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REPORTS

DATE:1998



5309 Wurzbach, Suite 100 San Antonio, Texas 78238 (210) 680-3767 (210) 680-3763 FAX

September 2, 1998

Mr. Tony Savoie TEXAS - NEW MEXICO PIPE LINE COMPANY P.O. Box 1030 Jal, New Mexico 88252

Re: Closure Report TNM-97-13 Section 34, Township 19S, Range 36E Lea County, New Mexico Job No. 710033-1 RECEIVED

SEP 1 0 1998

ENVIRONMENTAL BUREAU OIL CONSERVATION DIVISION

Dear Mr. Savoie:

Transmitted with this letter is the final Closure Report for TNM-97-13 located in Lea County, New Mexico. One copy has been forwarded to OCD Sante Fe and one to OCD Hobbs. Disk copies of the programs used to perform the closure calculations have been included with the copies to OCD Sante Fe and OCD Hobbs.

Please contact me at (210) 680-3767 or Jim Mosley at (512) 272-5305 with any questions or comments regarding the report or the programs.

Respectfully,

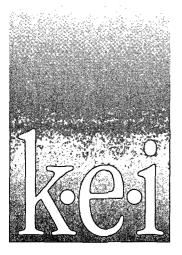
Dung Stay

Daryl Stacey Project Manager

Enclosure

cc: Marc Oler; TTTI Wayne Price, OCD Hobbs William Olson, OCD Sante Fe

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SEP 1 0 1998

ENVIRONMENTAL BUREAU OIL CONSERVATION DIVISION

SITE CLOSURE REPORT

TEXAS - NEW MEXICO PIPE LINE COMPANY TNM-97-13 SECTION 34, TOWNSHIP 19S, RANGE 36E LEA COUNTY, NEW MEXICO



5309 Wurzbach, Suite 100 San Antonio, Texas 78238 (210) 680-3767 (210) 680-3763 FAX

SITE CLOSURE REPORT

TEXAS - NEW MEXICO PIPE LINE COMPANY TNM-97-13 SECTION 34, TOWNSHIP 19S, RANGE 36E LEA COUNTY, NEW MEXICO

PREPARED FOR:

TEXAS - NEW MEXICO PIPE LINE COMPANY P.O. Box 1030 Jal, New Mexico 88252

Mr. Tony Savoie

PREPARED BY:

KEI

Daryl Stacey **Project Manager**

Pat Bullinger, P.E.

Job No. 710033-1

September 2, 1998

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- APPENDIX C JURY AND AT123D MODELS
- APPENDIX D RISK CALCULATIONS FOR SOIL PATHWAYS
- APPENDIX E WATER WELL RECORDS

INTRODUCTION

The Texas - New Mexico Pipe Line Company (TNMPL) release site TNM-97-13 is located approximately 3.5 miles southwest of Monument in Lea County, New Mexico. The site is specifically located in SE/4, SE/4, Section 34, Township 19 South, Range 36 East. A site location map is presented as FIG. 1. Details of the site are shown on FIG. 2.

A crude oil release from a 4 inch gathering line was discovered on June 20, 1997. The New Mexico Oil Conservation Division (OCD) was notified and emergency abatement activities began immediately. Approximately 395 barrels of crude oil were recovered. The contaminated soil was excavated and stockpiled on-site on plastic. Approximately 28,255 cubic yards of contaminated soil were landfarmed on site in an 11 acre landfarm.

This report presents the closure activities performed at the site and outlines the methodology and results of risk assessment calculations conducted for the landfarmed soils. The calculations are used to determine site-specific closure concentrations protective of human health and the environment.

CHRONOLOGY OF EVENTS

6/20/97	Release was discovered and reported to OCD. Approximately 395 gallons of crude oil were recovered.
6, 7, & 8/97	Approximately 28,255 cubic yards of contaminated soils were excavated and stockpiled on-site. The contaminated soils were later landfarmed on-site in an 11 acre landfill.
8/11, 13, 19, 20, 21/97	Soil samples from bottom and sidewalls of excavation were sampled and analyzed for BTEX and TPH concentrations.
9/16/97	Monitoring well was drilled at landfarm site and native soil samples were collected during drilling.
1/29/98:	Soil samples were obtained from 24 areas of the landfarm and analyzed for BTEX and TPH concentrations.
6/2/98:	Soil samples were obtained from 1 area of the landfarm and analyzed for TPH concentrations and fingerprint.

CLOSURE ACTIVITIES

EXCAVATION, BACKFILL, AND LANDFARM

Approximately 28,255 cubic yards of contaminated soil were excavated from the source area and placed on-site from August 11 through August 20, 1997. Excavation activities continued until OCD closure levels for TPH and BTEX were obtained (100 mg/kg and 50 mg/kg, respectively). Approximately 11 acres of clean soils were excavated to an approximate depth of 1 to 1.5 feet below ground surface. The clean excavated soils were used to backfill the existing excavation. The impacted soils removed from the existing excavation were then landfarmed in the area of the 11 acres. The release area was graded and reseeded following backfilling. The landfarm area was bermed to prevent run off.

CONFIRMATION SAMPLING

Following excavation of contaminated soil, 28 confirmation soil samples were obtained from the bottom hole and side walls of the excavation. Composite soil samples were analyzed for benzene, toluene, ethylbenzene, and xylene (BTEX) and total petroleum hydrocarbon (TPH) concentrations. Based on the laboratory results of the sidewall and excavation bottom soil samples in Section A, additional soils were excavated and the sidewall and excavation bottom resampled.

CONSTITUENT	MINIMUM VALUE (mg/kg)	MAXIMUM VALUE (mg/kg)
BENZENE	ND	ND
TOLUENE	ND	0.144
ETHYLBENZENE	ND	0.110
XYLENES	ND	0.477
ТРН	ND	65

ANALYTICAL RESULTS - EXCAVATION BOTTOM AND SIDEWALL

Confirmation soil laboratory results are summarized on TABLE I and graphically presented on FIG. 2.

LANDFARM SAMPLING

Soil samples were obtained from 24 areas of the landfarm and analyzed for BTEX and TPH. The results of the landfarm sampling are tabulated on TABLE II and are graphically shown on FIG. 3.

ANALYTICAL RESULTS - LANDFARMED SOIL

CONSTITUENT	MINIMUM VALUE (mg/kg)	MAXIMUM VALUE (mg/kg)
BENZENE	ND	0.136
BTEX	ND	4.435
ТРН	70	6003

Soil samples collected during the installation of monitoring well MW-1 at the landfarm site were submitted for determination of BTEX and TPH concentrations. All soil samples indicated BTEX and TPH concentrations below laboratory detection limits. The location of the monitoring well MW-1 is shown on FIG. 3. Soil laboratory reports and chain-of-custody documentation are presented in APPENDIX A. The QA/QC procedures utilized during sampling and analysis are presented in APPENDIX B.

RISK-BASED ASSESSMENT CALCULATIONS

Conservative assumptions were utilized in the calculations. The scenario chosen for a ground water pathway was residential ingestion of ground water from a domestic well. Three

scenarios were chosen for the soil pathways, including worker, resident, and construction worker. Inhalation of volatiles from soil, ingestion of soil, and dermal contact were considered for all 3 scenarios.

The constituents of concern were determined to be BTEX and TPH. The TPH was evaluated using the methodology developed by the national TPH Working Group. The mass fractions of the total TPH which fell into each of several standard categories of hydrocarbon were calculated from a "fingerprinting" analysis which was performed on a sample of the affected soil (sampled June 2, 1998). The mass fraction multiplied by the maximum TPH concentration detected in the landfarmed soils resulted in the relative concentration used in the risk calculations for each of the categories of hydrocarbon. The TPH mass fractions and relative concentrations are presented on WORKSHEET 1.

GROUND WATER PATHWAY

The site-specific input parameters and exposure parameters for the ground water pathway are presented on WORKSHEET 2. The following conservative assumptions were made for the ground water pathway:

- A new domestic drinking water well was assumed to be installed in the middle of the landfarm.
- It was assumed that the upper 2 feet of the entire landfarm had the same TPH concentration as the sample which was taken for fingerprint analysis purposes on June 2, 1998 (6003 ppm).
- It was assumed that the resident will ingest 2 liters of ground water per day, 350 days per year for 30 years. These exposure parameters represent the maximum potential (worstcase) exposure assumptions listed in EPA guidelines.

A dilution/attenuation factor (DAF) to predict the potential migration from soil into ground water for each constituent of concern was calculated from Jury and AT123D Models. A summary of the DAF calculations is provided in APPENDIX C. Ground water concentrations were then calculated based on the soil concentrations times the respective DAF.

The ground water concentrations for the BTEX constituents were compared to New Mexico Water Quality Control Commission Ground Water Standards. All calculated BTEX ground water concentrations were less than the standard values.

The ground water concentrations for each TPH mass fraction was divided by the reference dose for that category of hydrocarbon (as determined by the national TPH Working Group) to calculate a hazard quotient (HQ). All HQ values for the individual categories of hydrocarbon were less than the acceptable value of 1.0. Furthermore, the sum of the individual HQ values (the hazard index for total TPH) was less than 1.0.

The calculated BTEX ground water concentrations and the hazard index for TPH are presented on WORKSHEET 3.

SOIL PATHWAYS

The site-specific input parameters for soil are presented on WORKSHEET 4. The exposure input parameters for soil are presented on WORKSHEET 5. The following conservative assumptions were made for the soil pathways:

- A future residence was assumed to be constructed 100 feet from the source area.
- It was assumed that the upper 2 feet of the entire landfarm had the same TPH concentration as the sample which was taken for fingerprint analysis purposes on June 2, 1998 (6003 ppm).
- It was assumed that for non-carcinogens a child resident ingested 200 mg of soil per day, 350 days per year for 6 years, for carcinogens an adult resident ingested 124 mg of soil per day, 350 days per year for 30 years, and for both carcinogens and non-carcinogens that an adult resident inhaled 15 m³ of air per day and had 5800 cm² of skin surface area in contact with the soil, 350 days per year for 30 years. These exposure parameters represent the maximum potential (worst-case) exposure assumptions listed in EPA guidelines.
- It was assumed that a worker inhaled 20 m³/day, ingested 50 mg/day, and had 5800 cm² of skin surface area in contact with the soil, 250 days per year for 25 years. These exposure parameters represent the maximum potential (worst-case) exposure assumptions listed in EPA guidelines.
- It was assumed that a construction worker inhaled 20 m³/day, ingested 480 mg/day, and had 3300 cm² of skin surface area in contact with the soil 5 days/week for 12 weeks.

Exposure factor assumptions are chosen to reflect EPA guidance and site-specific conditions, and represent conservative estimates of potential exposure.

The overall impact to human health from exposure to chemicals due to soil pathways is estimated by combining the estimated dose and the critical toxicity values (slope factor for carcinogens, reference dose for non-carcinogens). A carcinogenic risk value was calculated for benzene and a hazard quotient value was calculated for each non-carcinogen considered a constituent of concern. The hazard quotients were then summed to calculate the total hazard index for each soil pathway. The calculated carcinogenic risk and the hazard index values for each soil pathway are summarized in WORKSHEET 6. All carcinogenic risk values were less than the acceptable value of 1.0×10^{-6} and hazard index values were less than the acceptable value of 1.0×10^{-6} and hazard index values were less than the acceptable value of 1.0×10^{-6} and hazard index values were less than the acceptable value of 1.0×10^{-6} and hazard index values were less than the acceptable value of 1.0×10^{-6} and hazard index values were less than the acceptable value of 1.0×10^{-6} and hazard index values were less than the acceptable value of 1.0×10^{-6} and hazard index values were less than the acceptable value of 1.0×10^{-6} and hazard index values were less than the acceptable value of 1.0×10^{-6} and hazard index values were less than the acceptable value of 1.0×10^{-6} and hazard index values were less than the acceptable value of 1.0×10^{-6} and hazard index values were less than the acceptable value of 1.0×10^{-6} and hazard index values were less than the acceptable value of 1.0×10^{-6} and hazard index values were less than the acceptable value of 1.0×10^{-6} and hazard index values were less than the acceptable value of 1.0×10^{-6} and hazard index values were less than the acceptable value of 1.0×10^{-6} and hazard index values were less than the acceptable value of 1.0×10^{-6} and hazard index values were less than the acceptable value of 1.0×10^{-6} and hazard index valu

WATER WELL SURVEY

A water well survey was conducted for the area within 0.5 mile of the site. Two water wells were located within 0.5 mile of the site. According to the well records, one is a domestic water well and one is a stock water well. The well records are presented in APPENDIX E.

SUMMARY

The following can be summarized from field/laboratory data and calculations:

- Approximately 28,255 cubic yards of contaminated soil were removed from the spill area and landfarmed on-site.
- Confirmation samples in the excavated areas indicate BTEX and TPH values below OCD closure levels.

- According to calculations presented herein, the landfarmed soils will not impact ground water with unacceptable levels of hydrocarbons.
- According to calculations presented herein, hydrocarbon impact from the landfarmed soils will not exceed acceptable levels through ingestion, inhalation, or dermal contact with an on-site worker, off-site resident, or a construction worker.

Therefore, we request the site be closed.

Texas New Mexico Pipe Line Co. Land Farm Foster, New Mexico

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WORKSHEET 1 TPH MASS FRACTIONS AND RELATIVE CONCENTRATIONS

Constituent of Concern	fingerprint (mg/kg)	Mass Fraction (%)	Maximum Concentration (mg/kg)
TPH - Total	6,003	100%	6,003
TPH-Arom-EC>8-10	0	0.00%	0
TPH-Arom-EC>10-12	70	1.17%	70
TPH-Arom-EC>12-16	688	11.46%	688
TPH-Arom-EC>16-21	526	8.77%	526
TPH-Arom-EC>21-35	752	12.53%	752
TPH-Aliph-EC 5-6	0	0.00%	0
TPH-Aliph-EC>6-8	0	0.00%	0
TPH-Aliph-EC>8-10	0	0.00%	0
TPH-Aliph-EC>10-12	29	0.48%	29
TPH-Aliph-EC>12-16	1,328	22.12%	1,328
TPH-Aliph-EC>16-35	2,610	43.47%	2,610

Texas New Mexico Pipe Line Co. Land Farm Foster, New Mexico

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WORKSHEET 2 SITE-SPECIFIC INPUT AND EXPOSURE PARAMETERS GROUND WATER PATHWAY

G	iround Water Parame	ters	
Parameter	Value	Units	Comments
Depth to Ground Water:	48	feet	Average value.
Fraction of Organic Carbon in Saturated Zone:	0.020		Default Value.
Distance to Residential Receptor	0	ft	See FIGURE 2.
Distance to Commercial Receptor	0	ft	See FIGURE 2.

	Soil Parameters	· · · · ·	
Parameter	Value	Units	Comments
Soil Bulk Density:	1.8	g/cc	Default Value.
Total Porosity in the Vadose Zone:	0.25		Default Value.
Moisture Content in the Vadose Zone:	0.1		Default Value.
Fraction of Organic Carbon in Vadose Zone:	0.020		Default Value.
Width of Source Area	1200.0	ft	
Total Soil Source Area	456,000	ft ²	See FIGURE 2.

	Exposure Parameters	· · · ·	
Parameter	Units	Resident	Worker
Body weight	kg	70	70
Averaging Time (carcinogens)	years	70	70
Averaging Time (non-carcinogens)	years	30	25
Exposure Frequency	days/yr	350	250
Exposure Duration,	years	30	25
Water Ingestion Rate	liters/day	2	1

Texas New Mexico Pipe Line Co. Land Farm

Foster, New Mexico

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WORKSHEET 3 CALCULATION OF RISK RESIDENTIAL INGESTION OF GROUND WATER

	BW	IRgw	EF	ED	foc	Dist
	(kg)	(Ľ/day)	(days/yr)	(years)		(m)
	70	2.0	350	30	0.020	0
For BTEX:	Conc _{gw} =	Conc _{soli} * DAl	F			

For TPH: HQ

HQ = Conc_{soil} * DAF * IR_{gw} * EF / (BW * 365 * RfD)

DAF = Dilution/Attenuation Factor from Jury and AT123D Models

	Constituent of Concern	Conc _{soll} (mg/kg)	DAF	Conc _{gw} (mg/L)	Standard (mg/L)
Benzei	ne	1.31e-1	2.56e-9	3.35e-10	1.00e-2
Ethylbe	enzene	3.65e-1	0.00e+0	0.00e+0	7.50e-1
Naphth	nalene	N/A	0.00e+0	0.00e+0	3.00e-2
Toluen	e	4.19e-1	0.00e+0	0.00e+0	7.50e-1
Xylene	(mixed isomers)	3.95e+0	0.00e+0	0.00e+0	6.20e-1

ТРН	Conc _{soil}	DAF	Conc _{gw}	RfD	
Fractions	(mg/kg)		(mg/L)	(mg/kg-d)	HQ
TPH - Total	6.00e+3		9.75e-3		5.35e-3
TPH-Arom-EC>8-10	0.00e+0	2.04e-4	0.00e+0	4.00e-2	0.00e+0
TPH-Arom-EC>10-12	7.02e+1	8.24e-5	5.79e-3	4.00e-2	3.96e-3
TPH-Arom-EC>12-16	6.88e+2	1.05e-6	7.22e-4	4.00e-2	4.95e-4
TPH-Arom-EC>16-21	5.26e+2	0.00e+0	0.00e+0	3.00e-2	0.00e+0
TPH-Arom-EC>21-35	7.52e+2	0.00e+0	0.00e+0	3.00e-2	0.00e+0
TPH-Aliph-EC 5-6	0.00e+0	6.09e-5	0.00e+0	5.00e+0	0.00e+0
TPH-Aliph-EC>6-8	0.00e+0	5.57e-5	0.00e+0	5.00e+0	0.00e+0
TPH-Aliph-EC>8-10	0.00e+0	6.05e-5	0.00e+0	1.00e-1	0.00e+0
TPH-Aliph-EC>10-12	2.88e+1	1.90e-5	5.47e-4	1.00e-1	1.50e-4
TPH-Aliph-EC>12-16	1.33e+3	2.03e-6	2.70e-3	1.00e-1	7.39e-4
TPH-Aliph-EC>16-35	2.61e+3	0.00e+0	0.00e+0	2.00e+0	0.00e+0

WORKSHEET 4 SITE-SPECIFIC INPUT PARAMETERS - SOIL Assumed future residence constructed 100 feet from source area. Comments Comments Assumed to be 10% of average wind speed. **RISK ASSESSMENT** Based on height of person Soil Parameters **Air Parameters** See FIGURE 3. Default Value. Default Value. Default Value. Default Value. Default Value. Default Value. Units m/sec Units m/sec g/cc I £ £ # ²# ŧ ₽ 4 Value Value 1200.0 456,000 0.020 15.5 1,170 0.492 1.8 0.32 4.92 100 6.5 0.1 0 Total Soil Source Area, Construction Worker Fraction of Organic Carbon in Vadose Zone: Average Wind Speed, Construction Worker Texas New Mexico Pipe Line Co. Width of Source Area, Costruction Worker Moisture Content in the Vadose Zone: Total Porosity in the Vadose Zone: Distance to Commercial Receptor Distance to Residential Receptor Parameter Parameter Foster, New Mexico Total Soil Source Area Width of Source Area Average Wind Speed Soil Bulk Density: **Diffusion Height** Land Farm

Texas New Mexico Pipe Line Co.

Land Farm Foster, New Mexico

WORKSHEET 5 EXPOSURE INPUT PARAMETERS - SOIL

		Resi	Resident		Construction	Con. Wkr.
Input Parameters	Units	Adult	Child	Worker	Worker	Units
Body weight	kg	70	15	02	02	kg
Averaging Time (carcinogens)	years	70		70	70	years
Averaging Time (non-carcinogens) - soil	years	30	9	25	0.24	years
Averaging Time (non-carcinogens) - ground water	years	30		25	0.06	years
Exposure Frequency	days/yr	350	350	250	5	days/wk
Exposure Frequency, dermal contact w/ soil	days/yr	350		250	5	days/wk
Exposure Duration, soil	years	30	9	25	12	weeks
Exposure Duration, ground water	years	30		25	3	weeks
Inhalation Rate	m³/day	15		20	20	m³/day
Soil Ingestion Rate	mg/day		200	50	480	mg/day
Age-adjusted Soil Ingestion Rate	mg-yr/kg-day	124				
Water Ingestion Rate	liters/day	2		1		
Skin Surface Area in contact w/ soil	cm ²	5800		5800	3300	cm ²
Soil to Skin Adherence Factor	mg/cm ²	1		۲	0.12	mg/cm ²
Skin Surface Area in contact w/ ground water					6170	cm ²
Dermal Contact Event Frequency					7	events/day
Duration of Dermal Contact Event					7	hr

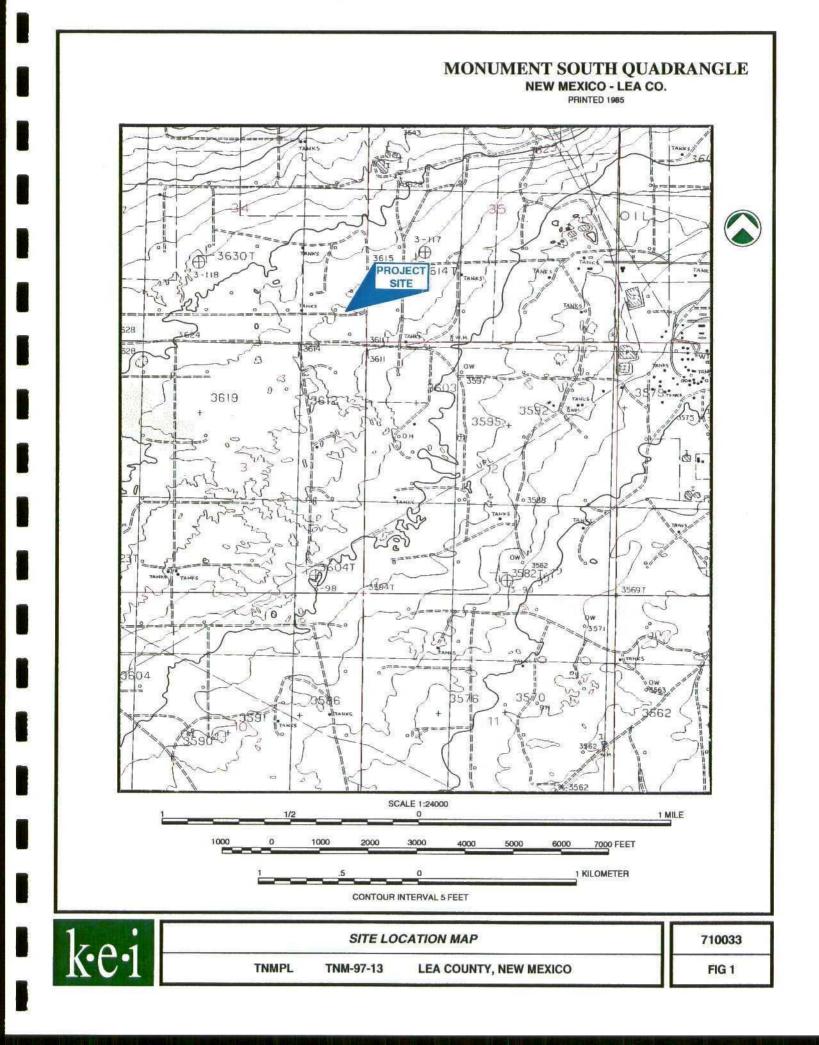
RISK ASSESSMENT

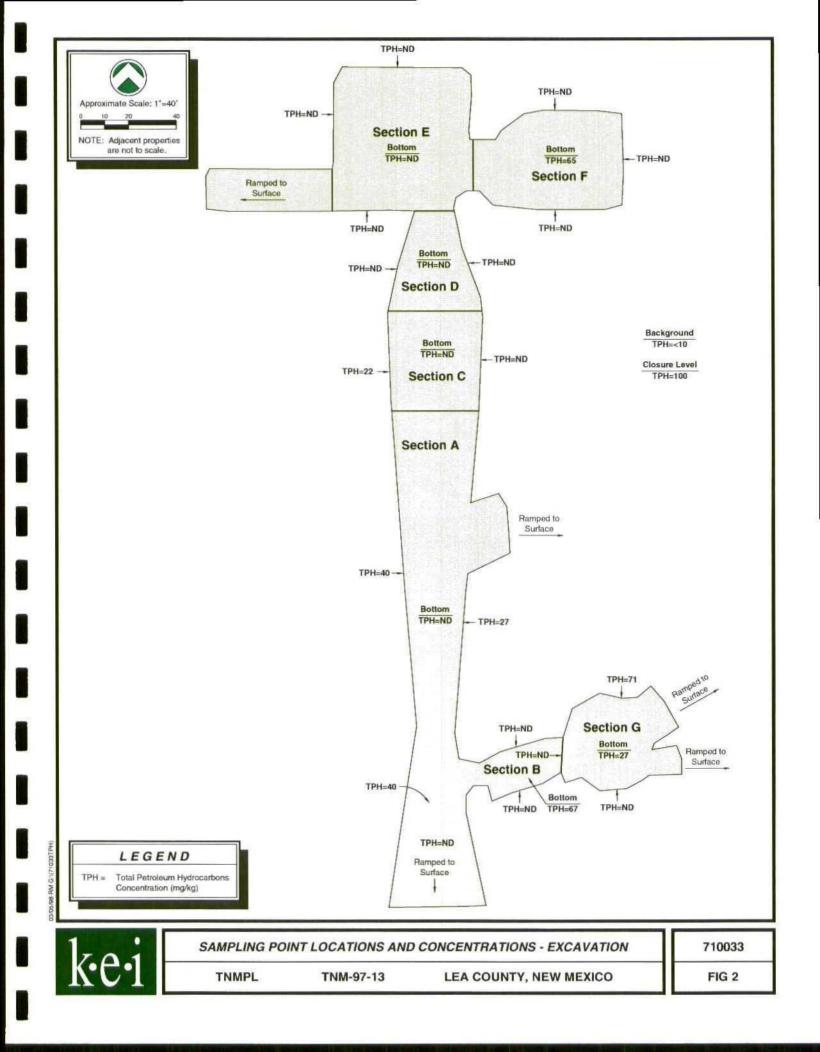
Texas New Mexico Pipe Line Co. Land Farm

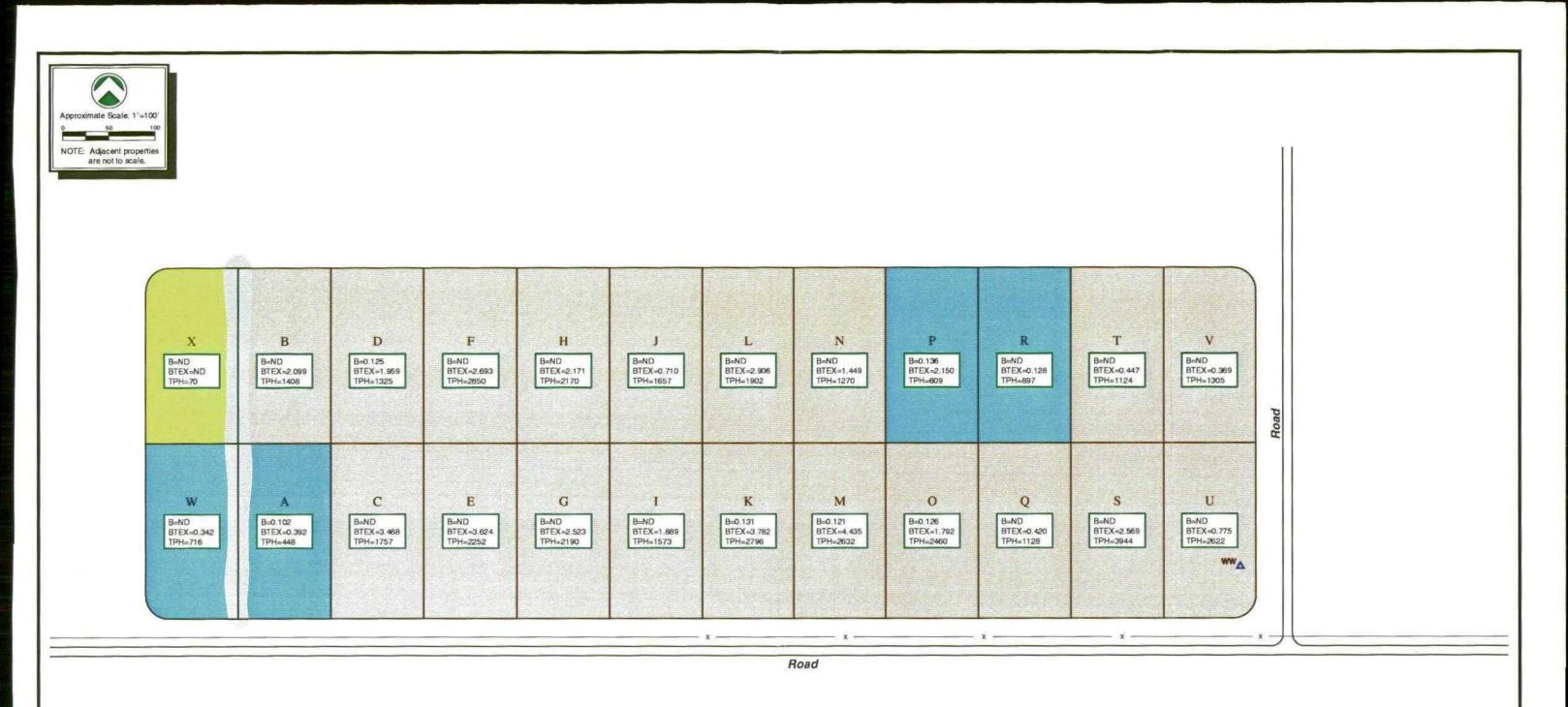
Foster, New Mexico

WORKSHEET 6 RISK and HAZARD INDEX CALCULATED FOR EXPOSURE TO SOIL

Risl	Risk and Hazard Index for SOILS 0 to 2 feet	dex for SOILS	0 to 2 feet		
'X' indicate	X' indicates pathway is complete:	X	×	X	
	Soil	On-Site	Off-Site	Construction	
Constituent	Concentrations	Worker	Resident	Worker	
of	Maximum	Inhalation +	Inhalation +	Inhalation +	
Concern	(mg/kg)	Ingestion+Dermal	Ingestion+Dermal	Ingestion+Dermal	
Carcinogens					
Benzene	0.136	5.50e-8	6.25e-8	1.56e-9	
	Total Risk:	5.50e-8	6.25e-8	1.56e-9	
Non-Carcinogens					
Ethylbenzene	0.365	1.46e-5	1.23e-5	5.39e-5	
Toluene	0.419	7.54e-5	7.13e-5	2.23e-4	
Xylene (mixed isomers)	3.95	4.44e-4	4.25e-4	1.28e-3	
TPH - New Method	6,003	5.91e-1	1.15e-1	7.33e-1	
	Hazard Index:	5.92e-1	1.16e-1	7.35e-1	







NOTE:

Soil samples were collected on January 29, 1998. Section S was resampled on June 2, 1998 for determination of TPH concentration and fingerprint. (TPH=6003)



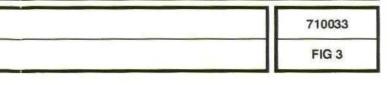
SAMPLING POINT LOCATIONS AND CONCENTRATIONS - LAND FARM

TNM-97-13

TNMPL

LEA COUNTY, NEW MEXICO





GENERAL NOTES

ND - Indicates constituent was not detected above the method detection limit.

Method detection limits:	TPH - 10 mg/kg BTEX - 0.100 mg/kg
Laboratory test methods:	BTEX - EPA Method SW846-8020, 8030 TPH - EPA Method 8015 DRO

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TABLE I

SUMMARY OF SOIL LABORATORY RESULTS EXCAVATION TNM-97-13 LEA COUNTY, NEW MEXICO

SAMPLE LOCATION	SAMPLE DATE	BENZENE (mg/kg)	TOLUENE (mg/kg)	ETHYL- BENZENE (mg/kg)	XYLENES (mg/kg)	BTEX (mg/kg)	TPH (mg/kg)
Excavation Sampling							
Section "A" Excavation Bottom	8/11/97	ND	1.376	0.917	5.291	7.584	351
Section "A" West Sidewall	8/11/97	ND	ND	ND	0.384	0.384	40
Section "A" East Sidewall	8/11/97	ND	ND	ND	ND	ND	27
Section "A" South Sidewall	8/11/97	ND	0.244	0.110	0.845	1.199	279
Section "B" Excavation Bottom	8/11/97	ND	ND	ND	ND	ND	67
Section "B" South Sidewall	8/11/97	ND	ND	ND	ND	ND	ND
Section "B" North Sidewall	8/11/97	ND	ND	ND	ND	ND	ND
Section "B" East Sidewall	8/11/97	ND	ND	ND	ND	ND	ND
Section "C" Excavation Bottom	8/19/97	ND	0.110	ND	0.278	0.388	ND
Section "C" West Sidewall	8/19/97	ND	ND	ND	0.102	0.102	22
Section "C" East Sidewall	8/19/97	ND	ND	ND	ND	ND	ND
Section "D" Excavation Bottom	8/19/97	ND	ND	ND	0.141	0.141	ND
Section "D" West Sidewall	8/19/97	ND	0.114	ND	0.197	0.311	ND
Section "D" East Sidewall	8/19/97	ND	ND	ND	ND	ND	ND
Section "B" Ramp	8/19/97	ND	0.115	0.110	0.211	0.436	ND
Section "E" Excavation Bottom	8/20/97	ND	ND	ND	ND	ND	ND
Section "E" West Sidewall	8/20/97	ND	ND	ND	NĎ	ND	ND
Section "E" E South Sidewall	8/20/97	ND	ND	ND	ND	ND	ND
Section "E" North Sidewall	8/20/97	ND	ND	ND	ND	ND	ND
Section "F" Excavation Bottom	8/20/97	ND	ND	0.101	0.477	0.578	65
Section "F" East Sidewall	8/20/97	ND	ND	ND	0.161	0.161	ND
Section "F" South Sidewall	8/20/97	ND	0.144	0.142	0.442	0.728	ND
Section "F" North Sidewall	8/20/97	ND	0.109	ND	0.18	0.289	ND
Section "G" Excavation Botto	8/20/97	ND	ND	ND	ND	ND	27
Section "G" South Sidewall	8/20/97	ND	ND	0.109	0.212	0.321	ND
Section "G" North Sidewall	8/20/97	ND	ND	ND	0.151	0.151	71
Background Sampling					· · · · · · · · · · · · · · · · · · ·		
Background	7/31/97	ND	0.120	ND	0.325	0.445	ND
Confirmation Sampling							
Section "A" Excavation Bottom	8/13/97	ND	ND	ND	0.130	0.130	ND(1)
Section "A" South Sidewall	8/13/97	ND	ND	ND	0.183	0.183	40(1)

NOTES

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1. Indicates the retest of excavation sidewall samples collected August 11, 1997, following overexcavation additional soils.

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TABLE II

SUMMARY OF SOIL LABORATORY RESULTS - LANDFARM TNM-97-13 LEA COUNTY, NEW MEXICO

SAMPLE LOCATION	SAMPLE DATE	BENZENE (mg/kg)	TOLUENE (mg/kg)	ETHYL- BENZENE (mg/kg)	XYLENES (mg/kg)	BTEX (mg/kg)	TPH (mg/kg)
Landfarm Sampling	••••••••••••••••••••••••••••••••••••••	·		<u> </u>			
AREA A	1/28/98	0.102	ND	ND	0.290	0.392	448
AREA B	1/28/98	ND	0.18	0.182	1.737	2.099	1408
AREA C	1/28/98	ND	0.419	0.286	2.763	3.468	1757
AREA D	1/28/98	0.125	0.301	0.127	1.406	1.959	1325
AREA E	1/28/98	ND	0.387	0.280	2.957	3.624	2252
AREA F	1/28/98	ND	0.307	0.198	2.188	2.693	2850
AREA G	1/28/98	ND	0.353	0.210	1.960	2.523	2190
AREA H	1/28/98	ND	0.223	0.193	1.755	2.171	2170
AREA I	1/28/98	ND	ND	0.180	1.709	1.889	1573
AREA J	1/28/98	ND	ND	0.106	0.604	0.710	1657
AREA K	1/28/98	0.131	ND	0.301	3.350	3.782	2796
AREA L	1/28/98	ND	ND	0.239	2.667	2.906	1902
AREA M	1/28/98	0.121	ND	0.365	3.949	4.435	2632
AREAN	1/28/98	ND	ND	0.147	1.302	1.449	1270
AREA O	1/28/98	0.126	0.118	0.203	1.345	1.792	2460
AREA P	1/28/98	0.136	ND	0,172	1.842	2.150	609
AREA Q	1/28/98	ND	ND	ND	0.42	0.420	1128
AREA R	1/28/98	ND	ND	ND	0.128	0.128	897
AREA S	1/28/98	ND	ND	0.191	2.378	2.569	3944
AREA S	6/2/98						6003
AREA T	1/28/98	ND	ND	ND	0.447	0.447	1124
AREA U	1/28/98	ND	ND	ND	0.775	0.775	2622
AREA V	1/28/98	ND	ND	ND	0.369	0.369	1305
AREA W	1/28/98	ND	ND	ND	0.342	0.342	716
AREA X	1/28/98	ND	ND	ND	ND	ND	70
Water Well Sampling							
MW-1, 5 to 7 feet	9/29/97	ND	ND	ND	ND	ND	ND
MW-2, 25 to 27 feet	9/29/97	ND	ND	ND	ND	ND	ND

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"Don't Treat Your Soil Like Dirt!"

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ATTN: MIKE HAWTHORNE 5309 WURZBACH SUITE 100 SAN ANTONIO, TEXAS 78238 FAX: 210-680-3763 Fax: 505-396-2754

Receiving Date: 08/21/97 Sample Type: SOIL Project #: 710033 Project Location: TNM 97-13 Analysis Date: BTEX 08/21/97 Analysis Date: DRO 08/22/97 Sampling Date: 08/20/97 Sample Condition: Intact/Iced

TOU /ODO

ELT#	FIELD CODE	BENZENE mg/kg	TOLUENE mg/kg	ETHYLBENZENE mg/kg	m.p-XYLENE mg/kg	o-XYLENE mg/kg	C10-C28
12263	Section G; Bottom Hole	<0.100	<0.100	<0.100	<0.100	<0.100	27
12264	Section G; South Wall	<0.100	<0,100	0.109	0.212	<0.100	<10
12265	Section G; North Wall	<0.100	<0.100	<0.100	0.151	<0.100	71

% IA	93	88	89	86	88	108
% EA	111	104	100	96	100	100
BLANK	<0.001	<0.001	<0.001	<0.001	<0.001	<10

METHODS: SW 846-8020,5030, 8015m DRO

Michael R. Fowler

8-22-97 Date

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"Don't Treat Your Soil Like Dirt!"

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ATTN: MIKE HAWTHORNE 5309 WURZBACH SUITE 100 SAN ANTONIO, TEXAS 78238 FAX: 210-680-3763 Fax: 505-396-2754

Receiving Date: 08/20/97 Sample Type: SOIL Project #: 710033 Project Location: TNM 97-13 Analysis Date: 08/21/97 Sampling Date: 08/20/97 Sample Condition: Intact/Iced

ELT#	FIELD CODE	BENZENE mg/kg	TOLUENE mg/kg	ETHYLBENZENE	m.p-XYLENE mg/kg	o-XYLENE mg/kg	TPH (DRO) C10-C28 mg/kg
12169	Section E; West Wall	<0.100	<0.100	<0.100	<0.100	<0.100	<10
12170	Section E; North Wall	<0.100	<0.100	<0.100	<0.100	<0.100	<10
12171	Section E; South Wall	<0.100	<0.100	<0.100	<0.100	<0.100	<10
12172	Section E; Bottom Hole	<0.100	<0.100	<0.100	<0.100	<0.100	<10
12173	Section F; East Wasli	<0.100	<0.100	<0.100	0.161	<0.100	<10
12174	Section F; South Wall	<0.100	0.144	0.142	0.305	0.137	<10
12175	Section F; North Wall	<0.100	0.109	<0.100	0.180	<0.100	<10
12176	Section F; Bottom Hole	<0.100	<0.100	0.101	0.308	0.169	65
	% IA	106	97	95	93	97	94
	% EA	109	102	99	97	100	98
	BLANK	<0.001	<0.001	<0.001	<0.001	<0.001	<10

METHODS: SW 846-8020,5030, 8015m DRO

Michael R. Fowler

8-21-97

Date

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"Don't Treat Your Soil Like Dirt!"

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ATTN: MIKE HAWTHORNE 5309 WURZBACH SUITE 100 SAN ANTONIO, TEXAS. 78238 FAX: 210-680-3763 Fax: 505-396-2754

Receiving Date: 08/19/97 Sample Type: SOIL Project #: 710033 Project Location: TNM 97-13 Analysis Date: 08/20/97 Sampling Date: 08/19/97 Sample Condition: Intact/Iced

ELT#	FIELD CODE	BENZENE mg/kg	TOLUENE mg/kg	ETHYLBENZENE mg/kg	m.p-XYLENE mg/kg	o-XYLENE mg/kg	TPH (DRO) C10-C28 mg/kg
12143	Section C; West Wall	<0.100	<0.100	<0.100	0.102	<0.100	22
12144	Section C; East Wall	<0.100	<0.100	<0.100	<0.100°	<0.100	<10
12145	Section C; Bottom Hole	<0.100	0.110	<0.100	0.172	0.106	<10
12146	Section D; West Wall	<0.100	0.114	<0.100	0.197	<0.100	<10
12147	Section D; East Wall	<0.100	<0.100	<0.100	<0.100	<0.100	<10
12148	Section D; Bottom Hole	<0.100	<0.100	<0.100	0.141	<0.100	<10
12149	Section B; Ramp	<0.100	0.115	0.110	0.211	<0.100	<10
	% IA % EA BLANK	97 118 <0.001	90 111 <0.001	89 109 <0.001	87 106 <0.001	90 108 <0.001	89 107 <10

METHODS: SW 846-8020,5030, 8015m DRO

Michael R. Fowler

-20-97 Date

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ENVIRONMENTAL LAB OF), Inc.

"Don't Treat Your Soil Like Dirt!<mark>KEI</mark> ATTN: THERESA NIX 5309 WURZBACH SUITE 100 SAN ANTONIO, TEXAS 78238 FAX: 210-680-3763 Fax: 505-396-2754

Receiving Date: 08/13/97 Sample Type: SOIL Project #: 710033 Project Location: TNM 97-13 Analysis Date: 08/14/97 Sampling Date: 08/13/97 Sample Condition: Intact/iced

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ELT#	FIELD CODE	BENZENE mg/kg	TOLUENE mg/kg	ETHYLBENZENE mg/kg	m.p-XYLENE mg/kg	o-XYLENE mg/kg	TPH (DRO) C10-C28 mg/kg
12091	Section A; Bottom Hole	<0.100	<0.100	<0.100	0.130	<0.100	<10
12092	Section A; South Wall	<0.100	<0.100	<0.100	0.183	<0.100	40

% IA	91	87	89	84	91	95
% EA	89	86	88	83	91	101
BLANK	<0.001	<0.001	<0.001	<0.001	<0.001	<10

METHODS: SW 846-8020,5030, 8015m DRO

Malical R. Jack

Michael R. Fowler

8-15-97 Date

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"Don't Treat Your Soil Like Dirt!^{KEI} ATTN: THERESA NIX 5309 WURZBACH SUITE 100 SAN ANTONIO, TEXAS 78238 FAX: 210-680-3763 Fax: 505-396-2754

Receiving Date: 08/11/97 Sample Type: SOIL Project #: 710033 Project Location: TNM 97-13 Analysis Date: 08/12/97 Sampling Date: 08/11/97 Sample Condition: Intact/Iced

ELT#	FIELD CODE	BENZENE mg/kg	TOLUENE mg/kg	ETHYLBENZENE mg/kg	m.p-XYLENE mg/kg	o-XYLENE mg/kg	TPH (DRO) C10-C28 mg/kg
12067	Area #A: Bottom Hole	<.100	1.376	0.917	3.338	1.953	351
12068	Area #A: West Wall	<.100	<.100	<.100	0.234	0.150	40
12069	Area #A; East Wall	<.100	<.100	<.100	<.100	<.100	27
12070	Area #A: South Wall	<.100	0.244	0.110	0.377	0.468	279
12071	Area #B; South Wall	<.100	<.100	<.100	<.100	<.100	<10
12072	Area #B; Bottom Hole	<.100	<.100	<.100	<.100	<.100	67
12073	Area #B; North Wall	<.100	<.100	<.100	<.100	<.100	<10
12074	Area #B; East Wall	<.100	<.100	<.100	<.100	<.100	<10

% IA	87	85	87	83	88	96
% EA	90	88	90	86	91	97
BLANK	<0.001	<0.001	<0.001	<0.001	<0.001	<10

METHODS: SW 846-8020,5030, 8015m DRO

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Michael R. Fowler

8-13-97

Date

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"Don't Treat Your Soil Like Dirt!" ATTN: THERESA NIX 5309 WURZBACH SUITE 100 SAN ANTONIO, TEXAS 78238 FAX: 210-680-3763 Fax: 505-396-2754

Receiving Date: 08/07/97 Sample Type: SOIL Project #: 710033 Project Location: TNM 97-13 Analysis Date: 08/07/97 Sampling Date: 07/31/97 Sample Condition: Intact/Iced

ELT#	FIELD CODE	BENZENE mg/kg	TOLUENE mg/kg	ETHYLBENZENE mg/kg	m.p-XYLENE mg/kg	o-XYLENE . mg/kg	TPH (DRO) C10-C28 mg/kg
12043	BACKGROUND	<0.100	0.120	<0.100	0.223	0.1 02	<10

% IA	93	95	96	92	96	94
% EA	97	97	100	95	98	104
BLANK	<0.001	<0.001	<0.001	<0.001	<0.001	<10
RPD	1	1	1	1	1	0

METHODS: SW 846-8020,5030, 8015m DRO

Michael R. I owlar

E S Date

nmental Lab of Texas, Inc. 126	FAX #:	Company Name & Address:	Jurchau Surte 100 SA, TX 73238	71cu 53 Project Name:		Sampler Signature;	1)-13	C 7 MATRIX PRESERVATIVE SAMPLING 00 AS 0 01 01 00 00 00 00 00 00 00 00 00 00 0	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	ВТЕХ 102 102 102 102 104 105 105 106 107 108 109 109 101 101 102 010 102 00 102 00 102 102 102 102 102 102 201 102 201 102 201 102 201 102 201 102 201 102 201 102 201 102 201 102 201 102 201 103 201 104 105 201 105 201 105 201 105 201 105 201 105 202 203 </th <th></th> <th>Relinquibed by Date: Times: Received by: REMARKS</th> <th>1111 B.7-97 1120 QMMULLES Please fux routs to Tany Savaie</th> <th></th> <th>Relinquished by: Date: Times: Received by Laboratory:</th> <th>RADIALIER NULLANDER RADIALIER 309 WILEDUL 10053 17-13</th> <th>Le contrainers de la contraine</th> <th></th> <th>A CECEIVED BY A CECEIVED BY A</th> <th></th> <th>Ne 2</th> <th>I'819 Hd1</th> <th>TCLP Metals Ag As Ba Cd Cr Pb Hg Se</th> <th></th> <th>ج <u> </u></th> <th></th> <th>۲</th> <th>۲ ۹۸ ci</th> <th></th> <th></th> <th></th>											Relinquibed by Date: Times: Received by: REMARKS	1111 B.7-97 1120 QMMULLES Please fux routs to Tany Savaie		Relinquished by: Date: Times: Received by Laboratory:	RADIALIER NULLANDER RADIALIER 309 WILEDUL 10053 17-13	Le contrainers de la contraine		A CECEIVED BY A		Ne 2	I'819 Hd1	TCLP Metals Ag As Ba Cd Cr Pb Hg Se		ج <u> </u>		۲	۲ ۹۸ ci			
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"Don't Treat Your Soil Like Dirt!^{KEI} ATTN: THERESA NIX 5309 WURZBACH SUITE 100 SAN ANTONIO, TEXAS 78238 FAX: 210-680-3763 FAX: 505-392-2065

Receiving Date: 01/29/98 Sample Type: SOIL Project #: 710033/TNM-97-13 Project Location: MONUMENT, NM (FOSTER'S SITE) Analysis Date: 01/29/98 Sampling Date: 01/28/98 Sample Condition: Intact/Iced

		TPH (DRO)	
		C10-C28	
ELT#	FIELD CODE	mg/kg	
13535	AREA: A	448	
13536	AREA: B	1,408	
13537	AREA: C	1,757	
13538	AREA: D	1,325	
13539	AREA: E	2,252	
13540	AREA: F	2.850	
13541	AREA: G	2.190	
13542	AREA: H	2,170	
13543	AREA: 1	1.573	
13544	AREA: J	1,657	
13545	AREA: K	2,796	
13546	AREA: L	1,902	
13547	AREA: M	2,632	
13548	AREA: N	1,270	
13549	AREA: O	2,460	
13550	AREA: P	609	
13551	AREA: Q	1,128	
13552	AREA: R	897	
13553	AREA: S	3.944	
13554	AREA: T	1,124	
ç	% IA	100	

109

<10

METHODS: SW 846- 8015m DRO

Michael R. Fowler

% EA

BLANK

Date



"Don't Treat Your Soil Like Dirt["EI

ATTN: THERESA NIX 5309 WURZBACH SUITE 100 SAN ANTONIO. TEXAS 78238 FAX: 210-680-3763 FAX: 505-392-2065

Receiving Date: 01/29/98 Sample Type: SOIL Project #: 710033/TNM-97-13 Project Location: MONUMENT, NM (FOSTER'S SITE) Analysis Date: 01/30/98 Sampling Date: 01/28/98 Sample Condition: Intact/Iced

		TPH (DRO) C10-C28	
ELT#	FIELD CODE	mg/kg	
13555	AREA: U	2.622	
13556	AREA: V	1,305	
13557	AREA: W	716	
13558	AREA: X	70	

% IA	105
% EA	98
BLANK	<10

METHODS: SW 846- 8015m DRO

Michael R. Fowler

2-3-Date



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"Don't Treat Your Soil Like Dirt,^{KEI} ATTN: TERESA NIX 5309 WURZBACH SUITE 100 SAN ANTONIO. TEXAS 78238 FAX: 210-680-3763 FAX: 505-392-2065

Receiving Date: 01/29/98 Sample Type: SOIL Project #: 710033/TNM-97-13 Project Location: MONUMENT.NM (FOSTER'S SITE) Analysis Date: 01/29/98 Sampling Date: 01/28/98 Sample Condition: Intact/Iced

ELT#	FIELD CODE	BENZENE mg/kg	TOLUENE mg/kg	ETHYLBENZENE mg/kg	m,p-XYLENE mg/kg	o-XYLENE mg/kg	
13535	AREA: A	0.102	<0.100	<0.100	0.165	0.125	
13536	AREA: B	<0.100	0.180	0.182	0.803	0.934	
13537	AREA: C	<0.100	0.419	0.286	1.410	1.353	
13538	AREA: D	0.125	0.301	0.127	0.716	0.690	
13539	AREA: E	<0.100	0.387	0.280	1.497	1.460	
13540	AREA: F	<0.100	0.307	0,198	1.113	1.075	
13541	AREA: G	<0.100	0.353	0.210	1.132	0.828	
13542	AREA: H	<0.100	0.223	0.193	0.995	0.760	
13543	AREA: I	<0.100	<0.100	0.180	0.975	0.734	
13544	AREA: J	<0.100	<0.100	0.106	0.604	<0.100	
13545	AREA: K	0.131	<0.100	0.301	1.767	1.583	
13546	AREA: L	<0.100	<0.100	0.239	1.307	1.360	
13547	AREA: M	0.121	<0.100	0.365	2.135	1.814	
13548	AREA: N	<0.100	<0.100	0.147	0.947	0.355	

% IA	90	92	94	92	95
% EA	88	90	90	88	91
BLANK	<0.001	<0.001	<0.001	<0.001	<0.001

METHODS: SW 846-8020,5030

Date

Michael R. Fowler

ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!" ATTN: TERESA NIX 5309 WURZBACH SUITE 100 SAN ANTONIO, TEXAS 78238 FAX: 210-680-3763 FAX: 505-392-2065

Receiving Date: 01/29/98 Sample Type: SOIL Project #: 710033/TNM-97-13 Project Location: MONUMENT,NM (FOSTER'S SITE) Analysis Date: 01/29/98 Sampling Date: 01/28/98 Sample Condition: Intact/Iced

ELT#	FIELD CODE	BENZENE mg/kg	TOLUENE mg/kg	ETHYLBENZENE mg/kg	m.p-XYLENE mg/kg	o-XYLENE mg/kg
13549	AREA: O	0.126	0.118	0.203	0.951	0.394
13550	AREA: P	0.126	<.100	0.172	0.936	0.906
13551	AREA: Q	<.100	<.100	<.100	0.280	0.140
13552	AREA: R	<.100	<.100	<.100	0.128	<.100
13553	AREA: S	<.100	<.100	0.191	1.263	1.115
13554	AREA: T	<.100	<.100	<.100	0.320	0.127
13555	AREA: U	<.100	<.100	<.100	0.572	0.203
13556	AREA: V	<.100	<.100	<.100	0.258	0.111
13557	AREA: W	<.100	<.100	<.100	0.222	0.120
13558	AREA: X	<.100	<.100	<.100	<.100	<.100

% IA	90	92	94	92	95
% EA	106	113	110	111	115
BLANK	<0.001	<0.001	<0.001	<0.001	<0.001

METHODS: SW 846-8020,5030

Michael R. Fowler

Environmental Lab of Texas, Inc. 12600 West I-20 East Odessa, Texas 79763 (915) 563-1800 FAX (915) 563-1713 Project Manager:	of of Longe	, In(C. 12600 West	1-20 East	Odessa	, Texas	19763		20	Ę						S RFO	1		
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-Mike Hawkherens	16		FAX#: 2	210-680-	- 3763	.ψ					ANAI	SISX	ANALYSIS REQUEST	ST					
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Date of FAX: Jun 5, 1998

Total # of pages including this page: _	2 Originals will be Mailed: Yes No
Deliver To: T. Nix/D. Stacey	
Requested by: K.E.I. Consultants, Ir	nC.
Project Name: Steven's	
Analytical Report: 1-82062	
Project Id: 710033-1-1-0	
lease remit your questions to :	
Dr. Eduardo Builes, President EduardoB@xenco.com	Brent Barron, Client Services Manager BrentB@xenco.com
Sunil Ajai, Technical Director SunilA@xenco.com	Debbie Simmons, Customer Service
Xenco@xenco.com	Dr. Carlos Castro, Laboratory Supervisor XencoSA@xenco.com
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11078 Morrison Road	Suite D	Dallas, Texas 75229	Phone (972) 481-9999	Fax (972) 481-9998
5309 Wurzbach Road	Suite 104	San Antonio, Texas 78238	Phone (210) 509-3334	Fax (210) 509-3335



CERTIFICATE OF ANALYSIS SUMMARY 1-82062

K.E.I. Consultants, Inc. Project Name: Steven's

Project ID: 710033-1-1-0 Project Manager: T. Nix/D. Stacey

Project Location: Monument, NM

Date Received in Lab : Jun 3, 1998 10:10 Date Report Faxed: Jun 5, 1998 xenco contact : Carlos Castro/Edward Yonemoto

Analysis Requested	Lab iD: Field ID: Depth: Matrix: Sampled:	Section S Solid	•	
Total Petroleum Hydrocarbons EPA 418.1	Analyzed: Units:	06/04/98 mg/kg R.L.		
Total Petroleum Hydrocarbons		750 (500)	· · · · · · · · · · · · · · · · · · ·	

This report summary, and the entire report it represents, has been made for the exclusive and confidential use of K.E.I. Consultants, Inc..

The interpretations and results expressed through this analytical report represent the best judgment of XENCO Laboratories. Xenco Laboratories, however, assumes no responsability and makes no warranty to the end use of the data hereby presented.

5

Sunil Ajai, M.S. Technical Director



COVER PAGE FACSIMILE

Date of FAX: Jun 6, 1998

Originals will be Mailed: (Yes Total # of pages including this page: No Deliver To: T. Nix/D. Stacey Requested by: K.E.I. Consultants, Inc. Project Name: Steven's Analytical Report: 1-82062 Project Id: 710033-1-1-0 Please remit your questions to : Brent Barron, Client Services Manager Dr. Eduardo Builes, President BrentB@xenco.com EduardoB(ā)xenco.com Debbie Simmons, Customer Service Sunil Ajai, Technical Director DebbieS@xenco.com SunilA@xenco.com Dr. Carlos Castro, Laboratory Supervisor XencoSA@xenco.com Xenco@xenco.com

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11078 Morrison Road	Suite D	Dallas, Texas 75229	Phone (972) 481-9999	Fax (972) 481-9998
5309 Wurzbach Road	Suite 104	San Antonio, Texas 78238	Phone (210) 509-3334	Fax (210) 509-3335

CARBON DISTRIBUTION IN SAMPLES

Client:	KEI
COC:	182062

Sample: 182062-001

% Aromatic C	omponent	% Aliphatic C	omponent
C6-C8	0.00	C5-C6	0.00
C9-C10	0.00	C7-C8	0.00
* C11-C12	1.17	C9-C10	0.00
* C13-C16	11.46	C11-C12	0.48
* C17-C21	8.77	C13-C16	22.12
* C22-C35	12.53	C17-C35	43.47
% Aromatic	33.92	% Aliphatic	66.08

% Aromatic

1.0

111

1.1

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j.

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TOTAL PETROLEUM HYDROCARBON CONCENTRATION =

6003 mg/Kg

* Results may be elevated due to interference from high mass aliphatic compounds

S. Μ.

Technical Director

				/							۴.				`			
₽77 ₽7 <i>3</i>	(Br	لر ار	¢¤	ONLY	A *	-	2	ε	4	ß	8	~	8	8	ç	Daryl Slocy	HANNY I	Services
Lab Batch # 182062 SA	Contractor COC # 144 Quee : PO No: CAN Dury Sheef Br		Turr around	•	48 ha	Call Paryl sharp			•			-			•	Remarks Phare Fax Analytical Acsults to Daryl S Fax # = 210-680-3763 • Soil Sanple W/the Alghest #PH value will gloo Analyzed for the Follonsing:	- Trace call Dayl Speciation Marachusella meth. Specifican mussechusells method Analyses tog with the Uishest TPH Concentration.	Precision Analytical/Somoss
CITATIN GALUSTODY RECORD AND ANALYSIS REQUEST FORM	Na coolers this shipment: Carrier: L1{RS Airtáil Na														•	1070000	10,10 specificant 10,10	ended
CUSTU SIS RE(No coolern thi No Currier: L1RS al Althill No		× × +		BTEX (500	2										DATB	398	recomm
	Hara (210) 680-3767 Hulknin, TX 78238	Anne	aryl Steel	3-1-1-0	Preservative Uni Deea Keer Unknown Waars Oil Par Nu: Tank Nu: Sample Description	Lord Germ										Received by: III (summary) IDATE	Received for Jeconomy by US	# Pre-scheduling is recommended
11.81 MearDwrym Surie L. Houslar, lexas 77082 (713) 589-0692 Fax (713) 589-0695		on ly	7/10	5	M W C G Container M A Ston Type R P B Ston Type P G	zo b /-										2-2-98 1630		
-	Comsultants		ument NM	Harty the	Date Time P 1 1	e 08:30	•											kow & White (Lab)
	Contractor L. E. I. Cumsul Address 5309 (Hurzbach	Project Name Steven 15	Project Location	Serritor Boratine		Section: 2June		2								Retinguished by Signamed		Pirk (Contractor), Yollow & Write (Lab)

QA/QC PROCEDURES

The soil samples collected were placed in a sterile glass container equipped with a Teflonlined lid furnished by the analytical laboratory. The container was filled to capacity with soil to limit the amount of head-space present. Each container was labeled and placed on ice in an insulated cooler. The cooler was sealed for shipment to Environmental Lab of Texas, Inc. in Odessa, Texas for determination of the following constituents:

- TPH concentrations using EPA Method 8015 DRO
- BTEX concentrations using EPA Method SW846-8020, 5030

Proper chain-of-custody documentation was maintained throughout the sampling process.

Form WR-23

arcy in 5.5.

STATE ENGINEER OFFICE

Dam- Generic Water St k- stock tomk

WELL RECORD

INSTRUCTIONS: This form should be executed in triplicate, preferably typewritten, and submitted to the nearest district office of the State Engineer. All sections, except Section 5, shall be answered as completely and accurately as possible when any well is drilled, repaired or deepened. When this form is used as a plugging record, only Section 1A and Section 5 need be completed.

1	T		1	(A) Uwne	er of well.			<u>1,0180,0</u> 2	·		
				Street and	Number.						. Fox.
1				City	analont 1)			1 00-	State	. Aox.
				SW 14	SE 14	ទារ	1/4	of Section	35	Tun 19.	is located in the Rge. <u>37</u> E
	<u> </u>			(B) Drill	ing Contra	actor	M.	L. Van	hoy	Licen	se No. 10-208
				Street and	l Number	<u>r. e</u>	• <u>f</u>	юх. 74			• 1:0x.
				City	Vencer	;		1. Jan 7 197		State	<u>. 1:0%.</u>
1				Drilling v	vas comm	enced.	••••••	July 17	8.		<u>19 5</u> 분 19 5분 19 5분
(Plat of 640 a	cres)	السيبية	Drilling w	as comple	eted					19.20
Elevatio	on at top of	casing i	n feel	t above se	a level				depth o	of well 7	<u>5</u>
State w	hether wel	l is shall	ow o	r artesian.	<u> </u>	allo	W	Depth to	water u	ipon complet	tion 50
Section	ŋ			PRIN				NG STRATA			
	2 Depth in	Feet	1	ckness in							
No.	From	To		Feet			Des	cription of V	vater-Bea	ring Formation	1
1	69	75	[*]	6	Wate	n-sor	ad l	tock			, <u></u>
2											
3						•					
4											
5									······		
	· <u> </u>				BECOD		<u> </u>				
Section	1			De	RECOR			UNG		71a=*	rations
Dia in.	Pounds ft.	Threa		Top	Bottom	Fee	t	Type Sho	e	From	To To
6	1	Weld	ed	0	75	75				60	
Section	4			RECOR		DING	AN		NG		
	h in Feet	Diame		Tons	····	cks of					· /·····
From	То	Hole ir	ı in.	Clay	Cerr	nent			M	ethods Used	
		-									
				· · · · · · · · · · · · · · · · · · ·					·		
	1	I		l			<u> </u>				
Section	-							ORD,			
						••••••••					
	a opproved	oy:				; 1				ere placed as	follows:
	s approved						No.	Depth of	of Plug	No	
Pluggin Pluggin				Basin Sup	ervisor			From	To	- NO. OI	Sacks Used
						-7		From	То		Sacks Used
		OF STAT	TE EN	Basin Sup GINEER O		7		From	То		Sacks Used
Pluggin	FOR USE Received	OF STAT	re en					From	То		Sacks Used

Use Dom. Location No. 19.37.35.343

inse

3%

1-0

Stking ack

 $(r_{1}, r_{2}, r_{3}) = 0$

File No. 2-3921

Section 6

LOG OF WELL

Depth	in Feet	Thickness		
From	То	in Feet	Color	Type of Material Encountered
0	-5	5		Tep Seil
5	69	64	Greyish	Caliche
_ 69	75	6	Red	Water-sand kock
			· · · · · · · · · · · · · · · · · · ·	L S Elev
				Depth to KTrc
				Hydro. Survey Field Check And
·····				SOURCE OF ALTITUDE GIVEN
				Interpolated from Topo. Sheet
				Determined by Inst. Leveling
				Other
				· · · · · · · · · · · · · · · · · · ·
	-			
	-			
		-		
<u></u>		-		
			1	

The undersigned hereby certifies that, to the best of his knowledge and belief, the foregoing is a true and correct record of the above described well.

W. Went Detlier Dog

Form WR-23

STATE ENGINEER OFFICE

WELL RECORD INSTRUCTIONS: This form should be executed in triplicate, preferably typewritten, and submitted to the nearest district office of the State Engineer. All sections, except Section 5, shall be answered as completely and accurately as possible when any well is drilled, repaired or deepened. When this form is used as a plugging record, only Section 1A and Section 5 need be completed.

Section 1			(A) Own	er of well					
				d Number.	CLIM	AX CHEMIC	L COM	PANY	
						278		State	
			Well was	drilled ur	HOBBS ider Perr	nit No		Nand	EW MEXICO is located in th Rge. 36B Se No. WD 46
						4 of Section	736 	wp	Rge.
		I	(B) Drill	ing Contra	actor		2	20S	36E
			Street and	d Number.	hur	rell Abbo	t		WD 46
			City		Pos	t Office)	30x 63	7 State	
				was comm	bbe enced			N	ew Mexiço
			Drilling v	vas comple	eted	October 19)		₁₉ 61
(P	lat of 640	acres)	_	-		October 21	ł		61
Elevatior	n at top o	f casing i	in feet above se	a level	••••••	Total d	epth of	well 02	Coot
State wh	ether we	ll is shall	low or artesian.	chol	1	Depth to w	ater upo	on completi	ion
Section 2						ING STRATA			92 feet
1	Depth i	n Foot	Thickness in						
No	From	To	Feet		De	scription of Wat	er-Bearin	g Formation	
1			-						
	65-	-70	5 feet	wa	ter sa	nd			
3			-						
4									
5			<u> </u>						
Section 3	3			RECOR		SING			
Dia	Pounds	Three	De De	pth		1	1	Perfor	ations
in.	ft.	in		Bottom	Feet	Type Shoe	F	rom	То
							-		
			•						
							-		
Section 4			RECOR	D OF MUD	DING AN	ID CEMENTING	,		
	in Feet	Diam		No. Sa		· ·	Metho	ods Used	
From	То	Hole in	n in. Clay	Cem	ient				
	_								
	_								
	1								
Section 5				PLUGG	SING REC				
		Control	ton				L	icense No	
									19
	approved					Cement Pl			
rugging	approved	L Dy.				<u></u>			
			Basin Sur	pervisor	No	b. Depth of From	To	No. of	Sacks Used
		·			7				
	FOR US		ohunnu Din the part of the par	NLY					
	n •		I LOINTSID	10		_			
Date 1	seceived .	-201220(Ate-engineer	13					
		W 8: 56	IA 1- VON 18	161 \		<u> </u>			
				· \	-				
				B					18 4 1

Bepth	in Peet	Thickness		caliche
Hrom	630	in Feet	Color	sand Type of Material Encountered
60	70			water sand
70	80			sandy clay
80	92			red bad
				= = = = = = = = = = = = = = = = = = = =
				L S Elev 5.5.2.7 Depth to K Trc Elev of K Trc
				Lepin to K Trc 2442
				Toe. No. 20106. Ro. 111.3020 Hydro: Survey Field Check X
				Hydro, Survey Field Check
				SOURCE OF ALTITUDE-GIVEN
				Interpolated from Topo. Sheet
				Interpolated from ropo. Sheet
				Determined by Inst: Leveling
				Other
<u> </u>				
	·]			
<u></u>	·			
<u> </u>				
<u></u>				
	1			

Section 6 4 LOG OF WELL1

The undersigned hereby certifies that, to the best of his knowledge and belief, the foregoing is a true and correct record of the above described well.

Munel albott Well Driller

Calculation of Risk Worker -- Inhalation of Volatiles from Soil Texas New Mexico Pipe Line Co.

....

ЫЕF	(kg/m³)	2.305E-10
foc	1	0.02
Ц	I	0.32
ß	(g/cc)	1.80
A	(m²)	42419
НО	(m)	2.0
>	(m/s)	4.92
ΓS	(m)	366
ED	(years)	25
Ш	(days/yr)	250
lRair	(m ³ /day)	20
BW	(kg)	70

For carcinogens:	For carcinogens: Risk = (Conc _{soil} * (VF + PEF) / DAF) * IR _{air} * EF * ED * SF / BW * 70 * 365		Dist (m)	DAF	
For non-carcinogens:	For non-carcinogens: HQ = (Conc _{soil} * (VF + PEF) / DAF) * IR _{air} * EF * (1/RfD) / BW * 365		0	1.00	
	VF = (2* Dei*E*Kas*10-3)/(LS*V*DH/A)*(3.14*alpha*ED*3.15E+7) ^{0.5}	10.5) ^{0.5}			

Constituent	Conc _{soll}	SF	RfD	Dei	Кd	H	Kas	alpha	۲F	Risk
of Concern	(mg/kg)	(1/mg/kg-d)	(mg/kg-d)	(cm ² /sec)	(cm³/g)	1	(g /cm³)	(cm ² /sec)	(m³/kg)	or HQ
Carcinogens										
Benzene	1.36e-1	2.91e-2		2.05e-2	1.66e+0	2.32e-1	1.40e-1	4.97e-4 1.96e-4	1.96e-4	5.43e-8
								Ϋ́	Total Risk:	5.43e-8
Non-Carcinogens										
Ethylbenzene	3.65e-1		2.86e-1	1.64e-2	2.19e+1	2.67e-1	1.22e-2	3.56e-5	5.14e-5	1.28e-5
Toluene	4.19e-1		1.14e-1	1.84e-2	6.04e+0	2.65e-1	4.39e-2	1.42e-4	1.03e-4	7.44e-5
Xylene (mixed isomers)	3.95e+0		2.00e-1	1.63e-2	4.80e+0	2.93e-1	6.10e-2	1.75e-4	1.15e-4	4.43e-4
TPH - New Method	6,003									0.120
	1									
TPH-Arom-EC>8-10	0		5.71e-2	2.20e-2	3.17e+1	4.84e-1	1.53e-2	5.94e-5	6.65e-5	0.000
TPH-Arom-EC>10-12	20		5.71e-2	2.20e-2	5.02e+1	1.36e-1	2.71e-3	1.06e-5	2.80e-5	0.007
TPH-Arom-EC>12-16	688		5.71e-2	2.20e-2	1.00e+2	5.16e-2	5.15e-4	2.01e-6	1.22e-5	0.029
TPH-Arom-EC>16-21	526		3.00e-2	2.20e-2	3.17e+2	1.18e-1	3.72e-4	1.45e-6	1.04e-5	0.036
TPH-Arom-EC>21-35	752		3.00e-2	2.20e-2	2.52e+3	6.65e-3	2.64e-6	1.03e-8	8.73e-7	4.29e-3
TPH-Aliph-EC 5-6	0		5.71e-2	2.20e-2	1.59e+1	3.28e+1	2.06e+0	5.89e-3	9.02e-4	0.000
TPH-Aliph-EC>6-8	0		5.71e-2	2.20e-2	7.96e+1	4.85e+1	6.09e-1	2.15e-3	4.41e-4	0.000
TPH-Aliph-EC>8-10	0		2.86e-1	2.20e-2	6.32e+2	7.92e+1	1.25e-1	4.79e-4	1.92e-4	0.000
TPH-Aliph-EC>10-12	29		2.86e-1	2.20e-2	5.02e+3	1.23e+2	2.45e-2	9.55e-5	8.43e-5	0.002
TPH-Aliph-EC>12-16	1,328		2.86e-1	2.20e-2	1.00e+5	5.25e+2	5.24e-3	2.05e-5	3.89e-5	0.035
TPH-Aliph-EC>16-35	2,610		2.00e+0	2.20e-2	2.00e+7	6.57e+4	3.28e-3	1.28e-5	3.08e-5	0.008

Worker -- Ingestion of Soil & Dermal Contact with Soil Texas New Mexico Pipe Line Co. **Calculation of Risk**

:

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	BW	СF	IRsoil	EF	ED	EF _{dermal}	SA	AF	
	(kg)	(mg/kg)	(mg/day)	(days/yr)	(years)	(days/yr)	(cm²)	(mg/cm ²)	
	02	1.00E+06	50	250	25	250	5,800	1.00	
For carcinogens:		Risk _{ING} = Conc _{soil} * IR _{soil} * EF * ED * SF / BW * 70 * 365 * CF	IR _{soil} * EF	* ED * SF	/ BW * 7	0 * 365 * CF			
	Risk _{der}	Risk _{DER} = Conc _{soil} * SA * AF * ABS * EF * ED * SF / BW * 70 * 365 * CF	SA * AF	* ABS * EF	* ED *	5F / BW * 70	1 * 365 * C		
For non-carcinogens:		HQ _{ING} = Conc _{soil} * IR _{soil} * EF * (1/RfD) / BW * 365 * CF	R _{soil} * EF *	(1/RfD) / E	30* 365	5 * CF			
	HQ _{DER} =	HQ _{DER} = Conc _{soil} * SA * AF* ABS * EF * (1/RfD) / BW * 365 * CF	SA * AF* /	ABS* EF *	(1/RfD) /	BW * 365 *	СF		
								_	
Constituent	Conc _{soil}	SFo	RfDo	Risk _{ing}	•	SFd	RfDd	ABS	Ř
of Concern	(mg/kg)	(1/mg/kg-d)	(mg/kg-d)	or HQ _{ING}		(1/mg/kg-d)	(mg/kg-d)	I	P
Carcinogens									
Benzene	1.36e-1	0.029		6.89E-10		0.029		0.000	0.0
		آر	Total Risk: 6.89e-10	6.89e-10			Ĕ	Total Risk:	0

Calculation of Risk Worker -- Combined Risk for Soil Texas New Mexico Pipe Line Co.

Riskinhal Risk_{DER} + Risk_{ing} + 11 **Risk**wkr-soll If On-Site:

If Off-Site: Risk_{wkr-soll} = Risk_{INHAL}

Riskwersoll or HQwersoll

5.50E-08

1.46E-05 7.54E-05 4.44E-04

Risk_{INHAL} OR HQINHAL 0.00E+00 0.00E+00 0.00E+00 0.00E+00 5.43E-08 1.28E-05 7.44E-05 4.43E-04 1.20E-01 6.73E-03 2.87E-02 3.56E-02 4.29E-03 1.66E-03 3.54E-02 7.86E-03 Risk_{der} or HQ_{DER} 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 9.96E-03 9.76E-02 0.00E+00 0.00E+00 1.64E-03 7.54E-02 9.96E-02 1.42E-01 7.40E-03 4.34E-01 or HQ_{ING} 0.00E+00 6.89E-10 1.79E-06 1.02E-06 0.00E+00 8.59E-04 8.41E-03 8.59E-03 1.23E-02 0.00E+00 0.00E+00 1.41E-04 6.50E-03 **Risk_{ing}** 9.66E-07 3.74E-02 6.38E-04

0.00E+00

5.91E-01

1.76E-02 1.35E-01 1.17E-01

1.59E-02

3.44E-03

0.00E+00

1.59E-01

1.44E-01

0.00E+00 0.00E+00

Calculation of Risk Resident -- Inhalation of Volatiles from Soil Texas New Mexico Pipe Line Co.

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PEF	(kg/m³)	2.305E-10
foc	I	0.02
ш	ł	0.32
۵	(g/cc)	1.80
۷	(m²)	42419
НО	(m)	2.0
>	(m/s)	4.92
rs	(m)	366
G	(years)	30
Ш	(days/yr)	350
lRair	(m ³ /day)	15
BV	(kg)	70

Dist (m) DAF	30.5 1.00)0.5
For carcinogens: Risk = (Conc _{soil} * (VF + PEF) / DAF) * IR _{air} * EF * ED * SF / BW * 70 * 365	For non-carcinogens: HQ = (Conc _{soil} * (VF + PEF) / DAF) * IR _{air} * EF * (1/RfD) / BW * 365	VF = (2*Dei*E*Kas*10-3)/(LS*V*DH/A)*(3.14*alpha*ED*3.15E+7) ^{0.5}
For carcinogens:	For non-carcinogens:	L

Constituent	Conc _{soil}	SF	RfD	Dei	Кd	.н	Kas	alpha	۲F	Risk
of Concern	(mg/kg)	(1/mg/kg-d)	(mg/kg-d)	(cm ² /sec)	(cm³/g)	ł	(g /cm ³)	(cm ² /sec)	(m³/kg)	or HQ
Carcinogens										
Benzene	1.36e-1	2.91e-2		2.05e-2	1.66e+0	2.32e-1	1.40e-1	4.97e-4	1.96e-4	6.25e-8
								To	Total Risk:	6.25e-8
Non-Carcinogens										
Ethylbenzene	3.65e-1		2.86e-1	1.64e-2	2.19e+1	2.67e-1	1.22e-2	3.56e-5	5.14e-5	1.23e-5
Toluene	4 .19e-1		1.14e-1	1.84e-2	6.04e+0	2.65e-1	4.39e-2	1.42e-4	1.03e-4	7.13e-5
Xylene (mixed isomers)	3.95e+0		2.00e-1	1.63e-2	4.80e+0	2.93e-1	6.10e-2	1.75e-4	1.15e-4	4.25e-4
TPH - New Method	6,003									0.115
TPH-Arom-EC>8-10	0		5.71e-2	2.20e-2	3.17e+1	4.84e-1	1.53e-2	5.94e-5	6.65e-5	0.000
TPH-Arom-EC>10-12	70		5.71e-2	2.20e-2	5.02e+1	1.36e-1	2.71e-3	1.06e-5	2.80e-5	0.006
TPH-Arom-EC>12-16	688		5.71e-2	2.20e-2	1.00e+2	5.16e-2	5.15e-4	2.01e-6	1.22e-5	0.028
TPH-Arom-EC>16-21	526		3.00e-2	2.20e-2	3.17e+2	1.18e-1	3.72e-4	1.45e-6	1.04e-5	0.034
TPH-Arom-EC>21-35	752		3.00e-2	2.20e-2	2.52e+3	6.65e-3	2.64e-6	1.03e-8	8.73e-7	4.11e-3
TPH-Aliph-EC 5-6	0		5.71e-2	2.20e-2	1.59e+1	3.28e+1	2.06e+0	5.89e-3	9.02e-4	0.000
TPH-Aliph-EC>6-8	0		5.71e-2	2.20e-2	7.96e+1	4.85e+1	6.09e-1	2.15e-3	4.41e-4	0.000
TPH-Aliph-EC>8-10	0		2.86e-1	2.20e-2	6.32e+2	7.92e+1	1.25e-1	4.79e-4	1.92e-4	0.000
TPH-Aliph-EC>10-12	29		2.86e-1	2.20e-2	5.02e+3	1.23e+2	2.45e-2	9.55e-5	8.43e-5	0.002
TPH-Aliph-EC>12-16	1,328		2.86e-1	2.20e-2	1.00e+5	5.25e+2	5.24e-3	2.05e-5	3.89e-5	0.034
TPH-Aliph-EC>16-35	2,610		2.00e+0	2.20e-2	2.00e+7	6.57e+4	3.28e-3	1.28e-5	3.08e-5	0.008

Calculation of Risk Resident -- Ingestion of Soil & Dermal Contact with Soil Texas New Mexico Pipe Line Co.

	BW	с	IRsoil	EF	ED	EF _{dermal}	SA	AF	
	(kg)	(mg/kg)	(mg/day)	(days/yr)	(years)	(days/yr)	(cm²)	(mg/cm ²)	
	70	1.00E+06	124	350	30	350	5,800	1.00	
For carcinogens:	Risk _{ing}	= Conc _{soil} *	Conc _{soil} * IR _{soil} * EF *	* ED	/ BW * 7	SF / BW * 70 * 365 * CF			
	Risk _{der}	= Conc _{soil}	* SA * AF *	* ABS * EF	* ED * S	Conc _{soil} * SA * AF * ABS * EF * ED * SF / BW * 70 * 365 * CF	* 365 * CI	11	
For non-carcinogens:	HQ _{iNG} =	Conc _{soil} * IR _{soil} * EF * (1/RfD) / BW * 365 * CF	R _{soil} * EF *	(1/RfD) / E	3W * 365	* CF			
	HQ _{DER} =	Conc _{soil} *	SA * AF* /	ABS* EF *	(1/RfD)/	SA * AF* ABS * EF * (1/RfD) / BW * 365 *	СF		
Constituent	Conc _{soil}	SFo	RfDo	Risk _{ing}	L	SFd	RfDd	ABS	Risk _{DER}
of Concern	(mg/kg)	(1/mg/kg-d)	(mg/kg-d)	or HQ _{ING}		(1/mg/kg-d)	(mg/kg-d)	ł	or HQ _{DER}
Carcinogens Benzene	1 360 1	0.00		6 70E_00		0000			0.006400
DOILZOILO	-200.1	-	Total Risk:	6.70e-9		0.040	To	Total Risk:	0.00e+0
Non-Carcinogens		1							• • •
Ethylbenzene	3.65e-1		0.10	4.67E-05			0.10	0.000	0.00E+00
Toluene	4.19e-1		0.20	2.68E-05			0.20	0.000	0.00E+00
Xylene (mixed isomers)	3.95e+0		2.00	2.52E-05			2.00	0.000	0.00E+00
TPH - New Method	6.00e+3			9.77E-01					6.07E-01
TPH-Arom-EC>8-10	0.00e+0		0.04	0.00E+00			0.04	0.100	0.00E+00
TPH-Arom-EC>10-12	7.02e+1		0.04	2.24E-02			0.04	0.100	1.40E-02
TPH-Arom-EC>12-16	6.88e+2		0.04	2.20E-01			0.04	0.100	1.37E-01
TPH-Arom-EC>16-21	5.26e+2		0.03	2.24E-01			0.03	0.100	1.39E-01
TPH-Arom-EC>21-35	7.52e+2		0.03	3.21E-01			0.03	0.100	1.99E-01
TPH-Aliph-EC 5-6	0.00e+0		0.06	0.00E+00			0.06	0.100	0.00E+00
TPH-Aliph-EC>6-8	0.00e+0		0.06	0.00E+00			0.06	0.100	0.00E+00
TPH-Aliph-EC>8-10	0.00e+0		0.10	0.00E+00			0.10	0.100	0.00E+00
TPH-Aliph-EC>10-12	2.88e+1		0.10	3.68E-03			0.10	0.100	2.29E-03
TPH-Aliph-EC>12-16	1.33e+3		0.10	1.70E-01			0.10	0.100	1.06E-01
TPH-Aliph-EC>16-35	2.61e+3		2.00	1.67E-02			2.00	0.100	1.04E-02

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Calculation of Risk Resident -- Combined Risk for Soil Texas New Mexico Pipe Line Co.

Risking + Riskder + Riskinhal 11 Risk_{res-SOIL} If On-Site:

If Off-Site: Risk_{res-SolL} = Risk_{INHAL}

·	1															
Riskinhal or HQinhal	6.25E-08	1.23E-05	7.13E-05	4.25E-04	1.15E-01	0.00E+00	6.45E-03	2.75E-02	3.41E-02	4.11E-03	0.00E+00	0.00E+00	0.00E+00	1.60E-03	3.39E-02	7.53E-03
		- 1 2 4 111					,		-							
Risk _{Der} or HQ _{Der}	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.07E-01	0.00E+00	1.40E-02	1.37E-01	1.39E-01	1.99E-01	0.00E+00	0.00E+00	0.00E+00	2.29E-03	1.06E-01	1.04E-02
	· · · · · · · · · · · ·															1
Risk _{ing} or HQ _{ing}	6.70E-09	4.67E-05	2.68E-05	2.52E-05	9.77E-01	0.00E+00	2.24E-02	2.20E-01	2.24E-01	3.21E-01	0.00E+00	0.00E+00	0.00E+00	3.68E-03	1.70E-01	1.67E-02
·····																
Constituent of Concern	<u>Carcinogens</u> Benzene	<u>Non-Carcinogens</u> Ethylbenzene	Toluene	Xylene (mixed isomers)	TPH - New Method	TPH-Arom-EC>8-10	TPH-Arom-EC>10-12	TPH-Arom-EC>12-16	TPH-Arom-EC>16-21	TPH-Arom-EC>21-35	TPH-Aliph-EC 5-6	TPH-Aliph-EC>6-8	TPH-Aliph-EC>8-10	TPH-Aliph-EC>10-12	TPH-Aliph-EC>12-16	TPH-Aliph-EC>16-35

or HQres-Soil **Risk**res-solL 3.39E-02 7.53E-03 1.15E-01 0.00E+00 0.00E+00 6.25E-08 1.23E-05 7.13E-05 0.00E+00 4.11E-03 0.00E+00 1.60E-03 4.25E-04 6.45E-03 2.75E-02 3.41E-02

	(m. 10)											
	BW	lRair	ЦШ	ED	ΓS	>	Н	A	В	ш	foc	α.
	(kg)	(m³/day)	(days/yr)	(years)	(m)	(m/s)	(m)	(m²)	(g/cc)	;	-	(kç
	20	20	5	12	5	0.49	2.0	109	1.80	0.32	0.02	4.5
For carcinogens:	Risk =	Conc _{soil} * (VF + PEF) * IR _{air} * EF	(VF + PEF	:) * IR _{air} *	EF * ED *		SF / BW * 70 * 365	10				
For non-carcinogens:	HQ = C	Conc _{soil} * (VI	ιu	* IR _{air} * E	+ PEF) * IR _{air} * EF * (1/RfD) / BW * 365) / BW *	365					
~	VF = ()	(2*Dei*E*	ſ)-3)/(F;	Kas * 10-3) / (LS * V * DH / A) * (3.14 * alpha	* ED *	3.15E+7) ^{0.5}	0.5		
								1				
Constituent	Conc _{soil}	SF	RfD	Dei	Кd	Ŧ	Kas	alpha	VF	Risk		
of Concern	(mg/kg)	(1/mg/kg-d)	(mg/kg-d)	(cm ² /sec)	(cm³/g)	1	(g /cm³)	(cm ² /sec)	(m³/kg)	or HQ		
Carcinogens Renzene	1 36e-1	2 91e-2		2 05e-2	1 66e+0	2 32e-1	1 40e-1	4 97e-4	5 63e-4	1 50e-9		
								, T	Total Risk:	1 50e-9		
Non-Carcinogens								-		2000		
Ethylbenzene	3.65e-1		2.86e-1	1.64e-2	2.19e+1	2.67e-1	1.22e-2	3.56e-5	1.47e-4	3.68e-5		
Toluene	4.19e-1		1.14e-1	1.84e-2	6.04e+0	2.65e-1	4.39e-2	1.42e-4	2.97e-4	2.13e-4		
Xylene (mixed isomers)	3.95e+0		2.00e-1	1.63e-2	4.80e+0	2.93e-1	6.10e-2	1.75e-4	3.29e-4	1.27e-3		
TPH - New Method	6.00e+3									3 45e-1		
TPH-Arom-EC>8-10	0.00e+0		5.71e-2	2.20e-2	3.17e+1	4.84e-1	1.53e-2	5.94e-5	1.91e-4	0.00e+0		
TPH-Arom-EC>10-12	7.02e+1		5.71e-2	2.20e-2	5.02e+1	1.36e-1	2.71e-3	1.06e-5	8.02e-5	1.93e-2		
TPH-Arom-EC>12-16	6.88e+2		5.71e-2	2.20e-2	1.00e+2	5.16e-2	5.15e-4	2.01e-6	3.50e-5	8.24e-2		
TPH-Arom-EC>16-21	5.26e+2		3.00e-2	2.20e-2	3.17e+2	1.18e-1	3.72e-4	1.45e-6	2.97e-5	1.02e-1		
TPH-Arom-EC>21-35	7.52e+2		3.00e-2	2.20e-2	2.52e+3	6.65e-3	2.64e-6	1.03e-8	2.50e-6	1.23e-2		
TPH-Aliph-EC 5-6	0.00e+0		5.71e-2	2.20e-2	1.59e+1	3.28e+1	2.06e+0	5.89e-3	2.59e-3	0.00e+0		
TPH-Aliph-EC>6-8	0.00e+0		5.71e-2	2.20e-2	7.96e+1	4.85e+1	6.09e-1	2.15e-3	1.27e-3	0.00e+0		
TPH-Aliph-EC>8-10	0.00e+0		2.86e-1	2.20e-2	6.32e+2	7.92e+1	1.25e-1	4.79e-4	5.51e-4	0.00e+0		
TPH-Aliph-EC>10-12	2.88e+1		2.86e-1	2.20e-2	5.02e+3	1.23e+2	2.45e-2	9.55e-5	2.42e-4	4.77e-3		
TPH-Aliph-EC>12-16	1.33e+3		2.86e-1	2.20e-2	1.00e+5	5.25e+2	5.24e-3	2.05e-5	1.12e-4	1.01e-1		
TPH-Aliph-EC>16-35	2.61e+3		2.00e+0	2.20e-2	2.00e+7	6.57e+4	3.28e-3	1.28e-5	8.83e-5	2.25e-2		

Construction Worker -- Inhalation of Volatiles from Soil Texas New Mexico Pipe Line Co. **Calculation of Risk**

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PEF (kg/m³) .58e-11

Calculation of Risk Construction Worker -- Ingestion of Soil & Dermal Contact with Soil Texas New Mexico Pipe Line Co.

or HQ_{DER} Risk_{DER} 2.96e-2 0.00e+0 6.80e-3 9.71e-3 0.00e+0 6.80e-4 1.12e-4 0.00e+0 0.00e+0 0.00e+0 0.00e+0 6.66e-3 0.00e+0 0.00e+0 0.00e+0 5.15e-3 5.06e-4 Total Risk: (mg/cm²) 0.000 0.000 0.000 0.000 0.100 0.100 0.100 0.100 0.100 0.100 0.100 ABS 0.100 0.100 0.100 0.100 0.12 ÅΕ I = Concsoil * SA * AF * ABS * EF * ED * SF / BW * 70 * 365 * CF (mg/kg-d) RfDd 3,300 0.10 0.20 0.06 0.06 0.10 0.10 0.10 2.00 (cm²) 2.00 0.04 0.04 0.04 0.03 0.03 SA = Conc_{soil} * SA * AF* ABS * EF * (1/RfD) / BW * 365 * CF Conc_{soil} * IR_{soil} * EF * ED * SF / BW * 70 * 365 * CF EF_{dermal} (1/mg/kg-d) (days/yr) 0.029 SFd S Conc_{soil} * IR_{soil} * EF * (1/RfD) / BW * 365 * CF (years) G 42 or HQ_{ING} 6.35e-11 9.27e-6 0.00e+0 0.00e+0 Risk_{ING} 6.35e-11 8.08e-2 8.24e-2 3.59e-1 1.18e-1 1.71e-5 9.84e-6 0.00e+0 0.00e+0 6.13e-3 (days/yr) 8.25e-3 **1.35e-3** 6.24e-2 Ц S Total Risk: (mg/day) (mg/kg-d) RfDo IRsoil 0.10 0.06 0.06 0.10 480 0.20 0.03 0.03 0.10 0.10 2.00 2.00 0.04 0.04 0.04 1.00E+06 (1/mg/kg-d) (mg/kg) SFo 0.029 Ч B HQ_{ING} = **Risk_{DER} Risk_{iNG}** Concsoll 1.36e-1 4.19e-1 3.95e+0 6.00e+3 7.02e+1 0.00e+0 0.00e+0 1.33e+3 0.00e+0 6.88e+2 5.26e+2 7.52e+2 0.00e+0 2.61e+3 HQDER 2.88e+1 3.65e-1 (mg/kg) BW (kg) 2 For carcinogens: For non-carcinogens: Xylene (mixed isomers) TPH-Arom-EC>10-12 FPH-Arom-EC>12-16 TPH-Aliph-EC>12-16 TPH-Arom-EC>16-21 TPH-Arom-EC>21-35 FPH-Aliph-EC>10-12 TPH-Aliph-EC>16-35 "PH-Arom-EC>8-10 **FPH-Aliph-EC>8-10** Constituent TPH-Aliph-EC>6-8 of Concern **TPH - New Method FPH-Aliph-EC 5-6** Non-Carcinogens Ethylbenzene Carcinogens Benzene **Foluene**

Construction Worker -- Combined Risk for Soil Texas New Mexico Pipe Line Co. **Calculation of Risk**

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Riskinhal Risk_{ing} + Risk_{ber} + II **Risk**_{CW-SOIL}

Riskewson or HQewson	1.56e-9	5.39e-5	2.23e-4	1.28e-3	7 330-1	0.00e+0	2.82e-2	1.70e-1	1.91e-1	1.40e-1	0.00e+0	0.00e+0	0.00e+0	6.24e-3	1.69e-1	2.92e-2
Riskinhal or HQinhal	1.50e-9	3.68e-5	2.13e-4	1.27e-3	3.45e-1	0.00e+0	1.93e-2	8.24e-2	1.02e-1	1.23e-2	0.00e+0	0.00e+0	0.00e+0	4.77e-3	1.01e-1	2.25e-2
Risk _{Der} or HQ _{Der}	0.00e+0	0.00e+0	0.00e+0	0.00e+0	2.96e-2	0.00e+0	6.80e-4	6.66e-3	6.80e-3	9.71e-3	0.00e+0	0.00e+0	0.00e+0	1.12e-4	5.15e-3	5.06e-4
Risking or HQ _{ING}	6.35e-11	1.71e-5	9.84e-6	9.27e-6	3.59e-1	0.00e+0	8.25e-3	8.08e-2	8.24e-2	1.18e-1	0.00e+0	0.00e+0	0.00e+0	1.35e-3	6.24e-2	6.13e-3
Constituent of Concern	<u>Carcinogens</u> Benzene	Non-Carcinogens Ethylbenzene	Toluene	Xylene (mixed isomers)	TPH - New Method	TPH-Arom-EC>8-10	TPH-Arom-EC>10-12	TPH-Arom-EC>12-16	TPH-Arom-EC>16-21	TPH-Arom-EC>21-35	TPH-Alph-EC 5-6	TPH-Aliph-EC>6-8	TPH-Aliph-EC>8-10	TPH-Aliph-EC>10-12	TPH-Aliph-EC>12-16	TPH-Aliph-EC>16-35

Jury Output File Analysis for Example Problem

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*** COMMON INPUT PARAMETERS ***

PARAMETER NAME UNITS

UNITS VALUE

Porosity	(cc/cc)	0.25
Bulk Density	(g/cc)	1.8
Water Content	(cc/cc)	0.1
Fractional Organic Carbon	(mg/mg)	2.00E-02
Incorporation Depth	(cm)	66.7
Clean Soil Thickness	(cm)	0
Simulation Time	(yrs)	70
Length of Soil Column	(cm)	1470
Infiltration Rate	(cm/day)	5.19E-02
Source Length	(m)	366
Source Width	(m)	116
Boundary Layer Thickness	(cm)	5

Chemical Specific Input Parameters for Benzene

Parameter Name Units Value

Total Soil Concentration	(mg/kg)	1
Diffusion Coeff. in Air	(cm^2/day	7517
Diffusion Coeff. in Water	(cm^2/day	0.8467
Henrys Constant [(mg/L)	/(mg/L)] .2490
Organic Carbon Part. Coeff.	(cc/g)	83
Lumped Chemical Decay Rate	(1/day)	2.00E-03

Outputs for Benzene

Time = 1 yrs

Cumulative Emissions to Air	(g)	36120
Advective Mass Loading Rate to Groundwater	(g/day)	3.3E-35
Diffusive Mass Loading Rate to Groundwater	(g/day)	1E-32
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	1E-32

Time = 2 yrs

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Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	37370 2.38E-18 2.16E-16 2.18E-16
Time = 3 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 4 yrs	(g) (g/day) (g/day) (g/day)	37630 5.97E-13 3.07E-11 3.13E-11
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	37710 1.97E-10 6.98E-09 7.17E-09
Time = 5 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	37730 4.53E-09 1.22E-07 1.26E-07
Time = 10 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	37750 1.98E-07 2.32E-06 2.52E-06
Time = 15 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	37750 4.8E-08 3.43E-07 3.91E-07
Time = 20 yrs ====================================		
Cumulative Emissions to Air	(g)	37750

Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g/day) (g/day) (g/day)	3.35E-09 1.67E-08 2E-08
Time = 25 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 30 yrs	(g) (g/day) (g/day) (g/day)	37750 1.46E-10 5.4E-10 6.86E-10
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	37750 5.07E-12 1.45E-11 1.96E-11
Time = 35 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 40 yrs	(g) (g/day) (g/day) (g/day)	37750 1.56E-13 3.55E-13 5.11E-13
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 45 yrs	(g) (g/day) (g/day) (g/day)	37750 4.49E-15 8.21E-15 1.27E-14
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	37750 1.23E-16 1.83E-16 3.06E-16
Time = 50 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater	(g) (g/day)	37750 3.29E-18

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Diffusive Mass Loading Rate to Groundwater	(g/day)	3.99E-18
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	7.27E-18
Time = 55 yrs		
Cumulative Emissions to Air	(g)	37750
Advective Mass Loading Rate to Groundwater	(g/day)	8.6E-20
Diffusive Mass Loading Rate to Groundwater	(g/day)	8.51E-20
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	1.71E-19
Time = 60 yrs		
Cumulative Emissions to Air	(g)	37750
Advective Mass Loading Rate to Groundwater	(g/day)	2.22E-21
Diffusive Mass Loading Rate to Groundwater	(g/day)	1.79E-21
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	4E-21
Time = 65 yrs		
Cumulative Emissions to Air	(g)	37750
Advective Mass Loading Rate to Groundwater	(g/day)	5.67E-23
Diffusive Mass Loading Rate to Groundwater	(g/day)	3.68E-23
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	9.35E-23
Time = 70 yrs ====================================		
Cumulative Emissions to Air	(g)	37750
Advective Mass Loading Rate to Groundwater	(g/day)	1.44E-24
Diffusive Mass Loading Rate to Groundwater	(g/day)	7.42E-25
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	2.18E-24
Chemical Specific Input Parameters for Ethylbenzene		
Parameter Name Units Value		
Total Soil Concentration	(mg/kg)	1
Diffusion Coeff. in Air	(cm^2/day	5702
Diffusion Coeff. in Water	(cm^2/day	0.5875
Henrys Constant [(mg/L) /	(mg/L)] .2870
Organic Carbon Part. Coeff.	(cc/g)	1100
Lumped Chemical Decay Rate	(1/day)	3.00E-03

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Outputs for Ethylbenzene

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Time ≈ 1 yrs		
		40.400
Cumulative Emissions to Air	(g)	13480
Advective Mass Loading Rate to Groundwater	(g/day)	0
Diffusive Mass Loading Rate to Groundwater	(g/day)	0
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	0
Time ≈ 2 yrs		
	<i>.</i> .	
Cumulative Emissions to Air	(g)	14840
Advective Mass Loading Rate to Groundwater	(g/day)	0
Diffusive Mass Loading Rate to Groundwater	(g/day)	0
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	0
Time ≈ 3 yrs		

	<i>4</i>	1.5.1.1.5
Cumulative Emissions to Air	(g)	15110
Advective Mass Loading Rate to Groundwater	(g/day)	0
Diffusive Mass Loading Rate to Groundwater	(g/day)	0
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	0
Time ≈ 4 yrs		
	<i>4</i> `	1.5.1.7.5
Cumulative Emissions to Air	(g)	15170
Advective Mass Loading Rate to Groundwater	(g/day)	0
Diffusive Mass Loading Rate to Groundwater	(g/day)	0
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	0
Time ≈ 5 yrs		

		15100
Cumulative Emissions to Air	(g)	15190
Advective Mass Loading Rate to Groundwater	(g/day)	0
Diffusive Mass Loading Rate to Groundwater	(g/day)	0
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	0
Time = 10 yrs		
Cumulative Emissions to Air	(g)	15190
Advective Mass Loading Rate to Groundwater	(g/day)	2.82E-56
Diffusive Mass Loading Rate to Groundwater	(g/day)	1.81E-53

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Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	0
Time = 15 yrs		
Cumulative Emissions to Air	(g)	15190
Advective Mass Loading Rate to Groundwater	(g/day)	4.84E-42
Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g/day) (g/day)	1.2E-39 1.21E-39
	(9,))	
_Time = 20 yrs ====================================		
		45400
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater	(g) (g/day)	15190 4.25E-36
Diffusive Mass Loading Rate to Groundwater	(g/day) (g/day)	4.25E-30 6.15E-34
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	6.19E-34
Time = 25 yrs		
Cumulative Emissions to Air	(g)	15190
Advective Mass Loading Rate to Groundwater	(g/day)	1.78E-33
Diffusive Mass Loading Rate to Groundwater	(g/day)	1.78E-31
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	1.79E-31
Time = 30 yrs		
Cumulative Emissions to Air	(g)	15190
Advective Mass Loading Rate to Groundwater	(g/day)	1.6E-32
Diffusive Mass Loading Rate to Groundwater	(g/day)	1.21E-30
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	1.23E-30
Time = 35 yrs		
##202200222222222222222222222222222222		
Cumulative Emissions to Air	(g)	15190
Advective Mass Loading Rate to Groundwater	(g/day)	1.6E-32
Diffusive Mass Loading Rate to Groundwater	(g/day)	9.73E-31
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	9.89E-31
Time = 40 yrs		
Cumulative Emissions to Air	(g)	15190
Advective Mass Loading Rate to Groundwater	(g/day)	4.06E-33
Diffusive Mass Loading Rate to Groundwater	(g/day)	2.05E-31
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	2.09E-31

2721-21-20 20-21-20

(g)

(g)

(g)

(g)

(g)

(g)

(g/day)

15190

4.09E-34

1.76E-32

1.8E-32

15190

2.17E-35

8.13E-34

8.35E-34

15190

7.18E-37 2.38E-35

2.46E-35

15190

1.67E-38 4.98E-37

5.14E-37

15190

2.98E-40 8E-39

8.3E-39

15190

4.28E-42

1.05E-40

1.09E-40

(33)	Time = 45 yrs
	Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater
	Diffusive Mass Loading Rate to Groundwater
12 1	Advective & Diffusive Mass Loading Rate to Groundwater
	Time = 50 yrs
-	
	Cumulative Emissions to Air
78	Advective Mass Loading Rate to Groundwater
	Diffusive Mass Loading Rate to Groundwater
	Advective & Diffusive Mass Loading Rate to Groundwater
70 1	Time = 55 yrs
124	Cumulative Emissions to Air
	Advective Mass Loading Rate to Groundwater
	Diffusive Mass Loading Rate to Groundwater
1574	Advective & Diffusive Mass Loading Rate to Groundwater
	Time - 60 vm
2.50	Time = 60 yrs
8	
	Cumulative Emissions to Air
873	Advective Mass Loading Rate to Groundwater
	Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater
6.9	
	Time = 65 yrs
80	Cumulative Emissions to Air
	Advective Mass Loading Rate to Groundwater
	Diffusive Mass Loading Rate to Groundwater
	Advective & Diffusive Mass Loading Rate to Groundwater
	Time = 70 vrs
	Time = 70 yrs ====================================
253	Cumulative Emissions to Air
	Advective Mass Loading Rate to Groundwater
	Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater
a* 4	A Ground & Diffusive Mass Loading Male to Groundwater
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Chemical Specific Input Parameters for Naphthalene

Parameter Name Units Value	
Total Soil Concentration Diffusion Coeff. in Air Diffusion Coeff. in Water Henrys Constant [Organic Carbon Part. Coeff. Lumped Chemical Decay Rate	(mg/kg) 1 (cm^2/day 5098 (cm^2/day 0.648 (mg/L) /(mg/L)] .5780E-01 (cc/g) 1300 (1/day) 0
Outputs for Naphthalene	
Time = 1 yrs	
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 2 yrs	(g) 7108 (g/day) 0 (g/day) 0 (g/day) 0
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) 10010 (g/day) 0 (g/day) 0 (g/day) 0
Time = 3 yrs	
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) 12190 (g/day) 0 (g/day) 0 (g/day) 0
Time = 4 yrs ====================================	
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) 14000 (g/day) 0 (g/day) 0 (g/day) 0

Time = 5 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	15550 0 0 0
Time = 10 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	21070 0 0 0
Time = 15 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	24530 0 0 0
Time = 20 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	26950 0 0 0
Time = 25 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	28750 0 0 0
Time = 30 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	30160 0 0 0
Time - Of us		

Time = 35 yrs

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Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	31300 0 0 0
Time = 40 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 45 yrs	(g) (g/day) (g/day) (g/day)	32240 0 0 0
Time = 45 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	33040 9.19E-73 3.34E-70 0
Time = 50 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	33730 1.6E-65 4.01E-63 0
Time = 55 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 60 yrs	(g) (g/day) (g/day) (g/day)	34320 1.35E-59 2.49E-57 0
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	34850 1.18E-54 1.67E-52 0

Time = 65 yrs

Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	35320 1.79E-50 2.02E-48 0
Time = 70 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	35740 6.87E-47 6.4E-45 7.01E-45
Chemical Specific Input Parameters for Toluene		
Parameter Name Units Value		
Total Soil Concentration Diffusion Coeff. in Air Diffusion Coeff. in Water Henrys Constant [Organic Carbon Part. Coeff. Lumped Chemical Decay Rate	(mg/kg) (cm^2/day (cm^2/day (mg/L) (cc/g) (1/day)	
Outputs for Toluene		
Time = 1 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	24150 0 0
Time = 2 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	25200 7.12E-61 8.55E-58 0
Time = 3 yrs		

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Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	25350 7.41E-42 3.06E-39 3.07E-39
Time = 4 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 5 yrs	(g) (g/day) (g/day) (g/day)	25370 1.36E-32 3.1E-30 3.11E-30
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	25380 3.1E-27 4.74E-25 4.77E-25
Time = 10 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 15 yrs	(g) (g/day) (g/day) (g/day)	25380 4.32E-18 2.36E-16 2.4E-16
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	25380 7.9E-17 2.56E-15 2.64E-15
Time = 20 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	25380 1.52E-17 3.47E-16 3.62E-16

Time = 25 yrs

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Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	25380 4.79E-19 8.35E-18 8.83E-18
Time = 30 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	25380 6.15E-21 8.56E-20 9.18E-20
Time = 35 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	25380 4.72E-23 5.47E-22 5.94E-22
Time = 40 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 45 yrs	(g) (g/day) (g/day) (g/day)	25380 2.65E-25 2.63E-24 2.9E-24
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 50 yrs	(g) (g/day) (g/day) (g/day)	25380 1.21E-27 1.04E-26 1.17E-26
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	25380 4.8E-30 3.63E-29 4.11E-29
Time = 55 yrs ====================================		
Cumulative Emissions to Air	(g)	25380

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Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g/day) (g/day) (g/day)	1.71E-32 1.15E-31 1.33E-31
Time = 60 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 65 yrs	(g) (g/day) (g/day) (g/day)	25380 5.67E-35 3.43E-34 3.99E-34
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 70 yrs	(g) (g/day) (g/day) (g/day)	25380 1.77E-37 9.67E-37 1.14E-36
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	25380 5.29E-40 2.63E-39 3.16E-39
Chemical Specific Input Parameters for Xylene		
Parameter Name Units Value		
Total Soil Concentration Diffusion Coeff. in Air Diffusion Coeff. in Water Henrys Constant [Organic Carbon Part. Coeff. Lumped Chemical Decay Rate	(mg/kg) (cm^2/day (cm^2/day (mg/L) (cc/g) (1/day)	1 6221 0.6739 /(mg/L)] .3150 240 2.00E-03
Outputs for Xylene		
Time = 1 yrs ====================================		
Cumulative Emissions to Air	(g)	28680

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Advective Mass Loading Rate to Groundwater	(g/day)	0
Diffusive Mass Loading Rate to Groundwater	(g/day)	0
Advective & Diffusive Mass Loading Rate to Groundwate		0
<u> </u>		
Time = 2 yrs		
Cumulative Emissions to Air	(g)	30520
Advective Mass Loading Rate to Groundwater	(g/day)	9.79E-48
Diffusive Mass Loading Rate to Groundwater	(g/day)	6.11E-45
Advective & Diffusive Mass Loading Rate to Groundwate		5.61E-45
Time = 3 yrs		
Cumulative Emissions to Air	(g)	30940
Advective Mass Loading Rate to Groundwater	(g/day)	1.04E-32
Diffusive Mass Loading Rate to Groundwater	(g/day)	2.65E-30
Advective & Diffusive Mass Loading Rate to Groundwate	er (g/day)	2.66E-30
Time		
Time = 4 yrs		
Ourselation Fraincisco de Ale		21060
Cumulative Emissions to Air	(g) (g/day)	31060 2.44E-25
Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater	(g/day) (g/day)	2.44E-23 3.7E-23
Advective & Diffusive Mass Loading Rate to Groundwate		3.72E-23
Advective & Dinusive Mass Loading Mate to Crodina wate		01122 20
Time = 5 yrs		
Cumulative Emissions to Air	(g)	31100
Advective Mass Loading Rate to Groundwater	(g/day)	4.86E-21
Diffusive Mass Loading Rate to Groundwater	(g/day)	5.15E-19
Advective & Diffusive Mass Loading Rate to Groundwate	r (g/day)	5.2E-19
Time = 10 yrs		
Cumulative Emissions to Air	(a)	31120
Advective Mass Loading Rate to Groundwater	(g) (g/day)	2E-13
Diffusive Mass Loading Rate to Groundwater	(g/day) (g/day)	8.14E-12
Advective & Diffusive Mass Loading Rate to Groundwate		8.34E-12
	. (9,0097	1
Time = 15 yrs ====================================		
Cumulative Emissions to Air	(g)	31120
Advective Mass Loading Rate to Groundwater	(g/day)	5.24E-12
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Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g/day) (g/day)	1.29E-10 1.34E-10
Time = 20 yrs		
	(2)	31120
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater	(g) (g/day)	3.91E-12
Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g/day) (g/day)	6.81E-11 7.2E-11
Time = 25 yrs		
Cumulative Emissions to Air	(g)	31120
Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater	(g/day) (g/day)	7.12E-13 9.51E-12
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day) (g/day)	1.02E-11
Time = 30 yrs ====================================		
Cumulative Emissions to Air	(g)	31120
Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater	(g/day) (g/day)	6.45E-14 6.96E-13
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	7.61E-13
Time = 35 yrs		
Cumulative Emissions to Air	(g)	31120
Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater	(g/day) (g/day)	3.96E-15 3.53E-14
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	3.93E-14
Time = 40 yrs ====================================		
Cumulative Emissions to Air	(g)	31120
Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater	(g/day) (g/day)	1.91E-16 1.45E-15
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	1.64E-15
Time = 45 yrs ====================================		
Cumulative Emissions to Air	(g)	31120
Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater	(g/day) (g/day)	7.85E-18 5.15E-17

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Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	5.93E-17
Time = 50 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	31120 2.9E-19 1.66E-18 1.95E-18
Time = 55 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	31120 9.89E-21 5.03E-20 6.02E-20
Time = 60 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 65 yrs	(g) (g/day) (g/day) (g/day)	31120 3.19E-22 1.45E-21 1.77E-21
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	31120 9.86E-24 4.02E-23 5.01E-23
Time = 70 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	31120 2.95E-25 1.09E-24 1.38E-24

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AT123D Output File Analysis for Example Problem

Chemicals in the analysis Benzene Ethylbenzene Naphthalene Toluene Xylene

Number of years simulated: 70

GENERAL INPUT DATA

NO. OF POINTS IN X-DIRECTION NO. OF POINTS IN Y-DIRECTION NO. OF POINTS IN Z-DIRECTION NO. OF POINTS IN Z-DIRECTION NO. OF ROOTS: NO. OF SERIES TERMS NO. OF BEGINNING TIME STEPS NO. OF ENDING TIME STEP NO. OF TIME INTERVALS FOR PRINTED OUT SOLUTION INSTANTANEOUS SOURCE CONTROL = 0 FOR INSTANT SOURCE SOURCE CONDITION CONTROL = 0 FOR STEADY SOURCE INTERMITTENT OUTPUT CONTROL = 0 NO SUCH OUTPUT CASE CONTROL =1 THERMAL, = 2 FOR CHEMICAL, = 3 RAD 2	1	1 10 1000 1 70 1 70 1
X-COORDINATE OF RECEPTOR WELL (METERS) Y-COORDINATE OF RECEPTOR WELL (METERS) AQUIFER DEPTH, = 0.0 FOR INFINITE DEEP (METERS) AQUIFER WIDTH, = 0.0 FOR INFINITE WIDE (METERS) BEGIN POINT OF X-SOURCE LOCATION (METERS) END POINT OF X-SOURCE LOCATION (METERS) BEGIN POINT OF Y-SOURCE LOCATION (METERS) END POINT OF Y-SOURCE LOCATION (METERS) BEGIN POINT OF Y-SOURCE LOCATION (METERS) END POINT OF Z-SOURCE LOCATION (METERS) BEGIN POINT OF Z-SOURCE LOCATION (METERS)		1.83E+02 5.80E+01 3.05E+00 0.00E+00 3.66E+02 0.00E+00 1.16E+02 0.00E+00 0.00E+00
POROSITY HYDRAULIC CONDUCTIVITY (METER/YEAR) HYDRAULIC GRADIENT LONGITUDINAL DISPERSIVITY (METER) LATERAL DISPERSIVITY (METER) VERTICAL DISPERSIVITY (METER)		2.50E-01 3.15E+01 2.00E-02 0.00E+00 0.00E+00 0.00E+00 1.80E+03
BULK DENSITY OF THE SOIL (KG/M**3) TIME INTERVAL SIZE FOR THE DESIRED SOLUTION (YR) DISCHARGE TIME (YR)		1.00E+03 1.00E+00 7.00E+01

1.00E+00

1.66E-03

INPUT DATA/RESULTS FOR CHEMICAL: Benzene INST. WASTE RELEASE (KG) VALID FOR INST CASE ONLY.. DISTRIBUTION COEFFICIENT, KD (M**3/KG) MOLECULAR DIFFUSION COEFFICIENT (M**2/YR) DECAY CONSTANT (1/YR)..... LIST OF TRANSIENT SOURCE RELEASE RATE .367E-32 .796E-16 .114E-10 .262E-08 .461E-07 .228E-06 .548E-06 .853E-06 .975E-06 .918E-06 .749E.00 .514E.00 .075E.00 .918E-00

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MOLECULAR DIFFUSION COEFFICIENT	(M**2/YR) 3.09E-02	
DECAY CONSTANT (1/YR)	7.30E-01	
LIST OF TRANSIENT SOURCE RELEASE F		
.367E-32 .796E-16 .114E-10 .262E-0	8 .461E-07	
.228E-06 .548E-06 .853E-06 .975E-0		
.748E-06 .549E-06 .371E-06 .236E-0		
.831E-07 .468E-07 .257E-07 .138E-0		
.381E-08 .196E-08 .994E-09 .501E-0		
.124E-09 .613E-10 .301E-10 .147E-1		
.347E-11 .168E-11 .809E-12 .389E-1		
.894E-13 .428E-13 .204E-13 .973E-1		
.220E-14 .105E-14 .497E-15 .236E-1		
.530E-16 .251E-16 .119E-16 .561E-1		
.125E-17 .593E-18 .280E-18 .132E-1		
.295E-19 .139E-19 .657E-20 .310E-2 .689E-21 .325E-21 .153E-21 .723E-2		
.161E-22 .759E-23 .358E-23 .169E-2		
RETARDATION FACTOR		
RETARDED SEEDAGE VELOCITY (MMP)	1 955-01	
RETARDED LONGITUDINAL DISPERSION	COEF. (M**2/YR) 9.55E-03	
RETARDED LATERAL DISPERSION COFFE	FICIENT (M**2/YR), 9.55F-03	
RETARDED LATERAL DISPERSION COEFF	ICIENT (M**2/YR) . 9.55E-03	
RETARDED LATERAL DISPERSION COEFF RETARDED VERTICAL DISPERSION COEFF	ICIENT (M**2/YR) . 9.55E-03	
RETARDED LATERAL DISPERSION COEFF RETARDED VERTICAL DISPERSION COEF	FICIENT (M**2/YR) . 9.55E-03 FICIENT (M**2/YR). 9.55E-03	
RETARDED LATERAL DISPERSION COEFF RETARDED VERTICAL DISPERSION COEF time [yr] = 1.00 avg. conc.	FICIENT (M**2/YR) . 9.55E-03 FICIENT (M**2/YR). 9.55E-03 [mg/l] = .000E+00	
RETARDED LATERAL DISPERSION COEFF RETARDED VERTICAL DISPERSION COEF time [yr] = 1.00 avg. conc.	FICIENT (M**2/YR) . 9.55E-03 FICIENT (M**2/YR). 9.55E-03	
RETARDED LATERAL DISPERSION COEFF RETARDED VERTICAL DISPERSION COEF time [yr] = 1.00 avg. conc.	FICIENT (M**2/YR) . 9.55E-03 FICIENT (M**2/YR). 9.55E-03 [mg/l] = .000E+00	
RETARDED LATERAL DISPERSION COEFFRETARDED VERTICAL DISPERSION COEFtime [yr] = 1.00avg. conc.time [yr] = 5.00avg. conc.	FICIENT (M**2/YR) . 9.55E-03 FICIENT (M**2/YR). 9.55E-03 [mg/l] = .000E+00	
RETARDED LATERAL DISPERSION COEFFRETARDED VERTICAL DISPERSION COEFtime [yr] = 1.00avg. conc.time [yr] = 5.00avg. conc.time [yr] = 10.0avg. conc.	FICIENT (M**2/YR) . 9.55E-03 FICIENT (M**2/YR). 9.55E-03 [mg/l] = .000E+00 [mg/l] = .000E+00 [mg/l] = .256E-08	
RETARDED LATERAL DISPERSION COEFFRETARDED VERTICAL DISPERSION COEFtime [yr] = 1.00avg. conc.time [yr] = 5.00avg. conc.time [yr] = 10.0avg. conc.	FICIENT (M**2/YR) . 9.55E-03 FICIENT (M**2/YR). 9.55E-03 [mg/I] = .000E+00 [mg/I] = .000E+00	
RETARDED LATERAL DISPERSION COEFFRETARDED VERTICAL DISPERSION COEFtime [yr] = 1.00avg. conc.time [yr] = 5.00avg. conc.time [yr] = 10.0avg. conc.time [yr] = 15.0avg. conc.	FICIENT (M**2/YR). 9.55E-03 FICIENT (M**2/YR). 9.55E-03 [mg/I] = .000E+00 [mg/I] = .000E+00 [mg/I] = .256E-08 [mg/I] = .115E-08	
RETARDED LATERAL DISPERSION COEFFRETARDED VERTICAL DISPERSION COEFtime [yr] = 1.00avg. conc.time [yr] = 5.00avg. conc.time [yr] = 10.0avg. conc.	FICIENT (M**2/YR). 9.55E-03 FICIENT (M**2/YR). 9.55E-03 [mg/I] = .000E+00 [mg/I] = .000E+00 [mg/I] = .256E-08 [mg/I] = .115E-08	
RETARDED LATERAL DISPERSION COEFFRETARDED VERTICAL DISPERSION COEFFtime [yr] = 1.00time [yr] = 5.00avg. conc.time [yr] = 10.0avg. conc.time [yr] = 15.0avg. conc.time [yr] = 20.0avg. conc.	FICIENT (M^{**2}/YR) . 9.55E-03 FICIENT (M^{**2}/YR) . 9.55E-03 [mg/l] = .000E+00 [mg/l] = .000E+00 [mg/l] = .256E-08 [mg/l] = .115E-08 [mg/l] = .000E+00	
RETARDED LATERAL DISPERSION COEFFRETARDED VERTICAL DISPERSION COEFFtime [yr] = 1.00avg. conc.time [yr] = 5.00avg. conc.time [yr] = 10.0avg. conc.time [yr] = 15.0avg. conc.time [yr] = 20.0	FICIENT (M**2/YR). 9.55E-03 FICIENT (M**2/YR). 9.55E-03 [mg/I] = .000E+00 [mg/I] = .000E+00 [mg/I] = .256E-08 [mg/I] = .115E-08	
RETARDED LATERAL DISPERSION COEFFRETARDED VERTICAL DISPERSION COEFtime [yr] =1.00avg. conc.time [yr] =5.00avg. conc.time [yr] =10.0avg. conc.time [yr] =15.0avg. conc.time [yr] =20.0avg. conc.time [yr] =25.0avg. conc.	FICIENT (M**2/YR). 9.55E-03 FICIENT (M**2/YR). 9.55E-03 [mg/l] = .000E+00 [mg/l] = .000E+00 [mg/l] = .256E-08 [mg/l] = .115E-08 [mg/l] = .000E+00 [mg/l] = .000E+00	
RETARDED LATERAL DISPERSION COEFFRETARDED VERTICAL DISPERSION COEFtime [yr] =1.00avg. conc.time [yr] =5.00avg. conc.time [yr] =10.0avg. conc.time [yr] =15.0avg. conc.time [yr] =20.0avg. conc.time [yr] =25.0avg. conc.	FICIENT (M^{**2}/YR) . 9.55E-03 FICIENT (M^{**2}/YR) . 9.55E-03 [mg/l] = .000E+00 [mg/l] = .000E+00 [mg/l] = .256E-08 [mg/l] = .115E-08 [mg/l] = .000E+00	
RETARDED LATERAL DISPERSION COEFFRETARDED VERTICAL DISPERSION COEFFtime [yr] = 1.00avg. conc.time [yr] = 5.00avg. conc.time [yr] = 10.0avg. conc.time [yr] = 15.0avg. conc.time [yr] = 20.0avg. conc.time [yr] = 25.0avg. conc.time [yr] = 30.0avg. conc.	FICIENT (M**2/YR). 9.55E-03 FICIENT (M**2/YR). 9.55E-03 [mg/I] = .000E+00 [mg/I] = .000E+00 [mg/I] = .256E-08 [mg/I] = .115E-08 [mg/I] = .000E+00 [mg/I] = .000E+00 [mg/I] = .000E+00	
RETARDED LATERAL DISPERSION COEFFRETARDED VERTICAL DISPERSION COEFFtime [yr] = 1.00avg. conc.time [yr] = 5.00avg. conc.time [yr] = 10.0avg. conc.time [yr] = 15.0avg. conc.time [yr] = 20.0avg. conc.time [yr] = 25.0avg. conc.time [yr] = 30.0avg. conc.	FICIENT (M**2/YR). 9.55E-03 FICIENT (M**2/YR). 9.55E-03 [mg/l] = .000E+00 [mg/l] = .000E+00 [mg/l] = .256E-08 [mg/l] = .115E-08 [mg/l] = .000E+00 [mg/l] = .000E+00	
RETARDED LATERAL DISPERSION COEFFRETARDED VERTICAL DISPERSION COEFFtime [yr] = 1.00avg. conc.time [yr] = 5.00avg. conc.time [yr] = 10.0avg. conc.time [yr] = 15.0avg. conc.time [yr] = 20.0avg. conc.time [yr] = 25.0avg. conc.time [yr] = 30.0avg. conc.time [yr] = 35.0avg. conc.	FICIENT (M**2/YR). 9.55E-03 FICIENT (M**2/YR). 9.55E-03 [mg/I] = .000E+00 [mg/I] = .000E+00 [mg/I] = .256E-08 [mg/I] = .115E-08 [mg/I] = .000E+00 [mg/I] = .000E+00 [mg/I] = .000E+00	

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avg. conc. [mg/l] = .000E+00

avg. conc. [mg/l] = .000E+00

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time [yr] =	55.0	avg. conc. [mg/l] =	.000E+00
time [yr] =	60.0	avg. conc. [mg/l] =	.000E+00
time [yr] =	65.0	avg. conc. [mg/l] =	.000E+00
time [yr] =	70.0	avg. conc. [mg/l] =	.000E+00

INPUT DATA/RESULTS FOR CHEMICAL: Ethylbenzene

INST. WASTE RELEASE (KG) VALID FOR INST CASE ONLY DISTRIBUTION COEFFICIENT, KD (M**3/KG) MOLECULAR DIFFUSION COEFFICIENT (M**2/YR) DECAY CONSTANT (1/YR) LIST OF TRANSIENT SOURCE RELEASE RATE	1.00E+00 2.20E-02 2.14E-02 1.10E+00
.000E+00 .000E+00 .000E+00 .000E+00 .000E+00	
.000E+00 .000E+00 .000E+00 .000E+00 .000E+00 .000E+00 .939E-46 .409E-43 .640E-41 .440E-39	
.156E-37 .317E-36 .409E-35 .358E-34 .226E-33	
.108E-32 .402E-32 .122E-31 .306E-31 .654E-31	
.121E-30 .197E-30 .286E-30 .375E-30 .448E-30	
.493E-30 .503E-30 .478E-30 .428E-30 .361E-30	
.289E-30 .221E-30 .161E-30 .113E-30 .761E-31	
.496E-31 .313E-31 .191E-31 .114E-31 .658E-32	
.372E-32 .205E-32 .111E-32 .587E-33 .305E-33	
.155E-33 .779E-34 .385E-34 .187E-34 .896E-35	
.424E-35 .198E-35 .912E-36 .416E-36 .188E-36	
.838E-37 .370E-37 .162E-37 .704E-38 .303E-38	
.129E-38 .548E-39 .230E-39 .962E-40	1 595+02
RETARDED SEEPAGE VELOCITY (M/YR) RETARDED SEEPAGE VELOCITY (M/YR) RETARDED LONGITUDINAL DISPERSION COEF. (M**2/YR)	1.58E-02
RETARDED LONGITUDINAL DISPERSION COEF. (M**2/YR)	5.38E-04
RETARDED LATERAL DISPERSION COEFFICIENT (M**2/YR) .	5.38E-04
RETARDED VERTICAL DISPERSION COEFFICIENT (M**2/YR).	
time [yr] = 1.00 avg. conc. [mg/l] = .000E+00	
time [yr] = 5.00 avg. conc. [mg/l] = .000E+00	
time [yr] = 10.0 avg. conc. [mg/l] = .000E+00	
time [yr] = 15.0 avg. conc. [mg/l] = .000E+00	
time [yr] = 20.0 avg. conc. [mg/l] = .000E+00	
time [yr] = 25.0 avg. conc. [mg/l] = .000E+00	

time [yr] =	30.0	avg. conc. [mg/l] =	.000E+00
time [yr] =	35.0	avg. conc. [mg/l] =	.000E+00
time [yr] =	40.0	avg. conc. [mg/l] =	.000E+00
time [yr] =	45.0	avg. conc. [mg/l] =	.000E+00
time [yr] =	50.0	avg. conc. [mg/l] =	.000E+00
time [yr] =	55.0	avg. conc. [mg/l] =	.000E+00
time [yr] =	60.0	avg. conc. [mg/l] =	.000E+00
time [yr] =	65.0	avg. conc. [mg/l] =	.000E+00
time [yr] =	70.0	avg. conc. [mg/l] =	.000E+00

INPUT DATA/RESULTS FOR CHEMICAL: Naphthalene

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INST. WASTE RELEASE (KG) VALID FOR INST CASE ONLY DISTRIBUTION COEFFICIENT, KD (M**3/KG) MOLECULAR DIFFUSION COEFFICIENT (M**2/YR)	1.00E+00 2.60E-02
MOLECULAR DIFFUSION COEFFICIENT (M**2/YR)	2.37E-02
DECAY CONSTANT (1/YR)	0.00E+00
LIST OF TRANSIENT SOURCE RELEASE RATE	
.000E+00 .000E+00 .000E+00 .000E+00 .000E+00	
.000E+00 .000E+00 .000E+00 .000E+00 .140E-47	
.420E-47 .210E-46 .108E-45 .517E-45	
RETARDATION FACTOR	1.88E+02
RETARDED SEEPAGE VELOCITY (M/YR)	1.34E-02
RETARDED LONGITUDINAL DISPERSION COEF. (M**2/YR)	5.03E-04
RETARDED LATERAL DISPERSION COEFFICIENT (M**2/YR) .	5.03E-04
RETARDED VERTICAL DISPERSION COEFFICIENT (M**2/YR).	5.03E-04
time [yr] = 1.00 avg. conc. [mg/l] = .000E+00	
time [yr] = 5.00 avg. conc. [mg/l] = .000E+00	

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time [yr] =	10.0	avg. conc. [mg/l] =	.000E+00
time [yr] =	15.0	avg. conc. [mg/l] =	.000E+00
time [yr] =	20.0	avg. conc. [mg/l] =	.000E+00
time [yr] =	25.0	avg. conc. [mg/l] =	.000E+00
time [yr] =	30.0	avg. conc. [mg/l] =	.000E+00
time [yr] =	35.0	avg. conc. [mg/l] =	.000E+00
time [yr] =	40.0	avg. conc. [mg/l] =	.000E+00
time [yr] =	45.0	avg. conc. [mg/l] =	.000E+00
time [yr] =	50.0	avg. conc. [mg/l] =	.000E+00
time [yr] =	55.0	avg. conc. [mg/l] =	.000E+00
time [yr] =	60.0	avg. conc. [mg/l] =	.000E+00
time [yr] =	65.0	avg. conc. [mg/l] =	.000E+00
time [yr] =	70.0	avg. conc. [mg/l] =	.000E+00

INPUT DATA/RESULTS FOR CHEMICAL: Toluene

.356E-24 .119E-24 .393E-25 .130E-25 .425E-26

.139E-26 .450E-27 .145E-27 .468E-28 .150E-28 .479E-29 .153E-29 .484E-30 .153E-30 .484E-31

.453E-34 .141E-34 .437E-35 .135E-35 .418E-36

.152E-31 .478E-32 .150E-32 .467E-33

INST. WASTE DISTRIBUTIO		• •			••	1.00E+00 6.00E-03
MOLECULAR			•	(M**2/YR)		2.71E-02
DECAY CONS	STANT (1/	YR)				1.20E+00
LIST OF TRAN	NSIENT SC	DURCE REI	EASE RAT	E		
.000E+00	.000E+00	.112E-38	.114E-29	.174E-24		
.326E-21	.491E-19	.153E-17	.167E-16	.876E-16		
.268E-15	.551E-15	.831E-15	.984E-15	.962E-15		
.804E-15 .	.591E-15	.391E-15	.236E-15	.132E-15		
.693E-16 .	.344E-16	.163E-16	.737E-17	.322E-17		
.136E-17 .	.560E-18	.224E-18	.878E-19	.335E-19		
.127E-19 .	.468E-20	.171E-20	.614E-21	.217E-21		
.766E-22 .	266E-22	.916E-23	.314E-23	.106E-23		

.129E-36	.397E-37	.122E-37	.375E-38	

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.146E-33

RETARDED RETARDED RETARDED	ION FACTOR SEEPAGE VELOCIT LONGITUDINAL DIS LATERAL DISPERS VERTICAL DISPERS	Y (M/YR) PERSION COEF. (N ION COEFFICIENT (/**2/YR) (M**2/YR) .	4.42E+01 5.70E-02 2.45E-03 2.45E-03 2.45E-03
time [yr] =	1.00	avg. conc. [mg/l] =	.000E+00	
time [yr] =	5.00	avg. conc. [mg/l] =	.000E+00	
time [yr] =	10.0	avg. conc. [mg/l] =	.000E+00	
time [yr] =	15.0	avg. conc. [mg/l] =	.000E+00	
time [yr] =	20.0	avg. conc. [mg/l] =	.000E+00	
time [yr] =	25.0	avg. conc. [mg/l] =	.000E+00	
time [yr] =	30.0	avg. conc. [mg/l] =	.000E+00	
time [yr] =	35.0	avg. conc. [mg/l] =	.000E+00	
tíme [yr] =	40.0	avg. conc. [mg/l] =	.000E+00	
time [yr] =	45.0	avg. conc. [mg/l] =	.000E+00	
time [yr] =	50.0	avg. conc. [mg/l] =	.000E+00	
time [yr] =	55.0	avg. conc. [mg/l] =	.000E+00	
time [yr] =	60.0	avg. conc. [mg/l] =	.000E+00	
time [yr] =	65.0	avg. conc. [mg/l] =	.000E+00	
time [yr] =	70.0	avg. conc. [mg/l] =	.000E+00	

INPUT DATA/RESULTS FOR CHEMICAL: Xylene

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DISTRIBUTION C	ELEASE (KG) VALI OEFFICIENT, KD FUSION COEFFIC	(M**3/KG)		4.8)E+00 0E-03 6E-02
DECAY CONSTA	NT (1/YR)			7.3	0E-01
LIST OF TRANSIE	ENT SOURCE REI	LEASE RAT	E		
.000E+00 .224	4E-44 .971E-30	.136E-22	.190E-18		
.835E-16 .508	BE-14 .899E-13	.698E-12	.304E-11		
.874E-11 .184	E-10 .303E-10	.416E-10	.490E-10		
.512E-10 .484	E-10 .422E-10	.343E-10	.263E-10		
.192E-10 .134	E-10 .903E-11	.589E-11	.373E-11		

3.56E+01

7.09E-02 2.77E-03

2.77E-03 2.77E-03

.178E-18 .538E-20 .156E-21 .436E-23 ION FACTO SEEPAGE LONGITUD	.484E-13 .217E-14 .827E-16 .282E-17 .889E-19 .266E-20 .763E-22 .213E-23 R 	.265E-13 .114E-14 .424E-16 .142E-17 .442E-19 .131E-20 .374E-22 .104E-23 Y (M/YR) PERSION CO ON COEFFIC	.143E .598E .216E .713E .220E .645E .183E EF. (M	E-13 E-15 E-16 E-18 E-19 E-21 E-22 M**2/YR)
1.00	:	avg. conc. [m	ıg/l] =	.000E+00
5.00	;	avg. conc. [m	ig/l] =	.000E+00
10.0	;	avg. conc. [m	g/l] =	.000E+00
15.0	;	avg. conc. [m	g/l] =	.000E+00
20.0	ä	avg. conc. [m	g/l] =	.000E+00
25.0	ā	avg. conc. [m	g/l] =	.000E+00
30.0	ä	avg. conc. [m	g/l] =	.000E+00
35.0	a	avg. conc. [m	g/l] =	.000E+00
40.0	a	avg. conc. [m	g/l] =	.000E+00
45.0	ā	avg. conc. [m	g/I] =	.000E+00
50.0	ā	avg. conc. [m	g/l] =	.000E+00
55.0	a	avg. conc. [m	g/l] =	.000E+00
60.0	a	avg. conc. [m	g/l] =	.000E+00
65.0	a	avg. conc. [m	g/i] =	.000E+00
70.0	a	vg. conc. [mg	g/i] =	.000E+00
	.875E-13 .411E-14 .161E-15 .558E-17 .178E-18 .538E-20 .156E-21 .436E-23 ION FACTOR SEEPAGE V LONGITUD LATERAL D VERTICAL I 1.00 5.00 10.0 15.0 20.0 25.0 30.0 35.0 40.0 45.0 55.0 60.0 65.0	.875E-13 .484E-13 .411E-14 .217E-14 .161E-15 .827E-16 .558E-17 .282E-17 .178E-18 .889E-19 .538E-20 .266E-20 .156E-21 .763E-22 .436E-23 .213E-23 ION FACTOR	.875E-13 .484E-13 .265E-13 .411E-14 .217E-14 .114E-14 .161E-15 .827E-16 .424E-16 .558E-17 .282E-17 .142E-17 .178E-18 .889E-19 .442E-19 .538E-20 .266E-20 .131E-20 .156E-21 .763E-22 .374E-22 .436E-23 .213E-23 .104E-23 ION FACTOR	.875E-13 .484E-13 .265E-13 .143E .411E-14 .217E-14 .114E-14 .598E .161E-15 .827E-16 .424E-16 .216E .558E-17 .282E-17 .142E-17 .713E .178E-18 .889E-19 .442E-19 .220E .538E-20 .266E-20 .131E-20 .645E .156E-21 .763E-22 .374E-23 .104E-23 ION FACTOR

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Jury Output File Analysis for Example Problem

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*** COMMON INPUT PARAMETERS ***

PARAMETER NAME UNITS VALUE

Porosity	(cc/cc)	0.25
Bulk Density	(g/cc)	1.8
Water Content	(cc/cc)	0.1
Fractional Organic Carbon	(mg/mg)	2.00E-02
Incorporation Depth	(cm)	66.7
Clean Soil Thickness	(cm)	0
Simulation Time	(yrs)	70
Length of Soil Column	(cm)	1470
Infiltration Rate	(cm/day)	5.19E-02
Source Length	(m)	366
Source Width	(m)	116
Boundary Layer Thickness	(cm)	5

Chemical Specific Input Parameters for TPH-AR08-10

Parameter Name Units Value

Total Soil Concentration	(mg/kg)	1	
Diffusion Coeff. in Air	(cm^2/day	8640	
Diffusion Coeff. in Water	(cm^2/day	0.864	
Henrys Constant [(mg/L)	/(mg/L)] 20).40
Organic Carbon Part. Coeff.	(cc/g)	1590	
Lumped Chemical Decay Rate	(1/day)	0	

Outputs for TPH-AR08-10

Time = 1 yrs

Cumulative Emissions to Air	(g)	48020
Advective Mass Loading Rate to Groundwater	(g/day)	3.07E-09
Diffusive Mass Loading Rate to Groundwater	(g/day)	8.23E-06
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	8.24E-06

Time = 2 yrs

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Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	49700 6.48E-06 0.007709 0.007716
Time = 3 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	50450 6.54E-05 0.04888 0.04895
Time = 4 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	50900 0.000184 0.09834 0.09852
Time = 5 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 10 yrs	(g) (g/day) (g/day) (g/day)	51210 0.000317 0.1302 0.1305
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	51970 0.000654 0.1098 0.1104
Time = 15 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 20 yrs	(g) (g/day) (g/day) (g/day)	52310 0.000641 0.05693 0.05757
Cumulative Emissions to Air	(g)	52510

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Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g/day) (g/day) (g/day)	0.000559 0.02771 0.02827
Time = 25 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 30 yrs	(g) (g/day) (g/day) (g/day)	52640 0.000478 0.01248 0.01296
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	52740 0.000409 0.004321 0.004729
Time = 35 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 40 yrs	(g) (g/day) (g/day) (g/day)	52820 0.000353 -0.00019 0.000167
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 45 yrs	(g) (g/day) (g/day) (g/day)	52890 0.000308 -0.00272 -0.00241
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 50 yrs	(g) (g/day) (g/day) (g/day)	52940 0.000271 -0.00414 -0.00387
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater	(g) (g/day)	52980 0.000241

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Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g/day) (g/day)	-0.00492 -0.00468
Time = 55 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	53020 0.000215 -0.00531 -0.0051
Time = 60 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	53060 0.000194 -0.00547 -0.00528
Time = 65 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	53090 0.000176 -0.00549 -0.00531
Time = 70 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	53110 0.000161 -0.00542 -0.00526
Chemical Specific Input Parameters for TPH-AR10-12		
Parameter Name Units Value		
Total Soil Concentration Diffusion Coeff. in Air Diffusion Coeff. in Water Henrys Constant [Organic Carbon Part. Coeff. Lumped Chemical Decay Rate	(mg/kg) (cm^2/day (cm^2/day (mg/L) (cc/g) (1/day)	1 8640 0.864 /(mg/L)] 5.820 2510 0

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Outputs for TPH-AR10-12

Time = 1 yrs		
Cumulative Emissions to Air	(g)	40810
Advective Mass Loading Rate to Groundwater	(g/day)	1.18E-39
Diffusive Mass Loading Rate to Groundwater	(g/day)	1.16E-35
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	1.16E-35
Time = 2 yrs ====================================		
Cumulative Emissions to Air	(g)	44460
Advective Mass Loading Rate to Groundwater	(g/day)	5.61E-21
Diffusive Mass Loading Rate to Groundwater	(g/day)	1.57E-17
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	1.57E-17
Time = 3 yrs ====================================		
Cumulative Emissions to Air	(g)	46130
Advective Mass Loading Rate to Groundwater	(g/day)	9.42E-15
Diffusive Mass Loading Rate to Groundwater	(g/day)	1.48E-11
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	1.48E-11
Time = 4 yrs ====================================		
Cumulative Emissions to Air	(g)	47140
Advective Mass Loading Rate to Groundwater	(g/day)	1.17E-11
Diffusive Mass Loading Rate to Groundwater	(g/day)	1.26E-08
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	1.26E-08
Time = 5 yrs		
Cumulative Emissions to Air	(g)	47830
Advective Mass Loading Rate to Groundwater	(g/day)	8.01E-10
Diffusive Mass Loading Rate to Groundwater	(g/day)	6.56E-07
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	6.57E-07
Time = 10 yrs ====================================		
Cumulative Emissions to Air	(g)	49560
Advective Mass Loading Rate to Groundwater	(g/day)	2.82E-06
Diffusive Mass Loading Rate to Groundwater	(g/day)	0.001023

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Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	0.001026
Time = 15 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	50330 3.38E-05 0.007702 0.007736
Time = 20 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	50790 0.000104 0.01692 0.01702
Time = 25 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	51100 0.000189 0.02363 0.02381
Time = 30 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	51340 0.000267 0.02685 0.02712
Time = 35 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 40 yrs	(g) (g/day) (g/day) (g/day)	51520 0.000331 0.02743 0.02777
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	51660 0.000379 0.02641 0.02679

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Cumulative Emissions to Air	(g)	51780
Advective Mass Loading Rate to Groundwater	(g/day)	0.000411
Diffusive Mass Loading Rate to Groundwater	(g/day)	0.02454
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	0.02495
Time = 50 yrs		
		54000
Cumulative Emissions to Air	(g) (g/day)	51890 0.000432
Advective Mass Loading Rate to Groundwater	(g/day)	0.000432
Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g/day) (g/day)	0.02275
Time = 55 yrs		
Cumulative Emissions to Air	(g)	51970
Advective Mass Loading Rate to Groundwater	(g/day)	0.000444
Diffusive Mass Loading Rate to Groundwater	(g/day)	0.02001
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	0.02046
Time = 60 yrs		
Cumulative Emissions to Air	(g)	52050
Advective Mass Loading Rate to Groundwater	(g/day)	0.000449
Diffusive Mass Loading Rate to Groundwater	(g/day)	0.01779
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	0.01824
Time = 65 yrs		
	()	50400
Cumulative Emissions to Air	(g)	52120
Advective Mass Loading Rate to Groundwater	(g/day)	0.000449
Diffusive Mass Loading Rate to Groundwater	(g/day)	0.01572
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	0.01617
Time = 70 yrs		
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Cumulative Emissions to Air	(g)	52180
Advective Mass Loading Rate to Groundwater	(g/day)	0.000446
Diffusive Mass Loading Rate to Groundwater	(g/day)	0.01384
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	0.01428

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Chemical Specific Input Parameters for TPH-AR12-16

Parameter Name Units Value		
Total Soil Concentration Diffusion Coeff. in Air Diffusion Coeff. in Water Henrys Constant [Organic Carbon Part. Coeff. Lumped Chemical Decay Rate	(mg/kg) (cm^2/day (cm^2/day (mg/L) (cc/g) (1/day)	1 8640 0.864 /(mg/L)] 2.250 5010 0
Outputs for TPH-AR12-16		
Time = 1 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 2 yrs	(g) (g/day) (g/day) (g/day)	27640 0 0 0
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	33950 0 0 0
Time = 3 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	37170 2.94E-66 4.68E-62 0
Time = 4 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	39200 2.26E-50 1.55E-46 0

Time = 5 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	4063 7.86E-4 3.15E-3 3.15E-3
Time = 10 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	4432 1.05E-2 1.18E-1 1.18E-1
Time = 15 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	4600 2.49E-1 1.56E-1 1.56E-1
Time = 20 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	4702 3.68E-1 1.58E-0 1.59E-0
Time = 25 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	4771 2.81E-1 9.15E-0 9.18E-0
Time ≈ 30 yrs ====================================	-	
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	4823 4.88E-0 1.28E-0 1.28E-0
Time – 35 vrs		

Time = 35 yrs

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Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	48640 3.65E-08 7.94E-06 7.98E-06
Time = 40 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 45 yrs	(g) (g/day) (g/day) (g/day)	48960 1.61E-07 3E-05 3.02E-05
Time = 45 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	49230 5.03E-07 8.16E-05 8.21E-05
Time = 50 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	49460 1.23E-06 0.000177 0.000178
Time = 55 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	49660 2.52E-06 0.000325 0.000328
Time = 60 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	49830 4.55E-06 0.00053 0.000535

Time = 65 yrs

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Cumulative Emissions to Air	(g)	49980
Advective Mass Loading Rate to Groundwater	(g/day)	7.42E-06
Diffusive Mass Loading Rate to Groundwater	(g/day)	0.000788
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	0.000796
Time = 70 yrs		
Cumulative Emissions to Air	(g)	50120
Advective Mass Loading Rate to Groundwater	(g/day)	1.12E-05
Diffusive Mass Loading Rate to Groundwater	(g/day)	0.001093
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	0.001104
Chemical Specific Input Parameters for TPH-AR16-21		
Parameter Name Units Value		
Total Soil Concentration	(mg/kg)	1
Diffusion Coeff. in Air	(cm^2/day	8640
Diffusion Coeff. in Water	(cm ² /day	
Henrys Constant [(mg/L)	/(mg/L)] .5400
Organic Carbon Part. Coeff.	(cc/g)	1.58E+04
Organic Carbon Part. Coeff. Lumped Chemical Decay Rate	(cc/g) (1/day)	1.58E+04 0
-	• •••	_
Lumped Chemical Decay Rate	• •••	_
Lumped Chemical Decay Rate Outputs for TPH-AR16-21 Time = 1 yrs	(1/day)	0
Lumped Chemical Decay Rate Outputs for TPH-AR16-21 Time = 1 yrs Cumulative Emissions to Air	(1/day) (g)	0 8307
Lumped Chemical Decay Rate Outputs for TPH-AR16-21 Time = 1 yrs ====================================	(1/day) (g) (g/day)	0 8307 0
Lumped Chemical Decay Rate Outputs for TPH-AR16-21 Time = 1 yrs Cumulative Emissions to Air	(1/day) (g)	0 8307
Lumped Chemical Decay Rate Outputs for TPH-AR16-21 Time = 1 yrs Time = 1 yrs Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(1/day) (g) (g/day) (g/day)	0 8307 0 0
Lumped Chemical Decay Rate Outputs for TPH-AR16-21 Time = 1 yrs ====================================	(1/day) (g) (g/day) (g/day)	0 8307 0 0
Lumped Chemical Decay Rate Outputs for TPH-AR16-21 Time = 1 yrs Time = 1 yrs Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 2 yrs	(1/day) (g) (g/day) (g/day) (g/day)	0 8307 0 0
Lumped Chemical Decay Rate Outputs for TPH-AR16-21 Time = 1 yrs Time = 1 yrs Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 2 yrs Cumulative Emissions to Air	(1/day) (g) (g/day) (g/day) (g/day)	0 8307 0 0
Lumped Chemical Decay Rate Outputs for TPH-AR16-21 Time = 1 yrs Time = 1 yrs Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 2 yrs Cumulative Emissions to Air Advective & Diffusive Mass Loading Rate to Groundwater Time = 2 yrs Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater	(1/day) (g) (g/day) (g/day) (g/day) (g/day)	0 8307 0 0 0 11790
Lumped Chemical Decay Rate Outputs for TPH-AR16-21 Time = 1 yrs Time = 1 yrs Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 2 yrs Cumulative Emissions to Air	(1/day) (g) (g/day) (g/day) (g/day) (g/day)	0 8307 0 0 0 11790 0

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Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	14440 0 0 0
Time = 4 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 5 yrs	(g) (g/day) (g/day) (g/day)	16630 0 0 0
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	18500 0 0 0
Time = 10 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 15 yrs	(g) (g/day) (g/day) (g/day)	24940 0 0 0
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	28820 0 0 0
Time = 20 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 25 yrs	(g) (g/day) (g/day) (g/day)	31460 0 0 0

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Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	33410 0 0 0
Time = 30 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	34910 0 0 0
Time = 35 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	36130 1.56E-74 8.9E-71 0
Time = 40 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	37130 1.3E-65 4.68E-62 0
Time = 45 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	37980 1.14E-58 2.84E-55 0
Time = 50 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	38710 4.08E-53 7.59E-50 0
Time = 55 yrs		
Cumulative Emissions to Air	(g)	39340

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Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g/day) (g/day) (g/day)	1.44E-48 2.09E-45 1.4E-45
Time = 60 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	39900 8.89E-45 1.04E-41 1.05E-41
Time = 65 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	40400 1.44E-41 1.41E-38 1.41E-38
Time = 70 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Chemical Specific Input Parameters for TPH-AR21-35	(g) (g/day) (g/day) (g/day)	40840 8.12E-39 6.75E-36 6.76E-36
Parameter Name Units Value		
Total Soil Concentration Diffusion Coeff. in Air Diffusion Coeff. in Water Henrys Constant [Organic Carbon Part. Coeff. Lumped Chemical Decay Rate	(mg/kg) (cm^2/day (cm^2/day (mg/L) (cc/g) (1/day)	1 8640 0.864 /(mg/L)] .2830E-01 1.26E+05 0
Outputs for TPH-AR21-35		
Time = 1 yrs		
Cumulative Emissions to Air	(g)	579

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Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g/day) (g/day) (g/day)	0 0 0
Time = 2 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 3 yrs	(g) (g/day) (g/day) (g/day)	857.2 0 0 0
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 4 yrs	(g) (g/day) (g/day) (g/day)	1071 0 0 0
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 5 yrs	(g) (g/day) (g/day) (g/day)	1252 0 0 0
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 10 yrs	(g) (g/day) (g/day) (g/day)	1411 0 0 0
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 15 yrs	(g) (g/day) (g/day) (g/day)	2035 0 0 0
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater	(g) (g/day)	2512 0

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Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g/day) (g/day)	0 0
Time = 20 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	2913 0 0 0
Time = 25 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 30 yrs	(g) (g/day) (g/day) (g/day)	3266 0 0 0
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	3584 0 0 0
Time = 35 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 40 yrs	(g) (g/day) (g/day) (g/day)	3876 0 0 0
Cumulative Emissions to Air	(g)	4147
Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g/day) (g/day) (g/day)	0 0 0
Time = 45 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day)	4401 0 0

Page 40

Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	0
Time = 50 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	4640 0 0 0
Time = 55 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	4868 0 0 0
Time = 60 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 65 yrs	(g) (g/day) (g/day) (g/day)	5085 0 0 0
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	5293 0 0 0
Time = 70 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	5493 0 0 0

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AT123D Output File Analysis for Example Problem

Chemicals in the analysis TPH-AR08-10 TPH-AR10-12 TPH-AR12-16 TPH-AR16-21 TPH-AR21-35

Number of years simulated: 70

GENERAL INPUT DATA

NO. OF POINTS IN X-DIRECTION NO. OF POINTS IN Y-DIRECTION NO. OF POINTS IN Z-DIRECTION NO. OF POINTS IN Z-DIRECTION NO. OF ROOTS: NO. OF SERIES TERMS NO. OF BEGINNING TIME STEPS NO. OF ENDING TIME STEP NO. OF TIME INTERVALS FOR PRINTED OUT SOLUTION INSTANTANEOUS SOURCE CONTROL = 0 FOR INSTANT SOURCE SOURCE CONDITION CONTROL = 0 FOR STEADY SOURCE INTERMITTENT OUTPUT CONTROL = 0 NO SUCH OUTPUT CASE CONTROL =1 THERMAL, = 2 FOR CHEMICAL, = 3 RAD 2	1	1 10 1000 1 70 1 70 1
X-COORDINATE OF RECEPTOR WELL (METERS) Y-COORDINATE OF RECEPTOR WELL (METERS) AQUIFER DEPTH, = 0.0 FOR INFINITE DEEP (METERS) AQUIFER WIDTH, = 0.0 FOR INFINITE WIDE (METERS) BEGIN POINT OF X-SOURCE LOCATION (METERS) END POINT OF X-SOURCE LOCATION (METERS) BEGIN POINT OF Y-SOURCE LOCATION (METERS) END POINT OF Y-SOURCE LOCATION (METERS) BEGIN POINT OF Y-SOURCE LOCATION (METERS) BEGIN POINT OF Z-SOURCE LOCATION (METERS) BEGIN POINT OF Z-SOURCE LOCATION (METERS) END POINT OF Z-SOURCE LOCATION (METERS)		1.83E+02 5.80E+01 3.05E+00 0.00E+00 3.66E+02 0.00E+00 1.16E+02 0.00E+00 0.00E+00
POROSITY HYDRAULIC CONDUCTIVITY (METER/YEAR) HYDRAULIC GRADIENT LONGITUDINAL DISPERSIVITY (METER) LATERAL DISPERSIVITY (METER) VERTICAL DISPERSIVITY (METER)		3.50E-01 3.15E+01 2.00E-02 0.00E+00 0.00E+00 0.00E+00
BULK DENSITY OF THE SOIL (KG/M**3) TIME INTERVAL SIZE FOR THE DESIRED SOLUTION (YR) DISCHARGE TIME (YR)		1.80E+03 1.00E+00 7.00E+01

INPUT DATA/RESULTS FOR CHEMICAL: TPH-AR08-10

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DISTRIBUTI	E RELEASE ON COEFFI	E (KG) VALID FOR INST CASE ONLY CIENT, KD (M**3/KG) N COEFFICIENT (M**2/YR) YR) DURCE RELEASE RATE	1.00E+00 3.18E-02
MOLECULA	R DIFFUSIO	N COEFFICIENT (M**2/YR)	3.15E-02
DECAY CON	ISTANT (1/	YR)	0.00E+00
LIST OF TRA	ANSIENT SC	DURCE RELEASE RATE	
.301E-05	.282E-02	.179E-01 .360E-01 .476E-01	
.522E-01	.520E-01	.491E-01 .449E-01 .403E-01	
		.276E-01 .241E-01 .210E-01	
		.138E-01 .119E-01 .103E-01	
		.655E-02 .558E-02 .473E-02	
.398E-02	.331E-02	.272E-02 .219E-02 .173E-02	
.131E-02	.943E-03	.615E-03 .322E-03 .609E-04	
.000E+00	.000E+00	.000E+00 .000E+00 .000E+00	
.000E+00	.000E+00	.000E+00 .000E+00 .000E+00	
.000E+00	.000E+00	.000E+00 .000E+00 .000E+00	
		.000E+00 .000E+00 .000E+00	
		.000E+00 .000E+00 .000E+00	۰.
		.000E+00 .000E+00 .000E+00	
.000E+00	.000E+00	.000E+00 .000E+00	
		۲	1.65E+02
RETARDED	SEEPAGE \	/ELOCITY (M/YR)	1.09E-02
		NAL DISPERSION COEF. (M**2/YR)	
RETARDED	LATERAL D	ISPERSION COEFFICIENT (M**2/YR).	5.48E-04
RETARDED	VERTICAL I	DISPERSION COEFFICIENT (M**2/YR).	5.48E-04
tine e frant -	1.00	avg. conc. [mg/l] = .000E+00	
time [yr] =	1.00	avg. conc. [mg/]000E+00	
time [yr] =	5.00	avg. conc. [mg/l] = .577E-04	
time [yr] =	10.0		
		avg. conc. [mg/l] = .176E-03	
time [yr] =	15.0	avg. conc. [mg/l] = .176E-03 avg. conc. [mg/l] = .204E-03	
time [yr] =	15.0	avg. conc. [mg/l] = .204E-03	
time [yr] = time [yr] =			
time [yr] =	20.0	avg. conc. [mg/l] = .204E-03 avg. conc. [mg/l] = .187E-03	
	20.0	avg. conc. [mg/l] = .204E-03	
time [yr] = time [yr] =	20.0 25.0	avg. conc. [mg/l] = .204E-03 avg. conc. [mg/l] = .187E-03 avg. conc. [mg/l] = .170E-03	
time [yr] =	20.0 25.0	avg. conc. [mg/l] = .204E-03 avg. conc. [mg/l] = .187E-03	· · ·
time [yr] = time [yr] = time [yr] =	20.0 25.0 30.0	avg. conc. [mg/l] = .204E-03 avg. conc. [mg/l] = .187E-03 avg. conc. [mg/l] = .170E-03 avg. conc. [mg/l] = .153E-03	
time [yr] = time [yr] =	20.0 25.0 30.0	avg. conc. [mg/l] = .204E-03 avg. conc. [mg/l] = .187E-03 avg. conc. [mg/l] = .170E-03	
time [yr] = time [yr] = time [yr] = time [yr] =	20.0 25.0 30.0 35.0	avg. conc. [mg/l] = .204E-03 avg. conc. [mg/l] = .187E-03 avg. conc. [mg/l] = .170E-03 avg. conc. [mg/l] = .153E-03 avg. conc. [mg/l] = .140E-03	· · · · · · · · · · · · · · · · · · ·
time [yr] = time [yr] = time [yr] =	20.0 25.0 30.0 35.0	avg. conc. [mg/l] = .204E-03 avg. conc. [mg/l] = .187E-03 avg. conc. [mg/l] = .170E-03 avg. conc. [mg/l] = .153E-03	· · ·
time [yr] = time [yr] = time [yr] = time [yr] = time [yr] =	20.0 25.0 30.0 35.0 40.0	avg. conc. [mg/l] = .204E-03 avg. conc. [mg/l] = .187E-03 avg. conc. [mg/l] = .170E-03 avg. conc. [mg/l] = .153E-03 avg. conc. [mg/l] = .140E-03 avg. conc. [mg/l] = .131E-03	· · · · ·
time [yr] = time [yr] = time [yr] = time [yr] =	20.0 25.0 30.0 35.0 40.0	avg. conc. [mg/l] = .204E-03 avg. conc. [mg/l] = .187E-03 avg. conc. [mg/l] = .170E-03 avg. conc. [mg/l] = .153E-03 avg. conc. [mg/l] = .140E-03	
time [yr] = time [yr] = time [yr] = time [yr] = time [yr] =	20.0 25.0 30.0 35.0 40.0 45.0	avg. conc. [mg/l] = .204E-03 avg. conc. [mg/l] = .187E-03 avg. conc. [mg/l] = .170E-03 avg. conc. [mg/l] = .153E-03 avg. conc. [mg/l] = .140E-03 avg. conc. [mg/l] = .131E-03	

 $(1,2,2) \in \mathbb{R}^{n}$

 $C \in \mathcal{C}(X, X) \to \mathbb{C}^{n}$

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 $(M_{1},\dots,M_{n})^{*}(0,0)$

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time [yr] =	55.0	avg. conc. [mg/l] =	.118E-03
time [y r] =	60.0	avg. conc. [mg/l] =	.116E-03
time [yr] =	65.0	avg. conc. [mg/l] =	.113E-03
time [yr] =	70.0	avg. conc. [mg/l] =	.112E-03

INPUT DATA/RESULTS FOR CHEMICAL: TPH-AR10-12

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DISTRIBUT	ION COEFF	ICIENT, KD DN COEFFI	(M**3/KG) CIENT	(M**2/YR)	1.00E+00 5.02E-02 3.15E-02 0.00E+00
LIST OF TR	ANSIENT S	OURCE RE	LEASE RA	TE	
.7276-33			.4012-00	.2402-00	
	.184E-04				
	.108E-02				
	.421E-02				
	.736E-02				
	.932E-02			.990E-02	
	.101E-01				
	.100E-01			.978E-02	
	.953E-02			.911E-02	
	.879E-02			.830E-02	
	.797E-02				
	.714E-02				
	.635E-02			.590E-02	
.576E-02	.562E-02	.548E-02	.535E-02		
RETARDAT	ION FACTO	R	•••••		2.59E+02 6.95E-03 3.48E-04
RETARDED	SEEPAGE	VELOCITY	(M/YR)		6.95E-03
RETARDED	LONGITUD	INAL DISPE	ERSION CC)EF. (M**2/YR)	3.48E-04
RETARDED	LATERAL	DISPERSIO	N COEFFIC	(IENT (M**2/YR) .	3.48E-04
RETARDED	VERTICAL	DISPERSIC	ON COEFFI	CIENT (M**2/YR).	3.48E-04
time [yr] =	1.00	а	vg. conc. [m	ng/l] = .000E+00	
time [yr] =	5.00	a	vg. conc. [m	ng/l] = .000E+00	
time [yr] =	10.0	а	vg. conc. [m	ng/l] = .173E-06	
time [yr] =				ng/l] = .394E-05	
time [yr] =				ng/l] = .130E-04	
time [yr] =	25.0	a	vg. conc. [m	ng/l] = .278E-04	

time [yr] =	30.0	avg. conc. [mg/l] =	.397E-04
time [yr] =	35.0	avg. conc. [mg/l] =	.533E-04
time [yr] =	40.0	avg. conc. [mg/l] =	.609E-04
time [yr] =	45.0	avg. conc. [mg/l] =	.697E-04
time [yr] =	50.0	avg. conc. [mg/l] =	.733E-04
time [yr] =	55.0	avg. conc. [mg/l] =	.784E-04
time [yr] =	60.0	avg. conc. [mg/l] =	.796E-04
time [yr] =	65.0	avg. conc. [mg/l] =	.824E-04
time [yr] =	70.0	avg. conc. [mg/l] =	.824E-04

INPUT DATA/RESULTS FOR CHEMICAL: TPH-AR12-16

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INST. WASTE RELEASE (KG) VALID FOR INST CASE ONLY DISTRIBUTION COEFFICIENT, KD (M**3/KG) MOLECULAR DIFFUSION COEFFICIENT (M**2/YR) DECAY CONSTANT (1/YR) LIST OF TRANSIENT SOURCE RELEASE RATE	1.00E+00 1.00E-01 3.15E-02 0.00E+00
.000E+00 .000E+00 .000E+00 .561E-46 .115E-36	
.183E-30 .487E-26 .101E-22 .378E-20 .429E-18	
.205E-16 .508E-15 .763E-14 .772E-13 .570E-12	
.326E-11 .151E-10 .586E-10 .196E-09 .579E-09	
.153E-08 .371E-08 .826E-08 .172E-07 .335E-07	
.619E-07 .109E-06 .184E-06 .298E-06 .467E-06	
.710E-06 .105E-05 .151E-05 .212E-05 .291E-05	
.393E-05 .520E-05 .678E-05 .870E-05 .110E-04	
.138E-04 .170E-04 .207E-04 .250E-04 .300E-04	
.355E-04 .418E-04 .492E-04 .565E-04 .650E-04	
.743E-04 .840E-04 .947E-04 .107E-03 .120E-03	
.133E-03 .147E-03 .163E-03 .178E-03 .195E-03	
.213E-03 .231E-03 .250E-03 .270E-03 .290E-03	
.312E-03 .334E-03 .356E-03 .379E-03	
RETARDED SEEPAGE VELOCITY (M/YR)	5.16E+02
RETARDED SEEPAGE VELOCITY (M/YR)	3.49E-03
RETARDED LONGITUDINAL DISPERSION COEF. (M**2/YR)	1.75E-04
RETARDED LATERAL DISPERSION COEFFICIENT (M**2/YR).	1.75E-04
RETARDED VERTICAL DISPERSION COEFFICIENT (M**2/YR).	1.75E-04
time [yr] = 1.00 avg. conc. [mg/l] = .000E+00	
time [yr] = 5.00 avg. conc. [mg/l] = .000E+00	

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time [yr] =	10.0	avg. conc. [mg/l] =	.000E+00
time [yr] =	15.0	avg. conc. [mg/l] =	.000E+00
time [yr] =	20.0	avg. conc. [mg/l] =	.000E+00
time [yr] =	25.0	avg. conc. [mg/l] =	.000E+00
time [yr] =	30.0	avg. conc. [mg/l] =	.000E+00
time [yr] =	35.0	avg. conc. [mg/l] =	.284E-08
time [yr] =	40.0	avg. conc. [mg/l] =	.121E-07
time [yr] =	45.0	avg. conc. [mg/l] =	.438E-07
time [yr] =	50.0	avg. conc. [mg/l] =	.103E-06
time [yr] =	55.0	avg. conc. [mg/l] =	.235E-06
time [yr] =	60.0	avg. conc. [mg/l] =	.408E-06
time [yr] =	65.0	avg. conc. [mg/l] =	.720E-06
time [yr] =	70.0	avg. conc. [mg/l] =	.105E-05

INPUT DATA/RESULTS FOR CHEMICAL: TPH-AR16-21

INST. WASTE RELEASE (KG) VALID FOR INST CASE ONLY DISTRIBUTION COEFFICIENT, KD (M**3/KG) MOLECULAR DIFFUSION COEFFICIENT (M**2/YR) DECAY CONSTANT (1/YR) LIST OF TRANSIENT SOURCE RELEASE RATE	
.000E+00 .000E+00 .000E+00 .000E+00 .000E+00	
.000E+00 .140E-47 .154E-46 .115E-45 .762E-45	
.473E-44 .275E-43 .151E-42 .779E-42 .381E-41	
.177E-40 .783E-40 .330E-39 .133E-38 .513E-38	
.190E-37 .678E-37 .233E-36 .771E-36	

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RETARDATION FACTOR	1.63E+03
RETARDED SEEPAGE VELOCITY (M/YR)	1.11E-03
RETARDED LONGITUDINAL DISPERSION COEF. (M**2/YR)	5.54E-05
RETARDED LATERAL DISPERSION COEFFICIENT (M**2/YR)	5.54E-05
RETARDED VERTICAL DISPERSION COEFFICIENT (M**2/YR).	5.54E-05

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time [yr] =	1.00	avg. conc. [mg/l] =	.000E+00
time [yr] =	5.00	avg. conc. [mg/l] =	.000E+00
time [yr] =	10.0	avg. conc. [mg/l] =	.000E+00
time [yr] =	15.0	avg. conc. [mg/l] =	.000E+00
time [yr] =	20.0	avg. conc. [mg/l] =	.000E+00
time [yr] =	25.0	avg. conc. [mg/l] =	.000E+00
time [yr] =	30.0	avg. conc. [mg/l] =	.000E+00
time [yr] =	35.0	avg. conc. [mg/l] =	.000E+00
time [yr] =	40.0	avg. conc. [mg/l] =	.000E+00
time [yr] =	45.0	avg. conc. [mg/l] =	.000E+00
time [yr] =	50.0	avg. conc. [mg/l] =	.000E+00
time [yr] =	55.0	avg. conc. [mg/l] =	.000E+00
time [yr] =	60.0	avg. conc. [mg/l] =	.000E+00
time [yr] =	65.0	avg. conc. [mg/l] =	.000E+00
time [yr] =	70.0	avg. conc. [mg/l] =	.000E+00

INPUT DATA/RESULTS FOR CHEMICAL: TPH-AR21-35

INST. WASTE RELEASE (KG) VALID FOR INST CASE ONLY			1.00E+00
DISTRIBUTION COEFFICIENT, KD (M**3/KG)			2.52E+00
MOLECULAR DIFFUSION	COEFFICIENT	(M**2/YR)	3.15E-02
DECAY CONSTANT (1/YR	.)		0.00E+00
LIST OF TRANSIENT SOURCE RELEASE RATE			
.000E+00 .000E+00 .	000E+00 .000	E+00 .000E+00	
.000E+00 .000E+00 .	000E+00 .000	E+00 .000E+00	
.000E+00 .000E+00 .	000E+00 .000	E+00 .000E+00	
.000E+00 .000E+00 .	000E+00 .000	E+00 .000E+00	
.000E+00 .000E+00 .	000E+00 .000	E+00 .000E+00	

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.000E+00 .000E+00 .000E+00 .000E+00 .000E+00 .000E+00 .000E+00 RETARDAT	.000E+00 .000E+00 .000E+00 .000E+00 .000E+00 .000E+00 .000E+00 .000E+00 ION FACTOR SEEPAGE VI	.000E+00 .000E+00 .000E+00 .000E+00 .000E+00 .000E+00	.000E+00 .000E+00 .000E+00 .000E+00 .000E+00 .000E+00 .000E+00	.00 .00 .00 .00 .00	0E+00 0E+00 0E+00	1.30E+04 1.39E-04
RETARDED	LONGITUDIN	IAL DISPER	SION COEF.	. (M	I**2/YR) M**2/YR)	6.95E-06 6.95E-06
	VERTICAL D					
time [yr] =	1.00	avg	. conc. [mg/l]	=	.000E+00	
time [yr] =	5.00	avg	. conc. [mg/l]	=	.000E+00	
time [yr] =	10.0	avg	. conc. [mg/l]	=	.000E+00	
time [yr] =	15.0	avg	. conc. [mg/l]	=	.000E+00	
time [yr] =	20.0	avg	. conc. [mg/l]	=	.000E+00	
time [yr] =	25.0	avg	. conc. [mg/l]	=	.000E+00	
time [yr] =	30.0	avg	. conc. [mg/l]	=	.000E+00	
time [yr] =	35.0	avg	. conc. [mg/l]	=	.000E+00	
time [yr] =	40.0	avg	. conc. [mg/l]	=	.000E+00	
time [yr] =	45.0	avg	. conc. [mg/l]	=	.000E+00	
time [yr] =	50.0	avg.	. conc. [mg/l]	=	.000E+00	
time [yr] =	55.0	avg.	conc. [mg/l]	=	.000E+00	
time [yr] =	60.0	avg.	conc. [mg/l]	=	.000E+00	
time [yr] =	65.0	avg.	conc. [mg/l]	=	.000E+00	
time [yr] =	70.0	avg.	conc. [mg/l]	= .	.000E+00	

 $\mathcal{L}_{\mathcal{M}}(\mathcal{M}) = \mathcal{L}$ A.C.A. $(g_{1}, g_{2}) \in \mathcal{M}_{1}^{1}$ $\{p_i\}_{i=1}^{N} \in \mathbb{Z}^{n} \setminus \{p_i\}$ $\{i_1,\dots,i_n\}$ 12.54 (1).54C (SC 1997) 1000-0000 1994 A. 18 M 2007 BARK AV 1.00 1.28.20 W. 199

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*** COMMON INPUT PARAMETERS ***

PARAMETER NAME

UNITS VALUE

Porosity	(cc/cc)	0.25
Bulk Density	(g/cc)	1.8
Water Content	(cc/cc)	0.1
Fractional Organic Carbon	(mg/mg)	2.00E-02
Incorporation Depth	(cm)	66.7
Clean Soil Thickness	(cm)	0
Simulation Time	(yrs)	70
Length of Soil Column	(cm)	1470
Infiltration Rate	(cm/day)	5.19E-02
Source Length	(m)	366
Source Width	(m)	116
Boundary Layer Thickness	(cm)	5

Chemical Specific Input Parameters for TPH-AL05-06

Parameter Name Units Value

Total Soil Concentration	(mg/kg)	1
Diffusion Coeff. in Air	(cm^2/day	8640
Diffusion Coeff. in Water	(cm^2/day	0.864
Henrys Constant [(mg/L)	/(mg/L)] 1410.
Organic Carbon Part. Coeff.	(cc/g)	794
Lumped Chemical Decay Rate	(1/day)	0

Outputs for TPH-AL05-06

Time = 1 yrs

Cumulative Emissions to Air	(g)	52620
Advective Mass Loading Rate to Groundwater	(g/day)	0.000151
Diffusive Mass Loading Rate to Groundwater	(g/day)	0.7064
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	0.7065

Time = 2 yrs

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Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	53030 8.87E-05 0.002569 0.002658
Time = 3 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater	(g) (g/day)	53210 5.72E-05
Diffusive Mass Loading Rate to Groundwater	(g/day)	-0.08651
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	-0.08645
Time = 4 yrs		
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Cumulative Emissions to Air	(g) (g/day)	53320 4.04E-05
Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater	(g/day) (g/day)	-0.09226
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	-0.09222
Time = 5 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater	(g) (g/day)	53390 3.05E-05
Diffusive Mass Loading Rate to Groundwater	(g/day) (g/day)	-0.0835
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	-0.08347
Time = 10 yrs		
Cumulative Emissions to Air	(g)	53580
Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater	(g/day) (g/day)	1.19E-05 -0.04365
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	-0.04364
Time = 15 yrs		
Cumulative Emissions to Air	(g)	53660
Advective Mass Loading Rate to Groundwater	(g/day) (g/day)	6.71E-06 -0.02664
Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g/day) (g/day)	-0.02663
Time = 20 yrs		
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Cumulative Emissions to Air	(g)	53710

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Advective Mass Loading Rate to Groundwater	(g/day)	4.43E-06
Diffusive Mass Loading Rate to Groundwater	(g/day)	-0.01828
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	-0.01827
Time = 25 yrs		
Cumulative Emissions to Air	(g)	53740
Advective Mass Loading Rate to Groundwater	(g/day)	3.21E-06
Diffusive Mass Loading Rate to Groundwater	(g/day)	-0.0135
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	-0.0135
Time = 30 yrs		
Cumulative Emissions to Air	(g)	53760
Advective Mass Loading Rate to Groundwater	(g/day)	2.46E-06
Diffusive Mass Loading Rate to Groundwater	(g/day)	-0.01049
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	-0.01049
Time = 35 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 40 yrs	(g) (g/day) (g/day) (g/day)	53780 1.96E-06 -0.00845 -0.00845
Cumulative Emissions to Air	(g)	53800
Advective Mass Loading Rate to Groundwater	(g/day)	1.61E-06
Diffusive Mass Loading Rate to Groundwater	(g/day)	-0.007
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	-0.007
Time = 45 yrs ====================================		
Cumulative Emissions to Air	(g)	53810
Advective Mass Loading Rate to Groundwater	(g/day)	1.35E-06
Diffusive Mass Loading Rate to Groundwater	(g/day)	-0.00591
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	-0.00591
Time = 50 yrs ====================================		
Cumulative Emissions to Air	(g)	53820
Advective Mass Loading Rate to Groundwater	(g/day)	1.16E-06

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Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g/day) (g/day)	-0.00508 -0.00508
Time = 55 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	53830 1E-06 -0.00443 -0.00443
Time = 60 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 65 yrs	(g) (g/day) (g/day) (g/day)	53840 8.83E-07 -0.00391 -0.00391
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 70 yrs	(g) (g/day) (g/day) (g/day)	53840 7.84E-07 -0.00348 -0.00348
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Chemical Specific Input Parameters for TPH-AL06-08	(g) (g/day) (g/day) (g/day)	53850 7.02E-07 -0.00312 -0.00312
Parameter Name Units Value		
Total Soil Concentration Diffusion Coeff. in Air Diffusion Coeff. in Water Henrys Constant [Organic Carbon Part. Coeff. Lumped Chemical Decay Rate	(mg/kg) (cm^2/day (cm^2/day (mg/L) / (cc/g) (1/day)	1 8640 0.864 (mg/L)] 2120. 3980 0

Outputs for TPH-AL06-08

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Time = 1 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	52440 8.55E-05 0.9369 0.937
Time = 2 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	52900 5.79E-05 0.1146 0.1147
Time = 3 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	53110 3.91E-05 -0.03866 -0.03862
Time = 4 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	53230 2.83E-05 -0.06989 -0.06986
Time = 5 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 10 yrs	(g) (g/day) (g/day) (g/day)	53310 2.16E-05 -0.07254 -0.07252
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day)	53520 8.71E-06 -0.04462

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Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	-0.04461
Time = 15 yrs		
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Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	53610 4.95E-06 -0.02828 -0.02827
Time = 20 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	53660 3.29E-06 -0.01974 -0.01973
Time = 25 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	53700 2.38E-06 -0.01473 -0.01473
Time = 30 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	53730 1.83E-06 -0.01152 -0.01151
Time = 35 yrs		
	(a)	53750
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	1.46E-06 -0.00932 -0.00932
Time = 40 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	53770 1.2E-06 -0.00774 -0.00774

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Time =

45 yrs

Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	53780 1.01E-06 -0.00656 -0.00656
Time = 50 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	53790 8.64E-07 -0.00565 -0.00565
Time = 55 yrs ====================================		n
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	53800 7.51E-07 -0.00493 -0.00493
Time = 60 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 65 yrs	(g) (g/day) (g/day) (g/day)	53810 6.6E-07 -0.00435 -0.00435
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	53820 5.87E-07 -0.00388 -0.00388
Time = 70 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	53830 5.26E-07 -0.00349 -0.00349

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Chemical Specific Input Parameters for TPH-AL08-10

Parameter Name Units Value		
Total Soil Concentration Diffusion Coeff. in Air Diffusion Coeff. in Water Henrys Constant [Organic Carbon Part. Coeff. Lumped Chemical Decay Rate	(mg/kg) (cm^2/day (cm^2/day (mg/L) (cc/g) (1/day)	1 8640 0.864 /(mg/L)] 3410. 3.16E+04 0
Outputs for TPH-AL08-10		
Time = 1 yrs		~
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 2 yrs	(g) (g/day) (g/day) (g/day)	51610 1.62E-05 0.8716 0.8716
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	52300 2.43E-05 0.5059 0.5059
Time = 3 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	52600 2.14E-05 0.216 0.216
Time = 4 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	52790 1.77E-05 0.08435 0.08437

Time = 5 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day)	5291 1.46E-0 0.0232
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	0.0232
Time = 10 yrs		
Cumulative Emissions to Air	(g)	5322
Advective Mass Loading Rate to Groundwater	(g/day) (g/day)	6.89E-0 -0.0327
Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g/day) (g/day)	-0.0327
Time = 15 yrs ====================================		
Cumulative Emissions to Air	(g)	5336
Advective Mass Loading Rate to Groundwater	(g/day)	4.13E-0
Diffusive Mass Loading Rate to Groundwater	(g/day) (g/day)	-0.0283 -0.0283
Advective & Diffusive Mass Loading Rate to Groundwater	(giuay)	-0.0285
Time = 20 yrs		
Cumulative Emissions to Air	(g)	5344
Advective Mass Loading Rate to Groundwater	(g/day)	2.81E-0
Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g/day) (g/day)	-0.0222
Time = 25 yrs		
		5240
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater	(g) (g/day)	5349 2.07E-0
Diffusive Mass Loading Rate to Groundwater	(g/day)	-0.0177
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	-0.0177
Time = 30 yrs		
Cumulative Emissions to Air	(g)	5353
Advective Mass Loading Rate to Groundwater	(g/day)	1.61E-0
Diffusive Mass Loading Rate to Groundwater	(g/day)	-0.0144
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	-0.0144

Time = 35 yrs

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Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	53560 1.29E-06 -0.01199 -0.01199
Time = 40 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	53590 1.07E-06 -0.01016 -0.01016
Time = 45 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	53610 9.03E-07 -0.00874 -0.00874
Time = 50 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	53630 7.76E-07 -0.00762 -0.00762
Time = 55 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 60 yrs	(g) (g/day) (g/day) (g/day)	53650 6.76E-07 -0.00672 -0.00672

Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day)	53660 5.96E-07 -0.00598
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Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	53670 5.31E-07 -0.00536 -0.00536
Time = 70 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	53680 4.76E-07 -0.00485 -0.00485
Chemical Specific Input Parameters for TPH-AL10-12		
Parameter Name Units Value		
Total Soil Concentration Diffusion Coeff. in Air Diffusion Coeff. in Water Henrys Constant [Organic Carbon Part. Coeff. Lumped Chemical Decay Rate	(mg/kg) (cm^2/day (cm^2/day (mg/L) (cc/g) (1/day)	
Outputs for TPH-AL10-12		
Time = 1 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	49350 7.25E-09 0.002903 0.002903
Time = 2 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	50670 5.56E-07 0.1005 0.1005
Time = 3 yrs		

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Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	51260 1.84E-06 0.2061 0.2061
Time = 4 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 5 yrs	(g) (g/day) (g/day) (g/day)	51610 2.94E-06 0.2322 0.2322
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	51850 3.62E-06 0.2144 0.2144
Time = 10 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 15 yrs	(g) (g/day) (g/day) (g/day)	52450 3.79E-06 0.07744 0.07744
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 20 yrs	(g) (g/day) (g/day) (g/day)	52710 2.96E-06 0.02275 0.02275
1011e - 20 yis 20223222222222222222222222222222222222		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 25 yrs	(g) (g/day) (g/day) (g/day)	52870 2.31E-06 0.003073 0.003075

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Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	52980 1.84E-06 -0.00454 -0.00454
Time = 30 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 35 yrs	(g) (g/day) (g/day) (g/day)	53060 1.51E-06 -0.00752 -0.00751
222522222222222222222222222222222222222		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	53120 1.26E-06 -0.00855 -0.00855
Time = 40 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	53170 1.07E-06 -0.00872 -0.00872
Time = 45 yrs ====================================		-
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	53210 9.25E-07 -0.0085 -0.0085
Time = 50 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	53250 8.09E-07 -0.00812 -0.00812
Time = 55 yrs		
Cumulative Emissions to Air	(g)	53280

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Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g/day) (g/day) (g/day)	7.15E-07 -0.00767 -0.00767
Time = 60 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 65 yrs	(g) (g/day) (g/day) (g/day)	53300 6.38E-07 -0.00721 -0.00721

Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	53330 5.74E-07 -0.00676 -0.00676
Time = 70 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Chemical Specific Input Parameters for TPH-AL12-16	(g) (g/day) (g/day) (g/day)	53350 5.2E-07 -0.00634 -0.00634
Parameter Name Units Value		
Total Soil Concentration Diffusion Coeff. in Air Diffusion Coeff. in Water Henrys Constant [Organic Carbon Part. Coeff. Lumped Chemical Decay Rate	(mg/kg) (cm^2/day (cm^2/day (mg/L) (cc/g) (1/day)	
Outputs for TPH-AL12-16		
Time = 1 yrs		
Cumulative Emissions to Air	(g)	44340

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Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g/day) (g/day) (g/day)	4.7E-25 5.43E-18 5.43E-18
Time = 2 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time ≈ 3 yrs	(g) (g/day) (g/day) (g/day)	47070 2.38E-15 1.05E-08 1.05E-08
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	48300 3.57E-12 9.54E-06 9.54E-06
Time = 4 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 5 yrs	(g) (g/day) (g/day) (g/day)	49040 1.26E-10 0.000239 0.000239
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	49540 9.96E-10 0.001464 0.001464
Time = 10 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 15 yrs	(g) (g/day) (g/day) (g/day)	50800 4.41E-08 0.02925 0.02925
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater	(g) (g/day)	51360 1.21E-07

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Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g/day) (g/day)	0.04965 0.04965
Time = 20 yrs		

Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	51690 1.77E-07 0.05065 0.05065
Time = 25 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	51920 2.06E-07 0.04388 0.04388
Time = 30 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	52090 2.17E-07 0.03568 0.03568
Time = 35 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 40 yrs	(g) (g/day) (g/day) (g/day)	52220 2.17E-07 0.02824 0.02824
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	52320 2.11E-07 0.02208 0.02208
Time = 45 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day)	52410 2.03E-07 0.01714

Page 64

Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	0.01714
Time = 50 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	52480 1.93E-07 0.01324 0.01324
Time = 55 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	52550 1.83E-07 0.01016 0.01016
Time = 60 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	52600 1.73E-07 0.007737 0.007738
Time = 65 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	52650 1.63E-07 0.005815 0.005816
Time = 70 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	52690 1.54E-07 0.004286 0.004286

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AT123D Output File Analysis for Example Problem

Chemicals in the analysis TPH-AL05-06 TPH-AL06-08 TPH-AL08-10 TPH-AL10-12 TPH-AL12-16

Number of years simulated: 7

70

GENERAL INPUT DATA

NO. OF POINTS IN X-DIRECTION NO. OF POINTS IN Y-DIRECTION NO. OF POINTS IN Z-DIRECTION NO. OF ROOTS: NO. OF SERIES TERMS NO. OF BEGINNING TIME STEPS NO. OF ENDING TIME STEP NO. OF ENDING TIME STEP NO. OF TIME INTERVALS FOR PRINTED OUT SOLUTION		1 10 1000 1 70 1
INSTANTANEOUS SOURCE CONTROL = 0 FOR INSTANT SOURCE SOURCE CONDITION CONTROL = 0 FOR STEADY SOURCE INTERMITTENT OUTPUT CONTROL = 0 NO SUCH OUTPUT CASE CONTROL =1 THERMAL, = 2 FOR CHEMICAL, = 3 RAD 2	1	70 1
X-COORDINATE OF RECEPTOR WELL (METERS) Y-COORDINATE OF RECEPTOR WELL (METERS) AQUIFER DEPTH, = 0.0 FOR INFINITE DEEP (METERS) AQUIFER WIDTH, = 0.0 FOR INFINITE WIDE (METERS) BEGIN POINT OF X-SOURCE LOCATION (METERS) END POINT OF X-SOURCE LOCATION (METERS) BEGIN POINT OF Y-SOURCE LOCATION (METERS) END POINT OF Y-SOURCE LOCATION (METERS) BEGIN POINT OF Z-SOURCE LOCATION (METERS) BEGIN POINT OF Z-SOURCE LOCATION (METERS) END POINT OF Z-SOURCE LOCATION (METERS)		1.83E+02 5.80E+01 3.05E+00 0.00E+00 3.66E+02 0.00E+00 1.16E+02 0.00E+00 0.00E+00
POROSITY HYDRAULIC CONDUCTIVITY (METER/YEAR) HYDRAULIC GRADIENT LONGITUDINAL DISPERSIVITY (METER) LATERAL DISPERSIVITY (METER) VERTICAL DISPERSIVITY (METER)		3.50E-01 3.15E+01 2.00E-02 0.00E+00 0.00E+00 0.00E+00
BULK DENSITY OF THE SOIL (KG/M**3) TIME INTERVAL SIZE FOR THE DESIRED SOLUTION (YR) DISCHARGE TIME (YR)		1.80E+03 1.00E+00 7.00E+01

AT123D-TPH2

$\sum_{i=1}^{n-1} \sum_{j=1}^{n-1} \sum_{i=1}^{n-1} \sum_{j=1}^{n-1} \sum_{j=1}^{n-1} \sum_{i=1}^{n-1} \sum_{j=1}^{n-1} \sum_{i=1}^{n-1} \sum_{j=1}^{n-1} $
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MOLECULA	ON COEFFIC R DIFFUSIO NSTANT (1/1	CIENT, KD (I N COEFFIC	M**3/KG) IENT (f	1.00E+00 1.59E-02 3.15E-02 0.00E+00
LIST OF TR	ANSIENT SC	URCE RELI	EASE RATE			
.258E+00	.970E-03	.000E+00	.000E+00	.000E+00		
.000E+00	.000E+00	.000E+00	.000E+00	.000E+00		
.000E+00	.000E+00	.000E+00	,000E+00	.000E+00		
	.000E+00		.000E+00			
	.000E+00		.000E+00			
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	.000E+00		.000E+00			
	.000E+00			.000E+00		
	.000E+00					
	ON FACTOR					8.27E+01
RETARDED	SEEPAGE V	ELOCITY (N	//YR)			2.18E-02
RETARDED	LONGITUDI	NAL DISPER	RSION COE	F. (M**2/YR)	1.09E-03
					R).	1.09E-03
					ſŔ).	1.09E-03
				,	,	
time [yr] =	1.00	ave	g. conc. [mg/	/l] = .105E-	04	
time [yr] =	5.00	avo				
time fund a			g. conc. [mg.	/i] = .609E-	04	
time [yr] =	10.0	avç		-		
time [yr] =		avç		/[] = .427E-	04	
		avç	g. conc. [mg/	/[] = .427E-	04	
time [yr] =	15.0	avç	g. conc. [mg/	/I] = .427E- /I] = .374E-	04	
	15.0	avç	g. conc. [mg. g. conc. [mg.	/I] = .427E- /I] = .374E-	04	
time [yr] =	15.0 20.0	avç avç	g. conc. [mg. g. conc. [mg.	/I] = .427E- /I] = .374E- /I] = .349E-	04 04 04	
time [yr] =	15.0 20.0	avç avç	g. conc. [mg, g. conc. [mg, g. conc. [mg,	/I] = .427E- /I] = .374E- /I] = .349E-	04 04 04	
time [yr] =	15.0 20.0 25.0	avç avç avç	g. conc. [mg, g. conc. [mg, g. conc. [mg,	/1] = .427E- /1] = .374E- /1] = .349E- /1] = .334E-	04 04 04 04	
time [yr] = time [yr] = time [yr] =	15.0 20.0 25.0	avç avç avç	g. conc. [mg, g. conc. [mg, g. conc. [mg, g. conc. [mg,	/1] = .427E- /1] = .374E- /1] = .349E- /1] = .334E-	04 04 04 04	
time [yr] = time [yr] = time [yr] =	15.0 20.0 25.0 30.0	avç avç avç avç	g. conc. [mg, g. conc. [mg, g. conc. [mg, g. conc. [mg,	/I] = .427E- /I] = .374E- /I] = .349E- /I] = .334E- /I] = .322E-	04 04 04 04	
time [yr] = time [yr] = time [yr] = time [yr] =	15.0 20.0 25.0 30.0	avç avç avç avç avç	g. conc. [mg, g. conc. [mg, g. conc. [mg, g. conc. [mg, g. conc. [mg, g. conc. [mg,	/I] = .427E- /I] = .374E- /I] = .349E- /I] = .334E- /I] = .322E- /I] = .314E-	04 04 04 04 04	
time [yr] = time [yr] = time [yr] = time [yr] =	15.0 20.0 25.0 30.0 35.0	avç avç avç avç avç	g. conc. [mg, g. conc. [mg, g. conc. [mg, g. conc. [mg, g. conc. [mg,	/I] = .427E- /I] = .374E- /I] = .349E- /I] = .334E- /I] = .322E- /I] = .314E-	04 04 04 04 04	
time [yr] = time [yr] = time [yr] = time [yr] = time [yr] =	15.0 20.0 25.0 30.0 35.0	avç avç avç avç avç	g. conc. [mg, g. conc. [mg, g. conc. [mg, g. conc. [mg, g. conc. [mg, g. conc. [mg,	/I] = .427E- /I] = .374E- /I] = .349E- /I] = .334E- /I] = .322E- /I] = .314E-	04 04 04 04 04	
time [yr] = time [yr] = time [yr] = time [yr] = time [yr] =	15.0 20.0 25.0 30.0 35.0 40.0	avg avg avg avg avg avg	g. conc. [mg, g. conc. [mg, g. conc. [mg, g. conc. [mg, g. conc. [mg, g. conc. [mg,	 (1] = .427E- (1] = .374E- (1] = .349E- (1] = .334E- (1] = .322E- (1] = .314E- (1] = .307E- 	04 04 04 04 04 04	
time [yr] = time [yr] = time [yr] = time [yr] = time [yr] = time [yr] =	15.0 20.0 25.0 30.0 35.0 40.0	avg avg avg avg avg avg	g. conc. [mg, g. conc. [mg, g. conc. [mg, g. conc. [mg, g. conc. [mg, g. conc. [mg, g. conc. [mg,	 (1] = .427E- (1] = .374E- (1] = .349E- (1] = .334E- (1] = .322E- (1] = .314E- (1] = .307E- 	04 04 04 04 04 04	
time [yr] = time [yr] = time [yr] = time [yr] = time [yr] = time [yr] =	15.0 20.0 25.0 30.0 35.0 40.0 45.0	avg avg avg avg avg avg avg	g. conc. [mg, g. conc. [mg, g. conc. [mg, g. conc. [mg, g. conc. [mg, g. conc. [mg, g. conc. [mg,	'[] = .427E- '[] = .374E- '[] = .349E- '[] = .334E- '[] = .322E- '[] = .314E- '[] = .307E- '[] = .301E-	04 04 04 04 04 04 04	

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time [yr] =	55.0	avg. conc. [mg/l] =	.292E-04
time [yr] =	60.0	avg. conc. [mg/l] =	.289E-04
time [yr] =	65.0	avg. conc. [mg/l] =	.285E-04
time [yr] =	70.0	avg. conc. [mg/l] =	.283E-04

INPUT DATA/RESULTS FOR CHEMICAL: TPH-AL06-08

INST. WASTE RELEASE (KG) VALID FOR INST CASE ONLY DISTRIBUTION COEFFICIENT, KD (M**3/KG) MOLECULAR DIFFUSION COEFFICIENT (M**2/YR) DECAY CONSTANT (1/YR)	1.00E+00 7.96E-02 3.15E-02 0.00E+00
LIST OF TRANSIENT SOURCE RELEASE RATE	
.342E+00 .418E-01 .000E+00 .000E+00 .000E+00	
.000E+00 .000E+00 .000E+00 .000E+00	
RETARDATION FACTOR	4.10E+02
RETARDED SEEPAGE VELOCITY (M/YR)	4.39E-03
RETARDED LONGITUDINAL DISPERSION COEF. (M**2/YR)	2.20E-04
RETARDED LATERAL DISPERSION COEFFICIENT (M**2/YR) .	2.20E-04
RETARDED VERTICAL DISPERSION COEFFICIENT (M**2/YR).	2.20E-04
time [yr] = 1.00 avg. conc. [mg/l] = .280E-05	
time [yr] = 5.00 avg. conc. [mg/l] = .557E-04	
time [yr] = 10.0 avg. conc. [mg/l] = .360E-04	
time [yr] = 15.0 avg. conc. [mg/l] = .287E-04	
time [yr] = 20.0 avg. conc. [mg/l] = .246E-04	
time [yr] = 25.0 avg. conc. [mg/l] = .219E-04	

time [yr] =	30.0	avg. conc. [mg/l] =	.200E-04
time [yr] =	35.0	avg. conc. [mg/l] =	.186E-04
time [yr] =	40.0	avg. conc. [mg/l] =	.176E-04
time [yr] =	45.0	avg. conc. [mg/l] =	.168E-04
time [yr] =	50.0	avg. conc. [mg/i] =	.162E-04
time [yr] =	55.0	avg. conc. [mg/l] =	.157E-04
time [yr] =	60.0	avg. conc. [mg/l] =	.153E-04
time [yr] =	65.0	avg. conc. [mg/l] =	.150E-04
time [yr] =	70.0	avg. conc. [mg/l] =	.147E-04

INPUT DATA/RESULTS FOR CHEMICAL: TPH-AL08-10

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INST. WASTE RELEASE (KG) VALID FOR INST CASE ONLY DISTRIBUTION COEFFICIENT, KD (M**3/KG) MOLECULAR DIFFUSION COEFFICIENT (M**2/YR) DECAY CONSTANT (1/YR)			
LIST OF TRANSIENT SOURCE RELEASE RATE			
.318E+00 .185E+00 .789E-01 .308E-01 .848E-02			
.000E+00 .000E+00 .000E+00 .000E+00 .000E+00			
.000E+00 .000E+00 .000E+00 .000E+00 .000E+00			
.000E+00 .000E+00 .000E+00 .000E+00 .000E+00			
.000E+00 .000E+00 .000E+00 .000E+00 .000E+00			
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.000E+00 .000E+00 .000E+00 .000E+00 .000E+00			
.000E+00 .000E+00 .000E+00 .000E+00			
RETARDATION FACTOR	3.25E+03		
RETARDED SEEPAGE VELOCITY (M/YR)	5.54E-04		
RETARDED LONGITUDINAL DISPERSION COEF. (M**2/YR)	2.77E-05		
RETARDED LATERAL DISPERSION COEFFICIENT (M**2/YR)			
RETARDED VERTICAL DISPERSION COEFFICIENT (M**2/YR).	2.77E-05		
time [yr] = 1.00 avg. conc. [mg/l] = .329E-06			
time (where $E = 0.0$			
time [yr] = 5.00 avg. conc. [mg/l] = .605E-04			

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time [yr] =	10.0	avg. conc. [mg/l] =	.358E-04
time [yr] =	15.0	avg. conc. [mg/l] =	.279E-04
time [yr] =	20.0	avg. conc. [mg/l] =	.237E-04
time [yr] =	25.0	avg. conc. [mg/l] =	.209E-04
time [yr] =	30.0	avg. conc. [mg/l] =	.190E-04
time [yr] =	35.0	avg. conc. [mg/l] =	.175E-04
time [yr] =	40.0	avg. conc. [mg/l] =	.163E-04
time [yr] =	45.0	avg. conc. [mg/l] =	.153E-04
time [yr] =	50.0	avg. conc. [mg/l] =	.145E-04
time [yr] =	55.0	avg. conc. [mg/l] =	.138E-04
time [yr] =	60.0	avg. conc. [mg/l] =	.132E-04
time [yr] =	65.0	avg. conc. [mg/l] =	.126E-04
time [yr] =	70.0	avg. conc. [mg/l] =	.122E-04

INPUT DATA/RESULTS FOR CHEMICAL: TPH-AL10-12

INST. WASTE RELEASE (KG) VALID FOR INST CASE ONLY DISTRIBUTION COEFFICIENT, KD (M**3/KG) MOLECULAR DIFFUSION COEFFICIENT (M**2/YR) DECAY CONSTANT (1/YR)					
LIST OF TRA					
			.848E-01		
.667E-01	.548E-01	.443E-01	.355E-01	.283E-01	
.224E-01	.177E-01	.139E-01	.108E-01	.830E-02	
.626E-02	.458E-02	.320E-02	.206E-02	.112E-02	
.344E-03	.000E+00	.000E+00	.000E+00	.000E+00	
.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	
.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	
.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	
.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	
.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	
.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	
.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	
.000E+00	.000E+00	.000E+00	.000E+00	.000E+00	
.000E+00	.000E+00	.000E+00	.000E+00		

1.00E+00 5.02E+00 3.15E-02 0.00E+00 100 B

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RETARDATION FACTOR	2.58E+04
RETARDED SEEPAGE VELOCITY (M/YR)	6.97E-05
RETARDED LONGITUDINAL DISPERSION COEF. (M**2/YR)	3.49E-06
RETARDED LATERAL DISPERSION COEFFICIENT (M**2/YR) .	3.49E-06
RETARDED VERTICAL DISPERSION COEFFICIENT (M**2/YR).	3.49E-06

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time [yr] =	1.00	avg. conc. [mg/l] =	.000E+00
time [yr] =	5.00	avg. conc. [mg/l] =	.138E-04
time [yr] =	10.0	avg. conc. [mg/l] =	.190E-04
time [yr] =	15.0	avg. conc. [mg/l] =	.166E-04
time [yr] =	20.0	avg. conc. [mg/l] =	.134E-04
time [yr] =	25.0	avg. conc. [mg/l] =	.112E-04
time [yr] =	30.0	avg. conc. [mg/l] =	.983E-05
time [yr] =	35.0	avg. conc. [mg/l] =	.888E-05
time [yr] =	40.0	avg. conc. [mg/l] =	.817E-05
time [yr] =	45.0	avg. conc. [mg/l] =	.761E-05
time [yr] =	50.0	avg. conc. [mg/l] =	.715E-05
time [yr] =	55.0	avg. conc. [mg/l] =	.677E-05
time [yr] =	60.0	avg. conc. [mg/l] =	.644E-05
time [yr] =	65.0	avg. conc. [mg/l] =	.616E-05
time [yr] =	70.0	avg. conc. [mg/l] =	.591E-05

INPUT DATA/RESULTS FOR CHEMICAL: TPH-AL12-16

INST. WASTE RELEASE (KG) VALID FOR IN	ST CASE ONLY 1.00E+00
DISTRIBUTION COEFFICIENT, KD (M**3/KG) 1.00E+02
MOLECULAR DIFFUSION COEFFICIENT	(M**2/YR) 3.15E-02
DECAY CONSTANT (1/YR)	0.00E+00
LIST OF TRANSIENT SOURCE RELEASE RA	ATE
.198E-17 .382E-08 .348E-05 .872E-04	.534E-03
.164E-02 .345E-02 .575E-02 .824E-02	.107E-01
.129E-01 .147E-01 .162E-01 .173E-01	.181E-01
.186E-01 .189E-01 .189E-01 .188E-01	.185E-01
.181E-01 .177E-01 .171E-01 .166E-01	.160E-01

.154E-01	.148E-01	.142E-01	.136E-01	.1308	E-01	
		.113E-01				
	.935E-02					
	.729E-02					
	.565E-02					
	.435E-02					
	.333E-02					
	.252E-02			.2128	E-02	
	.188E-02					
	ION FACTOR					5.15E+05
RETARDED	SEEPAGE \	/ELOCITY	(M/YR)		 ∕/**2/YR)	3.49E-06
RETARDED	LONGITUDI	NAL DISP	ERSION CO	EF. (N	//**2/YR)	1.75E-07
RETARDED				IENT	(M**2/YR) .	1 75E-07
					(M**2/YR).	1.75E-07
RETARDED	VERTICALI	JISPERSI			(W Z/W).	1.752-07
time [yr] =	1.00	e	avg. conc. [m	ig/l] =	.000E+00	
			•			
time [vr] =	5.00	a	iva, conc. [m	a/l] =	.000E+00	
				5.		
time [yr] =	10.0	-	ivg. conc. [m	a/l] =	148E-06	
une [yi] –	10.0	6	wg. conc. [m	'9'']	.1402 00	
	45.0	_		~ //1 -		
time [yr] =	15.0	a	ivg. conc. [m	g/i] =	.0092-00	
time [yr] =	20.0	a	ivg. conc. [m	g/l] =	.119E-05	
time [yr] =	25.0	а	ivg. conc. [m	g/l] =	.162E-05	
time [yr] =	30.0	а	vg. conc. [m	a/l1 =	.185E-05	
		-		3.1		
time [yr] =	25.0	-	vg. conc. [m	a/II =	200E-05	
une [yi] –	35.0	d	ivg. conc. [m	g/i] –	.2002-05	
			-		000 5 05	
time [yr] =	40.0	a	vg. conc. [m	g/I] =	.203E-05	
time [yr] =	45.0	a	vg. conc. [m	g/l] =	.203E-05	
time [yr] =	50.0	а	vg. conc. [m	a/l] =	.198E-05	
		-				
time [yr] =	55.0	-	vg. conc. (m	a/11 =	1025-05	
une [yi] –	55.0	a	vg. conc. [m	9/1] -	.1922-00	
			_			
time [yr] =	60.0	a	vg. conc. [m	g/i] =	.1855-05	
time [yr] =	65.0	a	vg. conc. [m	g/l] =	.177E-05	
time [yr] =	70.0	a	vg. conc. [m	a/l] =	.170E-05	
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Jury Output File Analysis for Example Problem

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*** COMMON INPUT PARAMETERS ***

PARAMETER NAME UNITS

UNITS VALUE

Porosity	(cc/cc)	0.25
Bulk Density	(g/cc)	1.8
Water Content	(cc/cc)	0.1
Fractional Organic Carbon	(mg/mg)	2.00E-02
Incorporation Depth	(cm)	66.7
Clean Soil Thickness	(cm)	0
Simulation Time	(yrs)	70
Length of Soil Column	(cm)	1470
Infiltration Rate	(cm/day)	5.19E-02
Source Length	(m)	366
Source Width	(m)	116
Boundary Layer Thickness	(cm)	5

Chemical Specific Input Parameters for TPH-AL16-35

Parameter Name Units Value

(mg/kg) **Total Soil Concentration** 1 (cm^2/day 8640 Diffusion Coeff. in Air (cm^2/day 0.864 Diffusion Coeff. in Water /(mg/L)] .2660E+06 (mg/L) Henrys Constant [1.00E+09 (cc/g) Organic Carbon Part. Coeff. (1/day) 0 Lumped Chemical Decay Rate

Outputs for TPH-AL16-35

Time = 1 yrs

Cumulative Emissions to Air	(g)	22630
Advective Mass Loading Rate to Groundwater	(g/day)	0
Diffusive Mass Loading Rate to Groundwater	(g/day)	0
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	0

Time = 2 yrs

JURY-TPH3

Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	29310 0 0 0
Time = 3 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 4 yrs	(g) (g/day) (g/day) (g/day)	33000 0 0 0
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	35410 0 0 0
Time = 5 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	37140 2.5E-72 4.89E-63 0
Time = 10 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	41710 3.65E-40 1.21E-31 1.21E-31
Time = 15 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	43840 2.06E-29 3.3E-21 3.3E-21
Time = 20 yrs ====================================		
Cumulative Emissions to Air	(g)	45140

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JURY-TPH3

Advective Mass Loading Rate to Groundwater	(g/day)	4.96E-24
Diffusive Mass Loading Rate to Groundwater	(g/day)	5.11E-16
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	5.11E-16
Time = 25 yrs ====================================		
Cumulative Emissions to Air	(g)	46030
Advective Mass Loading Rate to Groundwater	(g/day)	8.3E-21
Diffusive Mass Loading Rate to Groundwater	(g/day)	6.26E-13
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	6.26E-13
Time = 30 yrs		
Cumulative Emissions to Air	(g)	46700
Advective Mass Loading Rate to Groundwater	(g/day)	1.15E-18
Diffusive Mass Loading Rate to Groundwater	(g/day)	6.8E-11
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	6.8E-11
Time = 35 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 40 yrs	(g) (g/day) (g/day) (g/day)	47220 3.82E-17 1.86E-09 1.86E-09
Cumulative Emissions to Air	(g)	47640
Advective Mass Loading Rate to Groundwater	(g/day)	5.21E-16
Diffusive Mass Loading Rate to Groundwater	(g/day)	2.14E-08
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	2.14E-08
Time = 45 yrs ====================================		
Cumulative Emissions to Air	(g)	47990
Advective Mass Loading Rate to Groundwater	(g/day)	3.92E-15
Diffusive Mass Loading Rate to Groundwater	(g/day)	1.4E-07
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	1.4E-07
Time = 50 yrs		
Cumulative Emissions to Air	(g)	48280
Advective Mass Loading Rate to Groundwater	(g/day)	1.94E-14

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Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g/day) (g/day)	6.1E-07 6.1E-07
Time = 55 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	48540 7.12E-14 2E-06 2E-06
Time = 60 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 65 yrs	(g) (g/day) (g/day) (g/day)	48760 2.08E-13 5.28E-06 5.28E-06
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 70 yrs	(g) (g/day) (g/day) (g/day)	48960 5.13E-13 1.18E-05 1.18E-05
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	49130 1.1E-12 2.33E-05 2.33E-05



AT123D Output File Analysis for Example Problem

Chemicals in the analysis TPH-AL16-35

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Number of years simulated: 70

GENERAL INPUT DATA

NO. OF POINTS IN X-DIRECTION NO. OF POINTS IN Y-DIRECTION NO. OF POINTS IN Z-DIRECTION NO. OF ROOTS: NO. OF SERIES TERMS NO. OF BEGINNING TIME STEPS NO. OF ENDING TIME STEP NO. OF TIME INTERVALS FOR PRINTED OUT SOLUTION INSTANTANEOUS SOURCE CONTROL = 0 FOR INSTANT SOURCE SOURCE CONDITION CONTROL = 0 FOR STEADY SOURCE INTERMITTENT OUTPUT CONTROL = 0 NO SUCH OUTPUT CASE CONTROL =1 THERMAL, = 2 FOR CHEMICAL, = 3 RAD 2	1	1 10 1000 1 70 1 70 1
X-COORDINATE OF RECEPTOR WELL (METERS) Y-COORDINATE OF RECEPTOR WELL (METERS) AQUIFER DEPTH, = 0.0 FOR INFINITE DEEP (METERS) AQUIFER WIDTH, = 0.0 FOR INFINITE WIDE (METERS) BEGIN POINT OF X-SOURCE LOCATION (METERS) END POINT OF X-SOURCE LOCATION (METERS) BEGIN POINT OF Y-SOURCE LOCATION (METERS) END POINT OF Y-SOURCE LOCATION (METERS) BEGIN POINT OF Y-SOURCE LOCATION (METERS) BEGIN POINT OF Z-SOURCE LOCATION (METERS) END POINT OF Z-SOURCE LOCATION (METERS)		1.83E+02 5.80E+01 3.05E+00 0.00E+00 3.66E+02 0.00E+00 1.16E+02 0.00E+00 0.00E+00
POROSITY HYDRAULIC CONDUCTIVITY (METER/YEAR) HYDRAULIC GRADIENT LONGITUDINAL DISPERSIVITY (METER) LATERAL DISPERSIVITY (METER) VERTICAL DISPERSIVITY (METER) VERTICAL DISPERSIVITY (METER) BULK DENSITY OF THE SOIL (KG/M**3) TIME INTERVAL SIZE FOR THE DESIRED SOLUTION (YR) DISCHARGE TIME (YR)		3.50E-01 3.15E+01 2.00E-02 0.00E+00 0.00E+00 0.00E+00 1.80E+03 1.00E+00 7.00E+01
INPUT DATA/RESULTS FOR CHEMICAL: TPH-AL16-35 INST. WASTE RELEASE (KG) VALID FOR INST CASE ONLY		1.00E+00

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DISTRIBUTION COEFFICIENT,	KD (M**3/KG) FFICIENT (M**2/YR)	2.00E+04
MOLECULAR DIFFUSION COE	FFICIENT (M**2/YR)	3.15E-02
DECAY CONSTANT (1/YR)		0.00E+00
LIST OF TRANSIENT SOURCE		
.000E+00 .000E+00 .000E		
.000E+00 .157E-44 .632E		
.312E-28 .738E-26 .749E-		
.241E-19 .337E-18 .351E-		
.102E-14 .476E-14 .194E-		
.677E-12 .185E-11 .468E-		
.526E-10 .106E-09 .205E- .117E-08 .196E-08 .319E-		
.118E-07 .175E-07 .255E-		
.703E-07 .957E-07 .128E-		
.288E-06 .369E-06 .467E-		
.899E-06 .110E-05 .133E-		
.229E-05 .271E-05 .318E-		
.499E-05 .574E-05 .657E-		
RETARDATION FACTOR		1.03E+08
RETARDED SEEPAGE VELOCI	ΤΥ (M/YR)	1.75E-08
RETARDED LONGITUDINAL DI	SPERSION COEF. (M**2/YR)	8.76E-10
RETARDED LATERAL DISPERS	SPERSION COEF. (M**2/YR) SION COEFFICIENT (M**2/YR) . SION COEFFICIENT (M**2/YR).	8.76E-10
RETARDED VERTICAL DISPER	SION COEFFICIENT (M**2/YR).	8.76E-10
time [yr] = 1.00	avg. conc. [mg/l] = .000E+00	
time [yr] = 5.00	avg. conc. [mg/l] = .000E+00	
	avg. conc. [mgn]	
time [yr] = 10.0	avg. conc. [mg/l] = .000E+00	
time [yr] = 15.0	avg. conc. [mg/l] = .000E+00	
time [yr] = 20.0	avg. conc. [mg/l] = .000E+00	
time [yr] = 25.0	avg. conc. [mg/l] = .000E+00	
time [yr] = 30.0	avg. conc. [mg/l] = .000E+00	
time [yr] = 35.0	avg. conc. [mg/l] = .000E+00	
time [yr] = 40.0	avg. conc. [mg/l] = .000E+00	
ume [91] = 40.0		
time [yr] = 45.0	avg. conc. [mg/l] = .000E+00	
time [yr] = 50.0	avg. conc. [mg/l] = .000E+00	
	5-5 (5-)	
time [yr] = 55.0	avg. conc. [mg/l] = .000E+00	
time [yr] = 60.0	avg. conc. [mg/l] = .000E+00	

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time [yr] =	65.0	avg. conc. [mg/l] =	.000E+00
time [yr] =	70.0	avg. conc. [mg/l] =	.000E+00

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Jury Output File Analysis for Example Problem

PARAMETER NAME

*** COMMON INPUT PARAMETERS ***

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Porosity	(cc/cc)	0.25	
Bulk Density	(g/cc)	1.8	
Water Content	(cc/cc)	0.1	
Fractional Organic Carbon	(mg/mg)	2.00E-02	
Incorporation Depth	(cm)	66.7	
Clean Soil Thickness	<u>(cm)</u>	0	
Simulation Time	(yrs)	70	
Length of Soil Column	(cm)	1470	
Infiltration Rate	(cm/day)	5.19E-02	
Source Length	(m)	366	
Source Width	(m)	116	
Boundary Layer Thickness	(cm)	5	

UNITS VALUE

Chemical Specific Input Parameters for Benzene

Parameter Name	Units Value		
Total Soil Concentration		(mg/kg)	1
Diffusion Coeff. in Air		(cm^2/day	7517
Diffusion Coeff. in Water		(cm^2/day	0.8467
Henrys Constant [		(mg/L) /(I	mg/L)] .2490
Organic Carbon Part. Coe	eff.	(cc/g)	83
Lumped Chemical Decay	Rate	(1/day) 2	2.00E-03

Outputs for Benzene

Time = 1 yrs

Cumulative Emissions to Air	(g)	36120
Advective Mass Loading Rate to Groundwater	(g/day)	3.3E-35
Diffusive Mass Loading Rate to Groundwater	(g/day)	1E-32
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	1E-32

Time = 2 yrs

Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	37370 2.38E-18 2.16E-16 2.18E-16
Time = 3 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	37630 5.97E-13 3.07E-11 3.13E-11
Time = 4 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	37710 1.97E-10 6.98E-09 7.17E-09
Time = 5 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	37730 4.53E-09 1.22E-07 1.26E-07
Time = 10 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	37750 1.98E-07 2.32E-06 2.52E-06
Time = 15 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	37750 4.8E-08 3.43E-07 3.91E-07
Time = 20 yrs ====================================		
Cumulative Emissions to Air	(g)	37750

Advective Mass Loading Rate to Groundwater	(g/day)	3.35E-09
Diffusive Mass Loading Rate to Groundwater	(g/day)	1.67E-08
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	2E-08
Time = 25 yrs ====================================		
Cumulative Emissions to Air	(g)	37750
Advective Mass Loading Rate to Groundwater	(g/day)	1.46E-10
Diffusive Mass Loading Rate to Groundwater	(g/day)	5.4E-10
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	6.86E-10
Time = 30 yrs ====================================		
Cumulative Emissions to Air	(g)	37750
Advective Mass Loading Rate to Groundwater	(g/day)	5.07E-12
Diffusive Mass Loading Rate to Groundwater	(g/day)	1.45E-11
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	1.96E-11
Time = 35 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 40 yrs	(g) (g/day) (g/day) (g/day)	37750 1.56E-13 3.55E-13 5.11E-13
Cumulative Emissions to Air	(g)	37750
Advective Mass Loading Rate to Groundwater	(g/day)	4.49E-15
Diffusive Mass Loading Rate to Groundwater	(g/day)	8.21E-15
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	1.27E-14
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 50 yrs	(g) (g/day) (g/day) (g/day)	37750 1.23E-16 1.83E-16 3.06E-16
Cumulative Emissions to Air	(g)	37750
Advective Mass Loading Rate to Groundwater	(g/day)	3.29E-18

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# JURY-BTEX

Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g/day) (g/day)	3.99E-18 7.27E-18
Time = 55 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	37750 8.6E-20 8.51E-20 1.71E-19
Time = 60 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 65 yrs	(g) (g/day) (g/day) (g/day)	37750 2.22E-21 1.79E-21 4E-21
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 70 yrs	(g) (g/day) (g/day) (g/day)	37750 5.67E-23 3.68E-23 9.35E-23
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Chemical Specific Input Parameters for Ethylbenzene	(g) (g/day) (g/day) (g/day)	37750 1.44E-24 7.42E-25 2.18E-24
Parameter Name Units Value		
Total Soil Concentration Diffusion Coeff. in Air Diffusion Coeff. in Water Henrys Constant [ Organic Carbon Part. Coeff. Lumped Chemical Decay Rate	(mg/kg) (cm^2/day (cm^2/day (mg/L) (cc/g) (1/day)	1 5702 0.5875 /(mg/L)] .2870 1100 3.00E-03

Outputs for Ethylbenzene

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Time = 1 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	13480 0 0 0
Time = 2 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	14840 0 0 0
Time = 3 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 4 vrs	(g) (g/day) (g/day) (g/day)	15110 0 0 0
Time = 4 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 5 yrs	(g) (g/day) (g/day) (g/day)	15170 0 0 0
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	15190 0 0 0
Time = 10 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day)	15190 2.82E-56 1.81E-53

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# JURY-BTEX

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Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	0
Time = 15 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	15190 4.84E-42 1.2E-39 1.21E-39
Time = 20 yrs		
***************************************		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	15190 4.25E-36 6.15E-34 6.19E-34
Time = 25 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 30 yrs	(g) (g/day) (g/day) (g/day)	15190 1.78E-33 1.78E-31 1.79E-31
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	15190 1.6E-32 1.21E-30 1.23E-30
Time = 35 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	15190 1.6E-32 9.73E-31 9.89E-31
Time = 40 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	15190 4.06E-33 2.05E-31 2.09E-31

Time = 45 yrs

Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	15190 4.09E-34 1.76E-32 1.8E-32
Time = 50 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 55 yrs	(g) (g/day) (g/day) (g/day)	15190 2.17E-35 8.13E-34 8.35E-34
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 60 yrs	(g) (g/day) (g/day) (g/day)	15190 7.18E-37 2.38E-35 2.46E-35
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 65 yrs	(g) (g/day) (g/day) (g/day)	15190 1.67E-38 4.98E-37 5.14E-37
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 70 yrs	(g) (g/day) (g/day) (g/day)	15190 2.98E-40 8E-39 8.3E-39
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	15190 4.28E-42 1.05E-40 1.09E-40

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## Chemical Specific Input Parameters for Naphthalene

Parameter Name Units Value	
Total Soil Concentration Diffusion Coeff. in Air Diffusion Coeff. in Water Henrys Constant [ Organic Carbon Part. Coeff. Lumped Chemical Decay Rate	(mg/kg) 1 (cm^2/day 5098 (cm^2/day 0.648 (mg/L) /(mg/L)] .5780E-01 (cc/g) 1300 (1/day) 0
Outputs for Naphthalene	
Time = 1 yrs ====================================	
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 2 yrs	(g) 7108 (g/day) 0 (g/day) 0 (g/day) 0
nine – 2 yrs ====================================	
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) 10010 (g/day) 0 (g/day) 0 (g/day) 0
Time = 3 yrs	
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) 12190 (g/day) 0 (g/day) 0 (g/day) 0
Time = 4 yrs ====================================	
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) 14000 (g/day) 0 (g/day) 0 (g/day) 0

Page 8

Time = 5 yrs

Cumulative Emissions to Air	(g)	15550
Advective Mass Loading Rate to Groundwater	(g/day)	0
Diffusive Mass Loading Rate to Groundwater	(g/day)	0
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	0
Time = 10 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 15 yrs	(g) (g/day) (g/day) (g/day)	21070 0 0 0
Cumulative Emissions to Air	(g)	24530
Advective Mass Loading Rate to Groundwater	(g/day)	0
Diffusive Mass Loading Rate to Groundwater	(g/day)	0
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	0
Time = 20 yrs		
Cumulative Emissions to Air	(g)	26950
Advective Mass Loading Rate to Groundwater	(g/day)	0
Diffusive Mass Loading Rate to Groundwater	(g/day)	0
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	0
Time = 25 yrs		
Cumulative Emissions to Air	(g)	28750
Advective Mass Loading Rate to Groundwater	(g/day)	0
Diffusive Mass Loading Rate to Groundwater	(g/day)	0
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	0
Time = 30 yrs		
Cumulative Emissions to Air	(g)	30160
Advective Mass Loading Rate to Groundwater	(g/day)	0
Diffusive Mass Loading Rate to Groundwater	(g/day)	0
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	0

Time = 35 yrs

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Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	31300 0 0 0
Time = 40 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	32240 0 0 0
Time = 45 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	33040 9.19E-73 3.34E-70 0
Time = 50 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	33730 1.6E-65 4.01E-63 0
Time = 55 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	34320 1.35E-59 2.49E-57 0
Time = 60 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	34850 1.18E-54 1.67E-52 0
Time = 65 yrs		

# JURY-BTEX

Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	35320 1.79E-50 2.02E-48 0
Time = 70 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Chemical Specific Input Parameters for Toluene	(g) (g/day) (g/day) (g/day)	35740 6.87E-47 6.4E-45 7.01E-45
Parameter Name Units Value		
Total Soil Concentration Diffusion Coeff. in Air Diffusion Coeff. in Water Henrys Constant [ Organic Carbon Part. Coeff. Lumped Chemical Decay Rate	(mg/kg) (cm^2/day (cm^2/day (mg/L) (cc/g) (1/day)	0.743 /(mg/L)] .2840 300
Outputs for Toluene		
Time = 1 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	24150 0 0 0
Time = 2 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	25200 7.12E-61 8.55E-58 0
Time = 3 yrs		

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Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	25350 7.41E-42 3.06E-39 3.07E-39
Time = 4 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 5 yrs	(g) (g/day) (g/day) (g/day)	25370 1.36E-32 3.1E-30 3.11E-30
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 10 yrs	(g) (g/day) (g/day) (g/day)	25380 3.1E-27 4.74E-25 4.77E-25
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 15 yrs	(g) (g/day) (g/day) (g/day)	25380 4.32E-18 2.36E-16 2.4E-16
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 20 yrs	(g) (g/day) (g/day) (g/day)	25380 7.9E-17 2.56E-15 2.64E-15
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	25380 1.52E-17 3.47E-16 3.62E-16

Time = 25 yrs

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Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	25380 4.79E-19 8.35E-18 8.83E-18
Time = 30 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 35 yrs	(g) (g/day) (g/day) (g/day)	25380 6.15E-21 8.56E-20 9.18E-20
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	25380 4.72E-23 5.47E-22 5.94E-22
Time = 40 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 45 yrs	(g) (g/day) (g/day) (g/day)	25380 2.65E-25 2.63E-24 2.9E-24
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 50 yrs	(g) (g/day) (g/day) (g/day)	25380 1.21E-27 1.04E-26 1.17E-26
=======================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	25380 4.8E-30 3.63E-29 4.11E-29
Time = 55 yrs		
Cumulative Emissions to Air	(g)	25380

Advective Mass Loading Rate to Grou Diffusive Mass Loading Rate to Grou Advective & Diffusive Mass Loading R	ndwater	(g/day) (g/day) (g/day)	1.71E-32 1.15E-31 1.33E-31
Time = 60 yrs			
Cumulative Emissions to Air Advective Mass Loading Rate to Grou Diffusive Mass Loading Rate to Grou Advective & Diffusive Mass Loading R Time = 65 yrs	ndwater	(g) (g/day) (g/day) (g/day)	25380 5.67E-35 3.43E-34 3.99E-34
Cumulative Emissions to Air Advective Mass Loading Rate to Grou Diffusive Mass Loading Rate to Grou Advective & Diffusive Mass Loading F Time = 70 yrs	ndwater	(g) (g/day) (g/day) (g/day)	25380 1.77E-37 9.67E-37 1.14E-36
Cumulative Emissions to Air Advective Mass Loading Rate to Grou Diffusive Mass Loading Rate to Grou Advective & Diffusive Mass Loading F Chemical Specific Input Parameters	ndwater Rate to Groundwater	(g) (g/day) (g/day) (g/day)	25380 5.29E-40 2.63E-39 3.16E-39
Parameter Name Units Va	alue		
Total Soil Concentration Diffusion Coeff. in Air Diffusion Coeff. in Water Henrys Constant [ Organic Carbon Part. Coeff. Lumped Chemical Decay Rate		(mg/kg) (cm^2/day (cm^2/day (mg/L) (cc/g) (1/day)	
Outputs for Xylene			
Time = 1 yrs			

Cumulative Emissions to Air

(g)

28680

Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g/day) (g/day) (g/day)	0 0 0
Time = 2 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 3 yrs	(g) (g/day) (g/day) (g/day)	30520 9.79E-48 6.11E-45 5.61E-45
======================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	30940 1.04E-32 2.65E-30 2.66E-30
Time = 4 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	31060 2.44E-25 3.7E-23 3.72E-23
Time = 5 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	31100 4.86E-21 5.15E-19 5.2E-19
Time = 10 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 15 yrs	(g) (g/day) (g/day) (g/day)	31120 2E-13 8.14E-12 8.34E-12
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater	(g) (g/day)	31120 5.24E-12

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## JURY-BTEX

Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g/day) (g/day)	1.29E-10 1.34E-10
Time = 20 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater	(g) (g/day)	31120 3.91E-12
Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g/day) (g/day)	6.81E-11 7.2E-11
Time = 25 yrs		
Cumulative Emissions to Air	(g)	31120
Advective Mass Loading Rate to Groundwater	(g/day)	7.12E-13
Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g/day) (g/day)	9.51E-12 1.02E-11
Time = 30 yrs		
Cumulative Emissions to Air	(g)	31120
Advective Mass Loading Rate to Groundwater	(g/day)	6.45E-14
Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g/day) (g/day)	6.96E-13 7.61E-13
Time = 35 yrs ====================================		
Cumulative Emissions to Air	(g)	31120
Advective Mass Loading Rate to Groundwater	(g/day)	3.96E-15
Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g/day) (g/day)	3.53E-14 3.93E-14
Time = 40 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater	(g) (g/day)	31120 1.91E-16
Diffusive Mass Loading Rate to Groundwater	(g/day)	1.45E-15
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	1.64E-15
Time = 45 yrs ====================================		
	(a)	24400
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater	(g) (g/day)	31120 7.85E-18
Diffusive Mass Loading Rate to Groundwater	(g/day)	5.15E-17

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Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	5.93E-17
Time = 50 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 55 yrs	(g) (g/day) (g/day) (g/day)	31120 2.9E-19 1.66E-18 1.95E-18
Time = 55 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	31120 9.89E-21 5.03E-20 6.02E-20
Time = 60 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	31120 3.19E-22 1.45E-21 1.77E-21
Time = 65 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	31120 9.86E-24 4.02E-23 5.01E-23
Time = 70 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	31120 2.95E-25 1.09E-24 1.38E-24

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AT123D Output File Analysis for Example Problem

Chemicals in the analysis Benzene Ethylbenzene Naphthalene Toluene Xylene

Number of years simulated: 70

# GENERAL INPUT DATA

NO. OF POINTS IN X-DIRECTION NO. OF POINTS IN Y-DIRECTION NO. OF POINTS IN Z-DIRECTION NO. OF ROOTS: NO. OF SERIES TERMS NO. OF BEGINNING TIME STEPS NO. OF ENDING TIME STEP NO. OF TIME INTERVALS FOR PRINTED OUT SOLUTION INSTANTANEOUS SOURCE CONTROL = 0 FOR INSTANT SOURCE SOURCE CONDITION CONTROL = 0 FOR STEADY SOURCE INTERMITTENT OUTPUT CONTROL = 0 NO SUCH OUTPUT CASE CONTROL =1 THERMAL, = 2 FOR CHEMICAL, = 3 RAD 2	1	1 10 1000 1 70 1 70 1
X-COORDINATE OF RECEPTOR WELL (METERS) Y-COORDINATE OF RECEPTOR WELL (METERS) AQUIFER DEPTH, = 0.0 FOR INFINITE DEEP (METERS) AQUIFER WIDTH, = 0.0 FOR INFINITE WIDE (METERS) BEGIN POINT OF X-SOURCE LOCATION (METERS) END POINT OF X-SOURCE LOCATION (METERS) BEGIN POINT OF Y-SOURCE LOCATION (METERS) END POINT OF Y-SOURCE LOCATION (METERS) BEGIN POINT OF Y-SOURCE LOCATION (METERS) END POINT OF Z-SOURCE LOCATION (METERS) BEGIN POINT OF Z-SOURCE LOCATION (METERS) END POINT OF Z-SOURCE LOCATION (METERS)		1.83E+02 5.80E+01 3.05E+00 0.00E+00 3.66E+02 0.00E+00 1.16E+02 0.00E+00 0.00E+00
POROSITY HYDRAULIC CONDUCTIVITY (METER/YEAR) HYDRAULIC GRADIENT LONGITUDINAL DISPERSIVITY (METER) LATERAL DISPERSIVITY (METER) VERTICAL DISPERSIVITY (METER)		2.50E-01 3.15E+01 2.00E-02 0.00E+00 0.00E+00 0.00E+00
BULK DENSITY OF THE SOIL (KG/M**3) TIME INTERVAL SIZE FOR THE DESIRED SOLUTION (YR) DISCHARGE TIME (YR)		1.80E+03 1.00E+00 7.00E+01

# INPUT DATA/RESULTS FOR CHEMICAL: Benzene

	INST. WAST	E RELEASE ON COEFFI R DIFFUSIC	E (KG) VAL		ST CAS	SE ONLY	1.00E+00
			CIENT, KL	ORT (MT 3/KG)	/\/	 2/VR)	1.00E-03 3.09E-02
		ISTANT ( 1/			(10) 2		7.30E-02
		NSTANT ( 1/ ANSIENT SO	DURCE RE	LEASE RA	TE		
		.796E-16				E-07	
		.548E-06					
		.549E-06					
	.831E-07	.468E-07	.257E-07	.138E-07	.731E	E-08	
		.196E-08					
		.613E-10					
		.168E-11					
		.428E-13					
		.105E-14					
		.251E-16					
		.593E-18 .139E-19					
		.139E-19 .325E-21					
	RETARDATI			.1032-25			1.30E+01
		.759E-23 ON FACTOI SEEPAGE \ LONGITUDI		(M/YR)			1.95E-01
I	RETARDED	LONGITUD	INAL DISP	ERSION CO	DEF. (N	 //**2/YR)	9.55E-03
	RETARDED	LATERAL D	ISPERSIO			(M**2/YR) .	9.55E-03
ł	RETARDED	LATERAL D	DISPERSIO	ON COEFFI	CIENT	(M**2/YR).	9.55E-03
						, ,	
	time [yr] =	1.00	a	ivg. conc. [n	ng/l] =	.000E+00	
	time [yr] =	5.00	a	ivg. conc. [n	ng/l] =	.000E+00	
				_			
	time [yr] =	10.0	a	ivg. conc. [n	ng/I] =	.256E-08	
	there is a linear	45.0			//7		
	time [yr] =	15.0	a	vg. conc. [n	ng/i] =	.115E-08	
	timo (ur) —	20.0	а	va conc ín	og/I]	000=+00	
	time [yr] =	20.0	d	vg. conc. [n	ig/i]	.0002700	
	time [yr] =	25.0	-	vg. conc. [n	na/l] =	000E+00	
	time [M] -	20.0		ivg. conc. [n	19/11	.0002.00	
	time [yr] =	30.0	а	vg. conc. [n	na/I] =	.000E+00	
					.9.1		
	time [yr] =	35.0	а	vg. conc. [n	ng/l] =	.000E+00	
					0.		
	time [yr] =	40.0	а	vg. conc. [n	ng/l] =	.000E+00	
				•			
	time [yr] =	45.0	a	vg. conc. [n	ng/l] =	.000E+00	
	time [yr] =	50.0	а	vg. conc. [n	1g/l] =	.000E+00	

time [yr] =	55.0	avg. conc. [mg/l] =	.000E+00
time [yr] =	60.0	avg. conc. [mg/l] =	.000E+00
time [yr] =	65.0	avg. conc. [mg/l] =	.000E+00
time [yr] =	70.0	avg. conc. [mg/l] =	.000E+00

INPUT DATA/RESULTS FOR CHEMICAL: Ethylbenzene

INST. WASTE RELEASE (KG) VALID FOR INST CASE ONLY DISTRIBUTION COEFFICIENT, KD (M**3/KG) MOLECULAR DIFFUSION COEFFICIENT (M**2/YR) DECAY CONSTANT (1/YR) LIST OF TRANSIENT SOURCE RELEASE RATE .000E+00 .000E+00 .000E+00 .000E+00 .000E+00 .000E+00 .000E+00 .000E+00 .000E+00 .000E+00 .000E+00 .939E-46 .409E-43 .640E-41 .440E-39 .156E-37 .317E-36 .409E-35 .358E-34 .226E-33 .108E-32 .402E-32 .122E-31 .306E-31 .654E-31 .121E-30 .197E-30 .286E-30 .375E-30 .448E-30 .493E-30 .503E-30 .478E-30 .428E-30 .361E-30 .289E-30 .221E-30 .161E-30 .113E-30 .761E-31 .496E-31 .313E-31 .191E-31 .114E-31 .658E-32 .372E-32 .205E-32 .111E-32 .587E-33 .305E-33 .155E-33 .779E-34 .385E-34 .187E-34 .896E-35 .424E-35 .198E-35 .912E-36 .416E-36 .188E-36 .838E-37 .370E-37 .162E-37 .704E-38 .303E-38	1.00E+00 2.20E-02 2.14E-02 1.10E+00
.129E-38 .548E-39 .230E-39 .962E-40 RETARDATION FACTOR	1.59E+02
RETARDED SEEPAGE VELOCITY (M/YR) RETARDED LONGITUDINAL DISPERSION COEF. (M**2/YR)	1.58E-02
RETARDED LONGITUDINAL DISPERSION COEF. (M 2/YR) RETARDED LATERAL DISPERSION COEFFICIENT (M**2/YR) .	
RETARDED VERTICAL DISPERSION COEFFICIENT (M**2/YR).	
time [yr] = 1.00 avg. conc. [mg/l] = .000E+00	
time [yr] = 5.00 avg. conc. [mg/l] = .000E+00	
time [yr] = 10.0 avg. conc. [mg/l] = .000E+00	
time [yr] = 15.0 avg. conc. [mg/l] = .000E+00	
time [yr] = 20.0 avg. conc. [mg/l] = .000E+00	
time [yr] = 25.0 avg. conc. [mg/l] = .000E+00	

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time [yr] =	30.0	avg. conc. [mg/l] =	.000E+00
time [yr] =	35.0	avg. conc. [mg/l] =	.000E+00
time [yr] =	40.0	avg. conc. [mg/l] =	.000E+00
time [yr] =	45.0	avg. conc. [mg/l] =	.000E+00
time [yr] =	50.0	avg. conc. [mg/l] =	.000E+00
time [yr] =	55.0	avg. conc. [mg/l] =	.000E+00
time [yr] =	60.0	avg. conc. [mg/l] =	.000E+00
time [yr] =	65.0	avg. conc. [mg/l] =	.000E+00
time [yr] =	70.0	avg. conc. [mg/l] =	.000E+00

## INPUT DATA/RESULTS FOR CHEMICAL: Naphthalene

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INST. WASTE RELEASE (KG) VALID FOR INST CASE ONLY DISTRIBUTION COEFFICIENT, KD (M**3/KG) MOLECULAR DIFFUSION COEFFICIENT (M**2/YR)			
DISTRIBUTION COEFFICIENT, KD (M**3/KG)	2.60E-02		
MOLECULAR DIFFUSION COEFFICIENT (M**2/YR)	2.37E-02		
DECAY CONSTANT ( 1/YR )	0.00E+00		
LIST OF TRANSIENT SOURCE RELEASE RATE			
.000E+00 .000E+00 .000E+00 .000E+00 .000E+00			
.000E+00 .000E+00 .000E+00 .000E+00 .000E+00			
.000E+00 .000E+00 .000E+00 .000E+00 .000E+00			
.000E+00 .000E+00 .000E+00 .000E+00 .000E+00			
.000E+00 .000E+00 .000E+00 .000E+00 .000E+00			
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.000E+00 .000E+00 .000E+00 .000E+00 .000E+00			
.000E+00 .000E+00 .000E+00 .000E+00 .140E-47			
.420E-47 .210E-46 .108E-45 .517E-45			
RETARDATION FACTOR	1.88E+02		
	1.34E-02		
RETARDED LONGITUDINAL DISPERSION COEF. (M**2/YR)	5.03E-04		
RETARDED LATERAL DISPERSION COEFFICIENT (M**2/YR).	5.03E-04		
RETARDED VERTICAL DISPERSION COEFFICIENT (M**2/YR).	5.03E-04		
time [yr] = 1.00 avg. conc. [mg/l] = .000E+00			
time [yr] = 5.00 avg. conc. [mg/l] = .000E+00			

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time [yr] =	10.0	avg. conc. [mg/l] =	.000E+00
time [yr] =	15.0	avg. conc. [mg/l] =	.000E+00
time [yr] =	20.0	avg. conc. [mg/l] =	.000E+00
time [yr] =	25.0	avg. conc. [mg/l] =	.000E+00
time [yr] =	30.0	avg. conc. [mg/l] =	.000E+00
time [yr] =	35.0	avg. conc. [mg/l] =	.000E+00
time [yr] =	40.0	avg. conc. [mg/l] =	.000E+00
time [yr] =	45.0	avg. conc. [mg/l] =	.000E+00
time [yr] =	50.0	avg. conc. [mg/l] =	.000E+00
time [yr] =	55.0	avg. conc. [mg/l] =	.000E+00
time [yr] =	60.0	avg. conc. [mg/l] =	.000E+00
time [yr] =	65.0	avg. conc. [mg/l] =	.000E+00
time [yr] =	70.0	avg. conc. [mg/l] =	.000E+00

INPUT DATA/RESULTS FOR CHEMICAL: Toluene

INST. WAST DISTRIBUTH MOLECULAI DECAY CON LIST OF TR/	ON COEFFI R DIFFUSIC ISTANT ( 1/	CIENT, KD N COEFFIC YR )	(M**3/KG) . CIENT	(M**2/YR)	1.00E+00 6.00E-03 2.71E-02 1.20E+00
.000E+00	.000E+00	.112E-38	.114E-29	.174E-24	
.326E-21	.491E-19	.153E-17	.167E-16	.876E-16	
.268E-15	.551E-15	.831E-15	.984E-15	.962E-15	
.804E-15	.591E-15	.391E-15	.236E-15	.132E-15	
.693E-16	.344E-16	.163E-16	.737E-17	.322E-17	
.136E-17	.560E-18	.224E-18	.878E-19	.335E-19	
.127E-19	.468E-20	.171E-20	.614E-21	.217E-21	
.766E-22	.266E-22	.916E-23	.314E-23	.106E-23	
.356E-24	.119E-24	.393E-25	.130E-25	.425E-26	
.139E-26	.450E-27	.145E-27	.468E-28	.150E-28	
.479E-29	.153E-29	.484E-30	.153E-30	.484E-31	
.152E-31	.478E-32	.150E-32	.467E-33	.146E-33	
.453E-34	.141E-34	.437E-35	.135E-35	.418E-36	
.129E-36	.397E-37	.122E-37	.375E-38		

RETARDED RETARDED RETARDED	ON FACTOR SEEPAGE VELOCIT LONGITUDINAL DIS LATERAL DISPERS VERTICAL DISPERS	Y (M/YR) PERSION COEF. (M ION COEFFICIENT (	1**2/YR) [M**2/YR) .	4.42E+01 5.70E-02 2.45E-03 2.45E-03 2.45E-03
time [yr] =	1.00	avg. conc. [mg/l] =	.000E+00	
time [yr] =	5.00	avg. conc. [mg/l] =	.000E+00	
time [yr] =	10.0	avg. conc. [mg/l] =	.000E+00	
time [yr] =	15.0	avg. conc. [mg/l] =	.000E+00	
time [yr] =	20.0	avg. conc. [mg/l] =	.000E+00	
time [yr] =	25.0	avg. conc. [mg/l] =	.000E+00	
time [yr] =	30.0	avg. conc. [mg/l] =	.000E+00	
time [yr] =	35.0	avg. conc. [mg/l] =	.000E+00	
time [yr] =	40.0	avg. conc. [mg/l] =	.000E+00	
time [yr] =	45.0	avg. conc. [mg/l] =	.000E+00	
time [yr] =	50.0	avg. conc. [mg/l] =	.000E+00	
time [yr] =	55.0	avg. conc. [mg/l] =	.000E+00	
time [yr] =	60.0	avg. conc. [mg/l] =	.000E+00	
time [yr] =	65.0	avg. conc. [mg/l] =	.000E+00	
time [yr] =	70.0	avg. conc. [mg/l] =	.000E+00	

# INPUT DATA/RESULTS FOR CHEMICAL: Xylene

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INST. WASTE RELEAS	1.00E+00			
DISTRIBUTION COEFF	ICIENT, KD	(M**3/KG)		4.80E-03
MOLECULAR DIFFUSIO	ON COEFFI	CIENT	(M**2/YR)	2.46E-02
DECAY CONSTANT (1	/YR )			7.30E-01
LIST OF TRANSIENT S	OURCE RE	LEASE RAT	E	
.000E+00 .224E-44	.971E-30	.136E-22	.190E-18	
.835E-16 .508E-14	.899E-13	.698E-12	.304E-11	
.874E-11 .184E-10	.303E-10	.416E-10	.490E-10	
.512E-10 .484E-10	.422E-10	.343E-10	.263E-10	
.192E-10 .134E-10	.903E-11	.589E-11	.373E-11	

.157E-12 .770E-14 .311E-15 .110E-16 .357E-18 .109E-19 .317E-21 .893E-23 RETARDAT RETARDAT RETARDED RETARDED	.139E-11 .8 .875E-13 .4 .411E-14 .2 .161E-15 .8 .558E-17 .2 .178E-18 .8 .538E-20 .2 .156E-21 .7 .436E-23 .2 ON FACTOR . SEEPAGE VE LONGITUDIN LATERAL DIS VERTICAL DI	484E-13 217E-14 827E-16 282E-17 889E-19 266E-20 763E-22 213E-23 ELOCITY AL DISP	.265E-13 .114E-14 .424E-16 .142E-17 .442E-19 .131E-20 .374E-22 .104E-23 	.143E .598E .216E .713E .220E .645E .183E	E-13 E-15 E-16 E-18 E-19 E-21 E-22 M**2/YR)	3.56E+01 7.09E-02 2.77E-03 2.77E-03 2.77E-03
time [yr] =	1.00	a	vg. conc. [m	g/l] =	.000E+00	
time [yr] =	5.00	a	vg. conc. [m	g/l] =	.000E+00	
time [yr] =	10.0	а	vg. conc. [mɛ̯	g/l] =	.000E+00	
time [yr] =	15.0	a	vg. conc. [m	g/l] =	.000E+00	
time [yr] =	20.0	а	vg. conc. [m	g/l] =	.000E+00	
time [yr] =	25.0	а	vg. conc. [m	g/l] =	.000E+00	
time [yr] =	30.0	а	vg. conc. [mg	g/l] =	.000E+00	
time [yr] =	35.0	а	vg. conc. [mɛ	g/l] =	.000E+00	
time [yr] =			vg. conc. [mg			
time [yr] =	45.0	а	vg. conc. [mg	g/l] =	.000E+00	
time [yr] =	50.0	а	vg. conc. [mg	g/l] =	.000E+00	
time [yr] =	55.0	а	vg. conc. [mg	j/l] =	.000E+00	
time [yr] =	60.0	а	vg. conc. [mg	ı∕I] =	.000E+00	
time [yr] =	65.0	а	vg. conc. [mg	ı/i] =	.000E+00	
time [yr] =	70.0	а	vg. conc. [mg	ı/l] =	.000E+00	

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#### Jury Output File Analysis for Example Problem

#### *** COMMON INPUT PARAMETERS ***

PARAMETER NAME UN	IITS	VALUE		
Porosity			(cc/cc)	0.25
Bulk Density			(g/cc)	1.8
Water Content			(cc/cc)	0.1
Fractional Organic Carbon			(mg/mg)	2.00E-02
Incorporation Depth			(cm)	66.7
Clean Soil Thickness			(cm)	0
Simulation Time			(yrs)	70
Length of Soil Column			(cm)	1470
Infiltration Rate			(cm/day)	5.19E-02
Source Length			(m)	366
Source Width			<b>(</b> m)	116
Boundary Layer Thickness			(cm)	5

Chemical Specific Input Parameters for TPH-AR08-10

Parameter Name	Units	Value	

Total Soil Concentration	(mg/kg)	1
Diffusion Coeff. in Air	(cm^2/day	8640
Diffusion Coeff. in Water	(cm^2/day	0.864
Henrys Constant [	(mg/L)	/(mg/L)] 20.40
Organic Carbon Part. Coeff.	(cc/g)	1590
Lumped Chemical Decay Rate	(1/day)	0

#### Outputs for TPH-AR08-10

Time = 1 yrs

Cumulative Emissions to Air	(g)	48020
Advective Mass Loading Rate to Groundwater	(g/day)	3.07E-09
Diffusive Mass Loading Rate to Groundwater	(g/day)	8.23E-06
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	8.24E-06

Time = 2 yrs

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Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	49700 6.48E-06 0.007709 0.007716
Time = 3 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	50450 6.54E-05 0.04888 0.04895
Time = 4 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	50900 0.000184 0.09834 0.09852
Time = 5 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	51210 0.000317 0.1302 0.1305
Time		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	51970 0.000654 0.1098 0.1104
Time		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	52310 0.000641 0.05693 0.05757
Time		
Cumulative Emissions to Air	(g)	52510

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Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g/day) (g/day) (g/day)	0.000559 0.02771 0.02827
Time = 25 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 30 yrs	(g) (g/day) (g/day) (g/day)	52640 0.000478 0.01248 0.01296
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	52740 0.000409 0.004321 0.004729
Time = 35 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 40 yrs	(g) (g/day) (g/day) (g/day)	52820 0.000353 -0.00019 0.000167
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	52890 0.000308 -0.00272 -0.00241
Time = 45 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	52940 0.000271 -0.00414 -0.00387
Time = 50 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater	(g) (g/day)	52980 0.000241

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Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g/day) (g/day)	-0.00492 -0.00468
Time = 55 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	53020 0.000215 -0.00531 -0.0051
Time = 60 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	53060 0.000194 -0.00547 -0.00528
Time = 65 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 70 yrs	(g) (g/day) (g/day) (g/day)	53090 0.000176 -0.00549 -0.00531
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	53110 0.000161 -0.00542 -0.00526
Chemical Specific Input Parameters for TPH-AR10-12		
Parameter Name Units Value		
Total Soil Concentration Diffusion Coeff. in Air Diffusion Coeff. in Water Henrys Constant [ Organic Carbon Part. Coeff. Lumped Chemical Decay Rate	(mg/kg) (cm^2/day (cm^2/day (mg/L) (cc/g) (1/day)	

# Outputs for TPH-AR10-12

Time = 1 yrs		
Cumulative Emissions to Air	(g)	40810
Advective Mass Loading Rate to Groundwater	(g/day)	1.18E-39
Diffusive Mass Loading Rate to Groundwater	(g/day)	1.16E-35
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	1.16E-35
Time = 2 yrs ====================================		
Cumulative Emissions to Air	(g)	44460
Advective Mass Loading Rate to Groundwater	(g/day)	5.61E-21
Diffusive Mass Loading Rate to Groundwater	(g/day)	1.57E-17
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	1.57E-17
Time = 3 yrs ====================================		
Cumulative Emissions to Air	(g)	46130
Advective Mass Loading Rate to Groundwater	(g/day)	9.42E-15
Diffusive Mass Loading Rate to Groundwater	(g/day)	1.48E-11
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	1.48E-11
Time = 4 yrs ====================================		
Cumulative Emissions to Air	(g)	47140
Advective Mass Loading Rate to Groundwater	(g/day)	1.17E-11
Diffusive Mass Loading Rate to Groundwater	(g/day)	1.26E-08
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	1.26E-08
Time = 5 yrs ====================================		
Cumulative Emissions to Air	(g)	47830
Advective Mass Loading Rate to Groundwater	(g/day)	8.01E-10
Diffusive Mass Loading Rate to Groundwater	(g/day)	6.56E-07
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	6.57E-07
Time = 10 yrs ====================================		
Cumulative Emissions to Air	(g)	49560
Advective Mass Loading Rate to Groundwater	(g/day)	2.82E-06
Diffusive Mass Loading Rate to Groundwater	(g/day)	0.001023

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Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	0.001026
Time ≠ 15 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 20 yrs	(g) (g/day) (g/day) (g/day)	50330 3.38E-05 0.007702 0.007736
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 25 yrs	(g) (g/day) (g/day) (g/day)	50790 0.000104 0.01692 0.01702
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	51100 0.000189 0.02363 0.02381
Time = 30 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	51340 0.000267 0.02685 0.02712
Time = 35 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	51520 0.000331 0.02743 0.02777
Time = 40 yrs		
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Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	51660 0.000379 0.02641 0.02679

Time = 45 yrs

Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	51780 0.000411 0.02454 0.02495
Time = 50 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 55 yrs	(g) (g/day) (g/day) (g/day)	51890 0.000432 0.02231 0.02275
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 60 yrs	(g) (g/day) (g/day) (g/day)	51970 0.000444 0.02001 0.02046
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Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	52050 0.000449 0.01779 0.01824
Time = 65 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 70 yrs	(g) (g/day) (g/day) (g/day)	52120 0.000449 0.01572 0.01617
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	52180 0.000446 0.01384 0.01428

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# Chemical Specific Input Parameters for TPH-AR12-16

Parameter Name Units Value		
Total Soil Concentration Diffusion Coeff. in Air Diffusion Coeff. in Water Henrys Constant [ Organic Carbon Part. Coeff. Lumped Chemical Decay Rate	(mg/kg) (cm^2/day (cm^2/day (mg/L) (cc/g) (1/day)	
Outputs for TPH-AR12-16		
Time = 1 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 2 yrs	(g) (g/day) (g/day) (g/day)	27640 0 0 0
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 3 yrs	(g) (g/day) (g/day) (g/day)	33950 0 0 0
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 4 yrs	(g) (g/day) (g/day) (g/day)	37170 2.94E-66 4.68E-62 0
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	39200 2.26E-50 1.55E-46 0

Time = 5 yrs

Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	40630 7.86E-41 3.15E-37 3.15E-37
Time = 10 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 15 yrs	(g) (g/day) (g/day) (g/day)	44320 1.05E-21 1.18E-18 1.18E-18
Time = 15 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	46000 2.49E-15 1.56E-12 1.56E-12
Time = 20 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 25 yrs	(g) (g/day) (g/day) (g/day)	47020 3.68E-12 1.58E-09 1.59E-09
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 30 yrs	(g) (g/day) (g/day) (g/day)	47710 2.81E-10 9.15E-08 9.18E-08
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	48230 4.88E-09 1.28E-06 1.28E-06

Time = 35 yrs

48640 3.65E-08

7.94E-06

7.98E-06

48960 1.61E-07

3E-05

49230 5.03E-07

8.16E-05

8.21E-05

3.02E-05

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Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)
Time = 40 yrs	
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 45 yrs	(g) (g/day) (g/day) (g/day)
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)

# Time = 50 yrs

Cumulative Emissions to Air	(g)	49460
Advective Mass Loading Rate to Groundwater	(g/day)	1.23E-06
Diffusive Mass Loading Rate to Groundwater	(g/day)	0.000177
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	0.000178

Time = 55 yrs

Advective M Diffusive Ma	Emissions to Air lass Loading Rate to Groundwater ass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	49660 2.52E-06 0.000325 0.000328
Time = ==========	60 yrs		

Cumulative Emissions to Air	(g)	49830
Advective Mass Loading Rate to Groundwater	(g/day)	4.55E-06
Diffusive Mass Loading Rate to Groundwater	(g/day)	0.00053
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	0.000535

Time = 65 yrs

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Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	49980 7.42E-06 0.000788 0.000796
Time = 70 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	50120 1.12E-05 0.001093 0.001104
Chemical Specific Input Parameters for TPH-AR16-21		
Parameter Name Units Value		
Total Soil Concentration Diffusion Coeff. in Air Diffusion Coeff. in Water Henrys Constant [ Organic Carbon Part. Coeff. Lumped Chemical Decay Rate	(mg/kg) (cm^2/day (cm^2/day (mg/L) (cc/g) (1/day)	1 8640 0.864 /(mg/L)] .5400 1.58E+04 0
Outputs for TPH-AR16-21		
Time = 1 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	8307 0 0 0
Time = 2 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 3 yrs	(g) (g/day) (g/day) (g/day)	11790 0 0 0

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Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	14440 0 0 0
Time = 4 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 5 yrs	(g) (g/day) (g/day) (g/day)	16630 0 0 0
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 10 yrs	(g) (g/day) (g/day) (g/day)	18500 0 0 0
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 15 yrs	(g) (g/day) (g/day) (g/day)	24940 0 0 0
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 20 yrs	(g) (g/day) (g/day) (g/day)	28820 0 0 0
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	31460 0 0 0

Time = 25 yrs

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Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	33410 0 0 0
Time = 30 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 35 yrs	(g) (g/day) (g/day) (g/day)	34910 0 0 0
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 40 yrs	(g) (g/day) (g/day) (g/day)	36130 1.56E-74 8.9E-71 0
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 45 yrs	(g) (g/day) (g/day) (g/day)	37130 1.3E-65 4.68E-62 0
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 50 yrs	(g) (g/day) (g/day) (g/day)	37980 1.14E-58 2.84E-55 0
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 55 yrs	(g) (g/day) (g/day) (g/day)	38710 4.08E-53 7.59E-50 0
Cumulative Emissions to Air	(g)	39340

Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g/day) (g/day) (g/day)	1.44E-48 2.09E-45 1.4E-45
Time = 60 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 65 yrs	(g) (g/day) (g/day) (g/day)	39900 8.89E-45 1.04E-41 1.05E-41
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	40400 1.44E-41 1.41E-38 1.41E-38
Time = 70 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	40840 8.12E-39 6.75E-36 6.76E-36
Chemical Specific Input Parameters for TPH-AR21-35		
Parameter Name Units Value		
Total Soil Concentration Diffusion Coeff. in Air Diffusion Coeff. in Water Henrys Constant [ Organic Carbon Part. Coeff. Lumped Chemical Decay Rate	(mg/kg) (cm^2/day (cm^2/day (mg/L) (cc/g) (1/day)	1 8640 0.864 /(mg/L)] .2830E-01 1.26E+05 0
Outputs for TPH-AR21-35		
Time = 1 yrs ====================================		

Cumulative Emissions to Air

(g)

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Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g/day) (g/day) (g/day)	0 0 0
Time = 2 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 3 yrs	(g) (g/day) (g/day) (g/day)	857.2 0 0 0
======================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	1071 0 0 0
Time = 4 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 5 yrs	(g) (g/day) (g/day) (g/day)	1252 0 0 0
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 10 yrs	(g) (g/day) (g/day) (g/day)	1411 0 0 0
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 15 yrs	(g) (g/day) (g/day) (g/day)	2035 0 0 0
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater	(g) (g/day)	2512 0

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	Mass Loading Rate to Groundwater & Diffusive Mass Loading Rate to Groundwater	(g/day) (g/day)	0 0
Time =	20 yrs		
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	e Emissions to Air Mass Loading Rate to Groundwater	(g) (g/day)	2913 0
	Aass Loading Rate to Groundwater	(g/day)	0
Advective	& Diffusive Mass Loading Rate to Groundwater	(g/day)	0
Time =	25 yrs		
Cumulative	e Emissions to Air	(g)	3266
	Mass Loading Rate to Groundwater	(g/day)	0
	Aass Loading Rate to Groundwater & Diffusive Mass Loading Rate to Groundwater	(g/day) (g/day)	0 0
	-		
Time = =======	30 yrs		
Cumulativ	e Emissions to Air	(g)	3584
	Mass Loading Rate to Groundwater	(g/day)	0
Diffusive N	lass Loading Rate to Groundwater	(g/day)	0
Advective	& Diffusive Mass Loading Rate to Groundwater	(g/day)	0
Time =	35 yrs		
2	***************************************		
	e Emissions to Air	(g)	3876
	Mass Loading Rate to Groundwater	(g/day) (g/day)	0 0
	lass Loading Rate to Groundwater & Diffusive Mass Loading Rate to Groundwater	(g/day) (g/day)	0
	-		
Time =	40 yrs ====================================		
Cumulative	e Emissions to Air	(g)	4147
Advective	Mass Loading Rate to Groundwater	(g/day)	0
	lass Loading Rate to Groundwater	(g/day)	0
Advective	& Diffusive Mass Loading Rate to Groundwater	(g/day)	0
Time = ========	45 yrs		
Cumulative	e Emissions to Air	(g)	4401
	Mass Loading Rate to Groundwater	(g/day)	0
Diffusive M	lass Loading Rate to Groundwater	(g/day)	0

### JURY-TPH1

Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	0
Time = 50 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 55 yrs	(g) (g/day) (g/day) (g/day)	4640 0 0 0
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 60 yrs	(g) (g/day) (g/day) (g/day)	4868 0 0 0
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 65 yrs	(g) (g/day) (g/day) (g/day)	5085 0 0 0
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 70 yrs	(g) (g/day) (g/day) (g/day)	5293 0 0 0
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	5493 0 0 0

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AT123D Output File Analysis for Example Problem

Chemicals in the analysis TPH-AR08-10 TPH-AR10-12 TPH-AR12-16 TPH-AR16-21 TPH-AR21-35

Number of years simulated: 70

## GENERAL INPUT DATA

NO. OF POINTS IN X-DIRECTION ..... NO. OF POINTS IN Y-DIRECTION ..... NO. OF POINTS IN Z-DIRECTION ..... NO. OF ROOTS: NO. OF SERIES TERMS ..... NO. OF BEGINNING TIME STEPS ..... NO. OF ENDING TIME STEP .....

NO. OF BEGINNING TIME STEPS		1
NO. OF ENDING TIME STEP		70
NO. OF TIME INTERVALS FOR PRINTED OUT SOLUTION		1
INSTANTANEOUS SOURCE CONTROL = 0 FOR INSTANT SOURCE	1	
SOURCE CONDITION CONTROL = 0 FOR STEADY SOURCE	•	70
INTERMITTENT OUTPUT CONTROL = 0 NO SUCH OUTPUT		, 0
CASE CONTROL =1 THERMAL, = 2 FOR CHEMICAL, = 3 RAD 2		•
CASE CONTROL - I THERMAL, - 2 FOR CHEMICAL, - 3 RAD 2		
X-COORDINATE OF RECEPTOR WELL (METERS)		1.83E+02
Y-COORDINATE OF RECEPTOR WELL (METERS)		5.80E+01
AQUIFER DEPTH, = 0.0 FOR INFINITE DEEP (METERS)		3.05E+00
AQUIFER WIDTH, = 0.0 FOR INFINITE WIDE (METERS)		0.00E+00
BEGIN POINT OF X-SOURCE LOCATION (METERS)		0.00E+00
END POINT OF X-SOURCE LOCATION (METERS)		3.66E+02
BEGIN POINT OF Y-SOURCE LOCATION (METERS)		0.00E+00
END POINT OF Y-SOURCE LOCATION (METERS)		1.16E+02
BEGIN POINT OF Z-SOURCE LOCATION (METERS)		0.00E+00
END POINT OF Z-SOURCE LOCATION (METERS)		0.00E+00
POROSITY		3.50E-01
HYDRAULIC CONDUCTIVITY (METER/YEAR)		3.15E+01
HYDRAULIC GRADIENT		2.00E-02
LONGITUDINAL DISPERSIVITY (METER)		0.00E+00
LATERAL DISPERSIVITY (METER)		0.00E+00
VERTICAL DISPERSIVITY (METER)		0.00E+00
BULK DENSITY OF THE SOIL (KG/M**3)		1.80E+03
TIME INTERVAL SIZE FOR THE DESIRED SOLUTION (YR)		1.00E+00
DISCHARGE TIME (YR)		7.00E+01

## INPUT DATA/RESULTS FOR CHEMICAL: TPH-AR08-10

DECAY CON	STANT ( 1/YR )		T CASE ONLY 	1.00E+00 3.18E-02 3.15E-02 0.00E+00
LIST OF TRA	NSIENT SOURCE	RELEASE RAT	ſE	
	.282E-02 .179E-0			
	.520E-01 .491E-0			
	.315E-01 .276E-0			
	.159E-01 .138E-0			
	.765E-02 .655E-0			
	.331E-02 .272E-0			
	.943E-03 .615E-0			
	.000E+00 .000E			
	.000E+00 .000E			
		+00 .000E+00		
	.000E+00 .000E		000E+00	
	.000E+00 .000E			
	.000E+00 .000E		_	
.000E+00	.000E+00 .000E	+00 .000E+00		
RETARDATIC	ON FACTOR			1.65E+02
RETARDEDS	SEEPAGE VELOCI	IY (M/YR)		1.09E-02
RETARDED L	ONGITUDINAL DI	SPERSION CC	DEF. (M**2/YR)	5.48E-04
RETARDED L	ATERAL DISPERS	ION COEFFIC	IENT (M**2/YR) .	5.48E-04
RETARDED	ERTICAL DISPER	SION COEFFIC	CIENT (M**2/YR).	5.48E-04
time [yr] =	1.00	avg. conc. [m	ng/l] = .000E+00	
time [yr] =	5.00	avg. conc. [m	ng/l] = .577E-04	
time [yr] =	10.0	avg. conc. [m	ng/l] = .176E-03	
time [yr] =	15.0	avg. conc. [m	ng/i] = .204E-03	
time [yr] =	20.0	avg. conc. [m	ng/l] = .187E-03	
time [yr] =	25.0	avg. conc. [m	ig/l] = .170E-03	
time [yr] =	30.0	avg. conc. [m	g/l] = .153E-03	
time [yr] = 🗧	35.0	avg. conc. [m	ıg/i] = .140E-03	
time [yr] = 4	40.0	avg. conc. [m	g/l] = .131E-03	
time [yr] = 4	45.0	avg. conc. [m	ıg/l] = .125E-03	
time [yr] = -{	50.0	avg. conc. [m	g/l] = .121E-03	

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time [yr] =	55.0	avg. conc. [mg/l] =	.118E-03
time [yr] =	60.0	avg. conc. [mg/l] =	.116E-03
time [yr] =	65.0	avg. conc. [mg/l] =	.113E-03
time [yr] =	70.0	avg. conc. [mg/l] =	.112E-03

INPUT DATA/RESULTS FOR CHEMICAL: TPH-AR10-12

INST. WASTE RELEASE (KG) VALID FOR INST CASE ONLY DISTRIBUTION COEFFICIENT, KD (M**3/KG) MOLECULAR DIFFUSION COEFFICIENT (M**2/YR) DECAY CONSTANT ( 1/YR )	1.00E+00 5.02E-02 3.15E-02 0.00E+00
LIST OF TRANSIENT SOURCE RELEASE RATE	
.424E-35 .574E-17 .541E-11 .461E-08 .240E-06	
.311E-05 .184E-04 .670E-04 .177E-03 .374E-03	
.675E-03 .108E-02 .159E-02 .218E-02 .282E-02 .351E-02 .421E-02 .490E-02 .557E-02 .621E-02	
.351E-02 .421E-02 .490E-02 .557E-02 .621E-02 .681E-02 .736E-02 .786E-02 .830E-02 .869E-02	
.903E-02 .736E-02 .786E-02 .830E-02 .869E-02 .903E-02 .932E-02 .955E-02 .975E-02 .990E-02	
.100E-01 .101E-01 .101E-01 .101E-01 .101E-01	
.101E-01 .100E-01 .997E-02 .988E-02 .978E-02	
.966E-02 .953E-02 .940E-02 .926E-02 .911E-02	
.895E-02 .879E-02 .863E-02 .847E-02 .830E-02	
.814E-02 .797E-02 .780E-02 .763E-02 .747E-02	
.730E-02 .714E-02 .698E-02 .682E-02 .666E-02	
.650E-02 .635E-02 .620E-02 .605E-02 .590E-02	
.576E-02 .562E-02 .548E-02 .535E-02	
RETARDATION FACTOR	2.59E+02
RETARDED SEEPAGE VELOCITY (M/YR)	6.95E-03
RETARDED LONGITUDINAL DISPERSION COEF. (M**2/YR)	
RETARDED LATERAL DISPERSION COEFFICIENT (M**2/YR).	
RETARDED VERTICAL DISPERSION COEFFICIENT (M**2/YR).	3.48E-04
time [yr] = 1.00 avg. conc. [mg/l] = .000E+00	
time [yr] = 5.00 avg. conc. [mg/l] = .000E+00	
time [yr] = 10.0 avg. conc. [mg/l] = .173E-06	
time [yr] = 15.0 avg. conc. [mg/l] = .394E-05	
time [yr] = 20.0 avg. conc. [mg/l] = .130E-04	

time [yr] = 25.0 avg. conc. [mg/l] = .278E-04

time [yr] =	30.0	avg. conc. [mg/l] =	.397E-04
time [yr] =	35.0	avg. conc. [mg/l] =	.533E-04
time [yr] =	40.0	avg. conc. [mg/l] =	.609E-04
time [yr] =	45.0	avg. conc. [mg/l] =	.697E-04
time [yr] =	50.0	avg. conc. [mg/l] =	.733E-04
time [yr] =	55.0	avg. conc. [mg/l] =	.784E-04
time [yr] =	60.0	avg. conc. [mg/l] =	.796E-04
time [yr] =	65.0	avg. conc. [mg/l] =	.824E-04
time [yr] =	70.0	avg. conc. [mg/l] =	.824E-04

INPUT DATA/RESULTS FOR CHEMICAL: TPH-AR12-16

INST. WASTE RELEASE (KG) VALID FOR INST CASE ONLY DISTRIBUTION COEFFICIENT, KD (M**3/KG) MOLECULAR DIFFUSION COEFFICIENT (M**2/YR) DECAY CONSTANT ( 1/YR ) LIST OF TRANSIENT SOURCE RELEASE RATE	1.00E+00 1.00E-01 3.15E-02 0.00E+00
.000E+00 .000E+00 .000E+00 .561E-46 .115E-36	
.183E-30 .487E-26 .101E-22 .378E-20 .429E-18	
.205E-16 .508E-15 .763E-14 .772E-13 .570E-12	
.326E-11 .151E-10 .586E-10 .196E-09 .579E-09	
.153E-08 .371E-08 .826E-08 .172E-07 .335E-07	
.619E-07 .109E-06 .184E-06 .298E-06 .467E-06	
.710E-06 .105E-05 .151E-05 .212E-05 .291E-05	
.393E-05 .520E-05 .678E-05 .870E-05 .110E-04	
.138E-04 .170E-04 .207E-04 .250E-04 .300E-04	
.355E-04 .418E-04 .492E-04 .565E-04 .650E-04	
.743E-04 .840E-04 .947E-04 .107E-03 .120E-03	
.133E-03 .147E-03 .163E-03 .178E-03 .195E-03	
.213E-03 .231E-03 .250E-03 .270E-03 .290E-03	
.312E-03 .334E-03 .356E-03 .379E-03	
RETARDATION FACTOR RETARDED SEEPAGE VELOCITY (M/YR)	5.16E+02
RETARDED SEEPAGE VELOCITY (M/YR)	3.49E-03
RETARDED LONGITUDINAL DISPERSION COEF. (M**2/YR)	1.75E-04
RETARDED LATERAL DISPERSION COEFFICIENT (M**2/YR).	1.75E-04
RETARDED VERTICAL DISPERSION COEFFICIENT (M**2/YR).	1.75E-04
time [yr] = 1.00 avg. conc. [mg/l] = .000E+00	

time [yr] =	5.00	avg. conc. [mg/l] =	.000E+00
	0.00	avg. conc. [mg/i]	

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time [yr] =	10.0	avg. conc. [mg/l] =	.000E+00
time [yr] =	15.0	avg. conc. [mg/l] =	.000E+00
time [yr] =	20.0	avg. conc. [mg/l] =	.000E+00
time [yr] =	25.0	avg. conc. [mg/l] =	.000E+00
time [yr] =	30.0	avg. conc. [mg/l] =	.000E+00
time [yr] =	35.0	avg. conc. [mg/l] =	.284E-08
time [yr] =	40.0	avg. conc. [mg/l] =	.121E-07
time [yr] =	45.0	avg. conc. [mg/l] =	.438E-07
time [yr] =	50.0	avg. conc. [mg/l] =	.103E-06
time [yr] =	55.0	avg. conc. [mg/l] =	.235E-06
time [yr] =	60.0	avg. conc. [mg/l] =	.408E-06
time [yr] =	65.0	avg. conc. [mg/l] =	.720E-06
time [yr] =	70.0	avg. conc. [mg/l] =	.105E-05

INPUT DATA/RESULTS FOR CHEMICAL: TPH-AR16-21

INST. WASTE DISTRIBUTIO MOLECULAR DECAY CONS LIST OF TRAM	N COEFFI DIFFUSIO STANT ( 1/	CIENT, KD ( N COEFFIC YR )	(M**3/KG) CIENT	(M**2/YR)	Y	1.00E+00 3.16E-01 3.15E-02 0.00E+00
.000E+00	.000E+00	.000E+00	.000E+00	.000E+00		
.000E+00	.000E+00	.000E+00	.000E+00	.000E+00		
.000E+00	.000E+00	.000E+00	.000E+00	.000E+00		
.000E+00	.000E+00	.000E+00	.000E+00	.000E+00		
.000E+00	.000E+00	.000E+00	.000E+00	.000E+00		
.000E+00	.000E+00	.000E+00	.000E+00	.000E+00		
.000E+00	.000E+00	.000E+00	.000E+00	.000E+00		
.000E+00	.000E+00	.000E+00	.000E+00	.000E+00		
.000E+00	.000E+00	.000E+00	.000E+00	.000E+00		
.000E+00	.000E+00	.000E+00	.000E+00	.000E+00		
.000E+00	.140E-47	.154E-46	.115E-45	.762E-45		
.473E-44	.275E-43	.151E-42	.779E-42	.381E-41		
.177E-40	.783E-40	.330E-39	.133E-38	.513E-38		
.190E-37 .	.678E-37	.233E-36	.771E-36			

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RETARDED RETARDED RETARDED	ON FACTOR SEEPAGE VELOCIT LONGITUDINAL DIS LATERAL DISPERS	TY (M/YR) SPERSION COEF. (N ION COEFFICIENT	//**2/YR) (M**2/YR) .	1.63E+03 1.11E-03 5.54E-05 5.54E-05 5.54E-05
time [yr] =	1.00	avg. conc. [mg/l] =	.000E+00	
time [yr] =	5.00	avg. conc. [mg/l] =	.000E+00	
time [yr] =	10.0	avg. conc. [mg/l] =	.000E+00	
time [yr] =	15.0	avg. conc. [mg/l] =	.000E+00	
time [yr] =	20.0	avg. conc. [mg/l] =	.000E+00	
time [yr] =	25.0	avg. conc. [mg/l] =	.000E+00	
time [yr] =	30.0	avg. conc. [mg/l] =	.000E+00	
time [yr] =	35.0	avg. conc. [mg/l] =	.000E+00	
time [yr] =	40.0	avg. conc. [mg/l] =	.000E+00	
time [yr] =	45.0	avg. conc. [mg/l] =	.000E+00	
time [yr] =	50.0	avg. conc. [mg/l] =	.000E+00	
time [yr] =	55.0	avg. conc. [mg/l] =	.000E+00	
time [yr] =	60.0	avg. conc. [mg/l] =	.000E+00	
time [yr] =	65.0	avg. conc. [mg/l] =	.000E+00	
time [yr] =	70.0	avg. conc. [mg/l] =	.000E+00	

## INPUT DATA/RESULTS FOR CHEMICAL: TPH-AR21-35

INST. WASTE RELEAS	E (KG) VALIE	D FOR INST	CASE ONLY	1.00E+00
DISTRIBUTION COEFF	ICIENT, KD (	(M**3/KG)		2.52E+00
MOLECULAR DIFFUSIO	ON COEFFIC	IENT (	M**2/YR)	3.15E-02
DECAY CONSTANT ( 1	′YR )			0.00E+00
LIST OF TRANSIENT S	OURCE REL	EASE RATE		
.000E+00 .000E+00	.000E+00	.000E+00	.000E+00	
.000E+00 .000E+00	.000E+00	.000E+00	.000E+00	
.000E+00 .000E+00	.000E+00	.000E+00	.000E+00	
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				IT (M**2/YR) . NT (M**2/YR).	6.95E-06 6.95E-06
time [yr] =	1.00	avg	ı. conc. [mg/l]	= .000E+00	
time [yr] =	5.00	avg	ı. conc. [mg/l]	= .000E+00	
time [yr] =	10.0	avg	I. conc. [mg/l]	= .000E+00	
time [yr] =	15.0	avg	ı. conc. [mg/l]	= .000E+00	
time [yr] =	20.0	avg	. conc. [mg/l]	= .000E+00	
time [yr] =	25.0	avg	. conc. [mg/l]	= .000E+00	
time [yr] =	30.0	avg	. conc. [mg/l]	= .000E+00	
time [yr] =	35.0	avg	. conc. [mg/l]	= .000E+00	
time [yr] =	40.0	avg	. conc. [mg/l]	= .000E+00	
time [yr] =	45.0	avg	. conc. [mg/l]	= .000E+00	
time [yr] =	50.0	avg	. conc. [mg/l]	= .000E+00	
time [yr] =	55.0	avg	. conc. [mg/l]	= .000E+00	
time [yr] =	60.0	avg	. conc. [mg/l]	= .000E+00	
time [yr] =	65.0	avg	. conc. [mg/l]	= .000E+00	
time [yr] =	70.0	avg	. conc. [mg/l]	= .000E+00	

### Jury Output File Analysis for Example Problem

# *** COMMON INPUT PARAMETERS ***

PARAMETER NAME	UNITS	VALUE		
Porosity			(cc/cc)	0.25
Bulk Density			(g/cc)	1.8
Water Content			(cc/cc)	0.1
Fractional Organic Carbon			(mg/mg)	2.00E-02
Incorporation Depth			(cm)	66.7
Clean Soil Thickness			(cm)	0
Simulation Time			(yrs)	70
Length of Soil Column			(cm)	1470
Infiltration Rate			(cm/day)	5.19E-02
Source Length			(m)	366
Source Width			(m)	116
Boundary Layer Thickness			(cm)	5

#### Chemical Specific Input Parameters for TPH-AL05-06

#### Parameter Name Units Value

Total Soil Concentration	(mg/kg)	1	
Diffusion Coeff, in Air	(cm^2/day	8640	
Diffusion Coeff, in Water	(cm^2/day	0.864	
Henrys Constant [	(mg/L)	/(mg/L)] 141	0.
Organic Carbon Part. Coeff.	(cc/g)	794	
Lumped Chemical Decay Rate	(1/day)	0	

#### Outputs for TPH-AL05-06

Time = 1 yrs

Cumulative Emissions to Air	(g)	52620
Advective Mass Loading Rate to Groundwater	(g/day)	0.000151
Diffusive Mass Loading Rate to Groundwater	(g/day)	0.7064
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	0.7065

Time = 2 yrs

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Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	53030 8.87E-05 0.002569 0.002658
Time = 3 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	53210 5.72E-05 -0.08651 -0.08645
Time = 4 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	53320 4.04E-05 -0.09226 -0.09222
Time = 5 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	53390 3.05E-05 -0.0835 -0.08347
Time = 10 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	53580 1.19E-05 -0.04365 -0.04364
Time = 15 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	53660 6.71E-06 -0.02664 -0.02663
Time = 20 yrs		
Cumulative Emissions to Air	(g)	53710

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Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g/day) (g/day) (g/day)	4.43E-06 -0.01828 -0.01827	
Time = 25 yrs -==			
Cumulative Emissions to Air	(g)	53740	
Advective Mass Loading Rate to Groundwater	(g/day)	3.21E-06	
Diffusive Mass Loading Rate to Groundwater	(g/day)	-0.0135	
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	-0.0135	
Time = 30 yrs			
Cumulative Enviroinne to Air		53760	
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater	(g) (g/day)	2.46E-06	
Diffusive Mass Loading Rate to Groundwater	(g/day) (g/day)	-0.01049	
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	-0.01049	
Time = 35 yrs ====================================			
Cumulative Emissions to Air	(g)	53780	
Advective Mass Loading Rate to Groundwater	(g/day)	1.96E-06	
Diffusive Mass Loading Rate to Groundwater	(g/day)	-0.00845	
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	-0.00845	
Tíme = 40 yrs			
25=====================================			
Cumulative Emissions to Air	(g)	53800	
Advective Mass Loading Rate to Groundwater	(g/day)	1.61E-06	
Diffusive Mass Loading Rate to Groundwater	(g/day)	-0.007	
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	-0.007	
Time = 45 yrs ====================================			
Cumulative Emissions to Air	(g)	53810	
Advective Mass Loading Rate to Groundwater	(g/day)	1.35E-06	
Diffusive Mass Loading Rate to Groundwater	(g/day) (g/day)	-0.00591	
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	-0.00591	
Time = 50 yrs ====================================			
	(-)	50000	
Cumulative Emissions to Air	(g) (g/dav)	53820	
Advective Mass Loading Rate to Groundwater (g/day) 1.16E-06			

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Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g/day) (g/day)	-0.00508 -0.00508
Time = 55 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 60 yrs	(g) (g/day) (g/day) (g/day)	53830 1E-06 -0.00443 -0.00443
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	53840 8.83E-07 -0.00391 -0.00391
Time = 65 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	53840 7.84E-07 -0.00348 -0.00348
Time = 70 yrs		
***************************************		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	53850 7.02E-07 -0.00312 -0.00312
Chemical Specific Input Parameters for TPH-AL06-08		
Parameter Name Units Value		
Total Soil Concentration Diffusion Coeff. in Air Diffusion Coeff. in Water Henrys Constant [ Organic Carbon Part. Coeff. Lumped Chemical Decay Rate	(mg/kg) (cm^2/day (cm^2/day (mg/L) (cc/g) (1/day)	1 8640 0.864 /(mg/L)] 2120. 3980 0

Outputs for TPH-AL06-08

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Time = 1 yrs		
Cumulative Emissions to Air	(g)	52440
Advective Mass Loading Rate to Groundwater	(g/day)	8.55E-05
Diffusive Mass Loading Rate to Groundwater	(g/day)	0.9369
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	0.937
Time = 2 yrs ====================================		
Cumulative Emissions to Air	(g)	52900
Advective Mass Loading Rate to Groundwater	(g/day)	5.79E-05
Diffusive Mass Loading Rate to Groundwater	(g/day)	0.1146
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	0.1147
Time = 3 yrs ====================================		
Cumulative Emissions to Air	(g)	53110
Advective Mass Loading Rate to Groundwater	(g/day)	3.91E-05
Diffusive Mass Loading Rate to Groundwater	(g/day)	-0.03866
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	-0.03862
Time = 4 yrs ====================================		
Cumulative Emissions to Air	(g)	53230
Advective Mass Loading Rate to Groundwater	(g/day)	2.83E-05
Diffusive Mass Loading Rate to Groundwater	(g/day)	-0.06989
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	-0.06986
Time = 5 yrs ====================================		
Cumulative Emissions to Air	(g)	53310
Advective Mass Loading Rate to Groundwater	(g/day)	2.16E-05
Diffusive Mass Loading Rate to Groundwater	(g/day)	-0.07254
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	-0.07252
Time = 10 yrs ====================================		
Cumulative Emissions to Air	(g)	53520
Advective Mass Loading Rate to Groundwater	(g/day)	8.71E-06
Diffusive Mass Loading Rate to Groundwater	(g/day)	-0.04462

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Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	-0.04461
Time = 15 yrs		
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Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	53610 4.95E-06 -0.02828 -0.02827
Time = 20 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 25 yrs	(g) (g/day) (g/day) (g/day)	53660 3.29E-06 -0.01974 -0.01973
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 30 yrs	(g) (g/day) (g/day) (g/day)	53700 2.38E-06 -0.01473 -0.01473
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	53730 1.83E-06 -0.01152 -0.01151
Time = 35 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	53750 1.46E-06 -0.00932 -0.00932
Time = 40 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	53770 1.2E-06 -0.00774 -0.00774

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Time = 45 yrs

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Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	53780 1.01E-06 -0.00656 -0.00656
Time = 50 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 55 yrs	(g) (g/day) (g/day) (g/day)	53790 8.64E-07 -0.00565 -0.00565
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	53800 7.51E-07 -0.00493 -0.00493
Time = 60 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 65 yrs	(g) (g/day) (g/day) (g/day)	53810 6.6E-07 -0.00435 -0.00435
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 70 yrs	(g) (g/day) (g/day) (g/day)	53820 5.87E-07 -0.00388 -0.00388
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	53830 5.26E-07 -0.00349 -0.00349

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## Chemical Specific Input Parameters for TPH-AL08-10

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Parameter Name Units Value	
Total Soil Concentration Diffusion Coeff. in Air Diffusion Coeff. in Water Henrys Constant [ Organic Carbon Part. Coeff. Lumped Chemical Decay Rate	(mg/kg) 1 (cm^2/day 8640 (cm^2/day 0.864 (mg/L) /(mg/L)] 3410. (cc/g) 3.16E+04 (1/day) 0
Outputs for TPH-AL08-10	
Time = 1 yrs ====================================	
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 2 yrs	(g) 51610 (g/day) 1.62E-05 (g/day) 0.8716 (g/day) 0.8716
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 3 yrs	(g) 52300 (g/day) 2.43E-05 (g/day) 0.5059 (g/day) 0.5059
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 4 yrs	(g) 52600 (g/day) 2.14E-05 (g/day) 0.216 (g/day) 0.216
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) 52790 (g/day) 1.77E-05 (g/day) 0.08435 (g/day) 0.08437

Time = 5 yrs	
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Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	52910 1.46E-05 0.02322 0.02323
Time = 10 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	53220 6.89E-06 -0.03278 -0.03277
Time = 15 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	53360 4.13E-06 -0.02835 -0.02835
Time = 20 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 25 yrs	(g) (g/day) (g/day) (g/day)	53440 2.81E-06 -0.02229 -0.02229
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 30 yrs	(g) (g/day) (g/day) (g/day)	53490 2.07E-06 -0.01773 -0.01772
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	53530 1.61E-06 -0.01442 -0.01442

Time = 35 yrs

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Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	53560 1.29E-06 -0.01199 -0.01199
Time = 40 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	53590 1.07E-06 -0.01016 -0.01016
Time = 45 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	53610 9.03E-07 -0.00874 -0.00874
Time = 50 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	53630 7.76E-07 -0.00762 -0.00762
Time = 55 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	53650 6.76E-07 -0.00672 -0.00672
Time = 60 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 65 yrs	(g) (g/day) (g/day) (g/day)	53660 5.96E-07 -0.00598 -0.00598

Time = 65 yrs

Cumulative Emissions to Air Advective Mass Loading Rate to G Diffusive Mass Loading Rate to G Advective & Diffusive Mass Loadi	roundwater	(g) (g/day) (g/day) (g/day)	-0.00536
Time = 70 yrs ====================================			
Cumulative Emissions to Air Advective Mass Loading Rate to C Diffusive Mass Loading Rate to G Advective & Diffusive Mass Loadin Chemical Specific Input Paramete	roundwater ng Rate to Groundwater	(g) (g/day) (g/day) (g/day)	
Parameter Name Units	Value		
Total Soil Concentration Diffusion Coeff. in Air Diffusion Coeff. in Water Henrys Constant [ Organic Carbon Part. Coeff. Lumped Chemical Decay Rate		(mg/kg) (cm^2/day (cm^2/day (mg/L) (cc/g) (1/day)	0.864 /(mg/L)] 5410.

## Outputs for TPH-AL10-12

Time =	1 yrs
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Cumulative Emissions to Air	(g)	49350
Advective Mass Loading Rate to Groundwater	(g/day)	7.25E-09
Diffusive Mass Loading Rate to Groundwater	(g/day)	0.002903
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	0.002903
Time = 2 yrs ====================================		
Cumulative Emissions to Air	(g)	50670
Advective Mass Loading Rate to Groundwater	(g/day)	5.56E-07
Diffusive Mass Loading Rate to Groundwater	(g/day)	0.1005
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	0.1005

Time = 3 yrs

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Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	51260 1.84E-06 0.2061 0.2061
Time = 4 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 5 yrs	(g) (g/day) (g/day) (g/day)	51610 2.94E-06 0.2322 0.2322
<b></b> _ <b>_</b>		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	51850 3.62E-06 0.2144 0.2144
Time = 10 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	52450 3.79E-06 0.07744 0.07744
Time = 15 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	52710 2.96E-06 0.02275 0.02275
Time = 20 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	52870 2.31E-06 0.003073 0.003075

Time = 25 yrs

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Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	52980 1.84E-06 -0.00454 -0.00454
Time = 30 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater	(g) (g/day)	53060 1.51E-06
Diffusive Mass Loading Rate to Groundwater	(g/day)	-0.00752
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	-0.00751
Time = 35 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater	(g) (g/day)	53120 1.26E-06
Diffusive Mass Loading Rate to Groundwater	(g/day)	-0.00855
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	-0.00855
Time = 40 yrs ====================================		
Cumulative Emissions to Air	(g)	53170
Advective Mass Loading Rate to Groundwater	(g/day)	1.07E-06
Diffusive Mass Loading Rate to Groundwater	(g/day)	-0.00872
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	-0.00872
Time = 45 yrs ====================================		
Cumulative Emissions to Air	(g)	53210
Advective Mass Loading Rate to Groundwater	(g/day)	9.25E-07
Diffusive Mass Loading Rate to Groundwater	(g/day)	-0.0085
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	-0.0085
Time = 50 yrs ====================================		
Cumulative Emissions to Air	(g)	53250
Advective Mass Loading Rate to Groundwater	(g/day)	8.09E-07
Diffusive Mass Loading Rate to Groundwater	(g/day)	-0.00812
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	-0.00812
Time = 55 yrs ====================================		
Cumulative Emissions to Air	(g)	53280
	(3)	00200

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Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g/day) (g/day) (g/day)	7.15E-07 -0.00767 -0.00767
Time = 60 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 65 yrs	(g) (g/day) (g/day) (g/day)	53300 6.38E-07 -0.00721 -0.00721
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 70 yrs	(g) (g/day) (g/day) (g/day)	53330 5.74E-07 -0.00676 -0.00676
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	53350 5.2E-07 -0.00634 -0.00634
Chemical Specific Input Parameters for TPH-AL12-16		
Parameter Name Units Value Total Soil Concentration Diffusion Coeff. in Air Diffusion Coeff. in Water Henrys Constant [ Organic Carbon Part. Coeff. Lumped Chemical Decay Rate	(mg/kg) (cm^2/day (cm^2/day (mg/L) (cc/g) (1/day)	0.864 /(mg/L)] .2250E+05
Outputs for TPH-AL12-16		
Time = 1 yrs ====================================		
Cumulative Emissions to Air	(g)	44340

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Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g/day) (g/day) (g/day)	4.7E-25 5.43E-18 5.43E-18
Time = 2 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 3 yrs	(g) (g/day) (g/day) (g/day)	47070 2.38E-15 1.05E-08 1.05E-08
======================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	48300 3.57E-12 9.54E-06 9.54E-06
Time = 4 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 5 yrs	(g) (g/day) (g/day) (g/day)	49040 1.26E-10 0.000239 0.000239
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 10 yrs	(g) (g/day) (g/day) (g/day)	49540 9.96E-10 0.001464 0.001464
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 15 yrs	(g) (g/day) (g/day) (g/day)	50800 4.41E-08 0.02925 0.02925
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater	(g) (g/day)	51360 1.21E-07

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Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g/day) (g/day)	0.04965 0.04965
Time = 20 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	51690 1.77E-07 0.05065 0.05065
Time = 25 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	51920 2.06E-07 0.04388 0.04388
Time = 30 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	52090 2.17E-07 0.03568 0.03568
Time = 35 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 40 yrs	(g) (g/day) (g/day) (g/day)	52220 2.17E-07 0.02824 0.02824
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 45 yrs	(g) (g/day) (g/day) (g/day)	52320 2.11E-07 0.02208 0.02208
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day)	52410 2.03E-07 0.01714

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## JURY-TPH2

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Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	0.01714
Time = 50 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 55 yrs	(g) (g/day) (g/day) (g/day)	52480 1.93E-07 0.01324 0.01324
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	52550 1.83E-07 0.01016 0.01016
Time = 60 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	52600 1.73E-07 0.007737 0.007738
Time = 65 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	52650 1.63E-07 0.005815 0.005816
Time = 70 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	52690 1.54E-07 0.004286 0.004286

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AT123D Output File Analysis for Example Problem

Chemicals in the analysis TPH-AL05-06 TPH-AL06-08 TPH-AL08-10 TPH-AL10-12 TPH-AL12-16

Number of years simulated: 70

## GENERAL INPUT DATA

NO. OF POINTS IN X-DIRECTION NO. OF POINTS IN Y-DIRECTION NO. OF POINTS IN Z-DIRECTION NO. OF ROOTS: NO. OF SERIES TERMS NO. OF BEGINNING TIME STEPS NO. OF ENDING TIME STEP NO. OF TIME INTERVALS FOR PRINTED OUT SOLUTION INSTANTANEOUS SOURCE CONTROL = 0 FOR INSTANT SOURCE SOURCE CONDITION CONTROL = 0 FOR STEADY SOURCE INTERMITTENT OUTPUT CONTROL = 0 NO SUCH OUTPUT CASE CONTROL =1 THERMAL, = 2 FOR CHEMICAL, = 3 RAD 2	1	1 10 1000 1 70 1 70 1
X-COORDINATE OF RECEPTOR WELL (METERS) Y-COORDINATE OF RECEPTOR WELL (METERS) AQUIFER DEPTH, = 0.0 FOR INFINITE DEEP (METERS) AQUIFER WIDTH, = 0.0 FOR INFINITE WIDE (METERS) BEGIN POINT OF X-SOURCE LOCATION (METERS) END POINT OF X-SOURCE LOCATION (METERS) BEGIN POINT OF Y-SOURCE LOCATION (METERS) END POINT OF Y-SOURCE LOCATION (METERS) BEGIN POINT OF Y-SOURCE LOCATION (METERS) END POINT OF Z-SOURCE LOCATION (METERS) BEGIN POINT OF Z-SOURCE LOCATION (METERS)		1.83E+02 5.80E+01 3.05E+00 0.00E+00 3.66E+02 0.00E+00 1.16E+02 0.00E+00 0.00E+00
POROSITY HYDRAULIC CONDUCTIVITY (METER/YEAR) HYDRAULIC GRADIENT LONGITUDINAL DISPERSIVITY (METER) LATERAL DISPERSIVITY (METER) VERTICAL DISPERSIVITY (METER)		3.50E-01 3.15E+01 2.00E-02 0.00E+00 0.00E+00 0.00E+00
BULK DENSITY OF THE SOIL (KG/M**3) TIME INTERVAL SIZE FOR THE DESIRED SOLUTION (YR) DISCHARGE TIME (YR)		1.80E+03 1.00E+00 7.00E+01

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#### INPUT DATA/RESULTS FOR CHEMICAL: TPH-AL05-06

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DISTRIBUTIO MOLECULAF	ON COEFFIC	(KG) VALID FOR INST CASE ONLY CIENT, KD (M**3/KG) N COEFFICIENT (M**2/YR) (R )	1.00E+00 1.59E-02 3.15E-02 0.00E+00
LIST OF TRA	NSIENT SC	OURCE RELEASE RATE	
.258E+00	.970E-03	.000E+00 .000E+00 .000E+00	
.000E+00	.000E+00	.000E+00 .000E+00 .000E+00	
.000E+00	.000E+00	.000E+00 .000E+00 .000E+00	
.000E+00	.000E+00	.000E+00 .000E+00 .000E+00	
.000E+00	.000E+00	.000E+00 .000E+00 .000E+00	
.000E+00	.000E+00	.000E+00 .000E+00 .000E+00	
.000E+00	.000E+00	.000E+00 .000E+00 .000E+00	
.000E+00	.000E+00	.000E+00 .000E+00 .000E+00	
.000E+00	.000E+00	.000E+00 .000E+00 .000E+00	
.000E+00	.000E+00	.000E+00 .000E+00 .000E+00	
.000E+00	.000E+00	.000E+00 .000E+00 .000E+00	
.000E+00	.000E+00		
		.000E+00 .000E+00 .000E+00	
0005.00	0005.00	0005.00 0005.00	
RETARDATIC	ON FACTOR	.000E+00 .000E+00 ?	8.27E+01
RETARDED	SEEPAGE V	ELOCITY (M/YR)	2.18E-02
RETARDED	LONGHUDD	NAL DISPERSION COEF. (M ^{**} 2/YR)	1.09E-03
RETARDED		ISPERSION COEFFICIENT (M**2/YR) . DISPERSION COEFFICIENT (M**2/YR).	1.09E-03
RETARDED		DISPERSION COFFICIENT (M**2/YR)	1.09E-03
time [yr] =	1.00	avg. conc. [mg/l] = .105E-04	
time [yr] =	5.00	avg. conc. [mg/l] = .609E-04	
	0.00		
time [yr] =	10.0	avg. conc. [mg/l] = .427E-04	
une MI-	10.0		
time [yr] =	15.0	avg. conc. [mg/l] = .374E-04	
une [yi] –	15.0		
timo [vr] -	20.0	avg. conc. [mg/l] = .349E-04	
time [yr] =	20.0		
4	05.0		
time [yr] =	25.0	avg. conc. [mg/l] = .334E-04	
time [yr] =	30.0	avg. conc. [mg/l] = .322E-04	
time [yr] =	35.0	avg. conc. [mg/l] = .314E-04	
time [yr] =	40.0	avg. conc. [mg/l] = .307E-04	
time [yr] =	45.0	avg. conc. [mg/l] = .301E-04	
time [yr] =	50.0	avg. conc. [mg/l] = .296E-04	

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time [yr] =	55.0	avg. conc. [mg/l] =	.292E-04
time [yr] =	60.0	avg. conc. [mg/l] =	.289E-04
time [yr] =	65.0	avg. conc. [mg/l] =	.285E-04
time [yr] =	70.0	avg. conc. [mg/l] =	.283E-04

INPUT DATA/RESULTS FOR CHEMICAL: TPH-AL06-08

INST. WASTE RELEASE (KG) VALID FOR INST CASE ONLY DISTRIBUTION COEFFICIENT, KD (M**3/KG) MOLECULAR DIFFUSION COEFFICIENT (M**2/YR) DECAY CONSTANT ( 1/YR )				
LIST OF TRANSIENT SOURCE RELEASE RATE .342E+00 .418E-01 .000E+00 .000E+00 .000E+00				
.000E+00 .000E+00 .000E+00 .000E+00 .000E+00				
.000E+00 .000E+00 .000E+00 .000E+00 .000E+00				
.000E+00 .000E+00 .000E+00 .000E+00 .000E+00				
.000E+00 .000E+00 .000E+00 .000E+00 .000E+00				
.000E+00 .000E+00 .000E+00 .000E+00 .000E+00				
.000E+00 .000E+00 .000E+00 .000E+00 .000E+00				
.000E+00 .000E+00 .000E+00 .000E+00 .000E+00				
.000E+00 .000E+00 .000E+00 .000E+00 .000E+00				
.000E+00 .000E+00 .000E+00 .000E+00 .000E+00				
.000E+00 .000E+00 .000E+00 .000E+00 .000E+00				
.000E+00 .000E+00 .000E+00 .000E+00 .000E+00				
.000E+00 .000E+00 .000E+00 .000E+00 .000E+00				
.000E+00 .000E+00 .000E+00 .000E+00	4.405.00			
	4.10E+02 4.39E-03			
RETARDED SEEPAGE VELOCITY (M/YR) RETARDED LONGITUDINAL DISPERSION COEF. (M**2/YR)	4.39E-03			
RETARDED LATERAL DISPERSION COEFFICIENT (M**2/YR) .				
RETARDED VERTICAL DISPERSION COEFFICIENT (M*2/YR).				
time [yr] = 1.00 avg. conc. [mg/l] = .280E-05				
time [yr] = 5.00 avg. conc. [mg/l] = .557E-04				
time [yr] = 10.0 avg. conc. [mg/l] = .360E-04				
time [yr] = 15.0 avg. conc. [mg/l] = .287E-04				
time [yr] = 20.0 avg. conc. [mg/l] = .246E-04				

time [yr] = 25.0 avg. conc. [mg/l] = .219E-04

time [yr] =	30.0	avg. conc. [mg/l] =	.200E-04
time [yr] =	35.0	avg. conc. [mg/l] =	.186E-04
time [yr] =	40.0	avg. conc. [mg/l] =	.176E-04
time [yr] =	45.0	avg. conc. [mg/l] =	.168E-04
time [yr] =	50.0	avg. conc. [mg/l] =	.162E-04
time [yr] =	55.0	avg. conc. [mg/l] =	.157E-04
time [yr] =	60.0	avg. conc. [mg/l] =	.153E-04
time [yr] =	65.0	avg. conc. [mg/l] =	.150E-04
time [yr] =	70.0	avg. conc. [mg/l] =	.147E-04

INPUT DATA/RESULTS FOR CHEMICAL: TPH-AL08-10

INST. WASTE RELEAS	1.00E+00			
INST. WASTE RELEASE (KG) VALID FOR INST CASE ONLY DISTRIBUTION COEFFICIENT, KD (M**3/KG) MOLECULAR DIFFUSION COEFFICIENT (M**2/YR)				
MOLECULAR DIFFUSIO	ON COEFFICIENT (M**2/YR)	3.15E-02		
DECAY CONSTANT ( 1	/YR )	0.00E+00		
	OURCE RELEASE RATE			
.318E+00 .185E+00	.789E-01 .308E-01 .848E-02			
.000E+00 .000E+00	.000E+00 .000E+00 .000E+00			
.000E+00 .000E+00	000E+00 .000E+00 .000E+00			
.000E+00 .000E+00	000E+00 .000E+00 .000E+00			
.000E+00 .000E+00	000E+00 .000E+00 .000E+00			
.000E+00 .000E+00	.000E+00 .000E+00 .000E+00			
.000E+00 .000E+00	.000E+00 .000E+00 .000E+00			
.000E+00 .000E+00	.000E+00 .000E+00 .000E+00			
.000E+00 .000E+00	.000E+00 .000E+00 .000E+00			
.000E+00 .000E+00	000E+00 .000E+00 .000E+00			
.000E+00 .000E+00	.000E+00 .000E+00 .000E+00			
.000E+00 .000E+00	.000E+00 .000E+00 .000E+00			
.000E+00 .000E+00	.000E+00 .000E+00 .000E+00			
	.000E+00 .000E+00			
RETARDATION FACTO	PR	3.25E+03 5.54E-04		
RETARDED SEEPAGE				
RETARDED LONGITUE	DINAL DISPERSION COEF. (M**2/YR)	2.77E-05		
RETARDED LATERAL I	DISPERSION COEFFICIENT (M**2/YR).	2.77E-05		
RETARDED VERTICAL	DISPERSION COEFFICIENT (M**2/YR).	2.77E-05		
time [yr] = 1.00	avg. conc. [mg/l] = .329E-06			
time [yr] = 5.00	avg. conc. [mg/l] = .605E-04			

time [yr] = 5.00	avg. conc. [mg/l] =	.605E-04
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time [yr] =	10.0	avg. conc. [mg/l] =	.358E-04
time [yr] =	15.0	avg. conc. [mg/l] =	.279E-04
time [yr] =	20.0	avg. conc. [mg/l] =	.237E-04
time [yr] =	25.0	avg. conc. [mg/l] =	.209E-04
time [yr] =	30.0	avg. conc. [mg/l] =	.190E-04
time [yr] =	35.0	avg. conc. [mg/l] =	.175E-04
time [yr] =	40.0	avg. conc. [mg/l] =	.163E-04
time [yr] =	45.0	avg. conc. [mg/l] =	.153E-04
time [yr] =	50.0	avg. conc. [mg/l] =	.145E-04
time [yr] =	55.0	avg. conc. [mg/l] =	.138E-04
time [yr] =	60.0	avg. conc. [mg/l] =	.132E-04
time [yr] =	65.0	avg. conc. [mg/l] =	.126E-04
time [yr] =	70.0	avg. conc. [mg/l] =	.122E-04

INPUT DATA/RESULTS FOR CHEMICAL: TPH-AL10-12

INST. WAST DISTRIBUTIO MOLECULAI DECAY CON LIST OF TRA	ON COEFFI R DIFFUSIO ISTANT ( 1/	CIENT, KD ( N COEFFIC YR )	(M**3/KG) CIENT	(M**2/YR)	<i>(</i>	1.00E+00 5.02E+00 3.15E-02 0.00E+00
		.752E-01		- .783E-01		
			.355E-01			
			.108E-01			
			.206E-02			
.344E-03	.000E+00		.000E+00			
.000E+00	.000E+00		.000E+00			
.000E+00	.000E+00			.000E+00		
.000E+00	.000E+00					
.000E+00	.000E+00	.000E+00				
.000E+00	.000E+00	.000E+00	.000E+00	.000E+00		
.000E+00	.000E+00	.000E+00	.000E+00	.000E+00		
.000E+00	.000E+00	.000E+00	.000E+00	.000E+00		
.000E+00	.000E+00	.000E+00	.000E+00	.000E+00		
.000E+00	.000E+00	.000E+00	.000E+00			

RETARDED RETARDED RETARDED	ION FACTOR SEEPAGE VELOCIT LONGITUDINAL DIS LATERAL DISPERS VERTICAL DISPERS	™ (M/YR) PERSION COEF. (N ION COEFFICIENT	//**2/YR) (M**2/YR) .	2.58E+04 6.97E-05 3.49E-06 3.49E-06 3.49E-06
time [yr] =	1.00	avg. conc. [mg/i] =	.000E+00	
time [yr] =	5.00	avg. conc. [mg/l] =	.138E-04	
time [yr] =	10.0	avg. conc. [mg/l] =	.190E-04	
time [yr] =	15.0	avg. conc. [mg/l] =	.166E-04	
time [yr] =	20.0	avg. conc. [mg/l] =	.134E-04	
time [yr] =	25.0	avg. conc. [mg/l] =	.112E-04	
time [yr] =	30.0	avg. conc. [mg/l] =	.983E-05	
time [yr] =	35.0	avg. conc. [mg/l] =	.888E-05	
time [yr] =	40.0	avg. conc. [mg/l] =	.817E-05	
time [yr] =	45.0	avg. conc. [mg/l] =	.761E-05	
time [yr] =	50.0	avg. conc. [mg/l] =	.715E-05	
time [yr] =	55.0	avg. conc. [mg/l] =	.677E-05	
time [yr] =	60.0	avg. conc. [mg/l] =	.644E-05	
time [yr] =	65.0	avg. conc. [mg/l] =	.616E-05	
time [yr] =	70.0	avg. conc. [mg/l] =	.591E-05	

## INPUT DATA/RESULTS FOR CHEMICAL: TPH-AL12-16

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INST. WASTE RELEASE (KG) VALID FOR INST CASE ONLY	1.00E+00
DISTRIBUTION COEFFICIENT, KD (M**3/KG)	1.00E+02
MOLECULAR DIFFUSION COEFFICIENT (M**2/YR)	3.15E-02
DECAY CONSTANT ( 1/YR )	0.00E+00
LIST OF TRANSIENT SOURCE RELEASE RATE	
.198E-17 .382E-08 .348E-05 .872E-04 .534E-03	
.164E-02 .345E-02 .575E-02 .824E-02 .107E-01	
.129E-01 .147E-01 .162E-01 .173E-01 .181E-01	
.186E-01 .189E-01 .189E-01 .188E-01 .185E-01	
.181E-01 .177E-01 .171E-01 .166E-01 .160E-01	

.124E-01 .982E-02 .766E-02 .594E-02 .459E-02 .352E-02 .267E-02 .200E-02 RETARDAT RETARDED RETARDED RETARDED	.119E-01 .935E-02 .729E-02 .565E-02 .435E-02 .333E-02 .252E-02 .188E-02 ION FACTO SEEPAGE LONGITUD LATERAL E	.113E-01 .890E-02 .693E-02 .536E-02 .413E-02 .315E-02 .238E-02 .177E-02 R 	.847E-02 .658E-02 .509E-02 .391E-02 .299E-02 .225E-02 .167E-02 (M/YR) ERSION COI N COEFFICI	.103 .806 .626 .483 .371 .282 .212 EF. (N	E-01 E-02 E-02 E-02 E-02 E-02 E-02	1.75E-07
time [yr] =	1.00	a	ivg. conc. [m	g/l] =	.000E+00	
time [yr] =	5.00	e	wg. conc. [m	g/l] =	.000E+00	
time [yr] =	10.0	e	ivg. conc. [m	g/l] =	.148E-06	
time [yr] =	15.0	a	vg. conc. [m	g/l] =	.669E-06	
time [yr] =	20.0	a	vg. conc. [m	g/l] =	.119E-05	
time [yr] =	25.0	a	vg. conc. [mg	g/l] =	.162E-05	
time [yr] =	30.0	a	vg. conc. [mg	g/l] =	.185E-05	
time [yr] =	35.0	a	vg. conc. [mg	g/l] =	.200E-05	
time [yr] =	40.0	а	vg. conc. (mg	g/l] =	.203E-05	
time [yr] =	45.0	а	vg. conc. [mg	g/l] =	.203E-05	
time [yr] =	50.0	а	vg. conc. [mg	g/l] =	.198E-05	
time [yr] =	55.0	а	vg. conc. [mg	g/l] =	.192E-05	
time [yr] =	60.0	а	vg. conc. [mg	;/l] =	.185E-05	
time [yr] =	65.0	а	vg. conc. [mg	/l] =	.177E-05	
time [yr] =	70.0	а	vg. conc. [mg	ı/l] =	.170E-05	

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#### Jury Output File Analysis for Example Problem

## *** COMMON INPUT PARAMETERS ***

PARAMETER NAME	UNITS	VALUE		
Porosity			(cc/cc)	0.25
Bulk Density			(g/cc)	1.8
Water Content			(cc/cc)	0.1
Fractional Organic Carbon			(mg/mg)	2.00E-02
Incorporation Depth			(cm)	66.7
Clean Soil Thickness			(cm)	0
Simulation Time			(yrs)	70
Length of Soil Column			(cm)	1470
Infiltration Rate			(cm/day)	5.19E-02
Source Length			(m)	366
Source Width			(m)	116
Boundary Layer Thickness			(cm)	5

Chemical Specific Input Parameters for TPH-AL16-35

#### Parameter Name Units Value

Total Soil Concentration	(mg/kg)	1
Diffusion Coeff. in Air	(cm^2/day	8640
Diffusion Coeff. in Water	(cm^2/day	0.864
Henrys Constant [	(mg/L)	/(mg/L)] .2660E+06
Organic Carbon Part. Coeff.	(cc/g)	1.00E+09
Lumped Chemical Decay Rate	(1/day)	0

#### Outputs for TPH-AL16-35

Time = 1 yrs

Cumulative Emissions to Air	(g)	22630
Advective Mass Loading Rate to Groundwater	(g/day)	0
Diffusive Mass Loading Rate to Groundwater	(g/day)	0
Advective & Diffusive Mass Loading Rate to Groundwater	(g/day)	0

Time = 2 yrs

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Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	29310 0 0 0
Time = 3 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	33000 0 0 0
Time = 4 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	35410 0 0 0
Time = 5 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	37140 2.5E-72 4.89E-63 0
Time = 10 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	41710 3.65E-40 1.21E-31 1.21E-31
Time = 15 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	43840 2.06E-29 3.3E-21 3.3E-21
Time = 20 yrs		
Cumulative Emissions to Air	(g)	45140

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Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g/day) (g/day) (g/day)	4.96E-24 5.11E-16 5.11E-16
Time = 25 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	46030 8.3E-21 6.26E-13 6.26E-13
Time = 30 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	46700 1.15E-18 6.8E-11 6.8E-11
Time = 35 yrs ====================================		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 40 yrs	(g) (g/day) (g/day) (g/day)	47220 3.82E-17 1.86E-09 1.86E-09
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 45 yrs	(g) (g/day) (g/day) (g/day)	47640 5.21E-16 2.14E-08 2.14E-08
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 50 yrs	(g) (g/day) (g/day) (g/day)	47990 3.92E-15 1.4E-07 1.4E-07
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater	(g) (g/day)	48280 1.94E-14

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Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g/day) (g/day)	6.1E-07 6.1E-07
Time = 55 yrs		
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 60 yrs	(g) (g/day) (g/day) (g/day)	48540 7.12E-14 2E-06 2E-06
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 65 yrs	(g) (g/day) (g/day) (g/day)	48760 2.08E-13 5.28E-06 5.28E-06
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater Time = 70 yrs	(g) (g/day) (g/day) (g/day)	48960 5.13E-13 1.18E-05 1.18E-05
Cumulative Emissions to Air Advective Mass Loading Rate to Groundwater Diffusive Mass Loading Rate to Groundwater Advective & Diffusive Mass Loading Rate to Groundwater	(g) (g/day) (g/day) (g/day)	49130 1.1E-12 2.33E-05 2.33E-05

AT123D Output File Analysis for Example Problem

Chemicals in the analysis TPH-AL16-35

Number of years simulated: 70

## GENERAL INPUT DATA

NO. OF POINTS IN X-DIRECTION NO. OF POINTS IN Y-DIRECTION NO. OF POINTS IN Z-DIRECTION NO. OF ROOTS: NO. OF SERIES TERMS NO. OF BEGINNING TIME STEPS NO. OF ENDING TIME STEP NO. OF TIME INTERVALS FOR PRINTED OUT SOLUTION INSTANTANEOUS SOURCE CONTROL = 0 FOR INSTANT SOURCE SOURCE CONDITION CONTROL = 0 FOR STEADY SOURCE INTERMITTENT OUTPUT CONTROL = 0 NO SUCH OUTPUT CASE CONTROL =1 THERMAL, = 2 FOR CHEMICAL, = 3 RAD 2	1	1 10 1000 1 70 1 70 1
X-COORDINATE OF RECEPTOR WELL (METERS) Y-COORDINATE OF RECEPTOR WELL (METERS) AQUIFER DEPTH, = 0.0 FOR INFINITE DEEP (METERS) AQUIFER WIDTH, = 0.0 FOR INFINITE WIDE (METERS) BEGIN POINT OF X-SOURCE LOCATION (METERS) END POINT OF X-SOURCE LOCATION (METERS) BEGIN POINT OF Y-SOURCE LOCATION (METERS) END POINT OF Y-SOURCE LOCATION (METERS) BEGIN POINT OF Y-SOURCE LOCATION (METERS) BEGIN POINT OF Z-SOURCE LOCATION (METERS) BEGIN POINT OF Z-SOURCE LOCATION (METERS)		1.83E+02 5.80E+01 3.05E+00 0.00E+00 3.66E+02 0.00E+00 1.16E+02 0.00E+00 0.00E+00
POROSITY HYDRAULIC CONDUCTIVITY (METER/YEAR) HYDRAULIC GRADIENT LONGITUDINAL DISPERSIVITY (METER) LATERAL DISPERSIVITY (METER) VERTICAL DISPERSIVITY (METER)		3.50E-01 3.15E+01 2.00E-02 0.00E+00 0.00E+00 0.00E+00
BULK DENSITY OF THE SOIL (KG/M**3) TIME INTERVAL SIZE FOR THE DESIRED SOLUTION (YR) DISCHARGE TIME (YR)		1.80E+03 1.00E+00 7.00E+01
INPUT DATA/RESULTS FOR CHEMICAL: TPH-AL16-35 INST. WASTE RELEASE (KG) VALID FOR INST CASE ONLY		1.00E+00

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DISTRIBUTION COEFFICIENT, KD (M**3/KG) MOLECULAR DIFFUSION COEFFICIENT (M**2/YR) DECAY CONSTANT ( 1/YR )	
DISTRIBUTION COEFFICIENT, KD (M**3/KG) MOLECULAR DIFFUSION COFFICIENT (M**2/VR)	2.00E+04 3.15E-02
DECAY CONSTANT ( 1/YR )	0.00E+00
LIST OF TRANSIENT SOURCE RELEASE RATE	
.000E+00 .000E+00 .000E+00 .000E+00 .000E+00	
.000E+00 .157E-44 .632E-39 .144E-34 .441E-31	
.312E-28 .738E-26 .749E-24 .392E-22 .121E-20	
.241E-19 .337E-18 .351E-17 .285E-16 .187E-15	
.102E-14 .476E-14 .194E-13 .702E-13 .228E-12	
.677E-12 .185E-11 .468E-11 .111E-10 .248E-10	
.526E-10 .106E-09 .205E-09 .380E-09 .678E-09 .117E-08 .196E-08 .319E-08 .506E-08 .782E-08	
.118E-07 .175E-07 .255E-07 .363E-07 .509E-07	
.703E-07 .957E-07 .128E-06 .170E-06 .223E-06	
.288E-06 .369E-06 .467E-06 .586E-06 .729E-06	
.899E-06 .110E-05 .133E-05 .161E-05 .193E-05	
.229E-05 .271E-05 .318E-05 .371E-05 .431E-05	
499E-05 574E-05 657E-05 749E-05	
RETARDATION FACTOR RETARDED SEEPAGE VELOCITY (M/YR)	1.03E+08
RETARDED SEEPAGE VELOCITY (M/YR)	1.75E-08
RETARDED LONGITUDINAL DISPERSION COEF. (M**2/YR) RETARDED LATERAL DISPERSION COEFFICIENT (M**2/YR) . RETARDED VERTICAL DISPERSION COEFFICIENT (M**2/YR).	8.76E-10
RETARDED LATERAL DISPERSION COEFFICIENT (M**2/YR) .	8.76E-10
RETARDED VERTICAL DISPERSION COEFFICIENT (M**2/YR).	8.76E-10
time [yr] = 1.00 avg. conc. [mg/l] = .000E+00	
time [yr] = 5.00 avg. conc. [mg/l] = .000E+00	
time [yr] = 10.0 avg. conc. [mg/l] = .000E+00	
time [yr] = 15.0 avg. conc. [mg/l] = .000E+00	
time [yr] = 20.0 avg. conc. [mg/l] = .000E+00	
time [yr] = 25.0 avg. conc. [mg/l] = .000E+00	
time [yr] = 30.0 avg. conc. [mg/l] = .000E+00	
time (we) = $25.0$ and $\frac{1}{2}$ and $\frac{1}{2}$	
time [yr] = 35.0 avg. conc. [mg/l] = .000E+00	
time [yr] = 40.0 avg. conc. [mg/l] = .000E+00	
time [yr] = 45.0 avg. conc. [mg/l] = .000E+00	
time [yr] = 50.0 avg. conc. [mg/l] = .000E+00	
time [yr] = 55.0 avg. conc. [mg/l] = .000E+00	
time [yr] = 60.0 avg. conc. [mg/l] = .000E+00	