	1	ND	U	0.5	-0.693147181
AMW-036-082				25	3.218875825
AMW-043-082	1	ND	U	0.5	-0.693147181
AMW-044-082				180	5.192956851
AMW-045-082				26	3.258096538
AMW-052-082				3	1.098612289
AMW-053-082				8	2.079441542
AMW-054-082	1	ND	U	0.5	-0.693147181
AMW-055-082	1	ND	U	0.5	-0.693147181
AMW-056-082	1	ND	U	0.5	-0.693147181
BMW-018-082	1	ND	U	0.5	-0.693147181
BMW-036-082				25	3.218875825
BMW-043-082				46	3.828641396
BMW-044-082	1	ND	U	0.5	-0.693147181
BMW-045-082				99	4.59511985
BMW-052-082				1	0
BMW-053-082				97	4.574710979
BMW-054-082	1	ND	U	0.5	-0.693147181
BMW-055-082	1	ND	U	0.5	-0.693147181
BMW-056-082				11	2.397895273
CMW-018-082				76	4.33073334
DMW-036-082	1	ND	U	0.5	-0.693147181
DMW-043-082	1	ND	U	0.5	-0.693147181
DMW-044-082				7	1.945910149
DMW-045-082				50	3.912023005

Trichloroethene

MEAN =	25.38461538
GEOMEAN =	3.892318023
MEAN OF LN=	1.359004873
N=	26
S=	2.21
H=	4.35
UCL=	304.149114
MIN =	1
MAX =	180
NO. OF DET=	14

SVOC CONCENTRATION CALCULATION
PLUME 4
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912

1,2,4-Trichlorobenzene

MEAN =	5
GEOMEAN =	5
MEAN OF LN=	1.609437912
N=	10
S=	0.00
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912

1,2-Dichlorobenzene

MEAN =	5
GEOMEAN =	5
MEAN OF LN=	1.609437912
N=	10
S=	0.00
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

SVOC CONCENTRATION CALCULATION
PLUME 4
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912

1,3-Dichlorobenzene

MEAN =	5
GEOMEAN =	5
MEAN OF LN=	1.609437912
N=	10
S=	0.00
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912

1,4-Dichlorobenzene

MEAN =	5
GEOMEAN =	5
MEAN OF LN=	1.609437912
N=	10
S=	0.00
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

SVOC CONCENTRATION CALCULATION
PLUME 4
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912

2,2'-Oxybis(1-chloropropane)

MEAN =	5
GEOMEAN =	5
MEAN OF LN=	1.609437912
N=	10
S=	0.00
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

AMW-052-082	25	ND	U	12.5	2.525728644
AMW-053-082	25	ND	U	12.5	2.525728644
AMW-054-082	25	ND	U	12.5	2.525728644
AMW-055-082	25	ND	U	12.5	2.525728644
AMW-056-082	25	ND	U	12.5	2.525728644
BMW-052-082	25	ND	U	12.5	2.525728644
BMW-053-082	25	ND	U	12.5	2.525728644
BMW-054-082	25	ND	U	12.5	2.525728644
BMW-055-082	25	ND	U	12.5	2.525728644
BMW-056-082	25	ND	U	12.5	2.525728644

2,4,5-Trichlorophenol

MEAN =	12.5
GEOMEAN =	12.5
MEAN OF LN=	2.525728644
N=	10
S=	0.00
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

SVOC CONCENTRATION CALCULATION
PLUME 4
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912

2,4,6-Trichlorophenol

MEAN =	5
GEOMEAN =	5
MEAN OF LN=	1.609437912
N=	10
S=	0.00
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

AMW-052-082	10	ND	U	5	1.609437912
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912

2,4-Dichlorophenol

MEAN =	5
GEOMEAN =	5
MEAN OF LN=	1.609437912
N=	20
S=	0.00
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

SVOC CONCENTRATION CALCULATION
PLUME 4
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	25	ND	U	12.5	2.525728644
AMW-053-082	25	ND	U	12.5	2.525728644
AMW-054-082	25	ND	U	12.5	2.525728644
AMW-055-082	25	ND	U	12.5	2.525728644
AMW-056-082	25	ND	U	12.5	2.525728644
BMW-052-082	25	ND	U	12.5	2.525728644
BMW-053-082	25	ND	U	12.5	2.525728644
BMW-054-082	25	ND	U	12.5	2.525728644
BMW-055-082	25	ND	U	12.5	2.525728644
BMW-056-082	25	ND	U	12.5	2.525728644

2,4-Dinitrophenol

MEAN =	12.5
GEOMEAN =	12.5
MEAN OF LN=	2.525728644
N=	10
S=	0.00
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912

2,4-Dinitrotoluene

MEAN =	5
GEOMEAN =	5
MEAN OF LN=	1.609437912
N=	10
S=	0.00
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

SVOC CONCENTRATION CALCULATION
PLUME 4
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912

2,6-Dinitrotoluene (26DNT)

MEAN =	5
GEOMEAN =	5
MEAN OF LN=	1.609437912
N=	10
S=	0.00
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO OF DET=	0

AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912

2-Chloronaphthalene

MEAN =	5
GEOMEAN =	5
MEAN OF LN=	1.609437912
N=	10
S=	0.00
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

SVOC CONCENTRATION CALCULATION
PLUME 4
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912

2-Chlorophenol

MEAN =	5
GEOMEAN =	5
MEAN OF LN=	1.609437912
N=	10
S=	0.00
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912

2-Methylnaphthalene

MEAN =	5
GEOMEAN =	5
MEAN OF LN=	1.609437912
N=	10
S=	0.00
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

SVOC CONCENTRATION CALCULATION
PLUME 4
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912

2-Methylphenol

MEAN =	5
GEOMEAN =	5
MEAN OF LN=	1.609437912
N=	10
S=	0.00
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

AMW-052-082	25	ND	U	12.5	2.525728644
AMW-053-082	25	ND	U	12.5	2.525728644
AMW-054-082	25	ND	U	12.5	2.525728644
AMW-055-082	25	ND	U	12.5	2.525728644
AMW-056-082	25	ND	U	12.5	2.525728644
BMW-052-082	25	ND	U	12.5	2.525728644
BMW-053-082	25	ND	U	12.5	2.525728644
BMW-054-082	25	ND	U	12.5	2.525728644
BMW-055-082	25	ND	U	12.5	2.525728644
BMW-056-082	25	ND	U	12.5	2.525728644

2-Nitroaniline

MEAN =	12.5
GEOMEAN =	12.5
MEAN OF LN=	2.525728644
N=	10
S=	0.00
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

SVOC CONCENTRATION CALCULATION
PLUME 4
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912

2-Nitrophenol

MEAN =	5
GEOMEAN =	5
MEAN OF LN=	1.609437912
N=	10
S=	0.00
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912

3,3'-Dichlorobenzidine

MEAN =	5
GEOMEAN =	5
MEAN OF LN=	1.609437912
N=	10
S=	0.00
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

SVOC CONCENTRATION CALCULATION
PLUME 4
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	25	ND	U	12.5	2.525728644
AMW-053-082	25	ND	U	12.5	2.525728644
AMW-054-082	25	ND	U	12.5	2.525728644
AMW-055-082	25	ND	U	12.5	2.525728644
AMW-056-082	25	ND	U	12.5	2.525728644
BMW-052-082	25	ND	U	12.5	2.525728644
BMW-053-082	25	ND	U	12.5	2.525728644
BMW-054-082	25	ND	U	12.5	2.525728644
BMW-055-082	25	ND	U	12.5	2.525728644
BMW-056-082	25	ND	U	12.5	2.525728644

3-Nitroaniline

MEAN =	12.5
GEOMEAN =	12.5
MEAN OF LN=	2.525728644
N=	10
S=	0.00
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

AMW-052-082	25	ND	U	12.5	2.525728644
AMW-053-082	25	ND	U	12.5	2.525728644
AMW-054-082	25	ND	U	12.5	2.525728644
AMW-055-082	25	ND	U	12.5	2.525728644
AMW-056-082	25	ND	U	12.5	2.525728644
BMW-052-082	25	ND	U	12.5	2.525728644
BMW-053-082	25	ND	U	12.5	2.525728644
BMW-054-082	25	ND	U	12.5	2.525728644
BMW-055-082	25	ND	U	12.5	2.525728644
BMW-056-082	25	ND	U	12.5	2.525728644

4,6-Dinitro-2-methylphenol

MEAN =	12.5
GEOMEAN =	12.5
MEAN OF LN=	2.525728644
N=	10
S=	0.00
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

SVOC CONCENTRATION CALCULATION
PLUME 4
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912

4-Bromophenyl phenyl ether

MEAN =	5
GEOMEAN =	5
MEAN OF LN=	1.609437912
N=	10
S=	0.00
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912

4-Chloro-3-methylphenol

MEAN =	5
GEOMEAN =	5
MEAN OF LN=	1.609437912
N=	10
S=	0.00
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

SVOC CONCENTRATION CALCULATION
PLUME 4
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912

4-Chloroaniline

MEAN =	5
GEOMEAN =	5
M OF LN=	1.609437912
=	10
=	0.00
I=	NA
CL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912

4-Chlorophenyl phenyl ether

MEAN =	5
GEOMEAN =	5
MEAN OF LN=	1.609437912
N=	10
S=	0.00
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

SVOC CONCENTRATION CALCULATION
PLUME 4
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912

4-Methylphenol

MEAN =	5
GEOMEAN =	5
MEAN OF LN=	1.609437912
N=	10
S=	0.00
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

AMW-052-082	25	ND	U	12.5	2.525728644
AMW-053-082	25	ND	U	12.5	2.525728644
AMW-054-082	25	ND	U	12.5	2.525728644
AMW-055-082	25	ND	U	12.5	2.525728644
AMW-056-082	25	ND	U	12.5	2.525728644
BMW-052-082	25	ND	U	12.5	2.525728644
BMW-053-082	25	ND	U	12.5	2.525728644
BMW-054-082	25	ND	U	12.5	2.525728644
BMW-055-082	25	ND	U	12.5	2.525728644
BMW-056-082	25	ND	U	12.5	2.525728644

4-Nitroaniline

MEAN =	12.5
GEOMEAN =	12.5
MEAN OF LN=	2.525728644
N=	10
S=	0.00
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

B07NE003702-08163

SVOC CONCENTRATION CALCULATION
PLUME 4
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	25	ND	U	12.5	2.525728644
AMW-053-082	25	ND	U	12.5	2.525728644
AMW-054-082	25	ND	U	12.5	2.525728644
AMW-055-082	25	ND	U	12.5	2.525728644
AMW-056-082	25	ND	U	12.5	2.525728644
BMW-052-082	25	ND	U	12.5	2.525728644
BMW-053-082	25	ND	U	12.5	2.525728644
BMW-054-082	25	ND	U	12.5	2.525728644
BMW-055-082	25	ND	U	12.5	2.525728644
BMW-056-082	25	ND	U	12.5	2.525728644
			4-Nitrophenol		
			MEAN =	12.5	
			GEOMEAN =	12.5	
			MEAN OF LN=	2.525728644	
			N=	10	
			S=	0.00	
			H=	NA	
			UCL=	NA	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912
			Acenaphthene		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	10	
			S=	0.00	
			H=	NA	
			UCL=	NA	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

SVOC CONCENTRATION CALCULATION
PLUME 4
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912

Acenaphthylene

MEAN =	5
GEOMEAN =	5
MEAN OF LN=	1.609437912
N=	10
S=	0.00
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912

Anthracene

MEAN =	5
GEOMEAN =	5
MEAN OF LN=	1.609437912
N=	10
S=	0.00
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

SVOC CONCENTRATION CALCULATION
PLUME 4
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912

Benzo(a)anthracene

MEAN =	5
GEOMEAN =	5
MEAN OF LN=	1.609437912
N=	10
S=	0.00
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912

Benzo(a)pyrene

MEAN =	5
GEOMEAN =	5
MEAN OF LN=	1.609437912
N=	10
S=	0.00
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

SVOC CONCENTRATION CALCULATION
PLUME 4
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912

Benzo(b)fluoranthene

MEAN =	5
GEOMEAN =	5
MEAN OF LN=	1.609437912
N=	10
S=	0.00
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912

Benzo(g,h,i)perylene

MEAN =	5
GEOMEAN =	5
MEAN OF LN=	1.609437912
N=	10
S=	0.00
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

SVOC CONCENTRATION CALCULATION
PLUME 4
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912

Benzo(k)fluoranthene

MEAN =	5
GEOMEAN =	5
MEAN OF LN=	1.609437912
N=	10
S=	0.00
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912

bis(2-Chloroethoxy)methane

MEAN =	5
GEOMEAN =	5
MEAN OF LN=	1.609437912
N=	10
S=	0.00
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

SVOC CONCENTRATION CALCULATION
PLUME 4
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912

bis(2-Chloroethyl)ether

MEAN =	5
GEOMEAN =	5
MEAN OF LN=	1.609437912
N=	10
S=	0.00
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

AMW-052-082	BJ	5	1.609437912
AMW-053-082	BJ	4	1.386294361
AMW-054-082	BJ	2	0.693147181
AMW-055-082	BJ	9	2.197224577
AMW-056-082	BJ	4	1.386294361
BMW-052-082	BJ	2	0.693147181
BMW-053-082	B	12	2.48490665
BMW-054-082	BJ	4	1.386294361
BMW-055-082	BJ	6	1.791759469
BMW-056-082	BJ	3	1.098612289

bis(2-Ethylhexyl)phthalate

MEAN =	5.1
GEOMEAN =	4.361045552
MEAN OF LN=	1.472711834
N=	10
S=	0.58
H=	2.368
UCL=	8.177317124
MIN =	2
MAX =	12
NO. OF DET=	10

B07NE003702-08169

SVOC CONCENTRATION CALCULATION
PLUME 4
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912

Butyl benzyl phthalate

MEAN =	5
GEOMEAN =	5
MEAN OF LN=	1.609437912
N=	10
S=	0.00
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912

Carbazole

MEAN =	5
GEOMEAN =	5
MEAN OF LN=	1.609437912
N=	10
S=	0.00
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

SVOC CONCENTRATION CALCULATION
PLUME 4
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912

Chrysene

MEAN =	5
GEOMEAN =	5
MEAN OF LN=	1.609437912
N=	10
S=	0.00
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

AMW-052-082			J	1	0
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082			J	1	0
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912

Di-n-butyl phthalate

MEAN =	4.2
GEOMEAN =	3.623898318
MEAN OF LN=	1.28755033
N=	10
S=	0.68
H=	2.532
UCL=	8.089246521
MIN =	1
MAX =	1
NO. OF DET=	2

SVOC CONCENTRATION CALCULATION
PLUME 4
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912

Di-n-octyl phthalate

MEAN =	5
GEOMEAN =	5
MEAN OF LN=	1.609437912
N=	10
S=	0.00
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912

Dibenzo(a,h)anthracene

MEAN =	5
GEOMEAN =	5
MEAN OF LN=	1.609437912
N=	10
S=	0.00
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

SVOC CONCENTRATION CALCULATION
PLUME 4
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912

Dibenzofuran

MEAN =	5
GEOMEAN =	5
MEAN OF LN=	1.609437912
N=	10
S=	0.00
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET =	0

AMW-052-082	10		UBJ	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082			J	1	0
BMW-054-082			BJ	1	0
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10		UBJ	5	1.609437912

Diethyl phthalate

MEAN =	4.2
GEOMEAN =	3.623898318
MEAN OF LN=	1.28755033
N=	10
S=	0.68
H=	2.532
UCL=	8.089246521
MIN =	1
MAX =	1
NO. OF DET=	2

SVOC CONCENTRATION CALCULATION
PLUME 4
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912

Dimethyl phthalate

MEAN =	5
GEOMEAN =	5
MEAN OF LN=	1.609437912
N=	10
S=	0.00
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912

Fluoranthene

MEAN =	5
GEOMEAN =	5
MEAN OF LN=	1.609437912
N=	10
S=	0.00
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

SVOC CONCENTRATION CALCULATION
PLUME 4
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912

Fluorene

MEAN =	5
GEOMEAN =	5
MEAN OF LN=	1.609437912
N=	10
S=	0.00
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912

Hexachlorobenzene

MEAN =	5
GEOMEAN =	5
MEAN OF LN=	1.609437912
N=	10
S=	0.00
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

SVOC CONCENTRATION CALCULATION
PLUME 4
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912

Hexachlorobutadiene

MEAN =	5
GEOMEAN =	5
MEAN OF LN=	1.609437912
N=	10
S=	0.00
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912

Hexachlorocyclopentadiene

MEAN =	5
GEOMEAN =	5
MEAN OF LN=	1.609437912
N=	10
S=	0.00
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

SVOC CONCENTRATION CALCULATION
PLUME 4
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912

Hexachloroethane

MEAN =	5
GEOMEAN =	5
MEAN OF LN=	1.609437912
N=	10
S=	0.00
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912

Indeno(1,2,3-cd)pyrene

MEAN =	5
GEOMEAN =	5
MEAN OF LN=	1.609437912
N=	10
S=	0.00
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

SVOC CONCENTRATION CALCULATION
PLUME 4
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912

Isophorone

MEAN =	5
GEOMEAN =	5
MEAN OF LN=	1.609437912
N=	10
S=	0.00
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912

N-Nitroso-di-n-propylamine

MEAN =	5
GEOMEAN =	5
MEAN OF LN=	1.609437912
N=	10
S=	0.00
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

B07NE003702-08178

SVOC CONCENTRATION CALCULATION
PLUME 4
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082			J	1	0
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912

N-Nitrosodiphenylamine(1)

MEAN =	4.6
GEOMEAN =	4.256699613
MEAN OF LN=	1.448494121
N=	10
S=	0.51
H=	2.22
UCL=	7.061311987
MIN =	1
MAX =	1
NO. OF DET=	1

AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912

Naphthalene

MEAN =	5
GEOMEAN =	5
MEAN OF LN=	1.609437912
N=	10
S=	0.00
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

SVOC CONCENTRATION CALCULATION
PLUME 4
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912

Nitrobenzene (NB)

MEAN =	5
GEOMEAN =	5
MEAN OF LN=	1.609437912
N=	10
S=	0.00
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

AMW-052-082	25	ND	U	12.5	2.525728644
AMW-053-082	25	ND	U	12.5	2.525728644
AMW-054-082	25	ND	U	12.5	2.525728644
AMW-055-082	25	ND	U	12.5	2.525728644
AMW-056-082	25	ND	U	12.5	2.525728644
BMW-052-082	25	ND	U	12.5	2.525728644
BMW-053-082	25	ND	U	12.5	2.525728644
BMW-054-082	25	ND	U	12.5	2.525728644
BMW-055-082	25	ND	U	12.5	2.525728644
BMW-056-082	25	ND	U	12.5	2.525728644

Pentachlorophenol

MEAN =	12.5
GEOMEAN =	12.5
MEAN OF LN=	2.525728644
N=	10
S=	0.00
H=	NA
UCL =	NA
MIN =	0
MAX =	0
NO. OF DET=	0

B07NE003702-08180

SVOC CONCENTRATION CALCULATION
PLUME 4
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912
			Phenanthrene		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	10	
			S=	0.00	
			H=	NA	
			UCL=	NA	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082			J	1	0
AMW-055-082			J	1	0
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10		UBJ	5	1.609437912
BMW-054-082			J	2	0.693147181
BMW-055-082			J	1	0
BMW-056-082	10		UBJ	5	1.609437912
			Phenol		
			MEAN =	3.5	
			GEOMEAN =	2.815042799	
			MEAN OF LN=	1.034977466	
			N=	10	
			S=	0.77	
			H=	2.619	
			UCL=	7.393419683	
			MIN =	1	
			MAX =	2	
			NO. OF DET=	4	

SVOC CONCENTRATION CALCULATION
PLUME 4
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912

Pyrene

MEAN =	5
GEOMEAN =	5
MEAN OF LN=	1.609437912
N=	10
S=	0.00
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

METAL CONCENTRATION CALCULATION
PLUME 4
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	200		UB*	100	4.605170186
AMW-053-082	200		UB*	100	4.605170186
AMW-054-082	200		UB*	100	4.605170186
AMW-055-082	200		UB*	100	4.605170186
AMW-056-082	200		UB*	100	4.605170186
BMW-052-082	200		U*	100	4.605170186
BMW-053-082	200		U*	100	4.605170186
BMW-054-082			*	1820	7.50659178
BMW-055-082	200		UB*	100	4.605170186
BMW-056-082	200		U	100	4.605170186
			Aluminum		
			MEAN =	272	
			GEOMEAN =	133.6617487	
			MEAN OF LN=	4.895312345	
			N=	10	
			S=	0.92	
			H=	2.902	
			UCL=	494.6066411	
			MIN =	1820	
			MAX =	1820	
			NO. OF DET=	1	

AMW-052-082	39	ND	U	19.5	2.970414466
AMW-053-082	39	ND	U	19.5	2.970414466
AMW-054-082	39	ND	U	19.5	2.970414466
AMW-055-082	39	ND	U	19.5	2.970414466
AMW-056-082	39	ND	U	19.5	2.970414466
BMW-052-082	39	ND	U	19.5	2.970414466
BMW-053-082	39	ND	U	19.5	2.970414466
BMW-054-082	39	ND	U	1.95E+01	2.970414466
BMW-055-082	39	ND	U	19.5	2.970414466
BMW-056-082	39	ND	U	19.5	2.970414466
			Antimony		
			MEAN =	19.5	
			GEOMEAN =	19.5	
			MEAN OF LN=	2.970414466	
			N=	10	
			S=	0.00	
			H=	NA	
			UCL=	NA	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

METAL CONCENTRATION CALCULATION
PLUME 4
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	4	ND	UW	2	0.693147181
AMW-053-082	4	ND	UW	2	0.693147181
AMW-054-082	4	ND	UW	2	0.693147181
AMW-055-082	4	ND	UW	2	0.693147181
AMW-056-082	4	ND	UW	2	0.693147181
BMW-052-082	4	ND	U	2	0.693147181
BMW-053-082			B	7.8	2.054123734
BMW-054-082	4	ND	U	2	0.693147181
BMW-055-082	4	ND	UW	2	0.693147181
BMW-056-082			BWN	5	1.609437912

Arsenic

MEAN =	2.88
GEOMEAN =	2.51148424
MEAN OF LN=	0.920873909
N=	10
S=	0.49
H=	2.22
UCL=	4.076524905
MIN =	5
MAX =	7.8
NO. OF DET =	2

AMW-052-082	B	166	5.111987788
AMW-053-082	B	138	4.927253685
AMW-054-082		214	5.365976015
AMW-055-082	B	130	4.86753445
AMW-056-082	B	135	4.905274778
BMW-052-082	B	140	4.941642423
BMW-053-082	B	177	5.176149733
BMW-054-082		434	6.073044534
BMW-055-082		243	5.493061443
BMW-056-082		450	6.109247583

Barium

MEAN =	222.7
GEOMEAN =	199.7601193
MEAN OF LN=	5.297117243
N=	10
S=	0.47
H=	2.152
UCL=	311.0778153
MIN =	130
MAX =	450
NO. OF DET=	10

METAL CONCENTRATION CALCULATION
PLUME 4
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	1	ND	U	0.5	-0.693147181
AMW-053-082	1	ND	U	0.5	-0.693147181
AMW-054-082	1	ND	U	0.5	-0.693147181
AMW-055-082	1	ND	U	0.5	-0.693147181
AMW-056-082	1	ND	U	0.5	-0.693147181
BMW-052-082	1	ND	U	0.5	-0.693147181
BMW-053-082	1	ND	U	0.5	-0.693147181
BMW-054-082	1	ND	U	0.5	-0.693147181
BMW-055-082	1	ND	U	0.5	-0.693147181
BMW-056-082	1	ND	U	0.5	-0.693147181

Beryllium

MEAN =	0.5
GEOMEAN =	0.5
MEAN OF LN=	-0.693147181
N=	10
S=	0.00
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

AMW-052-082	5	ND	U	2.5	0.916290732
AMW-053-082	5	ND	U	2.5	0.916290732
AMW-054-082	5	ND	U	2.5	0.916290732
AMW-055-082	5	ND	U	2.5	0.916290732
AMW-056-082	5	ND	U	2.5	0.916290732
BMW-052-082	5	ND	U	2.5	0.916290732
BMW-053-082	5	ND	U	2.5	0.916290732
BMW-054-082	5	ND	U	2.5	0.916290732
BMW-055-082	5	ND	U	2.5	0.916290732
BMW-056-082	5	ND	U	2.5	0.916290732

Cadmium

MEAN =	2.5
GEOMEAN =	2.5
MEAN OF LN=	0.916290732
N=	10
S=	0.00
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

METAL CONCENTRATION CALCULATION
PLUME 4
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082				37500	10.53209621
AMW-053-082				54200	10.90043619
AMW-054-082				49900	10.81777628
AMW-055-082				52700	10.87237073
AMW-056-082				49600	10.81174611
BMW-052-082				27100	10.20728901
BMW-053-082				53000	10.87804719
BMW-054-082				42700	10.6619542
BMW-055-082				44400	10.70099475
BMW-056-082				99600	11.50891744
			Calcium		
			MEAN =	51070	
			GEOMEAN =	48492.42174	
			MEAN OF LN=	10.78916281	
			N=	10	
			S=	0.33	
			H=	2.031	
			UCL=	63971.37202	
			MIN =	27100	
			MAX =	99600	
			NO. OF DET=	10	
AMW-052-082	6	ND	U	3	1.098612289
AMW-053-082	6	ND	U	3	1.098612289
AMW-054-082	6	ND	U	3	1.098612289
AMW-055-082	6	ND	U	3	1.098612289
AMW-056-082	6	ND	U	3	1.098612289
BMW-052-082	6	ND	U	3	1.098612289
BMW-053-082	6	ND	U	3	1.098612289
BMW-054-082	6	ND	U	3	1.098612289
BMW-055-082	6	ND	U	3	1.098612289
BMW-056-082	6	ND	U	3	1.098612289
			Chromium		
			MEAN =	3	
			GEOMEAN =	3	
			MEAN OF LN=	1.098612289	
			N=	10	
			S=	0.00	
			H=	NA	
			UCL=	NA	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

B07NE003702-08187

METAL CONCENTRATION CALCULATION
PLUME 4
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	6	ND	U	3	1.098612289
AMW-053-082	6	ND	U	3	1.098612289
AMW-054-082	6	ND	U	3	1.098612289
AMW-055-082	6	ND	U	3	1.098612289
AMW-056-082	6	ND	U	3	1.098612289
BMW-052-082	6	ND	U	3	1.098612289
BMW-053-082	6	ND	U	3	1.098612289
BMW-054-082	6	ND	U	3	1.098612289
BMW-055-082	6	ND	U	3	1.098612289
BMW-056-082	6	ND	U	3	1.098612289

Cobalt

MEAN =	3
GEOMEAN =	3
MEAN OF LN=	1.098612289
N=	10
S=	0.00
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

AMW-052-082	4	ND	U	2	0.693147181
AMW-053-082	4	ND	U	2	0.693147181
AMW-054-082	4	ND	U	2	0.693147181
AMW-055-082	4	ND	U	2	0.693147181
AMW-056-082	4	ND	U	2	0.693147181
BMW-052-082	4	ND	U	2	0.693147181
BMW-053-082	4	ND	U	2	0.693147181
BMW-054-082	4	ND	U	2	0.693147181
BMW-055-082	4	ND	U	2	0.693147181
BMW-056-082	4	ND	U	2	0.693147181

Copper

MEAN =	2
GEOMEAN =	2
MEAN OF LN=	0.693147181
N=	10
S=	0.00
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

METAL CONCENTRATION CALCULATION
PLUME 4
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912
			Cyanide		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	10	
			S=	0.00	
			H=	NA	
			UCL=	NA	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-052-082	46	ND	U*	23	3.135494216
AMW-053-082			B*	58	4.060443011
AMW-054-082	46	ND	U*	23	3.135494216
AMW-055-082			B*	77.3	4.347693956
AMW-056-082	46	ND	U*	23	3.135494216
BMW-052-082			*	206	5.327876169
BMW-053-082			B*	58	4.060443011
BMW-054-082			*	1280	7.154615357
BMW-055-082	46	ND	U*	23	3.135494216
BMW-056-082			B	75.8	4.328098293
			Iron		
			MEAN =	184.71	
			GEOMEAN =	65.50422641	
			MEAN OF LN=	4.182114666	
			N=	10	
			S=	1.27	
			H=	3.639	
			UCL=	691.6677084	
			MIN =	58	
			MAX =	1280	
			NO. OF DET=	6	

METAL CONCENTRATION CALCULATION
PLUME 4
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	2	ND	U	1	0
AMW-053-082	2	ND	U	1	0
AMW-054-082	2	ND	U	1	0
AMW-055-082	2	ND	U	1	0
AMW-056-082	2	ND	UW	1	0
BMW-052-082	2	ND	U	1	0
BMW-053-082	2	ND	UW	1	0
BMW-054-082	2	ND	U	1	0
BMW-055-082	2	ND	U	1	0
BMW-056-082			BWN*	2.6	0.955511445

Lead

MEAN =	1.16
GEOMEAN =	1.100265093
MEAN OF LN=	0.095551145
N=	10
S=	0.30
H=	1.977
UCL=	1.405403143
MIN =	2.6
MAX =	2.6
NO. OF DET=	1

AMW-052-082				10700	9.27799902
AMW-053-082				12700	9.449357272
AMW-054-082				11900	9.384293679
AMW-055-082				11600	9.358760377
AMW-056-082				11300	9.332558005
BMW-052-082				8050	8.99342737
BMW-053-082				17900	9.792555992
BMW-054-082				13800	9.532423871
BMW-055-082				10600	9.26860928
BMW-056-082				31200	10.34817337

Magnesium

MEAN =	13975
GEOMEAN =	13014.45347
MEAN OF LN=	9.473815824
N=	10
S=	0.37
H=	2.031
UCL=	17876.71925
MIN =	8050
MAX =	31200
NO. OF DET=	10

METAL CONCENTRATION CALCULATION
PLUME 4
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082				73.3	4.294560609
AMW-053-082			B	10.7	2.370243741
AMW-054-082			B	7	1.945910149
AMW-055-082			B	9.1	2.208274414
AMW-056-082			B	8.8	2.174751721
BMW-052-082				82	4.406719247
BMW-053-082				20.9	3.039749159
BMW-054-082				1090	6.993932975
BMW-055-082				16.8	2.821378886
BMW-056-082				25.2	3.226843995
			Manganese		
			MEAN =	134.38	
			GEOMEAN =	28.45251307	
			MEAN OF LN=	3.34823649	
			N=	10	
			S=	1.54	
			H=	4.207	
			UCL=	802.9445668	
			MIN =	7	
			MAX =	1090	
			NO. OF DET=	10	
AMW-052-082	0.2	ND	U	0.1	-2.302585093
AMW-053-082	0.2	ND	U	0.1	-2.302585093
AMW-054-082	0.2	ND	U	0.1	-2.302585093
AMW-055-082	0.2	ND	U	0.1	-2.302585093
AMW-056-082	0.2	ND	U	0.1	-2.302585093
BMW-052-082	0.2	ND	U	0.1	-2.302585093
BMW-053-082	0.2	ND	U	0.1	-2.302585093
BMW-054-082	0.2	ND	U	0.1	-2.302585093
BMW-055-082	0.2	ND	U	0.1	-2.302585093
BMW-056-082	0.2	ND	U	0.1	-2.302585093
			Mercury		
			MEAN =	0.1	
			GEOMEAN =	0.1	
			MEAN OF LN=	-2.302585093	
			N=	10	
			S=	0.00	
			H=	NA	
			UCL=	NA	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

METAL CONCENTRATION CALCULATION
PLUME 4
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082			B	11.1	2.406945108
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912

Nickel

MEAN =	5.61
GEOMEAN =	5.415085295
MEAN OF LN=	1.689188632
N=	10
S=	0.25
H=	1.927
UCL=	6.5730771
MIN =	11.1
MAX =	11.1
NO. OF DET=	1

AMW-052-082	9620	9.171599544
AMW-053-082	7930	8.978408315
AMW-054-082	6600	8.794824928
AMW-055-082	7200	8.881836305
AMW-056-082	6770	8.820256366
BMW-052-082	6180	8.72907355
BMW-053-082	9000	9.104979856
BMW-054-082	7930	8.978408315
BMW-055-082	6320	8.751474487
BMW-056-082	5280	8.571681377

Potassium

MEAN =	7283
GEOMEAN =	7174.25573
MEAN OF LN=	8.878254304
N=	10
S=	0.18
H=	1.881
UCL=	8179.912709
MIN =	5280
MAX =	9620
NO. OF DET=	10

METAL CONCENTRATION CALCULATION
PLUME 4
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	4	ND	UWN	2	0.693147181
AMW-053-082	40	ND	UN	20	2.995732274
AMW-054-082	40	ND	UN	20	2.995732274
AMW-055-082	4	ND	UWN	2	0.693147181
AMW-056-082	4	ND	UWN	2	0.693147181
BMW-052-082	4	ND	UWN	2	0.693147181
BMW-053-082	4	ND	UWN	2	0.693147181
BMW-054-082	40	ND	UWN	20	2.995732274
BMW-055-082	40	ND	UN	20	2.995732274
BMW-056-082	4	ND	UN	2	0.693147181
			Selenium		
			MEAN =	9.2	
			GEOMEAN =	5.023772863	
			MEAN OF LN=	1.614181218	
			N=	10	
			S=	1.19	
			H=	NA	
			UCL=	NA	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-052-082	6	ND	U	3	1.098612289
AMW-053-082	6	ND	U	3	1.098612289
AMW-054-082	6	ND	U	3	1.098612289
AMW-055-082	6	ND	U	3	1.098612289
AMW-056-082	6	ND	U	3	1.098612289
BMW-052-082	6	ND	U	3	1.098612289
BMW-053-082	6	ND	U	3	1.098612289
BMW-054-082	6	ND	U	3	1.098612289
BMW-055-082	6	ND	U	3	1.098612289
BMW-056-082	6	ND	U	3	1.098612289
			Silver		
			MEAN =	3	
			GEOMEAN =	3	
			MEAN OF LN=	1.098612289	
			N=	10	
			S=	0.00	
			H=	NA	
			UCL=	NA	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

B07NE003702-08193

METAL CONCENTRATION CALCULATION
PLUME 4
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082			E	10800	9.287301413
AMW-053-082			E	12700	9.449357272
AMW-054-082			E	20100	9.908475094
AMW-055-082			E	19800	9.893437217
AMW-056-082			E	18900	9.846917201
BMW-052-082			E	11000	9.305650552
BMW-053-082			E	18000	9.798127037
BMW-054-082			E	14000	9.546812609
BMW-055-082			E	14700	9.595602773
BMW-056-082				32900	10.40122794
			Sodium		
			MEAN =	17290	
			GEOMEAN =	16371.39544	
			MEAN OF LN=	9.70329091	
			N=	10	
			S=	0.34	
			H=	2.031	
			UCL=	21785.35689	
			MIN =	10800	
			MAX =	32900	
			NO. OF DET=	10	
AMW-052-082	2	ND	UW	1	0
AMW-053-082	2	ND	UW	1	0
AMW-054-082	2	ND	UW	1	0
AMW-055-082	2	ND	UW	1	0
AMW-056-082	2	ND	U	1	0
BMW-052-082	2	ND	U	1	0
BMW-053-082	2	ND	UW	1	0
BMW-054-082	2	ND	U	1	0
BMW-055-082	2	ND	UW	1	0
BMW-056-082	2	ND	UWN	1	0
			Thallium		
			MEAN =	1	
			GEOMEAN =	1	
			MEAN OF LN=	0	
			N=	10	
			S=	0.00	
			H=	NA	
			UCL=	NA	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

METAL CONCENTRATION CALCULATION
PLUME 4
(all in µg/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	5	ND	U	2.5	0.916290732
AMW-053-082	5	ND	U	2.5	0.916290732
AMW-054-082	5	ND	U	2.5	0.916290732
AMW-055-082	5	ND	U	2.5	0.916290732
AMW-056-082	5	ND	U	2.5	0.916290732
BMW-052-082	5	ND	U	2.5	0.916290732
BMW-053-082	5	ND	U	2.5	0.916290732
BMW-054-082			B	5.5	1.704748092
BMW-055-082	5	ND	U	2.5	0.916290732
BMW-056-082	5	ND	U	2.5	0.916290732

Vanadium

MEAN =	2.8
GEOMEAN =	2.705093475
MEAN OF LN=	0.995136468
N=	10
S=	0.25
H=	1.927
UCL=	3.275183976
MIN =	5.5
MAX =	5.5
NO. OF DET=	1

AMW-052-082			B	5	1.609437912
AMW-053-082			B	4.1	1.410986974
AMW-054-082			B	4.3	1.458615023
AMW-055-082			B	14.5	2.674148649
AMW-056-082			B	5.1	1.62924054
BMW-052-082			B	4.8	1.568615918
BMW-053-082				30.6	3.421000009
BMW-054-082				47.1	3.852273001
BMW-055-082	3	ND	U	1.5	0.405465108
BMW-056-082			B	5.5	1.704748092

Zinc

MEAN =	12.25
GEOMEAN =	7.195480515
MEAN OF LN=	1.973453123
N=	10
S=	1.04
H=	3.103
UCL=	35.86878944
MIN =	4.1
MAX =	47.1
NO. OF DET=	9

J

APPENDIX J
BASELINE RISK ASSESSMENT
BASED ON THE REASONABLE AVERAGE EXPOSURE APPROACH

TABLE OF CONTENTS FOR APPENDIX J

Section		Page
J.1	SUBSITES EVALUATED IN THE AVERAGE EXPOSURE BRA	J-2
J.2	EVALUATION OF POTENTIAL EXPOSURE PATHWAYS	J-3
J.3	ESTIMATION OF EXPOSURE POINT CONCENTRATIONS	J-3
J.4	EVALUATION OF POTENTIAL EXPOSURE PARAMETERS	J-4
	J.4.1 Lifespan	J-5
	J.4.2 Exposure Duration	J-5
	J.4.3 Exposure Frequency	J-5
	J.4.4 Groundwater Ingestion Rate	J-6
	J.4.5 Soil Ingestion Rate	J-6
	J.4.6 Body Weight	J-6
	J.4.7 Air Inhalation Rate	J-6
	J.4.8 Exposure Time	J-6
	J.4.9 Skin Surface Area	J-7
	J.4.10 Soil Adherence	J-7
	J.4.11 Dermal Soil Absorption	J-7
J.5	RISK CHARACTERIZATION	J-8
	J.5.1 Area A	J-8
	J.5.1.1 Summary of Potential Non-Carcinogenic Health Hazards	J-8
	J.5.1.2 Summary of Potential Cancer Risk	J-8
	J.5.2 Area B	J-8
	J.5.2.1 Summary of Potential Non-Carcinogenic Health Hazards	J-8
	J.5.2.2 Summary of Potential Cancer Risk	J-9
	J.5.3 Area C	J-9
	J.5.3.1 Summary of Potential Non-Carcinogenic Health Hazards	J-9
	J.5.3.2 Summary of Potential Cancer Risk	J-10
	J.6 CUMULATIVE RISKS FOR SOIL AND GROUNDWATER PATHWAYS	J-10
	J.6.1 Area A	J-10
	J.6.2 Area B	J-11

LIST OF TABLES

TABLE J-1	MONITORING WELLS EVALUATED IN OU2 BASELINE RISK ASSESSMENT
TABLE J-2	EXPOSURE POINT CONCENTRATIONS IN GROUNDWATER - AREA A
TABLE J-3	EXPOSURE POINT CONCENTRATIONS IN GROUNDWATER - AREA B
TABLE J-4	EXPOSURE POINT CONCENTRATIONS IN GROUNDWATER - AREA C
TABLE J-5	AIR VOC EXPOSURE POINT CONCENTRATIONS IN SHOWER (RAE APPROACH)
TABLE J-6	EXPOSURE POINT CONCENTRATIONS IN SUBSURFACE SOIL (RAE APPROACH)
TABLE J-7	AIR EXPOSURE POINT CONCENTRATIONS - SUBSURFACE SOIL (RAE APPROACH)
TABLE J-8	AVERAGE EXPOSURE BY PARAMETERS FOR ESTIMATION OF CHEMICAL INTAKE BY INGESTION OF GROUNDWATER
TABLE J-9	AVERAGE EXPOSURE PARAMETERS FOR ESTIMATION OF CHEMICAL INTAKE BY DERMAL EXPOSURE WHILE SHOWERING
TABLE J-10	AVERAGE EXPOSURE PARAMETERS FOR ESTIMATION OF CHEMICAL INTAKE BY INHALATION EXPOSURE TO VOLATILIZED CHEMICALS DURING SHOWERING
TABLE J-11	AVERAGE EXPOSURE PARAMETERS FOR ESTIMATION OF CHEMICAL INTAKE BY INGESTION OF SUBSURFACE SOIL
TABLE J-12	AVERAGE EXPOSURE PARAMETERS FOR ESTIMATION OF CHEMICAL INTAKE BY DERMAL CONTACT WITH SUBSURFACE SOIL
TABLE J-13	AVERAGE EXPOSURE PARAMETERS FOR ESTIMATION OF CHEMICAL INTAKE BY INHALATION OF VOLATILIZED CHEMICALS FROM SUBSURFACE SOIL
TABLE J-14	SUMMARY OF RAE POTENTIAL CANCER RISKS AND NON-CARCINOGENIC HAZARD INDICES (HIs) - AREA A
TABLE J-15	SUMMARY OF RAE POTENTIAL CANCER RISKS AND NON-CARCINOGENIC HAZARD INDICES (HIs) - AREA B
TABLE J-16	SUMMARY OF RAE POTENTIAL CANCER RISKS AND NON-CARCINOGENIC HAZARD INDICES (HIs) - AREA C
TABLE J-17	SUMMARY OF RISK RANGES REPORTED IN THE OU1 BRA

B07NE003702-08199

TABLE J-18 SUMMARY OF CUMULATIVE CANCER RISKS AND HAZARD INDICES FOR SOIL (OU1) AND GROUNDWATER (OU2) PATHWAYS (RAE EXPOSURE)

LIST OF FIGURES

FIGURE J-1 OU2 REMEDIAL INVESTIGATION AREAS

LIST OF ATTACHMENTS

ATTACHMENT JA RAE RISK CALCULATIONS
ATTACHMENT JB RAE SHOWER MODEL CALCULATIONS
ATTACHMENT JC RAE CHEMICAL DATA

B07NE003702-08200

APPENDIX J
REASONABLE AVERAGE EXPOSURE RISK ASSESSMENT

In a Baseline Risk Assessment (BRA), potential health risks are typically evaluated for two levels of exposure:

- Representative levels: Risks are evaluated using arithmetic mean chemical concentrations and exposure parameters representing an "average" individual
- Upperbound levels: Risks are calculated using the estimated maximum contaminant concentrations and exposure parameters representing upperbound exposure

Two different upperbound exposure approaches have been evaluated. In Section 5.0, the Reasonable Maximum Exposure (RME) risks were evaluated based on chemical concentrations from the two most contaminated wells, using conservative exposure assumptions. In **Appendix I**, Plume Maximum Exposure (PME) risks were evaluated based on the upper 95 percent confidence limit of the arithmetic mean concentration in the contaminant plumes, using EPA standard default exposure parameters which are intended to represent upperbound exposure. However, neither the RME nor the PME approaches addressed risks/hazards associated with representative exposure (i.e., exposure based on arithmetic mean exposure point concentrations and exposure parameters representative of a typical population). Because the RME and PME approaches are based on a number of upperbound assumptions, estimated cancer risks and non-carcinogenic hazards generally are not representative of normal populations. In contrast, cancer risks and non-carcinogenic hazards calculated for representative exposure are designed to provide a realistic estimate of potential health hazards associated with the Site.

USACE prepared the RAE approach to addresses potential cancer risks and non-carcinogenic hazards based on average exposure, assuming the same exposure scenarios discussed in the Section 3.0 of this BRA.

B07NE003702-08201

J.1 SUBSITES EVALUATED IN THE AVERAGE EXPOSURE BRA

For purposes of evaluating potential average exposure to contaminated groundwater, the Site was partitioned into three different subareas (See **Figure J-1**):

- "Area A", located on the northwestern portion of the Site includes the Administration Area and the Bomb Booster Area.
- "Area B", located north of the load lines, and east of "Area A", includes the Atlas Missile Area.
- "Area C" includes the load lines, the OU1 Primary Area (an area bordering the four load lines), the Burning/Proving Grounds and Landfill Area and an area southeast of the Site where contamination has been detected in the groundwater.

The rationale for this partitioning is based on the following:

- As indicated in the OU2 RI Report, most contaminated groundwater is restricted to the southern and east-central portions of the Site (i.e., the load lines, Atlas Missile Area, and downgradient areas).
- Groundwater is mobile, and chemicals will migrate downgradient from the source area(s).
- Groundwater in the area of the Site flows south-southeast (see **Figure 1-2**).
- As indicated in the OU2 RI Report, no explosive contaminants have been detected in groundwater from monitoring wells in the Atlas Missile Area, while a number of explosive compounds are found in groundwater in the load lines.
- As identified in the OU1 BRA (SEC Donohue, 1993b), there is no identified source area that would impact groundwater in the Administration Area or Bomb Booster Area.
- The possibility exists that the contaminant plumes in the different load line areas may overlap.

The monitoring wells and hydropunch samples collected from each area are listed in **Table J-1**.

B07NE003702-08202

J.2 EVALUATION OF POTENTIAL EXPOSURE PATHWAYS

The RAE approach uses the same exposure scenarios and exposure pathways used in the RME approach (see **Section 3.4**).

According to on-site personnel, there are 5 showers at the Agronomy Building (located in Area C) that are used daily during the summer by Site workers. Thus, the evaluation of on-site worker populations in Area C will include an evaluation of shower exposure at the Agronomy Building.

Trace quantities of volatile organic compounds were identified in subsurface soil from Area B (Atlas Missile Area) and Area C (Load Line 1 Area). In order to evaluate risks associated with exposure to chemicals in subsurface soils, a hypothetical construction worker scenario performing intrusive (excavation) activities will be included in Area B and Area C. In addition to an evaluation of potential exposure to subsurface soil, the construction worker populations in both Area B and Area C will be evaluated for shower exposure at the Agronomy Building.

J.3 ESTIMATION OF EXPOSURE POINT CONCENTRATIONS

Exposure point concentrations are the chemical concentrations to which a receptor is exposed when contact is made with a specific environmental medium. Exposure point concentrations have been developed for the COCs previously identified (Section 2.0). The chemical concentrations presented in **Tables J-2**, **J-3** and **J-4** were used to develop exposure point concentrations in this Appendix. For ingestion and dermal contact with groundwater and soil, exposure point concentrations are based on current groundwater and soil concentrations. Arithmetic mean chemical concentrations were calculated for all COCs found within each exposure area. For samples in which a chemical was reported as "not detected," the chemical was assumed to be present at one-half the sample quantitation limit, in accordance with Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual (RAGS; EPA, 1989b). Potential exposure of residents as a result of volatilization from groundwater was evaluated for a shower scenario using the approach described in **Appendix F** (Shower Model). The calculations for air exposure point concentrations for showering are presented in **Attachment JB** and summarized in **Table J-5**.

B07NE003702-08203

Subsurface soil COC concentrations for the Atlas Missile Area (Area B) and Load Line 1 Area (Area C) are presented in **Table J-6**. Potential exposure of construction workers to volatilized VOCs emitted from subsurface soil was evaluated using the emissions model (Farmer's model) described in **Appendix D**. The results are presented in **Table J-7.**

J.4 EVALUATION OF POTENTIAL EXPOSURE PARAMETERS

Exposure parameters used to estimate average chemical exposure are presented in **Tables J-8**, **J-9**, **J-10**, **J-11**, **J-12** and **J-13**. These numerical values have been developed using a number of guidance sources, including the Exposure Factors Handbook (EPA, 1989a), OSWER Directive 9285.6-03 (Standard Default Exposure Factors; EPA, 1991a), Dermal Exposure Assessment: Principles and Applications (EPA, 1992a) and the Risk Assessment Guidance for Superfund (RAGS) Manual (EPA, 1989b). Exposure parameters used to estimate potential chemical exposure include:

- Lifespan (years)
- Exposure duration (years)
- Exposure frequency (days/year)
- Groundwater ingestion rate (L/day)
- Soil ingestion rate (mg/day)
- Body weight (kg)
- Air inhalation rate (m^3/day)
- Exposure time (min/day)
- Skin surface area (cm^2)
- Soil adherence (mg/cm^2)
- Dermal absorption from soil (percent)

These parameters are discussed individually in the following sections.

J.4.1 Lifespan

The assumed lifespan, as given in the OSWER Directive 9285.6-03 (EPA, 1991), is 70 years for all receptors. This value is used in both RME (see Section 3.0) and average exposure risk calculations.

J.4.2 Exposure Duration

Exposure duration refers to the number of years spent on or near the site. For average exposure, adult residents are assumed to have an average exposure duration of 9 years in a single residence (Exposure Factors Handbook, EPA, 1989). For average childhood exposure, the 0- to 6- year old child residents were assumed to spend the entire 6 year exposure duration in the same house.

Based on information supplied by the Bureau of Labor Statistics (U.S. Department of Labor, 1987), an on-site worker is assumed to have an average exposure duration of 5 years. For a construction worker, an exposure duration of 3 months is assumed for potential contact to subsurface soils.

J.4.3 Exposure Frequency

Residents are assumed to have an exposure frequency of 350 days per year, allowing for 15 days per year for vacations, holidays, etc. (OSWER Directive 9285.6-03; EPA, 1991). Current and future on-site workers are assumed to spend 250 days per year on-site, based on a 5-day working week for 50 weeks per year (OSWER Directive 9285.6-03; EPA, 1991). These values are identical to those used to estimate RME and PME exposure.

The exposure frequency for the soil contact pathway assumed for a construction worker scenario is 65 days per year, based on a typical 5 day work per week over a 3 month period. For showering, an exposure frequency of 45 days per year was assumed for both on-site and construction workers assuming that a shower is taken every other day over the 3-month exposure period.

B07NE003702-08205

J.4.4 Groundwater Ingestion Rate

Groundwater ingestion rates are based on data presented for the average intake rates in the Exposure Factors Handbook (EPA, 1989). Adult residents are assumed to drink an average of 1.4 liters of groundwater per day. The assumed child resident (0- to 6- years old), groundwater ingestion rate is 1.0 liters per day. Hypothetical on-site workers are assumed to drink 1.0 liter per day.

J.4.5 Soil Ingestion Rate

The soil ingestion rate refers to the amount of soil that is ingested daily. For average exposure, Exposure Factor Handbook (EPA, 1991) recommends soil ingestion rates of 10 mg/day for adult populations with average activity. This value is applied to the assessment of construction worker exposures. Soil ingestion was not assessed in the OU2 BRA for other receptor populations.

J.4.6 Body Weight

The body weights for all receptors have been obtained from the OSWER Directive 9285.6-03 (EPA, 1991), and are identical to those used to estimate RME and PME exposure. The body weight for adults is 70 kg, and is used for both adult residents, on-site workers, and construction workers. Body weight for children (age 0- to 6-years old) is a time-weighted average of 15 kg.

J.4.7 Air Inhalation Rate

The inhalation rate used for showering and average construction activities assumes the default value of 20 m^3/day (0.83 m^3/hour) recommended by Standard Default Exposure Factors for normal activity levels (EPA, 1991).

B07NE003702-08206

J.4.8 Exposure Time

The exposure time for showering is based on an average time of 7 minutes/day (Exposure Factors Handbook; EPA, 1989). Exposure time for inhalation of VOCs from an excavation area (construction workers) is assumed to be 4 hours (i.e., one-half of a working day).

J.4.9 Skin Surface Area

As discussed in Section 3, for shower scenarios, whole body exposure is assumed. The same values were used for RME, PME, and average exposures. The adult male surface area (19,400 cm^2) is assumed to represent the average surface area exposure for all adults. The total body surface area for 0- to 6- year old child, 6670 cm^2, was calculated as a time-weighted average of surface areas (50th percentile values) for the different age groups (Exposure Factors Handbook; EPA, 1989).

For hypothetical future construction worker workers exposed to contaminated subsurface soils in Areas B and C, the total exposed surface area was assumed to be limited to the workers hands and head, and was calculated to be 2,000 cm^2 (Exposure Factors Handbook; EPA, 1989).

J.4.10 Soil Adherence

Dermal soil adherence is used, in conjunction with exposed skin surface area, to define the total amount of soil adhering to exposed skin surfaces. Based on current scientific literature as reviewed in Dermal Exposure Assessment: Principles and Applications (EPA, 1992), the EPA recommends 0.2 mg/cm^2 for average exposure.

J.4.11 Dermal Soil Absorption

Dermal soil absorption values used to estimate chemical absorption through the skin are assumed to be 1.0 percent for organic chemicals and 0.1 percent for inorganic chemicals, as presented in EPA guidance (EPA, Region IV, 1991c).

B07NE003702-08207

J.5 RISK CHARACTERIZATION

The average risks associated with exposure to the COCs are summarized in **Tables J-14**, **J-15**, and **J-16**.

J.5.1 Area A

J.5.1.1 Summary of Potential Non-Carcinogenic Health Hazards

As can be seen in **Table J-14**, HIs for all potentially exposed populations in Area A are below the threshold value of 1, indicating that exposure to groundwater in this area is not likely to result in any non-carcinogenic toxic effects. HIs for various receptor populations were 0.06 (child resident), 0.02 (adult resident) and 0.01 (on-site worker). Ingestion of groundwater was the greatest contributor to potential non-carcinogenic hazards, and vanadium was the chemical contributing the greatest proportion of overall hazard from groundwater.

J.5.1.2 Summary of Potential Cancer Risk

A summary of potential cancer risks associated with groundwater in Area A is presented in **Table J-14**. As can be seen in this table, potential risks associated with groundwater in this area are very low, ranging from 4×10^{-7} (child resident), 2×10^{-7} (adult resident) to 5×10^{-8} (on-site worker). These values are below the lower end of EPA's acceptable risk range of 1×10^{-4} to 1×10^{-6}. Ingestion of groundwater was the greatest contributor to potential cancer risks, with RDX, methylene chloride, and tetrachloroethylene contributing significantly to overall risk from groundwater.

J.5.2 Area B

J.5.2.1 Summary of Potential Non-Carcinogenic Health Hazards

As can be seen in **Table J-15**, HIs for all potentially exposed populations in Area B are below the threshold value of 1, indicating that exposure to groundwater and subsurface soils in this area is not likely to result in any non-carcinogenic toxic effects. HIs for various receptor populations were 0.007 (child resident), 0.002 (adult resident), 0.001 (on-site worker)

B07NE003702-08208

and 0.000005 (construction worker). For exposure of resident and on-site worker scenarios, ingestion of groundwater was the primary contributor to potential non-carcinogenic hazard from groundwater, with 1,2-DCE contributing significantly to potential groundwater hazard. For subsurface soil exposure (construction worker), inhalation of volatile chemicals was the major exposure route, with acetone contributing the greatest proportion of the calculated hazard.

J.5.2.2 Summary of Potential Cancer Risk

A summary of potential cancer risks associated with groundwater in Area B is presented in **Table J-15**. As can be seen in this table, potential risks associated with groundwater and subsurface soil in this area are acceptable (i.e., within or below the EPA acceptable range of 1×10^{-4} to 1×10^{-6}): 2×10^{-6} (child resident), 9×10^{-7} (adult resident), 1×10^{-7} (site worker) and 8×10^{-9} (construction worker). For residents, ingestion of groundwater and inhalation of VOCs during showering both contributed significantly to potential cancer risks, and TCE was the chemical contributing the greatest proportion of overall risk from groundwater. For subsurface soil exposure, inhalation of volatilized chemical contributed the greatest proportion of the cancer risk.

J.5.3 Area C

J.5.3.1 Summary of Potential Non-Carcinogenic Health Hazards

As can be seen in **Table J-16**, hazard indices for all potentially exposed populations in Area C are below the threshold value of 1.0, indicating that exposure to groundwater in this area is not likely to result in any non-carcinogenic toxic effects. HIs for various receptor populations were 0.5 (child resident), 0.1 (adult resident), 0.06 (site worker) and 0.01 (construction worker). Ingestion of groundwater and inhalation of VOCs during showering both contributed significantly to potential non-carcinogenic hazard, with RDX, TNB, TNT, and dichloroethene (DCE) all contributing significantly to the overall hazard from groundwater.

B07NE003702-08209

J.5.3.2 Summary of Potential Cancer Risk

A summary of potential cancer risks associated with groundwater in Area C is presented in **Table J-16**. As can be seen in this table, potential risks associated with groundwater in this area are acceptable (i.e., within or below the EPA acceptable range of 1×10^{-4} to 1×10^{-6}), ranging 3×10^{-6}, 8×10^{-6} (adult and child residents, respectively), 7×10^{-7} (on-site worker) to 2×10^{-8} (construction worker). Ingestion of groundwater and inhalation of VOCs during showering both contributed significantly to potential cancer risks, with RDX and TCE both contributing to the overall risk from groundwater.

J.6 CUMULATIVE RISKS FOR SOIL AND GROUNDWATER PATHWAYS

Cumulative cancer risks and health hazards for combined soil and groundwater pathways were estimated for receptors in Area A and Area C. This was accomplished by adding risks/hazards developed in the OU2 BRA (groundwater) to the maximum reported risks/hazards developed in the OU1 BRA. **Table J-17** summarized the ranges of cancer risks and hazard indices reported in the OU1 BRA. The average cumulative cancer risks and Hazard Indices for Soil (OU1) and Groundwater (OU2) are summarized in **Table J-18**. Area B was not evaluated in the OU1 BRA, thus no cumulative values are presented for this area.

J.6.1 Area A

Cumulative HI values (**Table J-18**) for soil (OU1) and groundwater (OU2) were calculated to be 0.9 (child resident), 1.0 (adult resident) and 0.02 (on-site worker), indicating that potential non-carcinogenic health hazards associated with Area A are within an acceptable range (i.e., less than or equal to the threshold value of 1.0). Cumulative cancer risks (**Table J-18**) for soil (OU1) and groundwater (OU2) were 1×10^{-6} (adult resident) and 5×10^{-8} (on-site worker), indicating that potential cancer risks associated with Area A are within an acceptable range (i.e., within or below the EPA defined acceptable range of 1×10^{-4} to 1×10^{-6}).

B07NE003702-08210

J.6.2 Area B

Cumulative HI values for soil (OU1) and groundwater (OU2) were all driven by the soil values presented in **Table J-17**, and were as high as 3,000 (child resident), 1,000 (adult resident) and 2.0 (on-site worker), indicating that site soils present a potential non-carcinogenic health hazard. As was true for non-carcinogenic values, the cumulative cancer risks for soil (OU1) and groundwater (OU2) were driven by the soil values presented in **Table J-17**. Cancer risks were estimated to be as high as 5×10^{-3} (residents) and 3×10^{-5} (on-site workers), and were primarily due to chemicals found in site soils.

TABLES FOR APPENDIX J

TABLE J-1

MONITORING WELLS EVALUATED IN OU-2 BASELINE RISK ASSESSMENT

(AVERAGE EXPOSURE RISK ASSESSMENT)

BACKGROUND WELLS: MW-47A and MW-47B

AREA A - located on the northwestern portion of the former NOP, includes the former Administration Area and the Bomb Booster Area.

"A" Wells	"B" Wells	"C" Wells	"D" Wells
	MW-16B	MW-16C	
MW-48A	MW-48B		MW-48D
	MW-57B		

"J" Hydropunchs	"I" Hydropunches
H2 - 01I	H2 - 01J
H2 - 02I	H2 - 02J
H2 - 03I	H2 - 03J
H2 - 04I	H2 - 04J

AREA B - located north of the Load Lines, and east of "Area A", includes the former Atlas Missile Area.

"A" Wells	"B" Wells	"C" Wells	"D" Wells
MW-19A	MW-19B	MW-19C	
MW-58A	MW-58B		
MW-59A	MW-59B		MW-59D

TABLE J-1 (Cont.)

MONITORING WELLS EVALUATED IN OU-2 BASELINE RISK ASSESSMENT

(AVERAGE EXPOSURE RISK ASSESSMENT)

AREA C - includes the Load Lines, the Primary Area, the Burning/Proving Grounds and Landfill Area and an area southeast of the former NOP where contamination has been detected in the groundwater.

On-Site Wells:

"A" Wells	"B" Wells	"C" Wells	"D" Wells
MW-01A	MW-01B		
MW-02A	MW-02B		
MW-03A	MW-03B		
MW-04A	MW-04B		
MW-05A	MW-05B		
MW-06A	MW-06B		
MW-07A	MW-07B		
MW-08A	MW-08B		
MW-09A	MW-09B		MW-09D
MW-10A	MW-10B		
MW-11A			
MW-12A			
MW-13A			
MW-14A			
MW-15A			
MW-18A	MW-18B	MW-18C	
MW-20A	MW-20B	MW-20C	
MW-21A	MW-21B		MW-21D
MW-22A	MW-22B		
MW-23A	MW-23B		
MW-24A	MW-24B		
MW-25A	MW-25B		MW-25D
MW-26A	MW-26B		
MW-27A	MW-27B		
MW-28A	MW-28B		MW-28D

TABLE J-1 (Cont.)

MONITORING WELLS EVALUATED IN OU-2 BASELINE RISK ASSESSMENT

(AVERAGE EXPOSURE RISK ASSESSMENT)

MW-29A	MW-29B		
MW-30A	MW-30B		
MW-31A	MW-31B		
MW-32A	MW-32B		MW-32D
MW-33A	MW-33B		MW-33D
MW-34A	MW-34B		MW-34D
MW-35A	MW-35B		MW-35D
MW-40A	MW-40B		
MW-41A	MW-41B		MW-41D
MW-42A	MW-42B		MW-42D
MW-43A	MW-43B		MW-43D
MW-52A	MW-52B		
MW-53A	MW-53B		
MW-54A	MW-54B		
MW-55A	MW-55B		
MW-56A	MW-56B		

Off-Site Wells:

"A" Wells	"B" Wells	"C" Wells	"D" Wells
MW-36A	MW-36B		MW-36D
MW-37A	MW-37B		MW-37D
MW-38A			MW-38D
MW-39A			MW-39D
MW17A	MW17B	MW17C	
MW44A	MW44B		MW44D
MW45A	MW45B		MW45D
MW46A	MW46B		MW46D

TABLE J-2

EXPOSURE POINT CONCENTRATIONS IN GROUNDWATER
AREA A

Group	Chemicals of Concern (COCs)	Frequency of Detection	Concentration (µg/L)		
			Maximum Detected	Mean	RAE
VOCS	1,1,1-Trichloroethane	0/14	ND	NA	NA
	1,2-Dichloroethene (total)	0/6	ND	NA	NA
	1,2-Dichloropropane	0/14	ND	NA	NA
	Acetone	2/8	6	3.25	3.25
	Chloroform	0/14	ND	NA	NA
	Methylene chloride	9/14	6	1.71	1.71
	Tetrachloroethene	1/14	3	0.68	0.68
	Trichloroethene	0/14	ND	NA	NA
SVOCS	Diethyl phthalate	2/3	2	2.67	2
	Di-n-butyl phthalate	1/3	1	3.67	1
	N-Nitrosodiphenylamine	0/3	ND	NA	NA
	Phenol	1/3	3	4.33	3
EXPLOSIVE	1,3,5-Trinitrobenzene (TNB)	0/6	ND	NA	NA
	2,4,6-Trinitrotoluene (TNT)	0/6	ND	NA	NA
	2,4-Dinitrotoluene (2,4-DNT)	0/6	ND	NA	NA
	Hexahydro-1,3,5-trinitro-1,3-5-triazine (RDX)	1/6	0.91	0.21	0.21
	Octahydro-1,3,5,7--tetranitro-1,3,5,7-tetrazocine (HMX)	0/6	ND	NA	NA
METAL	Aluminum	0/3	ND	NA	NA
	Lead	0/3	ND	NA	NA
	Nickel	0/3	ND	NA	NA
	Vanadium	1/3	11.3	5.43	5.43

Notes:

NA - not applicable

ND - not detected

Mean - Arithmetic mean concentration, assuming one half detection limit for non-detects.

RAE - Reasonable Average Exposure. RAE is based on the arithmetic mean of data. In case where the arithmetic mean exceeded the maximum detected concentration, the maximum detected concentration was used as the RAE.

TABLE J-3

EXPOSURE POINT CONCENTRATIONS IN GROUNDWATER
AREA B

Group	Chemicals of Concern (COCs)	Frequency of Detection	Concentration (µg/L)		
			Maximum Detected	Mean	RAE
VOCS	1,1,1-Trichloroethane	0/8	ND	NA	NA
	1,2-Dichloroethene (total)	1/8	1	0.56	0.56
	1,2-Dichloropropane	0/8	ND	NA	NA
	Acetone	0/1	ND	NA	NA
	Chloroform	0/8	ND	NA	NA
	Methylene chloride	5/8	8	2.88	2.88
	Tetrachloroethene	0/8	ND	NA	NA
	Trichloroethene	1/8	130	16.69	16.69
SVOCS	Diethyl phthalate	-	NA	NA	NA
	Di-n-butyl phthalate	-	NA	NA	NA
	N-Nitrosodiphenylamine	-	NA	NA	NA
	Phenol	-	NA	NA	NA
EXPLOSIVE	1,3,5-Trinitrobenzene (TNB)	0/8	ND	NA	NA
	2,4,6-Trinitrotoluene (TNT)	0/8	ND	NA	NA
	2,4-Dinitrotoluene (24DNT)	0/8	ND	NA	NA
	Hexahydro-1,3,5-trinitro-1,3-5-triazine (RDX)	0/8	ND	NA	NA
	Octahydro-1,3,5,7--tetranitro-1,3,5,7-tetrazocine (HMX)	0/8	ND	NA	NA
METAL	Aluminum	-	NA	NA	NA
	Lead	-	NA	NA	NA
	Nickel	-	NA	NA	NA
	Vanadium	-	NA	NA	NA

Notes

NA - not applicable

ND - not detected

Mean - Arithmetic mean concentration, assuming one half detection limit for non-detects

RAE - Reasonable Average Exposure RAE is based on the arithmetic mean of data. In case where the arithmetic mean exceeded the maximum detected concentration, the maximum detected concentration was used as the RAE

B07NE003702-08217

TABLE J-4

EXPOSURE POINT CONCENTRATIONS IN GROUNDWATER
AREA C

GROUP	Chemicals of Concern (COCs)	Frequency of Detection	Concentration (µg/L)		
			Maximum Detected	Mean	RAE
VOCS	1,1,1-Trichloroethane	2/112	2	1.98	1.98
	1,2-Dichloroethene (total)	11/112	10	1.88	1.88
	1,2-Dichloropropane	1/112	25	2.26	2.26
	Acetone	10/33	16	7.17	7.17
	Chloroform	1/112	26	2.18	2.18
	Methylene chloride	38/112	43	2.10	2.10
	Tetrachloroethene	0/112	ND	NA	NA
	Trichloroethene	27/112	1800	31.11	31.11
SVOCS	Diethyl phthalate	2/10	1	4.20	1.00
	Di-n-butyl phthalate	2/10	1	4.20	1.00
	N-Nitrosodiphenylamine	1/10	1	4.60	1.00
	Phenol	4/10	2	3.50	2.00
EXPLOSIVE	1,3,5-Trinitrobenzene (TNB)	5/112	2.2	0.17	0.17
	2,4,6-Trinitrotoluene (TNT)	3/112	20	0.43	0.43
	2,4-Dinitrotoluene (24DNT)	1/112	0.97	0.13	0.13
	Hexahydro-1,3,5-trinitro-1,3-5-triazine (RDX)	43/112	98	2.09	2.09
	Octahydro-1,3,5,7--tetranitro-1,3,5,7-tetrazocine (HMX)	12/112	45	0.65	0.65
METAL	Aluminum	1/10	1820	272.00	272.00
	Lead	1/10	2.6	1.16	1.16
	Nickel	1/10	11.1	5.61	5.61
	Vanadium	1/10	5.5	2.80	2.80

Notes:

NA - not applicable

ND - not detected

Mean - Arithmetic mean concentration, assuming one half detection limit for non-detects.

RAE - Reasonable Average Exposure. RAE is based on the arithmetic mean of data. In case where the arithmetic mean exceeded the maximum detected concentration, the maximum detected concentration was used as the RAE.

TABLE J-5

AIR VOC EXPOSURE POINT CONCENTRATIONS IN SHOWER (RAE APPROACH)

Chemical Name	Area A (mg/m3)	Area B (mg/m3)	Area C (mg/m3)
1,1,1-Trichloroethane	NA	NA	1.70E-02
1,2-Dichloroethene (total)	NA	4.82E-03	1.62E-02
1,2-Dichloropropane	NA	NA	1.95E-02
Acetone	2.80E-02	NA	6.17E-02
Chloroform	NA	NA	1.88E-02
Methylene chloride	1.47E-02	2.48E-02	1.81E-02
Tetrachloroethene	5.86E-03	NA	NA
Trichloroethene	NA	1.44E-01	2.68E-01

Note:

100% volatilization was assumed .

TABLE J-6

EXPOSURE POINT CONCENTRATIONS IN SUBSURFACE SOIL (RAE APPROACH)

Group	Chemicals of Concern (COCs)	Frequency of Detection	Concentration (µg/kg)			
			Minimum Detected	Maximum Detected	Mean	RAE
	Area B (Atlas Missile Area)					
VOCS	Benzene	10/24	2	2	4.30	2.00
	Acetone	3/24	63	130	16.50	16.50
	Trichloroethene	2/24	4	4	5.60	4.00
	Area C (Load Line 1 Area)					
VOCS	Acetone	3/13	28	53	13.80	13.80
	Trichloroethene	2/13	10	10	6.30	6.30

Notes:

VOCs were the only class of chemicals analyzed.

Mean - Arithmetic mean concentration, assuming one half detection limit for non-detects.

RAE - Reasonable Average Exposure. RAE is based on the arithmetic mean of data. In case where the arithmetic mean exceeded the maximum detected concentration, the maximum detected concentration was used as the RAE.

B07NE003702-08220

TABLE J-7

AIR EXPOSURE POINT CONCENTRATIONS
SUBSURFACE SOIL
(RAE APPROACH)

Group	Chemicals of Concern (COCs)	RAE Air Concentration (mg/m3)
Area B (Atlas Missile Area)		
VOCS	Acetone	4.33E-05
	Benzene	2.58E-04
	Trichloroethene	5.48E-04
Area C (Load Line 1 Area)		
VOCS	Acetone	3.62E-05
	Trichloroethene	8.63E-04

Note:

Air concentration are based on subsurface soil exposure point concentrations presented in Table J-6, using the Farmer's Model presented in Appendix D.

TABLE J-8

AVERAGE EXPOSURE PARAMETERS FOR ESTIMATION OF CHEMICAL INTAKE BY INGESTION OF GROUNDWATER (a

Parameter	Residential		On-site
	Child (b	Adult	Worker
(IR) Ingestion Rate (liters/day)	1.0 (c	1.4 (c	1.0 (c
(EF) Exposure Frequency (days/year)	350 (d	350 (d	250 (e
(ED) Exposure Duration (years)	6 (f	9 (g	5 (h
(BW) Body Weight (kg)	15 (i	70 (j	70 (j
(AT1) Averaging Time - Non-carcinogenic Effects (days)	2,190 (k	3,285 (k	1,825 (k
(AT2) Averaging Time - Cancer Effects (days)	25,550 (l	25,550 (l	25,550 (l

Notes:

a) Average Exposure is assumed to be representative of exposure conditions at the site.

b) Assumes a 0- to 6- year old child.

c) Ingestion rates are based on the data presented for average intake in Exposure Factors Handbook (EPA, 1989b).

d) Residents are assumed to have an exposure frequency of 350 days per year (Standard Default Exposure Factors; EPA, 1991).

e) Based on a 5-day working week for 50 weeks per year (Standard Default Exposure Factors; EPA, 1991).

f) Child residents are assumed to spend the first 6 years of life on Site.

g) Exposure duration based on average time spent in a single residence (Exposure Factors Handbook; EPA, 1989b).

h) Based on information supplied by the Bureau of Labor Statistics (U.S. Department of Labor, 1987).

i) Body weights for 0- to 6- year old children are based on time-weighted average values from Exposure Factors Handbook (EPA, 1989b).

j) Body weight for adults based on Standard Default Exposure Factors (EPA, 1991).

k) Averaging time for non-carcinogenic effects is based on the exposure duration.

l) Averaging time for carcinogenic effects is based on lifetime of 70 years, as identified in Standard Default Exposure Factors (EPA, 1991).

TABLE J-9

AVERAGE EXPOSURE PARAMETERS FOR ESTIMATION OF CHEMICAL INTAKE BY DERMAL EXPOSURE WHILE SHOWERING [a]

Parameter	Residential		On-site	Construction
	Child [b]	Adult	Worker [o]	Worker [o]
(SA) Skin Surface Area Available for Contact (cm2)	6,670 [c]	19,400 [c]	19,400 [c]	19,400 [c]
(PC) Chemical-specific Dermal Permeability Constant (cm/hr)	Chemical Specific [d]			
(ET) Exposure Time (hours/day)	0.12 [e]	0.12 [e]	0.12 [e]	0.12 [e]
(EF) Exposure Frequency (days/year)	350 [f]	350 [f]	45 [g]	45 [g]
(ED) Exposure Duration (years)	6 [h]	9 [i]	5 [j]	1 [q]
(BW) Body Weight (kg)	15 [k]	70 [l]	70 [l]	70 [l]
(AT1) Averaging Time - Non-carcinogenic Effects (days)	2,190 [m]	3,285 [	1,825 [m]	91 [q]
(AT2) Averaging Time - Cancer Effects (days)	25,550 [n]	25,550 [n]	25,550 [n]	25,550 [n]

Notes:

a) Average Exposure is considered as the more representative exposure conditions at the site.

b) Assumes a 0- to 6- year old child.

c) Surface area based on whole body exposure Values calculated from Exposure Factors Handbook (EPA, 1989b).

d) Permeability constants are chemical specific values used to estimate chemical uptake across skin.

e) An exposure time of 7 minutes/day is based on average exposure presented in Exposure Factors Handbook (EPA, 1989b).

f) Residents are assumed to have an exposure frequency of 350 days per year (Standard Default Exposure Factors; EPA, 1991).

g) Assume to take a shower every other day in summer.

h) Child residents are assumed to spend first 6 years of life on Site.

i) Exposure duration based on average time spent in a single residence (Exposure Factors Handbook; EPA, 1989b).

j) Based on information supplied by the Bureau of Labor Statistics (U.S. Department of Labor, 1987).

k) Body weights for 0- to 6- years old children are based on time-weighted average values from Exposure Factors Handbood (EPA, 1989).

l) Body weight for adults based on Standard Default Exposure Factors (EPA, 1991).

m) Averaging time for non-carcinogenic effects based on the exposure duration.

n) Averaging time for carcinogenic effects based on lifetime of 70 years, as identified in Standard Default Exposure Facotrs (EPA, 1991).

n) Only on-site workers in Area C and construction workers in Area B and Area C are evaluated for showering at the Agronomy Building.

p) For average exposure, construction activity was assumed for 3 months.

TABLE J-10

AVERAGE EXPOSURE PARAMETERS FOR ESTIMATION OF CHEMICAL INTAKE BY INHALATION EXPOSURE TO VOLATILIZED CHEMICALS DURING SHOWERING [a]

Parameter	Residential		On-site	Construction
	Child [b]	Adult	Worker [n]	Worker [n]
(IR) Inhalation Rate (m3/hour)	0.83 [c]	0.83 [c]	0.83 [c]	0.83 [c]
(ET) Exposure Time (hours/day)	0.12 [d]	0.12 [d]	0.12 [d]	0.12 [d]
(EF) Exposure Frequency (days/year)	350 [e]	350 [e]	45 [f]	45 [f]
(ED) Exposure Duration (years)	6 [g]	9 [h]	5 [i]	1 [o]
(BW) Body Weight (kg)	15 [j]	70 [k]	70 [k]	70 [k]
(AT1) Averaging Time - Non-carcinogenic Effects (days)	2,190 [l]	3,285 [l]	1,825 [l]	91 [o]
(AT2) Averaging Time - Cancer Effects (days)	25,550 [m]	25,550 [m]	25,550 [m]	25,550 [m]

Notes:

a) Average Exposure is assumed to be representative of exposure conditions at the site.

b) Assumes a 0- to 6- year old child.

c) The default value, 20 m3/day, recommended by Standard Default Exposure Factors (EPA, 1991) for normal activity levels.

d) An exposure time of 7 minutes/day is based on average exposure presented in Exposure Factors Handbook (EPA, 1989b).

e) Residents are assumed to have an exposure frequency of 350 days per year (Standard Default Exposure Factors; EPA, 1991).

f) Workers are assume to take a shower every other day in summer.

g) Child residents are assumed to spend the first 6 years of life on Site.

h) Exposure duration based on average time spent in a single residence (Exposure Factors Handbook; EPA, 1989b).

i) Based on information supplied by the Bureau of Labor Statistics (U.S. Department of Labor, 1987).

j) Body weights for 0- to 6- year old children are based on time-weighted average values from Exposure Factors Handbook (EPA, 1989b).

k) Body weight for adults based on Standard Default Exposure Factors (EPA. 1991).

l) Averaging time for non-carcinogenic effects is based on the exposure duration.

m) Averaging time for carcinogenic effects is based on lifetime of 70 years, as identified in Standard Default Exposure Factprs (EPA, 1991).

n) Only on-site workers in Area C and construction workers in Area B and Area C are evaluated for showering at the Agronomy Building.

o) For average exposure, construction activity was assumed for 3 months.

TABLE J-11

AVERAGE EXPOSURE PARAMETERS FOR ESTIMATION OF CHEMICAL INTAKE BY INGESTION OF SUBSURFACE SOIL [a]

Parameter	Construction Worker [h]
(IR) Ingestion Rate (mg soil /day)	10 [b]
(EF)Exposure Frequency (days/year)	65 [c]
(ED) Exposure Duration (years)	1.0 [d]
(BW) Body Weight (kg)	70 [e]
(AT1) Averaging Time - Non-carcinogenic Effects (days)	91 [f]
(AT2) Averaging Time - Cancer Effects (days)	25,550 [g]

Notes:

a) Average Exposure is assumed to be representative of exposure conditions at the site.

b) The average value for adult worker (Exposure Factor Handbook; EPA, 1989b).

c) Based on 5 working days per week for 3 months.

d) For average exposure, construction activity was assumed to occur for 3 months.

e) Body weight for adults based on Standard Default Exposure Factors (EPA, 1991).

f) Averaging time for non-carcinogenic effects is based on the exposure duration.

g) Averaging time for carcinogenic effects is based on lifetime of 70 years, as identified in Standard Default Exposure Factors (EPA, 1991).

h) Exposure to subsurface soil was evaluated for Areas B and C only.

TABLE J-12

AVERAGE EXPOSURE PARAMETERS FOR ESTIMATION OF CHEMICAL INTAKE BY DERMAL CONTACT WITH SUBSURFACE SOIL [a]

Parameter	Construction Worker [j]
(SA) Exposed Surface Area (cm2)	2,000 [b]
(AD) Dermal Soil Adherence (mg/cm2)	0.2 [c]
(ABS) Absorption Factor (Unitless)	Chemical Specific [d]
(EF) Exposure Frequency (days/year)	65 [e]
(ED) Exposure Duration (years)	1.0 [f]
(BW) Body Weight (kg)	70 [g]
(AT1) Averaging Time - Non-carcinogenic Effects (days)	91 [h]
(AT2) Averaging Time - Cancer Effects (days)	25,550 [i]

Notes:

a) Average Exposure is assumed to be representative of exposure conditions at the site.

b) The value is based on hands and head (Exposure Factors Handbook; EPA, 1989b).

c) Based on the values recommended in Dermal Exposure Assessment: Principles and Applications (EPA, 1992).

d) Based on the USEPA Region IV Guidance (Feb.11, 1992), 1.0% is used as the absorption factor for organics and 0.1% is used for inorganics.

e) Based on 5 working days per week for 3 months.

f) For average exposure, construction activity was assumed for 3 months.

g) Body weight for adults based on Standard Default Exposure Factors (EPA, 1991).

h) Averaging time for non-carcinogenic effects is based on the exposure duration.

i) Averaging time for carcinogenic effects is based on lifetime of 70 years, as identified in Standard Default Exposure Factors (EPA, 1991).

j) Exposure to subsurface soil was evaluated for Areas B and C only.

TABLE J-13

AVERAGE EXPOSURE PARAMETERS FOR ESTIMATION OF CHEMICAL INTAKE BY INHALATION OF VOLATILIZED CHEMICALS FROM SUBSURFACE SOIL [a]

Parameter	Construction Worker [i]
(IR) Inhalation Rate (m3/hour)	0.83 [b]
(ET) Exposure Time (hours/day)	4.0 [c]
(EF) Exposure Frequency (days/year)	65 [d]
(ED) Exposure Duration (years)	1.0 [e]
(BW) Body Weight (kg)	70 [f]
(AT1) Averaging Time - Non-carcinogenic Effects (days)	91 [g]
(AT2) Averaging Time - Cancer Effects (days)	25,550 [h]

Notes:

a) Average Exposure is assumed to be representative of exposure conditions at the site.

b) The default value, 20 m3/day, recommended by Standard Default Exposure Factors (EPA, 1991).

c) For average exposure, assume 4 out of 8 working hours per day exposure to subsurface soil.

d) Based on 5 working days per week for 3 months.

e) For average exposure, construction activity was assumed to occur for 3 months.

f) Body weight for adults based on Standard Default Exposure Factors (EPA, 1991).

g) Averaging time for non-carcinogenic effects is based on the exposure duration.

h) Averaging time for carcinogenic effects is based on lifetime of 70 years, as identified in Standard Default Exposure Factors (EPA, 1991).

i) Exposure to subsurface soil was evaluated for Areas B and C only.

TABLE J-14

SUMMARY OF RAE
POTENTIAL CANCER RISKS AND NON-CARCINOGENIC HAZARD INDICES (HIs)
AREA A

Receptor	Route	Hazard Index (HI)	Cancer Risk
Adult Resident			
	Groundwater Ingestion	0.02	2E-07
	Shower Dermal	0.0001	3E-11
	Shower Inhalation	0.00002	6E-09
	TOTAL	**0.02**	**2E-07**
Child Resident			
	Groundwater Ingestion	0.06	4E-07
	Shower Dermal	0.0002	3E-11
	Shower Inhalation	0.0001	2E-08
	TOTAL	**0.06**	**4E-07**
On-site Worker			
	Groundwater Ingestion	0.01	5E-08
	TOTAL	**0.01**	**5E-08**

TABLE J-15

SUMMARY OF RAE
POTENTIAL CANCER RISKS AND NON-CARCINOGENIC HAZARD INDICES (HIs)
AREA B

Receptor Route	Hazard Index (HI)	Cancer Risk
Adult Resident		
Groundwater Ingestion	0.002	5E-07
Shower Dermal [a]	0.00	0E+00
Shower Inhalation	0.00004	4E-07
TOTAL	**0.002**	**9E-07**
Child Resident		
Groundwater Ingestion	0.007	1E-06
Shower Dermal [a]	0.00	0E+00
Shower Inhalation	0.0002	1E-06
TOTAL	**0.007**	**2E-06**
On-site Worker		
Groundwater Ingestion	0.001	1E-07
TOTAL	**0.001**	**1E-07**
Construction Worker (Atlas Missile Area)		
Shower Dermal [a]	0.00	0E+00
Shower Inhalation	0.000005	6E-09
Shower Total	0.000005	6E-09
Subsurface Soil Ingestion	0.000000002	4E-14
Subsurface Soil Dermal Contact	0.0000000007	1E-14
Subsurface Soil VOC inhalation	0.00	2E-09
Subsurface Soil Total	0.000000002	2E-09
TOTAL	**0.000005**	**8E-09**

Note:

a) All volatile components in groundwater assumed to volatilize, no chemicals of concern left for dermal exposure.

TABLE J-16

SUMMARY OF RAE
POTENTIAL CANCER RISKS AND NON-CARCINOGENIC HAZARD INDICES (HIs)
AREA C

Receptor	Route	Hazard Index (HI)	Cancer Risk
Adult Resident			
	Groundwater Ingestion	0.1	2E-06
	Shower Dermal	0.0007	3E-09
	Shower Inhalation	0.02	1E-06
	TOTAL	**0.1**	**3E-06**
Child Resident			
	Groundwater Ingestion	0.4	5E-06
	Shower Dermal	0.001	3E-09
	Shower Inhalation	0.1	3E-06
	TOTAL	**0.5**	**8E-06**
On-site Worker			
	Groundwater Ingestion	0.06	6E-07
	Shower Dermal	0.00008	2E-10
	Shower Inhalation	0.003	7E-08
	TOTAL	**0.06**	**7E-07**
Construction Worker (Load Line 1 Area)			
	Shower Dermal	0.0003	4E-11
	Shower Inhalation	0.01	1E-08
	Groundwater Total	0.01	1E-08
	Subsurface Soil Ingestion	0.000000001	3E-14
	Subsurface Soil Dermal Contact	0.0000000006	1E-14
	Subsurface Soil VOC inhalation	0.00	2E-09
	Subsurface Soil Total	0.000000001	2E-09
	TOTAL	**0.01**	**2E-08**

TABLE J-17
SUMMARY OF RISK RANGES REPORTED IN THE OU-1 BRA

RAE AREAS	Hazard Indices[b,d]		Cancer Risks[a,c]	
	Average	RME	Average	RME
Area A (includes Administration Area and Bomb Booster Area)	W 0.005 AR 1.0 CR 0.8	W 0.009 AR 1.0 CR 1.0	W 1×10^{-10} AR 1×10^{-6}	W 7×10^{-10} AR 5×10^{-6}
Area B	NA	NA	NA	NA
Area C (includes Load Lines, area surrounding the Load Lines, and the Burning/Proving Grounds)	W 0.00005 to 2 AR 0.08 to 1000 CR 0.2 to 3000	W 0.0001 to 4 AR 0.1 to 2000 CR 0.3 to 5000	W 1×10^{-10} to 1×10^{-5} W 3×10^{-8} to 3×10^{-5} (PCBs)[e] AR 1×10^{-6} to 1×10^{-2} AR 7×10^{-6} to 5×10^{-3} (PCBs)[e]	W 6×10^{-10} to 6×10^{-5} W 2×10^{-7} to 1×10^{-4} (PCBs)[e] AR 3×10^{-5} to 5×10^{-2} AR 3×10^{-5} to 2×10^{-2} (PCBs)[e]

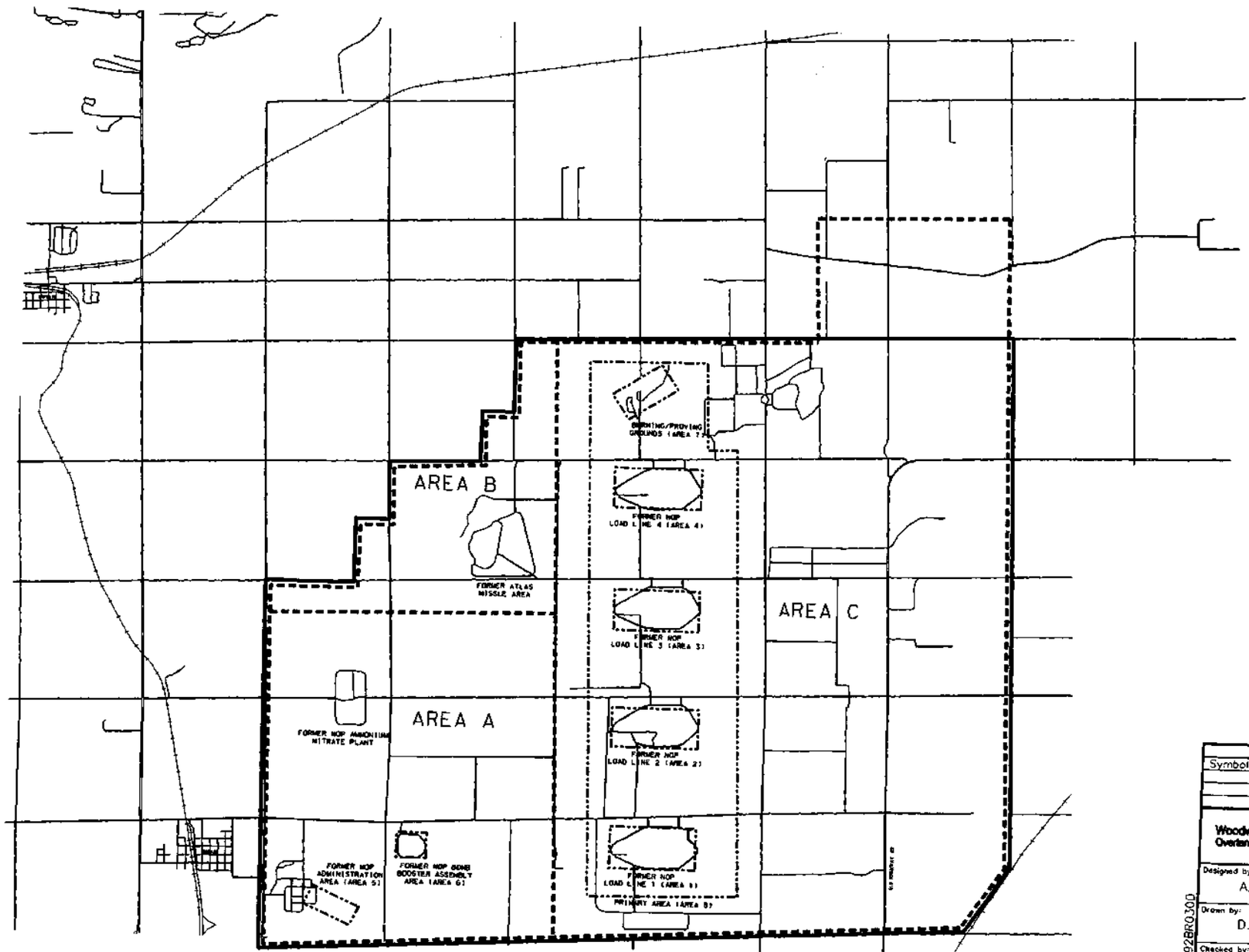
a Cancer risks (exclusive of PCBs) presented in Table 5-4 (Site worker) and 5-13 (resident) of the OU-1 Final Baseline Risk Assessment (SEC Donohue, 1993).
b Hazard indices presented in Tables 5-9 (workers) and 5-13 (residents) of the OU-1 Final Baseline Risk Assessment (SEC Donohue, 1993).
c PCB cancer risks presented in Table 5-14 of the OU-1 Final Baseline Risk Assessment (SEC Donohue, 1993).
d Hazard Indices do not include the contribution from inorganic chemicals found on-site. The OU-1 BRA indicated that HI values for inorganics exceeded 1.0 for both Area A and Area C (Area B was not evaluated), but in most cases these chemicals are probably naturally-occurring compounds present at background levels.
e PCBs were identified as potentially significant chemicals of concern in several of the load line areas in the OU-1 BRA, but were evaluated separately from other chemicals of concern.
W Site worker.
AR Adult resident.
CR Child resident.
NA Not applicable, soils in Area B were not identified as potential areas of PCB or explosives contamination.

TABLE J-18

SUMMARY OF CUMULATIVE CANCER RISKS AND HAZARD INDICES FOR SOIL (OU1) AND GROUNDWATER (OU2) PATHWAYS RAE EXPOSURE

RAE Area	Receptor	Hazard Indices			Cancer Risk		
		OU1	OU2	TOTAL	OU1	OU2	TOTAL
Area A	Child	0.8	0.06	0.9	NA	4E-07	--
	Adult	1.0	0.02	1.0	1E-06	2E-07	1E-06
	On-site Worker	0.005	0.01	0.02	1E-10	5E-08	5E-08
Area B	Child	NA	0.007	--	NA	2E-06	--
	Adult	NA	0.002	--	NA	9E-07	--
	On-site Worker	NA	0.001	--	NA	1E-07	--
Area C	Child	3000	0.5	3001	NA	8E-06	--
	Adult	1000	0.1	1000	5E-03	3E-06	5E-03
	On-site Worker	2	0.06	2	3E-05	7E-07	3E-05

FIGURES FOR APPENDIX J



LEGEND:

- FORMER NOP BOUNDARY
- OU-1 INVESTIGATION AREAS
- OU-2 SUBSITE AREAS

NOTE:

NORTHING AND EASTING LINES ARE TIED TO NEBRASKA STATE PLANAR COORDINATES.

SOURCE: USGS 7.5 MIN QUADRANGLES (1989) FOR MEAD, ASHLAND EAST, ASHLAND WEST, AND WANN 1927 NAD, 1929 NGVD

N

Revisions			
Symbol	Descriptions	Date	Apprv'd

Woodward-Clyde Consultants
Overland Park, Kansas

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

Designed by: A.C.E.
Drawn by: D.R.T.
Checked by: J.C.G.
Submitted by: JCG

U.S. Army Corps of Engineers

BASELINE RISK ASSESSMENT
FOR OPERABLE UNIT NO. 2 - GROUNDWATER
FMR. NEBRASKA ORDNANCE PLANT, MEAD, NE.

OU2 REMEDIAL INVESTIGATION AREAS

Scale: AS NOTED
Date: APRIL, 1994
Figure No.: J-1
Sheet number: 1

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ATTACHMENTS FOR APPENDIX J

ATTACHMENT JA
RAE RISK CALCULATIONS

RISK EQUATIONS

CALCULATION OF CHRONIC DAILY INTAKE (CDI)

For soil ingestion:

CDI = (C(X) * IR * EF * ED * CF) / (BW * AT1 or AT2)

For groundwater ingestion:

CDI = (C(X) * IR * EF * ED) / (BW * AT1 or AT2)

For dermal soil contact:

CDI = (C(X) * SA * AD * AB * EF * ED * CF) / (BW * AT1 or AT2)

For inhalation exposure:

CDI = (C(X) * IH * ET * EF * ED) / (BW * AT1 or AT2)

For dermal contact while showering:

CDI = (C(X) * SA * PC * ET * EF * ED * CF) / (BW * AT1 or AT2)

Where:
C(X) = Chemical concentration (mg/kg soil; mg/L water; mg/m3 air)
IR = Ingestion rate (mg/day soil or L/day water)
IH = Inhalation rate (m3/hour)
ET = Exposure time (hours/day)
EF = Exposure frequency (days/year)
ED = Exposure duration (years)
BW = Body weight (kg)
SA = Exposed body surface area (cm2)
AD = Soil adherence to skin (mg/cm2)
AB = Percent chemical absorption across skin (unitless)
PC = Permeability constant (cm2/hour)
CF = Conversion factor (1 L/1000 cm3 dermal water; 10E-6 kg/mg soil ingestion and dermal contact)
AT1 = Averaging time for non-carcinogenic effects (days)
AT2 = Averaging time for carcinogenic effects, based on lifetime (days)

CALCULATION OF CANCER RISK AND HAZARD INDEX

Cancer risk = Slope Factor * CDI

Hazard Index = CDI / Reference dose

TABLE 1
CHEMICAL PARAMETER TABLE FOR AVERAGE EXPOSURE SCENARIOS, AREA A

Chemical	Average Concentration					Reference Dose		Slope Factor		Permeability Constant	Dermal Absorption
	Surface Soil (mg/kg)	Sediment (mg/kg)	Surface Water (mg/L)	Ground Water (mg/L)	Air (mg/m3)	Oral	Inhalation	Oral	Inhalation	(cm/hr)	(Soil)
RDX				0.00021		0.003		0.11		0.000348	0.01
HMX						0.05				0.000348	0.01
TNB						5E-05				0 0038	0.01
TNT						0.0005		0.03		0.0038	0.01
2,4-DNT						0 002		0.68		0.0038	0.01
Aluminum										0.001	0.001
Nickel						0.02				0.001	0.001
Vanadium				0.00543		0.007				0.001	0.001
Di-N-Butylphthalate				0.001		0.1				0.363	0.01
Diethylphthalate				0.002		0.8				0.00502	0.01
Phenol				0.003		0.6				0.00554	0.01
N-Nitrosodiphenylamine								0.0049		0.036	0.01
1,2-DCE						0.009				0.00128	0.01
Acetone				0.00325	0.028	0.1				0.00057	0.01
Methylene Chloride				0.00171	0.0147	0.06	0.86	0.0075	0.00165	0.00446	0.01
Trichloroethene								0 011	0.017	0.0148	0.01
Benzene								0.029	0.029		0.01
1,1,1-Trichloroethane						0.09	0.29			0.017	0.01
1,2-Dichloropropane							0.00114	0.068		0.01	0.01
Tetrachloroethene				0.00068	0.00586	0.01		0.052	0.002	0.048	0.01
Chloroform						0.01		0.0061	0.081	0.0089	0.01

Notebook = ChemData

TABLE 2
ADULT RESIDENT GROUNDWATER INGESTION SCENARIO, AVERAGE EXPOSURE AREA A

chemical	C(x) (mg/L)	IR (L/d)	EF (d/yr)	ED (years)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0.00021	1.4	350	9	70	3285	25550	4.03E-06	0.003	1.34E-03	5.18E-07	0.11	5.70E-08
HMX	0	1.4	350	9	70	3285	25550	0.00E+00	0.05	0.00E+00	0.00E+00	0	0.00E+00
TNB	0	1.4	350	9	70	3285	25550	0.00E+00	5E-05	0.00E+00	0.00E+00	0	0.00E+00
TNT	0	1.4	350	9	70	3285	25550	0.00E+00	0.0005	0.00E+00	0.00E+00	0.03	0.00E+00
2,4-DNT	0	1.4	350	9	70	3285	25550	0.00E+00	0.002	0.00E+00	0.00E+00	0.68	0.00E+00
	0	1.4	350	9	70	3285	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Aluminum	0	1.4	350	9	70	3285	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Nickel	0	1.4	350	9	70	3285	25550	0.00E+00	0.02	0.00E+00	0.00E+00	0	0.00E+00
Vanadium	0.00543	1.4	350	9	70	3285	25550	1.04E-04	0.007	1.49E-02	1.34E-05	0	0.00E+00
	0	1.4	350	9	70	3285	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Di-N-Butylphthalate	0.001	1.4	350	9	70	3285	25550	1.92E-05	0.1	1.92E-04	2.47E-06	0	0.00E+00
Diethylphthalate	0.002	1.4	350	9	70	3285	25550	3.84E-05	0.8	4.79E-05	4.93E-06	0	0.00E+00
Phenol	0.003	1.4	350	9	70	3285	25550	5.75E-05	0.6	9.59E-05	7.40E-06	0	0.00E+00
N-Nitrosodiphenylamine	0	1.4	350	9	70	3285	25550	0.00E+00	0	0.00E+00	0.00E+00	0.0049	0.00E+00
	0	1.4	350	9	70	3285	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
1,2-DCE	0	1.4	350	9	70	3285	25550	0.00E+00	0.009	0.00E+00	0.00E+00	0	0.00E+00
Acetone	0.00325	1.4	350	9	70	3285	25550	6.23E-05	0.1	6.23E-04	8.01E-06	0	0.00E+00
Methylene Chloride	0.00171	1.4	350	9	70	3285	25550	3.28E-05	0.06	5.47E-04	4.22E-06	0.0075	3.16E-08
Trichloroethene	0	1.4	350	9	70	3285	25550	0.00E+00	0	0.00E+00	0.00E+00	0.011	0.00E+00
Benzene	0	1.4	350	9	70	3285	25550	0.00E+00	0	0.00E+00	0.00E+00	0.029	0.00E+00
1,1,1-Trichloroethane	0	1.4	350	9	70	3285	25550	0.00E+00	0.09	0.00E+00	0.00E+00	0	0.00E+00
1,2-Dichloropropane	0	1.4	350	9	70	3285	25550	0.00E+00	0	0.00E+00	0.00E+00	0.068	0.00E+00
Tetrachloroethene	0.00068	1.4	350	9	70	3285	25550	1.30E-05	0.01	1.30E-03	1.68E-06	0.052	8.72E-08
Chloroform	0	1.4	350	9	70	3285	25550	0.00E+00	0.01	0.00E+00	0.00E+00	0.0061	0.00E+00
Notebook = AdultAVE									HI =	1.90E-02		CR =	1.76E-07

TABLE 3
ADULT RESIDENT DERMAL SHOWER SCENARIO, AVERAGE EXPOSURE AREA A

chemical	C(x) (mg/L)	SA (cm2)	PC (cm/hr)	ET (h/d)	EF (d/yr)	ED (years)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0.00021	19400	0.00035	0.116667	350	9	70	3285	25550	2.27E-09	0.003	7.55E-07	2.913E-10	0.11	3.20E-11
HMX	0	19400	0.00035	0.116667	350	9	70	3285	25550	0.00E+00	0.05	0.00E+00	0	0	0.00E+00
TNB	0	19400	0.0038	0.116667	350	9	70	3285	25550	0.00E+00	5E-05	0.00E+00	0	0	0.00E+00
TNT	0	19400	0.0038	0.116667	350	9	70	3285	25550	0.00E+00	0.0005	0.00E+00	0	0.03	0.00E+00
2,4-DNT	0	19400	0.0038	0.116667	350	9	70	3285	25550	0.00E+00	0.002	0.00E+00	0	0.68	0.00E+00
	0	19400	0	0.116667	350	9	70	3285	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Aluminum	0	19400	0.001	0.116667	350	9	70	3285	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Nickel	0	19400	0.001	0.116667	350	9	70	3285	25550	0.00E+00	0.02	0.00E+00	0	0	0.00E+00
Vanadium	0.00543	19400	0.001	0.116667	350	9	70	3285	25550	1.68E-07	0.007	2.41E-05	2.165E-08	0	0.00E+00
	0	19400	0	0.116667	350	9	70	3285	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Di-N-Butylphthalate	0.001	19400	0.363	0.116667	350	9	70	3285	25550	1.13E-05	0.1	1.13E-04	1.447E-06	0	0.00E+00
Diethylphthalate	0.002	19400	0.00502	0.116667	350	9	70	3285	25550	3.11E-07	0.8	3.89E-07	4.002E-08	0	0.00E+00
Phenol	0.003	19400	0.00554	0.116667	350	9	70	3285	25550	5.15E-07	0.6	8.59E-07	6.625E-08	0	0.00E+00
N-Nitrosodiphenylamine	0	19400	0.036	0.116667	350	9	70	3285	25550	0.00E+00	0	0.00E+00	0	0.0049	0.00E+00
	0	19400	0	0.116667	350	9	70	3285	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
1,2-DCE	0	19400	0.00128	0.116667	350	9	70	3285	25550	0.00E+00	0.009	0.00E+00	0	0	0.00E+00
Acetone	0	19400	0.00057	0.116667	350	9	70	3285	25550	0.00E+00	0.1	0.00E+00	0	0	0.00E+00
Methylene Chloride	0	19400	0.00446	0.116667	350	9	70	3285	25550	0.00E+00	0.06	0.00E+00	0	0.0075	0.00E+00
Trichloroethene	0	19400	0.0148	0.116667	350	9	70	3285	25550	0.00E+00	0	0.00E+00	0	0.011	0.00E+00
Benzene	0	19400	0	0.116667	350	9	70	3285	25550	0.00E+00	0	0.00E+00	0	0.029	0.00E+00
1,1,1-Trichloroethane	0	19400	0.017	0.116667	350	9	70	3285	25550	0.00E+00	0.09	0.00E+00	0	0	0.00E+00
1,2-Dichloropropane	0	19400	0.01	0.116667	350	9	70	3285	25550	0.00E+00	0	0.00E+00	0	0.068	0.00E+00
Tetrachloroethene	0	19400	0.048	0.116667	350	9	70	3285	25550	0.00E+00	0.01	0.00E+00	0	0.052	0.00E+00
Chloroform	0	19400	0.0089	0.116667	350	9	70	3285	25550	0.00E+00	0.01	0.00E+00	0	0.0061	0.00E+00
											HI =	1.39E-04		CR =	3.20E-11

* Assumes 100 percent volatilization of VOCs, so none are available for dermal uptake

TABLE 4
ADULT RESIDENT SHOWER INHALATION SCENARIO, AVERAGE EXPOSURE AREA A

chemical	C(x) (mg/m3)	IH (m3/h)	ET (hr/d)	EF (d/yr)	ED (yr)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0	0.83	0.11667	350	9	70	3285	25550	0	0	0.00E+00	0	0	0.00E+00
HMX	0	0.83	0.11667	350	9	70	3285	25550	0	0	0.00E+00	0	0	0.00E+00
TNB	0	0.83	0.11667	350	9	70	3285	25550	0	0	0.00E+00	0	0	0.00E+00
TNT	0	0.83	0.11667	350	9	70	3285	25550	0	0	0.00E+00	0	0	0.00E+00
2,4-DNT	0	0.83	0.11667	350	9	70	3285	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.11667	350	9	70	3285	25550	0	0	0.00E+00	0	0	0.00E+00
Aluminum	0	0.83	0.11667	350	9	70	3285	25550	0	0	0.00E+00	0	0	0.00E+00
Nickel	0	0.83	0.11667	350	9	70	3285	25550	0	0	0.00E+00	0	0	0.00E+00
Vanadium	0	0.83	0.11667	350	9	70	3285	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.11667	350	9	70	3285	25550	0	0	0.00E+00	0	0	0.00E+00
Di-N-Butylphthalate	0	0.83	0.11667	350	9	70	3285	25550	0	0	0.00E+00	0	0	0.00E+00
Diethylphthalate	0	0.83	0.11667	350	9	70	3285	25550	0	0	0.00E+00	0	0	0.00E+00
Phenol	0	0.83	0.11667	350	9	70	3285	25550	0	0	0.00E+00	0	0	0.00E+00
N-Nitrosodiphenylamine	0	0.83	0.11667	350	9	70	3285	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.11667	350	9	70	3285	25550	0	0	0.00E+00	0	0	0.00E+00
1,2-DCE	0	0.83	0.11667	350	9	70	3285	25550	0	0	0.00E+00	0	0	0.00E+00
Acetone	0.028	0.83	0.11667	350	9	70	3285	25550	3.714E-05	0	0.00E+00	4.78E-06	0	0.00E+00
Methylene Chloride	0.0147	0.83	0.11667	350	9	70	3285	25550	1.95E-05	0.86	2.27E-05	2.51E-06	0.00165	4.14E-09
Trichloroethene	0	0.83	0.11667	350	9	70	3285	25550	0	0	0.00E+00	0	0.017	0.00E+00
Benzene	0	0.83	0.11667	350	9	70	3285	25550	0	0	0.00E+00	0	0.029	0.00E+00
1,1,1-Trichloroethane	0	0.83	0.11667	350	9	70	3285	25550	0	0.29	0.00E+00	0	0	0.00E+00
1,2-Dichloropropane	0	0.83	0.11667	350	9	70	3285	25550	0	0.00114	0.00E+00	0	0	0.00E+00
Tetrachloroethene	0.00586	0.83	0.11667	350	9	70	3285	25550	7.773E-06	0	0.00E+00	9.99E-07	0.002	2.00E-09
Chloroform	0	0.83	0.11667	350	9	70	3285	25550	0	0	0.00E+00	0	0.081	0.00E+00
										HI =	2.27E-05		CR =	6.14E-09

TABLE 5
CHILD (0-6 YEAR) RESIDENT GROUNDWATER INGESTION SCENARIO, AVERAGE EXPOSURE AREA A

chemical	C(x) (mg/L)	IR (L/d)	EF (d/yr)	ED (years)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0.00021	1	350	6	15	2190	25550	1.34E-05	0.003	4.47E-03	1.15E-06	0.11	1.27E-07
HMX	0	1	350	6	15	2190	25550	0.00E+00	0.05	0.00E+00	0.00E+00	0	0.00E+00
TNB	0	1	350	6	15	2190	25550	0.00E+00	5E-05	0.00E+00	0.00E+00	0	0.00E+00
TNT	0	1	350	6	15	2190	25550	0.00E+00	0.0005	0.00E+00	0.00E+00	0.03	0.00E+00
2,4-DNT	0	1	350	6	15	2190	25550	0.00E+00	0.002	0.00E+00	0.00E+00	0.68	0.00E+00
	0	1	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Aluminum	0	1	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Nickel	0	1	350	6	15	2190	25550	0.00E+00	0.02	0.00E+00	0.00E+00	0	0.00E+00
Vanadium	0.00543	1	350	6	15	2190	25550	3.47E-04	0.007	4.96E-02	2.98E-05	0	0.00E+00
	0	1	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Di-N-Butylphthalate	0.001	1	350	6	15	2190	25550	6.39E-05	0.1	6.39E-04	5.48E-06	0	0.00E+00
Diethylphthalate	0.002	1	350	6	15	2190	25550	1.28E-04	0.8	1.60E-04	1.10E-05	0	0.00E+00
Phenol	0.003	1	350	6	15	2190	25550	1.92E-04	0.6	3.20E-04	1.64E-05	0	0.00E+00
N-Nitrosodiphenylamine	0	1	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0.00E+00	0.0049	0.00E+00
	0	1	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
1,2-DCE	0	1	350	6	15	2190	25550	0.00E+00	0.009	0.00E+00	0.00E+00	0	0.00E+00
Acetone	0.00325	1	350	6	15	2190	25550	2.08E-04	0.1	2.08E-03	1.78E-05	0	0.00E+00
Methylene Chloride	0.00171	1	350	6	15	2190	25550	1.09E-04	0.06	1.82E-03	9.37E-06	0.0075	7.03E-08
Trichloroethene	0	1	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0.00E+00	0.011	0.00E+00
Benzene	0	1	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0.00E+00	0.029	0.00E+00
1,1,1-Trichloroethane	0	1	350	6	15	2190	25550	0.00E+00	0.09	0.00E+00	0.00E+00	0	0.00E+00
1,2-Dichloropropane	0	1	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0.00E+00	0.068	0.00E+00
Tetrachloroethene	0.00068	1	350	6	15	2190	25550	4.35E-05	0.01	4.35E-03	3.73E-06	0.052	1.94E-07
Chloroform	0	1	350	6	15	2190	25550	0.00E+00	0.01	0.00E+00	0.00E+00	0.0061	0.00E+00
Notebook = ChildAVE									HI =	6.34E-02		CR =	3.91E-07

TABLE 6
CHILD (0-6 YEAR) RESIDENT DERMAL SHOWER SCENARIO, AVERAGE EXPOSURE AREA A

chemical	C(x) (mg/L)	SA (cm2)	PC (cm/hr)	ET (h/d)	EF (d/yr)	ED (years)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0.00021	6670	0.000348	0.116667	350	6	15	2190	25550	3.64E-09	0.003	1.21E-06	3.12E-10	0.11	3.43E-11
HMX	0	6670	0.000348	0.116667	350	6	15	2190	25550	0.00E+00	0.05	0.00E+00	0	0	0.00E+00
TNB	0	6670	0.0038	0.116667	350	6	15	2190	25550	0.00E+00	5E-05	0.00E+00	0	0	0.00E+00
TNT	0	6670	0.0038	0.116667	350	6	15	2190	25550	0.00E+00	0.0005	0.00E+00	0	0.03	0.00E+00
2,4-DNT	0	6670	0.0038	0.116667	350	6	15	2190	25550	0.00E+00	0.002	0.00E+00	0	0.68	0.00E+00
	0	6670	0	0.116667	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Aluminum	0	6670	0.001	0.116667	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Nickel	0	6670	0.001	0.116667	350	6	15	2190	25550	0.00E+00	0.02	0.00E+00	0	0	0.00E+00
Vanadium	0.00543	6670	0.001	0.116667	350	6	15	2190	25550	2.70E-07	0.007	3.86E-05	2.32E-08	0	0.00E+00
	0	6670	0	0.116667	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Di-N-Butylphthalate	0.001	6670	0.363	0.116667	350	6	15	2190	25550	1.81E-05	0.1	1.81E-04	1.55E-06	0	0.00E+00
Diethylphthalate	0.002	6670	0.00502	0.116667	350	6	15	2190	25550	4.99E-07	0.8	6.24E-07	4.28E-08	0	0.00E+00
Phenol	0.003	6670	0.00554	0.116667	350	6	15	2190	25550	8.27E-07	0.6	1.38E-06	7.09E-08	0	0.00E+00
N-Nitrosodiphenylamine	0	6670	0.036	0.116667	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0.0049	0.00E+00
	0	6670	0	0.116667	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
1,2-DCE	0	6670	0.00128	0.116667	350	6	15	2190	25550	0.00E+00	0.009	0.00E+00	0	0	0.00E+00
Acetone	0	6670	0.00057	0.116667	350	6	15	2190	25550	0.00E+00	0.1	0.00E+00	0	0	0.00E+00
Methylene Chloride	0	6670	0.00446	0.116667	350	6	15	2190	25550	0.00E+00	0.06	0.00E+00	0	0.0075	0.00E+00
Trichloroethene	0	6670	0.0148	0.116667	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0.011	0.00E+00
Benzene	0	6670	0	0.116667	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0.029	0.00E+00
1,1,1-Trichloroethane	0	6670	0.017	0.116667	350	6	15	2190	25550	0.00E+00	0.09	0.00E+00	0	0	0.00E+00
1,2-Dichloropropane	0	6670	0.01	0.116667	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0.068	0.00E+00
Tetrachloroethene	0	6670	0.048	0.116667	350	6	15	2190	25550	0.00E+00	0.01	0.00E+00	0	0.052	0.00E+00
Chloroform	0	6670	0.0089	0.116667	350	6	15	2190	25550	0.00E+00	0.01	0.00E+00	0	0.0061	0.00E+00
											HI =	2.22E-04		CR =	3.43E-11

* Assumes 100 percent volatilization of VOCs, so none are available for dermal uptake

TABLE 7
CHILD (0-6 YEAR) RESIDENT SHOWER INHALATION SCENARIO, AVERAGE EXPOSURE AREA A

chemical	C(x) (mg/m3)	IH (m3/h)	ET (hr/d)	EF (d/yr)	ED (yr)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0	0.83	0.116667	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
HMX	0	0.83	0.116667	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
TNB	0	0.83	0.116667	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
TNT	0	0.83	0.116667	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
2,4-DNT	0	0.83	0.116667	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.116667	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Aluminum	0	0.83	0.116667	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Nickel	0	0.83	0.116667	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Vanadium	0	0.83	0.116667	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.116667	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Di-N-Butylphthalate	0	0.83	0.116667	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Diethylphthalate	0	0.83	0.116667	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Phenol	0	0.83	0.116667	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
N-Nitrosodiphenylamine	0	0.83	0.116667	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.116667	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
1,2-DCE	0	0.83	0.116667	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Acetone	0.028	0.83	0.116667	350	6	15	2190	25550	1.73E-04	0	0.00E+00	1.49E-05	0	0.00E+00
Methylene Chloride	0.0147	0.83	0.116667	350	6	15	2190	25550	9.10E-05	0.86	1.06E-04	7.8E-06	0.00165	1.29E-08
Trichloroethene	0	0.83	0.116667	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0.017	0.00E+00
Benzene	0	0.83	0.116667	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0.029	0.00E+00
1,1,1-Trichloroethane	0	0.83	0.116667	350	6	15	2190	25550	0.00E+00	0.29	0.00E+00	0	0	0.00E+00
1,2-Dichloropropane	0	0.83	0.116667	350	6	15	2190	25550	0.00E+00	0.00114	0.00E+00	0	0	0.00E+00
Tetrachloroethene	0.00586	0.83	0.116667	350	6	15	2190	25550	3.63E-05	0	0.00E+00	3.11E-06	0.002	6.22E-09
Chloroform	0	0.83	0.116667	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0.081	0.00E+00
										HI =	1.06E-04		CR =	1.91E-08

TABLE 8
ON-SITE WORKER GROUNDWATER INGESTION SCENARIO, AVERAGE EXPOSURE AREA A

chemical	C(x) (mg/L)	IR (L/d)	EF (d/yr)	ED (years)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0.00021	1	250	5	70	1825	25550	2.05E-06	0.003	6.85E-04	1.47E-07	0.11	1.61E-08
HMX	0	1	250	5	70	1825	25550	0.00E+00	0.05	0.00E+00	0.00E+00	0	0.00E+00
TNB	0	1	250	5	70	1825	25550	0.00E+00	5E-05	0.00E+00	0.00E+00	0	0.00E+00
TNT	0	1	250	5	70	1825	25550	0.00E+00	0.0005	0.00E+00	0.00E+00	0.03	0.00E+00
2,4-DNT	0	1	250	5	70	1825	25550	0.00E+00	0.002	0.00E+00	0.00E+00	0.68	0.00E+00
	0	1	250	5	70	1825	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Aluminum	0	1	250	5	70	1825	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Nickel	0	1	250	5	70	1825	25550	0.00E+00	0.02	0.00E+00	0.00E+00	0	0.00E+00
Vanadium	0.00543	1	250	5	70	1825	25550	5.31E-05	0.007	7.59E-03	3.80E-06	0	0.00E+00
	0	1	250	5	70	1825	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Di-N-Butylphthalate	0.001	1	250	5	70	1825	25550	9.78E-06	0.1	9.78E-05	6.99E-07	0	0.00E+00
Diethylphthalate	0.002	1	250	5	70	1825	25550	1.96E-05	0.8	2.45E-05	1.40E-06	0	0.00E+00
Phenol	0.003	1	250	5	70	1825	25550	2.94E-05	0.6	4.89E-05	2.10E-06	0	0.00E+00
N-Nitrosodiphenylamine	0	1	250	5	70	1825	25550	0.00E+00	0	0.00E+00	0.00E+00	0.0049	0.00E+00
	0	1	250	5	70	1825	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
1,2-DCE	0	1	250	5	70	1825	25550	0.00E+00	0.009	0.00E+00	0.00E+00	0	0.00E+00
Acetone	0.00325	1	250	5	70	1825	25550	3.18E-05	0.1	3.18E-04	2.27E-06	0	0.00E+00
Methylene Chloride	0.00171	1	250	5	70	1825	25550	1.67E-05	0.06	2.79E-04	1.20E-06	0.0075	8.96E-09
Trichloroethene	0	1	250	5	70	1825	25550	0.00E+00	0	0.00E+00	0.00E+00	0.011	0.00E+00
Benzene	0	1	250	5	70	1825	25550	0.00E+00	0	0.00E+00	0.00E+00	0.029	0.00E+00
1,1,1-Trichloroethane	0	1	250	5	70	1825	25550	0.00E+00	0.09	0.00E+00	0.00E+00	0	0.00E+00
1,2-Dichloropropane	0	1	250	5	70	1825	25550	0.00E+00	0	0.00E+00	0.00E+00	0.068	0.00E+00
Tetrachloroethene	0.00068	1	250	5	70	1825	25550	6.65E-06	0.01	6.65E-04	4.75E-07	0.052	2.47E-08
Chloroform	0	1	250	5	70	1825	25550	0.00E+00	0.01	0.00E+00	0.00E+00	0.0061	0.00E+00
Notebook = WorkAVE									HI =	9.71E-03		CR =	4.98E-08

TABLE 1
CHEMICAL PARAMETER TABLE FOR AVERAGE EXPOSURE SCENARIOS, AREA B

Chemical	Average Concentration					Reference Dose		Slope Factor		Permeability Constant	Dermal Absorption
	Surface Soil (mg/kg)	Sediment (mg/kg)	Surface Water (mg/L)	Ground Water (mg/L)	Air (mg/m3)	Oral	Inhalatio	Oral	Inhalation	(cm/hr)	(Soil)
RDX				0		0.003		0.11		0.000348	0.01
HMX				0		0.05				0.000348	0.01
TNB						5E-05				0.0038	0.01
TNT						0.0005		0.03		0.0038	0.01
2,4-DNT						0.002		0.68		0.0038	0.01
Aluminum										0.001	0.001
Nickel						0.02				0.001	0 001
Vanadium				0		0.007				0.001	0 001
Di-N-Butylphthalate				0		0.1				0.363	0.01
Diethylphthalate				0		0.8				0.00502	0.01
Phenol				0		0.6				0.00554	0.01
N-Nitrosodiphenylamine								0.0049		0.036	0.01
1,2-DCE				0.00056	0.00482	0.009				0.00128	0.01
Acetone				0		0.1				0.00057	0.01
Methylene Chloride				0.00288	0.0248	0.06	0.86	0.0075	0.00165	0.00446	0.01
Trichloroethene				0.01669	0.144			0.011	0.017	0.0148	0.01
Benzene								0.029	0.029		0.01
1,1,1-Trichloroethane						0.09	0.29			0.017	0.01
1,2-Dichloropropane							0.00114	0.068		0.01	0.01
Tetrachloroethene						0.01		0.052	0.002	0.048	0.01
Chloroform						0.01		0.0061	0.081	0.0089	0.01

Notebook = ChemData

TABLE 2
ADULT RESIDENT GROUNDWATER INGESTION SCENARIO, AVERAGE EXPOSURE AREA B

chemical	C(x) (mg/L)	IR (L/d)	EF (d/yr)	ED (years)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0	1.4	350	9	70	3285	25550	0.00E+00	0.003	0.00E+00	0.00E+00	0.11	0.00E+00
HMX	0	1.4	350	9	70	3285	25550	0.00E+00	0.05	0.00E+00	0.00E+00	0	0.00E+00
TNB	0	1.4	350	9	70	3285	25550	0.00E+00	5E-05	0.00E+00	0.00E+00	0	0.00E+00
TNT	0	1.4	350	9	70	3285	25550	0.00E+00	0.0005	0.00E+00	0.00E+00	0.03	0.00E+00
2,4-DNT	0	1.4	350	9	70	3285	25550	0.00E+00	0.002	0.00E+00	0.00E+00	0.68	0.00E+00
	0	1.4	350	9	70	3285	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Aluminum	0	1.4	350	9	70	3285	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Nickel	0	1.4	350	9	70	3285	25550	0.00E+00	0.02	0.00E+00	0.00E+00	0	0.00E+00
Vanadium	0	1.4	350	9	70	3285	25550	0.00E+00	0.007	0.00E+00	0.00E+00	0	0.00E+00
	0	1.4	350	9	70	3285	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Di-N-Butylphthalate	0	1.4	350	9	70	3285	25550	0.00E+00	0.1	0.00E+00	0.00E+00	0	0.00E+00
Diethylphthalate	0	1.4	350	9	70	3285	25550	0.00E+00	0.8	0.00E+00	0.00E+00	0	0.00E+00
Phenol	0	1.4	350	9	70	3285	25550	0.00E+00	0.6	0.00E+00	0.00E+00	0	0.00E+00
N-Nitrosodiphenylamine	0	1.4	350	9	70	3285	25550	0.00E+00	0	0.00E+00	0.00E+00	0.0049	0.00E+00
	0	1.4	350	9	70	3285	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
1,2-DCE	0.00056	1.4	350	9	70	3285	25550	1.07E-05	0.009	1.19E-03	1.38E-06	0	0.00E+00
Acetone	0	1.4	350	9	70	3285	25550	0.00E+00	0.1	0.00E+00	0.00E+00	0	0.00E+00
Methylene Chloride	0.00288	1.4	350	9	70	3285	25550	5.52E-05	0.06	9.21E-04	7.10E-06	0.0075	5.33E-08
Trichloroethene	0.01669	1.4	350	9	70	3285	25550	3.20E-04	0	0.00E+00	4.12E-05	0.011	4.53E-07
Benzene	0	1.4	350	9	70	3285	25550	0.00E+00	0	0.00E+00	0.00E+00	0.029	0.00E+00
1,1,1-Trichloroethane	0	1.4	350	9	70	3285	25550	0.00E+00	0.09	0.00E+00	0.00E+00	0	0.00E+00
1,2-Dichloropropane	0	1.4	350	9	70	3285	25550	0.00E+00	0	0.00E+00	0.00E+00	0.068	0.00E+00
Tetrachloroethene	0	1.4	350	9	70	3285	25550	0.00E+00	0.01	0.00E+00	0.00E+00	0.052	0.00E+00
Chloroform	0	1.4	350	9	70	3285	25550	0.00E+00	0.01	0.00E+00	0.00E+00	0.0061	0.00E+00
Notebook = AdultAVE									HI =	2.11E-03		CR =	5.06E-07

TABLE 3
ADULT RESIDENT DERMAL SHOWER SCENARIO, AVERAGE EXPOSURE AREA B

chemical	C(x) (mg/L)	SA (cm2)	PC (cm/hr)	ET (h/d)	EF (d/yr)	ED (years)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0	19400	0.00035	0.116667	350	9	70	3285	25550	0.00E+00	0.003	0.00E+00	0	0.11	0.00E+00
HMX	0	19400	0.00035	0.116667	350	9	70	3285	25550	0.00E+00	0.05	0.00E+00	0	0	0.00E+00
TNB	0	19400	0.0038	0.116667	350	9	70	3285	25550	0.00E+00	5E-05	0.00E+00	0	0	0.00E+00
TNT	0	19400	0.0038	0.116667	350	9	70	3285	25550	0.00E+00	0.0005	0.00E+00	0	0.03	0.00E+00
2,4-DNT	0	19400	0.0038	0.116667	350	9	70	3285	25550	0.00E+00	0.002	0.00E+00	0	0.68	0.00E+00
	0	19400	0	0.116667	350	9	70	3285	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Aluminum	0	19400	0.001	0.116667	350	9	70	3285	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Nickel	0	19400	0.001	0.116667	350	9	70	3285	25550	0.00E+00	0.02	0.00E+00	0	0	0.00E+00
Vanadium	0	19400	0.001	0.116667	350	9	70	3285	25550	0.00E+00	0.007	0.00E+00	0	0	0.00E+00
	0	19400	0	0.116667	350	9	70	3285	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Di-N-Butylphthalate	0	19400	0.363	0.116667	350	9	70	3285	25550	0.00E+00	0.1	0.00E+00	0	0	0.00E+00
Diethylphthalate	0	19400	0.00502	0.116667	350	9	70	3285	25550	0.00E+00	0.8	0.00E+00	0	0	0.00E+00
Phenol	0	19400	0.00554	0.116667	350	9	70	3285	25550	0.00E+00	0.6	0.00E+00	0	0	0.00E+00
N-Nitrosodiphenylamine	0	19400	0.036	0.116667	350	9	70	3285	25550	0.00E+00	0	0.00E+00	0	0.0049	0.00E+00
	0	19400	0	0.116667	350	9	70	3285	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
1,2-DCE	0	19400	0.00128	0.116667	350	9	70	3285	25550	0.00E+00	0.009	0.00E+00	0	0	0.00E+00
Acetone	0	19400	0.00057	0.116667	350	9	70	3285	25550	0.00E+00	0.1	0.00E+00	0	0	0.00E+00
Methylene Chloride	0	19400	0.00446	0.116667	350	9	70	3285	25550	0.00E+00	0.06	0.00E+00	0	0.0075	0.00E+00
Trichloroethene	0	19400	0.0148	0.116667	350	9	70	3285	25550	0.00E+00	0	0.00E+00	0	0.011	0.00E+00
Benzene	0	19400	0	0.116667	350	9	70	3285	25550	0.00E+00	0	0.00E+00	0	0.029	0.00E+00
1,1,1-Trichl.	0	19400	0.017	0.116667	350	9	70	3285	25550	0.00E+00	0.09	0.00E+00	0	0	0.00E+00
1,2-Dichloropropane	0	19400	0.01	0.116667	350	9	70	3285	25550	0.00E+00	0	0.00E+00	0	0.068	0.00E+00
Tetrachloroethene	0	19400	0.048	0.116667	350	9	70	3285	25550	0.00E+00	0.01	0.00E+00	0	0.052	0.00E+00
Chloroform	0	19400	0.0089	0.116667	350	9	70	3285	25550	0.00E+00	0.01	0.00E+00	0	0.0061	0.00E+00
											HI =	0.00E+00		CR =	0.00E+00

* Assumes 100 percent volatilization of VOCs, so none are available for dermal uptake

TABLE 4
ADULT RESIDENT SHOWER INHALATION SCENARIO, AVERAGE EXPOSURE AREA B

chemical	C(x) (mg/m3)	IR (m3/h)	ET (hr/d)	EF (d/yr)	ED (yr)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0	0.83	0.11667	350	9	70	3285	25550	0	0	0.00E+00	0	0	0.00E+00
HMX	0	0.83	0.11667	350	9	70	3285	25550	0	0	0.00E+00	0	0	0.00E+00
TNB	0	0.83	0.11667	350	9	70	3285	25550	0	0	0.00E+00	0	0	0.00E+00
TNT	0	0.83	0.11667	350	9	70	3285	25550	0	0	0.00E+00	0	0	0.00E+00
2,4-DNT	0	0.83	0.11667	350	9	70	3285	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.11667	350	9	70	3285	25550	0	0	0.00E+00	0	0	0.00E+00
Aluminum	0	0.83	0.11667	350	9	70	3285	25550	0	0	0.00E+00	0	0	0.00E+00
Nickel	0	0.83	0.11667	350	9	70	3285	25550	0	0	0.00E+00	0	0	0.00E+00
Vanadium	0	0.83	0.11667	350	9	70	3285	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.11667	350	9	70	3285	25550	0	0	0.00E+00	0	0	0.00E+00
Di-N-Butylphthalate	0	0.83	0.11667	350	9	70	3285	25550	0	0	0.00E+00	0	0	0.00E+00
Diethylphthalate	0	0.83	0.11667	350	9	70	3285	25550	0	0	0.00E+00	0	0	0.00E+00
Phenol	0	0.83	0.11667	350	9	70	3285	25550	0	0	0.00E+00	0	0	0.00E+00
N-Nitrosodiphenylamine	0	0.83	0.11667	350	9	70	3285	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.11667	350	9	70	3285	25550	0	0	0.00E+00	0	0	0.00E+00
1,2-DCE	0.00482	0.83	0.11667	350	9	70	3285	25550	6.394E-06	0	0.00E+00	8.22E-07	0	0.00E+00
Acetone	0	0.83	0.11667	350	9	70	3285	25550	0	0	0.00E+00	0	0	0.00E+00
Methylene Chloride	0.0248	0.83	0.11667	350	9	70	3285	25550	3.29E-05	0.86	3.83E-05	4.23E-06	0.00165	6.98E-09
Trichloroethene	0.144	0.83	0.11667	350	9	70	3285	25550	0.000191	0	0.00E+00	2.46E-05	0.017	4.18E-07
Benzene	0	0.83	0.11667	350	9	70	3285	25550	0	0	0.00E+00	0	0.029	0.00E+00
1,1,1-Trichloroethane	0	0.83	0.11667	350	9	70	3285	25550	0	0.29	0.00E+00	0	0	0.00E+00
1,2-Dichloropropane	0	0.83	0.11667	350	9	70	3285	25550	0	0.00114	0.00E+00	0	0	0.00E+00
Tetrachloroethene	0	0.83	0.11667	350	9	70	3285	25550	0	0	0.00E+00	0	0.002	0.00E+00
Chloroform	0	0.83	0.11667	350	9	70	3285	25550	0	0	0.00E+00	0	0.081	0.00E+00
										HI =	3.83E-05		CR =	4.24E-07

TABLE 5
CHILD (0-6 YEAR) RESIDENT GROUNDWATER INGESTION SCENARIO, AVERAGE EXPOSURE AREA B

chemical	C(x) (mg/L)	IR (L/d)	EF (d/yr)	ED (years)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0	1	350	6	15	2190	25550	0.00E+00	0.003	0.00E+00	0.00E+00	0.11	0.00E+00
HMX	0	1	350	6	15	2190	25550	0.00E+00	0.05	0.00E+00	0.00E+00	0	0.00E+00
TNB	0	1	350	6	15	2190	25550	0.00E+00	5E-05	0.00E+00	0.00E+00	0	0.00E+00
TNT	0	1	350	6	15	2190	25550	0.00E+00	0.0005	0.00E+00	0.00E+00	0.03	0.00E+00
2,4-DNT	0	1	350	6	15	2190	25550	0.00E+00	0.002	0.00E+00	0.00E+00	0.68	0.00E+00
	0	1	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Aluminum	0	1	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Nickel	0	1	350	6	15	2190	25550	0.00E+00	0.02	0.00E+00	0.00E+00	0	0.00E+00
Vanadium	0	1	350	6	15	2190	25550	0.00E+00	0.007	0.00E+00	0.00E+00	0	0.00E+00
	0	1	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Di-N-Butylphthalate	0	1	350	6	15	2190	25550	0.00E+00	0.1	0.00E+00	0.00E+00	0	0.00E+00
Diethylphthalate	0	1	350	6	15	2190	25550	0.00E+00	0.8	0.00E+00	0.00E+00	0	0.00E+00
Phenol	0	1	350	6	15	2190	25550	0.00E+00	0.6	0.00E+00	0.00E+00	0	0.00E+00
N-Nitrosodiphenylamine	0	1	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0.00E+00	0.0049	0.00E+00
	0	1	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
1,2-DCE	0.00056	1	350	6	15	2190	25550	3.58E-05	0.009	3.98E-03	3.07E-06	0	0.00E+00
Acetone	0	1	350	6	15	2190	25550	0.00E+00	0.1	0.00E+00	0.00E+00	0	0.00E+00
Methylene Chloride	0.00288	1	350	6	15	2190	25550	1.84E-04	0.06	3.07E-03	1.58E-05	0.0075	1.18E-07
Trichloroethene	0.01669	1	350	6	15	2190	25550	1.07E-03	0	0.00E+00	9.15E-05	0.011	1.01E-06
Benzene	0	1	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0.00E+00	0.029	0.00E+00
1,1,1-Trichloroethane	0	1	350	6	15	2190	25550	0.00E+00	0.09	0.00E+00	0.00E+00	0	0.00E+00
1,2-Dichloropropane	0	1	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0.00E+00	0.068	0.00E+00
Tetrachloroethene	0	1	350	6	15	2190	25550	0.00E+00	0.01	0.00E+00	0.00E+00	0.052	0.00E+00
Chloroform	0	1	350	6	15	2190	25550	0.00E+00	0.01	0.00E+00	0.00E+00	0.0061	0.00E+00
Notebook = ChildAVE									HI =	7.05E-03		CR =	1.12E-06

TABLE 6
CHILD (0-6 YEAR) RESIDENT DERMAL SHOWER SCENARIO, AVERAGE EXPOSURE AREA B

chemical	C(x) (mg/L)	SA (cm2)	PC (cm/hr)	ET (h/d)	EF (d/yr)	ED (years)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0	6670	0.000348	0.116667	350	6	15	2190	25550	0.00E+00	0.003	0.00E+00	0	0.11	0.00E+00
HMX	0	6670	0.000348	0.116667	350	6	15	2190	25550	0.00E+00	0.05	0.00E+00	0	0	0.00E+00
TNB	0	6670	0.0038	0.116667	350	6	15	2190	25550	0.00E+00	5E-05	0.00E+00	0	0	0.00E+00
TNT	0	6670	0.0038	0.116667	350	6	15	2190	25550	0.00E+00	0.0005	0.00E+00	0	0.03	0.00E+00
2,4-DNT	0	6670	0.0038	0.116667	350	6	15	2190	25550	0.00E+00	0.002	0.00E+00	0	0.68	0.00E+00
	0	6670	0	0.116667	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Aluminum	0	6670	0.001	0.116667	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Nickel	0	6670	0.001	0.116667	350	6	15	2190	25550	0.00E+00	0.02	0.00E+00	0	0	0.00E+00
Vanadium	0	6670	0.001	0.116667	350	6	15	2190	25550	0.00E+00	0.007	0.00E+00	0	0	0.00E+00
	0	6670	0	0.116667	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Di-N-Butylphthalate	0	6670	0.363	0.116667	350	6	15	2190	25550	0.00E+00	0.1	0.00E+00	0	0	0.00E+00
Diethylphthalate	0	6670	0.00502	0.116667	350	6	15	2190	25550	0.00E+00	0.8	0.00E+00	0	0	0.00E+00
Phenol	0	6670	0.00554	0.116667	350	6	15	2190	25550	0.00E+00	0.6	0.00E+00	0	0	0.00E+00
N-Nitrosodiphenylamine	0	6670	0.036	0.116667	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0.0049	0.00E+00
	0	6670	0	0.116667	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
1,2-DCE	0	6670	0.00128	0.116667	350	6	15	2190	25550	0.00E+00	0.009	0.00E+00	0	0	0.00E+00
Acetone	0	6670	0.00057	0.116667	350	6	15	2190	25550	0.00E+00	0.1	0.00E+00	0	0	0.00E+00
Methylene Chloride	0	6670	0.00446	0.116667	350	6	15	2190	25550	0.00E+00	0.06	0.00E+00	0	0.0075	0.00E+00
Trichloroethene	0	6670	0.0148	0.116667	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0.011	0.00E+00
Benzene	0	6670	0	0.116667	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0.029	0.00E+00
1,1,1-Trichloroethane	0	6670	0.017	0.116667	350	6	15	2190	25550	0.00E+00	0.09	0.00E+00	0	0	0.00E+00
1,2-Dichloropropane	0	6670	0.01	0.116667	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0.068	0.00E+00
Tetrachloroethene	0	6670	0.048	0.116667	350	6	15	2190	25550	0.00E+00	0.01	0.00E+00	0	0.052	0.00E+00
Chloroform	0	6670	0.0089	0.116667	350	6	15	2190	25550	0.00E+00	0.01	0.00E+00	0	0.0061	0.00E+00
											HI =	0.00E+00		CR =	0.00E+00

* Assumes 100 percent volatilization of VOCs, so none are available for dermal uptake

TABLE 7
CHILD (0-6 YEAR) RESIDENT SHOWER INHALATION SCENARIO, AVERAGE EXPOSURE AREA B

chemical	C(x) (mg/m3)	IH (m3/h)	ET (hr/d)	EF (d/yr)	ED (yr)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
0														
RDX	0	0.83	0.116667	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
HMX	0	0.83	0.116667	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
TNB	0	0.83	0.116667	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
TNT	0	0.83	0.116667	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
2,4-DNT	0	0.83	0.116667	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.116667	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
Aluminum	0	0.83	0.116667	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
Nickel	0	0.83	0.116667	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
Vanadium	0	0.83	0.116667	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.116667	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
Di-N-Butylphthalate	0	0.83	0.116667	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
Diethylphthalate	0	0.83	0.116667	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
Phenol	0	0.83	0.116667	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
N-Nitrosodiphenylamine	0	0.83	0.116667	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.116667	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
1,2-DCE	0.00482	0.83	0.116667	350	6	15	2190	25550	2.9837E-05	0	0.00E+00	2.56E-06	0	0.00E+00
Acetone	0	0.83	0.116667	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
Methylene Chloride	0.0248	0.83	0.116667	350	6	15	2190	25550	0.00015352	0.86	1.79E-04	1.32E-05	0.00165	2.17E-08
Trichloroethene	0.144	0.83	0.116667	350	6	15	2190	25550	0.0008914	0	0.00E+00	7.64E-05	0.017	1.30E-06
Benzene	0	0.83	0.116667	350	6	15	2190	25550	0	0	0.00E+00	0	0.029	0.00E+00
1,1,1-Trichloroethane	0	0.83	0.116667	350	6	15	2190	25550	0	0.29	0.00E+00	0	0	0.00E+00
1,2-Dichloropropane	0	0.83	0.116667	350	6	15	2190	25550	0	0.00114	0.00E+00	0	0	0.00E+00
Tetrachloroethene	0	0.83	0.116667	350	6	15	2190	25550	0	0	0.00E+00	0	0.002	0.00E+00
Chloroform	0	0.83	0.116667	350	6	15	2190	25550	0	0	0.00E+00	0	0.081	0.00E+00
										HI =	1.79E-04		CR =	1.32E-06

TABLE 8
ON-SITE WORKER GROUNDWATER INGESTION SCENARIO, AVERAGE EXPOSURE AREA B

chemical	C(x) (mg/L)	IR (L/d)	EF (d/yr)	ED (years)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0	1	250	5	70	1825	25550	0.00E+00	0.003	0.00E+00	0.00E+00	0.11	0.00E+00
HMX	0	1	250	5	70	1825	25550	0.00E+00	0.05	0.00E+00	0.00E+00	0	0.00E+00
TNB	0	1	250	5	70	1825	25550	0.00E+00	5E-05	0.00E+00	0.00E+00	0	0.00E+00
TNT	0	1	250	5	70	1825	25550	0.00E+00	0.0005	0.00E+00	0.00E+00	0.03	0.00E+00
2,4-DNT	0	1	250	5	70	1825	25550	0.00E+00	0.002	0.00E+00	0.00E+00	0.68	0.00E+00
	0	1	250	5	70	1825	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Aluminum	0	1	250	5	70	1825	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Nickel	0	1	250	5	70	1825	25550	0.00E+00	0.02	0.00E+00	0.00E+00	0	0.00E+00
Vanadium	0	1	250	5	70	1825	25550	0.00E+00	0.007	0.00E+00	0.00E+00	0	0.00E+00
	0	1	250	5	70	1825	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Di-N-Butylphthalate	0	1	250	5	70	1825	25550	0.00E+00	0.1	0.00E+00	0.00E+00	0	0.00E+00
Diethylphthalate	0	1	250	5	70	1825	25550	0.00E+00	0.8	0.00E+00	0.00E+00	0	0.00E+00
Phenol	0	1	250	5	70	1825	25550	0.00E+00	0.6	0.00E+00	0.00E+00	0	0.00E+00
N-Nitrosodiphenylamine	0	1	250	5	70	1825	25550	0.00E+00	0	0.00E+00	0.00E+00	0.0049	0.00E+00
	0	1	250	5	70	1825	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
1,2-DCE	0.00056	1	250	5	70	1825	25550	5.48E-06	0.009	6.09E-04	3.91E-07	0	0.00E+00
Acetone	0	1	250	5	70	1825	25550	0.00E+00	0.1	0.00E+00	0.00E+00	0	0.00E+00
Methylene Chloride	0.00288	1	250	5	70	1825	25550	2.82E-05	0.06	4.70E-04	2.01E-06	0.0075	1.51E-08
Trichloroethene	0.01669	1	250	5	70	1825	25550	1.63E-04	0	0.00E+00	1.17E-05	0.011	1.28E-07
Benzene	0	1	250	5	70	1825	25550	0.00E+00	0	0.00E+00	0.00E+00	0.029	0.00E+00
1,1,1-Trichloroethane	0	1	250	5	70	1825	25550	0.00E+00	0.09	0.00E+00	0.00E+00	0	0.00E+00
1,2-Dichloropropane	0	1	250	5	70	1825	25550	0.00E+00	0	0.00E+00	0.00E+00	0.068	0.00E+00
Tetrachloroethene	0	1	250	5	70	1825	25550	0.00E+00	0.01	0.00E+00	0.00E+00	0.052	0.00E+00
Chloroform	0	1	250	5	70	1825	25550	0.00E+00	0.01	0.00E+00	0.00E+00	0.0061	0.00E+00
Notebook = WorkAVE									HI =	1.08E-03		CR =	1.43E-07

TABLE 9
CONSTRUCTION WORKER DERMAL SHOWER SCENARIO, AVERAGE EXPOSURE AREA B

chemical	C(x) (mg/L)	SA (cm2)	PC (cm/hr)	ET (h/d)	EF (d/yr)	ED (years)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0	19400	0.0003	0.1167	45	1	70	365	25550	0.00E+00	0.003	0.00E+00	0	0.11	0.00E+00
HMX	0	19400	0.0003	0.1167	45	1	70	365	25550	0.00E+00	0.05	0.00E+00	0	0	0.00E+00
TNB	0	19400	0.0038	0.1167	45	1	70	365	25550	0.00E+00	5E-05	0.00E+00	0	0	0.00E+00
TNT	0	19400	0.0038	0.1167	45	1	70	365	25550	0.00E+00	0.0005	0.00E+00	0	0.03	0.00E+00
2,4-DNT	0	19400	0.0038	0.1167	45	1	70	365	25550	0.00E+00	0.002	0.00E+00	0	0.68	0.00E+00
	0	19400	0	0.1167	45	1	70	365	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Aluminum	0	19400	0.001	0.1167	45	1	70	365	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Nickel	0	19400	0.001	0.1167	45	1	70	365	25550	0.00E+00	0.02	0.00E+00	0	0	0.00E+00
Vanadium	0	19400	0.001	0.1167	45	1	70	365	25550	0.00E+00	0.007	0.00E+00	0	0	0.00E+00
	0	19400	0	0.1167	45	1	70	365	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Di-N-Butylphthalate	0	19400	0.363	0.1167	45	1	70	365	25550	0.00E+00	0.1	0.00E+00	0	0	0.00E+00
Diethylphthalate	0	19400	0.005	0.1167	45	1	70	365	25550	0.00E+00	0.8	0.00E+00	0	0	0.00E+00
Phenol	0	19400	0.0055	0.1167	45	1	70	365	25550	0.00E+00	0.6	0.00E+00	0	0	0.00E+00
N-Nitrosodiphenylamine	0	19400	0.036	0.1167	45	1	70	365	25550	0.00E+00	0	0.00E+00	0	0.0049	0.00E+00
	0	19400	0	0.1167	45	1	70	365	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
1,2-DCE	0	19400	0.0013	0.1167	45	1	70	365	25550	0.00E+00	0.009	0.00E+00	0	0	0.00E+00
Acetone	0	19400	0.0006	0.1167	45	1	70	365	25550	0.00E+00	0.1	0.00E+00	0	0	0.00E+00
Methylene Chloride	0	19400	0.0045	0.1167	45	1	70	365	25550	0.00E+00	0.06	0.00E+00	0	0.0075	0.00E+00
Trichloroethene	0	19400	0.0148	0.1167	45	1	70	365	25550	0.00E+00	0	0.00E+00	0	0.011	0.00E+00
Benzene	0	19400	0	0.1167	45	1	70	365	25550	0.00E+00	0	0.00E+00	0	0.029	0.00E+00
1,1,1-Trichloroethane	0	19400	0.017	0.1167	45	1	70	365	25550	0.00E+00	0.09	0.00E+00	0	0	0.00E+00
1,2-Dichlor[illegible]	0	19400	0.01	0.1167	45	1	70	365	25550	0.00E+00	0	0.00E+00	0	0.068	0.00E+00
Tetrachlo[illegible]	0	19400	0.048	0.1167	45	1	70	365	25550	0.00E+00	0.01	0.00E+00	0	0.052	0.00E+00
Chloroform	0	19400	0.0089	0.1167	45	1	70	365	25550	0.00E+00	0.01	0.00E+00	0	0.0061	0.00E+00
											HI =	0.00E+00		CR =	0.00E+00

* Assumes 100 percent volatilization of VOCs, so none are available for dermal uptake

TABLE 10
CONSTRUCTION WORKER SHOWER INHALATION SCENARIO, AVERAGE EXPOSURE AREA B

chemical	C(x) (mg/m3)	IH (m3/h)	ET (hr/d)	EF (d/yr)	ED (yr)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0	0.83	0.1167	45	1	70	365	25550	0	0	0.00E+00	0	0	0.00E+00
HMX	0	0.83	0.1167	45	1	70	365	25550	0	0	0.00E+00	0	0	0.00E+00
TNB	0	0.83	0.1167	45	1	70	365	25550	0	0	0.00E+00	0	0	0.00E+00
TNT	0	0.83	0.1167	45	1	70	365	25550	0	0	0.00E+00	0	0	0.00E+00
2,4-DNT	0	0.83	0.1167	45	1	70	365	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.1167	45	1	70	365	25550	0	0	0.00E+00	0	0	0.00E+00
Aluminum	0	0.83	0.1167	45	1	70	365	25550	0	0	0.00E+00	0	0	0.00E+00
Nickel	0	0.83	0.1167	45	1	70	365	25550	0	0	0.00E+00	0	0	0.00E+00
Vanadium	0	0.83	0.1167	45	1	70	365	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.1167	45	1	70	365	25550	0	0	0.00E+00	0	0	0.00E+00
Di-N-Butylphthalate	0	0.83	0.1167	45	1	70	365	25550	0	0	0.00E+00	0	0	0.00E+00
Diethylphthalate	0	0.83	0.1167	45	1	70	365	25550	0	0	0.00E+00	0	0	0.00E+00
Phenol	0	0.83	0.1167	45	1	70	365	25550	0	0	0.00E+00	0	0	0.00E+00
N-Nitrosodiphenylamine	0	0.83	0.1167	45	1	70	365	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.1167	45	1	70	365	25550	0	0	0.00E+00	0	0	0.00E+00
1,2-DCE	0.00482	0.83	0.1167	45	1	70	365	25550	8.2204E-07	0	0.00E+00	1.174E-08	0	0.00E+00
Acetone	0	0.83	0.1167	45	1	70	365	25550	0	0	0.00E+00	0	0	0.00E+00
Methylene Chloride	0.0248	0.83	0.1167	45	1	70	365	25550	4.2296E-06	0.86	4.92E-06	6.042E-08	0.00165	9.97E-11
Trichloroethene	0.144	0.83	0.1167	45	1	70	365	25550	2.4559E-05	0	0.00E+00	3.508E-07	0.017	5.96E-09
Benzene	0	0.83	0.1167	45	1	70	365	25550	0	0	0.00E+00	0	0.029	0.00E+00
1,1,1-Trichloroethane	0	0.83	0.1167	45	1	70	365	25550	0	0.29	0.00E+00	0	0	0.00E+00
1,2-Dichloropropane	0	0.83	0.1167	45	1	70	365	25550	0	0.00114	0.00E+00	0	0	0.00E+00
Tetrachloroethene	0	0.83	0.1167	45	1	70	365	25550	0	0	0.00E+00	0	0.002	0.00E+00
Chloroform	0	0.83	0.1167	45	1	70	365	25550	0	0	0.00E+00	0	0.081	0.00E+00
										HI =	4.92E-06		CR =	6.06E-09

TABLE 1
CHEMICAL PARAMETER TABLE FOR AVERAGE EXPOSURE SCENARIOS AREA C

Chemical	Average Concentration					Reference Dose		Slope Factor		Permeability Constant	Dermal Absorption
	Surface Soil (mg/kg)	Sediment (mg/kg)	Surface Water (mg/L)	Ground Water (mg/L)	Air (mg/m3)	Oral	Inhalation	Oral	Inhalation	(cm/hr)	(Soil)
RDX				0.00209		0.003		0.1		0.000348	0.01
HMX				0.00065		0.05				0.000348	0.01
TNB				0.00017		5E-05				0.0038	0.01
TNT				0.00043		0.0005		0.03		0.0038	0.01
2,4-DNT				0.00013		0.002		0.68		0.0038	0.01
Aluminum				0.272						0.001	0.001
Nickel				0.00561		0.02				0.001	0.001
Vanadium				0.0028		0.007				0.001	0.001
Di-N-Butylphthalate				0.001		0.1				0.363	0.01
Diethylphthalate				0.001		0.8				0.00502	0.01
Phenol				0.002		0.6				0.00554	0.01
N-Nitrosodiphenylamine				0.001				0.0049		0.036	0.01
1,2-DCE				0.00188	0.0162	0.009				0.00128	0.01
Acetone				0.00717	0.0617	0.1				0.00057	0.01
Methylene Chloride				0.0021	0.0181	0.06	0.86	0.0075	0.00165	0.00446	0.01
Trichloroethene				0.03111	0.268			0.011	0.017	0.0148	0.01
Benzene				0				0.029	0.029		0.01
1,1,1-Trichloroethane				0.00198	0.017	0.09	0.29			0.017	0.01
1,2-Dichloropropane				0.00226	0.0195		0.00114	0.068		0.01	0.01
Tetrachloroethene				0		0.01		0.052	0.002	0.048	0.01
Chloroform				0.00218	0.0188	0.01		0.0061	0.081	0.0089	0.01

Notebook = ChemData

TABLE 2
ADULT RESIDENT GROUNDWATER INGESTION SCENARIO, AVERAGE EXPOSURE AREA C

chemical	C(x) (mg/L)	IR (L/d)	EF (d/yr)	ED (years)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0.00209	1.4	350	9	70	3285	25550	4.01E-05	0.003	1.34E-02	5.15E-06	0.11	5.67E-07
HMX	0.00065	1.4	350	9	70	3285	25550	1.25E-05	0.05	2.49E-04	1.60E-06	0	0.00E+00
TNB	0.00017	1.4	350	9	70	3285	25550	3.26E-06	5E-05	6.52E-02	4.19E-07	0	0.00E+00
TNT	0.00043	1.4	350	9	70	3285	25550	8.25E-06	0.0005	1.65E-02	1.06E-06	0.03	3.18E-08
2,4-DNT	0.00013	1.4	350	9	70	3285	25550	2.49E-06	0.002	1.25E-03	3.21E-07	0.68	2.18E-07
	0	1.4	350	9	70	3285	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Aluminum	0.272	1.4	350	9	70	3285	25550	5.22E-03	0	0.00E+00	6.71E-04	0	0.00E+00
Nickel	0.00561	1.4	350	9	70	3285	25550	1.08E-04	0.02	5.38E-03	1.38E-05	0	0.00E+00
Vanadium	0.0028	1.4	350	9	70	3285	25550	5.37E-05	0.007	7.67E-03	6.90E-06	0	0.00E+00
	0	1.4	350	9	70	3285	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Di-N-Butylphthalate	0.001	1.4	350	9	70	3285	25550	1.92E-05	0.1	1.92E-04	2.47E-06	0	0.00E+00
Diethylphthalate	0.001	1.4	350	9	70	3285	25550	1.92E-05	0.8	2.40E-05	2.47E-06	0	0.00E+00
Phenol	0.002	1.4	350	9	70	3285	25550	3.84E-05	0.6	6.39E-05	4.93E-06	0	0.00E+00
N-Nitrosodiphenylamine	0.001	1.4	350	9	70	3285	25550	1.92E-05	0	0.00E+00	2.47E-06	0.0049	1.21E-08
	0	1.4	350	9	70	3285	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
1,2-DCE	0.00188	1.4	350	9	70	3285	25550	3.61E-05	0.009	4.01E-03	4.64E-06	0	0.00E+00
Acetone	0.00717	1.4	350	9	70	3285	25550	1.38E-04	0.1	1.38E-03	1.77E-05	0	0.00E+00
Methylene Chloride	0.0021	1.4	350	9	70	3285	25550	4.03E-05	0.06	6.71E-04	5.18E-06	0.0075	3.88E-08
Trichloroethene	0.03111	1.4	350	9	70	3285	25550	5.97E-04	0	0.00E+00	7.67E-05	0.011	8.44E-07
Benzene	0	1.4	350	9	70	3285	25550	0.00E+00	0	0.00E+00	0.00E+00	0.029	0.00E+00
1,1,1-Trichloroethane	0.00198	1.4	350	9	70	3285	25550	3.80E-05	0.09	4.22E-04	4.88E-06	0	0.00E+00
1,2-Dichloropropane	0.00226	1.4	350	9	70	3285	25550	4.33E-05	0	0.00E+00	5.57E-06	0.068	3.79E-07
Tetrachloroethene	0	1.4	350	9	70	3285	25550	0.00E+00	0.01	0.00E+00	0.00E+00	0.052	0.00E+00
Chloroform	0.00218	1.4	350	9	70	3285	25550	4.18E-05	0.01	4.18E-03	5.38E-06	0.0061	3.28E-08
Notebook = AdultAVE									HI =	1.21E-01		CR =	2.12E-06

TABLE 3
ADULT RESIDENT DERMAL SHOWER SCENARIO, AVERAGE EXPOSURE AREA C

chemical	C(x) (mg/L)	SA (cm2)	PC (cm/hr)	ET (h/d)	EF (d/yr)	ED (years)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0.00209	19400	0.00035	0.116667	350	9	70	3285	25550	2.26E-08	0.003	7.52E-06	2.899E-09	0.11	3.19E-10
HMX	0.00065	19400	0.00035	0.116667	350	9	70	3285	25550	7.01E-09	0.05	1.40E-07	9.017E-10	0	0.00E+00
TNB	0.00017	19400	0.0038	0.116667	350	9	70	3285	25550	2.00E-08	5E-05	4.01E-04	2.575E-09	0	0.00E+00
TNT	0.00043	19400	0.0038	0.116667	350	9	70	3285	25550	5.07E-08	0.0005	1.01E-04	6.514E-09	0.03	1.95E-10
2,4-DNT	0.00013	19400	0.0038	0.116667	350	9	70	3285	25550	1.53E-08	0.002	7.66E-06	1.969E-09	0.68	1.34E-09
	0	19400	0	0.116667	350	9	70	3285	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Aluminum	0.272	19400	0.001	0.116667	350	9	70	3285	25550	8.43E-06	0	0.00E+00	1.084E-06	0	0.00E+00
Nickel	0.00561	19400	0.001	0.116667	350	9	70	3285	25550	1.74E-07	0.02	8.70E-06	2.236E-08	0	0.00E+00
Vanadium	0.0028	19400	0.001	0.116667	350	9	70	3285	25550	8.68E-08	0.007	1.24E-05	1.116E-08	0	0.00E+00
	0	19400	0	0.116667	350	9	70	3285	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Di-N-Butylphthalate	0.001	19400	0.363	0.116667	350	9	70	3285	25550	1.13E-05	0.1	1.13E-04	1.447E-06	0	0.00E+00
Diethylphthalate	0.001	19400	0.00502	0.116667	350	9	70	3285	25550	1.56E-07	0.8	1.95E-07	2.001E-08	0	0.00E+00
Phenol	0.002	19400	0.00554	0.116667	350	9	70	3285	25550	3.44E-07	0.6	5.73E-07	4.417E-08	0	0.00E+00
N-Nitrosodiphenylamine	0.001	19400	0.036	0.116667	350	9	70	3285	25550	1.12E-06	0	0.00E+00	1.435E-07	0.0049	7.03E-10
	0	19400	0	0.116667	350	9	70	3285	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
1,2-DCE	0	19400	0.00128	0.116667	350	9	70	3285	25550	0.00E+00	0.009	0.00E+00	0	0	0.00E+00
Acetone	0	19400	0.00057	0.116667	350	9	70	3285	25550	0.00E+00	0.1	0.00E+00	0	0	0.00E+00
Methylene Chloride	0	19400	0.00446	0.116667	350	9	70	3285	25550	0.00E+00	0.06	0.00E+00	0	0.0075	0.00E+00
Trichloroethene	0	19400	0.0148	0.116667	350	9	70	3285	25550	0.00E+00	0	0.00E+00	0	0.011	0.00E+00
Benzene	0	19400	0	0.116667	350	9	70	3285	25550	0.00E+00	0	0.00E+00	0	0.029	0.00E+00
1,1,1-Trichloroethane	0	19400	0.017	0.116667	350	9	70	3285	25550	0.00E+00	0.09	0.00E+00	0	0	0.00E+00
1,2-Dichloropropane	0	19400	0.01	0.116667	350	9	70	3285	25550	0.00E+00	0	0.00E+00	0	0.068	0.00E+00
Tetrachloroethene	0	19400	0.048	0.116667	350	9	70	3285	25550	0.00E+00	0.01	0.00E+00	0	0.052	0.00E+00
Chloroform	0	19400	0.0089	0.116667	350	9	70	3285	25550	0.00E+00	0.01	0.00E+00	0	0.0061	0.00E+00
											HI =	6.52E-04		CR =	2.56E-09

* Assumes 100 percent volatilization of VOCs, so none are available for dermal uptake

TABLE 4
ADULT RESIDENT SHOWER INHALATION SCENARIO, AVERAGE EXPOSURE AREA C

chemical	C(x) (mg/m3)	IH (m3/h)	ET (hr/d)	EF (d/yr)	ED (yr)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0	0.83	0.11667	350	9	70	3285	25550	0	0	0.00E+00	0	0	0.00E+00
HMX	0	0.83	0.11667	350	9	70	3285	25550	0	0	0.00E+00	0	0	0.00E+00
TNB	0	0.83	0.11667	350	9	70	3285	25550	0	0	0.00E+00	0	0	0.00E+00
TNT	0	0.83	0.11667	350	9	70	3285	25550	0	0	0.00E+00	0	0	0.00E+00
2,4-DNT	0	0.83	0.11667	350	9	70	3285	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.11667	350	9	70	3285	25550	0	0	0.00E+00	0	0	0.00E+00
Aluminum	0	0.83	0.11667	350	9	70	3285	25550	0	0	0.00E+00	0	0	0.00E+00
Nickel	0	0.83	0.11667	350	9	70	3285	25550	0	0	0.00E+00	0	0	0.00E+00
Vanadium	0	0.83	0.11667	350	9	70	3285	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.11667	350	9	70	3285	25550	0	0	0.00E+00	0	0	0.00E+00
Di-N-Butylphthalate	0	0.83	0.11667	350	9	70	3285	25550	0	0	0.00E+00	0	0	0.00E+00
Diethylphthalate	0	0.83	0.11667	350	9	70	3285	25550	0	0	0.00E+00	0	0	0.00E+00
Phenol	0	0.83	0.11667	350	9	70	3285	25550	0	0	0.00E+00	0	0	0.00E+00
N-Nitrosodiphenylamine	0	0.83	0.11667	350	9	70	3285	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.11667	350	9	70	3285	25550	0	0	0.00E+00	0	0	0.00E+00
1,2-DCE	0.0162	0.83	0.11667	350	9	70	3285	25550	2.149E-05	0	0.00E+00	2.76E-06	0	0.00E+00
Acetone	0.0617	0.83	0.11667	350	9	70	3285	25550	8.184E-05	0	0.00E+00	1.05E-05	0	0.00E+00
Methylene Chloride	0.0181	0.83	0.11667	350	9	70	3285	25550	2.401E-05	0.86	2.79E-05	3.09E-06	0.00165	5.09E-09
Trichloroethene	0.268	0.83	0.11667	350	9	70	3285	25550	0.0003555	0	0.00E+00	4.57E-05	0.017	7.77E-07
Benzene	0	0.83	0.11667	350	9	70	3285	25550	0	0	0.00E+00	0	0.029	0.00E+00
1,1,1-Trichloroethane	0.017	0.83	0.11667	350	9	70	3285	25550	2.255E-05	0.29	7.78E-05	2.9E-06	0	0.00E+00
1,2-Dichloropropane	0.0195	0.83	0.11667	350	9	70	3285	25550	2.587E-05	0.00114	2.27E-02	3.33E-06	0	0.00E+00
Tetrachloroethene	0	0.83	0.11667	350	9	70	3285	25550	0	0	0.00E+00	0	0.002	0.00E+00
Chloroform	0.0188	0.83	0.11667	350	9	70	3285	25550	2.494E-05	0	0.00E+00	3.21E-06	0.081	2.60E-07
										HI =	2.28E-02		CR =	1.04E-06

TABLE 5
CHILD (0-6 YEAR) RESIDENT GROUNDWATER INGESTION SCENARIO, AVERAGE EXPOSURE AREA C

chemical	C(x) (mg/L)	IR (L/d)	EF (d/yr)	ED (years)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0.00209	1	350	6	15	2190	25550	1.34E-04	0.003	4.45E-02	1.15E-05	0.11	1.26E-06
HMX	0.00065	1	350	6	15	2190	25550	4.16E-05	0.05	8.31E-04	3.56E-06	0	0.00E+00
TNB	0.00017	1	350	6	15	2190	25550	1.09E-05	5E-05	2.17E-01	9.32E-07	0	0.00E+00
TNT	0.00043	1	350	6	15	2190	25550	2.75E-05	0.0005	5.50E-02	2.36E-06	0.03	7.07E-08
2,4-DNT	0.00013	1	350	6	15	2190	25550	8.31E-06	0.002	4.16E-03	7.12E-07	0.68	4.84E-07
	0	1	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Aluminum	0.272	1	350	6	15	2190	25550	1.74E-02	0	0.00E+00	1.49E-03	0	0.00E+00
Nickel	0.00561	1	350	6	15	2190	25550	3.59E-04	0.02	1.79E-02	3.07E-05	0	0.00E+00
Vanadium	0.0028	1	350	6	15	2190	25550	1.79E-04	0.007	2.56E-02	1.53E-05	0	0.00E+00
	0	1	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Di-N-Butylphthalate	0.001	1	350	6	15	2190	25550	6.39E-05	0.1	6.39E-04	5.48E-06	0	0.00E+00
Diethylphthalate	0.001	1	350	6	15	2190	25550	6.39E-05	0.8	7.99E-05	5.48E-06	0	0.00E+00
Phenol	0.002	1	350	6	15	2190	25550	1.28E-04	0.6	2.13E-04	1.10E-05	0	0.00E+00
N-Nitrosodiphenylamine	0.001	1	350	6	15	2190	25550	6.39E-05	0	0.00E+00	5.48E-06	0.0049	2.68E-08
	0	1	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
1,2-DCE	0.00188	1	350	6	15	2190	25550	1.20E-04	0.009	1.34E-02	1.03E-05	0	0.00E+00
Acetone	0.00717	1	350	6	15	2190	25550	4.58E-04	0.1	4.58E-03	3.93E-05	0	0.00E+00
Methylene Chloride	0.0021	1	350	6	15	2190	25550	1.34E-04	0.06	2.24E-03	1.15E-05	0.0075	8.63E-08
Trichloroethene	0.03111	1	350	6	15	2190	25550	1.99E-03	0	0.00E+00	1.70E-04	0.011	1.88E-06
Benzene	0	1	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0.00E+00	0.029	0.00E+00
1,1,1-Trichloroethane	0.00198	1	350	6	15	2190	25550	1.27E-04	0.09	1.41E-03	1.08E-05	0	0.00E+00
1,2-Dichloropropane	0.00226	1	350	6	15	2190	25550	1.44E-04	0	0.00E+00	1.24E-05	0.068	8.42E-07
Tetrachloroethene	0	1	350	6	15	2190	25550	0.00E+00	0.01	0.00E+00	0.00E+00	0.052	0.00E+00
Chloroform	0.00218	1	350	6	15	2190	25550	1.39E-04	0.01	1.39E-02	1.19E-05	0.0061	7.29E-08
Notebook = ChildAVE									HI =	4.02E-01		CR =	4.72E-06

TABLE 6
CHILD (0-6 YEAR) RESIDENT DERMAL SHOWER EXPOSURE, AVERAGE EXPOSURE AREA C

chemical	C(x) (mg/L)	SA (cm2)	PC (cm/hr)	ET (h/d)	EF (d/yr)	ED (years)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0.00209	6670	0.000348	0.116667	350	6	15	2190	25550	3.62E-08	0.003	1.21E-05	3.101E-09	0.11	3.41E-10
HMX	0.00065	6670	0.000348	0.116667	350	6	15	2190	25550	1.13E-08	0.05	2.25E-07	9.645E-10	0	0.00E+00
TNB	0.00017	6670	0.0038	0.116667	350	6	15	2190	25550	3.21E-08	5E-05	6.43E-04	2.754E-09	0	0.00E+00
TNT	0.00043	6670	0.0038	0.116667	350	6	15	2190	25550	8.13E-08	0.0005	1.63E-04	6.967E-09	0.03	2.09E-10
2,4-DNT	0.00013	6670	0.0038	0.116667	350	6	15	2190	25550	2.46E-08	0.002	1.23E-05	2.106E-09	0.68	1.43E-09
	0	6670	0	0.116667	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Aluminum	0.272	6670	0.001	0.116667	350	6	15	2190	25550	1.35E-05	0	0.00E+00	1.16E-06	0	0.00E+00
Nickel	0.00561	6670	0.001	0.116667	350	6	15	2190	25550	2.79E-07	0.02	1.40E-05	2.392E-08	0	0.00E+00
Vanadium	0.0028	6670	0.001	0.116667	350	6	15	2190	25550	1.39E-07	0.007	1.99E-05	1.194E-08	0	0.00E+00
	0	6670	0	0.116667	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Di-N-Butylphthalate	0.001	6670	0.363	0.116667	350	6	15	2190	25550	1.81E-05	0.1	1.81E-04	1.548E-06	0	0.00E+00
Diethylphthalate	0.001	6670	0.00502	0.116667	350	6	15	2190	25550	2.50E-07	0.8	3.12E-07	2.14E-08	0	0.00E+00
Phenol	0.002	6670	0.00554	0.116667	350	6	15	2190	25550	5.51E-07	0.6	9.19E-07	4.724E-08	0	0.00E+00
N-Nitrosodiphenylamine	0.001	6670	0.036	0.116667	350	6	15	2190	25550	1.79E-06	0	0.00E+00	1.535E-07	0.0049	7.52E-10
	0	6670	0	0.116667	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
1,2-DCE	0	6670	0.00128	0.116667	350	6	15	2190	25550	0.00E+00	0.009	0.00E+00	0	0	0.00E+00
Acetone	0	6670	0.00057	0.116667	350	6	15	2190	25550	0.00E+00	0.1	0.00E+00	0	0	0.00E+00
Methylene Chloride	0	6670	0.00446	0.116667	350	6	15	2190	25550	0.00E+00	0.06	0.00E+00	0	0.0075	0.00E+00
Trichloroethene	0	6670	0.0148	0.116667	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0.011	0.00E+00
Benzene	0	6670	0	0.116667	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0.029	0.00E+00
1,1,1-Trichloroethane	0	6670	0.017	0.116667	350	6	15	2190	25550	0.00E+00	0.09	0.00E+00	0	0	0.00E+00
1,2-Dichloropropane	0	6670	0.01	0.116667	350	6	15	2190	25550	0.00E+00	0	0.00E+00	0	0.068	0.00E+00
Tetrachloroethene	0	6670	0.048	0.116667	350	6	15	2190	25550	0.00E+00	0.01	0.00E+00	0	0.052	0.00E+00
Chloroform	0	6670	0.0089	0.116667	350	6	15	2190	25550	0.00E+00	0.01	0.00E+00	0	0.0061	0.00E+00
											HI =	1.05E-03		CR =	2.73E-09

* Assumes 100 percent volatilization of VOCs, so none are available for dermal uptake

TABLE 7
CHILD (0-6) RESIDENT SHOWER INHALATION SCENARIO, AVERAGE EXPOSURE AREA C

chemical	C(x) (mg/m3)	IH (m3/h)	ET (hr/d)	EF (d/yr)	ED (yr)	BW (kg)	AT1 non-can	AT2 cancer	CDI non-can	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
0														
RDX	0	0.83	0.116667	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
HMX	0	0.83	0.116667	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
TNB	0	0.83	0.116667	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
TNT	0	0.83	0.116667	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
2,4-DNT	0	0.83	0.116667	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.116667	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
Aluminum	0	0.83	0.116667	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
Nickel	0	0.83	0.116667	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
Vanadium	0	0.83	0.116667	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.116667	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
Di-N-Butylphthalate	0	0.83	0.116667	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
Diethylphthalate	0	0.83	0.116667	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
Phenol	0	0.83	0.116667	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
N-Nitrosodiphenylamine	0	0.83	0.116667	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.116667	350	6	15	2190	25550	0	0	0.00E+00	0	0	0.00E+00
1,2-DCE	0.0162	0.83	0.116667	350	6	15	2190	25550	0.0001	0	0.00E+00	8.596E-06	0	0.00E+00
Acetone	0.0617	0.83	0.116667	350	6	15	2190	25550	*********	0	0.00E+00	3.274E-05	0	0.00E+00
Methylene Chloride	0.0181	0.83	0.116667	350	6	15	2190	25550	*********	0.86	1.30E-04	9.604E-06	0.00165	1.58E-08
Trichloroethene	0.268	0.83	0.116667	350	6	15	2190	25550	*********	0	0.00E+00	0.0001422	0.017	2.42E-06
Benzene	0	0.83	0.116667	350	6	15	2190	25550	0	0	0.00E+00	0	0.029	0.00E+00
1,1,1-Trichloroethane	0.017	0.83	0.116667	350	6	15	2190	25550	*********	0.29	3.63E-04	9.02E-06	0	0.00E+00
1,2-Dichloropropane	0.0195	0.83	0.116667	350	6	15	2190	25550	*********	0.00114	1.06E-01	1.035E-05	0	0.00E+00
Tetrachloroethene	0	0.83	0.116667	350	6	15	2190	25550	0	0	0.00E+00	0	0.002	0.00E+00
Chloroform	0.0188	0.83	0.116667	350	6	15	2190	25550	*********	0	0.00E+00	9.975E-06	0.081	8.08E-07
										HI =	1.06E-01		CR =	3.24E-06

TABLE 8
WORKER GROUNDWATER INGESTION SCENARIO, AVERAGE EXPOSURE AREA C

chemical	C(x) (mg/L)	IR (L/d)	EF (d/yr)	ED (years)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0.00209	1	250	5	70	1825	25550	2.05E-05	0.003	6.82E-03	1.46E-06	0.11	1.61E-07
HMX	0.00065	1	250	5	70	1825	25550	6.36E-06	0.05	1.27E-04	4.54E-07	0	0.00E+00
TNB	0.00017	1	250	5	70	1825	25550	1.66E-06	5E-05	3.33E-02	1.19E-07	0	0.00E+00
TNT	0.00043	1	250	5	70	1825	25550	4.21E-06	0.0005	8.41E-03	3.01E-07	0.03	9.02E-09
2,4-DNT	0.00013	1	250	5	70	1825	25550	1.27E-06	0.002	6.36E-04	9.09E-08	0.68	6.18E-08
	0	1	250	5	70	1825	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Aluminum	0.272	1	250	5	70	1825	25550	2.66E-03	0	0.00E+00	1.90E-04	0	0.00E+00
Nickel	0.00561	1	250	5	70	1825	25550	5.49E-05	0.02	2.74E-03	3.92E-06	0	0.00E+00
Vanadium	0.0028	1	250	5	70	1825	25550	2.74E-05	0.007	3.91E-03	1.96E-06	0	0.00E+00
	0	1	250	5	70	1825	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Di-N-Butylphthalate	0.001	1	250	5	70	1825	25550	9.78E-06	0.1	9.78E-05	6.99E-07	0	0.00E+00
Diethylphthalate	0.001	1	250	5	70	1825	25550	9.78E-06	0.8	1.22E-05	6.99E-07	0	0.00E+00
Phenol	0.002	1	250	5	70	1825	25550	1.96E-05	0.6	3.26E-05	1.40E-06	0	0.00E+00
N-Nitrosodiphenylamine	0.001	1	250	5	70	1825	25550	9.78E-06	0	0.00E+00	6.99E-07	0.0049	3.42E-09
	0	1	250	5	70	1825	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
1,2-DCE	0.00188	1	250	5	70	1825	25550	1.84E-05	0.009	2.04E-03	1.31E-06	0	0.00E+00
Acetone	0.00717	1	250	5	70	1825	25550	7.02E-05	0.1	7.02E-04	5.01E-06	0	0.00E+00
Methylene Chloride	0.0021	1	250	5	70	1825	25550	2.05E-05	0.06	3.42E-04	1.47E-06	0.0075	1.10E-08
Trichloroethene	0.03111	1	250	5	70	1825	25550	3.04E-04	0	0.00E+00	2.17E-05	0.011	2.39E-07
Benzene	0	1	250	5	70	1825	25550	0.00E+00	0	0.00E+00	0.00E+00	0.029	0.00E+00
1,1,1-Trichloroethane	0.00198	1	250	5	70	1825	25550	1.94E-05	0.09	2.15E-04	1.38E-06	0	0.00E+00
1,2-Dichloropropane	0.00226	1	250	5	70	1825	25550	2.21E-05	0	0.00E+00	1.58E-06	0.068	1.07E-07
Tetrachloroethene	0	1	250	5	70	1825	25550	0.00E+00	0.01	0.00E+00	0.00E+00	0.052	0.00E+00
Chloroform	0.00218	1	250	5	70	1825	25550	2.13E-05	0.01	2.13E-03	1.52E-06	0.0061	9.29E-09
Notebook = AgWorkAV									HI =	6.15E-02		CR =	6.02E-07

TABLE 9
ON-SITE WORKER DERMAL SHOWER SCENARIO (AGRONOMY BUILDING), AVERAGE EXPOSURE AREA C

chemical	C(x) (mg/kg)	SA (cm2)	PC (cm/hr)	ET (h/d)	EF (d/yr)	ED (years)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0.00209	19400	0.00035	0.116667	45	5	70	1825	25550	2.90E-09	0.003	9.66E-07	2.07E-10	0.11	2.28E-11
HMX	0.00065	19400	0.00035	0.116667	45	5	70	1825	25550	9.02E-10	0.05	1.80E-08	6.44E-11	0	0.00E+00
TNB	0.00017	19400	0.0038	0.116667	45	5	70	1825	25550	2.58E-09	5E-05	5.15E-05	1.84E-10	0	0.00E+00
TNT	0.00043	19400	0.0038	0.116667	45	5	70	1825	25550	6.51E-09	0.0005	1.30E-05	4.65E-10	0.03	1.40E-11
2,4-DNT	0.00013	19400	0.0038	0.116667	45	5	70	1825	25550	1.97E-09	0.002	9.85E-07	1.41E-10	0.68	9.56E-11
	0	19400	0	0.116667	45	5	70	1825	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Aluminum	0.272	19400	0.001	0.116667	45	5	70	1825	25550	1.08E-06	0	0.00E+00	7.74E-08	0	0.00E+00
Nickel	0.00561	19400	0.001	0.116667	45	5	70	1825	25550	2.24E-08	0.02	1.12E-06	1.6E-09	0	0.00E+00
Vanadium	0.0028	19400	0.001	0.116667	45	5	70	1825	25550	1.12E-08	0.007	1.59E-06	7.97E-10	0	0.00E+00
	0	19400	0	0.116667	45	5	70	1825	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Di-N-Butylphthalate	0.001	19400	0.363	0.116667	45	5	70	1825	25550	1.45E-06	0.1	1.45E-05	1.03E-07	0	0.00E+00
Diethylphthalate	0.001	19400	0.00502	0.116667	45	5	70	1825	25550	2.00E-08	0.8	2.50E-08	1.43E-09	0	0.00E+00
Phenol	0.002	19400	0.00554	0.116667	45	5	70	1825	25550	4.42E-08	0.6	7.36E-08	3.15E-09	0	0.00E+00
N-Nitrosodiphenylamine	0.001	19400	0.036	0.116667	45	5	70	1825	25550	1.44E-07	0	0.00E+00	1.03E-08	0.0049	5.02E-11
	0	19400	0	0.116667	45	5	70	1825	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
1,2-DCE	0	19400	0.00128	0.116667	45	5	70	1825	25550	0.00E+00	0.009	0.00E+00	0	0	0.00E+00
Acetone	0	19400	0.00057	0.116667	45	5	70	1825	25550	0.00E+00	0.1	0.00E+00	0	0	0.00E+00
Methylene Chloride	0	19400	0.00446	0.116667	45	5	70	1825	25550	0.00E+00	0.06	0.00E+00	0	0.0075	0.00E+00
Trichloroethene	0	19400	0.0148	0.116667	45	5	70	1825	25550	0.00E+00	0	0.00E+00	0	0.011	0.00E+00
Benzene	0	19400	0	0.116667	45	5	70	1825	25550	0.00E+00	0	0.00E+00	0	0.029	0.00E+00
1,1,1-Trichloroethane	0	19400	0.017	0.116667	45	5	70	1825	25550	0.00E+00	0.09	0.00E+00	0	0	0.00E+00
1,2-Dichloropropane	0	19400	0.01	0.116667	45	5	70	1825	25550	0.00E+00	0	0.00E+00	0	0.068	0.00E+00
Tetrachloroethene	0	19400	0.048	0.116667	45	5	70	1825	25550	0.00E+00	0.01	0.00E+00	0	0.052	0.00E+00
Chloroform	0	19400	0.0089	0.116667	45	5	70	1825	25550	0.00E+00	0.01	0.00E+00	0	0.0061	0.00E+00
											HI =	8.38E-05		CR =	1.83E-10

* Showers currently exist in the Agronomy Building, located in Area C

** Assumes 100 percent volatilization of VOCs, so none are available for dermal uptake

TABLE 10
ON-SITE WORKER SHOWER INHALATION SCENARIO (AGRONOMY BUILDING), AVERAGE EXPOSURE AREA C

chemical	C(x) (mg/m3)	IH (m3/h)	ET (hr/d)	EF (d/yr)	ED (yr)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0	0.83	0.11667	45	5	70	1825	25550	0	0	0.00E+00	0	0	0.00E+00
HMX	0	0.83	0.11667	45	5	70	1825	25550	0	0	0.00E+00	0	0	0.00E+00
TNB	0	0.83	0.11667	45	5	70	1825	25550	0	0	0.00E+00	0	0	0.00E+00
TNT	0	0.83	0.11667	45	5	70	1825	25550	0	0	0.00E+00	0	0	0.00E+00
2,4-DNT	0	0.83	0.11667	45	5	70	1825	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.11667	45	5	70	1825	25550	0	0	0.00E+00	0	0	0.00E+00
Aluminum	0	0.83	0.11667	45	5	70	1825	25550	0	0	0.00E+00	0	0	0.00E+00
Nickel	0	0.83	0.11667	45	5	70	1825	25550	0	0	0.00E+00	0	0	0.00E+00
Vanadium	0	0.83	0.11667	45	5	70	1825	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.11667	45	5	70	1825	25550	0	0	0.00E+00	0	0	0.00E+00
Di-N-Butylphthalate	0	0.83	0.11667	45	5	70	1825	25550	0	0	0.00E+00	0	0	0.00E+00
Diethylphthalate	0	0.83	0.11667	45	5	70	1825	25550	0	0	0.00E+00	0	0	0.00E+00
Phenol	0	0.83	0.11667	45	5	70	1825	25550	0	0	0.00E+00	0	0	0.00E+00
N-Nitrosodiphenylamine	0	0.83	0.11667	45	5	70	1825	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.11667	45	5	70	1825	25550	0	0	0.00E+00	0	0	0.00E+00
1,2-DCE	0.0162	0.83	0.11667	45	5	70	1825	25550	2.7629E-06	0	0.00E+00	1.97E-07	0	0.00E+00
Acetone	0.0617	0.83	0.11667	45	5	70	1825	25550	1.0523E-05	0	0.00E+00	7.52E-07	0	0.00E+00
Methylene Chloride	0.0181	0.83	0.11667	45	5	70	1825	25550	3.0869E-06	0.86	3.59E-06	2.2E-07	0.00165	3.64E-10
Trichloroethene	0.268	0.83	0.11667	45	5	70	1825	25550	4.5707E-05	0	0.00E+00	3.26E-06	0.017	5.55E-08
Benzene	0	0.83	0.11667	45	5	70	1825	25550	0	0	0.00E+00	0	0.029	0.00E+00
1,1,1-Trichloroethane	0.017	0.83	0.11667	45	5	70	1825	25550	2.8993E-06	0.29	1.00E-05	2.07E-07	0	0.00E+00
1,2-Dichloropropane	0.0195	0.83	0.11667	45	5	70	1825	25550	3.3257E-06	0.00114	2.92E-03	2.38E-07	0	0.00E+00
Tetrachloroethene	0	0.83	0.11667	45	5	70	1825	25550	0	0	0.00E+00	0	0.002	0.00E+00
Chloroform	0.0188	0.83	0.11667	45	5	70	1825	25550	3.2063E-06	0	0.00E+00	2.29E-07	0.081	1.86E-08
										HI =	2.93E-03		CR =	7.44E-08

* Showers currently exist in the Agronomy Building, located in Area C

TABLE 11
CONSTRUCTION WORKER DERMAL SHOWER SCENARIO, AVERAGE EXPOSURE AREA C (AGRONOMY BUILDING)

chemical	C(x) (mg/L)	SA (cm2)	PC (cm/hr)	ET (h/d)	EF (d/yr)	ED (years)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0.00209	19400	0.000348	0.11667	45	1	70	91	25550	1.16E-08	0.003	3.88E-06	4.142E-11	0.11	4.56E-12
HMX	0.00065	19400	0.000348	0.11667	45	1	70	91	25550	3.62E-09	0.05	7.23E-08	1.288E-11	0	0.00E+00
TNB	0.00017	19400	0.0038	0.11667	45	1	70	91	25550	1.03E-08	5E-05	2.07E-04	3.679E-11	0	0.00E+00
TNT	0.00043	19400	0.0038	0.11667	45	1	70	91	25550	2.61E-08	0.0005	5.23E-05	9.305E-11	0.03	2.79E-12
2,4-DNT	0.00013	19400	0.0038	0.11667	45	1	70	91	25550	7.90E-09	0.002	3.95E-06	2.813E-11	0.68	1.91E-11
	0	19400	0	0.11667	45	1	70	91	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Aluminum	0.272	19400	0.001	0.11667	45	1	70	91	25550	4.35E-06	0	0.00E+00	1.549E-08	0	0.00E+00
Nickel	0.00561	19400	0.001	0.11667	45	1	70	91	25550	8.97E-08	0.02	4.48E-06	3.195E-10	0	0.00E+00
Vanadium	0.0028	19400	0.001	0.11667	45	1	70	91	25550	4.48E-08	0.007	6.40E-06	1.595E-10	0	0.00E+00
	0	19400	0	0.11667	45	1	70	91	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Di-N-Butylphthalate	0.001	19400	0.363	0.11667	45	1	70	91	25550	5.80E-06	0.1	5.80E-05	2.067E-08	0	0.00E+00
Diethylphthalate	0.001	19400	0.00502	0.11667	45	1	70	91	25550	8.03E-08	0.8	1.00E-07	2.859E-10	0	0.00E+00
Phenol	0.002	19400	0.00554	0.11667	45	1	70	91	25550	1.77E-07	0.6	2.95E-07	6.31E-10	0	0.00E+00
N-Nitrosodiphenylamine	0.001	19400	0.036	0.11667	45	1	70	91	25550	5.76E-07	0	0.00E+00	2.05E-09	0.0049	1.00E-11
	0	19400	0	0.11667	45	1	70	91	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
1,2-DCE	0	19400	0.00128	0.11667	45	1	70	91	25550	0.00E+00	0.009	0.00E+00	0	0	0.00E+00
Acetone	0	19400	0.00057	0.11667	45	1	70	91	25550	0.00E+00	0.1	0.00E+00	0	0	0.00E+00
Methylene Chloride	0	19400	0.00446	0.11667	45	1	70	91	25550	0.00E+00	0.06	0.00E+00	0	0.0075	0.00E+00
Trichloroethene	0	19400	0.0148	0.11667	45	1	70	91	25550	0.00E+00	0	0.00E+00	0	0.011	0.00E+00
Benzene	0	19400	0	0.11667	45	1	70	91	25550	0.00E+00	0	0.00E+00	0	0.029	0.00E+00
1,1,1-Trichloroethane	0	19400	0.017	0.11667	45	1	70	91	25550	0.00E+00	0.09	0.00E+00	0	0	0.00E+00
1,2-Dichloropropane	0	19400	0.01	0.11667	45	1	70	91	25550	0.00E+00	0	0.00E+00	0	0.068	0.00E+00
Tetrachloroethene	0	19400	0.048	0.11667	45	1	70	91	25550	0.00E+00	0.01	0.00E+00	0	0.052	0.00E+00
Chloroform	0	19400	0.0089	0.11667	45	1	70	91	25550	0.00E+00	0.01	0.00E+00	0	0.0061	0.00E+00
											HI =	3.36E-04		CR =	3.65E-11

* Showers currently exist in the Agronomy Building, located in Area C
** Assumes 100 percent volatilization of VOCs, so none are available for dermal uptake

TABLE 12
CONSTRUCTION WORKER SHOWER INHALATION SCENARIO, AVERAGE EXPOSURE AREA C (AGRONOMY BUILDING)

chemical	C(x) (mg/m3)	IH (m3/h)	ET (hr/d)	EF (d/yr)	ED (yr)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0	0.83	0.116667	45	1	70	91	25550	0	0	0.00E+00	0	0	0.00E+00
HMX	0	0.83	0.116667	45	1	70	91	25550	0	0	0.00E+00	0	0	0.00E+00
TNB	0	0.83	0.116667	45	1	70	91	25550	0	0	0.00E+00	0	0	0.00E+00
TNT	0	0.83	0.116667	45	1	70	91	25550	0	0	0.00E+00	0	0	0.00E+00
2,4-DNT	0	0.83	0.116667	45	1	70	91	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.116667	45	1	70	91	25550	0	0	0.00E+00	0	0	0.00E+00
Aluminum	0	0.83	0.116667	45	1	70	91	25550	0	0	0.00E+00	0	0	0.00E+00
Nickel	0	0.83	0.116667	45	1	70	91	25550	0	0	0.00E+00	0	0	0.00E+00
Vanadium	0	0.83	0.116667	45	1	70	91	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.116667	45	1	70	91	25550	0	0	0.00E+00	0	0	0.00E+00
Di-N-Butylphthalate	0	0.83	0.116667	45	1	70	91	25550	0	0	0.00E+00	0	0	0.00E+00
Diethylphthalate	0	0.83	0.116667	45	1	70	91	25550	0	0	0.00E+00	0	0	0.00E+00
Phenol	0	0.83	0.116667	45	1	70	91	25550	0	0	0.00E+00	0	0	0.00E+00
N-Nitrosodiphenylamine	0	0.83	0.116667	45	1	70	91	25550	0	0	0.00E+00	0	0	0.00E+00
	0	0.83	0.116667	45	1	70	91	25550	0	0	0.00E+00	0	0	0.00E+00
1,2-DCE	0.0162	0.83	0.116667	45	1	70	91	25550	1.108E-05	0	0.00E+00	3.947E-08	0	0.00E+00
Acetone	0.0617	0.83	0.116667	45	1	70	91	25550	4.221E-05	0	0.00E+00	1.5033E-07	0	0.00E+00
Methylene Chloride	0.0181	0.83	0.116667	45	1	70	91	25550	1.238E-05	0.86	1.44E-05	4.4099E-08	0.00165	7.28E-11
Trichloroethene	0.268	0.83	0.116667	45	1	70	91	25550	0.00018333	0	0.00E+00	6.5295E-07	0.017	1.11E-08
Benzene	0	0.83	0.116667	45	1	70	91	25550	0	0	0.00E+00	0	0.029	0.00E+00
1,1,1-Trichloroethane	0.017	0.83	0.116667	45	1	70	91	25550	1.163E-05	0.29	4.01E-05	4.1419E-08	0	0.00E+00
1,2-Dichloropropane	0.0195	0.83	0.116667	45	1	70	91	25550	1.334E-05	0.00114	1.17E-02	4.751E-08	0	0.00E+00
Tetrachloroethene	0	0.83	0.116667	45	1	70	91	25550	0	0	0.00E+00	0	0.002	0.00E+00
Chloroform	0.0188	0.83	0.116667	45	1	70	91	25550	1.286E-05	0	0.00E+00	4.5804E-08	0.081	3.71E-09
										HI =	1.18E-02		CR =	1.49E-08

* Showers currently exist in the Agronomy Building, located in Area C

TABLE 1
CHEMICAL PARAMETER TABLE FOR SUBSURFACE SOIL, AVERAGE EXPOSURE AREA B (ATLAS MISSILE AREA)

Chemical	Average Concentration					Reference Dose		Slope Factor		Permeability Constant	Dermal Absorption
	Subsurface Soil (mg/kg)	Sediment (mg/kg)	Surface Water (mg/L)	Ground Water (mg/L)	Air (mg/m3)	Oral	Inhalation	Oral	Inhalation	(cm/hr)	(Soil)
RDX	0				0.00E+00	0.003		0.11		0.000348	0.01
HMX	0				0.00E+00	0.05				0.000348	0.01
Vanadium	0				0.00E+00	0.007				0.001	0.001
Di-N-Butylphthalate	0				0.00E+00	1				0.363	0.01
Diethylphthalate	0				0.00E+00	8				0.00502	0.01
Phenol	0				0.00E+00	0.6				0.00554	0.01
1,2-DCE	0				0.00E+00	0.009				0.00128	0.01
Acetone	0.0165				4.33E-05	1				0.00057	0.01
Methylene Chloride	0				0.00E+00	0.06	0.86	0.0075	0.00165	0.00446	0.01
Trichloroethene	0.004				5.48E-04			0.011	0.017	0.0148	0.01
Benzene	0.002				2.58E-04			0.029	0.029		0.01

Notebook = ChemData

* PC not available for HMX, value for RDX substituted
Where subchronic RfDs were not available, chronic values were substituted

TABLE 2
CONSTRUCTION WORKER SOIL INGESTION SCENARIO, AVERAGE EXPOSURE AREA B (ATLAS MISSILE AREA)

chemical	C(x) (mg/kg)	IR (mg/d)	EF (d/y)	ED (yr)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0	10	65	1	70	91	25550	0.00E+00	0.003	0.00E+00	0.00E+00	0.11	0.00E+00
HMX	0	10	65	1	70	91	25550	0.00E+00	0.05	0.00E+00	0.00E+00	0	0.00E+00
	0	10	65	1	70	91	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Vanadium	0	10	65	1	70	91	25550	0.00E+00	0.007	0.00E+00	0.00E+00	0	0.00E+00
	0	10	65	1	70	91	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Di-N-Butylphthalate	0	10	65	1	70	91	25550	0.00E+00	1	0.00E+00	0.00E+00	0	0.00E+00
Diethylphthalate	0	10	65	1	70	91	25550	0.00E+00	8	0.00E+00	0.00E+00	0	0.00E+00
Phenol	0	10	65	1	70	91	25550	0.00E+00	0.6	0.00E+00	0.00E+00	0	0.00E+00
	0	10	65	1	70	91	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
1,2-DCE	0	10	65	1	70	91	25550	0.00E+00	0.009	0.00E+00	0.00E+00	0	0.00E+00
Acetone	0.0165	10	65	1	70	91	25550	1.68E-09	1	1.68E-09	6.00E-12	0	0.00E+00
Methylene Chloride	0	10	65	1	70	91	25550	0.00E+00	0.06	0.00E+00	0.00E+00	0.0075	0.00E+00
Trichloroethene	0.004	10	65	1	70	91	25550	4.08E-10	0	0.00E+00	1.45E-12	0.011	1.60E-14
Benzene	0.002	10	65	1	70	91	25550	2.04E-10	0	0.00E+00	7.27E-13	0.029	2.11E-14
	0	10	65	1	70	91	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Notebook = ConstrAV									HI =	1.68E-09		CR =	3.71E-14

TABLE 3
CONSTRUCTION WORKER DERMAL SOIL CONTACT SCENARIO, AVERAGE EXPOSURE AREA B (ATLAS MISSILE AREA)

chemical	C(x) (mg/kg)	SA (cm2)	AD (mg/cm2	AB unitless	EF (d/y)	ED (yr)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0	2000	0.2	0.01	65	1	70	91	25550	0.00E+00	0.003	0.00E+00	0	0.11	0.00E+00
HMX	0	2000	0.2	0.01	65	1	70	91	25550	0.00E+00	0.05	0.00E+00	0	0	0.00E+00
	0	2000	0.2	0	65	1	70	91	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Vanadium	0	2000	0.2	0.001	65	1	70	91	25550	0.00E+00	0.007	0.00E+00	0	0	0.00E+00
	0	2000	0.2	0	65	1	70	91	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Di-N-Butylphthalate	0	2000	0.2	0.01	65	1	70	91	25550	0.00E+00	1	0.00E+00	0	0	0.00E+00
Diethylphthalate	0	2000	0.2	0.01	65	1	70	91	25550	0.00E+00	8	0.00E+00	0	0	0.00E+00
Phenol	0	2000	0.2	0.01	65	1	70	91	25550	0.00E+00	0.6	0.00E+00	0	0	0.00E+00
	0	2000	0.2	0	65	1	70	91	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
1,2-DCE	0	2000	0.2	0.01	65	1	70	91	25550	0.00E+00	0.009	0.00E+00	0	0	0.00E+00
Acetone	0.0165	2000	0.2	0.01	65	1	70	91	25550	6.73E-10	1	6.73E-10	2.399E-12	0	0.00E+00
Methylene Chloride	0	2000	0.2	0.01	65	1	70	91	25550	0.00E+00	0.06	0.00E+00	0	0.0075	0.00E+00
Trichloroethene	0.004	2000	0.2	0.01	65	1	70	91	25550	1.63E-10	0	0.00E+00	5.815E-13	0.011	6.40E-15
Benzene	0.002	2000	0.2	0.01	65	1	70	91	25550	8.16E-11	0	0.00E+00	2.907E-13	0.029	8.43E-15
	0	2000	0.2	0	65	1	70	91	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Notebook = ConstrAV											HI =	6.73E-10		CR =	1.48E-14

TABLE 4
CONSTRUCTION WORKER INHALATION SCENARIO, AVERAGE EXPOSURE AREA B (ATLAS MISSILE AREA)

chemical	C(x) (mg/m3)	IR (m3/h)	ET (h/d)	EF (d/y)	ED (yr)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0	0.83	4	65	1	70	91	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
HMX	0	0.83	4	65	1	70	91	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
	0	0.83	4	65	1	70	91	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Vanadium	0	0.83	4	65	1	70	91	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
	0	0.83	4	65	1	70	91	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Di-N-Butylphthalate	0	0.83	4	65	1	70	91	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Diethylphthalate	0	0.83	4	65	1	70	91	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Phenol	0	0.83	4	65	1	70	91	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
	0	0.83	4	65	1	70	91	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
1,2-DCE	0	0.83	4	65	1	70	91	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Acetone	4.3E-05	0.83	4	65	1	70	91	25550	1.47E-06	0	0.00E+00	5.22E-09	0	0.00E+00
Methylene Chloride	0	0.83	4	65	1	70	91	25550	0.00E+00	0.86	0.00E+00	0.00E+00	0.00165	0.00E+00
Trichloroethene	0.00055	0.83	4	65	1	70	91	25550	1.86E-05	0	0.00E+00	6.61E-08	0.017	1.12E-09
Benzene	0.00026	0.83	4	65	1	70	91	25550	8.74E-06	0	0.00E+00	3.11E-08	0.029	9.03E-10
	0	0.83	4	65	1	70	91	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Notebook = ConstrAV										HI =	0.00E+00		CR =	2.03E-09

TABLE 1
CHEMICAL PARAMETER TABLE FOR SUBSURFACE SOIL, AVERAGE EXPOSURE AREA C (LOAD LINE 1)

Chemical	Average Concentration					Reference Dose		Slope Factor		Permeability Constant	Dermal Absorption
	Surface Soil (mg/kg)	Sediment (mg/kg)	Surface Water (mg/L)	Ground Water (mg/L)	Air (mg/m3)	Oral	Inhalatio	Oral	Inhalation	(cm/hr)	(Soil)
RDX	0				0.00E+00	0.003		0.11		0.000348	0.01
HMX	0				0.00E+00	0.05				0.000348	0.01
Vanadium	0				0.00E+00	0.007				0.001	0.001
Di-N-Butylphthalate	0				0 00E+00	1				0.363	0.01
Diethylphthalate	0				0.00E+00	8				0.00502	0.01
Phenol	0				0.00E+00	0.6				0.00554	0 01
1,2-DCE	0				0.00E+00	0.009				0.00128	0.01
Acetone	0.0138				3.62E-05	1				0.00057	0.01
Methylene Chloride	0				0.00E+00	0.06	0.86	0.0075	0.00165	0.00446	0.01
Trichloroethene	0.0063				8.63E-04			0.011	0.017	0.0148	0.01
Benzene	0							0.029	0.029		0.01

Notebook = ChemData

* PC not available for HMX, value for RDX substituted
Where subchronic RfDs were not available, chronic values were substituted

TABLE 2
CONSTRUCTION WORKER SOIL INGESTION SCENARIO, AVERAGE EXPOSURE AREA C (LOAD LINE 1)

chemical	C(x) (mg/kg)	IR (mg/d)	EF (d/y)	ED (yr)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0	10	65	1	70	91	25550	0.00E+00	0.003	0.00E+00	0.00E+00	0.11	0.00E+00
HMX	0	10	65	1	70	91	25550	0.00E+00	0.05	0.00E+00	0.00E+00	0	0.00E+00
	0	10	65	1	70	91	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Vanadium	0	10	65	1	70	91	25550	0.00E+00	0.007	0.00E+00	0.00E+00	0	0.00E+00
	0	10	65	1	70	91	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Di-N-Butylphthalate	0	10	65	1	70	91	25550	0.00E+00	1	0.00E+00	0.00E+00	0	0.00E+00
Diethylphthalate	0	10	65	1	70	91	25550	0.00E+00	8	0.00E+00	0.00E+00	0	0.00E+00
Phenol	0	10	65	1	70	91	25550	0.00E+00	0.6	0.00E+00	0.00E+00	0	0.00E+00
	0	10	65	1	70	91	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
1,2-DCE	0	10	65	1	70	91	25550	0.00E+00	0.009	0.00E+00	0.00E+00	0	0.00E+00
Acetone	0.0138	10	65	1	70	91	25550	1.41E-09	1	1.41E-09	5.02E-12	0	0.00E+00
Methylene Chloride	0	10	65	1	70	91	25550	0.00E+00	0.06	0.00E+00	0.00E+00	0.0075	0.00E+00
Trichloroethene	0.0063	10	65	1	70	91	25550	6.43E-10	0	0.00E+00	2.29E-12	0.011	2.52E-14
Benzene	0	10	65	1	70	91	25550	0.00E+00	0	0.00E+00	0.00E+00	0.029	0.00E+00
	0	10	65	1	70	91	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Notebook = ConstrAV									HI =	1.41E-09		CR =	2.52E-14

TABLE 3
CONSTRUCTION WORKER DERMAL SOIL CONTACT SCENARIO, AVERAGE EXPOSURE AREA C (LOAD LINE 1)

chemical	C(x) (mg/kg)	SA (cm2)	AD (mg/cm2	AB unitless	EF (d/y)	ED (yr)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0	2000	0.2	0.01	65	1	70	91	25550	0.00E+00	0.003	0.00E+00	0	0.11	0.00E+00
HMX	0	2000	0.2	0.01	65	1	70	91	25550	0.00E+00	0.05	0.00E+00	0	0	0.00E+00
	0	2000	0.2	0	65	1	70	91	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Vanadium	0	2000	0.2	0.001	65	1	70	91	25550	0.00E+00	0.007	0.00E+00	0	0	0.00E+00
	0	2000	0.2	0	65	1	70	91	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Di-N-Butylphthalate	0	2000	0.2	0.01	65	1	70	91	25550	0.00E+00	1	0.00E+00	0	0	0.00E+00
Diethylphthalate	0	2000	0.2	0.01	65	1	70	91	25550	0.00E+00	8	0.00E+00	0	0	0.00E+00
Phenol	0	2000	0.2	0.01	65	1	70	91	25550	0.00E+00	0.6	0.00E+00	0	0	0.00E+00
	0	2000	0.2	0	65	1	70	91	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
1,2-DCE	0	2000	0.2	0.01	65	1	70	91	25550	0.00E+00	0.009	0.00E+00	0	0	0.00E+00
Acetone	0.0138	2000	0.2	0.01	65	1	70	91	25550	5.63E-10	1	5.63E-10	2.006E-12	0	0.00E+00
Methylene Chloride	0	2000	0.2	0.01	65	1	70	91	25550	0.00E+00	0.06	0.00E+00	0	0.0075	0.00E+00
Trichloroethene	0.0063	2000	0.2	0.01	65	1	70	91	25550	2.57E-10	0	0.00E+00	9.159E-13	0.011	1.01E-14
Benzene	0	2000	0.2	0.01	65	1	70	91	25550	0.00E+00	0	0.00E+00	0	0.029	0.00E+00
	0	2000	0.2	0	65	1	70	91	25550	0.00E+00	0	0.00E+00	0	0	0.00E+00
Notebook = ConstrAV												HI = 5.63E-10			CR = 1.01E-14

TABLE 4
CONSTRUCTION WORKER INHALATION SCENARIO, AVERAGE EXPOSURE AREA C (LOAD LINE 1)

chemical	C(x) (mg/m3)	IH (m3/h)	ET (h/d)	EF (d/y)	ED (yr)	BW (kg)	AT1 non-cancer	AT2 cancer	CDI non-cancer	RfD	Hazard Quotient	CDI cancer	Slope Factor	Cancer Risk
RDX	0	0.83	4	65	1	70	91	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
HMX	0	0.83	4	65	1	70	91	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
	0	0.83	4	65	1	70	91	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Vanadium	0	0.83	4	65	1	70	91	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
	0	0.83	4	65	1	70	91	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Di-N-Butylphthalate	0	0.83	4	65	1	70	91	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Diethylphthalate	0	0.83	4	65	1	70	91	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Phenol	0	0.83	4	65	1	70	91	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
	0	0.83	4	65	1	70	91	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
1,2-DCE	0	0.83	4	65	1	70	91	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Acetone	3.6E-05	0.83	4	65	1	70	91	25550	1.23E-06	0	0.00E+00	4.37E-09	0	0.00E+00
Methylene Chloride	0	0.83	4	65	1	70	91	25550	0.00E+00	0.86	0.00E+00	0.00E+00	0.00165	0.00E+00
Trichloroethene	0.00086	0.83	4	65	1	70	91	25550	2.92E-05	0	0.00E+00	1.04E-07	0.017	1.77E-09
Benzene	0	0.83	4	65	1	70	91	25550	0.00E+00	0	0.00E+00	0.00E+00	0.029	0.00E+00
	0	0.83	4	65	1	70	91	25550	0.00E+00	0	0.00E+00	0.00E+00	0	0.00E+00
Notebook = ConstrAV										HI =	0.00E+00		CR =	1.77E-09

ATTACHMENT JB
RAE SHOWER MODEL CALCULATIONS

MEAD FORMER NOP
CONCENTRATION IN
SHOWER OF VOLATILE
CHEMICALS IN
GROUNDWATER - INHALATION Acetone AREA A AVERAGE CONC

Assumptions

Water flow rate (Qw) = 9.5 L/min (approx. 2.5 gal/min)
Volume of shower (Vd) = 4 1 m3 (approx 3 ft x 6ft x 8ft)
Fraction volatilized (F) = 100%
Air change rate of room (ach) = 0.03/min (approx 2 changes per hour)
Mixing factor (K) = 1
Time (t) = one minute time intervals

$$C(i) = [(Qw \times Cw \times F) / (K \times Vd \times ach)](1-e^{-(K)(ach)(t)}) + Cs\,(e^{-(K)(ach)(t)})$$

|----------C(a)----------C(b)----|

C(i) = Indoor Air Concentration
S = Emission Rate (= Qw x Cw x F)
K = Mixing Rate
V = Volume of room
Q = Air flow rate in and out of room
t = time interval
C(s) = C(i) at time = (t-1)

First part of equation is constant

C(a) (mg/m3)	Qw (L/min)	Cw (mg/L)	F (unitless)	K (unitless)	Vd (m3)	ach (min^-1_)	t (min)
0 007419	9 500000	0 003250	1 000000	1.000000	4.100000	0 030000	1 000000

Second part of equation is dependent on C(i) at t-1

$$Cb = Cs\,(e^{-(K)(ach)(t)})$$

where C(s) = C(i) at (t-1)

	C(b) (mg/m3)	Cs (mg/m3)	K (unitless)	ach (min^-1)	t (min)
0-1 min	0.000000	0.000000	1 000000	0.030000	**1.000000**
1-2 min	0 007199	0 007419	1 000000	0 030000	**1.000000**
2-3 min	0 014186	0 014618	1 000000	0 030000	**1.000000**
3-4 min	0 020966	0 021605	1 000000	0.030000	**1.000000**
4-5 min	0 027546	0 028385	1 000000	0 030000	**1.000000**
5-6 min	0 033931	0 034965	1 000000	0.030000	**1.000000**
6-7 min	0 040128	0 041350	1 000000	0 030000	**1.000000**

Third part of equation is dependent on above two

C(i) = C(a) + C(b)

	C(i) (mg/m3)	C(a) (mg/m3)	C(b) (mg/m3)
0-1 min	0 007419	0 007419	**0.000000**
1-2 min	0 014618	0 007419	**0.007199**
2-3 min	0 021605	0.007419	**0.014186**
3-4 min	0 028385	0 007419	**0.020966**
4-5 min	0 034965	0 007419	**0.027546**
5-6 min	0 041350	0 007419	**0.033931**
6-7 min	0.047546	0 007419	**0.040128**

Average Concentration = 2 80E-02 (mg/m3)

MEAD FORMER NOP
CONCENTRATION IN
SHOWER OF VOLATILE
CHEMICALS IN
GROUNDWATER - INHALATION Methylene Chloride AREA A AVERAGE CONC

Assumptions

Water flow rate (Qw) = 9 5 L/min (approx. 2.5 gal/min)
Volume of shower (Vd) = 4 1 m3 (approx 3 ft x 6ft x 8ft)
Fraction volatilized (F) = 100%
Air change rate of room (ach) = 0.03/min (approx 2 changes per hour)
Mixing factor (K) = 1
Time (t) = one minute time intervals

$$C(i) = [(Qw \times Cw \times F) / (K \times Vd \times ach)](1-e^{-(K)(ach)(t)}) + Cs\,(e^{-(K)(ach)(t)})$$

|----------C(a)----------| -----C(b)----|

C(i) = Indoor Air Concentration
S = Emission Rate (= Qw x Cw x F)
K = Mixing Rate
V = Volume of room
Q = Air flow rate in and out of room
t = time interval
C(s) = C(i) at time = (t-1)

First part of equation is constant:

C(a) (mg/m3)	Qw (L/min)	Cw (mg/L)	F (unitless)	K (unitless)	Vd (m3)	ach (min^-1)	t (min)
0 003903	9 500000	0 001710	1 000000	1 000000	4.100000	0 030000	1 000000

Second part of equation is dependent on C(i) at t-1

$$Cb = Cs\,(e^{-(K)(ach)(t)})$$

where C(s) = C(i) at (t-1)

	C(b) (mg/m3)	Cs (mg/m3)	K (unitless)	ach (min^-1)	t (min)
0-1 min	0 000000	0 000000	1 000000	0 030000	**1.000000**
1-2 min	0 003788	0 003903	1.000000	0 030000	**1.000000**
2-3 min	0 007464	0 007691	1 000000	0 030000	**1.000000**
3-4 min	0 011031	0 011367	1 000000	0 030000	**1.000000**
4-5 min	0 014493	0 014935	1.000000	0 030000	**1.000000**
5-6 min	0 017853	0 018397	1.000000	0 030000	**1.000000**
6-7 min	0 021113	0 021756	1 000000	0.030000	**1.000000**

Third part of equation is dependent on above two

C(i) = C(a) + C(b)

	C(i) (mg/m3)	C(a) (mg/m3)	C(b) (mg/m3)
0-1 min	0 003903	[illegible]	**0.000000**
1-2 min	0 007691	[illegible]	**0.003788**
2-3 min	0 011367	[illegible]	**0.007464**
3-4 min	0.014935	[illegible]	**0.011031**
4-5 min	0 018397	[illegible]	**0.014493**
5-6 min	0 021756	0 003903	**0.017853**
6-7 min	0 025017	0 003903	**0.021113**

Average Concentration = 1.47E-02 (mg/m3)

MEAD FORMER NOP
CONCENTRATION IN
SHOWER OF VOLATILE
CHEMICALS IN
GROUNDWATER - INHALATION Tetrachloroethene AREA A AVERAGE CONC

Assumptions:

Water flow rate (Qw) = 9 5 L/min (approx. 2 5 gal/min)
Volume of shower (Vd) = 4 1 m3 (approx 3 ft x 6ft x 8ft)
Fraction volatilized (F) = 100%
Air change rate of room (ach) = 0.03/min (approx 2 changes per hour)
Mixing factor (K) = 1
Time (t) = one minute time intervals

$$C(i) = [(Qw \times Cw \times F) / (K \times Vd \times ach)](1-e^{-(K)(ach)(t)}) + Cs(e^{-(K)(ach)(t)})$$

|----------C(a)----------| -----C(b)-----|

C(i) = Indoor Air Concentration
S = Emission Rate (= Qw x Cw x F)
K = Mixing Rate
V = Volume of room
Q = Air flow rate in and out of room
t = time interval
C(s) = C(i) at time = (t-1)

First part of equation is constant:

C(a) (mg/m3)	Qw (L/min)	Cw (mg/L)	F (unitless)	K (unitless)	Vd (m3)	ach (min^-1_)	t (min)
0.001552	9 500000	0 000680	1.000000	1.000000	4 100000	0 030000	1 000000

Second part of equation is dependent on C(i) at t-1:

$$Cb = Cs(e^{-(K)(ach)(t)})$$

where C(s) = C(i) at (t-1)

	C(b) (mg/m3)	Cs (mg/m3)	K (unitless)	ach (min^-1)	t (min)
0-1 min	0 000000	0 000000	1.000000	0 030000	**1.000000**
1-2 min	0 001506	0.001552	1 000000	0.030000	**1.000000**
2-3 min	0 002968	0 003059	1 000000	0.030000	**1.000000**
3-4 min	0 004387	0 004520	1 000000	0 030000	**1.000000**
4-5 min	0 005763	0.005939	1 000000	0 030000	**1.000000**
5-6 min	0 007099	0 007316	1 000000	0 030000	**1.000000**
6-7 min	0 008396	0 008652	1 000000	0 030000	**1.000000**

Third part of equation is dependent on above two.

C(i) = C(a) + C(b)

	C(i) (mg/m3)	C(a) (mg/m3)	C(b) (mg/m3)
0-1 min	0 001552	0 001552	**0.000000**
1-2 min	0.003059	0.001552	**0.001506**
2-3 min	0 004520	0 001552	**0.002968**
3-4 min	0 005939	0 001552	**0.004387**
4-5 min	0 007316	0.001552	**0.005763**
5-6 min	0 008652	0 001552	**0.007099**
6-7 min	0 009948	0 001552	**0.008396**

Average Concentration = 5.86E-03 (mg/m3)

MEAD FORMER NOP
CONCENTRATION IN
SHOWER OF VOLATILE
CHEMICALS IN
GROUNDWATER - INHALATION DCE AREA B AVERAGE CONC

Assumptions

Water flow rate (Qw) = 9 5 L/min (approx 2 5 gal/min)
Volume of shower (Vd) = 4 1 m3 (approx 3 ft x 6ft x 8ft)
Fraction volatilized (F) = 100%
Air change rate of room (ach) = 0 03/min (approx 2 changes per hour)
Mixing factor (K) = 1
Time (t) = one minute time intervals

$$C(i) = [(Qw \times Cw \times F) / (K \times Vd \times ach)] (1-e^{-(K)(ach)(t)}) + Cs (e^{-(K)(ach)(t)})$$

|----------C(a)---------- -----C(b)----|

C(i) = Indoor Air Concentration
S = Emission Rate (= Qw x Cw x F)
K = Mixing Rate
V = Volume of room
Q = Air flow rate in and out of room
t = time interval
C(s) = C(i) at time = (t-1)

First part of equation is constant

C(a) (mg/m3)	Qw (L/min)	Cw (mg/L)	F (unitless)	K (unitless)	Vd (m3)	ach (min^-1_)	t (min)
0 001278	9 500000	0 000560	1 000000	1.000000	4 100000	0 030000	1 000000

Second part of equation is dependent on C(i) at t-1

$$Cb = Cs (e^{-(K)(ach)(t)})$$

where C(s) = C(i) at (t-1)

	C(b) (mg/m3)	Cs (mg/m3)	K (unitless)	ach (min^-1)	t (min)
0-1 min	0 000000	0 000000	1 000000	0 030000	**1.000000**
1-2 min	0 001241	0 001278	1.000000	0 030000	**1.000000**
2-3 min	0 002444	0 002519	1 000000	0 030000	**1.000000**
3-4 min	0 003613	0 003723	1 000000	0 030000	**1.000000**
4-5 min	0 004746	0 004891	1 000000	0 030000	**1.000000**
5-6 min	0 005847	0 006025	1 000000	0 030000	**1.000000**
6-7 min	0 006914	0 007125	1 000000	0 030000	**1.000000**

Third part of equation is dependent on above two

C(i) = C(a) + C(b)

	C(i) (mg/m3)	C(a) (mg/m3)	C(b) (mg/m3)
0-1 min	0 001278	0 001278	**0.000000**
1-2 min	0 002519	0 001278	**0.001241**
2-3 min	0 003723	0 001278	**0.002444**
3-4 min	0 004891	0 001278	**0.003613**
4-5 min	0 006025	0 001278	**0.004746**
5-6 min	0 007125	0 001278	**0.005847**
6-7 min	0 008193	0 001278	**0.006914**

Average Concentration = 4 82E-03 (mg/m3)

MEAD FORMER NOP
CONCENTRATION IN
SHOWER OF VOLATILE
CHEMICALS IN
GROUNDWATER - INHALATION Methylene Chloride AREA B AVERAGE CONC

Assumptions

Water flow rate (Qw) = 9.5 L/min (approx 2.5 gal/min)
Volume of shower (Vd) = 4.1 m3 (approx 3 ft x 6ft x 8ft)
Fraction volatilized (F) = 100%
Air change rate of room (ach) = 0.03/min (approx 2 changes per hour)
Mixing factor (K) = 1
Time (t) = one minute time intervals

$$C(i) = [(Qw \times Cw \times F) / (K \times Vd \times ach)](1-e^{-(K)(ach)(t)}) + Cs\,(e^{-(K)(ach)(t)})$$

|----------C(a)----------| -----C(b)-----|

C(i) = Indoor Air Concentration
S = Emission Rate (= Qw x Cw x F)
K = Mixing Rate
V = Volume of room
Q = Air flow rate in and out of room
t = time interval
C(s) = C(i) at time = (t-1)

First part of equation is constant:

C(a) (mg/m3)	Qw (L/min)	Cw (mg/L)	F (unitless)	K (unitless)	Vd (m3)	ach (min^-1_)	t (min)
0.006574	9.500000	0.002880	1.000000	1.000000	4.100000	0.030000	1.000000

Second part of equation is dependent on C(i) at t-1:

$$Cb = Cs\,(e^{-(K)(ach)(t)})$$

where C(s) = C(i) at (t-1)

	C(b) (mg/m3)	Cs (mg/m3)	K (unitless)	ach (min^-1)	t (min)
0-1 min	0.000000	0.000000	1.000000	0.030000	**1.000000**
1-2 min	0.006380	0.006574	1.000000	0.030000	**1.000000**
2-3 min	0.012571	0.012954	1.000000	0.030000	**1.000000**
3-4 min	0.018579	0.019145	1.000000	0.030000	**1.000000**
4-5 min	0.024410	0.025153	1.000000	0.030000	**1.000000**
5-6 min	0.030068	0.030984	1.000000	0.030000	**1.000000**
6-7 min	0.035559	0.036642	1.000000	0.030000	**1.000000**

Third part of equation is dependent on above two.

C(i) = C(a) + C(b)

	C(i) (mg/m3)	C(a) (mg/m3)	C(b) (mg/m3)
0-1 min	0.006574	0.006574	**0.000000**
1-2 min	0.012954	0.006574	**0.006380**
2-3 min	0.019145	0.006574	**0.012571**
3-4 min	0.025153	0.006574	**0.018579**
4-5 min	0.030984	0.006574	**0.024410**
5-6 min	0.036642	0.006574	**0.030068**
6-7 min	0.042133	0.006574	**0.035559**

Average Concentration = 2.48E-02 (mg/m3)

MEAD FORMER NOP
CONCENTRATION IN
SHOWER OF VOLATILE
CHEMICALS IN
GROUNDWATER - INHALATION Trichloroethene AREA B AVERAGE CONC

Assumptions

Water flow rate (Qw) = 9 5 L/min (approx. 2.5 gal/min)
Volume of shower (Vd) = 4 1 m3 (approx 3 ft x 6ft x 8ft)
Fraction volatilized (F) = 100%
Air change rate of room (ach) = 0 03/min (approx 2 changes per hour)
Mixing factor (K) = 1
Time (t) = one minute time intervals

$$C(t) = [(Qw \times Cw \times F) / (K \times Vd \times ach)](1-e^{-(K)(ach)(t)}) + Cs(e^{-(K)(ach)(t)})$$

|----------C(a)----------|-----C(b)-----|

C(t) = Indoor Air Concentration
S = Emission Rate (= Qw x Cw x F)
K = Mixing Rate
V = Volume of room
Q = Air flow rate in and out of room
t = time interval
C(s) = C(t) at time = (t-1)

First part of equation is constant

C(a) (mg/m3)	Qw (L/min)	Cw (mg/L)	F (unitless)	K (unitless)	Vd (m3)	acn (min^-1_)	t (min)
0 038098	9 500000	0 016690	1 000000	1 000000	4.100000	0 030000	1 000000

Second part of equation is dependent on C(t) at t-1

$$Cb = Cs(e^{-(K)(ach)(t)})$$

where C(s) = C(t) at (t-1)

	C(b) (mg/m3)	Cs (mg/m3)	K (unitless)	ach (min^-1)	t (min)
0-1 min	0 000000	0 000000	1 000000	0.030000	**1.000000**
1-2 min	0 036972	0 038098	1.000000	0.030000	**1.000000**
2-3 min	0 072851	0 075069	1 000000	0.030000	**1.000000**
3-4 min	0 107669	0 110948	1 000000	0 030000	**1.000000**
4-5 min	0 141459	0 145767	1.000000	0.030000	**1.000000**
5-6 min	0 174250	0.179556	1 000000	0 030000	**1.000000**
6-7 min	0 206072	0 212347	1.000000	0 030000	**1.000000**

Third part of equation is dependent on above two

C(t) = C(a) + C(b)

	C(t) (mg/m3)	C(a) (mg/m3)	C(b) (mg/m3)
0-1 min	0 038098	0 038098	**0.000000**
1-2 min	0 075069	0 038098	**0.036972**
2-3 min	0 110948	0 038098	**0.072851**
3-4 min	0 145767	0 038098	**0.107669**
4-5 min	0 179556	0 038098	**0.141459**
5-6 min	0 212347	0 038098	**0.174250**
6-7 min	0 244169	0 038098	**0.206072**

Average Concentration = 1 44E-01 (mg/m3)

MEAD FORMER NOP
CONCENTRATION IN
SHOWER OF VOLATILE
CHEMICALS IN
GROUNDWATER - INHALATION DCE AREA C AVERAGE CONC.

Assumptions:

Water flow rate (Qw) = 9.5 L/min (approx. 2.5 gal/min)
Volume of shower (Vd) = 4.1 m3 (approx 3 ft x 6ft x 8ft)
Fraction volatilized (F) = 100%
Air change rate of room (ach) = 0.03/min (approx 2 changes per hour)
Mixing factor (K) = 1
Time (t) = one minute time intervals

$$C(i) = [(Qw \times Cw \times F) / (K \times Vd \times ach)](1-e^{-(K)(ach)(t)}) + Cs(e^{-(K)(ach)(t)})$$

|----------C(a)---------- ----C(b)----|

C(i) = Indoor Air Concentration
S = Emission Rate (= Qw x Cw x F)
K = Mixing Rate
V = Volume of room
Q = Air flow rate in and out of room
t = time interval
C(s) = C(i) at time = (t-1)

First part of equation is constant:

C(a) (mg/m3)	Qw (L/min)	Cw (mg/L)	F (unitless)	K (unitless)	Vd (m3)	ach (min^-1_)	t (min)
0.004291	9.500000	0.001880	1.000000	1.000000	4.100000	0.030000	1.000000

Second part of equation is dependent on C(i) at t-1:

$$Cb = Cs(e^{-(K)(ach)(t)})$$

where C(s) = C(i) at (t-1)

	C(b) (mg/m3)	Cs (mg/m3)	K (unitless)	ach (min^-1)	t (min)
0-1 min	0.000000	0.000000	1.000000	0.030000	1.000000
1-2 min	0.004165	0.004291	1.000000	0.030000	1.000000
2-3 min	0.008206	0.008456	1.000000	0.030000	1.000000
3-4 min	0.012128	0.012497	1.000000	0.030000	1.000000
4-5 min	0.015934	0.016420	1.000000	0.030000	1.000000
5-6 min	0.019628	0.020226	1.000000	0.030000	1.000000
6-7 min	0.023212	0.023919	1.000000	0.030000	1.000000

Third part of equation is dependent on above two:

C(i) = C(a) + C(b)

	C(i) (mg/m3)	C(a) (mg/m3)	C(b) (mg/m3)
0-1 min	0.004291	0.004291	0.000000
1-2 min	0.008456	0.004291	0.004165
2-3 min	0.012497	0.004291	0.008206
3-4 min	0.016420	0.004291	0.012128
4-5 min	0.020226	0.004291	0.015934
5-6 min	0.023919	0.004291	0.019628
6-7 min	0.027504	0.004291	0.023212

Average Concentration = 1.62E-02 (mg/m3)

MEAD FORMER NOP
CONCENTRATION IN
SHOWER OF VOLATILE
CHEMICALS IN
GROUNDWATER - INHALATION Acetone AREA C AVERAGE CONC.

Assumptions

Water flow rate (Qw) = 9.5 L/min (approx. 2.5 gal/min)
Volume of shower (Vd) = 4.1 m3 (approx 3 ft x 6ft x 8ft)
Fraction volatilized (F) = 100%
Air change rate of room (ach) = 0 03/min (approx 2 changes per hour)
Mixing factor (K) = 1
Time (t) = one minute time intervals

$$C(i) = [(Qw \times Cw \times F) / (K \times Vd \times ach)](1-e^{-(K)(ach)(t)}) + Cs\,(e^{-(K)(ach)(t)})$$

|----------C(a)----------| -----C(b)---|

C(i) = Indoor Air Concentration
S = Emission Rate (= Qw x Cw x F)
K = Mixing Rate
V = Volume of room
Q = Air flow rate in and out of room
t = time interval
C(s) = C(i) at time = (t-1)

First part of equation is constant

C(a) (mg/m3)	Qw (L/min)	Cw (mg/L)	F (unitless)	K (unitless)	Vd (m3)	ach (min^-1_)	t (min)
0 016367	9 500000	0.007170	1 000000	1 000000	4 100000	0 030000	1 000000

Second part of equation is dependent on C(i) at t-1.

$$Cb = Cs\,(e^{-(K)(ach)(t)})$$

where C(s) = C(i) at (t-1)

	C(b) (mg/m3)	Cs (mg/m3)	K (unitless)	ach (min^-1)	t (min)
0-1 min	0 000000	0.000000	1 000000	0 030000	**1.000000**
1-2 min	0 015883	0 016367	1 000000	0 030000	**1.000000**
2-3 min	0 031297	0.032250	1 000000	0 030000	**1.000000**
3-4 min	0 046255	0 047663	1 000000	0 030000	**1.000000**
4-5 min	0 060771	0 062621	1 000000	0 030000	**1.000000**
5-6 min	0 074857	0 077137	1 000000	0 030000	**1.000000**
6-7 min	0 088528	0 091224	1 000000	0 030000	**1.000000**

Third part of equation is dependent on above two.

C(i) = C(a) + C(b)

	C(i) (mg/m3)	C(a) (mg/m3)	C(b) (mg/m3)
0-1 min	0 016367	0 016367	**0.000000**
1-2 min	0 032250	0 016367	**0.015883**
2-3 min	0 047663	0 016367	**0.031297**
3-4 min	0 062621	0 016367	**0.046255**
4-5 min	0 077137	0.016367	**0.060771**
5-6 min	0 091224	0.016367	**0.074857**
6-7 min	0 104895	0.016367	**0.088528**

Average Concentration = 6 17E-02 (mg/m3)

MEAD FORMER NOP
CONCENTRATION IN
SHOWER OF VOLATILE
CHEMICALS IN
GROUNDWATER - INHALATION Methylene Chloride AREA C AVERAGE CONC.

Assumptions:

Water flow rate (Qw) = 9.5 L/min (approx. 2.5 gal/min)
Volume of shower (Vd) = 4.1 m3 (approx 3 ft x 6ft x 8ft)
Fraction volatilized (F) = 100%
Air change rate of room (ach) = 0.03/min (approx 2 changes per hour)
Mixing factor (K) = 1
Time (t) = one minute time intervals

$$C(i) = [(Qw \times Cw \times F) / (K \times Vd \times ach)](1-e^{-(K)(ach)(t)}) + Cs\,(e^{-(K)(ach)(t)})$$

|----------C(a)----------| -----C(b)-----|

C(i) = Indoor Air Concentration
S = Emission Rate (= Qw x Cw x F)
K = Mixing Rate
V = Volume of room
Q = Air flow rate in and out of room
t = time interval
C(s) = C(i) at time = (t-1)

First part of equation is constant:

C(a) (mg/m3)	Qw (L/min)	Cw (mg/L)	F (unitless)	K (unitless)	Vd (m3)	ach (min^-1_)	t (min)
0.004794	9.500000	0.002100	1.000000	1.000000	4.100000	0.030000	1.000000

Second part of equation is dependent on C(i) at t-1:

$$Cb = Cs\,(e^{-(K)(ach)(t)})$$

where C(s) = C(i) at (t-1)

	C(b) (mg/m3)	Cs (mg/m3)	K (unitless)	ach (min^-1)	t (min)
0-1 min	0.000000	0.000000	1.000000	0.030000	**1.000000**
1-2 min	0.004652	0.004794	1.000000	0.030000	**1.000000**
2-3 min	0.009166	0.009446	1.000000	0.030000	**1.000000**
3-4 min	0.013547	0.013960	1.000000	0.030000	**1.000000**
4-5 min	0.017799	0.018341	1.000000	0.030000	**1.000000**
5-6 min	0.021925	0.022592	1.000000	0.030000	**1.000000**
6-7 min	0.025929	0.026718	1.000000	0.030000	**1.000000**

Third part of equation is dependent on above two:

C(i) = C(a) + C(b)

	C(i) (mg/m3)	C(a) (mg/m3)	C(b) (mg/m3)
0-1 min	0.004794	0.004794	**0.000000**
1-2 min	0.009446	0.004794	**0.004652**
2-3 min	0.013960	0.004794	**0.009166**
3-4 min	0.018341	0.004794	**0.013547**
4-5 min	0.022592	0.004794	**0.017799**
5-6 min	0.026718	0.004794	**0.021925**
6-7 min	0.030722	0.004794	**0.025929**

Average Concentration = 1.81E-02 (mg/m3)

MEAD FORMER NOP
CONCENTRATION IN
SHOWER OF VOLATILE
CHEMICALS IN
GROUNDWATER - INHALATION Trichloroethene AREA C AVERAGE CONC.

Assumptions

Water flow rate (Qw) = 9 5 L/min (approx 2 5 gal/min)
Volume of shower (Vd) = 4 1 m3 (approx 3 ft x 6ft x 8ft)
Fraction volatilized (F) = 100%
Air change rate of room (ach) = 0 03/min (approx 2 changes per hour)
Mixing factor (K) = 1
Time (t) = one minute time intervals

$$C(i) = [(Qw \times Cw \times F) / (K \times Vd \times ach)](1-e^{-(K)(ach)(t)}) + Cs(e^{-(K)(ach)(t)})$$

|----------C(a)----------| -----C(b)-----|

C(i) = Indoor Air Concentration
S = Emission Rate (= Qw x Cw x F)
K = Mixing Rate
V = Volume of room
Q = Air flow rate in and out of room
t = time interval
C(s) = C(i) at time = (t-1)

First part of equation is constant

C(a) (mg/m3)	Qw (L/min)	Cw (mg/L)	F (unitless)	K (unitless)	Vd (m3)	ach (min^-1_)	t (min)
0 071014	9 500000	0 031110	1.000000	1 000000	4 100000	0 030000	1 000000

Second part of equation is dependent on C(i) at t-1

$$Cb = Cs(e^{-(K)(ach)(t)})$$

where C(s) = C(i) at (t-1)

	C(b) (mg/m3)	Cs (mg/m3)	K (unitless)	ach (min^-1)	t (min)
0-1 min	0 000000	0.000000	1 000000	0 030000	**1.000000**
1-2 min	0 068915	0 071014	1 000000	0 030000	**1.000000**
2-3 min	0 135793	0 139928	1 000000	0 030000	**1.000000**
3-4 min	0 200695	0 206807	1 000000	0.030000	**1.000000**
4-5 min	0 263678	0 271708	1.000000	0.030000	**1.000000**
5-6 min	0 324800	0 334692	1 000000	0 030000	**1.000000**
6-7 min	0 384115	0 395814	1 000000	0 030000	**1.000000**

Third part of equation is dependent on above two

C(i) = C(a) + C(b)

	C(i) (mg/m3)	C(a) (mg/m3)	C(b) (mg/m3)
0-1 min	0 071014	0 071014	**0.000000**
1-2 min	0 139928	0 071014	**0.068915**
2-3 min	0 206807	0 071014	**0.135793**
3-4 min	0 271708	0 071014	**0.200695**
4-5 min	0 334692	0 071014	**0.263678**
5-6 min	0 395814	0 071014	**0.324800**
6-7 min	0 455129	0 071014	**0.384115**

Average Concentration = 2 68E-01 (mg/m3)

MEAD FORMER NOP
CONCENTRATION IN
SHOWER OF VOLATILE
CHEMICALS IN
GROUNDWATER - INHALATION 1,1,1-Trichloroethane AREA C AVERAGE CONC.

Assumptions

Water flow rate (Qw) = 9.5 L/min (approx. 2.5 gal/min)
Volume of shower (Vd) = 4.1 m3 (approx 3 ft x 6ft x 8ft)
Fraction volatilized (F) = 100%
Air change rate of room (ach) = 0 03/min (approx 2 changes per hour)
Mixing factor (K) = 1
Time (t) = one minute time intervals

$$C(i) = [(Qw \times Cw \times F) / (K \times Vd \times ach)](1-e^{-(K)(ach)(t)}) + Cs\,(e^{-(K)(ach)(t)})$$

|----------C(a)----------| ----C(b)-----|

C(i) = Indoor Air Concentration
S = Emission Rate (= Qw x Cw x F)
K = Mixing Rate
V = Volume of room
Q = Air flow rate in and out of room
t = time interval
C(s) = C(i) at time = (t-1)

First part of equation is constant:

C(a) (mg/m3)	Qw (L/min)	Cw (mg/L)	F (unitless)	K (unitless)	Vd (m3)	ach (min^-1)	t (min)
0 004520	9.500000	0.001980	1 000000	1.000000	4.100000	0 030000	1.000000

Second part of equation is dependent on C(i) at t-1:

$$Cb = Cs\,(e^{-(K)(ach)(t)})$$

where C(s) = C(i) at (t-1)

	C(b) (mg/m3)	Cs (mg/m3)	K (unitless)	ach (min^-1)	t (min)
0-1 min	0.000000	0 000000	1 000000	0.030000	**1.000000**
1-2 min	0 004386	0.004520	1 000000	0.030000	**1.000000**
2-3 min	0 008643	0.008906	1.000000	0.030000	**1.000000**
3-4 min	0 012773	0.013162	1.000000	0 030000	**1.000000**
4-5 min	0 016782	0.017293	1.000000	0 030000	**1.000000**
5-6 min	0 020672	0 021301	1.000000	0.030000	**1.000000**
6-7 min	0 024447	0.025192	1 000000	0.030000	**1.000000**

Third part of equation is dependent on above two:

C(i) = C(a) + C(b)

	C(i) (mg/m3)	C(a) (mg/m3)	C(b) (mg/m3)
0-1 min	0.004520	0 004520	**0.000000**
1-2 min	0.008906	0.004520	**0.004386**
2-3 min	0.013162	0.004520	**0.008643**
3-4 min	0 017293	0.004520	**0.012773**
4-5 min	0.021301	0.004520	**0.016782**
5-6 min	0.025192	0.004520	**0.020672**
6-7 min	0.028967	0 004520	**0.024447**

Average Concentration = 1 70E-02 (mg/m3)

MEAD FORMER NOP
CONCENTRATION IN
SHOWER OF VOLATILE
CHEMICALS IN
GROUNDWATER - INHALATION 1,2-Dichloropropane AREA C AVERAGE CONC.

Assumptions

Water flow rate (Qw) = 9 5 L/min (approx. 2 5 gal/min)
Volume of shower (Vd) = 4 1 m3 (approx 3 ft x 6ft x 8ft)
Fraction volatilized (F) = 100%
Air change rate of room (ach) = 0.03/min (approx 2 changes per hour)
Mixing factor (K) = 1
Time (t) = one minute time intervals

$$C(i) = [(Qw \times Cw \times F) / (K \times Vd \times ach)](1 - e^{-(K)(ach)(t)}) + Cs\,(e^{-(K)(ach)(t)})$$

|------C(a)------| ----C(b)----|

C(i) = Indoor Air Concentration
S = Emission Rate (= Qw x Cw x F)
K = Mixing Rate
V = Volume of room
Q = Air flow rate in and out of room
t = time interval
C(s) = C(i) at time = (t-1)

First part of equation is constant

C(a) (mg/m3)	Qw (L/min)	Cw (mg/L)	F (unitless)	K (unitless)	Vd (m3)	ach (min^-1_)	t (min)
0 005159	9.500000	0 002260	1 000000	1 000000	4.100000	0 030000	1 000000

Second part of equation is dependent on C(i) at t-1

$$Cb = Cs\,(e^{-(K)(ach)(t)})$$

where C(s) = C(i) at (t-1)

	C(b) (mg/m3)	Cs (mg/m3)	K (unitless)	ach (min^-1)	t (min)
0-1 min	0 000000	0 000000	1 000000	0 030000	**1.000000**
1-2 min	0 005006	0 005159	1 000000	0 030000	**1.000000**
2-3 min	0 009865	0 010165	1 000000	0.030000	**1.000000**
3-4 min	0 014580	0 015024	1 000000	0 030000	**1.000000**
4-5 min	0 019155	0 019738	1.000000	0.030000	**1.000000**
5-6 min	0 023595	0 024314	1 000000	0 030000	**1.000000**
6-7 min	0 027904	0.028754	1 000000	0.030000	**1.000000**

Third part of equation is dependent on above two.

C(i) = C(a) + C(b)

	C(i) (mg/m3)	C(a) (mg/m3)	C(b) (mg/m3)
0-1 min	0 005159	0 005159	**0.000000**
1-2 min	0 010165	0.005159	**0.005006**
2-3 min	0 015024	0 005159	**0.009865**
3-4 min	0 019738	0 005159	**0.014580**
4-5 min	0 024314	0 005159	**0.019155**
5-6 min	0 028754	0.005159	**0.023595**
6-7 min	0 033063	0 005159	**0.027904**

Average Concentration = 1 95E-02 (mg/m3)

MEAD FORMER NOP
CONCENTRATION IN
SHOWER OF VOLATILE
CHEMICALS IN
GROUNDWATER - INHALATION Chloroform AREA C AVERAGE CONC.

Assumptions

Water flow rate (Qw) = 9 5 L/min (approx. 2.5 gal/min)
Volume of shower (Vd) = 4 1 m3 (approx 3 ft x 6ft x 8ft)
Fraction volatilized (F) = 100%
Air change rate of room (ach) = 0.03/min (approx 2 changes per hour)
Mixing factor (K) = 1
Time (t) = one minute time intervals

$$C(i) = [(Qw \times Cw \times F) / (K \times Vd \times ach)]\,(1-e^{-(K)(ach)(t)}) + Cs\,(e^{-(K)(ach)(t)})$$

|----------C(a)----------| ----C(b)----|

C(i) = Indoor Air Concentration
S = Emission Rate (= Qw x Cw x F)
K = Mixing Rate
V = Volume of room
Q = Air flow rate in and out of room
t = time interval
C(s) = C(i) at time = (t-1)

First part of equation is constant:

C(a) (mg/m3)	Qw (L/min)	Cw (mg/L)	F (unitless)	K (unitless)	Vd (m3)	ach (min^-1_)	t (min)
0.004976	9.500000	0 002180	1.000000	1 000000	4 100000	0.030000	1 000000

Second part of equation is dependent on C(i) at t-1.

$$Cb = Cs\,(e^{-(K)(ach)(t)})$$

where C(s) = C(i) at (t-1)

	C(b) (mg/m3)	Cs (mg/m3)	K (unitless)	ach (min^-1)	t (min)
0-1 min	0 000000	0.000000	1.000000	0 030000	**1.000000**
1-2 min	0 004829	0 004976	1 000000	0.030000	**1.000000**
2-3 min	0 009516	0.009805	1 000000	0.030000	**1.000000**
3-4 min	0 014063	0 014492	1.000000	0 030000	**1.000000**
4-5 min	0 018477	0.019040	1.000000	0.030000	**1.000000**
5-6 min	0 022760	0 023453	1 000000	0.030000	**1.000000**
6-7 min	0 026916	0 027736	1.000000	0.030000	**1.000000**

Third part of equation is dependent on above two

C(i) = C(a) + C(b)

	C(i) (mg/m3)	C(a) (mg/m3)	C(b) (mg/m3)
0-1 min	0 004976	0.004976	**0.000000**
1-2 min	0 009805	0.004976	**0.004829**
2-3 min	0 014492	0.004976	**0.009516**
3-4 min	0.019040	0.004976	**0.014063**
4-5 min	0 023453	0 004976	**0.018477**
5-6 min	0 027736	0 004976	**0.022760**
6-7 min	0.031893	0 004976	**0.026916**

Average Concentration = 1 88E-02 (mg/m3)

ATTACHMENT JC
RAE CHEMICAL DATA

EXPLOSIVE CONCENTRATION CALCULATION
AREA A
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS.RES.
AMW-048-82	0.25	ND	U	0.125	-2.079441542
BMW-016-082	0.25	ND	U	0.125	-2.079441542
BMW-048-082	0.25	ND	U	0.125	-2.079441542
BMW-057-082	0.25	ND	U	0.125	-2.079441542
CMW-016-082	0.25	ND	U	0.125	-2.079441542
DMW-048-082	0.25	ND	U	0.125	-2.079441542
			1,3,5-Trinitrobenzene (TNB)		
			MEAN =	0.125	
			GEOMEAN =	0.125	
			MEAN OF LN=	-2.079441542	
			N=	6	
			S=	0	
			H=	NA	
			UCL=	1.25E-01	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-048-082	0.25	ND	U	0.125	-2.079441542
BMW-016-082	0.25	ND	U	0.125	-2.079441542
BMW-048-082	0.25	ND	U	0.125	-2.079441542
BMW-057-082	0.25	ND	U	0.125	-2.079441542
CMW-016-082	0.25	ND	U	0.125	-2.079441542
DMW-048-082	0.25	ND	U	0.125	-2.079441542
			1,3-Dinitrobenzene (DNB)		
			MEAN =	0.125	
			GEOMEAN =	0.125	
			MEAN OF LN=	-2.079441542	
			N=	6	
			S=	0	
			H=	NA	
			UCL=	1.25E-01	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-048-082	0.25	ND	U	0.125	-2.079441542
BMW-016-082	0.25	ND	U	0.125	-2.079441542
BMW-048-082	0.25	ND	U	0.125	-2.079441542
BMW-057-082	0.25	ND	U	0.125	-2.079441542
CMW-016-082	0.25	ND	U	0.125	-2.079441542
DMW-048-082	0.25	ND	U	0.125	-2.079441542
			2,4,6-Trinitrotoluene (TNT)		
			MEAN =	0.125	
			GEOMEAN =	0.125	
			MEAN OF LN=	-2.079441542	
			N=	6	
			S=	0	
			H=	NA	
			UCL=	1.25E-01	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

EXPLOSIVE CONCENTRATION CALCULATION
AREA A
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-048-082	0.25	ND	U	0.125	-2.079441542
BMW-016-082	0.25	ND	U	0.125	-2.079441542
BMW-048-082	0.25	ND	U	0.125	-2.079441542
BMW-057-082	0.25	ND	U	0.125	-2.079441542
CMW-016-082	0.25	ND	U	0.125	-2.079441542
DMW-048-082	0.25	ND	U	0.125	-2.079441542
			2,4-Dinitrotoluene (24DNT)		
			MEAN =	0.125	
			GEOMEAN =	0.125	
			MEAN OF LN=	-2.079441542	
			N=	6	
			S=	0	
			H=	NA	
			UCL=	1.25E-01	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-048-082	0.5	ND	U	0.25	-1.386294361
BMW-016-082	0.5	ND	U	0.25	-1.386294361
BMW-048-082	0.5	ND	U	0.25	-1.386294361
BMW-057-082	0.5	ND	U	0.25	-1.386294361
CMW-016-082	0.5	ND	U	0.25	-1.386294361
DMW-048-082	0.5	ND	U	0.25	-1.386294361
			2,6-Dinitrotoluene (26DNT)		
			MEAN =	0.25	
			GEOMEAN =	0.25	
			MEAN OF LN=	-1.386294361	
			N=	6	
			S=	2.6656E-08	
			H=	NA	
			UCL=	2.50E-01	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-048-082	0.5	ND	U	0.25	-1.386294361
BMW-016-082	0.5	ND	U	0.25	-1.386294361
BMW-048-082	0.5	ND	U	0.25	-1.386294361
BMW-057-082	0.5	ND	U	0.25	-1.386294361
CMW-016-082	0.5	ND	U	0.25	-1.386294361
DMW-048-082	0.5	ND	U	0.25	-1.386294361
			2-Nitrotoluene (2NT)		
			MEAN =	0.25	
			GEOMEAN =	0.25	
			MEAN OF LN=	-1.386294361	
			N=	6	
			S=	2.6656E-08	
			H=	NA	
			UCL=	2.50E-01	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

EXPLOSIVE CONCENTRATION CALCULATION
AREA A
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-048-082	0.5	ND	U	0.25	-1.386294361
BMW-016-082	0.5	ND	U	0.25	-1.386294361
BMW-048-082	0.5	ND	U	0.25	-1.386294361
BMW-057-082	0.5	ND	U	0.25	-1.386294361
CMW-016-082	0.5	ND	U	0.25	-1.386294361
DMW-048-082	0.5	ND	U	0.25	-1.386294361
			3-Nitrotoluene (3NT)		
			MEAN =	0.25	
			GEOMEAN =	0.25	
			MEAN OF LN=	-1.386294361	
			N=	6	
			S=	2.6656E-08	
			H=	NA	
			UCL=	2.50E-01	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-048-082	0.5	ND	U	0.25	-1.386294361
BMW-016-082	0.5	ND	U	0.25	-1.386294361
BMW-048-082	0.5	ND	U	0.25	-1.386294361
BMW-057-082	0.5	ND	U	0.25	-1.386294361
CMW-016-082	0.5	ND	U	0.25	-1.386294361
DMW-048-082	0.5	ND	U	0.25	-1.386294361
			4-Nitrotoluene (4NT)		
			MEAN =	0.25	
			GEOMEAN =	0.25	
			MEAN OF LN=	-1.386294361	
			N=	6	
			S=	2.6656E-08	
			H=	NA	
			UCL=	2.50E-01	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-048-082	0.15	ND	U	0.075	-2.590267165
BMW-016-082	0.15	ND	U	0.075	-2.590267165
BMW-048-082	0.15	ND	U	0.075	-2.590267165
BMW-057-082	0.15	ND	U	0.075	-2.590267165
CMW-016-082				0.91	-0.094310679
DMW-048-082	0.15	ND	U	0.075	-2.590267165
			Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)		
			MEAN =	0.214166667	
			GEOMEAN =	0.113690616	
			MEAN OF LN=	-2.174274418	
			N=	6	
			S=	1.018969968	
			H=	4.191	
			UCL=	1.29E+00	
			MIN =	0.91	
			MAX =	0.91	
			NO. OF DET=	1	

EXPLOSIVE CONCENTRATION CALCULATION
AREA A
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-048-082	0.5	ND	U	0.25	-1.386294361
BMW-016-082	0.5	ND	U	0.25	-1.386294361
BMW-048-082	0.5	ND	U	0.25	-1.386294361
BMW-057-082	0.5	ND	U	0.25	-1.386294361
CMW-016-082	0.5	ND	U	0.25	-1.386294361
DMW-048-082	0.5	ND	U	0.25	-1.386294361
			Methyl-2,4,6-trinitrophenylnitramine (Tetryl)		
			MEAN =	0.25	
			GEOMEAN =	0.25	
			MEAN OF LN=	-1.386294361	
			N=	6	
			S=	2.6656E-08	
			H=	NA	
			UCL=	2.50E-01	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-048-082	0.25	ND	U	0.125	-2.079441542
BMW-016-082	0.25	ND	U	0.125	-2.079441542
BMW-048-082	0.25	ND	U	0.125	-2.079441542
BMW-057-082	0.25	ND	U	0.125	-2.079441542
CMW-016-082	0.25	ND	U	0.125	-2.079441542
DMW-048-082	0.25	ND	U	0.125	-2.079441542
			Nitrobenzene (NB)		
			MEAN =	0.125	
			GEOMEAN =	0.125	
			MEAN OF LN=	-2.079441542	
			N=	6	
			S=	0	
			H=	NA	
			UCL=	1.25E-01	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-048-082	0.25	ND	U	0.125	-2.079441542
BMW-016-082	0.25	ND	U	0.125	-2.079441542
BMW-048-082	0.25	ND	U	0.125	-2.079441542
BMW-057-082	0.25	ND	U	0.125	-2.079441542
CMW-016-082	0.25	ND	U	0.125	-2.079441542
DMW-048-082	0.25	ND	U	0.125	-2.079441542
			Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)		
			MEAN =	0.125	
			GEOMEAN =	0.125	
			MEAN OF LN=	-2.079441542	
			N=	6	
			S=	0	
			H=	NA	
			UCL=	1.25E-01	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

EXPLOSIVE CONCENTRATION CALCULATION
AREA B
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-019-082	0.25	ND	U	0.125	-2.079441542
AMW-058-082	0.25	ND	U	0.125	-2.079441542
AMW-059-082	0.25	ND	U	0.125	-2.079441542
BMW-019-082	0.25	ND	U	0.125	-2.079441542
BMW-058-082	0.25	ND	U	0.125	-2.079441542
BMW-059-082	0.25	ND	U	0.125	-2.079441542
CMW-019-082	0.25	ND	U	0.125	-2.079441542
DMW-059-082	0.25	ND	U	0.125	-2.079441542
			1,3,5-Trinitrobenzene (TNB)		
			MEAN =	0.125	
			GEOMEAN =	0.125	
			MEAN OF LN=	-2.079441542	
			N=	8	
			S=	0	
			H=	NA	
			UCL=	1.25E-01	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-019-082	0.25	ND	U	0.125	-2.079441542
AMW-058-082	0.25	ND	U	0.125	-2.079441542
AMW-059-082	0.25	ND	U	0.125	-2.079441542
BMW-019-082	0.25	ND	U	0.125	-2.079441542
BMW-058-082	0.25	ND	U	0.125	-2.079441542
BMW-059-082	0.25	ND	U	0.125	-2.079441542
CMW-019-082	0.25	ND	U	0.125	-2.079441542
DMW-059-082	0.25	ND	U	0.125	-2.079441542
			1,3-Dinitrobenzene (DNB)		
			MEAN =	0.125	
			GEOMEAN =	0.125	
			MEAN OF LN=	-2.079441542	
			N=	8	
			S=	0	
			H=	NA	
			UCL=	1.25E-01	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

EXPLOSIVE CONCENTRATION CALCULATION
AREA B
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-019-082	0.25	ND	U	0.125	-2.079441542
AMW-058-082	0.25	ND	U	0.125	-2.079441542
AMW-059-082	0.25	ND	U	0.125	-2.079441542
BMW-019-082	0.25	ND	U	0.125	-2.079441542
BMW-058-082	0.25	ND	U	0.125	-2.079441542
BMW-059-082	0.25	ND	U	0.125	-2.079441542
CMW-019-082	0.25	ND	U	0.125	-2.079441542
DMW-059-082	0.25	ND	U	0.125	-2.079441542
			2,4,6-Trinitrotoluene (TNT)		
			MEAN =	0.125	
			GEOMEAN =	0.125	
			MEAN OF LN=	-2.079441542	
			N=	8	
			S=	0	
			H=	NA	
			UCL=	1.25E-01	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-019-082	0.25	ND	U	0.125	-2.079441542
AMW-058-082	0.25	ND	U	0.125	-2.079441542
AMW-059-082	0.25	ND	U	0.125	-2.079441542
BMW-019-082	0.25	ND	U	0.125	-2.079441542
BMW-058-082	0.25	ND	U	0.125	-2.079441542
BMW-059-082	0.25	ND	U	0.125	-2.079441542
CMW-019-082	0.25	ND	U	0.125	-2.079441542
DMW-059-082	0.25	ND	U	0.125	-2.079441542
			2,4-Dinitrotoluene (24DNT)		
			MEAN =	0.125	
			GEOMEAN =	0.125	
			MEAN OF LN=	-2.079441542	
			N=	8	
			S=	0	
			H=	NA	
			UCL=	1.25E-01	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

B07NE003702-08297

EXPLOSIVE CONCENTRATION CALCULATION
AREA B
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-019-082	0.5	ND	U	0.25	-1.386294361
AMW-058-082	0.5	ND	U	0.25	-1.386294361
AMW-059-082	0.5	ND	U	0.25	-1.386294361
BMW-019-082	0.5	ND	U	0.25	-1.386294361
BMW-058-082	0.5	ND	U	0.25	-1.386294361
BMW-059-082	0.5	ND	U	0.25	-1.386294361
CMW-019-082	0.5	ND	U	0.25	-1.386294361
DMW-059-082	0.5	ND	U	0.25	-1.386294361
			2,6-Dinitrotoluene (26DNT)		
			MEAN =	0.25	
			GEOMEAN =	0.25	
			MEAN OF LN=	-1.386294361	
			N=	8	
			S=	1.593E-08	
			H=	NA	
			UCL=	2.50E-01	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-019-082	0.5	ND	U	0.25	-1.386294361
AMW-058-082	0.5	ND	U	0.25	-1.386294361
AMW-059-082	0.5	ND	U	0.25	-1.386294361
BMW-019-082	0.5	ND	U	0.25	-1.386294361
BMW-058-082	0.5	ND	U	0.25	-1.386294361
BMW-059-082	0.5	ND	U	0.25	-1.386294361
CMW-019-082	0.5	ND	U	0.25	-1.386294361
DMW-059-082	0.5	ND	U	0.25	-1.386294361
			2-Nitrotoluene (2NT)		
			MEAN =	0.25	
			GEOMEAN =	0.25	
			MEAN OF LN=	-1.386294361	
			N=	8	
			S=	1.593E-08	
			H=	NA	
			UCL=	2.50E-01	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

EXPLOSIVE CONCENTRATION CALCULATION
AREA B
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-019-082	0.5	ND	U	0.25	-1.386294361
AMW-058-082	0.5	ND	U	0.25	-1.386294361
AMW-059-082	0.5	ND	U	0.25	-1.386294361
BMW-019-082	0.5	ND	U	0.25	-1.386294361
BMW-058-082	0.5	ND	U	0.25	-1.386294361
BMW-059-082	0.5	ND	U	0.25	-1.386294361
CMW-019-082	0.5	ND	U	0.25	-1.386294361
DMW-059-082	0.5	ND	U	0.25	-1.386294361
			3-Nitrotoluene (3NT)		
			MEAN =	0.25	
			GEOMEAN =	0.25	
			MEAN OF LN=	-1.386294361	
			N=	8	
			S=	1.593E-08	
			H=	NA	
			UCL=	2.50E-01	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-019-082	0.5	ND	U	0.25	-1.386294361
AMW-058-082	0.5	ND	U	0.25	-1.386294361
AMW-059-082	0.5	ND	U	0.25	-1.386294361
BMW-019-082	0.5	ND	U	0.25	-1.386294361
BMW-058-082	0.5	ND	U	0.25	-1.386294361
BMW-059-082	0.5	ND	U	0.25	-1.386294361
CMW-019-082	0.5	ND	U	0.25	-1.386294361
DMW-059-082	0.5	ND	U	0.25	-1.386294361
			4-Nitrotoluene (4NT)		
			MEAN =	0.25	
			GEOMEAN =	0.25	
			MEAN OF LN=	-1.386294361	
			N=	8	
			S=	1.593E-08	
			H=	NA	
			UCL=	2.50E-01	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

B07NE003702-08299

EXPLOSIVE CONCENTRATION CALCULATION
AREA B
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-019-082	0.15	ND	U	0.075	-2.590267165
AMW-058-082	0.15	ND	U	0.075	-2.590267165
AMW-059-082	0.15	ND	U	0.075	-2.590267165
BMW-019-082	0.15	ND	U	0.075	-2.590267165
BMW-058-082	0.15	ND	U	0.075	-2.590267165
BMW-059-082	0.15	ND	U	0.075	-2.590267165
CMW-019-082	0.15	ND	U	0.075	-2.590267165
DMW-059-082	0.15	ND	U	0.075	-2.590267165
			Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)		
			MEAN =	0.075	
			GEOMEAN =	0.075	
			MEAN OF LN=	-2.590267165	
			N=	8	
			S=	0	
			H=	NA	
			UCL=	7.50E-02	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-019-082	0.5	ND	U	0.25	-1.386294361
AMW-058-082	0.5	ND	U	0.25	-1.386294361
AMW-059-082	0.5	ND	U	0.25	-1.386294361
BMW-019-082	0.5	ND	U	0.25	-1.386294361
BMW-058-082	0.5	ND	U	0.25	-1.386294361
BMW-059-082	0.5	ND	U	0.25	-1.386294361
CMW-019-082	0.5	ND	U	0.25	-1.386294361
DMW-059-082	0.5	ND	U	0.25	-1.386294361
			Methyl-2,4,6-trinitrophenylnitramine (Tetryl)		
			MEAN =	0.25	
			GEOMEAN =	0.25	
			MEAN OF LN=	-1.386294361	
			N=	8	
			S=	1.593E-08	
			H=	NA	
			UCL=	2.50E-01	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

EXPLOSIVE CONCENTRATION CALCULATION
AREA B
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-019-082	0.25	ND	U	0.125	-2.079441542
AMW-058-082	0.25	ND	U	0.125	-2.079441542
AMW-059-082	0.25	ND	U	0.125	-2.079441542
BMW-019-082	0.25	ND	U	0.125	-2.079441542
BMW-058-082	0.25	ND	U	0	-2.079441542
BMW-059-082	0.25	ND	U	0	-2.079441542
CMW-019-082	0.25	ND	U	0.125	-2.079441542
DMW-059-082	0.25	ND	U	0.125	-2.079441542
			Nitrobenzene (NB)		
			MEAN =	0.125	
			GEOMEAN =	0.125	
			MEAN OF LN=	-2.079441542	
			N=	8	
			S=	0	
			H=	NA	
			UCL=	1.25E-01	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-019-082	0.25	ND	U	0.125	-2.079441542
AMW-058-082	0.25	ND	U	0.125	-2.079441542
AMW-059-082	0.25	ND	U	0.125	-2.079441542
BMW-019-082	0.25	ND	U	0.125	-2.079441542
BMW-058-082	0.25	ND	U	0.125	-2.079441542
BMW-059-082	0.25	ND	U	0.125	-2.079441542
CMW-019-082	0.25	ND	U	0.125	-2.079441542
DMW-059-082	0.25	ND	U	0.125	-2.079441542
			Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)		
			MEAN =	0.125	
			GEOMEAN =	0.125	
			MEAN OF LN=	-2.079441542	
			N=	8	
			S=	0	
			H=	NA	
			UCL=	1.25E-01	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

EXPLOSIVE CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
		1,3,5-Trinitrobenzene (TNB)			
AMW-001-082	0.25	ND	U	0.125	-2.079441542
AMW-002-082	0.25	ND	U	0.125	-2.079441542
AMW-003-082	0.25	ND	U	0.125	-2.079441542
AMW-004-082	0.25	ND	U	0.125	-2.079441542
AMW-005-082	0.25	ND	U	0.125	-2.079441542
AMW-006-082	0.25	ND	U	0.125	-2.079441542
AMW-007-082	0.25	ND	U	0.125	-2.079441542
AMW-008-082	0.25	ND	U	0.125	-2.079441542
AMW-009-082	0.25	ND	U	0.125	-2.079441542
AMW-010-082	0.25	ND	U	0.125	-2.079441542
AMW-011-082	0.25	ND	U	0.125	-2.079441542
AMW-012-082	0.25	ND	U	0.125	-2.079441542
AMW-013-082	0.25	ND	U	0.125	-2.079441542
AMW-014-082	0.25	ND	U	0.125	-2.079441542
AMW-015-082	0.25	ND	U	0.125	-2.079441542
AMW-017-082	0.25	ND	U	0.125	-2.079441542
AMW-018-082	0.25	ND	U	0.125	-2.079441542
AMW-020-082	0.25	ND	U	0.125	-2.079441542
AMW-021-082	0.25	ND	U	0.125	-2.079441542
AMW-022-082	0.25	ND	U	0.125	-2.079441542
AMW-023-082	0.25	ND	U	0.125	-2.079441542
AMW-024-082	0.25	ND	U	0.125	-2.079441542
AMW-025-082	0.25	ND	U	0.125	-2.079441542
AMW-026-082	0.25	ND	U	0.125	-2.079441542
AMW-027-082	0.25	ND	U	0.125	-2.079441542
AMW-028-082	0.25	ND	U	0.125	-2.079441542
AMW-029-082	0.25	ND	U	0.125	-2.079441542
AMW-030-082	0.25	ND	U	0.125	-2.079441542
AMW-031-082	0.25	ND	U	0.125	-2.079441542
AMW-032-082	0.25	ND	U	0.125	-2.079441542
AMW-033-082	0.25	ND	U	0.125	-2.079441542
AMW-034-082	0.25	ND	U	0.125	-2.079441542
AMW-035-082	0.25	ND	U	0.125	-2.079441542
AMW-036-082	0.25	ND	U	0.125	-2.079441542
AMW-037-082	0.25	ND	U	0.125	-2.079441542
AMW-038-082	0.25	ND	U	0.125	-2.079441542
AMW-039-082	0.25	ND	U	0.125	-2.079441542
AMW-040-082	0.25	ND	U	0.125	-2.079441542
AMW-041-082	0.25	ND	U	0.125	-2.079441542
AMW-042-082	0.25	ND	U	0.125	-2.079441542
AMW-043-082	0.25	ND	U	0.125	-2.079441542
AMW-044-082	0.25	ND	U	0.125	-2.079441542
AMW-045-082	0.25	ND	U	0.125	-2.079441542
AMW-046-082	0.25	ND	U	0.125	-2.079441542
AMW-052-082	0.25	ND	U	0.125	-2.079441542
AMW-053-082	0.25	ND	U	0.125	-2.079441542
AMW-054-082	0.25	ND	U	0.125	-2.079441542
AMW-055-082	0.25	ND	U	0.125	-2.079441542
AMW-056-082	0.25	ND	U	0.125	-2.079441542

EXPLOSIVE CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
BMW-001-082	0.25	ND	U	0.125	-2.079441542
BMW-002-082				2.2	0.78845736
BMW-003-082	0.25	ND	U	0.125	-2.079441542
BMW-004-082	0.25	ND	U	0.125	-2.079441542
BMW-005-082				2	0.693147181
BMW-006-082	0.25	ND	U	0.125	-2.079441542
BMW-007-082				0.39	-0.94160854
BMW-008-082	0.25	ND	U	0.125	-2.079441542
BMW-009-082	0.25	ND	U	0.125	-2.079441542
BMW-010-082	0.25	ND	U	0.125	-2.079441542
BMW-017-082	0.25	ND	U	0.125	-2.079441542
BMW-018-082	0.25	ND	U	0.125	-2.079441542
BMW-020-082	0.25	ND	U	0.125	-2.079441542
BMW-021-082				0.57	-0.562118918
BMW-022-082	0.25	ND	U	0.125	-2.079441542
BMW-023-082	0.25	ND	U	0.125	-2.079441542
BMW-024-082				0.32	-1.139434283
BMW-025-082	0.25	ND	U	0.125	-2.079441542
BMW-026-082	0.25	ND	U	0.125	-2.079441542
BMW-027-082	0.25	ND	U	0.125	-2.079441542
BMW-028-082	0.25	ND	U	0.125	-2.079441542
BMW-029-082	0.25	ND	U	0.125	-2.079441542
BMW-030-082	0.25	ND	U	0.125	-2.079441542
BMW-031-082	0.25	ND	U	0.125	-2.079441542
BMW-032-082	0.25	ND	U	0.125	-2.079441542
BMW-033-082	0.25	ND	U	0.125	-2.079441542
BMW-034-082	0.25	ND	U	0.125	-2.079441542
BMW-035-082	0.25	ND	U	0.125	-2.079441542
BMW-036-082	0.25	ND	U	0.125	-2.079441542
BMW-037-082	0.25	ND	U	0.125	-2.079441542
BMW-040-082	0.25	ND	U	0.125	-2.079441542
BMW-041-082	0.25	ND	U	0.125	-2.079441542
BMW-042-082	0.25	ND	U	0.125	-2.079441542
BMW-043-082	0.25	ND	U	0.125	-2.079441542
BMW-044-082	0.25	ND	U	0.125	-2.079441542
BMW-045-082	0.25	ND	U	0.125	-2.079441542
BMW-046-082	0.25	ND	U	0.125	-2.079441542
BMW-052-082	0.25	ND	U	0.125	-2.079441542
BMW-053-082	0.25	ND	U	0.125	-2.079441542
BMW-054-082	0.25	ND	U	0.125	-2.079441542
BMW-055-082	0.25	ND	U	0.125	-2.079441542
BMW-056-082	0.25	ND	U	0.125	-2.079441542
CMW-017-082	0.25	ND	U	0.125	-2.079441542
CMW-018-082	0.25	ND	U	0.125	-2.079441542
CMW-020-082	0.25	ND	U	0.125	-2.079441542
DMW-009-082	0.25	ND	U	0.125	-2.079441542
DMW-021-082	0.25	ND	U	0.125	-2.079441542
DMW-025-082	0.25	ND	U	0.125	-2.079441542
DMW-028-082	0.25	ND	U	0.125	-2.079441542
DMW-032-082	0.25	ND	U	0.125	-2.079441542
DMW-033-082	0.25	ND	U	0.125	-2.079441542
DMW-034-082	0.25	ND	U	0.125	-2.079441542

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EXPLOSIVE CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
DMW-035-082	0.25	ND	U	0.125	-2.079441542
DMW-036-082	0.25	ND	U	0.125	-2.079441542
DMW-037-082	0.25	ND	U	0.125	-2.079441542
DMW-038-082	0.25	ND	U	0.125	-2.079441542
DMW-039-082	0.25	ND	U	0.125	-2.079441542
DMW-041-082	0.25	ND	U	0.125	-2.079441542
DMW-042-082	0.25	ND	U	0.125	-2.079441542
DMW-043-082	0.25	ND	U	0.125	-2.079441542
DMW-044-082	0.25	ND	U	0.125	-2.079441542
DMW-045-082	0.25	ND	U	0.125	-2.079441542
DMW-046-082	0.25	ND	U	0.125	-2.079441542

1,3,5-Trinitrobenzene (TNB)

MEAN =	0.168348214
GEOMEAN =	0.135744562
MEAN OF LN=	-1.996980376
N=	112
S=	0.42
H=	1.777
UCL=	1.59E-01
MIN =	0.32
MAX =	2.2
NO. OF DET=	5

EXPLOSIVE CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
			1,3-Dinitrobenzene (DNB)		
AMW-001-082	0.25	ND	U	0.125	-2.079441542
AMW-002-082	0.25	ND	U	0.125	-2.079441542
AMW-003-082	0.25	ND	U	0.125	-2.079441542
AMW-004-082	0.25	ND	U	0.125	-2.079441542
AMW-005-082	0.25	ND	U	0.125	-2.079441542
AMW-006-082	0.25	ND	U	0.125	-2.079441542
AMW-007-082	0.25	ND	U	0.125	-2.079441542
AMW-008-082	0.25	ND	U	0.125	-2.079441542
AMW-009-082	0.25	ND	U	0.125	-2.079441542
AMW-010-082	0.25	ND	U	0.125	-2.079441542
AMW-011-082	0.25	ND	U	0.125	-2.079441542
AMW-012-082	0.25	ND	U	0.125	-2.079441542
AMW-013-082	0.25	ND	U	0.125	-2.079441542
AMW-014-082	0.25	ND	U	0.125	-2.079441542
AMW-015-082	0.25	ND	U	0.125	-2.079441542
AMW-017-082	0.25	ND	U	0.125	-2.079441542
AMW-018-082	0.25	ND	U	0.125	-2.079441542
AMW-020-082	0.25	ND	U	0.125	-2.079441542
AMW-021-082	0.25	ND	U	0.125	-2.079441542
AMW-022-082	0.25	ND	U	0.125	-2.079441542
AMW-023-082	0.25	ND	U	0.125	-2.079441542
AMW-024-082	0.25	ND	U	0.125	-2.079441542
AMW-025-082	0.25	ND	U	0.125	-2.079441542
AMW-026-082	0.25	ND	U	0.125	-2.079441542
AMW-027-082	0.25	ND	U	0.125	-2.079441542
AMW-028-082	0.25	ND	U	0.125	-2.079441542
AMW-029-082	0.25	ND	U	0.125	-2.079441542
AMW-030-082	0.25	ND	U	0.125	-2.079441542
AMW-031-082	0.25	ND	U	0.125	-2.079441542
AMW-032-082	0.25	ND	U	0.125	-2.079441542
AMW-033-082	0.25	ND	U	0.125	-2.079441542
AMW-034-082	0.25	ND	U	0.125	-2.079441542
AMW-035-082	0.25	ND	U	0.125	-2.079441542
AMW-036-082	0.25	ND	U	0.125	-2.079441542
AMW-037-082	0.25	ND	U	0.125	-2.079441542
AMW-038-082	0.25	ND	U	0.125	-2.079441542
AMW-039-082	0.25	ND	U	0.125	-2.079441542
AMW-040-082	0.25	ND	U	0.125	-2.079441542
AMW-041-082	0.25	ND	U	0.125	-2.079441542
AMW-042-082	0.25	ND	U	0.125	-2.079441542
AMW-043-082	0.25	ND	U	0.125	-2.079441542
AMW-044-082	0.25	ND	U	0.125	-2.079441542
AMW-045-082	0.25	ND	U	0.125	-2.079441542
AMW-046-082	0.25	ND	U	0.125	-2.079441542
AMW-052-082	0.25	ND	U	0.125	-2.079441542
AMW-053-082	0.25	ND	U	0.125	-2.079441542
AMW-054-082	0.25	ND	U	0.125	-2.079441542
AMW-055-082	0.25	ND	U	0.125	-2.079441542
AMW-056-082	0.25	ND	U	0.125	-2.079441542

EXPLOSIVE CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
BMW-001-082	0.25	ND	U	0.125	-2.079441542
BMW-002-082	0.25	ND	U	0.125	-2.079441542
BMW-003-082	0.25	ND	U	0.125	-2.079441542
BMW-004-082	0.25	ND	U	0.125	-2.079441542
BMW-005-082	0.25	ND	U	0.125	-2.079441542
BMW-006-082	0.25	ND	U	0.125	-2.079441542
BMW-007-082	0.25	ND	U	0.125	-2.079441542
BMW-008-082	0.25	ND	U	0.125	-2.079441542
BMW-009-082	0.25	ND	U	0.125	-2.079441542
BMW-010-082	0.25	ND	U	0.125	-2.079441542
BMW-017-082	0.25	ND	U	0.125	-2.079441542
BMW-018-082	0.25	ND	U	0.125	-2.079441542
BMW-020-082	0.25	ND	U	0.125	-2.079441542
BMW-021-082	0.25	ND	U	0.125	-2.079441542
BMW-022-082	0.25	ND	U	0.125	-2.079441542
BMW-023-082	0.25	ND	U	0.125	-2.079441542
BMW-024-082	0.25	ND	U	0.125	-2.079441542
BMW-025-082	0.25	ND	U	0.125	-2.079441542
BMW-026-082	0.25	ND	U	0.125	-2.079441542
BMW-027-082	0.25	ND	U	0.125	-2.079441542
BMW-028-082	0.25	ND	U	0.125	-2.079441542
BMW-029-082	0.25	ND	U	0.125	-2.079441542
BMW-030-082	0.25	ND	U	0.125	-2.079441542
BMW-031-082	0.25	ND	U	0.125	-2.079441542
BMW-032-082	0.25	ND	U	0.125	-2.079441542
BMW-033-082	0.25	ND	U	0.125	-2.079441542
BMW-034-082	0.25	ND	U	0.125	-2.079441542
BMW-035-082	0.25	ND	U	0.125	-2.079441542
BMW-036-082	0.25	ND	U	0.125	-2.079441542
BMW-037-082	0.25	ND	U	0.125	-2.079441542
BMW-040-082	0.25	ND	U	0.125	-2.079441542
BMW-041-082	0.25	ND	U	0.125	-2.079441542
BMW-042-082	0.25	ND	U	0.125	-2.079441542
BMW-043-082	0.25	ND	U	0.125	-2.079441542
BMW-044-082	0.25	ND	U	0.125	-2.079441542
BMW-045-082	0.25	ND	U	0.125	-2.079441542
BMW-046-082	0.25	ND	U	0.125	-2.079441542
BMW-052-082	0.25	ND	U	0.125	-2.079441542
BMW-053-082	0.25	ND	U	0.125	-2.079441542
BMW-054-082	0.25	ND	U	0.125	-2.079441542
BMW-055-082	0.25	ND	U	0.125	-2.079441542
BMW-056-082	0.25	ND	U	0.125	-2.079441542
CMW-017-082	0.25	ND	U	0.125	-2.079441542
CMW-018-082	0.25	ND	U	0.125	-2.079441542
CMW-020-082	0.25	ND	U	0.125	-2.079441542
DMW-009-082	0.25	ND	U	0.125	-2.079441542
DMW-021-082	0.25	ND	U	0.125	-2.079441542
DMW-025-082	0.25	ND	U	0.125	-2.079441542
DMW-028-082	0.25	ND	U	0.125	-2.079441542
DMW-032-082	0.25	ND	U	0.125	-2.079441542
DMW-033-082	0.25	ND	U	0.125	-2.079441542
DMW-034-082	0.25	ND	U	0.125	-2.079441542

EXPLOSIVE CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
DMW-035-082	0.25	ND	U	0.125	-2.079441542
DMW-036-082	0.25	ND	U	0.125	-2.079441542
DMW-037-082	0.25	ND	U	0.125	-2.079441542
DMW-038-082	0.25	ND	U	0.125	-2.079441542
DMW-039-082	0.25	ND	U	0.125	-2.079441542
DMW-041-082	0.25	ND	U	0.125	-2.079441542
DMW-042-082	0.25	ND	U	0.125	-2.079441542
DMW-043-082	0.25	ND	U	0.125	-2.079441542
DMW-044-082	0.25	ND	U	0.125	-2.079441542
DMW-045-082	0.25	ND	U	0.125	-2.079441542
DMW-046-082	0.25	ND	U	0.125	-2.079441542

1,3-Dinitrobenzene (DNB)

MEAN =	0.125
GEOMEAN =	0.125
MEAN OF LN=	-2.079441542
N=	112
S=	0
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO OF DET=	0

EXPLOSIVE CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
		2,4,6-Trinitrotoluene (TNT)			
AMW-001-082	0.25	ND	U	0.125	-2.079441542
AMW-002-082	0.25	ND	U	0.125	-2.079441542
AMW-003-082	0.25	ND	U	0.125	-2.079441542
AMW-004-082	0.25	ND	U	0.125	-2.079441542
AMW-005-082	0.25	ND	U	0.125	-2.079441542
AMW-006-082	0.25	ND	U	0.125	-2.079441542
AMW-007-082	0.25	ND	U	0.125	-2.079441542
AMW-008-082	0.25	ND	U	0.125	-2.079441542
AMW-009-082	0.25	ND	U	0.125	-2.079441542
AMW-010-082	0.25	ND	U	0.125	-2.079441542
AMW-011-082	0.25	ND	U	0.125	-2.079441542
AMW-012-082	0.25	ND	U	0.125	-2.079441542
AMW-013-082	0.25	ND	U	0.125	-2.079441542
AMW-014-082	0.25	ND	U	0.125	-2.079441542
AMW-015-082	0.25	ND	U	0.125	-2.079441542
AMW-017-082	0.25	ND	U	0.125	-2.079441542
AMW-018-082	0.25	ND	U	0.125	-2.079441542
AMW-020-082	0.25	ND	U	0.125	-2.079441542
AMW-021-082	0.25	ND	U	0.125	-2.079441542
AMW-022-082	0.25	ND	U	0.125	-2.079441542
AMW-023-082	0.25	ND	U	0.125	-2.079441542
AMW-024-082	0.25	ND	U	0.125	-2.079441542
AMW-025-082	0.25	ND	U	0.125	-2.079441542
AMW-026-082	0.25	ND	U	0.125	-2.079441542
AMW-027-082	0.25	ND	U	0.125	-2.079441542
AMW-028-082	0.25	ND	U	0.125	-2.079441542
AMW-029-082	0.25	ND	U	0.125	-2.079441542
AMW-030-082	0.25	ND	U	0.125	-2.079441542
AMW-031-082	0.25	ND	U	0.125	-2.079441542
AMW-032-082	0.25	ND	U	0.125	-2.079441542
AMW-033-082	0.25	ND	U	0.125	-2.079441542
AMW-034-082	0.25	ND	U	0.125	-2.079441542
AMW-035-082	0.25	ND	U	0.125	-2.079441542
AMW-036-082	0.25	ND	U	0.125	-2.079441542
AMW-037-082	0.25	ND	U	0.125	-2.079441542
AMW-038-082	0.25	ND	U	0.125	-2.079441542
AMW-039-082	0.25	ND	U	0.125	-2.079441542
AMW-040-082	0.25	ND	U	0.125	-2.079441542
AMW-041-082	0.25	ND	U	0.125	-2.079441542
AMW-042-082	0.25	ND	U	0.125	-2.079441542
AMW-043-082	0.25	ND	U	0.125	-2.079441542
AMW-044-082	0.25	ND	U	0.125	-2.079441542
AMW-045-082	0.25	ND	U	0.125	-2.079441542
AMW-046-082	0.25	ND	U	0.125	-2.079441542
AMW-052-082	0.25	ND	U	0.125	-2.079441542
AMW-053-082	0.25	ND	U	0.125	-2.079441542
AMW-054-082	0.25	ND	U	0.125	-2.079441542
AMW-055-082	0.25	ND	U	0.125	-2.079441542
AMW-056-082	0.25	ND	U	0.125	-2.079441542
BMW-001-082	0.25	ND	U	0.125	-2.079441542

EXPLOSIVE CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
BMW-002-082				6.5	1.871802177
BMW-003-082	0.25	ND	U	0.125	-2.079441542
BMW-004-082	0.25	ND	U	0.125	-2.079441542
BMW-005-082				20	2.995732274
BMW-006-082	0.25	ND	U	0.125	-2.079441542
BMW-007-082				7.5	2.014903021
BMW-008-082	0.25	ND	U	0.125	-2.079441542
BMW-009-082	0.25	ND	U	0.125	-2.079441542
BMW-010-082	0.25	ND	U	0.125	-2.079441542
BMW-017-082	0.25	ND	U	0.125	-2.079441542
BMW-018-082	0.25	ND	U	0.125	-2.079441542
BMW-020-082	0.25	ND	U	0.125	-2.079441542
BMW-021-082	0.25	ND	U	0.125	-2.079441542
BMW-022-082	0.25	ND	U	0.125	-2.079441542
BMW-023-082	0.25	ND	U	0.125	-2.079441542
BMW-024-082	0.25	ND	U	0.125	-2.079441542
BMW-025-082	0.25	ND	U	0.125	-2.079441542
BMW-026-082	0.25	ND	U	0.125	-2.079441542
BMW-027-082	0.25	ND	U	0.125	-2.079441542
BMW-028-082	0.25	ND	U	0.125	-2.079441542
BMW-029-082	0.25	ND	U	0.125	-2.079441542
BMW-030-082	0.25	ND	U	0.125	-2.079441542
BMW-031-082	0.25	ND	U	0.125	-2.079441542
BMW-032-082	0.25	ND	U	0.125	-2.079441542
BMW-033-082	0.25	ND	U	0.125	-2.079441542
BMW-034-082	0.25	ND	U	0.125	-2.079441542
BMW-035-082	0.25	ND	U	0.125	-2.079441542
BMW-036-082	0.25	ND	U	0.125	-2.079441542
BMW-037-082	0.25	ND	U	0.125	-2.079441542
BMW-040-082	0.25	ND	U	0.125	-2.079441542
BMW-041-082	0.25	ND	U	0.125	-2.079441542
BMW-042-082	0.25	ND	U	0.125	-2.079441542
BMW-043-082	0.25	ND	U	0.125	-2.079441542
BMW-044-082	0.25	ND	U	0.125	-2.079441542
BMW-045-082	0.25	ND	U	0.125	-2.079441542
BMW-046-082	0.25	ND	U	0.125	-2.079441542
BMW-052-082	0.25	ND	U	0.125	-2.079441542
BMW-053-082	0.25	ND	U	0.125	-2.079441542
BMW-054-082	0.25	ND	U	0.125	-2.079441542
BMW-055-082	0.25	ND	U	0.125	-2.079441542
BMW-056-082	0.25	ND	U	0.125	-2.079441542
CMW-017-082	0.25	ND	U	0.125	-2.079441542
CMW-018-082	0.25	ND	U	0.125	-2.079441542
CMW-020-082	0.25	ND	U	0.125	-2.079441542
DMW-009-082	0.25	ND	U	0.125	-2.079441542
DMW-021-082	0.25	ND	U	0.125	-2.079441542
DMW-025-082	0.25	ND	U	0.125	-2.079441542
DMW-028-082	0.25	ND	U	0.125	-2.079441542
DMW-032-082	0.25	ND	U	0.125	-2.079441542
DMW-033-082	0.25	ND	U	0.125	-2.079441542
DMW-034-082	0.25	ND	U	0.125	-2.079441542
DMW-035-082	0.25	ND	U	0.125	-2.079441542

B07NE003702-08309

EXPLOSIVE CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
DMW-036-082	0.25	ND	U	0.125	-2.079441542
DMW-037-082	0.25	ND	U	0.125	-2.079441542
DMW-038-082	0.25	ND	U	0.125	-2.079441542
DMW-039-082	0.25	ND	U	0.125	-2.079441542
DMW-041-082	0.25	ND	U	0.125	-2.079441542
DMW-042-082	0.25	ND	U	0.125	-2.079441542
DMW-043-082	0.25	ND	U	0.125	-2.079441542
DMW-044-082	0.25	ND	U	0.125	-2.079441542
DMW-045-082	0.25	ND	U	0.125	-2.079441542
DMW-046-082	0.25	ND	U	0.125	-2.079441542

2,4,6-Trinitrotoluene (TNT)

MEAN =	0.425223214
GEOMEAN =	0.14053596
MEAN OF LN=	-1.96229188
N=	112
S=	0.71
H=	1.96
UCL=	2.07E-01
MIN =	6.5
MAX =	20
NO. OF DET=	3

EXPLOSIVE CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
		2,4-Dinitrotoluene (24DNT)			
AMW-001-082	0.25	ND	U	0.125	-2.079441542
AMW-002-082	0.25	ND	U	0.125	-2.079441542
AMW-003-082	0.25	ND	U	0.125	-2.079441542
AMW-004-082	0.25	ND	U	0.125	-2.079441542
AMW-005-082	0.25	ND	U	0.125	-2.079441542
AMW-006-082	0.25	ND	U	0.125	-2.079441542
AMW-007-082	0.25	ND	U	0.125	-2.079441542
AMW-008-082	0.25	ND	U	0.125	-2.079441542
AMW-009-082	0.25	ND	U	0.125	-2.079441542
AMW-010-082	0.25	ND	U	0.125	-2.079441542
AMW-011-082	0.25	ND	U	0.125	-2.079441542
AMW-012-082	0.25	ND	U	0.125	-2.079441542
AMW-013-082	0.25	ND	U	0.125	-2.079441542
AMW-014-082	0.25	ND	U	0.125	-2.079441542
AMW-015-082	0.25	ND	U	0.125	-2.079441542
AMW-017-082	0.25	ND	U	0.125	-2.079441542
AMW-018-082	0.25	ND	U	0.125	-2.079441542
AMW-020-082	0.25	ND	U	0.125	-2.079441542
AMW-021-082	0.25	ND	U	0.125	-2.079441542
AMW-022-082	0.25	ND	U	0.125	-2.079441542
AMW-023-082	0.25	ND	U	0.125	-2.079441542
AMW-024-082	0.25	ND	U	0.125	-2.079441542
AMW-025-082	0.25	ND	U	0.125	-2.079441542
AMW-026-082	0.25	ND	U	0.125	-2.079441542
AMW-027-082	0.25	ND	U	0.125	-2.079441542
AMW-028-082	0.25	ND	U	0.125	-2.079441542
AMW-029-082	0.25	ND	U	0.125	-2.079441542
AMW-030-082	0.25	ND	U	0.125	-2.079441542
AMW-031-082	0.25	ND	U	0.125	-2.079441542
AMW-032-082	0.25	ND	U	0.125	-2.079441542
AMW-033-082	0.25	ND	U	0.125	-2.079441542
AMW-034-082	0.25	ND	U	0.125	-2.079441542
AMW-035-082	0.25	ND	U	0.125	-2.079441542
AMW-036-082	0.25	ND	U	0.125	-2.079441542
AMW-037-082	0.25	ND	U	0.125	-2.079441542
AMW-038-082	0.25	ND	U	0.125	-2.079441542
AMW-039-082	0.25	ND	U	0.125	-2.079441542
AMW-040-082	0.25	ND	U	0.125	-2.079441542
AMW-041-082	0.25	ND	U	0.125	-2.079441542
AMW-042-082	0.25	ND	U	0.125	-2.079441542
AMW-043-082	0.25	ND	U	0.125	-2.079441542
AMW-044-082	0.25	ND	U	0.125	-2.079441542
AMW-045-082	0.25	ND	U	0.125	-2.079441542
AMW-046-082	0.25	ND	U	0.125	-2.079441542
AMW-052-082	0.25	ND	U	0.125	-2.079441542
AMW-053-082	0.25	ND	U	0.125	-2.079441542
AMW-054-082	0.25	ND	U	0.125	-2.079441542
AMW-055-082	0.25	ND	U	0.125	-2.079441542
AMW-056-082	0.25	ND	U	0.125	-2.079441542

B07NE003702-08311

EXPLOSIVE CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
BMW-001-082	0.25	ND	U	0.125	-2.079441542
BMW-002-082	0.25	ND	U	0.125	-2.079441542
BMW-003-082	0.25	ND	U	0.125	-2.079441542
BMW-004-082	0.25	ND	U	0.125	-2.079441542
BMW-005-082				0.97	-0.030459207
BMW-006-082	0.25	ND	U	0.125	-2.079441542
BMW-007-082	0.25	ND	U	0.125	-2.079441542
BMW-008-082	0.25	ND	U	0.125	-2.079441542
BMW-009-082	0.25	ND	U	0.125	-2.079441542
BMW-010-082	0.25	ND	U	0.125	-2.079441542
BMW-017-082	0.25	ND	U	0.125	-2.079441542
BMW-018-082	0.25	ND	U	0.125	-2.079441542
BMW-020-082	0.25	ND	U	0.125	-2.079441542
BMW-021-082	0.25	ND	U	0.125	-2.079441542
BMW-022-082	0.25	ND	U	0.125	-2.079441542
BMW-023-082	0.25	ND	U	0.125	-2.079441542
BMW-024-082	0.25	ND	U	0.125	-2.079441542
BMW-025-082	0.25	ND	U	0.125	-2.079441542
BMW-026-082	0.25	ND	U	0.125	-2.079441542
BMW-027-082	0.25	ND	U	0.125	-2.079441542
BMW-028-082	0.25	ND	U	0.125	-2.079441542
BMW-029-082	0.25	ND	U	0.125	-2.079441542
BMW-030-082	0.25	ND	U	0.125	-2.079441542
BMW-031-082	0.25	ND	U	0.125	-2.079441542
BMW-032-082	0.25	ND	U	0.125	-2.079441542
BMW-033-082	0.25	ND	U	0.125	-2.079441542
BMW-034-082	0.25	ND	U	0.125	-2.079441542
BMW-035-082	0.25	ND	U	0.125	-2.079441542
BMW-036-082	0.25	ND	U	0.125	-2.079441542
BMW-037-082	0.25	ND	U	0.125	-2.079441542
BMW-040-082	0.25	ND	U	0.125	-2.079441542
BMW-041-082	0.25	ND	U	0.125	-2.079441542
BMW-042-082	0.25	ND	U	0.125	-2.079441542
BMW-043-082	0.25	ND	U	0.125	-2.079441542
BMW-044-082	0.25	ND	U	0.125	-2.079441542
BMW-045-082	0.25	ND	U	0.125	-2.079441542
BMW-046-082	0.25	ND	U	0.125	-2.079441542
BMW-052-082	0.25	ND	U	0.125	-2.079441542
BMW-053-082	0.25	ND	U	0.125	-2.079441542
BMW-054-082	0.25	ND	U	0.125	-2.079441542
BMW-055-082	0.25	ND	U	0.125	-2.079441542
BMW-056-082	0.25	ND	U	0.125	-2.079441542
CMW-017-082	0.25	ND	U	0.125	-2.079441542
CMW-018-082	0.25	ND	U	0.125	-2.079441542
CMW-020-082	0.25	ND	U	0.125	-2.079441542
DMW-009-082	0.25	ND	U	0.125	-2.079441542
DMW-021-082	0.25	ND	U	0.125	-2.079441542
DMW-025-082	0.25	ND	U	0.125	-2.079441542
DMW-028-082	0.25	ND	U	0.125	-2.079441542
DMW-032-082	0.25	ND	U	0.125	-2.079441542
DMW-033-082	0.25	ND	U	0.125	-2.079441542
DMW-034-082	0.25	ND	U	0.125	-2.079441542

EXPLOSIVE CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
DMW-035-082	0.25	ND	U	0.125	-2.079441542
DMW-036-082	0.25	ND	U	0.125	-2.079441542
DMW-037-082	0.25	ND	U	0.125	-2.079441542
DMW-038-082	0.25	ND	U	0.125	-2.079441542
DMW-039-082	0.25	ND	U	0.125	-2.079441542
DMW-041-082	0.25	ND	U	0.125	-2.079441542
DMW-042-082	0.25	ND	U	0.125	-2.079441542
DMW-043-082	0.25	ND	U	0.125	-2.079441542
DMW-044-082	0.25	ND	U	0.125	-2.079441542
DMW-045-082	0.25	ND	U	0.125	-2.079441542
DMW-046-082	0.25	ND	U	0.125	-2.079441542

2,4-Dinitrotoluene (24DNT)

MEAN =	0.132544643
GEOMEAN =	0.127307857
MEAN OF LN=	-2.061147057
N=	112
S=	0.19
H=	1.697
UCL=	1.34E-01
MIN =	0.97
MAX =	0.97
NO. OF DET=	1

EXPLOSIVE CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
		2,6-Dinitrotoluene (26DNT)			
AMW-001-082	0.5	ND	U	0.25	-1.386294361
AMW-002-082	0.5	ND	U	0.25	-1.386294361
AMW-003-082	0.5	ND	U	0.25	-1.386294361
AMW-004-082	0.5	ND	U	0.25	-1.386294361
AMW-005-082	0.5	ND	U	0.25	-1.386294361
AMW-006-082	0.5	ND	U	0.25	-1.386294361
AMW-007-082	0.5	ND	U	0.25	-1.386294361
AMW-008-082	0.5	ND	U	0.25	-1.386294361
AMW-009-082	0.5	ND	U	0.25	-1.386294361
AMW-010-082	0.5	ND	U	0.25	-1.386294361
AMW-011-082	0.5	ND	U	0.25	-1.386294361
AMW-012-082	0.5	ND	U	0.25	-1.386294361
AMW-013-082	0.5	ND	U	0.25	-1.386294361
AMW-014-082	0.5	ND	U	0.25	-1.386294361
AMW-015-082	0.5	ND	U	0.25	-1.386294361
AMW-017-082	0.5	ND	U	0.25	-1.386294361
AMW-018-082	0.5	ND	U	0.25	-1.386294361
AMW-020-082	0.5	ND	U	0.25	-1.386294361
AMW-021-082	0.5	ND	U	0.25	-1.386294361
AMW-022-082	0.5	ND	U	0.25	-1.386294361
AMW-023-082	0.5	ND	U	0.25	-1.386294361
AMW-024-082	0.5	ND	U	0.25	-1.386294361
AMW-025-082	0.5	ND	U	0.25	-1.386294361
AMW-026-082	0.5	ND	U	0.25	-1.386294361
AMW-027-082	0.5	ND	U	0.25	-1.386294361
AMW-028-082	0.5	ND	U	0.25	-1.386294361
AMW-029-082	0.5	ND	U	0.25	-1.386294361
AMW-030-082	0.5	ND	U	0.25	-1.386294361
AMW-031-082	0.5	ND	U	0.25	-1.386294361
AMW-032-082	0.5	ND	U	0.25	-1.386294361
AMW-033-082	0.5	ND	U	0.25	-1.386294361
AMW-034-082	0.5	ND	U	0.25	-1.386294361
AMW-035-082	0.5	ND	U	0.25	-1.386294361
AMW-036-082	0.5	ND	U	0.25	-1.386294361
AMW-037-082	0.5	ND	U	0.25	-1.386294361
AMW-038-082	0.5	ND	U	0.25	-1.386294361
AMW-039-082	0.5	ND	U	0.25	-1.386294361
AMW-040-082	0.5	ND	U	0.25	-1.386294361
AMW-041-082	0.5	ND	U	0.25	-1.386294361
AMW-042-082	0.5	ND	U	0.25	-1.386294361
AMW-043-082	0.5	ND	U	0.25	-1.386294361
AMW-044-082	0.5	ND	U	0.25	-1.386294361
AMW-045-082	0.5	ND	U	0.25	-1.386294361
AMW-046-082	0.5	ND	U	0.25	-1.386294361
AMW-052-082	0.5	ND	U	0.25	-1.386294361
AMW-053-082	0.5	ND	U	0.25	-1.386294361
AMW-054-082	0.5	ND	U	0.25	-1.386294361
AMW-055-082	0.5	ND	U	0.25	-1.386294361
AMW-056-082	0.5	ND	U	0.25	-1.386294361

EXPLOSIVE CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
BMW-001-082	0.5	ND	U	0.25	-1.386294361
BMW-002-082	0.5	ND	U	0.25	-1.386294361
BMW-003-082	0.5	ND	U	0.25	-1.386294361
BMW-004-082	0.5	ND	U	0.25	-1.386294361
BMW-005-082	0.5	ND	U	0.25	-1.386294361
BMW-006-082	0.5	ND	U	0.25	-1.386294361
BMW-007-082	0.5	ND	U	0.25	-1.386294361
BMW-008-082	0.5	ND	U	0.25	-1.386294361
BMW-009-082	0.5	ND	U	0.25	-1.386294361
BMW-010-082	0.5	ND	U	0.25	-1.386294361
BMW-017-082	0.5	ND	U	0.25	-1.386294361
BMW-018-082	0.5	ND	U	0.25	-1.386294361
BMW-020-082	0.5	ND	U	0.25	-1.386294361
BMW-021-082	0.5	ND	U	0.25	-1.386294361
BMW-022-082	0.5	ND	U	0.25	-1.386294361
BMW-023-082	0.5	ND	U	0.25	-1.386294361
BMW-024-082	0.5	ND	U	0.25	-1.386294361
BMW-025-082	0.5	ND	U	0.25	-1.386294361
BMW-026-082	0.5	ND	U	0.25	-1.386294361
BMW-027-082	0.5	ND	U	0.25	-1.386294361
BMW-028-082	0.5	ND	U	0.25	-1.386294361
BMW-029-082	0.5	ND	U	0.25	-1.386294361
BMW-030-082	0.5	ND	U	0.25	-1.386294361
BMW-031-082	0.5	ND	U	0.25	-1.386294361
BMW-032-082	0.5	ND	U	0.25	-1.386294361
BMW-033-082	0.5	ND	U	0.25	-1.386294361
BMW-034-082	0.5	ND	U	0.25	-1.386294361
BMW-035-082	0.5	ND	U	0.25	-1.386294361
BMW-036-082	0.5	ND	U	0.25	-1.386294361
BMW-037-082	0.5	ND	U	0.25	-1.386294361
BMW-040-082	0.5	ND	U	0.25	-1.386294361
BMW-041-082	0.5	ND	U	0.25	-1.386294361
BMW-042-082	0.5	ND	U	0.25	-1.386294361
BMW-043-082	0.5	ND	U	0.25	-1.386294361
BMW-044-082	0.5	ND	U	0.25	-1.386294361
BMW-045-082	0.5	ND	U	0.25	-1.386294361
BMW-046-082	0.5	ND	U	0.25	-1.386294361
BMW-052-082	0.5	ND	U	0.25	-1.386294361
BMW-053-082	0.5	ND	U	0.25	-1.386294361
BMW-054-082	0.5	ND	U	0.25	-1.386294361
BMW-055-082	0.5	ND	U	0.25	-1.386294361
BMW-056-082	0.5	ND	U	0.25	-1.386294361
CMW-017-082	0.5	ND	U	0.25	-1.386294361
CMW-018-082	0.5	ND	U	0.25	-1.386294361
CMW-020-082	0.5	ND	U	0.25	-1.386294361
DMW-009-082	0.5	ND	U	0.25	-1.386294361
DMW-021-082	0.5	ND	U	0.25	-1.386294361
DMW-025-082	0.5	ND	U	0.25	-1.386294361
DMW-028-082	0.5	ND	U	0.25	-1.386294361
DMW-032-082	0.5	ND	U	0.25	-1.386294361
DMW-033-082	0.5	ND	U	0.25	-1.386294361
DMW-034-082	0.5	ND	U	0.25	-1.386294361

B07NE003702-08315

EXPLOSIVE CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
DMW-035-082	0.5	ND	U	0.25	-1.386294361
DMW-036-082	0.5	ND	U	0.25	-1.386294361
DMW-037-082	0.5	ND	U	0.25	-1.386294361
DMW-038-082	0.5	ND	U	0.25	-1.386294361
DMW-039-082	0.5	ND	U	0.25	-1.386294361
DMW-041-082	0.5	ND	U	0.25	-1.386294361
DMW-042-082	0.5	ND	U	0.25	-1.386294361
DMW-043-082	0.5	ND	U	0.25	-1.386294361
DMW-044-082	0.5	ND	U	0.25	-1.386294361
DMW-045-082	0.5	ND	U	0.25	-1.386294361
DMW-046-082	0.5	ND	U	0.25	-1.386294361

2,6-Dinitrotoluene (26DNT)

MEAN =	0.25
GEOMEAN =	0.25
MEAN OF LN=	-1.386294361
N=	112
S=	0
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

EXPLOSIVE CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
		2-Nitrotoluene (2NT)			
AMW-001-082	0.5	ND	U	0.25	-1.386294361
AMW-002-082	0.5	ND	U	0.25	-1.386294361
AMW-003-082	0.5	ND	U	0.25	-1.386294361
AMW-004-082	0.5	ND	U	0.25	-1.386294361
AMW-005-082	0.5	ND	U	0.25	-1.386294361
AMW-006-082	0.5	ND	U	0.25	-1.386294361
AMW-007-082	0.5	ND	U	0.25	-1.386294361
AMW-008-082	0.5	ND	U	0.25	-1.386294361
AMW-009-082	0.5	ND	U	0.25	-1.386294361
AMW-010-082	0.5	ND	U	0.25	-1.386294361
AMW-011-082	0.5	ND	U	0.25	-1.386294361
AMW-012-082	0.5	ND	U	0.25	-1.386294361
AMW-013-082	0.5	ND	U	0.25	-1.386294361
AMW-014-082	0.5	ND	U	0.25	-1.386294361
AMW-015-082	0.5	ND	U	0.25	-1.386294361
AMW-017-082	0.5	ND	U	0.25	-1.386294361
AMW-018-082	0.5	ND	U	0.25	-1.386294361
AMW-020-082	0.5	ND	U	0.25	-1.386294361
AMW-021-082	0.5	ND	U	0.25	-1.386294361
AMW-022-082	0.5	ND	U	0.25	-1.386294361
AMW-023-082	0.5	ND	U	0.25	-1.386294361
AMW-024-082	0.5	ND	U	0.25	-1.386294361
AMW-025-082	0.5	ND	U	0.25	-1.386294361
AMW-026-082	0.5	ND	U	0.25	-1.386294361
AMW-027-082	0.5	ND	U	0.25	-1.386294361
AMW-028-082	0.5	ND	U	0.25	-1.386294361
AMW-029-082	0.5	ND	U	0.25	-1.386294361
AMW-030-082	0.5	ND	U	0.25	-1.386294361
AMW-031-082	0.5	ND	U	0.25	-1.386294361
AMW-032-082	0.5	ND	U	0.25	-1.386294361
AMW-033-082	0.5	ND	U	0.25	-1.386294361
AMW-034-082	0.5	ND	U	0.25	-1.386294361
AMW-035-082	0.5	ND	U	0.25	-1.386294361
AMW-036-082	0.5	ND	U	0.25	-1.386294361
AMW-037-082	0.5	ND	U	0.25	-1.386294361
AMW-038-082	0.5	ND	U	0.25	-1.386294361
AMW-039-082	0.5	ND	U	0.25	-1.386294361
AMW-040-082	0.5	ND	U	0.25	-1.386294361
AMW-041-082	0.5	ND	U	0.25	-1.386294361
AMW-042-082	0.5	ND	U	0.25	-1.386294361
AMW-043-082	0.5	ND	U	0.25	-1.386294361
AMW-044-082	0.5	ND	U	0.25	-1.386294361
AMW-045-082	0.5	ND	U	0.25	-1.386294361
AMW-046-082	0.5	ND	U	0.25	-1.386294361
AMW-052-082	0.5	ND	U	0.25	-1.386294361
AMW-053-082	0.5	ND	U	0.25	-1.386294361
AMW-054-082	0.5	ND	U	0.25	-1.386294361
AMW-055-082	0.5	ND	U	0.25	-1.386294361
AMW-056-082	0.5	ND	U	0.25	-1.386294361

EXPLOSIVE CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
BMW-001-082	0.5	ND	U	0.25	-1.386294361
BMW-002-082	0.5	ND	U	0.25	-1.386294361
BMW-003-082	0.5	ND	U	0.25	-1.386294361
BMW-004-082	0.5	ND	U	0.25	-1.386294361
BMW-005-082	0.5	ND	U	0.25	-1.386294361
BMW-006-082	0.5	ND	U	0.25	-1.386294361
BMW-007-082	0.5	ND	U	0.25	-1.386294361
BMW-008-082	0.5	ND	U	0.25	-1.386294361
BMW-009-082	0.5	ND	U	0.25	-1.386294361
BMW-010-082	0.5	ND	U	0.25	-1.386294361
BMW-017-082	0.5	ND	U	0.25	-1.386294361
BMW-018-082	0.5	ND	U	0.25	-1.386294361
BMW-020-082	0.5	ND	U	0.25	-1.386294361
BMW-021-082	0.5	ND	U	0.25	-1.386294361
BMW-022-082	0.5	ND	U	0.25	-1.386294361
BMW-023-082	0.5	ND	U	0.25	-1.386294361
BMW-024-082	0.5	ND	U	0.25	-1.386294361
BMW-025-082	0.5	ND	U	0.25	-1.386294361
BMW-026-082	0.5	ND	U	0.25	-1.386294361
BMW-027-082	0.5	ND	U	0.25	-1.386294361
BMW-028-082	0.5	ND	U	0.25	-1.386294361
BMW-029-082	0.5	ND	U	0.25	-1.386294361
BMW-030-082	0.5	ND	U	0.25	-1.386294361
BMW-031-082	0.5	ND	U	0.25	-1.386294361
BMW-032-082	0.5	ND	U	0.25	-1.386294361
BMW-033-082	0.5	ND	U	0.25	-1.386294361
BMW-034-082	0.5	ND	U	0.25	-1.386294361
BMW-035-082	0.5	ND	U	0.25	-1.386294361
BMW-036-082	0.5	ND	U	0.25	-1.386294361
BMW-037-082	0.5	ND	U	0.25	-1.386294361
BMW-040-082	0.5	ND	U	0.25	-1.386294361
BMW-041-082	0.5	ND	U	0.25	-1.386294361
BMW-042-082	0.5	ND	U	0.25	-1.386294361
BMW-043-082	0.5	ND	U	0.25	-1.386294361
BMW-044-082	0.5	ND	U	0.25	-1.386294361
BMW-045-082	0.5	ND	U	0.25	-1.386294361
BMW-046-082	0.5	ND	U	0.25	-1.386294361
BMW-052-082	0.5	ND	U	0.25	-1.386294361
BMW-053-082	0.5	ND	U	0.25	-1.386294361
BMW-054-082	0.5	ND	U	0.25	-1.386294361
BMW-055-082	0.5	ND	U	0.25	-1.386294361
BMW-056-082	0.5	ND	U	0.25	-1.386294361
CMW-017-082	0.5	ND	U	0.25	-1.386294361
CMW-018-082	0.5	ND	U	0.25	-1.386294361
CMW-020-082	0.5	ND	U	0.25	-1.386294361
DMW-009-082	0.5	ND	U	0.25	-1.386294361
DMW-021-082	0.5	ND	U	0.25	-1.386294361
DMW-025-082	0.5	ND	U	0.25	-1.386294361
DMW-028-082	0.5	ND	U	0.25	-1.386294361
DMW-032-082	0.5	ND	U	0.25	-1.386294361
DMW-033-082	0.5	ND	U	0.25	-1.386294361
DMW-034-082	0.5	ND	U	0.25	-1.386294361

EXPLOSIVE CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
DMW-035-082	0.5	ND	U	0.25	-1.386294361
DMW-036-082	0.5	ND	U	0.25	-1.386294361
DMW-037-082	0.5	ND	U	0.25	-1.386294361
DMW-038-082	0.5	ND	U	0.25	-1.386294361
DMW-039-082	0.5	ND	U	0.25	-1.386294361
DMW-041-082	0.5	ND	U	0.25	-1.386294361
DMW-042-082	0.5	ND	U	0.25	-1.386294361
DMW-043-082	0.5	ND	U	0.25	-1.386294361
DMW-044-082	0.5	ND	U	0.25	-1.386294361
DMW-045-082	0.5	ND	U	0.25	-1.386294361
DMW-046-082	0.5	ND	U	0.25	-1.386294361

2-Nitrotoluene (2NT)	
MEAN =	0.25
GEOMEAN =	0.25
MEAN OF LN=	-1.386294361
N=	112
S=	0
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO OF DET=	0

EXPLOSIVE CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
		3-Nitrotoluene (3NT)			
AMW-001-082	0.5	ND	U	0.25	-1.386294361
AMW-002-082	0.5	ND	U	0.25	-1.386294361
AMW-003-082	0.5	ND	U	0.25	-1.386294361
AMW-004-082	0.5	ND	U	0.25	-1.386294361
AMW-005-082	0.5	ND	U	0.25	-1.386294361
AMW-006-082	0.5	ND	U	0.25	-1.386294361
AMW-007-082	0.5	ND	U	0.25	-1.386294361
AMW-008-082	0.5	ND	U	0.25	-1.386294361
AMW-009-082	0.5	ND	U	0.25	-1.386294361
AMW-010-082	0.5	ND	U	0.25	-1.386294361
AMW-011-082	0.5	ND	U	0.25	-1.386294361
AMW-012-082	0.5	ND	U	0.25	-1.386294361
AMW-013-082	0.5	ND	U	0.25	-1.386294361
AMW-014-082	0.5	ND	U	0.25	-1.386294361
AMW-015-082	0.5	ND	U	0.25	-1.386294361
AMW-017-082	0.5	ND	U	0.25	-1.386294361
AMW-018-082	0.5	ND	U	0.25	-1.386294361
AMW-020-082	0.5	ND	U	0.25	-1.386294361
AMW-021-082	0.5	ND	U	0.25	-1.386294361
AMW-022-082	0.5	ND	U	0.25	-1.386294361
AMW-023-082	0.5	ND	U	0.25	-1.386294361
AMW-024-082	0.5	ND	U	0.25	-1.386294361
AMW-025-082	0.5	ND	U	0.25	-1.386294361
AMW-026-082	0.5	ND	U	0.25	-1.386294361
AMW-027-082	0.5	ND	U	0.25	-1.386294361
AMW-028-082	0.5	ND	U	0.25	-1.386294361
AMW-029-082	0.5	ND	U	0.25	-1.386294361
AMW-030-082	0.5	ND	U	0.25	-1.386294361
AMW-031-082	0.5	ND	U	0.25	-1.386294361
AMW-032-082	0.5	ND	U	0.25	-1.386294361
AMW-033-082	0.5	ND	U	0.25	-1.386294361
AMW-034-082	0.5	ND	U	0.25	-1.386294361
AMW-035-082	0.5	ND	U	0.25	-1.386294361
AMW-036-082	0.5	ND	U	0.25	-1.386294361
AMW-037-082	0.5	ND	U	0.25	-1.386294361
AMW-038-082	0.5	ND	U	0.25	-1.386294361
AMW-039-082	0.5	ND	U	0.25	-1.386294361
AMW-040-082	0.5	ND	U	0.25	-1.386294361
AMW-041-082	0.5	ND	U	0.25	-1.386294361
AMW-042-082	0.5	ND	U	0.25	-1.386294361
AMW-043-082	0.5	ND	U	0.25	-1.386294361
AMW-044-082	0.5	ND	U	0.25	-1.386294361
AMW-045-082	0.5	ND	U	0.25	-1.386294361
AMW-046-082	0.5	ND	U	0.25	-1.386294361
AMW-052-082	0.5	ND	U	0.25	-1.386294361
AMW-053-082	0.5	ND	U	0.25	-1.386294361
AMW-054-082	0.5	ND	U	0.25	-1.386294361
AMW-055-082	0.5	ND	U	0.25	-1.386294361
AMW-056-082	0.5	ND	U	0.25	-1.386294361

B07NE003702-08320

EXPLOSIVE CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
BMW-001-082	0.5	ND	U	0.25	-1.386294361
BMW-002-082	0.5	ND	U	0.25	-1.386294361
BMW-003-082	0.5	ND	U	0.25	-1.386294361
BMW-004-082	0.5	ND	U	0.25	-1.386294361
BMW-005-082	0.5	ND	U	0.25	-1.386294361
BMW-006-082	0.5	ND	U	0.25	-1.386294361
BMW-007-082	0.5	ND	U	0.25	-1.386294361
BMW-008-082	0.5	ND	U	0.25	-1.386294361
BMW-009-082	0.5	ND	U	0.25	-1.386294361
BMW-010-082	0.5	ND	U	0.25	-1.386294361
BMW-017-082	0.5	ND	U	0.25	-1.386294361
BMW-018-082	0.5	ND	U	0.25	-1.386294361
BMW-020-082	0.5	ND	U	0.25	-1.386294361
BMW-021-082	0.5	ND	U	0.25	-1.386294361
BMW-022-082	0.5	ND	U	0.25	-1.386294361
BMW-023-082	0.5	ND	U	0.25	-1.386294361
BMW-024-082	0.5	ND	U	0.25	-1.386294361
BMW-025-082	0.5	ND	U	0.25	-1.386294361
BMW-026-082	0.5	ND	U	0.25	-1.386294361
BMW-027-082	0.5	ND	U	0.25	-1.386294361
BMW-028-082	0.5	ND	U	0.25	-1.386294361
BMW-029-082	0.5	ND	U	0.25	-1.386294361
BMW-030-082	0.5	ND	U	0.25	-1.386294361
BMW-031-082	0.5	ND	U	0.25	-1.386294361
BMW-032-082	0.5	ND	U	0.25	-1.386294361
BMW-033-082	0.5	ND	U	0.25	-1.386294361
BMW-034-082	0.5	ND	U	0.25	-1.386294361
BMW-035-082	0.5	ND	U	0.25	-1.386294361
BMW-036-082	0.5	ND	U	0.25	-1.386294361
BMW-037-082	0.5	ND	U	0.25	-1.386294361
BMW-040-082	0.5	ND	U	0.25	-1.386294361
BMW-041-082	0.5	ND	U	0.25	-1.386294361
BMW-042-082	0.5	ND	U	0.25	-1.386294361
BMW-043-082	0.5	ND	U	0.25	-1.386294361
BMW-044-082	0.5	ND	U	0.25	-1.386294361
BMW-045-082	0.5	ND	U	0.25	-1.386294361
BMW-046-082	0.5	ND	U	0.25	-1.386294361
BMW-052-082	0.5	ND	U	0.25	-1.386294361
BMW-053-082	0.5	ND	U	0.25	-1.386294361
BMW-054-082	0.5	ND	U	0.25	-1.386294361
BMW-055-082	0.5	ND	U	0.25	-1.386294361
BMW-056-082	0.5	ND	U	0.25	-1.386294361
CMW-017-082	0.5	ND	U	0.25	-1.386294361
CMW-018-082	0.5	ND	U	0.25	-1.386294361
CMW-020-082	0.5	ND	U	0.25	-1.386294361
DMW-009-082	0.5	ND	U	0.25	-1.386294361
DMW-021-082	0.5	ND	U	0.25	-1.386294361
DMW-025-082	0.5	ND	U	0.25	-1.386294361
DMW-028-082	0.5	ND	U	0.25	-1.386294361
DMW-032-082	0.5	ND	U	0.25	-1.386294361
DMW-033-082	0.5	ND	U	0.25	-1.386294361
DMW-034-082	0.5	ND	U	0.25	-1.386294361

B07NE003702-08321

EXPLOSIVE CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L.	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
DMW-035-082	0.5	ND	U	0.25	-1.386294361
DMW-036-082	0.5	ND	U	0.25	-1.386294361
DMW-037-082	0.5	ND	U	0.25	-1.386294361
DMW-038-082	0.5	ND	U	0.25	-1.386294361
DMW-039-082	0.5	ND	U	0.25	-1.386294361
DMW-041-082	0.5	ND	U	0.25	-1.386294361
DMW-042-082	0.5	ND	U	0.25	-1.386294361
DMW-043-082	0.5	ND	U	0.25	-1.386294361
DMW-044-082	0.5	ND	U	0.25	-1.386294361
DMW-045-082	0.5	ND	U	0.25	-1.386294361
DMW-046-082	0.5	ND	U	0.25	-1.386294361

3-Nitrotoluene (3NT)

MEAN =	0.25
GEOMEAN =	0.25
MEAN OF LN=	-1.386294361
N=	112
S=	0
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

EXPLOSIVE CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
		4-Nitrotoluene (4NT)			
AMW-001-082	0.5	ND	U	0.25	-1.386294361
AMW-002-082	0.5	ND	U	0.25	-1.386294361
AMW-003-082	0.5	ND	U	0.25	-1.386294361
AMW-004-082	0.5	ND	U	0.25	-1.386294361
AMW-005-082	0.5	ND	U	0.25	-1.386294361
AMW-006-082	0.5	ND	U	0.25	-1.386294361
AMW-007-082	0.5	ND	U	0.25	-1.386294361
AMW-008-082	0.5	ND	U	0.25	-1.386294361
AMW-009-082	0.5	ND	U	0.25	-1.386294361
AMW-010-082	0.5	ND	U	0.25	-1.386294361
AMW-011-082	0.5	ND	U	0.25	-1.386294361
AMW-012-082	0.5	ND	U	0.25	-1.386294361
AMW-013-082	0.5	ND	U	0.25	-1.386294361
AMW-014-082	0.5	ND	U	0.25	-1.386294361
AMW-015-082	0.5	ND	U	0.25	-1.386294361
AMW-017-082	0.5	ND	U	0.25	-1.386294361
AMW-018-082	0.5	ND	U	0.25	-1.386294361
AMW-020-082	0.5	ND	U	0.25	-1.386294361
AMW-021-082	0.5	ND	U	0.25	-1.386294361
AMW-022-082	0.5	ND	U	0.25	-1.386294361
AMW-023-082	0.5	ND	U	0.25	-1.386294361
AMW-024-082	0.5	ND	U	0.25	-1.386294361
AMW-025-082	0.5	ND	U	0.25	-1.386294361
AMW-026-082	0.5	ND	U	0.25	-1.386294361
AMW-027-082	0.5	ND	U	0.25	-1.386294361
AMW-028-082	0.5	ND	U	0.25	-1.386294361
AMW-029-082	0.5	ND	U	0.25	-1.386294361
AMW-030-082	0.5	ND	U	0.25	-1.386294361
AMW-031-082	0.5	ND	U	0.25	-1.386294361
AMW-032-082	0.5	ND	U	0.25	-1.386294361
AMW-033-082	0.5	ND	U	0.25	-1.386294361
AMW-034-082	0.5	ND	U	0.25	-1.386294361
AMW-035-082	0.5	ND	U	0.25	-1.386294361
AMW-036-082	0.5	ND	U	0.25	-1.386294361
AMW-037-082	0.5	ND	U	0.25	-1.386294361
AMW-038-082	0.5	ND	U	0.25	-1.386294361
AMW-039-082	0.5	ND	U	0.25	-1.386294361
AMW-040-082	0.5	ND	U	0.25	-1.386294361
AMW-041-082	0.5	ND	U	0.25	-1.386294361
AMW-042-082	0.5	ND	U	0.25	-1.386294361
AMW-043-082	0.5	ND	U	0.25	-1.386294361
AMW-044-082	0.5	ND	U	0.25	-1.386294361
AMW-045-082	0.5	ND	U	0.25	-1.386294361
AMW-046-082	0.5	ND	U	0.25	-1.386294361
AMW-052-082	0.5	ND	U	0.25	-1.386294361
AMW-053-082	0.5	ND	U	0.25	-1.386294361
AMW-054-082	0.5	ND	U	0.25	-1.386294361
AMW-055-082	0.5	ND	U	0.25	-1.386294361
AMW-056-082	0.5	ND	U	0.25	-1.386294361

B07NE003702-08323

EXPLOSIVE CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
BMW-001-082	0.5	ND	U	0.25	-1.386294361
BMW-002-082	0.5	ND	U	0.25	-1.386294361
BMW-003-082	0.5	ND	U	0.25	-1.386294361
BMW-004-082	0.5	ND	U	0.25	-1.386294361
BMW-005-082	0.5	ND	U	0.25	-1.386294361
BMW-006-082	0.5	ND	U	0.25	-1.386294361
BMW-007-082	0.5	ND	U	0.25	-1.386294361
BMW-008-082	0.5	ND	U	0.25	-1.386294361
BMW-009-082	0.5	ND	U	0.25	-1.386294361
BMW-010-082	0.5	ND	U	0.25	-1.386294361
BMW-017-082	0.5	ND	U	0.25	-1.386294361
BMW-018-082	0.5	ND	U	0.25	-1.386294361
BMW-020-082	0.5	ND	U	0.25	-1.386294361
BMW-021-082	0.5	ND	U	0.25	-1.386294361
BMW-022-082	0.5	ND	U	0.25	-1.386294361
BMW-023-082	0.5	ND	U	0.25	-1.386294361
BMW-024-082	0.5	ND	U	0.25	-1.386294361
BMW-025-082	0.5	ND	U	0.25	-1.386294361
BMW-026-082	0.5	ND	U	0.25	-1.386294361
BMW-027-082	0.5	ND	U	0.25	-1.386294361
BMW-028-082	0.5	ND	U	0.25	-1.386294361
BMW-029-082	0.5	ND	U	0.25	-1.386294361
BMW-030-082	0.5	ND	U	0.25	-1.386294361
BMW-031-082	0.5	ND	U	0.25	-1.386294361
BMW-032-082	0.5	ND	U	0.25	-1.386294361
BMW-033-082	0.5	ND	U	0.25	-1.386294361
BMW-034-082	0.5	ND	U	0.25	-1.386294361
BMW-035-082	0.5	ND	U	0.25	-1.386294361
BMW-036-082	0.5	ND	U	0.25	-1.386294361
BMW-037-082	0.5	ND	U	0.25	-1.386294361
BMW-040-082	0.5	ND	U	0.25	-1.386294361
BMW-041-082	0.5	ND	U	0.25	-1.386294361
BMW-042-082	0.5	ND	U	0.25	-1.386294361
BMW-043-082	0.5	ND	U	0.25	-1.386294361
BMW-044-082	0.5	ND	U	0.25	-1.386294361
BMW-045-082	0.5	ND	U	0.25	-1.386294361
BMW-046-082	0.5	ND	U	0.25	-1.386294361
BMW-052-082	0.5	ND	U	0.25	-1.386294361
BMW-053-082	0.5	ND	U	0.25	-1.386294361
BMW-054-082	0.5	ND	U	0.25	-1.386294361
BMW-055-082	0.5	ND	U	0.25	-1.386294361
BMW-056-082	0.5	ND	U	0.25	-1.386294361
CMW-017-082	0.5	ND	U	0.25	-1.386294361
CMW-018-082	0.5	ND	U	0.25	-1.386294361
CMW-020-082	0.5	ND	U	0.25	-1.386294361
DMW-009-082	0.5	ND	U	0.25	-1.386294361
DMW-021-082	0.5	ND	U	0.25	-1.386294361
DMW-025-082	0.5	ND	U	0.25	-1.386294361
DMW-028-082	0.5	ND	U	0.25	-1.386294361
DMW-032-082	0.5	ND	U	0.25	-1.386294361
DMW-033-082	0.5	ND	U	0.25	-1.386294361
DMW-034-082	0.5	ND	U	0.25	-1.386294361

EXPLOSIVE CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
DMW-035-082	0.5	ND	U	0.25	-1.386294361
DMW-036-082	0.5	ND	U	0.25	-1.386294361
DMW-037-082	0.5	ND	U	0.25	-1.386294361
DMW-038-082	0.5	ND	U	0.25	-1.386294361
DMW-039-082	0.5	ND	U	0.25	-1.386294361
DMW-041-082	0.5	ND	U	0.25	-1.386294361
DMW-042-082	0.5	ND	U	0.25	-1.386294361
DMW-043-082	0.5	ND	U	0.25	-1.386294361
DMW-044-082	0.5	ND	U	0.25	-1.386294361
DMW-045-082	0.5	ND	U	0.25	-1.386294361
DMW-046-082	0.5	ND	U	0.25	-1.386294361
			4-Nitrotoluene (4NT)		
			MEAN =	0.25	
			GEOMEAN =	0.25	
			MEAN OF LN=	-1.386294361	
			N=	112	
			S=	0	
			H=	NA	
			UCL=	NA	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

EXPLOSIVE CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
			Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)		
AMW-001-082	0.15	ND	U	0.075	-2.590267165
AMW-002-082				0.17	-1.771956842
AMW-003-082				0.48	-0.733969175
AMW-004-082				0.16	-1.832581464
AMW-005-082	0.15	ND	U	0.075	-2.590267165
AMW-006-082	0.15	ND	U	0.075	-2.590267165
AMW-007-082				0.18	-1.714798428
AMW-008-082	0.15	ND	U	0.075	-2.590267165
AMW-009-082	0.15	ND	U	0.075	-2.590267165
AMW-010-082	0.15	ND	U	0.075	-2.590267165
AMW-011-082				33	3.496507561
AMW-012-082	0.15	ND	U	0.075	-2.590267165
AMW-013-082	0.15	ND	U	0.075	-2.590267165
AMW-014-082	0.15	ND	U	0.075	-2.590267165
AMW-015-082	0.15	ND	U	0.075	-2.590267165
AMW-017-082				0.16	-1.832581464
AMW-018-082	0.15	ND	U	0.075	-2.590267165
AMW-020-082	0.15	ND	U	0.075	-2.590267165
AMW-021-082	0.15	ND	U	0.075	-2.590267165
AMW-022-082	0.15	ND	U	0.075	-2.590267165
AMW-023-082	0.15	ND	U	0.075	-2.590267165
AMW-024-082	0.15	ND	U	0.075	-2.590267165
AMW-025-082	0.15	ND	U	0.075	-2.590267165
AMW-026-082	0.15	ND	U	0.075	-2.590267165
AMW-027-082	0.15	ND	U	0.075	-2.590267165
AMW-028-082	0.15	ND	U	0.075	-2.590267165
AMW-029-082				4.4	1.481604541
AMW-030-082	0.15	ND	U	0.075	-2.590267165
AMW-031-082	0.15	ND	U	0.075	-2.590267165
AMW-032-082				3.9	1.360976553
AMW-033-082				9.2	2.219203484
AMW-034-082	0.15	ND	U	0.075	-2.590267165
AMW-035-082				0.34	-1.078809661
AMW-036-082	0.15	ND	U	0.075	-2.590267165
AMW-037-082	0.15	ND	U	0.075	-2.590267165
AMW-038-082	0.15	ND	U	0.075	-2.590267165
AMW-039-082	0.15	ND	U	0.075	-2.590267165
AMW-040-082	0.15	ND	U	0.075	-2.590267165
AMW-041-082	0.15	ND	U	0.075	-2.590267165
AMW-042-082				0.73	-0.314710745
AMW-043-082	0.15	ND	U	0.075	-2.590267165
AMW-044-082				0.73	-0.314710745
AMW-045-082				0.67	-0.400477567
AMW-046-082	0.15	ND	U	0.075	-2.590267165
AMW-052-082				3.1	1.131402111
AMW-053-082				4.8	1.568615918
AMW-054-082				0.91	-0.094310679
AMW-055-082				0.52	-0.653926467
AMW-056-082				0.91	-0.094310679

EXPLOSIVE CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
BMW-001-082	0.15	ND	U	0.075	-2.590267165
BMW-002-082				6.7	1.902107526
BMW-003-082				0.26	-1.347073648
BMW-004-082				4.5	1.504077397
BMW-005-082				98	4.584967479
BMW-006-082	0.15	ND	U	0.075	-2.590267165
BMW-007-082				1.9	0.641853886
BMW-008-082				4.7	1.547562509
BMW-009-082	0.15	ND	U	0.075	-2.590267165
BMW-010-082	0.15	ND	U	0.075	-2.590267165
BMW-017-082	0.15	ND	U	0.075	-2.590267165
BMW-018-082	0.15	ND	U	0.075	-2.590267165
BMW-020-082	0.15	ND	U	0.075	-2.590267165
BMW-021-082				10	2.302585093
BMW-022-082				0.25	-1.386294361
BMW-023-082	0.15	ND	U	0.075	-2.590267165
BMW-024-082				0.46	-0.776528789
BMW-025-082	0.15	ND	U	0.075	-2.590267165
BMW-026-082	0.15	ND	U	0.075	-2.590267165
BMW-027-082	0.15	ND	U	0.075	-2.590267165
BMW-028-082	0.15	ND	U	0.075	-2.590267165
BMW-029-082	0.15	ND	U	0.075	-2.590267165
BMW-030-082	0.15	ND	U	0.075	-2.590267165
BMW-031-082				4.7	1.547562509
BMW-032-082				0.16	-1.832581464
BMW-033-082				1.8	0.587786665
BMW-034-082				0.91	-0.094310679
BMW-035-082	0.15	ND	U	0.075	-2.590267165
BMW-036-082	0.15	ND	U	0.075	-2.590267165
BMW-037-082	0.15	ND	U	0.075	-2.590267165
BMW-040-082	0.15	ND	U	0.075	-2.590267165
BMW-041-082	0.15	ND	U	0.075	-2.590267165
BMW-042-082				0.26	-1.347073648
BMW-043-082				18	2.890371758
BMW-044-082				1.6	0.470003629
BMW-045-082				0.79	-0.235722334
BMW-046-082	0.15	ND	U	0.075	-2.590267165
BMW-052-082				0.37	-0.994252273
BMW-053-082				4.2	1.435084525
BMW-054-082	0.15	ND	U	0.075	-2.590267165
BMW-055-082				0.24	-1.427116356
BMW-056-082				0.67	-0.400477567
CMW-017-082	0.15	ND	U	0.075	-2.590267165
CMW-018-082				1.9	0.641853886
CMW-020-082	0.15	ND	U	0.075	-2.590267165
DMW-009-082	0.15	ND	U	0.075	-2.590267165
DMW-021-082	0.15	ND	U	0.075	-2.590267165
DMW-025-082	0.15	ND	U	0.075	-2.590267165
DMW-028-082	0.15	ND	U	0.075	-2.590267[illegible]
DMW-032-082				0.72	-0.32850[illegible]
DMW-033-082	0.15	ND	U	0.075	-2.590267[illegible]
DMW-034-082	0.15	ND	U	0.075	-2.590267165

EXPLOSIVE CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
DMW-035-082	0.15	ND	U	0.075	-2.590267165
DMW-036-082	0.15	ND	U	0.075	-2.590267165
DMW-037-082	0.15	ND	U	0.075	-2.590267165
DMW-038-082	0.15	ND	U	0.075	-2.590267165
DMW-039-082	0.15	ND	U	0.075	-2.590267165
DMW-041-082	0.15	ND	U	0.075	-2.590267165
DMW-042-082				1.2	0.182321557
DMW-043-082	0.15	ND	U	0.075	-2.590267165
DMW-044-082	0.15	ND	U	0.075	-2.590267165
DMW-045-082				0.44	-0.820980552
DMW-046-082	0.15	ND	U	0.075	-2.590267165

Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)

MEAN =	2.091651786
GEOMEAN =	0.221028265
MEAN OF LN=	-1.509464692
N=	112
S=	1.67
H=	2.853
UCL=	1.41E+00
MIN =	0.16
MAX =	98
NO. OF DET=	43

B07NE003702-08328

EXPLOSIVE CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
		Methyl-2,4,6-trinitrophenylnitramine (Tetryl)			
AMW-001-082	0.5	ND	U	0.25	-1.386294361
AMW-002-082	0.5	ND	U	0.25	-1.386294361
AMW-003-082	0.5	ND	U	0.25	-1.386294361
AMW-004-082	0.5	ND	U	0.25	-1.386294361
AMW-005-082	0.5	ND	U	0.25	-1.386294361
AMW-006-082	0.5	ND	U	0.25	-1.386294361
AMW-007-082	0.5	ND	U	0.25	-1.386294361
AMW-008-082	0.5	ND	U	0.25	-1.386294361
AMW-009-082	0.5	ND	U	0.25	-1.386294361
AMW-010-082	0.5	ND	U	0.25	-1.386294361
AMW-011-082	0.5	ND	U	0.25	-1.386294361
AMW-012-082	0.5	ND	U	0.25	-1.386294361
AMW-013-082	0.5	ND	U	0.25	-1.386294361
AMW-014-082	0.5	ND	U	0.25	-1.386294361
AMW-015-082	0.5	ND	U	0.25	-1.386294361
AMW-017-082	0.5	ND	U	0.25	-1.386294361
AMW-018-082	0.5	ND	U	0.25	-1.386294361
AMW-020-082	0.5	ND	U	0.25	-1.386294361
AMW-021-082	0.5	ND	U	0.25	-1.386294361
AMW-022-082	0.5	ND	U	0.25	-1.386294361
AMW-023-082	0.5	ND	U	0.25	-1.386294361
AMW-024-082	0.5	ND	U	0.25	-1.386294361
AMW-025-082	0.5	ND	U	0.25	-1.386294361
AMW-026-082	0.5	ND	U	0.25	-1.386294361
AMW-027-082	0.5	ND	U	0.25	-1.386294361
AMW-028-082	0.5	ND	U	0.25	-1.386294361
AMW-029-082	0.5	ND	U	0.25	-1.386294361
AMW-030-082	0.5	ND	U	0.25	-1.386294361
AMW-031-082	0.5	ND	U	0.25	-1.386294361
AMW-032-082	0.5	ND	U	0.25	-1.386294361
AMW-033-082	0.5	ND	U	0.25	-1.386294361
AMW-034-082	0.5	ND	U	0.25	-1.386294361
AMW-035-082	0.5	ND	U	0.25	-1.386294361
AMW-036-082	0.5	ND	U	0.25	-1.386294361
AMW-037-082	0.5	ND	U	0.25	-1.386294361
AMW-038-082	0.5	ND	U	0.25	-1.386294361
AMW-039-082	0.5	ND	U	0.25	-1.386294361
AMW-040-082	0.5	ND	U	0.25	-1.386294361
AMW-041-082	0.5	ND	U	0.25	-1.386294361
AMW-042-082	0.5	ND	U	0.25	-1.386294361
AMW-043-082	0.5	ND	U	0.25	-1.386294361
AMW-044-082	0.5	ND	U	0.25	-1.386294361
AMW-045-082	0.5	ND	U	0.25	-1.386294361
AMW-046-082	0.5	ND	U	0.25	-1.386294361
AMW-052-082	0.5	ND	U	0.25	-1.386294361
AMW-053-082	0.5	ND	U	0.25	-1.386294361
AMW-054-082	0.5	ND	U	0.25	-1.386294361
AMW-055-082	0.5	ND	U	0.25	-1.386294361
AMW-056-082	0.5	ND	U	0.25	-1.386294361

B07NE003702-08329

EXPLOSIVE CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
BMW-001-082	0.5	ND	U	0.25	-1.386294361
BMW-002-082	0.5	ND	U	0.25	-1.386294361
BMW-003-082	0.5	ND	U	0.25	-1.386294361
BMW-004-082	0.5	ND	U	0.25	-1.386294361
BMW-005-082	0.5	ND	U	0.25	-1.386294361
BMW-006-082	0.5	ND	U	0.25	-1.386294361
BMW-007-082	0.5	ND	U	0.25	-1.386294361
BMW-008-082	0.5	ND	U	0.25	-1.386294361
BMW-009-082	0.5	ND	U	0.25	-1.386294361
BMW-010-082	0.5	ND	U	0.25	-1.386294361
BMW-017-082	0.5	ND	U	0.25	-1.386294361
BMW-018-082	0.5	ND	U	0.25	-1.386294361
BMW-020-082	0.5	ND	U	0.25	-1.386294361
BMW-021-082	0.5	ND	U	0.25	-1.386294361
BMW-022-082	0.5	ND	U	0.25	-1.386294361
BMW-023-082	0.5	ND	U	0.25	-1.386294361
BMW-024-082	0.5	ND	U	0.25	-1.386294361
BMW-025-082	0.5	ND	U	0.25	-1.386294361
BMW-026-082	0.5	ND	U	0.25	-1.386294361
BMW-027-082	0.5	ND	U	0.25	-1.386294361
BMW-028-082	0.5	ND	U	0.25	-1.386294361
BMW-029-082	0.5	ND	U	0.25	-1.386294361
BMW-030-082	0.5	ND	U	0.25	-1.386294361
BMW-031-082	0.5	ND	U	0.25	-1.386294361
BMW-032-082	0.5	ND	U	0.25	-1.386294361
BMW-033-082	0.5	ND	U	0.25	-1.386294361
BMW-034-082	0.5	ND	U	0.25	-1.386294361
BMW-035-082	0.5	ND	U	0.25	-1.386294361
BMW-036-082	0.5	ND	U	0.25	-1.386294361
BMW-037-082	0.5	ND	U	0.25	-1.386294361
BMW-040-082	0.5	ND	U	0.25	-1.386294361
BMW-041-082	0.5	ND	U	0.25	-1.386294361
BMW-042-082	0.5	ND	U	0.25	-1.386294361
BMW-043-082	0.5	ND	U	0.25	-1.386294361
BMW-044-082	0.5	ND	U	0.25	-1.386294361
BMW-045-082	0.5	ND	U	0.25	-1.386294361
BMW-046-082	0.5	ND	U	0.25	-1.386294361
BMW-052-082	0.5	ND	U	0.25	-1.386294361
BMW-053-082	0.5	ND	U	0.25	-1.386294361
BMW-054-082	0.5	ND	U	0.25	-1.386294361
BMW-055-082	0.5	ND	U	0.25	-1.386294361
BMW-056-082	0.5	ND	U	0.25	-1.386294361
CMW-017-082	0.5	ND	U	0.25	-1.386294361
CMW-018-082	0.5	ND	U	0.25	-1.386294361
CMW-020-082	0.5	ND	U	0.25	-1.386294361
DMW-009-082	0.5	ND	U	0.25	-1.386294361
DMW-021-082	0.5	ND	U	0.25	-1.386294361
DMW-025-082	0.5	ND	U	0.25	-1.386294361
DMW-028-082	0.5	ND	U	0.25	-1.386294361
DMW-032-082	0.5	ND	U	0.25	-1.386294361
DMW-033-082	0.5	ND	U	0.25	-1.386294361
DMW-034-082	0.5	ND	U	0.25	-1.386294361

EXPLOSIVE CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
DMW-035-082	0.5	ND	U	0.25	-1.386294361
DMW-036-082	0.5	ND	U	0.25	-1.386294361
DMW-037-082	0.5	ND	U	0.25	-1.386294361
DMW-038-082	0.5	ND	U	0.25	-1.386294361
DMW-039-082	0.5	ND	U	0.25	-1.386294361
DMW-041-082	0.5	ND	U	0.25	-1.386294361
DMW-042-082	0.5	ND	U	0.25	-1.386294361
DMW-043-082	0.5	ND	U	0.25	-1.386294361
DMW-044-082	0.5	ND	U	0.25	-1.386294361
DMW-045-082	0.5	ND	U	0.25	-1.386294361
DMW-046-082	0.5	ND	U	0.25	-1.386294361

Methyl-2,4,6-trinitrophenylnitramine (Tetryl)

MEAN =	0.25
GEOMEAN =	0.25
MEAN OF LN=	-1.386294361
N=	112
S=	0
H=	NA
UCL=	NA
MIN =	0
MAX =	0
NO. OF DET=	0

EXPLOSIVE CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
		Nitrobenzene (NB)			
AMW-001-082	0.25	ND	U	0.125	-2.079441542
AMW-002-082	0.25	ND	U	0.125	-2.079441542
AMW-003-082	0.25	ND	U	0.125	-2.079441542
AMW-004-082	0.25	ND	U	0.125	-2.079441542
AMW-005-082	0.25	ND	U	0.125	-2.079441542
AMW-006-082	0.25	ND	U	0.125	-2.079441542
AMW-007-082	0.25	ND	U	0.125	-2.079441542
AMW-008-082	0.25	ND	U	0.125	-2.079441542
AMW-009-082	0.25	ND	U	0.125	-2.079441542
AMW-010-082	0.25	ND	U	0.125	-2.079441542
AMW-011-082	0.25	ND	U	0.125	-2.079441542
AMW-012-082	0.25	ND	U	0.125	-2.079441542
AMW-013-082	0.25	ND	U	0.125	-2.079441542
AMW-014-082	0.25	ND	U	0.125	-2.079441542
AMW-015-082	0.25	ND	U	0.125	-2.079441542
AMW-017-082	0.25	ND	U	0.125	-2.079441542
AMW-018-082	0.25	ND	U	0.125	-2.079441542
AMW-020-082	0.25	ND	U	0.125	-2.079441542
AMW-021-082	0.25	ND	U	0.125	-2.079441542
AMW-022-082	0.25	ND	U	0.125	-2.079441542
AMW-023-082	0.25	ND	U	0.125	-2.079441542
AMW-024-082	0.25	ND	U	0.125	-2.079441542
AMW-025-082	0.25	ND	U	0.125	-2.079441542
AMW-026-082	0.25	ND	U	0.125	-2.079441542
AMW-027-082	0.25	ND	U	0.125	-2.079441542
AMW-028-082	0.25	ND	U	0.125	-2.079441542
AMW-029-082	0.25	ND	U	0.125	-2.079441542
AMW-030-082	0.25	ND	U	0.125	-2.079441542
AMW-031-082	0.25	ND	U	0.125	-2.079441542
AMW-032-082	0.25	ND	U	0.125	-2.079441542
AMW-033-082	0.25	ND	U	0.125	-2.079441542
AMW-034-082	0.25	ND	U	0.125	-2.079441542
AMW-035-082	0.25	ND	U	0.125	-2.079441542
AMW-036-082	0.25	ND	U	0.125	-2.079441542
AMW-037-082	0.25	ND	U	0.125	-2.079441542
AMW-038-082	0.25	ND	U	0.125	-2.079441542
AMW-039-082	0.25	ND	U	0.125	-2.079441542
AMW-040-082	0.25	ND	U	0.125	-2.079441542
AMW-041-082	0.25	ND	U	0.125	-2.079441542
AMW-042-082	0.25	ND	U	0.125	-2.079441542
AMW-043-082	0.25	ND	U	0.125	-2.079441542
AMW-044-082	0.25	ND	U	0.125	-2.079441542
AMW-045-082	0.25	ND	U	0.125	-2.079441542
AMW-046-082	0.25	ND	U	0.125	-2.079441542
AMW-052-082	0.25	ND	U	0.125	-2.079441542
AMW-053-082	0.25	ND	U	0.125	-2.079441542
AMW-054-082	0.25	ND	U	0.125	-2.079441542
AMW-055-082	0.25	ND	U	0.125	-2.079441542
AMW-056-082	0.25	ND	U	0.125	-2.079441542

B07NE003702-08332

EXPLOSIVE CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
BMW-001-082	0.25	ND	U	0.125	-2.079441542
BMW-002-082	0.25	ND	U	0.125	-2.079441542
BMW-003-082	0.25	ND	U	0.125	-2.079441542
BMW-004-082	0.25	ND	U	0.125	-2.079441542
BMW-005-082	0.25	ND	U	0.125	-2.079441542
BMW-006-082	0.25	ND	U	0.125	-2.079441542
BMW-007-082	0.25	ND	U	0.125	-2.079441542
BMW-008-082	0.25	ND	U	0.125	-2.079441542
BMW-009-082	0.25	ND	U	0.125	-2.079441542
BMW-010-082	0.25	ND	U	0.125	-2.079441542
BMW-017-082	0.25	ND	U	0.125	-2.079441542
BMW-018-082	0.25	ND	U	0.125	-2.079441542
BMW-020-082	0.25	ND	U	0.125	-2.079441542
BMW-021-082	0.25	ND	U	0.125	-2.079441542
BMW-022-082	0.25	ND	U	0.125	-2.079441542
BMW-023-082	0.25	ND	U	0.125	-2.079441542
BMW-024-082	0.25	ND	U	0.125	-2.079441542
BMW-025-082	0.25	ND	U	0.125	-2.079441542
BMW-026-082	0.25	ND	U	0.125	-2.079441542
BMW-027-082	0.25	ND	U	0.125	-2.079441542
BMW-028-082	0.25	ND	U	0.125	-2.079441542
BMW-029-082	0.25	ND	U	0.125	-2.079441542
BMW-030-082	0.25	ND	U	0.125	-2.079441542
BMW-031-082	0.25	ND	U	0.125	-2.079441542
BMW-032-082	0.25	ND	U	0.125	-2.079441542
BMW-033-082	0.25	ND	U	0.125	-2.079441542
BMW-034-082	0.25	ND	U	0.125	-2.079441542
BMW-035-082	0.25	ND	U	0.125	-2.079441542
BMW-036-082	0.25	ND	U	0.125	-2.079441542
BMW-037-082	0.25	ND	U	0.125	-2.079441542
BMW-040-082	0.25	ND	U	0.125	-2.079441542
BMW-041-082	0.25	ND	U	0.125	-2.079441542
BMW-042-082	0.25	ND	U	0.125	-2.079441542
BMW-043-082	0.25	ND	U	0.125	-2.079441542
BMW-044-082	0.25	ND	U	0.125	-2.079441542
BMW-045-082	0.25	ND	U	0.125	-2.079441542
BMW-046-082	0.25	ND	U	0.125	-2.079441542
BMW-052-082	0.25	ND	U	0.125	-2.079441542
BMW-053-082	0.25	ND	U	0.125	-2.079441542
BMW-054-082	0.25	ND	U	0.125	-2.079441542
BMW-055-082	0.25	ND	U	0.125	-2.079441542
BMW-056-082	0.25	ND	U	0.125	-2.079441542
CMW-017-082	0.25	ND	U	0.125	-2.079441542
CMW-018-082	0.25	ND	U	0.125	-2.079441542
CMW-020-082	0.25	ND	U	0.125	-2.079441542
DMW-009-082	0.25	ND	U	0.125	-2.079441542
DMW-021-082	0.25	ND	U	0.125	-2.079441542
DMW-025-082	0.25	ND	U	0.125	-2.079441542
DMW-028-082	0.25	ND	U	0.125	-2.079441542
DMW-032-082	0.25	ND	U	0.125	-2.079441542
DMW-033-082	0.25	ND	U	0.125	-2.079441542
DMW-034-082	0.25	ND	U	0.125	-2.079441542

B07NE003702-08333

EXPLOSIVE CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
DMW-035-082	0.25	ND	U	0.125	-2.079441542
DMW-036-082	0.25	ND	U	0.125	-2.079441542
DMW-037-082	0.25	ND	U	0.125	-2.079441542
DMW-038-082	0.25	ND	U	0.125	-2.079441542
DMW-039-082	0.25	ND	U	0.125	-2.079441542
DMW-041-082	0.25	ND	U	0.125	-2.079441542
DMW-042-082	0.25	ND	U	0.125	-2.079441542
DMW-043-082	0.25	ND	U	0.125	-2.079441542
DMW-044-082	0.25	ND	U	0.125	-2.079441542
DMW-045-082	0.25	ND	U	0.125	-2.079441542
DMW-046-082	0.25	ND	U	0.125	-2.079441542
			Nitrobenzene (NB)		
			MEAN =	0.125	
			GEOMEAN =	0.125	
			MEAN OF LN=	-2.079441542	
			N=	112	
			S=	0	
			H=	NA	
			UCL=	NA	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

EXPLOSIVE CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
			Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)		
AMW-001-082	0.25	ND	U	0.125	-2.079441542
AMW-002-082	0.25	ND	U	0.125	-2.079441542
AMW-003-082	0.25	ND	U	0.125	-2.079441542
AMW-004-082	0.25	ND	U	0.125	-2.079441542
AMW-005-082	0.25	ND	U	0.125	-2.079441542
AMW-006-082	0.25	ND	U	0.125	-2.079441542
AMW-007-082	0.25	ND	U	0.125	-2.079441542
AMW-008-082	0.25	ND	U	0.125	-2.079441542
AMW-009-082	0.25	ND	U	0.125	-2.079441542
AMW-010-082	0.25	ND	U	0.125	-2.079441542
AMW-011-082				3.7	1.30833282
AMW-012-082	0.25	ND	U	0.125	-2.079441542
AMW-013-082	0.25	ND	U	0.125	-2.079441542
AMW-014-082	0.25	ND	U	0.125	-2.079441542
AMW-015-082	0.25	ND	U	0.125	-2.079441542
AMW-017-082	0.25	ND	U	0.125	-2.079441542
AMW-018-082	0.25	ND	U	0.125	-2.079441542
AMW-020-082	0.25	ND	U	0.125	-2.079441542
AMW-021-082	0.25	ND	U	0.125	-2.079441542
AMW-022-082	0.25	ND	U	0.125	-2.079441542
AMW-023-082	0.25	ND	U	0.125	-2.079441542
AMW-024-082	0.25	ND	U	0.125	-2.079441542
AMW-025-082	0.25	ND	U	0.125	-2.079441542
AMW-026-082	0.25	ND	U	0.125	-2.079441542
AMW-027-082	0.25	ND	U	0.125	-2.079441542
AMW-028-082	0.25	ND	U	0.125	-2.079441542
AMW-029-082	0.25	ND	U	0.125	-2.079441542
AMW-030-082	0.25	ND	U	0.125	-2.079441542
AMW-031-082	0.25	ND	U	0.125	-2.079441542
AMW-032-082	0.25	ND	U	0.125	-2.079441542
AMW-033-082				0.98	-0.020202707
AMW-034-082	0.25	ND	U	0.125	-2.079441542
AMW-035-082	0.25	ND	U	0.125	-2.079441542
AMW-036-082	0.25	ND	U	0.125	-2.079441542
AMW-037-082	0.25	ND	U	0.125	-2.079441542
AMW-038-082	0.25	ND	U	0.125	-2.079441542
AMW-039-082	0.25	ND	U	0.125	-2.079441542
AMW-040-082	0.25	ND	U	0.125	-2.079441542
AMW-041-082	0.25	ND	U	0.125	-2.079441542
AMW-042-082	0.25	ND	U	0.125	-2.079441542
AMW-043-082	0.25	ND	U	0.125	-2.079441542
AMW-044-082	0.25	ND	U	0.125	-2.079441542
AMW-045-082	0.25	ND	U	0.125	-2.079441542
AMW-046-082	0.25	ND	U	0.125	-2.079441542
AMW-052-082				0.92	-0.083381609
AMW-053-082				1.9	0.641853886
AMW-054-082	0.25	ND	U	0.125	-2.079441542
AMW-055-082	0.25	ND	U	0.125	-2.079441542
AMW-056-082	0.25	ND	U	0.125	-2.079441542

B07NE003702-08335

EXPLOSIVE CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
BMW-001-082	0.25	ND	U	0.125	-2.079441542
BMW-002-082	0.25	ND	U	0.125	-2.079441542
BMW-003-082	0.25	ND	U	0.125	-2.079441542
BMW-004-082				1.3	0.262364264
BMW-005-082				45	3.80666249
BMW-006-082	0.25	ND	U	0.125	-2.079441542
BMW-007-082	0.25	ND	U	0.125	-2.079441542
BMW-008-082	0.25	ND	U	0.125	-2.079441542
BMW-009-082	0.25	ND	U	0.125	-2.079441542
BMW-010-082	0.25	ND	U	0.125	-2.079441542
BMW-017-082	0.25	ND	U	0.125	-2.079441542
BMW-018-082	0.25	ND	U	0.125	-2.079441542
BMW-020-082	0.25	ND	U	0.125	-2.079441542
BMW-021-082				0.94	-0.061875404
BMW-022-082	0.25	ND	U	0.125	-2.079441542
BMW-023-082	0.25	ND	U	0.125	-2.079441542
BMW-024-082	0.25	ND	U	0.125	-2.079441542
BMW-025-082	0.25	ND	U	0.125	-2.079441542
BMW-026-082	0.25	ND	U	0.125	-2.079441542
BMW-027-082	0.25	ND	U	0.125	-2.079441542
BMW-028-082	0.25	ND	U	0.125	-2.079441542
BMW-029-082	0.25	ND	U	0.125	-2.079441542
BMW-030-082	0.25	ND	U	0.125	-2.079441542
BMW-031-082	0.25	ND	U	0.125	-2.079441542
BMW-032-082	0.25	ND	U	0.125	-2.079441542
BMW-033-082	0.25	ND	U	0.125	-2.079441542
BMW-034-082	0.25	ND	U	0.125	-2.079441542
BMW-035-082	0.25	ND	U	0.125	-2.079441542
BMW-036-082	0.25	ND	U	0.125	-2.079441542
BMW-037-082	0.25	ND	U	0.125	-2.079441542
BMW-040-082	0.25	ND	U	0.125	-2.079441542
BMW-041-082	0.25	ND	U	0.125	-2.079441542
BMW-042-082	0.25	ND	U	0.125	-2.079441542
BMW-043-082				3.8	1.335001067
BMW-044-082	0.25	ND	U	0.125	-2.079441542
BMW-045-082	0.25	ND	U	0.125	-2.079441542
BMW-046-082	0.25	ND	U	0.125	-2.079441542
BMW-052-082				0.48	-0.733969175
BMW-053-082				0.91	-0.094310679
BMW-054-082	0.25	ND	U	0.125	-2.079441542
BMW-055-082	0.25	ND	U	0.125	-2.079441542
BMW-056-082				0.43	-0.84397007
CMW-017-082	0.25	ND	U	0.125	-2.079441542
CMW-018-082				0.26	-1.347073648
CMW-020-082	0.25	ND	U	0.125	-2.079441542
DMW-009-082	0.25	ND	U	0.125	-2.079441542
DMW-021-082	0.25	ND	U	0.125	-2.079441542
DMW-025-082	0.25	ND	U	0.125	-2.079441542
DMW-028-082	0.25	ND	U	0.125	-2.079441542
DMW-032-082	0.25	ND	U	0.125	-2.079441542
DMW-033-082	0.25	ND	U	0.125	-2.079441542
DMW-034-082	0.25	ND	U	0.125	-2.079441542

B07NE003702-08336

EXPLOSIVE CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
DMW-035-082	0.25	ND	U	0.125	-2.079441542
DMW-036-082	0.25	ND	U	0.125	-2.079441542
DMW-037-082	0.25	ND	U	0.125	-2.079441542
DMW-038-082	0.25	ND	U	0.125	-2.079441542
DMW-039-082	0.25	ND	U	0.125	-2.079441542
DMW-041-082	0.25	ND	U	0.125	-2.079441542
DMW-042-082	0.25	ND	U	0.125	-2.079441542
DMW-043-082	0.25	ND	U	0.125	-2.079441542
DMW-044-082	0.25	ND	U	0.125	-2.079441542
DMW-045-082	0.25	ND	U	0.125	-2.079441542
DMW-046-082	0.25	ND	U	0.125	-2.079441542

Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)

MEAN =	0.652857143
GEOMEAN =	0.162120212
MEAN OF LN=	-1.819417169
N=	112
S=	0.87
H=	2.075
UCL=	2.80E-01
MIN =	0.26
MAX =	45
NO. OF DET=	12

B07NE003702-08337

VOC CONCENTRATION CALCULATION
AREA A
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-048-082	1	ND	U	0.5	-0.693147181
BMW-016-082	1	ND	U	0.5	-0.693147181
BMW-048-082	1	ND	U	0.5	-0.693147181
BMW-057-082	1	ND	U	0.5	-0.693147181
CMW-016-082	1	ND	U	0.5	-0.693147181
DMW-048-082	1	ND	U	0.5	-0.693147181
IH2-601-082	1	ND	UJ	0.5	-0.693147181
IH2-602-082	1	ND	UJ	0.5	-0.693147181
IH2-603-082	1	ND	U	0.5	-0.693147181
IH2-604-082	1	ND	U	0.5	-0.693147181
JH2-601-082	1	ND	UJ	0.5	-0.693147181
JH2-602-082	1	ND	U	0.5	-0.693147181
JH2-603-082	1	ND	U	0.5	-0.693147181
JH2-604-082	1	ND	U	0.5	-0.693147181

1,1,1-Trichloroethane

MEAN =	0.5
GEOMEAN =	0.5
MEAN OF LN=	-0.693147181
N=	14
S=	1.16894E-08
H=	3
UCL=	5.00E-01
MIN =	0
MAX =	0
NO. OF DET=	0

AMW-048-082	1	ND	U	0.5	-0.693147181
BMW-016-082	1	ND	U	0.5	-0.693147181
BMW-048-082	1	ND	U	0.5	-0.693147181
BMW-057-082	1	ND	U	0.5	-0.693147181
CMW-016-082	1	ND	U	0.5	-0.693147181
DMW-048-082	1	ND	U	0.5	-0.693147181
IH2-601-082	1	ND	UJ	0.5	-0.693147181
IH2-602-082	1	ND	UJ	0.5	-0.693147181
IH2-603-082	1	ND	U	0.5	-0.693147181
IH2-604-082	1	ND	U	0.5	-0.693147181
JH2-601-082	1	ND	UJ	0.5	-0.693147181
JH2-602-082	1	ND	U	0.5	-0.693147181
JH2-603-082	1	ND	U	0.5	-0.693147181
JH2-604-082	1	ND	U	0.5	-0.693147181

1,1,2,2-Tetrachloroethane

MEAN =	0.5
GEOMEAN =	0.5
MEAN OF LN=	-0.693147181
N=	14
S=	1.16894E-08
H=	NA
UCL=	5.00E-01
MIN =	0
MAX =	0
NO. OF DET=	0

VOC CONCENTRATION CALCULATION
AREA A
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-048-082	1	ND	U	0.5	-0.693147181
BMW-016-082	1	ND	U	0.5	-0.693147181
BMW-048-082	1	ND	U	0.5	-0.693147181
BMW-057-082	1	ND	U	0.5	-0.693147181
CMW-016-082	1	ND	U	0.5	-0.693147181
DMW-048-082	1	ND	U	0.5	-0.693147181
IH2-601-082	1	ND	UJ	0.5	-0.693147181
IH2-602-082	1	ND	UJ	0.5	-0.693147181
IH2-603-082	1	ND	U	0.5	-0.693147181
IH2-604-082	1	ND	U	0.5	-0.693147181
JH2-601-082	1	ND	UJ	0.5	-0.693147181
JH2-602-082	1	ND	U	0.5	-0.693147181
JH2-603-082	1	ND	U	0.5	-0.693147181
JH2-604-082	1	ND	U	0.5	-0.693147181

1,1,2-Trichloroethane

MEAN =	0.5
GEOMEAN =	0.5
MEAN OF LN=	-0.693147181
N=	14
S=	1.16894E-08
H=	NA
UCL=	5.00E-01
MIN =	0
MAX =	0
NO. OF DET=	0

AMW-048-082	1	ND	U	0.5	-0.693147181
BMW-016-082	1	ND	U	0.5	-0.693147181
BMW-048-082	1	ND	U	0.5	-0.693147181
BMW-057-082	1	ND	U	0.5	-0.693147181
CMW-016-082	1	ND	U	0.5	-0.693147181
DMW-048-082	1	ND	U	0.5	-0.693147181
IH2-601-082	1	ND	UJ	0.5	-0.693147181
IH2-602-082	1	ND	UJ	0.5	-0.693147181
IH2-603-082	1	ND	U	0.5	-0.693147181
IH2-604-082	1	ND	U	0.5	-0.693147181
JH2-601-082	1	ND	UJ	0.5	-0.693147181
JH2-602-082	1	ND	U	0.5	-0.693147181
JH2-603-082	1	ND	U	0.5	-0.693147181
JH2-604-082	1	ND	U	0.5	-0.693147181

1,1-Dichloroethane

MEAN =	0.5
GEOMEAN =	0.5
MEAN OF LN=	-0.693147181
N=	14
S=	1.16894E-08
H=	NA
UCL=	5.00E-01
MIN =	0
MAX =	0
NO. OF DET=	0

VOC CONCENTRATION CALCULATION
AREA A
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-048-082	1	ND	U	0.5	-0.693147181
BMW-016-082	1	ND	U	0.5	-0.693147181
BMW-048-082	1	ND	U	0.5	-0.693147181
BMW-057-082	1	ND	U	0.5	-0.693147181
CMW-016-082	1	ND	U	0.5	-0.693147181
DMW-048-082	1	ND	U	0.5	-0.693147181
IH2-601-082	1	ND	UJ	0.5	-0 693147181
IH2-602-082	1	ND	UJ	0.5	-0.693147181
IH2-603-082	1	ND	U	0.5	-0.693147181
IH2-604-082	1	ND	U	0.5	-0.693147181
JH2-601-082	1	ND	UJ	0.5	-0.693147181
JH2-602-082	1	ND	U	0.5	-0.693147181
JH2-603-082	1	ND	U	0.5	-0.693147181
JH2-604-082	1	ND	U	0.5	-0.693147181
			1,1-Dichloroethene		
			MEAN =	0.5	
			GEOMEAN =	0.5	
			MEAN OF LN=	-0.693147181	
			N=	14	
			S=	1.16894E-08	
			H=	NA	
			UCL=	5.00E-01	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
IH2-601-082	10	ND	UJ	5	1.609437912
IH2-602-082	10	ND	UJ	5	1.609437912
IH2-603-082	10	ND	U	5	1.609437912
JH2-601-082	10	ND	UJ	5	1.609437912
JH2-602-082	10	ND	U	5	1.609437912
JH2-603-082	10	ND	U	5	1.609437912
			1,2-Dichloroethene(Total)		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	6	
			S=	1 88486E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

VOC CONCENTRATION CALCULATION
AREA A
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-048-082	1	ND	U	0.5	-0.693147181
BMW-016-082	1	ND	U	0.5	-0.693147181
BMW-048-082	1	ND	U	0.5	-0.693147181
BMW-057-082	1	ND	U	0.5	-0.693147181
CMW-016-082	1	ND	U	0.5	-0.693147181
DMW-048-082	1	ND	U	0.5	-0.693147181
IH2-601-082	1	ND	UJ	0.5	-0.693147181
IH2-602-082	1	ND	UJ	0.5	-0.693147181
IH2-603-082	1	ND	U	0.5	-0.693147181
IH2-604-082	1	ND	U	0.5	-0.693147181
JH2-601-082	1	ND	UJ	0.5	-0.693147181
JH2-602-082	1	ND	U	0.5	-0.693147181
JH2-603-082	1	ND	U	0.5	-0.693147181
JH2-604-082	1	ND	U	0.5	-0.693147181
			1,2-Dichloropropane		
			MEAN =	0.5	
			GEOMEAN =	0.5	
			MEAN OF LN=	-0.693147181	
			N=	14	
			S=	1.16894E-08	
			H=	2.205	
			UCL=	5.00E-01	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
IH2-601-082	5	ND	UJ	2.5	0.916290732
IH2-602-082	5	ND	UJ	2.5	0.916290732
IH2-603-082	5	ND	U	2.5	0.916290732
IH2-604-082				5	1.609437912
JH2-601-082	5	ND	UJ	2.5	0.916290732
JH2-602-082	5	ND	U	2.5	0.916290732
JH2-603-082	5	ND	U	2.5	0.916290732
JH2-604-082				6	1.791759469
			Acetone		
			MEAN =	3.25	
			GEOMEAN =	3.041551423	
			MEAN OF LN=	1.112367722	
			N=	8	
			S=	0.366319345	
			H=	2.13	
			UCL=	4.37E+00	
			MIN =	5	
			MAX =	6	
			NO. OF DET=	2	

B07NE003702-08342

VOC CONCENTRATION CALCULATION
AREA A
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-048-082	1	ND	U	0.5	-0.693147181
BMW-016-082	1	ND	U	0.5	-0.693147181
BMW-048-082	1	ND	U	0.5	-0.693147181
BMW-057-082	1	ND	U	0.5	-0.693147181
CMW-016-082	1	ND	U	0.5	-0.693147181
DMW-048-082	1	ND	U	0.5	-0.693147181
IH2-601-082	1	ND	UJ	0.5	-0.693147181
IH2-602-082	1	ND	UJ	0.5	-0.693147181
IH2-603-082	1	ND	U	0.5	-0.693147181
IH2-604-082	1	ND	U	0.5	-0.693147181
JH2-601-082	1	ND	UJ	0.5	-0.693147181
JH2-602-082	1	ND	U	0.5	-0.693147181
JH2-603-082	1	ND	U	0.5	-0.693147181
JH2-604-082	1	ND	U	0.5	-0.693147181
			Chloroform		
			MEAN =	0.5	
			GEOMEAN =	0.5	
			MEAN OF LN=	-0.693147181	
			N=	14	
			S=	1.16894E-08	
			H=	3	
			UCL=	5.00E-01	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-048-082				2	0.693147181
BMW-016-082			BJ	1	0
BMW-048-082			J	0.7	-0.356674944
BMW-057-082			B	6	1.791759469
CMW-016-082	2	ND	UB	1	0
DMW-048-082	2	ND	UBJ	1	0
IH2-601-082			BJ	2	0.693147181
IH2-602-082			BJ	0.8	-0.223143551
IH2-603-082	2	ND	U	1	0
IH2-604-082	5		UB	2.5	0.916290732
JH2-601-082			BJ	2	0.693147181
JH2-602-082			BJ	0.9	-0.105360516
JH2-603-082			BJ	2	0.693147181
JH2-604-082	2	ND	U	1	0
			Methylene chloride		
			MEAN =	1.707142857	
			GEOMEAN =	1.408510624	
			MEAN OF LN=	0.342532851	
			N=	14	
			S=	0.589478981	
			H=	4.41	
			UCL=	3.45E+00	
			MIN =	0.7	
			MAX =	6	
			NO. OF DET=	9	

VOC CONCENTRATION CALCULATION
AREA A
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-048-082	1	ND	U	0.5	-0.693147181
BMW-016-082				3	1.098612289
BMW-048-082	1	ND	U	0.5	-0.693147181
BMW-057-082	1	ND	U	0.5	-0.693147181
CMW-016-082	1	ND	U	0.5	-0.693147181
DMW-048-082	1	ND	U	0.5	-0.693147181
IH2-601-082	1	ND	UJ	0.5	-0.693147181
IH2-602-082	1	ND	UJ	0.5	-0.693147181
IH2-603-082	1	ND	U	0.5	-0.693147181
IH2-604-082	1	ND	U	0.5	-0.693147181
JH2-601-082	1	ND	UJ	0.5	-0.693147181
JH2-602-082	1	ND	U	0.5	-0.693147181
JH2-603-082	1	ND	U	0.5	-0.693147181
JH2-604-082	1	ND	U	0.5	-0.693147181

Tetrachloroethene

MEAN =	0.678571429
GEOMEAN =	0.568266738
MEAN OF LN=	-0.565164361
N=	14
S=	0.478867861
H=	2.038
UCL=	8.35E-01
MIN =	3
MAX =	3
NO. OF DET=	1

AMW-048-082	1	ND	U	0.5	-0.693147181
BMW-016-082	1	ND	U	0.5	-0.693147181
BMW-048-082	1	ND	U	0.5	-0.693147181
BMW-057-082	1	ND	U	0.5	-0.693147181
CMW-016-082	1	ND	U	0.5	-0.693147181
DMW-048-082	1	ND	U	0.5	-0.693147181
IH2-601-082	1	ND	UJ	0.5	-0.693147181
IH2-602-082	1	ND	UJ	0.5	-0.693147181
IH2-603-082	1	ND	U	0.5	-0.693147181
IH2-604-082	1	ND	U	0.5	-0.693147181
JH2-601-082	1	ND	UJ	0.5	-0.693147181
JH2-602-082	1	ND	U	0.5	-0.693147181
JH2-603-082	1	ND	U	0.5	-0.693147181
JH2-604-082	1	ND	U	0.5	-0.693147181

Trichloroethene

MEAN =	0.5
GEOMEAN =	0.5
MEAN OF LN=	-0.693147181
N=	14
S=	1.16894E-08
H=	NA
UCL=	5.00E-01
MIN =	0
MAX =	0
NO. OF DET=	0

VOC CONCENTRATION CALCULATION
AREA B
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-019-082	1	ND	U	0.5	-0.693147181
AMW-058-082	1	ND	U	0.5	-0.693147181
AMW-059-082	1	ND	U	0.5	-0.693147181
BMW-019-082	1	ND	U	0.5	-0.693147181
BMW-058-082	10	ND	U	5	1.609437912
BMW-059-082	1	ND	U	0.5	-0.693147181
CMW-019-082	1	ND	U	0.5	-0.693147181
DMW-059-082	1	ND	U	0.5	-0.693147181

1,1,1-Trichloroethane

MEAN =	1.0625
GEOMEAN =	0.666760716
MEAN OF LN=	-0.405324044
N=	8
S=	0.814086767
H=	2.965
UCL=	2.31E+00
MIN =	0
MAX =	0
NO. OF DET=	0

AMW-019-082	1	ND	U	0.5	-0.693147181
AMW-058-082	1	ND	U	0.5	-0.693147181
AMW-059-082	1	ND	U	0.5	-0.693147181
BMW-019-082	1	ND	U	0.5	-0.693147181
BMW-058-082	10	ND	U	5	1.609437912
BMW-059-082	1	ND	U	0.5	-0.693147181
CMW-019-082	1	ND	U	0.5	-0.693147181
DMW-059-082	1	ND	U	0.5	-0.693147181

1,1,2,2-Tetrachloroethane

MEAN =	1.0625
GEOMEAN =	0.666760716
MEAN OF LN=	-0.405324044
N=	8
S=	0.814086767
H=	2.965
UCL=	2.31E+00
MIN =	0
MAX =	0
NO. OF DET=	0

VOC CONCENTRATION CALCULATION
AREA B
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-019-082	1	ND	U	0.5	-0.693147181
AMW-058-082	1	ND	U	0.5	-0.693147181
AMW-059-082	1	ND	U	0.5	-0.693147181
BMW-019-082	1	ND	U	0.5	-0.693147181
BMW-058-082	10	ND	U	5	1.609437912
BMW-059-082	1	ND	U	0.5	-0.693147181
CMW-019-082	1	ND	U	0.5	-0.693147181
DMW-059-082	1	ND	U	0.5	-0.693147181

1,1,2-Trichloroethane

MEAN =	1.0625
GEOMEAN =	0.666760716
MEAN OF LN=	-0.405324044
N=	8
S=	0.814086767
H=	NA
UCL=	9.29E-01
MIN =	0
MAX =	0
NO. OF DET=	0

AMW-019-082	1	ND	U	0.5	-0.693147181
AMW-058-082	1	ND	U	0.5	-0.693147181
AMW-059-082	1	ND	U	0.5	-0.693147181
BMW-019-082	1	ND	U	0.5	-0.693147181
BMW-058-082	10	ND	U	5	1.609437912
BMW-059-082	1	ND	U	0.5	-0.693147181
CMW-019-082	1	ND	U	0.5	-0.693147181
DMW-059-082	1	ND	U	0.5	-0.693147181

1,1-Dichloroethane

MEAN =	1.0625
GEOMEAN =	0.666760716
MEAN OF LN=	-0.405324044
N=	8
S=	0.814086767
H=	NA
UCL=	9.29E-01
MIN =	0
MAX =	0
NO. OF DET=	0

VOC CONCENTRATION CALCULATION
AREA B
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-019-082	1	ND	U	0.5	-0.693147181
AMW-058-082	1	ND	U	0.5	-0.693147181
AMW-059-082	1	ND	U	0.5	-0.693147181
BMW-019-082	1	ND	U	0.5	-0.693147181
BMW-058-082	10	ND	U	5	1.609437912
BMW-059-082	1	ND	U	0.5	-0.693147181
CMW-019-082	1	ND	U	0.5	-0.693147181
DMW-059-082	1	ND	U	0.5	-0.693147181

1,1-Dichloroethene

MEAN =	1.0625
GEOMEAN =	0.666760716
MEAN OF LN=	-0.405324044
N=	8
S=	0.814086767
H=	NA
UCL=	9.29E-01
MIN =	0
MAX =	0
NO. OF DET=	0

AMW-019-082	1	ND	U	0.5	-0.693147181
AMW-058-082	1	ND	U	0.5	-0.693147181
AMW-059-082	1	ND	U	0.5	-0.693147181
BMW-019-082	1	ND	U	0.5	-0.693147181
BMW-058-082	10	ND	U	5	1.609437912
BMW-059-082	1	ND	U	0.5	-0.693147181
CMW-019-082	1	ND	U	0.5	-0.693147181
DMW-059-082	1	ND	U	0.5	-0.693147181

1,2-Dichloropropane

MEAN =	1.0625
GEOMEAN =	0.666760716
MEAN OF LN=	-0.405324044
N=	8
S=	0.814086767
H=	2.205
UCL=	1.83E+00
MIN =	0
MAX =	0
NO. OF DET=	0

VOC CONCENTRATION CALCULATION
AREA B
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-019-082	1	ND	U	0.5	-0.693147181
AMW-058-082	1	ND	U	0.5	-0.693147181
AMW-059-082	1	ND	U	0.5	-0.693147181
BMW-019-082	1	ND	U	0.5	-0.693147181
BMW-058-082	10	ND	U	5	1.609437912
BMW-059-082	1	ND	U	0.5	-0.693147181
CMW-019-082	1	ND	U	0.5	-0.693147181
DMW-059-082	1	ND	U	0.5	-0.693147181
			Chloroform		
			MEAN =	1.0625	
			GEOMEAN =	0.666760716	
			MEAN OF LN=	-0.405324044	
			N=	8	
			S=	0.814086767	
			H=	NA	
			UCL=	9.29E-01	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-019-082	1	ND	U	0.5	-0.693147181
AMW-058-082	1	ND	U	0.5	-0.693147181
AMW-059-082	1	ND	U	0.5	-0.693147181
BMW-019-082	1	ND	U	0.5	-0.693147181
BMW-058-082			J	1	0
BMW-059-082	1	ND	U	0.5	-0.693147181
CMW-019-082	1	ND	U	0.5	-0.693147181
DMW-059-082	1	ND	U	0.5	-0.693147181
			1,2-Dichloroethene(Total)		
			MEAN =	0.5625	
			GEOMEAN =	0.545253866	
			MEAN OF LN=	-0.606503783	
			N=	8	
			S=	0.245064536	
			H=	2.002	
			UCL=	6.76E-01	
			MIN =	1	
			MAX =	1	
			NO. OF DET=	1	

VOC CONCENTRATION CALCULATION
AREA B
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-019-082			B	8	2.079441542
AMW-058-082	2	ND	UB	1	0
AMW-059-082			B	4	1.386294361
BMW-019-082			B	4	1.386294361
BMW-058-082			BJ	2	0.693147181
BMW-059-082	2	ND	UB	1	0
CMW-019-082	2	ND	UB	1	0
DMW-059-082			B	2	0.693147181
			Methylene chloride		
			MEAN =	2.875	
			GEOMEAN =	2.181015465	
			MEAN OF LN=	0.779790578	
			N=	8	
			S=	0.780477921	
			H=	2.965	
			UCL=	7.09E+00	
			MIN =	2	
			MAX =	8	
			NO. OF DET=	5	
AMW-019-082	1	ND	U	0.5	-0.693147181
AMW-058-082	1	ND	U	0.5	-0.693147181
AMW-059-082	1	ND	U	0.5	-0.693147181
BMW-019-082	1	ND	U	0.5	-0.693147181
BMW-058-082	10	ND	U	5	1.609437912
BMW-059-082	1	ND	U	0.5	-0.693147181
CMW-019-082	1	ND	U	0.5	-0.693147181
DMW-059-082	1	ND	U	0.5	-0.693147181
			Tetrachloroethene		
			MEAN =	1.0625	
			GEOMEAN =	0.666760716	
			MEAN OF LN=	-0.405324044	
			N=	8	
			S=	0.814086767	
			H=	NA	
			UCL=	9.29E-01	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

VOC CONCENTRATION CALCULATION
AREA B
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-019-082	1	ND	U	0.5	-0.693147181
AMW-058-082	1	ND	U	0.5	-0.693147181
AMW-059-082	1	ND	U	0.5	-0.693147181
BMW-019-082	1	ND	U	0.5	-0.693147181
BMW-058-082				130	4.86753445
BMW-059-082	1	ND	U	0.5	-0.693147181
CMW-019-082	1	ND	U	0.5	-0.693147181
DMW-059-082	1	ND	U	0.5	-0.693147181

Trichloroethene

MEAN =	16.6875
GEOMEAN =	1.001939902
MEAN OF LN=	0.001938023
N=	8
S=	1.965997845
H=	6.177
UCL=	6 82E+02
MIN =	130
MAX =	130
NO. OF DET=	1

VOC CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
		1,1,1-Trichloroethane			
AMW-001-082	1	ND	U	0.5	-0.693147181
AMW-002-082	10	ND	U	5	1.609437912
AMW-003-082	1	ND	U	0.5	-0.693147181
AMW-004-082	1	ND	U	0.5	-0.693147181
AMW-005-082	1	ND	U	0.5	-0.693147181
AMW-006-082	1	ND	U	0.5	-0.693147181
AMW-007-082	1	ND	U	0.5	-0.693147181
AMW-008-082	1	ND	U	0.5	-0.693147181
AMW-009-082	17	ND	U	8.5	2.140066163
AMW-010-082	1	ND	U	0.5	-0.693147181
AMW-011-082	1	ND	U	0.5	-0.693147181
AMW-012-082	10	ND	U	5	1.609437912
AMW-013-082	1	ND	U	0.5	-0.693147181
AMW-014-082	1	ND	U	0.5	-0.693147181
AMW-015-082	1	ND	U	0.5	-0.693147181
AMW-018-082	1	ND	U	0.5	-0.693147181
AMW-020-082	1	ND	U	0.5	-0.693147181
AMW-021-082	1	ND	U	0.5	-0.693147181
AMW-022-082	1	ND	U	0.5	-0.693147181
AMW-023-082	1	ND	U	0.5	-0.693147181
AMW-024-082	1	ND	U	0.5	-0.693147181
AMW-025-082	1	ND	U	0.5	-0.693147181
AMW-026-082	1	ND	U	0.5	-0.693147181
AMW-027-082	1	ND	U	0.5	-0.693147181
AMW-028-082	1	ND	U	0.5	-0.693147181
AMW-029-082	1	ND	U	0.5	-0.693147181
AMW-030-082	1	ND	U	0.5	-0.693147181
AMW-031-082	1	ND	U	0.5	-0.693147181
AMW-032-082	1	ND	U	0.5	-0.693147181
AMW-033-082	1	ND	U	0.5	-0.693147181
AMW-034-082	1	ND	U	0.5	-0.693147181
AMW-035-082	1	ND	U	0.5	-0.693147181
AMW-040-082	10	ND	U	5	1.609437912
AMW-041-082	1	ND	U	0.5	-0.693147181
AMW-042-082	1	ND	U	0.5	-0.693147181
AMW-043-082	1	ND	U	0.5	-0.693147181
AMW-052-082	1	ND	U	0.5	-0.693147181
AMW-053-082	1	ND	U	0.5	-0.693147181
AMW-054-082	1	ND	U	0.5	-0.693147181
AMW-055-082	1	ND	U	0.5	-0.693147181
AMW-056-082	1	ND	U	0.5	-0.693147181
BMW-001-082	1	ND	U	0.5	-0.693147181
BMW-002-082	1	ND	U	0.5	-0.693147181
BMW-003-082	1	ND	U	0.5	-0.693147181
BMW-004-082	1	ND	U	0.5	-0.693147181
BMW-005-082	1	ND	U	0.5	-0.693147181
BMW-006-082	1	ND	U	0.5	-0.693147181
BMW-007-082	1	ND	U	0.5	-0.693147181
BMW-008-082	1	ND	U	0.5	-0.693147181
BMW-009-082	10	ND	U	5	1.609437912
BMW-010-082	1	ND	U	0.5	-0.693147181

VOC CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
BMW-018-082	1	ND	U	0.5	-0.693147181
BMW-020-082	1	ND	U	0.5	-0.693147181
BMW-021-082	10	ND	U	5	1.609437912
BMW-022-082	1	ND	U	0.5	-0.693147181
BMW-023-082	10	ND	U	5	1.609437912
BMW-024-082	1	ND	U	0.5	-0.693147181
BMW-025-082	1	ND	U	0.5	-0.693147181
BMW-026-082	1	ND	U	0.5	-0.693147181
BMW-027-082	1	ND	U	0.5	-0.693147181
BMW-028-082	1	ND	U	0.5	-0.693147181
BMW-029-082	1	ND	U	0.5	-0.693147181
BMW-030-082	1	ND	U	0.5	-0.693147181
BMW-031-082	1	ND	U	0.5	-0.693147181
BMW-032-082-RE	2	ND	U	1	0
BMW-033-082	1	ND	U	0.5	-0.693147181
BMW-034-082	1	ND	U	0.5	-0.693147181
BMW-035-082	1	ND	U	0.5	-0.693147181
BMW-040-082	170	ND	U	85	4.442651256
BMW-041-082	1	ND	U	0.5	-0.693147181
BMW-042-082	1	ND	U	0.5	-0.693147181
BMW-043-082			J	2	0.693147181
BMW-052-082	1	ND	U	0.5	-0.693147181
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	1	ND	U	0.5	-0.693147181
BMW-055-082	1	ND	U	0.5	-0.693147181
BMW-056-082	10	ND	U	5	1.609437912
CMW-018-082	10	ND	U	5	1.609437912
CMW-020-082	1	ND	U	0.5	-0.693147181
DMW-009-082-RE	16	ND	U	8	2.079441542
DMW-021-082	1	ND	U	0.5	-0.693147181
DMW-025-082	1	ND	U	0.5	-0.693147181
DMW-028-082	1	ND	U	0.5	-0.693147181
DMW-032-082	1	ND	U	0.5	-0.693147181
DMW-033-082	1	ND	U	0.5	-0.693147181
DMW-034-082	1	ND	U	0.5	-0.693147181
DMW-035-082	1	ND	U	0.5	-0.693147181
DMW-041-082	1	ND	U	0.5	-0.693147181
DMW-042-082	1	ND	U	0.5	-0.693147181
DMW-043-082	1	ND	U	0.5	-0.693147181
AMW-017-082	1	ND	U	0.5	-0.693147181
AMW-036-082	10	ND	U	5	1.609437912
AMW-037-082	1	ND	U	0.5	-0.693147181
AMW-038-082	1	ND	U	0.5	-0.693147181
AMW-039-082	1	ND	U	0.5	-0.693147181
AMW-044-082	10	ND	U	5	1.609437912
AMW-045-082	10	ND	U	5	1.609437912
AMW-046-082	1	ND	U	0.5	-0.693147181
BMW-017-082	1	ND	U	0.5	-0.693147181
BMW-036-082	1	ND	U	5	1.609437912
BMW-037-082	1	ND	U	0.5	-0.693147181
BMW-044-082	1	ND	U	0.5	-0.693147181
BMW-045-082			J	1	0

VOC CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
BMW-046-082	1	ND	U	0.5	-0.693147181
CMW-017-082	1	ND	U	0.5	-0.693147181
DMW-036-082	1	ND	U	0.5	-0 693147181
DMW-037-082	1	ND	U	0.5	-0.693147181
DMW-038-082	1	ND	U	0.5	-0.693147181
DMW-039-082	1	ND	U	0.5	-0.693147181
DMW-044-082	1	ND	U	0.5	-0.693147181
DMW-045-082	10	ND	U	5	1.609437912
DMW-046-082	1	ND	U	0.5	-0 693147181

1,1,1-Trichloroethane

MEAN =	1.977678571
GEOMEAN =	0.752268749
MEAN OF LN=	-0.28466164
N=	112
S=	0.951583291
H=	2.151
UCL=	1.44E+00
MIN =	1
MAX =	2
NO. OF DET=	2

VOC CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
		1,1,2,2-Tetrachloroethane			
AMW-001-082	1	ND	U	0.5	-0.693147181
AMW-002-082	10	ND	U	5	1.609437912
AMW-003-082	1	ND	U	0.5	-0.693147181
AMW-004-082	1	ND	U	0.5	-0.693147181
AMW-005-082	1	ND	U	0.5	-0.693147181
AMW-006-082	1	ND	U	0.5	-0.693147181
AMW-007-082	1	ND	U	0.5	-0.693147181
AMW-008-082	1	ND	U	0.5	-0.693147181
AMW-009-082	17	ND	U	8.5	2.140066163
AMW-010-082	1	ND	U	0.5	-0.693147181
AMW-011-082	1	ND	U	0.5	-0.693147181
AMW-012-082	10	ND	U	5	1.609437912
AMW-013-082	1	ND	U	0.5	-0.693147181
AMW-014-082	1	ND	U	0.5	-0.693147181
AMW-015-082	1	ND	U	0.5	-0.693147181
AMW-018-082	1	ND	U	0.5	-0.693147181
AMW-020-082	1	ND	U	0.5	-0.693147181
AMW-021-082	1	ND	U	0.5	-0.693147181
AMW-022-082	1	ND	U	0.5	-0.693147181
AMW-023-082	1	ND	U	0.5	-0.693147181
AMW-024-082	1	ND	U	0.5	-0.693147181
AMW-025-082	1	ND	U	0.5	-0.693147181
AMW-026-082	1	ND	U	0.5	-0.693147181
AMW-027-082	1	ND	U	0.5	-0.693147181
AMW-028-082	1	ND	U	0.5	-0.693147181
AMW-029-082	1	ND	U	0.5	-0.693147181
AMW-030-082	1	ND	U	0.5	-0.693147181
AMW-031-082	1	ND	U	0.5	-0.693147181
AMW-032-082	1	ND	U	0.5	-0.693147181
AMW-033-082	1	ND	U	0.5	-0.693147181
AMW-034-082	1	ND	U	0.5	-0.693147181
AMW-035-082	1	ND	U	0.5	-0.693147181
AMW-040-082	10	ND	U	5	1.609437912
AMW-041-082	1	ND	U	0.5	-0.693147181
AMW-042-082	1	ND	U	0.5	-0.693147181
AMW-043-082	1	ND	U	0.5	-0.693147181
AMW-052-082	1	ND	U	0.5	-0.693147181
AMW-053-082	1	ND	U	0.5	-0.693147181
AMW-054-082	1	ND	U	0.5	-0.693147181
AMW-055-082	1	ND	U	0.5	-0.693147181
AMW-056-082	1	ND	U	0.5	-0.693147181
BMW-001-082	1	ND	U	0.5	-0.693147181
BMW-002-082	1	ND	U	0.5	-0.693147181
BMW-003-082	1	ND	U	0.5	-0.693147181
BMW-004-082	1	ND	U	0.5	-0.693147181
BMW-005-082	1	ND	U	0.5	-0.693147181
BMW-006-082	1	ND	U	0.5	-0.693147181
BMW-007-082	1	ND	U	0.5	-0.693147181
BMW-008-082	1	ND	U	0.5	-0.693147181
BMW-009-082	10	ND	U	5	1.609437912
BMW-010-082	1	ND	U	0.5	-0.693147181

VOC CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
BMW-018-082	1	ND	U	0.5	-0.693147181
BMW-020-082	1	ND	U	0.5	-0.693147181
BMW-021-082	10	ND	U	5	1.609437912
BMW-022-082	1	ND	U	0.5	-0.693147181
BMW-023-082	10	ND	U	5	1.609437912
BMW-024-082	1	ND	U	0.5	-0.693147181
BMW-025-082	1	ND	U	0.5	-0.693147181
BMW-026-082	1	ND	U	0.5	-0.693147181
BMW-027-082	1	ND	U	0.5	-0.693147181
BMW-028-082	1	ND	U	0.5	-0.693147181
BMW-029-082	1	ND	U	0.5	-0.693147181
BMW-030-082	1	ND	U	0.5	-0.693147181
BMW-031-082	1	ND	U	0.5	-0.693147181
BMW-032-082-RE	2	ND	U	1	0
BMW-033-082	1	ND	U	0.5	-0.693147181
BMW-034-082	1	ND	U	0.5	-0.693147181
BMW-035-082	1	ND	U	0.5	-0.693147181
BMW-040-082	170	ND	U	85	4.442651256
BMW-041-082	1	ND	U	0.5	-0.693147181
BMW-042-082	1	ND	U	0.5	-0.693147181
BMW-043-082	10	ND	U	5	1.609437912
BMW-052-082	1	ND	U	0.5	-0.693147181
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	1	ND	U	0.5	-0.693147181
BMW-055-082	1	ND	U	0.5	-0.693147181
BMW-056-082	10	ND	U	5	1.609437912
CMW-018-082	10	ND	U	5	1.609437912
CMW-020-082	1	ND	U	0.5	-0.693147181
DMW-009-082-RE	16	ND	U	8	2.079441542
DMW-021-082	1	ND	U	0.5	-0.693147181
DMW-025-082	1	ND	U	0.5	-0.693147181
DMW-028-082	1	ND	U	0.5	-0.693147181
DMW-032-082	1	ND	U	0.5	-0.693147181
DMW-033-082	1	ND	U	0.5	-0.693147181
DMW-034-082	1	ND	U	0.5	-0.693147181
DMW-035-082	1	ND	U	0.5	-0.693147181
DMW-041-082	1	ND	U	0.5	-0.693147181
DMW-042-082	1	ND	U	0.5	-0.693147181
DMW-043-082	1	ND	U	0.5	-0.693147181
AMW-017-082	1	ND	U	0.5	-0.693147181
AMW-036-082	10	ND	U	5	1.609437912
AMW-037-082	1	ND	U	0.5	-0.693147181
AMW-038-082	1	ND	U	0.5	-0.693147181
AMW-039-082	1	ND	U	0.5	-0.693147181
AMW-044-082	10	ND	U	5	1.609437912
AMW-045-082	10	ND	U	5	1.609437912
AMW-046-082	1	ND	U	0.5	-0.693147181
BMW-017-082	1	ND	U	0.5	-0.693147181
BMW-036-082	10	ND	U	5	1.609437912
BMW-037-082	1	ND	U	0.5	-0.693147181
BMW-044-082	1	ND	U	0.5	-0.693147181
BMW-045-082	10	ND	U	5	1.609437912

VOC CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
BMW-046-082	1	ND	U	0.5	-0.693147181
CMW-017-082	1	ND	U	0.5	-0.693147181
DMW-036-082	1	ND	U	0.5	-0.693147181
DMW-037-082	1	ND	U	0.5	-0.693147181
DMW-038-082	1	ND	U	0.5	-0.693147181
DMW-039-082	1	ND	U	0.5	-0.693147181
DMW-044-082	1	ND	U	0.5	-0.693147181
DMW-045-082	10	ND	U	5	1.609437912
DMW-046-082	1	ND	U	0.5	-0.693147181

1,1,2,2-Tetrachloroethane

MEAN =	2.040178571
GEOMEAN =	0.769426004
MEAN OF LN=	-0.262110492
N=	112
S=	0.979946773
H=	2.151
UCL=	1.52E+00
MIN =	0
MAX =	0
NO. OF DET=	0

VOC CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
		1,1,2-Trichloroethane			
AMW-001-082	1	ND	U	0.5	-0.693147181
AMW-002-082	10	ND	U	5	1.609437912
AMW-003-082	1	ND	U	0.5	-0.693147181
AMW-004-082	1	ND	U	0.5	-0.693147181
AMW-005-082	1	ND	U	0.5	-0.693147181
AMW-006-082	1	ND	U	0.5	-0.693147181
AMW-007-082	1	ND	U	0.5	-0.693147181
AMW-008-082	1	ND	U	0.5	-0.693147181
AMW-009-082	17	ND	U	8.5	2.140066163
AMW-010-082	1	ND	U	0.5	-0.693147181
AMW-011-082	1	ND	U	0.5	-0.693147181
AMW-012-082	10	ND	U	5	1.609437912
AMW-013-082	1	ND	U	0.5	-0.693147181
AMW-014-082	1	ND	U	0.5	-0.693147181
AMW-015-082	1	ND	U	0.5	-0.693147181
AMW-018-082	1	ND	U	0.5	-0.693147181
AMW-020-082	1	ND	U	0.5	-0.693147181
AMW-021-082	1	ND	U	0.5	-0.693147181
AMW-022-082	1	ND	U	0.5	-0.693147181
AMW-023-082	1	ND	U	0.5	-0.693147181
AMW-024-082	1	ND	U	0.5	-0.693147181
AMW-025-082	1	ND	U	0.5	-0.693147181
AMW-026-082	1	ND	U	0.5	-0.693147181
AMW-027-082	1	ND	U	0.5	-0.693147181
AMW-028-082	1	ND	U	0.5	-0.693147181
AMW-029-082	1	ND	U	0.5	-0.693147181
AMW-030-082	1	ND	U	0.5	-0.693147181
AMW-031-082	1	ND	U	0.5	-0.693147181
AMW-032-082	1	ND	U	0.5	-0.693147181
AMW-033-082	1	ND	U	0.5	-0.693147181
AMW-034-082	1	ND	U	0.5	-0.693147181
AMW-035-082	1	ND	U	0.5	-0.693147181
AMW-040-082	10	ND	U	5	1.609437912
AMW-041-082	1	ND	U	0.5	-0.693147181
AMW-042-082	1	ND	U	0.5	-0.693147181
AMW-043-082	1	ND	U	0.5	-0.693147181
AMW-052-082	1	ND	U	0.5	-0.693147181
AMW-053-082	1	ND	U	0.5	-0.693147181
AMW-054-082	1	ND	U	0.5	-0.693147181
AMW-055-082	1	ND	U	0.5	-0.693147181
AMW-056-082	1	ND	U	0.5	-0.693147181
BMW-001-082	1	ND	U	0.5	-0.693147181
BMW-002-082	1	ND	U	0.5	-0.693147181
BMW-003-082	1	ND	U	0.5	-0.693147181
BMW-004-082	1	ND	U	0.5	-0.693147181
BMW-005-082	1	ND	U	0.5	-0.693147181
BMW-006-082	1	ND	U	0.5	-0.693147181
BMW-007-082	1	ND	U	0.5	-0.693147181
BMW-008-082	1	ND	U	0.5	-0.693147181
BMW-009-082	10	ND	U	5	1.609437912
BMW-010-082	1	ND	U	0.5	-0.693147181

VOC CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
BMW-018-082	1	ND	U	0.5	-0.693147181
BMW-020-082	1	ND	U	0.5	-0.693147181
BMW-021-082	10	ND	U	5	1.609437912
BMW-022-082	1	ND	U	0.5	-0.693147181
BMW-023-082	10	ND	U	5	1.609437912
BMW-024-082	1	ND	U	0.5	-0.693147181
BMW-025-082	1	ND	U	0.5	-0.693147181
BMW-026-082	1	ND	U	0.5	-0.693147181
BMW-027-082	1	ND	U	0.5	-0.693147181
BMW-028-082	1	ND	U	0.5	-0.693147181
BMW-029-082	1	ND	U	0.5	-0.693147181
BMW-030-082	1	ND	U	0.5	-0.693147181
BMW-031-082	1	ND	U	0.5	-0.693147181
BMW-032-082-RE	2	ND	U	1	0
BMW-033-082	1	ND	U	0.5	-0.693147181
BMW-034-082	1	ND	U	0.5	-0.693147181
BMW-035-082	1	ND	U	0.5	-0.693147181
BMW-040-082	170	ND	U	85	4.442651256
BMW-041-082	1	ND	U	0.5	-0.693147181
BMW-042-082	1	ND	U	0.5	-0.693147181
BMW-043-082	10	ND	U	5	1.609437912
BMW-052-082	1	ND	U	0.5	-0.693147181
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	1	ND	U	0.5	-0.693147181
BMW-055-082	1	ND	U	0.5	-0.693147181
BMW-056-082	10	ND	U	5	1.609437912
CMW-018-082	10	ND	U	5	1.609437912
CMW-020-082	1	ND	U	0.5	-0.693147181
DMW-009-082-RE	16	ND	U	8	2.079441542
DMW-021-082	1	ND	U	0.5	-0.693147181
DMW-025-082	1	ND	U	0.5	-0.693147181
DMW-028-082	1	ND	U	0.5	-0.693147181
DMW-032-082	1	ND	U	0.5	-0.693147181
DMW-033-082	1	ND	U	0.5	-0.693147181
DMW-034-082	1	ND	U	0.5	-0.693147181
DMW-035-082	1	ND	U	0.5	-0.693147181
DMW-041-082	1	ND	U	0.5	-0.693147181
DMW-042-082	1	ND	U	0.5	-0.693147181
DMW-043-082	1	ND	U	0.5	-0.693147181
AMW-017-082	1	ND	U	0.5	-0.693147181
AMW-036-082	10	ND	U	5	1.609437912
AMW-037-082	1	ND	U	0.5	-0.693147181
AMW-038-082	1	ND	U	0.5	-0.693147181
AMW-039-082	1	ND	U	0.5	-0.693147181
AMW-044-082	10	ND	U	5	1.609437912
AMW-045-082	10	ND	U	5	1.609437912
AMW-046-082	1	ND	U	0.5	-0.693147181
BMW-017-082	1	ND	U	0.5	-0.693147181
BMW-036-082	10	ND	U	5	1.609437912
BMW-037-082	1	ND	U	0.5	-0.693147181
BMW-044-082	1	ND	U	0.5	-0.693147181
BMW-045-082	10	ND	U	5	1.609437912

VOC CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
BMW-046-082	1	ND	U	0.5	-0.693147181
CMW-017-082	1	ND	U	0.5	-0.693147181
DMW-036-082	1	ND	U	0.5	-0.693147181
DMW-037-082	1	ND	U	0.5	-0.693147181
DMW-038-082	1	ND	U	0.5	-0.693147181
DMW-039-082	1	ND	U	0.5	-0.693147181
DMW-044-082	1	ND	U	0.5	-0.693147181
DMW-045-082	10	ND	U	5	1.609437912
DMW-046-082	1	ND	U	0.5	-0.693147181

1,1,2-Trichloroethane

MEAN =	2.040178571
GEOMEAN =	0.769426004
MEAN OF LN=	-0.262110492
N=	112
S=	0.979946773
H=	2.151
UCL=	1.52E+00
MIN =	0
MAX =	0
NO. OF DET=	0

VOC CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
		1,1-Dichloroethane			
AMW-001-082	1	ND	U	0.5	-0.693147181
AMW-002-082	10	ND	U	5	1.609437912
AMW-003-082	1	ND	U	0.5	-0.693147181
AMW-004-082	1	ND	U	0.5	-0.693147181
AMW-005-082	1	ND	U	0.5	-0.693147181
AMW-006-082	1	ND	U	0.5	-0.693147181
AMW-007-082	1	ND	U	0.5	-0.693147181
AMW-008-082	1	ND	U	0.5	-0.693147181
AMW-009-082	17	ND	U	8.5	2.140066163
AMW-010-082	1	ND	U	0.5	-0.693147181
AMW-011-082	1	ND	U	0.5	-0.693147181
AMW-012-082	10	ND	U	5	1.609437912
AMW-013-082	1	ND	U	0.5	-0.693147181
AMW-014-082	1	ND	U	0.5	-0.693147181
AMW-015-082	1	ND	U	0.5	-0.693147181
AMW-018-082	1	ND	U	0.5	-0.693147181
AMW-020-082	1	ND	U	0.5	-0.693147181
AMW-021-082	1	ND	U	0.5	-0.693147181
AMW-022-082	1	ND	U	0.5	-0.693147181
AMW-023-082	1	ND	U	0.5	-0.693147181
AMW-024-082	1	ND	U	0.5	-0.693147181
AMW-025-082	1	ND	U	0.5	-0.693147181
AMW-026-082	1	ND	U	0.5	-0.693147181
AMW-027-082	1	ND	U	0.5	-0.693147181
AMW-028-082	1	ND	U	0.5	-0.693147181
AMW-029-082	1	ND	U	0.5	-0.693147181
AMW-030-082	1	ND	U	0.5	-0.693147181
AMW-031-082	1	ND	U	0.5	-0.693147181
AMW-032-082	1	ND	U	0.5	-0.693147181
AMW-033-082	1	ND	U	0.5	-0.693147181
AMW-034-082	1	ND	U	0.5	-0.693147181
AMW-035-082	1	ND	U	0.5	-0.693147181
AMW-040-082	10	ND	U	5	1.609437912
AMW-041-082	1	ND	U	0.5	-0.693147181
AMW-042-082	1	ND	U	0.5	-0.693147181
AMW-043-082	1	ND	U	0.5	-0.693147181
AMW-052-082	1	ND	U	0.5	-0.693147181
AMW-053-082	1	ND	U	0.5	-0.693147181
AMW-054-082	1	ND	U	0.5	-0.693147181
AMW-055-082	1	ND	U	0.5	-0.693147181
AMW-056-082	1	ND	U	0.5	-0.693147181
BMW-001-082	1	ND	U	0.5	-0.693147181
BMW-002-082	1	ND	U	0.5	-0.693147181
BMW-003-082	1	ND	U	0.5	-0.693147181
BMW-004-082	1	ND	U	0.5	-0.693147181
BMW-005-082	1	ND	U	0.5	-0.693147181
BMW-006-082	1	ND	U	0.5	-0.693147181
BMW-007-082	1	ND	U	0.5	-0.693147181
BMW-008-082	1	ND	U	0.5	-0.693147181
BMW-009-082	10	ND	U	5	1.609437912
BMW-010-082	1	ND	U	0.5	-0.693147181

VOC CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
BMW-018-082	1	ND	U	0.5	-0.693147181
BMW-020-082	1	ND	U	0.5	-0.693147181
BMW-021-082	10	ND	U	5	1.609437912
BMW-022-082	1	ND	U	0.5	-0.693147181
BMW-023-082	10	ND	U	5	1.609437912
BMW-024-082	1	ND	U	0.5	-0.693147181
BMW-025-082	1	ND	U	0.5	-0.693147181
BMW-026-082	1	ND	U	0.5	-0.693147181
BMW-027-082	1	ND	U	0.5	-0.693147181
BMW-028-082	1	ND	U	0.5	-0.693147181
BMW-029-082	1	ND	U	0.5	-0.693147181
BMW-030-082	1	ND	U	0.5	-0.693147181
BMW-031-082	1	ND	U	0.5	-0.693147181
BMW-032-082-RE	2	ND	U	1	0
BMW-033-082	1	ND	U	0.5	-0.693147181
BMW-034-082	1	ND	U	0.5	-0.693147181
BMW-035-082	1	ND	U	0.5	-0.693147181
BMW-040-082	170	ND	U	85	4.442651256
BMW-041-082	1	ND	U	0.5	-0.693147181
BMW-042-082	1	ND	U	0.5	-0.693147181
BMW-043-082	10	ND	U	5	1.609437912
BMW-052-082	1	ND	U	0.5	-0.693147181
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	1	ND	U	0.5	-0.693147181
BMW-055-082	1	ND	U	0.5	-0.693147181
BMW-056-082	10	ND	U	5	1.609437912
CMW-018-082	10	ND	U	5	1.609437912
CMW-020-082	1	ND	U	0.5	-0.693147181
DMW-009-082-RE	16	ND	U	8	2.079441542
DMW-021-082	1	ND	U	0.5	-0.693147181
DMW-025-082	1	ND	U	0.5	-0.693147181
DMW-028-082	1	ND	U	0.5	-0.693147181
DMW-032-082	1	ND	U	0.5	-0.693147181
DMW-033-082	1	ND	U	0.5	-0.693147181
DMW-034-082	1	ND	U	0.5	-0.693147181
DMW-035-082	1	ND	U	0.5	-0.693147181
DMW-041-082	1	ND	U	0.5	-0.693147181
DMW-042-082	1	ND	U	0.5	-0.693147181
DMW-043-082	1	ND	U	0.5	-0.693147181
AMW-017-082	1	ND	U	0.5	-0.693147181
AMW-036-082	10	ND	U	5	1.609437912
AMW-037-082	1	ND	U	0.5	-0.693147181
AMW-038-082	1	ND	U	0.5	-0.693147181
AMW-039-082	1	ND	U	0.5	-0.693147181
AMW-044-082	10	ND	U	5	1.609437912
AMW-045-082	10	ND	U	5	1.609437912
AMW-046-082	1	ND	U	0.5	-0.693147181
BMW-017-082	1	ND	U	0.5	-0.693147181
BMW-036-082	10	ND	U	5	1.609437912
BMW-037-082	1	ND	U	0.5	-0.693147181
BMW-044-082	1	ND	U	0.5	-0.693147181
BMW-045-082	10	ND	U	5	1.609437912

VOC CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
BMW-046-082	1	ND	U	0.5	-0.693147181
CMW-017-082	1	ND	U	0.5	-0.693147181
DMW-036-082	1	ND	U	0.5	-0.693147181
DMW-037-082	1	ND	U	0.5	-0.693147181
DMW-038-082	1	ND	U	0.5	-0.693147181
DMW-039-082	1	ND	U	0.5	-0.693147181
DMW-044-082	1	ND	U	0.5	-0.693147181
DMW-045-082	10	ND	U	5	1.609437912
DMW-046-082	1	ND	U	0.5	-0.693147181

1,1	oroethane	
	=	2.040178571
GEO	=	0.769426004
MEAN	=	-0.262110492
		112
S		0.979946773
H=		2.151
UCL=		1.52E+00
MIN =		0
MAX =		0
NO. OF DET=		0

B07NE003702-08362

VOC CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
		1,1-Dichloroethene			
AMW-001-082	1	ND	U	0.5	-0.693147181
AMW-002-082	10	ND	U	5	1.609437912
AMW-003-082	1	ND	U	0.5	-0.693147181
AMW-004-082	1	ND	U	0.5	-0.693147181
AMW-005-082	1	ND	U	0.5	-0.693147181
AMW-006-082	1	ND	U	0.5	-0.693147181
AMW-007-082	1	ND	U	0.5	-0.693147181
AMW-008-082	1	ND	U	0.5	-0.693147181
AMW-009-082	17	ND	U	8.5	2.140066163
AMW-010-082	1	ND	U	0.5	-0.693147181
AMW-011-082	1	ND	U	0.5	-0.693147181
AMW-012-082	10	ND	U	5	1.609437912
AMW-013-082	1	ND	U	0.5	-0.693147181
AMW-014-082	1	ND	U	0.5	-0.693147181
AMW-015-082	1	ND	U	0.5	-0.693147181
AMW-018-082	1	ND	U	0.5	-0.693147181
AMW-020-082	1	ND	U	0.5	-0.693147181
AMW-021-082	1	ND	U	0.5	-0.693147181
AMW-022-082	1	ND	U	0.5	-0.693147181
AMW-023-082	1	ND	U	0.5	-0.693147181
AMW-024-082	1	ND	U	0.5	-0.693147181
AMW-025-082	1	ND	U	0.5	-0.693147181
AMW-026-082	1	ND	U	0.5	-0.693147181
AMW-027-082	1	ND	U	0.5	-0.693147181
AMW-028-082	1	ND	U	0.5	-0.693147181
AMW-029-082	1	ND	U	0.5	-0.693147181
AMW-030-082	1	ND	U	0.5	-0.693147181
AMW-031-082	1	ND	U	0.5	-0.693147181
AMW-032-082	1	ND	U	0.5	-0.693147181
AMW-033-082	1	ND	U	0.5	-0.693147181
AMW-034-082	1	ND	U	0.5	-0.693147181
AMW-035-082	1	ND	U	0.5	-0.693147181
AMW-040-082	10	ND	U	5	1.609437912
AMW-041-082	1	ND	U	0.5	-0.693147181
AMW-042-082	1	ND	U	0.5	-0.693147181
AMW-043-082	1	ND	U	0.5	-0.693147181
AMW-052-082	1	ND	U	0.5	-0.693147181
AMW-053-082	1	ND	U	0.5	-0.693147181
AMW-054-082	1	ND	U	0.5	-0.693147181
AMW-055-082	1	ND	U	0.5	-0.693147181
AMW-056-082	1	ND	U	0.5	-0.693147181
BMW-001-082	1	ND	U	0.5	-0.693147181
BMW-002-082	1	ND	U	0.5	-0.693147181
BMW-003-082	1	ND	U	0.5	-0.693147181
BMW-004-082	1	ND	U	0.5	-0.693147181
BMW-005-082	1	ND	U	0.5	-0.693147181
BMW-006-082	1	ND	U	0.5	-0.693147181
BMW-007-082	1	ND	U	0.5	-0.693147181
BMW-008-082	1	ND	U	0.5	-0.693147181
BMW-009-082	10	ND	U	5	1.609437912
BMW-010-082	1	ND	U	0.5	-0.693147181

VOC CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
BMW-018-082	1	ND	U	0.5	-0.693147181
BMW-020-082	1	ND	U	0.5	-0.693147181
BMW-021-082	10	ND	U	5	1.609437912
BMW-022-082	1	ND	U	0.5	-0.693147181
BMW-023-082	10	ND	U	5	1.609437912
BMW-024-082	1	ND	U	0.5	-0.693147181
BMW-025-082	1	ND	U	0.5	-0.693147181
BMW-026-082	1	ND	U	0.5	-0.693147181
BMW-027-082	1	ND	U	0.5	-0.693147181
BMW-028-082	1	ND	U	0.5	-0.693147181
BMW-029-082	1	ND	U	0.5	-0.693147181
BMW-030-082	1	ND	U	0.5	-0.693147181
BMW-031-082	1	ND	U	0.5	-0.693147181
BMW-032-082-RE	2	ND	U	1	0
BMW-033-082	1	ND	U	0.5	-0.693147181
BMW-034-082	1	ND	U	0.5	-0.693147181
BMW-035-082	1	ND	U	0.5	-0.693147181
BMW-040-082	170	ND	U	85	4.442651256
BMW-041-082	1	ND	U	0.5	-0.693147181
BMW-042-082	1	ND	U	0.5	-0.693147181
BMW-043-082	10	ND	U	5	1.609437912
BMW-052-082	1	ND	U	0.5	-0.693147181
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	1	ND	U	0.5	-0.693147181
BMW-055-082	1	ND	U	0.5	-0.693147181
BMW-056-082	10	ND	U	5	1.609437912
CMW-018-082	10	ND	U	5	1.609437912
CMW-020-082	1	ND	U	0.5	-0.693147181
DMW-009-082-RE	16	ND	U	8	2.079441542
DMW-021-082	1	ND	U	0.5	-0.693147181
DMW-025-082	1	ND	U	0.5	-0.693147181
DMW-028-082	1	ND	U	0.5	-0.693147181
DMW-032-082	1	ND	U	0.5	-0.693147181
DMW-033-082	1	ND	U	0.5	-0.693147181
DMW-034-082	1	ND	U	0.5	-0.693147181
DMW-035-082	1	ND	U	0.5	-0.693147181
DMW-041-082	1	ND	U	0.5	-0.693147181
DMW-042-082	1	ND	U	0.5	-0.693147181
DMW-043-082	1	ND	U	0.5	-0.693147181
AMW-017-082	1	ND	U	0.5	-0.693147181
AMW-036-082	10	ND	U	5	1.609437912
AMW-037-082	1	ND	U	0.5	-0.693147181
AMW-038-082	1	ND	U	0.5	-0.693147181
AMW-039-082	1	ND	U	0.5	-0.693147181
AMW-044-082	10	ND	U	5	1.609437912
AMW-045-082	10	ND	U	5	1.609437912
AMW-046-082	1	ND	U	0.5	-0.693147181
BMW-017-082	1	ND	U	0.5	-0.693147181
BMW-036-082	10	ND	U	5	1.609437912
BMW-037-082	1	ND	U	0.5	-0.693147181
BMW-044-082	1	ND	U	0.5	-0.693147181
BMW-045-082	10	ND	U	5	1.609437912

VOC CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
BMW-046-082	1	ND	U	0.5	-0.693147181
CMW-017-082	1	ND	U	0.5	-0.693147181
DMW-036-082	1	ND	U	0.5	-0.693147181
DMW-037-082	1	ND	U	0.5	-0.693147181
DMW-038-082	1	ND	U	0.5	-0.693147181
DMW-039-082	1	ND	U	0.5	-0.693147181
DMW-044-082	1	ND	U	0.5	-0.693147181
DMW-045-082	10	ND	U	5	1.609437912
DMW-046-082	1	ND	U	0.5	-0.693147181

1,1-Dichloroethene

MEAN =	2.040178571
GEOMEAN =	0.769426004
MEAN OF LN=	-0.262110492
N=	112
S=	0.979946773
H=	2.151
UCL=	1.52E+00
MIN =	0
MAX =	0
NO. OF DET=	0

VOC CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
		1,2-Dichloroethene(Total)			
AMW-002-082	10	ND	U	5	1.609437912
AMW-009-082			J	2	0.693147181
AMW-012-082	10	ND	U	5	1.609437912
AMW-040-082	10	ND	U	5	1.609437912
BMW-009-082	10	ND	U	5	1.609437912
BMW-021-082	10	ND	U	5	1.609437912
BMW-023-082	10	ND	U	5	1.609437912
BMW-040-082	170	ND	U	85	4.442651256
BMW-043-082			J	2	0.693147181
BMW-053-082				10	2.302585093
BMW-056-082	10	ND	U	5	1.609437912
CMW-018-082			J	3	1.098612289
DMW-009-082-RE	16	ND	U	8	2.079441542
AMW-036-082			J	1	0
AMW-044-082			J	1	0
AMW-045-082	10	ND	U	5	1.609437912
BMW-036-082			J	1	0
BMW-045-082			J	1	0
DMW-045-082	10	ND	U	5	1.609437912

1,2-Dichloroethene(Total)

MEAN =	8.368421053
GEOMEAN =	3.886879375
MEAN OF LN=	1.357606619
N=	19
S=	1.049464813
H=	2.621
UCL=	1.29E+01
MIN =	1
MAX =	10
NO. OF DET=	8

VOC CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
		1,2-Dichloropropane			
AMW-001-082	1	ND	U	0.5	-0.693147181
AMW-002-082	10	ND	U	5	1.609437912
AMW-003-082	1	ND	U	0.5	-0.693147181
AMW-004-082	1	ND	U	0.5	-0.693147181
AMW-005-082	1	ND	U	0.5	-0.693147181
AMW-006-082	1	ND	U	0.5	-0.693147181
AMW-007-082	1	ND	U	0.5	-0.693147181
AMW-008-082	1	ND	U	0.5	-0.693147181
AMW-009-082	17	ND	U	8.5	2.140066163
AMW-010-082	1	ND	U	0.5	-0.693147181
AMW-011-082	1	ND	U	0.5	-0.693147181
AMW-012-082	10	ND	U	5	1.609437912
AMW-013-082	1	ND	U	0.5	-0.693147181
AMW-014-082			E	25	3.218875825
AMW-015-082	1	ND	U	0.5	-0.693147181
AMW-018-082	1	ND	U	0.5	-0.693147181
AMW-020-082	1	ND	U	0.5	-0.693147181
AMW-021-082	1	ND	U	0.5	-0.693147181
AMW-022-082	1	ND	U	0.5	-0.693147181
AMW-023-082	1	ND	U	0.5	-0.693147181
AMW-024-082	1	ND	U	0.5	-0.693147181
AMW-025-082	1	ND	U	0.5	-0.693147181
AMW-026-082	1	ND	U	0.5	-0.693147181
AMW-027-082	1	ND	U	0.5	-0.693147181
AMW-028-082	1	ND	U	0.5	-0.693147181
AMW-029-082	1	ND	U	0.5	-0.693147181
AMW-030-082	1	ND	U	0.5	-0.693147181
AMW-031-082	1	ND	U	0.5	-0.693147181
AMW-032-082	1	ND	U	0.5	-0.693147181
AMW-033-082	1	ND	U	0.5	-0.693147181
AMW-034-082	1	ND	U	0.5	-0.693147181
AMW-035-082	1	ND	U	0.5	-0.693147181
AMW-040-082	10	ND	U	5	1.609437912
AMW-041-082	1	ND	U	0.5	-0.693147181
AMW-042-082	1	ND	U	0.5	-0.693147181
AMW-043-082	1	ND	U	0.5	-0.693147181
AMW-052-082	1	ND	U	0.5	-0.693147181
AMW-053-082	1	ND	U	0.5	-0.693147181
AMW-054-082	1	ND	U	0.5	-0.693147181
AMW-055-082	1	ND	U	0.5	-0.693147181
AMW-056-082	1	ND	U	0.5	-0.693147181
BMW-001-082	1	ND	U	0.5	-0.693147181
BMW-002-082	1	ND	U	0.5	-0.693147181
BMW-003-082	1	ND	U	0.5	-0.693147181
BMW-004-082	1	ND	U	0.5	-0.693147181
BMW-005-082	1	ND	U	0.5	-0.693147181
BMW-006-082	1	ND	U	0.5	-0.693147181
BMW-007-082	1	ND	U	0.5	-0.693147181
BMW-008-082	1	ND	U	0.5	-0.693147181
BMW-009-082	10	ND	U	5	1.609437912
BMW-010-082	1	ND	U	0.5	-0.693147181

VOC CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
BMW-018-082	1	ND	U	0.5	-0.693147181
BMW-020-082	1	ND	U	0.5	-0.693147181
BMW-021-082	10	ND	U	5	1.609437912
BMW-022-082	1	ND	U	0.5	-0.693147181
BMW-023-082	10	ND	U	5	1.609437912
BMW-024-082	1	ND	U	0.5	-0.693147181
BMW-025-082	1	ND	U	0.5	-0.693147181
BMW-026-082	1	ND	U	0.5	-0.693147181
BMW-027-082	1	ND	U	0.5	-0.693147181
BMW-028-082	1	ND	U	0.5	-0.693147181
BMW-029-082	1	ND	U	0.5	-0.693147181
BMW-030-082	1	ND	U	0.5	-0.693147181
BMW-031-082	1	ND	U	0.5	-0.693147181
BMW-032-082-RE	2	ND	U	1	0
BMW-033-082	1	ND	U	0.5	-0.693147181
BMW-034-082	1	ND	U	0.5	-0.693147181
BMW-035-082	1	ND	U	0.5	-0.693147181
BMW-040-082	170	ND	U	85	4.442651256
BMW-041-082	1	ND	U	0.5	-0.693147181
BMW-042-082	1	ND	U	0.5	-0.693147181
BMW-043-082	10	ND	U	5	1.609437912
BMW-052-082	1	ND	U	0.5	-0.693147181
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	1	ND	U	0.5	-0.693147181
BMW-055-082	1	ND	U	0.5	-0.693147181
BMW-056-082	10	ND	U	5	1.609437912
CMW-018-082	10	ND	U	5	1.609437912
CMW-020-082	1	ND	U	0.5	-0.693147181
DMW-009-082-RE	16	ND	U	8	2.079441542
DMW-021-082	1	ND	U	0.5	-0.693147181
DMW-025-082	1	ND	U	0.5	-0.693147181
DMW-028-082	1	ND	U	0.5	-0.693147181
DMW-032-082	1	ND	U	0.5	-0.693147181
DMW-033-082	1	ND	U	0.5	-0.693147181
DMW-034-082	1	ND	U	0.5	-0.693147181
DMW-035-082	1	ND	U	0.5	-0.693147181
DMW-041-082	1	ND	U	0.5	-0.693147181
DMW-042-082	1	ND	U	0.5	-0.693147181
DMW-043-082	1	ND	U	0.5	-0.693147181
AMW-017-082	1	ND	U	0.5	-0.693147181
AMW-036-082	10	ND	U	5	1.609437912
AMW-037-082	1	ND	U	0.5	-0.693147181
AMW-038-082	1	ND	U	0.5	-0.693147181
AMW-039-082	1	ND	U	0.5	-0.693147181
AMW-044-082	10	ND	U	5	1.609437912
AMW-045-082	10	ND	U	5	1.609437912
AMW-046-082	1	ND	U	0.5	-0.693147181
BMW-017-082	1	ND	U	0.5	-0.693147181
BMW-036-082	10	ND	U	5	1.609437912
BMW-037-082	1	ND	U	0.5	-0.693147181
BMW-044-082	1	ND	U	0.5	-0.693147181
BMW-045-082	10	ND	U	5	1.609437912

VOC CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
BMW-046-082	1	ND	U	0.5	-0.693147181
CMW-017-082	1	ND	U	0.5	-0.693147181
DMW-036-082	1	ND	U	0.5	-0.693147181
DMW-037-082	1	ND	U	0.5	-0.693147181
DMW-038-082	1	ND	U	0.5	-0.693147181
DMW-039-082	1	ND	U	0.5	-0.693147181
DMW-044-082	1	ND	U	0.5	-0.693147181
DMW-045-082	10	ND	U	5	1.609437912
DMW-046-082	1	ND	U	0.5	-0.693147181

1,2-Dichloropropane

MEAN =	2.258928571
GEOMEAN =	0.796775983
MEAN OF LN=	-0.227181715
N=	112
S=	1.032741698
H=	2.205
UCL=	1.69E+00
MIN =	25
MAX =	25
NO. OF DET=	1

VOC CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
			Acetone		
AMW-002-082	10	ND	U	5	1.609437912
AMW-003-082			J	2	0.693147181
AMW-009-082	17	ND	U	8.5	2.140066163
AMW-011-082				7	1.945910149
AMW-012-082	10	ND	U	5	1.609437912
AMW-018-082	5	ND	U	2.5	0.916290732
AMW-020-082	5	ND	U	2.5	0.916290732
AMW-025-082			J	3	1.098612289
AMW-031-082			J	4	1.386294361
AMW-033-082	5	ND	U	2.5	0.916290732
AMW-035-082			J	2	0.693147181
AMW-040-082	10	ND	U	5	1.609437912
BMW-003-082				6	1.791759469
BMW-007-082				12	2.48490665
BMW-009-082	10	ND	U	5	1.609437912
BMW-018-082	5	ND	U	2.5	0.916290732
BMW-021-082	10	ND	U	5	1.609437912
BMW-023-082	10	ND	U	5	1.609437912
BMW-025-082	5	ND	U	2.5	0.916290732
BMW-027-082			J	2	0.693147181
BMW-031-082				16	2.772588722
BMW-033-082	5	ND	U	2.5	0.916290732
BMW-034-082	5	ND	U	2.5	0.916290732
BMW-035-082	5	ND	U	2.5	0.916290732
BMW-040-082	170	ND	U	85	4.442651256
BMW-053-082	10	ND	U	5	1.609437912
BMW-055-082				6	1.791759469
BMW-056-082	10	ND	U	5	1.609437912
CMW-018-082	10	ND	U	5	1.609437912
DMW-009-082-RE	16	ND	U	8	2.079441542
DMW-025-082	5	ND	U	2.5	0.916290732
DMW-035-082	5	ND	U	2.5	0.916290732
AMW-044-082	10	ND	U	5	1.609437912

Acetone	
MEAN =	7.166666667
GEOMEAN =	4.450658498
MEAN OF LN=	1.493052062
N=	33
S=	0.750326053
H=	2.142
UCL=	7.84E+00
MIN =	2
MAX =	16
NO. OF DET=	10

VOC CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
			Chloroform		
AMW-001-082	1	ND	U	0.5	-0.693147181
AMW-002-082	10	ND	U	5	1.609437912
AMW-003-082	1	ND	U	0.5	-0.693147181
AMW-004-082	1	ND	U	0.5	-0.693147181
AMW-005-082	1	ND	U	0.5	-0.693147181
AMW-006-082	1	ND	U	0.5	-0.693147181
AMW-007-082	1	ND	U	0.5	-0.693147181
AMW-008-082	1	ND	U	0.5	-0.693147181
AMW-009-082	17	ND	U	8.5	2.140066163
AMW-010-082	1	ND	U	0.5	-0.693147181
AMW-011-082	1	ND	U	0.5	-0.693147181
AMW-012-082	10	ND	U	5	1.609437912
AMW-013-082	1	ND	U	0.5	-0.693147181
AMW-014-082	1	ND	U	0.5	-0.693147181
AMW-015-082	1	ND	U	0.5	-0.693147181
AMW-018-082	1	ND	U	0.5	-0.693147181
AMW-020-082	1	ND	U	0.5	-0.693147181
AMW-021-082	1	ND	U	0.5	-0.693[illegible]181
AMW-022-082	1	ND	U	0.5	-0.693[illegible]181
AMW-023-082	1	ND	U	0.5	-0.693147181
AMW-024-082	1	ND	U	0.5	-0.693147181
AMW-025-082	1	ND	U	0.5	-0.693147181
AMW-026-082	1	ND	U	0.5	-0.693147181
AMW-027-082	1	ND	U	0.5	-0.693147181
AMW-028-082	1	ND	U	0.5	-0.693147181
AMW-029-082	1	ND	U	0.5	-0.693147181
AMW-030-082	1	ND	U	0.5	-0.693147181
AMW-031-082	1	ND	U	0.5	-0.693147181
AMW-032-082	1	ND	U	0.5	-0.693147181
AMW-033-082	1	ND	U	0.5	-0.693147181
AMW-034-082	1	ND	U	0.5	-0.693147181
AMW-035-082	1	ND	U	0.5	-0.693147181
AMW-040-082	10	ND	U	5	1.609437912
AMW-041-082	1	ND	U	0.5	-0.693147181
AMW-042-082	1	ND	U	0.5	-0.693147181
AMW-043-082	1	ND	U	0.5	-0.693147181
AMW-052-082	1	ND	U	0.5	-0.693147181
AMW-053-082	1	ND	U	0.5	-0.693147181
AMW-054-082	1	ND	U	0.5	-0.693147181
AMW-055-082	1	ND	U	0.5	-0.693147181
AMW-056-082	1	ND	U	0.5	-0.693147181
BMW-001-082	1	ND	U	0.5	-0.693147181
BMW-002-082	1	ND	U	0.5	-0.693147181
BMW-003-082	1	ND	U	0.5	-0.693147181
BMW-004-082	1	ND	U	0.5	-0.693147181
BMW-005-082	1	ND	U	0.5	-0.693147181
BMW-006-082	1	ND	U	0.5	-0.693147181
BMW-007-082	1	ND	U	0.5	-0.693147181
BMW-008-082	1	ND	U	0.5	-0.693147181
BMW-009-082				26	3.258096538
BMW-010-082	1	ND	U	0.5	-0.693147181

VOC CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
BMW-018-082	1	ND	U	0.5	-0.693147181
BMW-020-082	1	ND	U	0.5	-0.693147181
BMW-021-082	10	ND	U	5	1.609437912
BMW-022-082	1	ND	U	0.5	-0.693147181
BMW-023-082	10	ND	U	5	1.609437912
BMW-024-082	1	ND	U	0.5	-0.693147181
BMW-025-082	1	ND	U	0.5	-0.693147181
BMW-026-082	1	ND	U	0.5	-0.693147181
BMW-027-082	1	ND	U	0.5	-0.693147181
BMW-028-082	1	ND	U	0.5	-0.693147181
BMW-029-082	1	ND	U	0.5	-0.693147181
BMW-030-082	1	ND	U	0.5	-0.693147181
BMW-031-082	1	ND	U	0.5	-0.693147181
BMW-032-082-RE	2	ND	U	1	0
BMW-033-082	1	ND	U	0.5	-0.693147181
BMW-034-082	1	ND	U	0.5	-0.693147181
BMW-035-082	1	ND	U	0.5	-0.693147181
BMW-040-082	170	ND	U	85	4.442651256
BMW-041-082	1	ND	U	0.5	-0.693147181
BMW-042-082	1	ND	U	0.5	-0.693147181
BMW-043-082	10	ND	U	5	1.609437912
BMW-052-082	1	ND	U	0.5	-0.693147181
BMW-053-082	5	ND	UJ	2.5	0.916290732
BMW-054-082	1	ND	U	0.5	-0.693147181
BMW-055-082	1	ND	U	0.5	-0.693147181
BMW-056-082	10	ND	U	5	1.609437912
CMW-018-082	5	ND	U	2.5	0.916290732
CMW-020-082	1	ND	U	0.5	-0.693147181
DMW-009-082-RE	16	ND	U	8	2.079441542
DMW-021-082	1	ND	U	0.5	-0.693147181
DMW-025-082	1	ND	U	0.5	-0.693147181
DMW-028-082	1	ND	U	0.5	-0.693147181
DMW-032-082	1	ND	U	0.5	-0.693147181
DMW-033-082	1	ND	U	0.5	-0.693147181
DMW-034-082	1	ND	U	0.5	-0.693147181
DMW-035-082	1	ND	U	0.5	-0.693147181
DMW-041-082	1	ND	U	0.5	-0.693147181
DMW-042-082	1	ND	U	0.5	-0.693147181
DMW-043-082	1	ND	U	0.5	-0.693147181
AMW-017-082	1	ND	U	0.5	-0.693147181
AMW-036-082	10	ND	U	5	1.609437912
AMW-037-082	1	ND	U	0.5	-0.693147181
AMW-038-082	1	ND	U	0.5	-0.693147181
AMW-039-082	1	ND	U	0.5	-0.693147181
AMW-044-082	10	ND	U	5	1.609437912
AMW-045-082	10	ND	U	5	1.609437912
AMW-046-082	1	ND	U	0.5	-0.693147181
BMW-017-082	1	ND	U	0.5	-0.693147181
BMW-036-082	10	ND	U	5	1.609437912
BMW-037-082	1	ND	U	0.5	-0.693147181
BMW-044-082	1	ND	U	0.5	-0.693147181
BMW-045-082	10	ND	U	5	1.609437912

VOC CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
BMW-046-082	1	ND	U	0.5	-0.693147181
CMW-017-082	1	ND	U	0.5	-0.693147181
DMW-036-082	1	ND	U	0.5	-0.693147181
DMW-037-082	1	ND	U	0.5	-0.693147181
DMW-038-082	1	ND	U	0.5	-0.693147181
DMW-039-082	1	ND	U	0.5	-0.693147181
DMW-044-082	1	ND	U	0.5	-0.693147181
DMW-045-082	10	ND	U	5	1.609437912
DMW-046-082	1	ND	U	0.5	-0.693147181

Chloroform	
MEAN =	2.183035714
GEOMEAN =	0.771230526
MEAN OF LN=	-0.259767953
N=	112
S=	1.001140079
H=	2.205
UCL=	1.57E+00
MIN =	26
MAX =	26
NO. OF DET=	1

VOC CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
		1,2-Dichloroethene(Total)			
AMW-001-082	1	ND	U	0.5	-0.693147181
AMW-002-082	10	ND	U	5	1.609437912
AMW-003-082	1	ND	U	0.5	-0.693147181
AMW-004-082	1	ND	U	0.5	-0.693147181
AMW-005-082	1	ND	U	0.5	-0.693147181
AMW-006-082	1	ND	U	0.5	-0.693147181
AMW-007-082	1	ND	U	0.5	-0.693147181
AMW-008-082	1	ND	U	0.5	-0.693147181
AMW-009-082			J	2	0.693147181
AMW-010-082	1	ND	U	0.5	-0.693147181
AMW-011-082	1	ND	U	0.5	-0.693147181
AMW-012-082	10	ND	U	5	1.609437912
AMW-013-082	1	ND	U	0.5	-0.693147181
AMW-014-082	1	ND	U	0.5	-0.693147181
AMW-015-082	1	ND	U	0.5	-0.693147181
AMW-017-082	1	ND	U	0.5	-0.693147181
AMW-018-082	1	ND	U	0.5	-0.693147181
AMW-020-082	1	ND	U	0.5	-0.693147181
AMW-021-082	1	ND	U	0.5	-0.693147181
AMW-022-082	1	ND	U	0.5	-0.693147181
AMW-023-082	1	ND	U	0.5	-0.693147181
AMW-024-082	1	ND	U	0.5	-0.693147181
AMW-025-082	1	ND	U	0.5	-0.693147181
AMW-026-082	1	ND	U	0.5	-0.693147181
AMW-027-082	1	ND	U	0.5	-0.693147181
AMW-028-082	1	ND	U	0.5	-0.693147181
AMW-029-082	1	ND	U	0.5	-0.693147181
AMW-030-082	1	ND	U	0.5	-0.693147181
AMW-031-082	1	ND	U	0.5	-0.693147181
AMW-032-082	1	ND	U	0.5	-0.693147181
AMW-033-082	1	ND	U	0.5	-0.693147181
AMW-034-082	1	ND	U	0.5	-0.693147181
AMW-035-082	1	ND	U	0.5	-0.693147181
AMW-036-082			J	1	0
AMW-037-082	1	ND	U	0.5	-0.693147181
AMW-038-082	1	ND	U	0.5	-0.693147181
AMW-039-082	1	ND	U	0.5	-0.693147181
AMW-040-082	10	ND	U	5	1.609437912
AMW-041-082	1	ND	U	0.5	-0.693147181
AMW-042-082	1	ND	U	0.5	-0.693147181
AMW-043-082	1	ND	U	0.5	-0.693147181
AMW-044-082			J	1	0
AMW-045-082	10	ND	U	5	1.609437912
AMW-046-082	1	ND	U	0.5	-0.693147181
AMW-052-082				2	0.693147181
AMW-053-082				2	0.693147181
AMW-054-082	1	ND	U	0.5	-0.693147181
AMW-055-082	1	ND	U	0.5	-0.693147181
AMW-056-082	1	ND	U	0.5	-0.693147181
BMW-001-082	1	ND	U	0.5	-0.693147181
BMW-002-082	1	ND	U	0.5	-0.693147181

VOC CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
BMW-003-082	1	ND	U	0.5	-0.693147181
BMW-004-082	1	ND	U	0.5	-0.693147181
BMW-005-082	1	ND	U	0.5	-0.693147181
BMW-006-082	1	ND	U	0.5	-0.693147181
BMW-007-082	1	ND	U	0.5	-0.693147181
BMW-008-082	1	ND	U	0.5	-0.693147181
BMW-009-082	10	ND	U	5	1.609437912
BMW-010-082	1	ND	U	0.5	-0.693147181
BMW-017-082	1	ND	U	0.5	-0.693147181
BMW-018-082	1	ND	U	0.5	-0.693147181
BMW-020-082	1	ND	U	0.5	-0.693147181
BMW-021-082	10	ND	U	5	1.609437912
BMW-022-082	1	ND	U	0.5	-0.693147181
BMW-023-082	10	ND	U	5	1.609437912
BMW-024-082	1	ND	U	0.5	-0.693147181
BMW-025-082	1	ND	U	0.5	-0.693147181
BMW-026-082	1	ND	U	0.5	-0.693147181
BMW-027-082	1	ND	U	0.5	-0.693147181
BMW-028-082	1	ND	U	0.5	-0.693147181
BMW-029-082	1	ND	U	0.5	-0.693147181
BMW-030-082	1	ND	U	0.5	-0.693147181
BMW-031-082	1	ND	U	0.5	-0.693147181
BMW-032-082-RE	2	ND	U	1	0
BMW-033-082	1	ND	U	0.5	-0.693147181
BMW-034-082	1	ND	U	0.5	-0.693147181
BMW-035-082	1	ND	U	0.5	-0.693147181
BMW-036-082			J	1	0
BMW-037-082	1	ND	U	0.5	-0.693147181
BMW-040-082	170	ND	U	85	4.442651256
BMW-041-082	1	ND	U	0.5	-0.693147181
BMW-042-082	1	ND	U	0.5	-0.693147181
BMW-043-082			J	2	0.693147181
BMW-044-082	1	ND	U	0.5	-0.693147181
BMW-045-082			J	1	0
BMW-046-082	1	ND	U	0.5	-0.693147181
BMW-052-082				2	0.693147181
BMW-053-082				10	2.302585093
BMW-054-082	1	ND	U	0.5	-0.693147181
BMW-055-082	1	ND	U	0.5	-0.693147181
BMW-056-082	10	ND	U	5	1.609437912
CMW-017-082	1	ND	U	0.5	-0.693147181
CMW-018-082			J	3	1.098612289
CMW-020-082	1	ND	U	0.5	-0.693147181
DMW-009-082-RE	16	ND	U	8	2.079441542
DMW-021-082	1	ND	U	0.5	-0.693147181
DMW-025-082	1	ND	U	0.5	-0.693147181
DMW-028-082	1	ND	U	0.5	-0.693147181
DMW-032-082	1	ND	U	0.5	-0.693147181
DMW-033-082	1	ND	U	0.5	-0.693147181
DMW-034-082	1	ND	U	0.5	-0.693147181
DMW-035-082	1	ND	U	0.5	-0.693147181
DMW-036-082	1	ND	U	0.5	-0.693147181

VOC CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
DMW-037-082	1	ND	U	0.5	-0.693147181
DMW-038-082	1	ND	U	0.5	-0.693147181
DMW-039-082	1	ND	U	0.5	-0.693147181
DMW-041-082	1	ND	U	0.5	-0.693147181
DMW-042-082	1	ND	U	0.5	-0.693147181
DMW-043-082	1	ND	U	0.5	-0.693147181
DMW-044-082	1	ND	U	0.5	-0.693147181
DMW-045-082	10	ND	U	5	1.609437912
DMW-046-082	1	ND	U	0.5	-0.693147181

1,2-Dichloroethene(Total)

MEAN =	1.879464286
GEOMEAN =	0.739390007
MEAN OF LN=	-0.301929748
N=	112
S=	0.894604322
H=	2.117
UCL=	1.32E+00
MIN =	1
MAX =	10
NO. OF DET=	11

VOC CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
			Methylene chloride		
AMW-001-082	2	ND	U	1	0
AMW-002-082	10	ND	U	5	1.609437912
AMW-003-082			BJ	1	0
AMW-004-082	2		UBJ	1	0
AMW-005-082	2		UB	1	0
AMW-006-082	2		UBJ	1	0
AMW-007-082	2		UBJ	1	0
AMW-008-082	2		UBJ	1	0
AMW-009-082	5		UBJ	2.5	0.916290732
AMW-010-082	2		BJ	1	0
AMW-011-082	2		BJ	1	0
AMW-012-082	5		BJ	1	0
AMW-013-082	2	ND	U	1	0
AMW-014-082	2		UBJ	1	0
AMW-015-082			B	5	1.609437912
AMW-018-082			BJ	1	0
AMW-020-082	5		UBJ	2.5	0.916290732
AMW-021-082	2		UB	1	0
AMW-022-082	2		UBJ	1	0
AMW-023-082			BJ	1	0
AMW-024-082	2	ND	U	1	0
AMW-025-082			BJ	0.8	-0.223143551
AMW-026-082			BJ	1	0
AMW-027-082	2		UBJ	1	0
AMW-028-082			B	2	0.693147181
AMW-029-082	2		UB	1	0
AMW-030-082	2	ND	U	1	0
AMW-031-082	2		UBJ	1	0
AMW-032-082	2		UB	1	0
AMW-033-082	5		UBJ	2.5	0.916290732
AMW-034-082	2		UBJ	1	0
AMW-035-082			BJ	1	0
AMW-040-082			BJ	5	1.609437912
AMW-041-082			BJ	1	0
AMW-042-082	5		UBJ	2.5	0.916290732
AMW-043-082	2		UB	1	0
AMW-052-082	2		UBJ	1	0
AMW-053-082	2		UBJ	1	0
AMW-054-082			BJ	1	0
AMW-055-082	2		UBJ	1	0
AMW-056-082	2		UJ	1	0
BMW-001-082	2		UBJ	1	0
BMW-002-082	2	ND	U	1	0
BMW-003-082			BJ	1	0
BMW-004-082			B	6	1.791759469
BMW-005-082	2		UBJ	1	0
BMW-006-082	2	ND	U	1	0
BMW-007-082	2		UBJ	1	0
BMW-008-082	2		UBJ	1	0
BMW-009-082	5		UBJ	2.5	0.916290732
BMW-010-082	2		UBJ	1	0

VOC CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
BMW-018-082			BJ	1	0
BMW-020-082	2		UB	1	0
BMW-021-082			BJ	2	0.693147181
BMW-022-082	2		UB	1	0
BMW-023-082			BJ	1	0
BMW-024-082	2		UBJ	1	0
BMW-025-082			BJ	1	0
BMW-026-082	2		UB	1	0
BMW-027-082	2		UBJ	1	0
BMW-028-082			B	2	0.693147181
BMW-029-082	2		UB	1	0
BMW-030-082			[illegible]	0.9	-0.105360516
BMW-031-082			BJ	1	0
BMW-032-082-RE	2		UB	1	0
BMW-033-082	5		UBJ	2.5	0.916290732
BMW-034-082			BJ	1	0
BMW-035-082			BJ	1	0
BMW-040-082			BJ	43	3.761200116
BMW-041-082	2		UBJ	1	0
BMW-042-082	5		UB	2.5	0.916290732
BMW-043-082			BJ	3	1.098612289
BMW-052-082	2	ND	U	1	0
BMW-053-082	5		UBJ	2.5	0.916290732
BMW-054-082	2		UBJ	1	0
BMW-055-082	2		UBJ	1	0
BMW-056-082	2		BJ	1	0
CMW-018-082			BJ	1	0
CMW-020-082	2		UB	1	0
DMW-009-082-RE	5		UBDJ	2.5	0.916290732
DMW-021-082			BJ	1	0
DMW-025-082			BJ	0.7	-0.356674944
DMW-028-082	2		UBJ	1	0
DMW-032-082	2		UB	1	0
DMW-033-082			B	3	1.098612289
DMW-034-082	2		UBJ	1	0
DMW-035-082			BJ	1	0
DMW-041-082			BJ	0.9	-0.105360516
DMW-042-082	5		UBJ	2.5	0.916290732
DMW-043-082	2		UB	1	0
AMW-017-082	2		UB	1	0
AMW-036-082	5		UBJ	2.5	0.916290732
AMW-037-082	5		UB	2.5	0.916290732
AMW-038-082	2		UB	1	0
AMW-039-082	2	ND	U	1	0
AMW-044-082			BJ	3	1.098612289
AMW-045-082			B	18	2.890371758
AMW-046-082	5		UB	2.5	0.916290732
BMW-017-082			B	8	2.079441542
BMW-036-082	5		UBJ	2.5	0.916290732
BMW-037-082	5		UBJ	2.5	0.916290732
BMW-044-082	2		UB	1	0
BMW-045-082	5		UBJ	2.5	0.916290732

VOC CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L.	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
BMW-046-082	5		UBJ	2.5	0.916290732
CMW-017-082			BJ	0.9	-0.105360516
DMW-036-082	5		UBJ	2.5	0.916290732
DMW-037-082	5		UB	2.5	0.916290732
DMW-038-082	2		UBJ	1	0
DMW-039-082	2	ND	U	1	0
DMW-044-082	2		UBJ	1	0
DMW-045-082	5		UBJ	2.5	0.916290732
DMW-046-082	5		UBJ	2.5	0.916290732

Methylene chloride

MEAN =	2.095535714
GEOMEAN =	1.417453902
MEAN OF LN=	0.348862235
N=	112
S=	0.651257706
H=	1.925
UCL=	1.97E+00
MIN =	0.7
MAX =	43
NO. OF DET=	38

VOC CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
		Tetrachloroethene			
AMW-001-082	1	ND	U	0.5	-0.693147181
AMW-002-082	10	ND	U	5	1.609437912
AMW-003-082	1	ND	U	0.5	-0.693147181
AMW-004-082	1	ND	U	0.5	-0.693147181
AMW-005-082	1	ND	U	0.5	-0.693147181
AMW-006-082	1	ND	U	0.5	-0.693147181
AMW-007-082	1	ND	U	0.5	-0.693147181
AMW-008-082	1	ND	U	0.5	-0.693147181
AMW-009-082	17	ND	U	8.5	2.140066163
AMW-010-082	1	ND	U	0.5	-0.693147181
AMW-011-082	1	ND	U	0.5	-0.693147181
AMW-012-082	10	ND	U	5	1.609437912
AMW-013-082	1	ND	U	0.5	-0.693147181
AMW-014-082	1	ND	U	0.5	-0.693147181
AMW-015-082	1	ND	U	0.5	-0.693147181
AMW-018-082	1	ND	U	0.5	-0.693147181
AMW-020-082	1	ND	U	0.5	-0.693147181
AMW-021-082	1	ND	U	0.5	-0.693147181
AMW-022-082	1	ND	U	0.5	-0.693147181
AMW-023-082	1	ND	U	0.5	-0.693147181
AMW-024-082	1	ND	U	0.5	-0.693147181
AMW-025-082	1	ND	U	0.5	-0.693147181
AMW-026-082	1	ND	U	0.5	-0.693147181
AMW-027-082	1	ND	U	0.5	-0.693147181
AMW-028-082	1	ND	U	0.5	-0.693147181
AMW-029-082	1	ND	U	0.5	-0.693147181
AMW-030-082	1	ND	U	0.5	-0.693147181
AMW-031-082	1	ND	U	0.5	-0.693147181
AMW-032-082	1	ND	U	0.5	-0.693147181
AMW-033-082	1	ND	U	0.5	-0.693147181
AMW-034-082	1	ND	U	0.5	-0.693147181
AMW-035-082	1	ND	U	0.5	-0.693147181
AMW-040-082	10	ND	U	5	1.609437912
AMW-041-082	1	ND	U	0.5	-0.693147181
AMW-042-082	1	ND	U	0.5	-0.693147181
AMW-043-082	1	ND	U	0.5	-0.693147181
AMW-052-082	1	ND	U	0.5	-0.693147181
AMW-053-082	1	ND	U	0.5	-0.693147181
AMW-054-082	1	ND	U	0.5	-0.693147181
AMW-055-082	1	ND	U	0.5	-0.693147181
AMW-056-082	1	ND	U	0.5	-0.693147181
BMW-001-082	1	ND	U	0.5	-0.693147181
BMW-002-082	1	ND	U	0.5	-0.693147181
BMW-003-082	1	ND	U	0.5	-0.693147181
BMW-004-082	1	ND	U	0.5	-0.693147181
BMW-005-082	1	ND	U	0.5	-0.693147181
BMW-006-082	1	ND	U	0.5	-0.693147181
BMW-007-082	1	ND	U	0.5	-0.693147181
BMW-008-082	1	ND	U	0.5	-0.693147181
BMW-009-082	10	ND	U	5	1.609437912
BMW-010-082	1	ND	U	0.5	-0.693147181

VOC CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
BMW-018-082	1	ND	U	0.5	-0.693147181
BMW-020-082	1	ND	U	0.5	-0.693147181
BMW-021-082	10	ND	U	5	1.609437912
BMW-022-082	1	ND	U	0.5	-0.693147181
BMW-023-082	10	ND	U	5	1.609437912
BMW-024-082	1	ND	U	0.5	-0.693147181
BMW-025-082	1	ND	U	0.5	-0.693147181
BMW-026-082	1	ND	U	0.5	-0.693147181
BMW-027-082	1	ND	U	0.5	-0.693147181
BMW-028-082	1	ND	U	0.5	-0.693147181
BMW-029-082	1	ND	U	0.5	-0.693147181
BMW-030-082	1	ND	U	0.5	-0.693147181
BMW-031-082	1	ND	U	0.5	-0.693147181
BMW-032-082-RE	2	ND	U	1	0
BMW-033-082	1	ND	U	0.5	-0.693147181
BMW-034-082	1	ND	U	0.5	-0.693147181
BMW-035-082	1	ND	U	0.5	-0.693147181
BMW-040-082	170	ND	U	85	4.442651256
BMW-041-082	1	ND	U	0.5	-0.693147181
BMW-042-082	1	ND	U	0.5	-0.693147181
BMW-043-082	10	ND	U	5	1.609437912
BMW-052-082	1	ND	U	0.5	-0.693147181
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	1	ND	U	0.5	-0.693147181
BMW-055-082	1	ND	U	0.5	-0.693147181
BMW-056-082	10	ND	U	5	1.609437912
CMW-018-082	10	ND	U	5	1.609437912
CMW-020-082	1	ND	U	0.5	-0.693147181
DMW-009-082-RE	16	ND	U	8	2.079441542
DMW-021-082	1	ND	U	0.5	-0.693147181
DMW-025-082	1	ND	U	0.5	-0.693147181
DMW-028-082	1	ND	U	0.5	-0.693147181
DMW-032-082	1	ND	U	0.5	-0.693147181
DMW-033-082	1	ND	U	0.5	-0.693147181
DMW-034-082	1	ND	U	0.5	-0.693147181
DMW-035-082	1	ND	U	0.5	-0.693147181
DMW-041-082	1	ND	U	0.5	-0.693147181
DMW-042-082	1	ND	U	0.5	-0.693147181
DMW-043-082	1	ND	U	0.5	-0.693147181
AMW-017-082	1	ND	U	0.5	-0.693147181
AMW-036-082	10	ND	U	5	1.609437912
AMW-037-082	1	ND	U	0.5	-0.693147181
AMW-038-082	1	ND	U	0.5	-0.693147181
AMW-039-082	1	ND	U	0.5	-0.693147181
AMW-044-082	10	ND	U	5	1.609437912
AMW-045-082	10	ND	U	5	1.609437912
AMW-046-082	1	ND	U	0.5	-0.693147181
BMW-017-082	1	ND	U	0.5	-0.693147181
BMW-036-082	10	ND	U	5	1.609437912
BMW-037-082	1	ND	U	0.5	-0.693147181
BMW-044-082	1	ND	U	0.5	-0.693147181
BMW-045-082	10	ND	U	5	1.609437912

VOC CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
BMW-046-082	1	ND	U	0.5	-0.693147181
CMW-017-082	1	ND	U	0.5	-0.693147181
DMW-036-082	1	ND	U	0.5	-0.693147181
DMW-037-082	1	ND	U	0.5	-0.693147181
DMW-038-082	1	ND	U	0.5	-0.693147181
DMW-039-082	1	ND	U	0.5	-0.693147181
DMW-044-082	1	ND	U	0.5	-0.693147181
DMW-045-082	10	ND	U	5	1.609437912
DMW-046-082	1	ND	U	0.5	-0.693147181

Tetrachloroethene

MEAN =	2.040178571
GEOMEAN =	0.769426004
MEAN OF LN=	-0.262110492
N=	112
S=	0.979946773
H=	2.205
UCL=	1.53E+00
MIN =	0
MAX =	0
NO. OF DET=	0

VOC CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
		Trichloroethene			
AMW-001-082	1	ND	U	0.5	-0.693147181
AMW-002-082				130	4.86753445
AMW-003-082	1	ND	U	0.5	-0.693147181
AMW-004-082	1	ND	U	0.5	-0.693147181
AMW-005-082				4	1.386294361
AMW-006-082	1	ND	U	0.5	-0.693147181
AMW-007-082	1	ND	U	0.5	-0.693147181
AMW-008-082	1	ND	U	0.5	-0.693147181
AMW-009-082				300	5.703782475
AMW-010-082	1	ND	U	0.5	-0.693147181
AMW-011-082	1	ND	U	0.5	-0.693147181
AMW-012-082				30	3.401197382
AMW-013-082	1	ND	U	0.5	-0.693147181
AMW-014-082	1	ND	U	0.5	-0.693147181
AMW-015-082	1	ND	U	0.5	-0.693147181
AMW-018-082	1	ND	U	0.5	-0.693147181
AMW-020-082	1	ND	U	0.5	-0.693147181
AMW-021-082	1	ND	U	0.5	-0.693147181
AMW-022-082	1	ND	U	0.5	-0.693147181
AMW-023-082	1	ND	U	0.5	-0.693147181
AMW-024-082			J	0.9	-0.105360516
AMW-025-082	1	ND	U	0.5	-0.693147181
AMW-026-082	1	ND	U	0.5	-0.693147181
AMW-027-082	1	ND	U	0.5	-0.693147181
AMW-028-082	1	ND	U	0.5	-0.693147181
AMW-029-082	1	ND	U	0.5	-0.693147181
AMW-030-082	1	ND	U	0.5	-0.693147181
AMW-031-082	1	ND	U	0.5	-0.693147181
AMW-032-082	1	ND	U	0.5	-0.693147181
AMW-033-082				1	0
AMW-034-082	1	ND	U	0.5	-0.693147181
AMW-035-082	1	ND	U	0.5	-0.693147181
AMW-040-082				22	3.091042453
AMW-041-082	1	ND	U	0.5	-0.693147181
AMW-042-082	1	ND	U	0.5	-0.693147181
AMW-043-082	1	ND	U	0.5	-0.693147181
AMW-052-082				3	1.098612289
AMW-053-082				8	2.079441542
AMW-054-082	1	ND	U	0.5	-0.693147181
AMW-055-082	1	ND	U	0.5	-0.693147181
AMW-056-082	1	ND	U	0.5	-0.693147181
BMW-001-082	1	ND	U	0.5	-0.693147181
BMW-002-082				11	2.397895273
BMW-003-082	1	ND	U	0.5	-0.693147181
BMW-004-082	1	ND	U	0.5	-0.693147181
BMW-005-082	1	ND	U	0.5	-0.693147181
BMW-006-082	1	ND	U	0.5	-0.693147181
BMW-007-082	1	ND	U	0.5	-0.693147181
BMW-008-082	1	ND	U	0.5	-0.693147181
BMW-009-082				31	3.433987204
BMW-010-082	1	ND	U	0.5	-0.693147181

VOC CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
BMW-018-082	1	ND	U	0.5	-0.693147181
BMW-020-082	1	ND	U	0.5	-0.693147181
BMW-021-082				140	4.941642423
BMW-022-082	1	ND	U	0.5	-0.693147181
BMW-023-082				97	4.574710979
BMW-024-082	1	ND	U	0.5	-0.693147181
BMW-025-082	1	ND	U	0.5	-0.693147181
BMW-026-082	1	ND	U	0.5	-0.693147181
BMW-027-082	1	ND	U	0.5	-0.693147181
BMW-028-082	1	ND	U	0.5	-0.693147181
BMW-029-082	1	ND	U	0.5	-0.693147181
BMW-030-082	1	ND	U	0.5	-0.693147181
BMW-031-082	1	ND	U	0.5	-0.693147181
BMW-032-082-RE	2	ND	U	1	0
BMW-033-082	1	ND	U	0.5	-0.693147181
BMW-034-082	1	ND	U	0.5	-0.693147181
BMW-035-082	1	ND	U	0.5	-0.693147181
BMW-040-082				1800	7.495541944
BMW-041-082	1	ND	U	0.5	-0.693147181
BMW-042-082	1	ND	U	0.5	-0.693147181
BMW-043-082				46	3.828641396
BMW-052-082				1	0
BMW-053-082				97	4.574710979
BMW-054-082	1	ND	U	0.5	-0.693147181
BMW-055-082	1	ND	U	0.5	-0.693147181
BMW-056-082				11	2.397895273
CMW-018-082				76	4.33073334
CMW-020-082	1	ND	U	0.5	-0.693147181
DMW-009-082-RE			D	220	5.393627546
DMW-021-082	1	ND	U	0.5	-0.693147181
DMW-025-082	1	ND	U	0.5	-0.693147181
DMW-028-082	1	ND	U	0.5	-0.693147181
DMW-032-082	1	ND	U	0.5	-0.693147181
DMW-033-082	1	ND	U	0.5	-0.693147181
DMW-034-082	1	ND	U	0.5	-0.693147181
DMW-035-082	1	ND	U	0.5	-0.693147181
DMW-041-082	1	ND	U	0.5	-0.693147181
DMW-042-082	1	ND	U	0.5	-0.693147181
DMW-043-082	1	ND	U	0.5	-0.693147181
AMW-017-082	1	ND	U	0.5	-0.693147181
AMW-036-082				25	3.218875825
AMW-037-082	1	ND	U	0.5	-0.693147181
AMW-038-082	1	ND	U	0.5	-0.693147181
AMW-039-082	1	ND	U	0.5	-0.693147181
AMW-044-082				180	5.192956851
AMW-045-082				26	3.258096538
AMW-046-082	1	ND	U	0.5	-0.693147181
BMW-017-082	1	ND	U	0.5	-0.693147181
BMW-036-082				25	3.218875825
BMW-037-082	1	ND	U	0.5	-0.693147181
BMW-044-082	1	ND	U	0.5	-0.693147181
BMW-045-082				99	4.59511985

VOC CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
BMW-046-082	1	ND	U	0.5	-0.693147181
CMW-017-082	1	ND	U	0.5	-0.693147181
DMW-036-082	1	ND	U	0.5	-0.693147181
DMW-037-082	1	ND	U	0.5	-0.693147181
DMW-038-082	1	ND	U	0.5	-0.693147181
DMW-039-082	1	ND	U	0.5	-0.693147181
DMW-044-082				7	1.945910149
DMW-045-082				50	3.912023005
DMW-046-082	1	ND	U	0.5	-0.693147181

Trichloroethene

MEAN =	31.10625
GEOMEAN =	1.330824192
MEAN OF LN=	0.285798443
N=	112
S=	1.951641423
H=	3.295
UCL=	1.65E+01
MIN =	0.9
MAX =	1800
NO. OF DET=	27

SVOC CONCENTRATION CALCULATION
AREA A
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-048-082-RE	10	ND	U	5	1.609437912
BMW-048-082	10	ND	U	5	1.609437912
DMW-048-082	10	ND	U	5	1.609437912
			1,2,4-Trichlorobenzene		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	3	
			S=	2.10734E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-048-082-RE	10	ND	U	5	1.609437912
BMW-048-082	10	ND	U	5	1.609437912
DMW-048-082	10	ND	U	5	1.609437912
			1,2-Dichlorobenzene		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	3	
			S=	2.10734E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-048-082-RE	10	ND	U	5	1.609437912
BMW-048-082	10	ND	U	5	1.609437912
DMW-048-082	10	ND	U	5	1.609437912
			1,3-Dichlorobenzene		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	3	
			S=	2.10734E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

B07NE003702-08387

SVOC CONCENTRATION CALCULATION
AREA A
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-048-082-RE	10	ND	U	5	1.609437912
BMW-048-082	10	ND	U	5	1.609437912
DMW-048-082	10	ND	U	5	1.609437912
			1,4-Dichlorobenzene		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	3	
			S=	2.10734E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-048-082-RE	10	ND	U	5	1.609437912
BMW-048-082	10	ND	U	5	1.609437912
DMW-048-082	10	ND	U	5	1.609437912
			2,2'-Oxybis(1-chloropropane)		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	3	
			S=	2.10734E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-048-082-RE	25	ND	U	12.5	2.525728644
BMW-048-082	25	ND	U	12.5	2.525728644
DMW-048-082	25	ND	U	12.5	2.525728644
			2,4,5-Trichlorophenol		
			MEAN =	12.5	
			GEOMEAN =	12.5	
			MEAN OF LN=	2.525728644	
			N=	3	
			S=	0	
			H=	NA	
			UCL=	1.25E+01	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

B07NE003702-08388

SVOC CONCENTRATION CALCULATION
AREA A
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-048-082-RE	10	ND	U	5	1.609437912
BMW-048-082	10	ND	U	5	1.609437912
DMW-048-082	10	ND	U	5	1.609437912
			2,4,6-Trichlorophenol		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	3	
			S=	2.10734E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-048-082-RE	10	ND	U	5	1.609437912
BMW-048-082	10	ND	U	5	1.609437912
DMW-048-082	10	ND	U	5	1.609437912
			2,4-Dichlorophenol		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	3	
			S=	2.10734E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-048-082-RE	10	ND	U	5	1.609437912
BMW-048-082	10	ND	U	5	1.609437912
DMW-048-082	10	ND	U	5	1.609437912
			2,4-Dimethylphenol		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	3	
			S=	2.10734E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

SVOC CONCENTRATION CALCULATION
AREA A
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-048-082-RE	25	ND	U	12.5	2.525728644
BMW-048-082	25	ND	U	12.5	2.525728644
DMW-048-082	25	ND	U	12.5	2.525728644
			2,4-Dinitrophenol		
			MEAN =	12.5	
			GEOMEAN =	12.5	
			MEAN OF LN=	2.525728644	
			N=	3	
			S=	0	
			H=	NA	
			UCL=	1.25E+01	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-048-082-RE	10	ND	U	5	1.609437912
BMW-048-082	10	ND	U	5	1.609437912
DMW-048-082	10	ND	U	5	1.609437912
			2,4-Dinitrotoluene		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	3	
			S=	2.10734E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-048-082-RE	10	ND	U	5	1.609437912
BMW-048-082	10	ND	U	5	1.609437912
DMW-048-082	10	ND	U	5	1.609437912
			2,6-Dinitrotoluene (26DNT)		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	3	
			S=	2.10734E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

SVOC CONCENTRATION CALCULATION
AREA A
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-048-082-RE	10	ND	U	5	1.609437912
BMW-048-082	10	ND	U	5	1.609437912
DMW-048-082	10	ND	U	5	1.609437912
			2-Chloronaphthalene		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	3	
			S=	2.10734E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-048-082-RE	10	ND	U	5	1.609437912
BMW-048-082	10	ND	U	5	1.609437912
DMW-048-082	10	ND	U	5	1.609437912
			2-Chlorophenol		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	3	
			S=	2.10734E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-048-082-RE	10	ND	U	5	1.609437912
BMW-048-082	10	ND	U	5	1.609437912
DMW-048-082	10	ND	U	5	1.609437912
			2-Methylnaphthalene		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	3	
			S=	2.10734E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

SVOC CONCENTRATION CALCULATION
AREA A
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-048-082-RE	10	ND	U	5	1.609437912
BMW-048-082	10	ND	U	5	1.609437912
DMW-048-082	10	ND	U	5	1.609437912
			2-Methylphenol		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	3	
			S=	2.10734E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-048-082-RE	25	ND	U	12.5	2.525728644
BMW-048-082	25	ND	U	12.5	2.525728644
DMW-048-082	25	ND	U	12.5	2.525728644
			2-Nitroaniline		
			MEAN =	12.5	
			GEOMEAN =	12.5	
			MEAN OF LN=	2.525728644	
			N=	3	
			S=	0	
			H=	NA	
			UCL=	1.25E+01	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-048-082-RE	10	ND	U	5	1.609437912
BMW-048-082	10	ND	U	5	1.609437912
DMW-048-082	10	ND	U	5	1.609437912
			2-Nitrophenol		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	3	
			S=	2.10734E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

B07NE003702-08392

SVOC CONCENTRATION CALCULATION
AREA A
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-048-082-RE	10	ND	U	5	1.609437912
BMW-048-082	10	ND	U	5	1.609437912
DMW-048-082	10	ND	U	5	1.609437912
			3,3'-Dichlorobenzidine		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	3	
			S=	2.10734E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-048-082-RE	25	ND	U	12.5	2.525728644
BMW-048-082	25	ND	U	12.5	2.525728644
DMW-048-082	25	ND	U	12.5	2.525728644
			3-Nitroaniline		
			MEAN =	12.5	
			GEOMEAN =	12.5	
			MEAN OF LN=	2.525728644	
			N=	3	
			S=	0	
			H=	NA	
			UCL=	1.25E+01	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-048-082-RE	25	ND	U	12.5	2.525728644
BMW-048-082	25	ND	U	12.5	2.525728644
DMW-048-082	25	ND	U	12.5	2.525728644
			4,6-Dinitro-2-methylphenol		
			MEAN =	12.5	
			GEOMEAN =	12.5	
			MEAN OF LN=	2.525728644	
			N=	3	
			S=	0	
			H=	NA	
			UCL=	1.25E+01	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

SVOC CONCENTRATION CALCULATION
AREA A
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-048-082-RE	10	ND	U	5	1.609437912
BMW-048-082	10	ND	U	5	1.609437912
DMW-048-082	10	ND	U	5	1.609437912
			4-Bromophenyl phenyl ether		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	3	
			S=	2.10734E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-048-082-RE	10	ND	U	5	1.609437912
BMW-048-082	10	ND	U	5	1.609437912
DMW-048-082	10	ND	U	5	1.609437912
			4-Chloro-3-methylphenol		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	3	
			S=	2.10734E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-048-082-RE	10	ND	U	5	1.609437912
BMW-048-082	10	ND	U	5	1.609437912
DMW-048-082	10	ND	U	5	1.609437912
			4-Chloroaniline		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	3	
			S=	2.10734E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

SVOC CONCENTRATION CALCULATION
AREA A
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-048-082-RE	10	ND	U	5	1.609437912
BMW-048-082	10	ND	U	5	1.609437912
DMW-048-082	10	ND	U	5	1.609437912
			4-Chlorophenyl phenyl ether		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	3	
			S=	2.10734E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-048-082-RE	10	ND	U	5	1.609437912
BMW-048-082	10	ND	U	5	1.609437912
DMW-048-082	10	ND	U	5	1.609437912
			4-Methylphenol		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	3	
			S=	2.10734E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-048-082-RE	25	ND	U	12.5	2.525728644
BMW-048-082	25	ND	U	12.5	2.525728644
DMW-048-082	25	ND	U	12.5	2.525728644
			4-Nitroaniline		
			MEAN =	12.5	
			GEOMEAN =	12.5	
			MEAN OF LN=	2.525728644	
			N=	3	
			S=	0	
			H=	NA	
			UCL=	1.25E+01	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

SVOC CONCENTRATION CALCULATION
AREA A
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-048-082-RE	25	ND	U	12.5	2.525728644
BMW-048-082	25	ND	U	12.5	2.525728644
DMW-048-082	25	ND	U	12.5	2.525728644
			4-Nitrophenol		
			MEAN =	12.5	
			GEOMEAN =	12.5	
			MEAN OF LN=	2.525728644	
			N=	3	
			S=	0	
			H=	NA	
			UCL=	1.25E+01	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-048-082-RE	10	ND	U	5	1.609437912
BMW-048-082	10	ND	U	5	1.609437912
DMW-048-082	10	ND	U	5	1.609437912
			Acenaphthene		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	3	
			S=	2.10734E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-048-082-RE	10	ND	U	5	1.609437912
BMW-048-082	10	ND	U	5	1.609437912
DMW-048-082	10	ND	U	5	1.609437912
			Acenaphthylene		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	3	
			S=	2.10734E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

SVOC CONCENTRATION CALCULATION
AREA A
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-048-082-RE	10	ND	U	5	1.609437912
BMW-048-082	10	ND	U	5	1.609437912
DMW-048-082	10	ND	U	5	1.609437912
			Anthracene		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	3	
			S=	2.10734E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO OF DET=	0	
AMW-048-082-RE	10	ND	U	5	1.609437912
BMW-048-082	10	ND	U	5	1.609437912
DMW-048-082	10	ND	U	5	1.609437912
			Benzo(a)anthracene		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	3	
			S=	2.10734E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-048-082-RE	10	ND	U	5	1.609437912
BMW-048-082	10	ND	U	5	1.609437912
DMW-048-082	10	ND	U	5	1.609437912
			Benzo(a)pyrene		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	3	
			S=	2.10734E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

SVOC CONCENTRATION CALCULATION
AREA A
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-048-082-RE	10	ND	U	5	1.609437912
BMW-048-082	10	ND	U	5	1.609437912
DMW-048-082	10	ND	U	5	1.609437912
			Benzo(b)fluoranthene		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	3	
			S=	2.10734E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-048-082-RE	10	ND	U	5	1.609437912
BMW-048-082	10	ND	U	5	1.609437912
DMW-048-082	10	ND	U	5	1.609437912
			Benzo(g,h,i)perylene		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	3	
			S=	2.10734E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-048-082-RE	10	ND	U	5	1.609437912
BMW-048-082	10	ND	U	5	1.609437912
DMW-048-082	10	ND	U	5	1.609437912
			Benzo(k)fluoranthene		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	3	
			S=	2.10734E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

SVOC CONCENTRATION CALCULATION
AREA A
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-048-082-RE	10	ND	U	5	1.609437912
BMW-048-082	10	ND	U	5	1.609437912
DMW-048-082	10	ND	U	5	1.609437912
			bis(2-Chloroethoxy)methane		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	3	
			S=	2.10734E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-048-082-RE	10	ND	U	5	1.609437912
BMW-048-082	10	ND	U	5	1.609437912
DMW-048-082	10	ND	U	5	1.609437912
			bis(2-Chloroethyl)ether		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	3	
			S=	2.10734E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-048-082-RE			BJ	5	1.609437912
BMW-048-082			BJ	2	0.693147181
DMW-048-082			B	20	2.995732274
			bis(2-Ethylhexyl)phthalate		
			MEAN =	9	
			GEOMEAN =	5.848035476	
			MEAN OF LN=	1.766105789	
			N=	3	
			S=	1.15925974	
			H=	14.57	
			UCL=	1.76E+06	
			MIN =	2	
			MAX =	20	
			NO. OF DET=	3	

SVOC CONCENTRATION CALCULATION
AREA A
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-048-082-RE	10	ND	U	5	1.609437912
BMW-048-082	10	ND	U	5	1.609437912
DMW-048-082	10	ND	U	5	1.609437912
			Butyl benzyl phthalate		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	3	
			S=	2.10734E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-048-082-RE	10	ND	U	5	1.609437912
BMW-048-082	10	ND	U	5	1.609437912
DMW-048-082	10	ND	U	5	1.609437912
			Carbazole		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	3	
			S=	2.10734E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-048-082-RE	10	ND	U	5	1.609437912
BMW-048-082	10	ND	U	5	1.609437912
DMW-048-082	10	ND	U	5	1.609437912
			Chrysene		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	3	
			S=	2.10734E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

SVOC CONCENTRATION CALCULATION
AREA A
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-048-082-RE	10	ND	U	5	1.609437912
BMW-048-082	10	ND	U	5	1.609437912
DMW-048-082			J	1	0
			Di-n-butyl phthalate		
			MEAN =	3.666666667	
			GEOMEAN =	2.924017738	
			MEAN OF LN=	1.072958608	
			N=	3	
			S=	0.929209412	
			H=	12.27	
			UCL=	1.43E+04	
			MIN =	1	
			MAX =	1	
			NO. OF DET=	1	
AMW-048-082-RE	10	ND	U	5	1.609437912
BMW-048-082	10	ND	U	5	1.609437912
DMW-048-082	10	ND	U	5	1.609437912
			Di-n-octyl phthalate		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	3	
			S=	2.10734E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-048-082-RE	10	ND	U	5	1.609437912
BMW-048-082	10	ND	U	5	1.609437912
DMW-048-082	10	ND	U	5	1.609437912
			Dibenzo(a,h)anthracene		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	3	
			S=	2.10734E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

SVOC CONCENTRATION CALCULATION
AREA A
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-048-082-RE	10	ND	U	5	1.609437912
BMW-048-082	10	ND	U	5	1.609437912
DMW-048-082	10	ND	U	5	1.609437912
			Dibenzofuran		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	3	
			S=	2.10734E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-048-082-RE			J	1	0
BMW-048-082	10	ND	U	5	1.609437912
DMW-048-082			BJ	2	0.693147181
			Diethyl phthalate		
			MEAN =	2.666666667	
			GEOMEAN =	2.15443469	
			MEAN OF LN=	0.767528364	
			N=	3	
			S=	0.807293019	
			H=	10.43	
			UCL=	1.15E+03	
			MIN =	1	
			MAX =	2	
			NO. OF DET=	2	
AMW-048-082-RE	10	ND	U	5	1.609437912
BMW-048-082	10	ND	U	5	1.609437912
DMW-048-082	10	ND	U	5	1.609437912
			Dimethyl phthalate		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	3	
			S=	2.10734E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

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SVOC CONCENTRATION CALCULATION
AREA A
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-048-082-RE	10	ND	U	5	1.609437912
BMW-048-082	10	ND	U	5	1.609437912
DMW-048-082	10	ND	U	5	1.609437912
			Fluoranthene		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	3	
			S=	2.10734E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-048-082-RE	10	ND	U	5	1.609437912
BMW-048-082	10	ND	U	5	1.609437912
DMW-048-082	10	ND	U	5	1.609437912
			Fluorene		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	3	
			S=	2.10734E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-048-082-RE	10	ND	U	5	1.609437912
BMW-048-082	10	ND	U	5	1.609437912
DMW-048-082	10	ND	U	5	1.609437912
			Hexachlorobenzene		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	3	
			S=	2.10734E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

SVOC CONCENTRATION CALCULATION
AREA A
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-048-082-RE	10	ND	U	5	1.609437912
BMW-048-082	10	ND	U	5	1.609437912
DMW-048-082	10	ND	U	5	1.609437912
			Hexachlorobutadiene		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	3	
			S=	2.10734E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-048-082-RE	10	ND	U	5	1.609437912
BMW-048-082	10	ND	U	5	1.609437912
DMW-048-082	10	ND	U	5	1.609437912
			Hexachlorocyclopentadiene		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	3	
			S=	2.10734E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-048-082-RE	10	ND	U	5	1.609437912
BMW-048-082	10	ND	U	5	1.609437912
DMW-048-082	10	ND	U	5	1.609437912
			Hexachloroethane		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	3	
			S=	2.10734E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

SVOC CONCENTRATION CALCULATION
AREA A
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-048-082-RE	10	ND	U	5	1.609437912
BMW-048-082	10	ND	U	5	1.609437912
DMW-048-082	10	ND	U	5	1.609437912
			Indeno(1,2,3-cd)pyrene		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	3	
			S=	2.10734E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-048-082-RE	10	ND	U	5	1.609437912
BMW-048-082	10	ND	U	5	1.609437912
DMW-048-082	10	ND	U	5	1.609437912
			Isophorone		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	3	
			S=	2.10734E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-048-082-RE	10	ND	U	5	1.609437912
BMW-048-082	10	ND	U	5	1.609437912
DMW-048-082	10	ND	U	5	1.609437912
			N-Nitroso-di-n-propylamine		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	3	
			S=	2.10734E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

SVOC CONCENTRATION CALCULATION
AREA A
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-048-082-RE	10	ND	U	5	1.609437912
BMW-048-082	10	ND	U	5	1.609437912
DMW-048-082	10	ND	U	5	1.609437912
			N-Nitrosodiphenylamine(1)		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	3	
			S=	2.10734E-08	
			H=	2.016	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-048-082-RE	10	ND	U	5	1.609437912
BMW-048-082	10	ND	U	5	1.609437912
DMW-048-082	10	ND	U	5	1.609437912
			Naphthalene		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	3	
			S=	2.10734E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-048-082-RE	10	ND	U	5	1.609437912
BMW-048-082	10	ND	U	5	1.609437912
DMW-048-082	10	ND	U	5	1.609437912
			Nitrobenzene (NB)		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	3	
			S=	2.10734E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

SVOC CONCENTRATION CALCULATION
AREA A
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-048-082-RE	25	ND	U	12.5	2.525728644
BMW-048-082	25	ND	U	12.5	2.525728644
DMW-048-082	25	ND	U	12.5	2.525728644
			Pentachlorophenol		
			MEAN =	12.5	
			GEOMEAN =	12.5	
			MEAN OF LN=	2.525728644	
			N=	3	
			S=	0	
			H=	NA	
			UCL=	1.25E+01	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-048-082-RE	10	ND	U	5	1.609437912
BMW-048-082	10	ND	U	5	1.609437912
DMW-048-082	10	ND	U	5	1.609437912
			Phenanthrene		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	3	
			S=	2.10734E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-048-082-RE	10	ND	U	5	1.609437912
BMW-048-082	10	ND	U	5	1.609437912
DMW-048-082			J	3	1.098612289
			Phenol		
			MEAN =	4.333333333	
			GEOMEAN =	4.217163327	
			MEAN OF LN=	1.439162705	
			N=	3	
			S=	0.294925311	
			H=	4.109	
			UCL=	1.04E+01	
			MIN =	3	
			MAX =	3	
			NO. OF DET=	1	

SVOC CONCENTRATION CALCULATION
AREA A
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-048-082-RE	10	ND	U	5	1.609437912
BMW-048-082	10	ND	U	5	1.609437912
DMW-048-082	10	ND	U	5	1.609437912
			Pyrene		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	3	
			S=	2.10734E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

SVOC CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912
			1,2,4-Trichlorobenzene		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	10	
			S=	2.80979E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912
			1,2-Dichlorobenzene		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	10	
			S=	2.80979E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

B07NE003702-08409

SVOC CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912
			1,3-Dichlorobenzene		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	10	
			S=	2.80979E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912
			1,4-Dichlorobenzene		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	10	
			S=	2.80979E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

SVOC CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912
			2,2'-Oxybis(1-chloropropane)		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	10	
			S=	2.80979E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-052-082	25	ND	U	12.5	2.525728644
AMW-053-082	25	ND	U	12.5	2.525728644
AMW-054-082	25	ND	U	12.5	2.525728644
AMW-055-082	25	ND	U	12.5	2.525728644
AMW-056-082	25	ND	U	12.5	2.525728644
BMW-052-082	25	ND	U	12.5	2.525728644
BMW-053-082	25	ND	U	12.5	2.525728644
BMW-054-082	25	ND	U	12.5	2.525728644
BMW-055-082	25	ND	U	12.5	2.525728644
BMW-056-082	25	ND	U	12.5	2.525728644
			2,4,5-Trichlorophenol		
			MEAN =	12.5	
			GEOMEAN =	12.5	
			MEAN OF LN=	2.525728644	
			N=	10	
			S=	2.80979E-08	
			H=	NA	
			UCL=	1.25E+01	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

SVOC CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L.	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912
			2,4,6-Trichlorophenol		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	10	
			S=	2.80979E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10		U	5	1.609437912
BMW-054-082	10		U	5	1.609437912
BMW-055-082	10		U	5	1.609437912
BMW-056-082	10		U	5	1.609437912
			2,4-Dichlorophenol		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	10	
			S=	2.80979E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

SVOC CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912
			2,4-Dimethylphenol		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	10	
			S=	2.80979E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-052-082	25	ND	U	12.5	2.525728644
AMW-053-082	25	ND	U	12.5	2.525728644
AMW-054-082	25	ND	U	12.5	2.525728644
AMW-055-082	25	ND	U	12.5	2.525728644
AMW-056-082	25	ND	U	12.5	2.525728644
BMW-052-082	25	ND	U	12.5	2.525728644
BMW-053-082	25	ND	U	12.5	2.525728644
BMW-054-082	25	ND	U	12.5	2.525728644
BMW-055-082	25	ND	U	12.5	2.525728644
BMW-056-082	25	ND	U	12.5	2.525728644
			2,4-Dinitrophenol		
			MEAN =	12.5	
			GEOMEAN =	12.5	
			MEAN OF LN=	2.525728644	
			N=	10	
			S=	2.80979E-08	
			H=	NA	
			UCL=	1.25E+01	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

SVOC CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912
			2,4-Dinitrotoluene		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	10	
			S=	2.80979E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912
			2,6-Dinitrotoluene (26DNT)		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	10	
			S=	2.80979E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

B07NE003702-08414

SVOC CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912
			2-Chloronaphthalene		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	10	
			S=	2.80979E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912
			2-Chlorophenol		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	10	
			S=	2.80979E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

SVOC CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND		5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912
			2-Methylnaphthalene		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	10	
			S=	2.80979E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912
			2-Methylphenol		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	10	
			S=	2.80979E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

SVOC CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	25	ND	U	12.5	2.525728644
AMW-053-082	25	ND	U	12.5	2.525728644
AMW-054-082	25	ND	U	12.5	2.525728644
AMW-055-082	25	ND	U	12.5	2.525728644
AMW-056-082	25	ND	U	12.5	2.525728644
BMW-052-082	25	ND	U	12.5	2.525728644
BMW-053-082	25	ND	U	12.5	2.525728644
BMW-054-082	25	ND	U	12.5	2.525728644
BMW-055-082	25	ND	U	12.5	2.525728644
BMW-056-082	25	ND	U	12.5	2.525728644
			2-Nitroaniline		
			MEAN =	12.5	
			GEOMEAN =	12.5	
			MEAN OF LN=	2.525728644	
			N=	10	
			S=	2.80979E-08	
			H=	NA	
			UCL=	1.25E+01	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912
			2-Nitrophenol		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	10	
			S=	2.80979E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

B07NE003702-08417

SVOC CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912
			3,3'-Dichlorobenzidine		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	10	
			S=	2.80979E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-052-082	25	ND	U	12.5	2.525728644
AMW-053-082	25	ND	U	12.5	2.525728644
AMW-054-082	25	ND	U	12.5	2.525728644
AMW-055-082	25	ND	U	12.5	2.525728644
AMW-056-082	25	ND	U	12.5	2.525728644
BMW-052-082	25	ND	U	12.5	2.525728644
BMW-053-082	25	ND	U	12.5	2.525728644
BMW-054-082	25	ND	U	12.5	2.525728644
BMW-055-082	25	ND	U	12.5	2.525728644
BMW-056-082	25	ND	U	12.5	2.525728644
			3-Nitroaniline		
			MEAN =	12.5	
			GEOMEAN =	12.5	
			MEAN OF LN=	2.525728644	
			N=	10	
			S=	2.80979E-08	
			H=	NA	
			UCL=	1.25E+01	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

SVOC CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	25	ND	U	12.5	2.525728644
AMW-053-082	25	ND	U	12.5	2.525728644
AMW-054-082	25	ND	U	12.5	2.525728644
AMW-055-082	25	ND	U	12.5	2.525728644
AMW-056-082	25	ND	U	12.5	2.525728644
BMW-052-082	25	ND	U	12.5	2.525728644
BMW-053-082	25	ND	U	12.5	2.525728644
BMW-054-082	25	ND	U	12.5	2.525728644
BMW-055-082	25	ND	U	12.5	2.525728644
BMW-056-082	25	ND	U	12.5	2.525728644
			4,6-Dinitro-2-methylphenol		
			MEAN =	12.5	
			GEOMEAN =	12.5	
			MEAN OF LN=	2.525728644	
			N=	10	
			S=	2.80979E-08	
			H=	NA	
			UCL=	1.25E+01	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912
			4-Bromophenyl phenyl ether		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	10	
			S=	2.80979E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

SVOC CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912
			4-Chloro-3-methylphenol		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	10	
			S=	2.80979E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912
			4-Chloroaniline		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	10	
			S=	2.80979E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

B07NE003702-08420

SVOC CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912
			4-Chlorophenyl phenyl ether		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	10	
			S=	2.80979E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912
			4-Methylphenol		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	10	
			S=	2.80979E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

SVOC CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L.	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	25	ND	U	12.5	2.525728644
AMW-053-082	25	ND	U	12.5	2.525728644
AMW-054-082	25	ND	U	12.5	2.525728644
AMW-055-082	25	ND	U	12.5	2.525728644
AMW-056-082	25	ND	U	12.5	2.525728644
BMW-052-082	25	ND	U	12.5	2.525728644
BMW-053-082	25	ND	U	12.5	2.525728644
BMW-054-082	25	ND	U	12.5	2.525728644
BMW-055-082	25	ND	[illegible]	12.5	2.525728644
BMW-056-082	25	ND		12.5	2.525728644
			4-[illegible]line		
			M[illegible]	12.5	
			GEOME[illegible]	12.5	
			MEAN OF LN=	2.525728644	
			N=	10	
			S=	2.80979E-08	
			H=	NA	
			UCL=	1.25E+01	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-052-082	25	ND	U	12.5	2.525728644
AMW-053-082	25	ND	U	12.5	2.525728644
AMW-054-082	25	ND	U	12.5	2.525728644
AMW-055-082	25	ND	U	12.5	2.525728644
AMW-056-082	25	ND	U	12.5	2.525728644
BMW-052-082	25	ND	U	12.5	2.525728644
BMW-053-082	25	ND	U	12.5	2.525728644
BMW-054-082	25	ND	U	12.5	2.525728644
BMW-055-082	25	ND	U	12.5	2.525728644
BMW-056-082	25	ND	U	12.5	2.525728644
			4-Nitrophenol		
			MEAN =	12.5	
			GEOMEAN =	12.5	
			MEAN OF LN=	2.525728644	
			N=	10	
			S=	2.80979E-08	
			H=	NA	
			UCL=	1.25E+01	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

SVOC CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912
			Acenaphthene		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	10	
			S=	2.80979E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912
			Acenaphthylene		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	10	
			S=	2.80979E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

B07NE003702-08423

SVOC CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912
			Anthracene		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	10	
			S=	2.80979E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055 2	10	ND	U	5	1.609437912
BMW-056 2	10	ND	U	5	1.609437912
			Benzo(a)anthracene		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	10	
			S=	2.80979E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

B07NE003702-08424

SVOC CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912
			Benzo(a)pyrene		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	10	
			S=	2.80979E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912
			Benzo(b)fluoranthene		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	10	
			S=	2.80979E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

B07NE003702-08425

SVOC CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912
			Benzo(g,h,i)perylene		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	10	
			S=	2.80979E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912
			Benzo(k)fluoranthene		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	10	
			S=	2.80979E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

B07NE003702-08426

SVOC CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912
			bis(2-Chloroethoxy)methane		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	10	
			S=	2.80979E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912
			bis(2-Chloroethyl)ether		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	10	
			S=	2.80979E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

SVOC CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082			BJ	5	1.609437912
AMW-053-082			BJ	4	1.386294361
AMW-054-082			BJ	2	0.693147181
AMW-055-082			BJ	9	2.197224577
AMW-056-082			BJ	4	1.386294361
BMW-052-082			BJ	2	0.693147181
BMW-053-082			B	12	2.48490665
BMW-054-082			BJ	4	1.386294361
BMW-055-082			BJ	6	1.791759469
BMW-056-082			BJ	3	1.098612289
			bis(2-Ethylhexyl)phthalate		
			MEAN =	5.1	
			GEOMEAN =	4.361045552	
			MEAN OF LN=	1.472711834	
			N=	10	
			S=	0.581925824	
			H=	2.368	
			UCL=	8.18E+00	
			MIN =	2	
			MAX =	12	
			NO. OF DET=	10	
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912
			Butyl benzyl phthalate		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	10	
			S=	2.80979E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

B07NE003702-08428

SVOC CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912
			Carbazole		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	10	
			S=	2.80979E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912
			Chrysene		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	10	
			S=	2.80979E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

SVOC CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082			J	1	0
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082			J	1	0
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912
			Di-n-butyl phthalate		
			MEAN =	4.2	
			GEOMEAN =	3.623898318	
			MEAN OF LN=	1.28755033	
			N=	10	
			S=	0.678598607	
			H=	2.448	
			UCL=	7.94E+00	
			MIN =	1	
			MAX =	1	
			NO. OF DET=	2	
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912
			Di-n-octyl phthalate		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	10	
			S=	2.80979E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

B07NE003702-08430

SVOC CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912
			Dibenzo(a,h)anthracene		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	10	
			S=	2.80979E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912
			Dibenzofuran		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	10	
			S=	2.80979E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

SVOC CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	10		UBJ	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082			J	1	0
BMW-054-082			BJ	1	0
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10		UBJ	5	1.609437912
			Diethyl phthalate		
			MEAN =	4.2	
			GEOMEAN =	3.623898318	
			MEAN OF LN=	1.28755033	
			N=	10	
			S=	0.678598607	
			H=	2.448	
			UCL=	7.94E+00	
			MIN =	1	
			MAX =	1	
			NO. OF DET=	2	
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912
			Dimethyl phthalate		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	10	
			S=	2.80979E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

SVOC CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912
			Fluoranthene		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	10	
			S=	2.80979E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912
			Fluorene		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	10	
			S=	2.80979E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

B07NE003702-08433

SVOC CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912
			Hexachlorobenzene		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	10	
			S=	2.80979E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912
			Hexachlorobutadiene		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	10	
			S=	2.80979E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

B07NE003702-08434

SVOC CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.I.	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912
			Hexachlorocyclopentadiene		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	10	
			S=	2.80979E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912
			Hexachloroethane		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	10	
			S=	2.80979E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

SVOC CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912
			Indeno(1,2,3-cd)pyrene		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	10	
			S=	2.80979E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912
			Isophorone		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	10	
			S=	2.80979E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

B07NE003702-08436

SVOC CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912
			N-Nitroso-di-n-propylamine		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	10	
			S=	2.80979E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082			J	1	0
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912
			N-Nitrosodiphenylamine(1)		
			MEAN =	4.6	
			GEOMEAN =	4.256699613	
			MEAN OF LN=	1.448494121	
			N=	10	
			S=	0.508948956	
			H=	2.22	
			UCL=	7.06E+00	
			MIN =	1	
			MAX =	1	
			NO. OF DET=	1	

SVOC CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L.	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912
			Naphthalene		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	10	
			S=	2.80979E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912
			Nitrobenzene (NB)		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	10	
			S=	2.80979E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

B07NE003702-08438

SVOC CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	25	ND	U	12.5	2.525728644
AMW-053-082	25	ND	U	12.5	2.525728644
AMW-054-082	25	ND	U	12.5	2.525728644
AMW-055-082	25	ND	U	12.5	2.525728644
AMW-056-082	25	ND	U	12.5	2.525728644
BMW-052-082	25	ND	U	12.5	2.525728644
BMW-053-082	25	ND	U	12.5	2.525728644
BMW-054-082	25	ND	U	12.5	2.525728644
BMW-055-082	25	ND	U	12.5	2.525728644
BMW-056-082	25	ND	U	12.5	2.525728644
			Pentachlorophenol		
			MEAN =	12.5	
			GEOMEAN =	12.5	
			MEAN OF LN=	2.525728644	
			N=	10	
			S=	2.80979E-08	
			H=	NA	
			UCL=	1.25E+01	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912
			Phenanthrene		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	10	
			S=	2.80979E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

SVOC CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082			J	1	0
AMW-055-082			J	1	0
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10		UBJ	5	1.609437912
BMW-054-082			J	2	0.693147181
BMW-055-082			J	1	0
BMW-056-082	10		UBJ	5	1.609437912
			Phenol		
			MEAN =	3.5	
			GEOMEAN =	2.815042799	
			MEAN OF LN=	1.034977466	
			N=	10	
			S=	0.768144361	
			H=	2.619	
			UCL=	7.39E+00	
			MIN =	1	
			MAX =	2	
			NO. OF DET=	4	
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912
			Pyrene		
			MEAN =	5	
			GEOMEAN =	5	
			MEAN OF LN=	1.609437912	
			N=	10	
			S=	2.80979E-08	
			H=	NA	
			UCL=	5.00E+00	
			MIN =	0	
			MAX =	0	
			NO. OF DET=	0	

B07NE003702-08440

METAL CONCENTRATION CALCULATION
AREA A
(all in ug/L)

WELL NAME	D.L	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-048-082	200	U*	100	4.605170186
BMW-048-082	200	U*	100	4.605170186
DMW-048-082	200	U*	100	4.605170186
		Aluminum		
		MEAN =	100	
		GEOMEAN =	100	
		MEAN OF LN=	4.605170186	
		N=	3	
		S=	0	
		H=	NA	
		UCL=	1.00E+02	
		MIN =	0	
		MAX =	0	
		NO. OF DET=	0	
AMW-048-082	39	U	19.5	2.970414466
BMW-048-082	39	U	19.5	2.970414466
DMW-048-082	39	U	19.5	2.970414466
		Antimony		
		MEAN =	19.5	
		GEOMEAN =	19.5	
		MEAN OF LN=	2.970414466	
		N=	3	
		S=	0	
		H=	NA	
		UCL=	1.95E+01	
		MIN =	0	
		MAX =	0	
		NO. OF DET=	0	
AMW-048-082		NA	11.9	2.4765384
BMW-048-082		B	9.3	2.2300144
DMW-048-082			19.8	2.985681938
		Arsenic		
		MEAN =	13.66666667	
		GEOMEAN =	12.98868048	
		MEAN OF LN=	2.564078246	
		N=	3	
		S=	0.385364471	
		H=	5.22	
		UCL=	5.80E+01	
		MIN =	9.3	
		MAX =	19.8	
		NO. OF DET=	3	

METAL CONCENTRATION CALCULATION
AREA A
(all in ug/L)

WELL NAME	D.L	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-048-082		B	116	4.753590191
BMW-048-082			234	5.455321115
DMW-048-082		B	134	4.8978398
		Barium		
		MEAN =	161.3333333	
		GEOMEAN =	153.7893336	
		MEAN OF LN=	5.035583702	
		N=	3	
		S=	0.370589543	
		H=	5.22	
		UCL=	6.47E+02	
		MIN =	116	
		MAX =	234	
		NO. OF DET=	3	
AMW-048-082	1	U	0.5	-0.693147181
BMW-048-082	1	U	0.5	-0.693147181
DMW-048-082	1	U	0.5	-0.693147181
		Beryllium		
		MEAN =	0.5	
		GEOMEAN =	0.5	
		MEAN OF LN=	-0.693147181	
		N=	3	
		S=	0	
		H=	NA	
		UCL=	5.00E-01	
		MIN =	0	
		MAX =	0	
		NO. OF DET=	0	
AMW-048-082	5	U	2.5	0.916290732
BMW-048-082	5	U	2.5	0.916290732
DMW-048-082	5	U	2.5	0.916290732
		Cadmium		
		MEAN =	2.5	
		GEOMEAN =	2.5	
		MEAN OF LN=	0.916290732	
		N=	3	
		S=	0	
		H=	NA	
		UCL=	2.50E+00	
		MIN =	0	
		MAX =	0	
		NO. OF DET=	0	

B07NE003702-08443

METAL CONCENTRATION CALCULATION
AREA A
(all in ug/L)

WELL NAME	D.L	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-048-082			73600	11.2064003
BMW-048-082			73000	11.19821472
DMW-048-082			75700	11.23453344
		Calcium		
		MEAN =	74100	
		GEOMEAN =	74091.0105	
		MEAN OF LN=	11.21304949	
		N=	3	
		S=	0.019050487	
		H=	2.75	
		UCL=	7.69E+04	
		MIN =	73000	
		MAX =	75700	
		NO. OF DET=	3	
AMW-048-082	6	U	3	1.098612289
BMW-048-082	6	U	3	1.098612289
DMW-048-082	6	U	3	1.098612289
		Chromium		
		MEAN =	3	
		GEOMEAN =	3	
		MEAN OF LN=	1.098612289	
		N=	3	
		S=	0	
		H=	NA	
		UCL=	3.00E+00	
		MIN =	0	
		MAX =	0	
		NO. OF DET=	0	
AMW-048-082	6	U	3	1.098612289
BMW-048-082	6	U	3	1.098612289
DMW-048-082	6	U	3	1.098612289
		Cobalt		
		MEAN =	3	
		GEOMEAN =	3	
		MEAN OF LN=	1.098612289	
		N=	3	
		S=	0	
		H=	NA	
		UCL=	3.00E+00	
		MIN =	0	
		MAX =	0	
		NO. OF DET=	0	

METAL CONCENTRATION CALCULATION
AREA A
(all in ug/L)

WELL NAME	D.L	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-048-082	4	U	2	0.693147181
BMW-048-082	4	U	2	0.693147181
DMW-048-082	4	U	2	0.693147181
		Copper		
		MEAN =	2	
		GEOMEAN =	2	
		MEAN OF LN=	0.693147181	
		N=	3	
		S=	1.05367E-08	
		H=	NA	
		UCL=	2.00E+00	
		MIN =	0	
		MAX =	0	
		NO. OF DET=	0	
AMW-048-082	10	U	5	1.609437912
BMW-048-082	10	U	5	1.609437912
DMW-048-082	10	U	5	1.609437912
		Cyanide		
		MEAN =	5	
		GEOMEAN =	5	
		MEAN OF LN=	1.609437912	
		N=	3	
		S=	2.10734E-08	
		H=	NA	
		UCL=	5.00E+00	
		MIN =	0	
		MAX =	0	
		NO. OF DET=	0	
AMW-048-082		*	1030	6.937314081
BMW-048-082		B*	64.4	4.165113633
DMW-048-082		*	1430	7.265429723
		Iron		
		MEAN =	841.4666667	
		GEOMEAN =	456.057613	
		MEAN OF LN=	6.122619146	
		N=	3	
		S=	1.703169352	
		H=	22.87	
		UCL=	1.78E+15	
		MIN =	64.4	
		MAX =	1430	
		NO. OF DET=	3	

METAL CONCENTRATION CALCULATION
AREA A
(all in ug/L)

WELL NAME	D.L	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-048-082	2	U	1	0
BMW-048-082	2	U	1	0
DMW-048-082	2	UW	1	0
		Lead		
		MEAN =	1	
		GEOMEAN =	1	
		MEAN OF LN=	0	
		N=	3	
		S=	0	
		H=	NA	
		UCL=	1.00E+00	
		MIN =	0	
		MAX =	0	
		NO. OF DET=	0	
AMW-048-082			12300	9.417354541
BMW-048-082			17900	9.792555992
DMW-048-082			13000	9.472704636
		Magnesium		
		MEAN =	14400	
		GEOMEAN =	14198.21772	
		MEAN OF LN=	9.560871723	
		N=	3	
		S=	0.20254409	
		H=	3.295	
		UCL=	2.32E+04	
		MIN =	12300	
		MAX =	17900	
		NO. OF DET=	3	
AMW-048-082			303	5.713732806
BMW-048-082		B	14.9	2.701361213
DMW-048-082			309	5.733341277
		Manganese		
		MEAN =	208.9666667	
		GEOMEAN =	111.7366875	
		MEAN OF LN=	4.716145098	
		N=	3	
		S=	1.744881572	
		H=	22.87	
		UCL=	9.20E+14	
		MIN =	14.9	
		MAX =	309	
		NO. OF DET=	3	

METAL CONCENTRATION CALCULATION
AREA A
(all in ug/L)

WELL NAME	D.L	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-048-082	0.2	U	0.1	-2.302585093
BMW-048-082	0.2	U	0.1	-2.302585093
DMW-048-082	0.2	U	0.1	-2.302585093
		Mercury		
		MEAN =	0.1	
		GEOMEAN =	0.1	
		MEAN OF LN=	-2.302585093	
		N=	3	
		S=	0	
		H=	NA	
		UCL=	1.00E-01	
		MIN =	0	
		MAX =	0	
		NO. OF DET=	0	
AMW-048-082	10	U	5	1.609437912
BMW-048-082	10	U	5	1.609437912
DMW-048-082	10	U	5	1.609437912
		Nickel		
		MEAN =	5	
		GEOMEAN =	5	
		MEAN OF LN=	1.609437912	
		N=	3	
		S=	2.10734E-08	
		H=	NA	
		UCL=	5.00E+00	
		MIN =	0	
		MAX =	0	
		NO. OF DET=	0	
AMW-048-082			10200	9.230142999
BMW-048-082			10500	9.259130536
DMW-048-082			10200	9.230142999
		Potassium		
		MEAN =	10300	
		GEOMEAN =	10299.03532	
		MEAN OF LN=	9.239805512	
		N=	3	
		S=	0.016735962	
		H=	2.75	
		UCL=	1.06E+04	
		MIN =	10200	
		MAX =	10500	
		NO. OF DET=	3	

METAL CONCENTRATION CALCULATION
AREA A
(all in ug/L)

WELL NAME	D.L	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-048-082	4	UWN	2	0.693147181
BMW-048-082	20	UWN	10	2.302585093
DMW-048-082	20	UN	10	2.302585093
		Selenium		
		MEAN =	7.333333333	
		GEOMEAN =	5.848035476	
		MEAN OF LN=	1.766105789	
		N=	3	
		S=	0.929209412	
		H=	NA	
		UCL=	9.01E+00	
		MIN =	0	
		MAX =	0	
		NO. OF DET=	0	
AMW-048-082	6	U	3	1.098612289
BMW-048-082	6	U	3	1.098612289
DMW-048-082	6	U	3	1.098612289
		Silver		
		MEAN =	3	
		GEOMEAN =	3	
		MEAN OF LN=	1.098612289	
		N=	3	
		S=	0	
		H=	NA	
		UCL=	3.00E+00	
		MIN =	0	
		MAX =	0	
		NO. OF DET=	0	
AMW-048-082		E	21100	9.957028319
BMW-048-082		E	20400	9.92329018
DMW-048-082		E	23600	10.06900199
		Sodium		
		MEAN =	21700	
		GEOMEAN =	21657.49429	
		MEAN OF LN=	9.98310683	
		N=	3	
		S=	0.07627614	
		H=	2.75	
		UCL=	2.52E+04	
		MIN =	20400	
		MAX =	23600	
		NO. OF DET=	3	

METAL CONCENTRATION CALCULATION
AREA A
(all in ug/L)

WELL NAME	D.L	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-048-082	2	U	1	0
BMW-048-082	2	UW	1	0
DMW-048-082	2	U	1	0
		Thallium		
		MEAN =	1	
		GEOMEAN =	1	
		MEAN OF LN=	0	
		N=	3	
		S=	0	
		H=	NA	
		UCL=	1.00E+00	
		MIN =	0	
		MAX =	0	
		NO. OF DET=	0	
AMW-048-082	5	U	2.5	0.916290732
BMW-048-082		B	11.3	2.424802726
DMW-048-082	5	U	2.5	0.916290732
		Vanadium		
		MEAN =	5.433333333	
		GEOMEAN =	4.133514705	
		MEAN OF LN=	1.419128063	
		N=	3	
		S=	0.870939806	
		H=	11.09	
		UCL=	5.59E+03	
		MIN =	11.3	
		MAX =	11.3	
		NO. OF DET=	1	
AMW-048-082		B	5.4	1.686398954
BMW-048-082		B	4.3	1.458615023
DMW-048-082		B	11.7	2.459588842
		Zinc		
		MEAN =	7.133333333	
		GEOMEAN =	6.476634054	
		MEAN OF LN=	1.868200939	
		N=	3	
		S=	6.495	
		H=	2.649	
		UCL=	1.80E+15	
		MIN =	4.3	
		MAX =	11.7	
		NO. OF DET=	3	

METAL CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	200	ND	UB*	100	4.605170186
AMW-053-082	200	ND	UB*	100	4.605170186
AMW-054-082	200	ND	UB*	100	4.605170186
AMW-055-082	200	ND	UB*	100	4.605170186
AMW-056-082	200	ND	UB*	100	4.605170186
BMW-052-082	200	ND	U*	100	4.605170186
BMW-053-082	200	ND	U*	100	4.605170186
BMW-054-082			*	1820	7.50659178
BMW-055-082	200	ND	UB*	100	4.605170186
BMW-056-082	200	ND	U	100	4.605170186

Aluminum

MEAN =	272
GEOMEAN =	133.6617487
MEAN OF LN=	4.895312345
N=	10
S=	0.917510069
H=	2.902
UCL=	4.95E+02
MIN =	1820
MAX =	1820
NO. OF DET=	1

METAL CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	39	ND	U	19.5	2.970414466
AMW-053-082	39	ND	U	19.5	2.970414466
AMW-054-082	39	ND	U	19.5	2.970414466
AMW-055-082	39	ND	U	19.5	2.970414466
AMW-056-082	39	ND	U	19.5	2.970414466
BMW-052-082	39	ND	U	19.5	2.970414466
BMW-053-082	39	ND	U	19.5	2.970414466
BMW-054-082	39	ND	U	19.5	2.970414466
BMW-055-082	39	ND	U	19.5	2.970414466
BMW-056-082	39	ND	U	19.5	2.970414466

Antimony

MEAN =	19.5
GEOMEAN =	19.5
MEAN OF LN=	2.970414466
N=	10
S=	3.97364E-08
H=	NA
UCL=	1.95E+01
MIN =	0
MAX =	0
NO. OF DET=	0

METAL CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	4	ND	UW	2	0.693147181
AMW-053-082	4	ND	UW	2	0.693147181
AMW-054-082	4	ND	UW	2	0.693147181
AMW-055-082	4	ND	UW	2	0.693147181
AMW-056-082	4	ND	UW	2	0.693147181
BMW-052-082	4	ND	U	2	0.693147181
BMW-053-082			B	7.8	2.054123734
BMW-054-082	4	ND	U	2	0.693147181
BMW-055-082	4	ND	UW	2	0.693147181
BMW-056-082			BWN	5	1.609437912

Arsenic

MEAN =	2.88
GEOMEAN =	2.51148424
MEAN OF LN=	0.920873909
N=	10
S=	0.491398374
H=	2.22
UCL=	4.08E+00
MIN =	5
MAX =	7.8
NO. OF DET=	2

METAL CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082			B	166	5.111987788
AMW-053-082			B	138	4.927253685
AMW-054-082				214	5.365976015
AMW-055-082			B	130	4.86753445
AMW-056-082			B	135	4.905274778
BMW-052-082			B	140	4.941642423
BMW-053-082			B	177	5.176149733
BMW-054-082				434	6.073044534
BMW-055-082				243	5.493061443
BMW-056-082				450	6.109247583

Barium

MEAN =	222.7
GEOMEAN =	199.7601193
MEAN OF LN=	5.297117243
N=	10
S=	0.466059588
H=	2.152
UCL=	3.11E+02
MIN =	130
MAX =	450
NO. OF DET=	10

METAL CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	1	ND	U	0.5	-0.693147181
AMW-053-082	1	ND	U	0.5	-0.693147181
AMW-054-082	1	ND	U	0.5	-0.693147181
AMW-055-082	1	ND	U	0.5	-0.693147181
AMW-056-082	1	ND	U	0.5	-0.693147181
BMW-052-082	1	ND	U	0.5	-0.693147181
BMW-053-082	1	ND	U	0.5	-0.693147181
BMW-054-082	1	ND	U	0.5	-0.693147181
BMW-055-082	1	ND	U	0.5	-0.693147181
BMW-056-082	1	ND	U	0.5	-0.693147181

Beryllium

MEAN =	0.5
GEOMEAN =	0.5
MEAN OF LN=	-0.693147181
N=	10
S=	0
H=	NA
UCL=	5.00E-01
MIN =	0
MAX =	0
NO. OF DET=	0

METAL CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	*Ln* OF 1/2ND OR POS RES.
AMW-052-082	5	ND	U	2.5	0.916290732
AMW-053-082	5	ND	U	2.5	0.916290732
AMW-054-082	5	ND	U	2.5	0.916290732
AMW-055-082	5	ND	U	2.5	0.916290732
AMW-056-082	5	ND	U	2.5	0.916290732
BMW-052-082	5	ND	U	2.5	0.916290732
BMW-053-082	5	ND	U	2.5	0.916290732
BMW-054-082	5	ND	U	2.5	0.916290732
BMW-055-082	5	ND	U	2.5	0.916290732
BMW-056-082	5	ND	U	2.5	0.916290732

Cadmium

MEAN =	2.5
GEOMEAN =	2.5
MEAN OF LN=	0.916290732
N=	10
S=	0
H=	N/A
UCL=	2.50E+00
MIN =	0
MAX =	0
NO. OF DET=	0

METAL CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082				37500	10.53209621
AMW-053-082				54200	10.90043619
AMW-054-082				49900	10.81777628
AMW-055-082				52700	10.87237073
AMW-056-082				49600	10.81174611
BMW-052-082				27100	10.20728901
BMW-053-082				53000	10.87804719
BMW-054-082				42700	10.6619542
BMW-055-082				44400	10.70099475
BMW-056-082				99600	11.50891744
			Calcium		
			MEAN =	51070	
			GEOMEAN =	48492.42174	
			MEAN OF LN=	10.78916281	
			N=	10	
			S=	0.329173582	
			H=	1.977	
			UCL=	6.36E+04	
			MIN =	27100	
			MAX =	99600	
			NO. OF DET=	10	

B07NE003702-08456

METAL CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	6	ND	U	3	1.098612289
AMW-053-082	6	ND	U	3	1.098612289
AMW-054-082	6	ND	U	3	1.098612289
AMW-055-082	6	ND	U	3	1.098612289
AMW-056-082	6	ND	U	3	1.098612289
BMW-052-082	6	ND	U	3	1.098612289
BMW-053-082	6	ND	U	3	1.098612289
BMW-054-082	6	ND	U	3	1.098612289
BMW-055-082	6	ND	U	3	1.098612289
BMW-056-082	6	ND	U	3	1.098612289

Chromium

MEAN =	3
GEOMEAN =	3
MEAN OF LN=	1.098612289
N=	10
S=	1.40489E-08
H=	NA
UCL=	3.00E+00
MIN =	0
MAX =	0
NO. OF DET=	0

B07NE003702-08457

METAL CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	6	ND	U	3	1.098612289
AMW-053-082	6	ND	U	3	1.098612289
AMW-054-082	6	ND	U	3	1.098612289
AMW-055-082	6	ND	U	3	1.098612289
AMW-056-082	6	ND	U	3	1.098612289
BMW-052-082	6	ND	U	3	1.098612289
BMW-053-082	6	ND	U	3	1.098612289
BMW-054-082	6	ND	U	3	1.098612289
BMW-055-082	6	ND	U	3	1.098612289
BMW-056-082	6	ND	U	3	1.098612289

Cobalt

MEAN =	3
GEOMEAN =	3
MEAN OF LN=	1.098612289
N=	10
S=	1.40489E-08
H=	NA
UCL=	3.00E+00
MIN =	0
MAX =	0
NO. OF DET=	0

METAL CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	4	ND	U	2	0.693147181
AMW-053-082	4	ND	U	2	0.693147181
AMW-054-082	4	ND	U	2	0.693147181
AMW-055-082	4	ND	U	2	0.693147181
AMW-056-082	4	ND	U	2	0.693147181
BMW-052-082	4	ND	U	2	0.693147181
BMW-053-082	4	ND	U	2	0.693147181
BMW-054-082	4	ND	U	2	0.693147181
BMW-055-082	4	ND	U	2	0.693147181
BMW-056-082	4	ND	U	2	0.693147181

Copper

MEAN =	2
GEOMEAN =	2
MEAN OF LN=	0.693147181
N=	10
S=	0
H=	NA
UCL=	2.00E+00
MIN =	0
MAX =	0
NO OF DET=	0

METAL CONCENTRATION CALCULATION
AREA C
(alt in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082	10	ND	U	5	1.609437912
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912

Cyanide

MEAN =	5
GEOMEAN =	5
MEAN OF LN=	1.609437912
N=	10
S=	2.80979E-08
H=	NA
UCL=	5.00E+00
MIN =	0
MAX =	0
NO. OF DET=	0

METAL CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	46	ND	U*	23	3.135494216
AMW-053-082			B*	58	4.060443011
AMW-054-082	46	ND	U*	23	3.135494216
AMW-055-082			B*	77.3	4.347693956
AMW-056-082	46	ND	U*	23	3.135494216
BMW-052-082			*	206	5.327876169
BMW-053-082			B*	58	4.060443011
BMW-054-082			*	1280	7.154615357
BMW-055-082	46	ND	U*	23	3.135494216
BMW-056-082			B	75.8	4.328098293

Iron

MEAN =	184.71
GEOMEAN =	65.50422641
MEAN OF LN=	4.182114666
N=	10
S=	1.274036584
H=	3.639
UCL=	3.84E+00
MIN =	58
MAX =	1280
NO. OF DET=	6

METAL CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	2	ND	U	1	0
AMW-053-082	2	ND	U	1	0
AMW-054-082	2	ND	U	1	0
AMW-055-082	2	ND	U	1	0
AMW-056-082	2	ND	UW	1	0
BMW-052-082	2	ND	U	1	0
BMW-053-082	2	ND	UW	1	0
BMW-054-082	2	ND	U	1	0
BMW-055-082	2	ND	U	1	0
BMW-056-082			BWN*	2.6	0.955511445

Lead

MEAN =	1.16
GEOMEAN =	1.100265093
MEAN OF LN=	0.095551145
N=	10
S=	0.30215925
H=	1.977
UCL=	1.41E+00
MIN =	2.6
MAX =	2.6
NO. OF DET=	1

METAL CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082				10700	9.27799902
AMW-053-082				12700	9.449357272
AMW-054-082				11900	9.384293679
AMW-055-082				11600	9.358760377
AMW-056-082				11300	9.332558005
BMW-052-082				8050	8.99342737
BMW-053-082				17900	9.792555992
BMW-054-082				13800	9.532423871
BMW-055-082				10600	9.26860928
BMW-056-082				31200	10.34817337
			Magnesium		
			MEAN =	13975	
			GEOMEAN =	13014.45347	
			MEAN OF LN=	9.473815824	
			N=	10	
			S=	0.36856513	
			H=	2.031	
			UCL=	1.79E+04	
			MIN =	8050	
			MAX =	31200	
			NO. OF DET=	10	

METAL CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082				73.3	4.294560609
AMW-053-082			B	10.7	2.370243741
AMW-054-082			B	7	1.945910149
AMW-055-082			B	9.1	2.208274414
AMW-056-082			B	8.8	2.174751721
BMW-052-082				82	4.406719247
BMW-053-082				20.9	3.039749159
BMW-054-082				1090	6.993932975
BMW-055-082				16.8	2.821378886
BMW-056-082				25.2	3.226843995

Manganese

MEAN =	134.38
GEOMEAN =	28.45251307
MEAN OF LN=	3.34823649
N=	10
S=	1.538183144
H=	4.207
UCL=	8.03E+02
MIN =	7
MAX =	1090
NO. OF DET=	10

METAL CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	0.2	ND	U	0.1	-2.302585093
AMW-053-082	0.2	ND	U	0.1	-2.302585093
AMW-054-082	0.2	ND	U	0.1	-2.302585093
AMW-055-082	0.2	ND	U	0.1	-2.302585093
AMW-056-082	0.2	ND	U	0.1	-2.302585093
BMW-052-082	0.2	ND	U	0.1	-2.302585093
BMW-053-082	0.2	ND	U	0.1	-2.302585093
BMW-054-082	0.2	ND	U	0.1	-2.302585093
BMW-055-082	0.2	ND	U	0.1	-2.302585093
BMW-056-082	0.2	ND	U	0.1	-2.302585093

Mercury

MEAN =	0.1
GEOMEAN =	0.1
MEAN OF LN=	-2.302585093
N=	10
S=	0
H=	NA
UCL=	1.00E-01
MIN =	0
MAX =	0
NO. OF DET=	0

METAL CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	10	ND	U	5	1.609437912
AMW-053-082	10	ND	U	5	1.609437912
AMW-054-082	10	ND	U	5	1.609437912
AMW-055-082	10	ND	U	5	1.609437912
AMW-056-082	10	ND	U	5	1.609437912
BMW-052-082	10	ND	U	5	1.609437912
BMW-053-082	10	ND	U	5	1.609437912
BMW-054-082			B	11.1	2.406945108
BMW-055-082	10	ND	U	5	1.609437912
BMW-056-082	10	ND	U	5	1.609437912

Nickel

MEAN =	5.61
GEOMEAN =	5.415085295
MEAN OF LN=	1.689188632
N=	10
S=	0.252193919
H+	1.927
UCL=	6.57E+00
MIN =	11.1
MAX =	11.1
NO. OF DET=	1

METAL CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082				9620	9.171599544
AMW-053-082				7930	8.978408315
AMW-054-082				6600	8.794824928
AMW-055-082				7200	8.881836305
AMW-056-082				6770	8.820256366
BMW-052-082				6180	8.72907355
BMW-053-082				9000	9.104979856
BMW-054-082				7930	8.978408315
BMW-055-082				6320	8.751474487
BMW-056-082				5280	8.571681377
			Potassium		
			MEAN =	7283	
			GEOMEAN =	7174.25573	
			MEAN OF LN=	8.878254304	
			N=	10	
			S=	0.182625783	
			H=	1.881	
			UCL=	8.18E+03	
			MIN =	5280	
			MAX =	9620	
			NO. OF DET=	10	

METAL CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	4	ND	UWN	2	0.693147181
AMW-053-082	40	ND	UN	20	2.995732274
AMW-054-082	40	ND	UN	20	2.995732274
AMW-055-082	4	ND	UWN	2	0.693147181
AMW-056-082	4	ND	UWN	2	0.693147181
BMW-052-082	4	ND	UWN	2	0.693147181
BMW-053-082	4	ND	UWN	2	0.693147181
BMW-054-082	40	ND	UWN	20	2.995732274
BMW-055-082	40	ND	UN	20	2.995732274
BMW-056-082	4	ND	UN	2	0.693147181

Selenium

MEAN =	9.2
GEOMEAN =	5.023772863
MEAN OF LN=	1.614181218
N=	10
S=	1.189049829
H=	NA
UCL=	1.02E+01
MIN =	0
MAX =	0
NO. OF DET=	0

METAL CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	6	ND	U	3	1.098612289
AMW-053-082	6	ND	U	3	1.098612289
AMW-054-082	6	ND	U	3	1.098612289
AMW-055-082	6	ND	U	3	1.098612289
AMW-056-082	6	ND	U	3	1.098612289
BMW-052-082	6	ND	U	3	1.098612289
BMW-053-082	6	ND	U	3	1.098612289
BMW-054-082	6	ND	U	3	1.098612289
BMW-055-082	6	ND	U	3	1.098612289
BMW-056-082	6	ND	U	3	1.098612289

Silver

MEAN =	3
GEOMEAN =	3
MEAN OF LN=	1.098612289
N=	10
S=	1.40489E-08
H=	NA
UCL=	3.00E+00
MIN =	0
MAX =	0
NO. OF DET=	0

METAL CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082			E	10800	9.287301413
AMW-053-082			E	12700	9.449357272
AMW-054-082			E	20100	9.908475094
AMW-055-082			E	19800	9.893437217
AMW-056-082			E	18900	9.846917201
BMW-052-082			E	11000	9.305650552
BMW-053-082			E	18000	9.798127037
BMW-054-082			E	14000	9.546812609
BMW-055-082			E	14700	9.595602773
BMW-056-082				32900	10.40122794

Sodium

MEAN =	17290
GEOMEAN =	16371.39544
MEAN OF LN=	9.70329091
N=	10
S=	0.337758011
H=	2.031
UCL=	2.18E+04
MIN =	10800
MAX =	32900
NO. OF DET=	10

METAL CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	2	ND	UW	1	0
AMW-053-082	2	ND	UW	1	0
AMW-054-082	2	ND	UW	1	0
AMW-055-082	2	ND	UW	1	0
AMW-056-082	2	ND	U	1	0
BMW-052-082	2	ND	U	1	0
BMW-053-082	2	ND	UW	1	0
BMW-054-082	2	ND	U	1	0
BMW-055-082	2	ND	UW	1	0
BMW-056-082	2	ND	UWN	1	0

Thallium

MEAN =	1
GEOMEAN =	1
MEAN OF LN=	0
N=	10
S=	0
H=	NA
UCL=	1.00E+00
MIN =	0
MAX =	0
NO. OF DET=	0

METAL CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082	5	ND	U	2.5	0.916290732
AMW-053-082	5	ND	U	2.5	0.916290732
AMW-054-082	5	ND	U	2.5	0.916290732
AMW-055-082	5	ND	U	2.5	0.916290732
AMW-056-082	5	ND	U	2.5	0.916290732
BMW-052-082	5	ND	U	2.5	0.916290732
BMW-053-082	5	ND	U	2.5	0.916290732
BMW-054-082			B	5.5	1.704748092
BMW-055-082	5	ND	U	2.5	0.916290732
BMW-056-082	5	ND	U	2.5	0.916290732

Vanadium

MEAN =	2.8
GEOMEAN =	2.705093475
MEAN OF LN=	0.995136468
N=	10
S=	0.24933211
H=	1.927
UCL=	3.28E+00
MIN =	5.5
MAX =	5.5
NO. OF DET=	1

METAL CONCENTRATION CALCULATION
AREA C
(all in ug/L)

WELL NAME	D.L	ND RES.	QUAL.	POS. RES. OR 1/2 ND	Ln OF 1/2ND OR POS RES.
AMW-052-082			B	5	1.609437912
AMW-053-082			B	4.1	1.410986974
AMW-054-082			B	4.3	1.458615023
AMW-055-082			B	14.5	2.674148649
AMW-056-082			B	5.1	1.62924054
BMW-052-082			B	4.8	1.568615918
BMW-053-082				30.6	3.421000009
BMW-054-082				47.1	3.852273001
BMW-055-082	3	ND	U	1.5	0.405465108
BMW-056-082			B	5.5	1.704748092

Zinc

MEAN =	12.25
GEOMEAN =	7.195480515
MEAN OF LN=	1.973453123
N=	10
S=	1.035128984
H=	3.103
UCL=	3.59E+01
MIN =	4.1
MAX =	47.1
NO. OF DET=	9