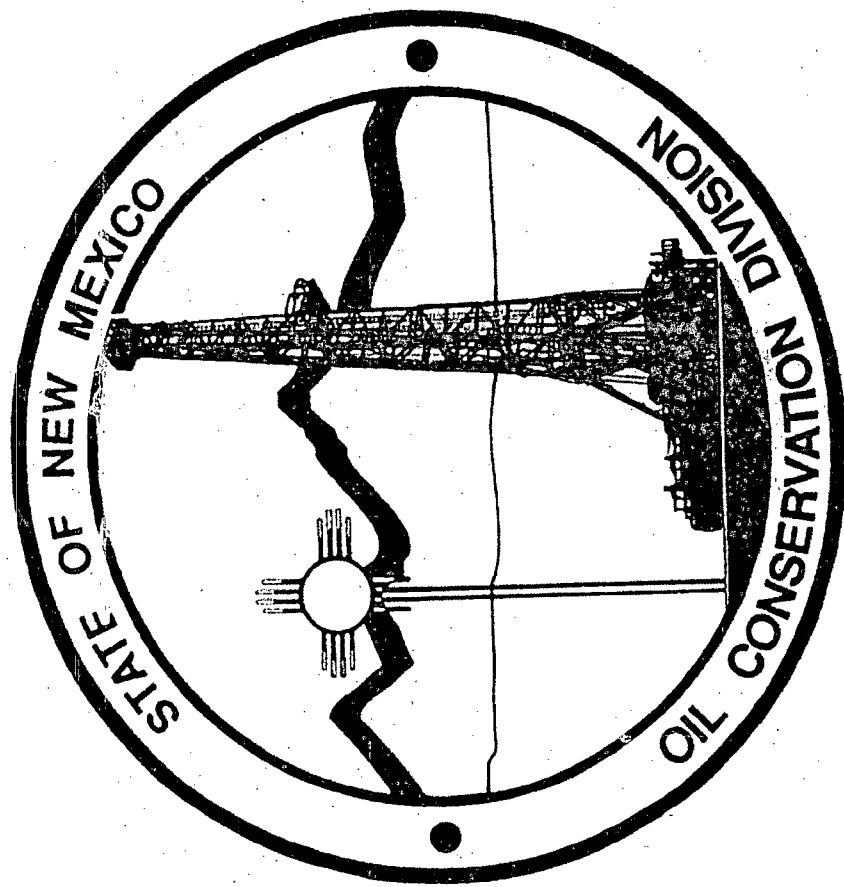


CASE NO. 14292
OCD EXHIBIT 9



Trench Release Modeling for the Permian Basin

Output Files

HELP and Multimed Output Files for a Pit with No Liner

```
PRECIPITATION DATA FILE: C:\HELP7\lea\H050.D4
TEMPERATURE DATA FILE: C:\HELP7\lea\H050.D7
SOLAR RADIATION DATA FILE: C:\HELP7\lea\H050.D13
EVAPOTRANSPIRATION DATA: c:\help7\lea\H050.D11
SOIL AND DESIGN DATA FILE: C:\HELP7\lea\HPIT21NL.D10
OUTPUT DATA FILE: C:\HELP7\lea\hpit21nl.OUT
```

TITLE: Permian Basin Pit - 2' sandy loam cover - no liner

LAYER 1

THICKNESS	=	24.00	INCHES
POROSITY	=	0.4530	VOL/VOL
FIELD CAPACITY	=	0.1900	VOL/VOL
WILTING POINT	=	0.0850	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.1113	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.720000011000E-03	CM/SEC

NOTE: SATURATED HYDRAULIC CONDUCTIVITY IS MULTIPLIED BY 2.49
FOR ROOT CHANNELS IN TOP HALF OF EVAPORATIVE ZONE.

LAYER 2

TYPE 1 - VERTICAL PERCOLATION LAYER MATERIAL TEXTURE NUMBER 9

THICKNESS	=	150.00	INCHES
POROSITY	=	0.5010	VOL/VOL
FIELD CAPACITY	=	0.2840	VOL/VOL
WILTING POINT	=	0.1350	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.2830	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.190000006000E-03	CM/SEC

GENERAL DESIGN AND EVAPORATIVE ZONE DATA

NOTE: SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT
SOIL DATA BASE USING SOIL TEXTURE # 6 WITH A
POOR STAND OF GRASS, A SURFACE SLOPE OF 1.3
AND A SLOPE LENGTH OF 75. FEET.

SCS RUNOFF CURVE NUMBER	=	80.90	
FRACTION OF AREA ALLOWING RUNOFF	=	100.0	PERCENT
AREA PROJECTED ON HORIZONTAL PLANE	=	0.500	ACRES
EVAPORATIVE ZONE DEPTH	=	20.0	INCHES
INITIAL WATER IN EVAPORATIVE ZONE	=	2.226	INCHES
UPPER LIMIT OF EVAPORATIVE STORAGE	=	9.060	INCHES
LOWER LIMIT OF EVAPORATIVE STORAGE	=	1.700	INCHES
INITIAL SNOW WATER	=	0.000	INCHES
INITIAL WATER IN LAYER MATERIALS	=	45.121	INCHES
TOTAL INITIAL WATER	=	45.121	INCHES
TOTAL SUBSURFACE INFLOW	=	0.00	INCHES/YEAR

EVAPOTRANSPIRATION AND WEATHER DATA

NOTE: EVAPOTRANSPIRATION DATA WAS OBTAINED FROM
HOBBS NEW MEXICO

STATION LATITUDE	=	32.42	DEGREES
MAXIMUM LEAF AREA INDEX	=	1.60	
START OF GROWING SEASON (JULIAN DATE)	=	67	
END OF GROWING SEASON (JULIAN DATE)	=	317	
EVAPORATIVE ZONE DEPTH	=	20.0	INCHES
AVERAGE ANNUAL WIND SPEED	=	11.10	MPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY	=	52.00	%
AVERAGE 2ND QUARTER RELATIVE HUMIDITY	=	50.00	%
AVERAGE 3RD QUARTER RELATIVE HUMIDITY	=	55.00	%

AVERAGE 4TH QUARTER RELATIVE HUMIDITY = 50.00 %

NOTE: PRECIPITATION DATA FOR HOBBS NEW MEXICO
WAS ENTERED FROM A EARTH INFO CLIMATEDATA.

NOTE: TEMPERATURE DATA FOR HOBBS NEW MEXICO
WAS ENTERED FROM A EARTH INFO CLIMATEDATA.

NOTE: SOLAR RADIATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR MIDLAND TEXAS
AND STATION LATITUDE = 32.43 DEGREES

.....
AVERAGE MONTHLY VALUES IN INCHES FOR YEARS 1951 THROUGH 2000

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION						
TOTALS	0.42 2.27	0.54 2.35	0.49 2.51	0.71 1.57	2.33 0.67	1.68 0.57
STD. DEVIATIONS	0.54 2.20	0.62 1.99	0.57 2.84	0.74 1.82	2.28 0.88	1.42 0.97
RUNOFF						
TOTALS	0.000 0.122	0.000 0.103	0.001 0.218	0.001 0.076	0.121 0.018	0.021 0.003
STD. DEVIATIONS	0.000 0.367	0.000 0.335	0.004 0.692	0.004 0.305	0.572 0.113	0.073 0.018
EVAPOTRANSPIRATION						
TOTALS	0.503 1.860	0.515 2.095	0.506 1.671	0.657 1.189	1.867 0.871	1.980 0.545
STD. DEVIATIONS	0.527 1.381	0.558 1.286	0.490 1.015	0.598 0.901	1.238 0.757	1.405 0.459
PERCOLATION/LEAKAGE THROUGH LAYER 2						
TOTALS	0.1775	0.1132	0.1087	0.0780	0.0495	0.0287

0.0474 0.0514 0.0704 0.0954 0.1542 0.1974
 STD. DEVIATIONS 0.3211 0.2262 0.2319 0.1838 0.1508 0.0859
 0.1985 0.1762 0.1708 0.1943 0.2984 0.3743

AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1951 THROUGH 2000

	INCHES	CU. FEET	PERCENT
PRECIPITATION	16.12 (5.994)	29250.2	100.00
RUNOFF	0.683 (0.9939)	1239.50	4.238
EVAPOTRANSPIRATION	14.257 (4.1298)	25877.24	88.469
PERCOLATION/LEAKAGE THROUGH LAYER 2	1.17176 (1.59639)	2126.737	7.27085
CHANGE IN WATER STORAGE	0.004 (2.1321)	6.70	0.023

PEAK DAILY VALUES FOR YEARS 1951 THROUGH 2000

	(INCHES)	(CU. FT.)
PRECIPITATION	7.50	13612.500
RUNOFF	4.041	7334.1924
PERCOLATION/LEAKAGE THROUGH LAYER 2	0.069410	125.97987
SNOW WATER	2.96	5372.9717
MAXIMUM VEG. SOIL WATER (VOL/VOL)		0.3492
MINIMUM VEG. SOIL WATER (VOL/VOL)		0.0850

.....

FINAL WATER STORAGE AT END OF YEAR 2000

LAYER	(INCHES)	(VOL/VOL)
1	2.7118	0.1130
2	42.5939	0.2840
SNOW WATER	0.000	

.....

.....

hpn16010.out

U. S. ENVIRONMENTAL PROTECTION AGENCY
EXPOSURE ASSESSMENT
MULTIMEDIA MODEL

MULTIMED (Version 1.01, June 1991)

Run options

Proposed Lea County Pit 100' to GW, Ksat of 1e-3 cm/sec

50 year ave. - sandy loam cov no liner - 60K chloride - 10' mixing zone
Chemical simulated is DEFAULT CHEMICAL

Option Chosen Saturated and unsaturated zone models
Run was DETERMIN

Infiltration input by user

Run was transient

Reject runs if Y coordinate outside plume

Do not reject runs if Z coordinate outside plume

Gaussian source used in saturated zone model

UNSATURATED ZONE FLOW MODEL PARAMETERS

(input parameter description and value)

NP - Total number of nodal points 240

NMAT - Number of different porous materials 1

KPROP - Van Genuchten or Brooks and Corey 1

IMSHGN - Spatial discretization option 1

NVFLAYR - Number of layers in flow model 1

OPTIONS CHOSEN

Van Genuchten functional coefficients
User defined coordinate system

1

Layer information

LAYER NO.	LAYER THICKNESS	MATERIAL PROPERTY
1	30.40	1

DATA FOR MATERIAL 1

VADOSE ZONE MATERIAL VARIABLES

MAX	VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS		LIMITS	
				MEAN	STD DEV	MIN	MAX
0.100E+05	Saturated hydraulic conductivity	cm/hr	CONSTANT	3.60	-999.	0.100E-10	
0.990	Unsaturated zone porosity	--	CONSTANT	0.250	-999.	0.100E-08	
999.	Air entry pressure head	m	CONSTANT	0.700	-999.	0.000E+00	
999.	Depth of the unsaturated zone	m	CONSTANT	30.4	-999.	0.100E-08	

DATA FOR MATERIAL 1

VADOSE ZONE FUNCTION VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS	LIMITS
---------------	-------	--------------	------------	--------

	MAX	MEAN	STD DEV	MIN
1.00	Residual water content	0.116	-999.	0.100E-08
10.0	Brook and Corey exponent, EN	0.000E+00	-999.	0.000E+00
1.00	ALFA coefficient	0.500E-02	-999.	0.000E+00
5.00	Van Genuchten exponent, ENN	1.09	-999.	1.00

UNSATURATED ZONE TRANSPORT MODEL PARAMETERS

NLAY	- Number of different layers used	1
NTSTPS	- Number of time values concentration calc	40
DUMMY	- Not presently used	1
ISOL	- Type of scheme used in unsaturated zone	1
N	- Stehfest terms or number of increments	18
NTEL	- Points in Lagrangian interpolation	3
NGPTS	- Number of Gauss points	104
NIT	- Convolution integral segments	2
IBOUND	- Type of boundary condition	2
ITSGEN	- Time values generated or input	1
TMAX	- Max simulation time	0.0
WTFUN	- Weighting factor	1.2

OPTIONS CHOSEN

Stehfest numerical inversion algorithm
 Nondecaying pulse source
 Computer generated times for computing concentrations

DATA FOR LAYER 1

 VADOSE TRANSPORT VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS		LIMITS	
			MEAN	STD DEV	MIN	MAX
Thickness of layer	m	CONSTANT	30.4	-999.	0.100E-08	-
Longitudinal dispersivity of layer	m	DERIVED	1.00	-999.	0.100E-02	-
Percent organic matter	--	CONSTANT	0.000E+00	-999.	0.000E+00	-
Bulk density of soil for layer	g/cc	CONSTANT	1.73	-999.	0.100E-01	-
Biological decay coefficient	1/yr	CONSTANT	0.000E+00	-999.	0.000E+00	-

CHEMICAL SPECIFIC VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS		LIMITS	
			MEAN	STD DEV	MIN	MAX
Solid phase decay coefficient	1/yr	DERIVED	-999.	-999.	0.000E+00	-
Dissolved phase decay coefficient	1/yr	DERIVED	-999.	-999.	0.000E+00	-
Overall chemical decay coefficient	1/yr	DERIVED	-999.	-999.	0.000E+00	-
Acid catalyzed hydrolysis rate	1/M-yr	CONSTANT	0.000E+00	-999.	0.000E+00	-
Neutral hydrolysis rate constant	1/yr	CONSTANT	0.000E+00	-999.	0.000E+00	-
Base catalyzed hydrolysis rate	1/M-yr	CONSTANT	0.000E+00	-999.	0.000E+00	-
Reference temperature	C	CONSTANT	20.0	-999.	0.000E+00	-
Normalized distribution coefficient	ml/g	CONSTANT	0.000E+00	-999.	0.000E+00	-
Distribution coefficient	--	DERIVED	-999.	-999.	0.000E+00	-

999.	Biodegradation coefficient (sat. zone)	1/yr	CONSTANT	0.000E+00	-999.	0.000E+00
10.0	Air diffusion coefficient	cm ² /s	CONSTANT	0.000E+00	-999.	0.000E+00
100.	Reference temperature for air diffusion	C	CONSTANT	20.0	-999.	0.000E+00
999.	Molecular weight	g/M	CONSTANT	0.000E+00	-999.	0.000E+00
1.00	Mole fraction of solute	--	CONSTANT	0.000E+00	-999.	0.100E-08
100.	Vapor pressure of solute	mm Hg	CONSTANT	0.000E+00	-999.	0.000E+00
1.00	Henry's law constant	atm-m ³ /M	CONSTANT	0.000E+00	-999.	0.100E-09
1.00	Overall 1st order decay sat. zone	1/yr	DERIVED	0.000E+00	0.000E+00	0.000E+00
1.00	Not currently used		CONSTANT	-999.	-999.	0.000E+00
1.00	Not currently used		CONSTANT	-999.	-999.	0.000E+00

SOURCE SPECIFIC VARIABLES

	VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS		LIMITS	
				MEAN	STD DEV	MAX	MIN
0.100E+11	Infiltration rate	m/yr	CONSTANT	0.298E-01	-999.	0.100E-09	
999.	Area of waste disposal unit	m ²	CONSTANT	167.	-999.	0.100E-01	
999.	Duration of pulse	yr	CONSTANT	50.0	-999.	0.100E-08	
0.100E+11	Spread of contaminant source	m	DERIVED	-999.	-999.	0.100E-08	
0.100E+11	Recharge rate	m/yr	CONSTANT	0.000E+00	-999.	0.000E+00	
999.	Source decay constant	1/yr	CONSTANT	0.000E+00	-999.	0.000E+00	
999.	Initial concentration at landfill	mg/l	CONSTANT	0.600E+05	-999.	0.000E+00	

0.100E+11	Length scale of facility	m	DERIVED	-999.	-999.	0.100E-08
0.100E+11	Width scale of facility	m	DERIVED	-999.	-999.	0.100E-08
1.00	Near field dilution		DERIVED	1.00	0.000E+00	0.000E+00

AQUIFER SPECIFIC VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS		LIMITS	
			MEAN	STD DEV	MIN	MAX

MAX

100.	Particle diameter	cm	CONSTANT	0.500E-01	-999.	0.100E-08
0.990	Aquifer porosity	--	CONSTANT	0.300	-999.	0.100E-08
5.00	Bulk density	g/cc	CONSTANT	1.70	-999.	0.100E-01
0.100E+06	Aquifer thickness	m	CONSTANT	31.0	-999.	0.100E-08
0.100E+06	Source thickness (mixing zone depth)	m	CONSTANT	3.05	-999.	0.100E-08
0.100E+09	Conductivity (hydraulic)	m/yr	CONSTANT	30.0	-999.	0.100E-06
999.	Gradient (hydraulic)		CONSTANT	0.100E-02	-999.	0.100E-07
0.100E+09	Groundwater seepage velocity	m/yr	DERIVED	-999.	-999.	0.100E-09
0.100E+09	Retardation coefficient	--	DERIVED	1.00	-999.	1.00
0.100E+05	Longitudinal dispersivity	m	FUNCTION OF X	-999.	-999.	0.100E-02
999.	Transverse dispersivity	m	FUNCTION OF X	-999.	-999.	-999.
0.100E+05	Vertical dispersivity	m	FUNCTION OF X	-999.	-999.	0.100E-02
100.	Temperature of aquifer	C	CONSTANT	20.0	-999.	0.000E+00
14.0	pH	--	CONSTANT	7.00	-999.	0.300

Organic carbon content (fraction)	CONSTANT	0.000E+00 -999.	0.100E-05
Well distance from site	CONSTANT	1.00 -999.	1.00
Angle off center	CONSTANT	0.000E+00 -999.	0.000E+00
Well vertical distance	CONSTANT	0.000E+00 -999.	0.000E+00

1.00

999.

360.

1.00

1

TIME	CONCENTRATION
0.100E+03	0.00000E+00
0.120E+03	0.00000E+00
0.140E+03	0.46169E+02
0.160E+03	0.57809E+03
0.180E+03	0.40749E+04
0.200E+03	0.10397E+05
0.220E+03	0.17330E+05
0.240E+03	0.21348E+05
0.260E+03	0.22070E+05
0.280E+03	0.20045E+05
0.300E+03	0.16506E+05
0.320E+03	0.12553E+05
0.340E+03	0.88966E+04
0.360E+03	0.56902E+04
0.380E+03	0.34018E+04
0.400E+03	0.18817E+04
0.420E+03	0.99628E+03
0.440E+03	0.29021E+03
0.460E+03	0.18995E+03
0.480E+03	0.10658E+03

HELP and Multimed Output Files for an On-site Trench Burial

HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE
 HELP MODEL VERSION 3.07 (1 NOVEMBER 1997)
 DEVELOPED BY ENVIRONMENTAL LABORATORY
 USAE WATERWAYS EXPERIMENT STATION
 FOR USEPA RISK REDUCTION ENGINEERING LABORATORY

PRECIPITATION DATA FILE: C:\HELP7\lea\HO50.D4
 TEMPERATURE DATA FILE: C:\HELP7\lea\HO50.D7
 SOLAR RADIATION DATA FILE: C:\HELP7\lea\HO50.D13
 EVAPOTRANSPIRATION DATA: c:\help7\lea\HO50.D11
 SOIL AND DESIGN DATA FILE: C:\HELP7\lea\HPTILFG.D10
 OUTPUT DATA FILE: C:\HELP7\lea\hptilfg.OUT

TIME: 10:15 DATE: 9/ 5/2007

TITLE: Lea County Pit - 16am cover - liner, good - F.C.

NOTE: INITIAL MOISTURE CONTENT OF THE LAYERS AND SNOW WATER
 WERE SPECIFIED BY THE USER.

LAYER 1

TYPE 1 - VERTICAL PERCOLATION LAYER
 MATERIAL TEXTURE NUMBER 7

THICKNESS = 6.00 INCHES
 POROSITY = 0.4730 VOL/VOL
 FIELD CAPACITY = 0.2220 VOL/VOL
 WILTING POINT = 0.1040 VOL/VOL
 INITIAL SOIL WATER CONTENT = 0.1335 VOL/VOL
 EFFECTIVE SAT. HYD. COND. = 0.520000001000E-03 CM/SEC
 NOTE: SATURATED HYDRAULIC CONDUCTIVITY IS MULTIPLIED BY 2.49
 FOR ROOT CHANNELS IN TOP HALF OF EVAPORATIVE ZONE.

LAYER 2

TYPE 1 - VERTICAL PERCOLATION LAYER

MATERIAL TEXTURE NUMBER 8

THICKNESS	=	36.00	INCHES
POROSITY	=	0.4630	VOL/VOL
FIELD CAPACITY	=	0.2320	VOL/VOL
WILTING POINT	=	0.1160	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.1450	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.369999994000E-03	CM/SEC

LAYER 3

TYPE 2 - LATERAL DRAINAGE LAYER

MATERIAL TEXTURE NUMBER 8

THICKNESS	=	6.00	INCHES
POROSITY	=	0.4630	VOL/VOL
FIELD CAPACITY	=	0.2320	VOL/VOL
WILTING POINT	=	0.1160	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.1450	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.369999994000E-03	CM/SEC
SLOPE	=	1.00	PERCENT
DRAINAGE LENGTH	=	10.0	FEET

LAYER 4

TYPE 4 - FLEXIBLE MEMBRANE LINER

MATERIAL TEXTURE NUMBER 36

THICKNESS	=	0.02	INCHES
POROSITY	=	0.0000	VOL/VOL
FIELD CAPACITY	=	0.0000	VOL/VOL
WILTING POINT	=	0.0000	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.0000	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.399999993000E-12	CM/SEC
FML PINHOLE DENSITY	=	1.00	HOLES/ACRE
FML INSTALLATION DEFECTS	=	4.00	HOLES/ACRE
FML PLACEMENT QUALITY	=	3	- GOOD

LAYER 5

TYPE 1 - VERTICAL PERCOLATION LAYER

MATERIAL TEXTURE NUMBER 9

THICKNESS	=	150.00	INCHES
POROSITY	=	0.5010	VOL/VOL
FIELD CAPACITY	=	0.2840	VOL/VOL
WILTING POINT	=	0.1350	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.2830	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.190000006000E-03	CM/SEC

LAYER 6

TYPE 4 - FLEXIBLE MEMBRANE LINER

MATERIAL TEXTURE NUMBER 36

THICKNESS	=	0.02	INCHES
POROSITY	=	0.0000	VOL/VOL
FIELD CAPACITY	=	0.0000	VOL/VOL
WILTING POINT	=	0.0000	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.0000	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.399999993000E-12	CM/SEC
FML PINHOLE DENSITY	=	1.00	HOLES/ACRE
FML INSTALLATION DEFECTS	=	4.00	HOLES/ACRE
FML PLACEMENT QUALITY	=	3	GOOD

GENERAL DESIGN AND EVAPORATIVE ZONE DATA

NOTE: SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT
SOIL DATA BASE USING SOIL TEXTURE # 7 WITH A
POOR STAND OF GRASS, A SURFACE SLOPE OF 1.8
AND A SLOPE LENGTH OF 75. FEET.

SCS RUNOFF CURVE NUMBER	=	83.90	
FRACTION OF AREA ALLOWING RUNOFF	=	100.0	PERCENT
AREA PROJECTED ON HORIZONTAL PLANE	=	0.500	ACRES
EVAPORATIVE ZONE DEPTH	=	20.0	INCHES
INITIAL WATER IN EVAPORATIVE ZONE	=	2.831	INCHES
UPPER LIMIT OF EVAPORATIVE STORAGE	=	9.320	INCHES
LOWER LIMIT OF EVAPORATIVE STORAGE	=	2.248	INCHES
INITIAL SNOW WATER	=	0.000	INCHES
INITIAL WATER IN LAYER MATERIALS	=	49.341	INCHES
TOTAL INITIAL WATER	=	49.341	INCHES
TOTAL SUBSURFACE INFLOW	=	0.00	INCHES/YEAR

EVAPOTRANSPIRATION AND WEATHER DATA

NOTE: EVAPOTRANSPIRATION DATA WAS OBTAINED FROM

HOBBS

NEW MEXICO

STATION LATITUDE = 32.42 DEGREES
 MAXIMUM LEAF AREA INDEX = 1.60
 START OF GROWING SEASON (JULIAN DATE) = 67
 END OF GROWING SEASON (JULIAN DATE) = 317
 EVAPORATIVE ZONE DEPTH = 20.0 INCHES
 AVERAGE ANNUAL WIND SPEED = 11.10 MPH
 AVERAGE 1ST QUARTER RELATIVE HUMIDITY = 52.00 %
 AVERAGE 2ND QUARTER RELATIVE HUMIDITY = 50.00 %
 AVERAGE 3RD QUARTER RELATIVE HUMIDITY = 55.00 %
 AVERAGE 4TH QUARTER RELATIVE HUMIDITY = 58.00 %

NOTE: PRECIPITATION DATA FOR HOBBS NEW MEXICO
 WAS ENTERED FROM A EARTH INFO CLIMATEDATA.

NOTE: TEMPERATURE DATA FOR HOBBS NEW MEXICO
 WAS ENTERED FROM A EARTH INFO CLIMATEDATA.

NOTE: SOLAR RADIATION DATA WAS SYNTHETICALLY GENERATED USING
 COEFFICIENTS FOR MIDLAND TEXAS
 AND STATION LATITUDE = 32.43 DEGREES

AVERAGE MONTHLY VALUES IN INCHES FOR YEARS 1951 THROUGH 2000

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
	-----	-----	-----	-----	-----	-----
PRECIPITATION						
TOTALS	0.42 2.27	0.54 2.35	0.49 2.51	0.71 1.57	2.33 0.67	1.68 0.57
STD. DEVIATIONS	0.54 2.20	0.62 1.99	0.57 2.84	0.74 1.82	2.28 0.88	1.42 0.97
RUNOFF						
TOTALS	0.000 0.168	0.000 0.150	0.003 0.285	0.003 0.111	0.167 0.025	0.039 0.006
STD. DEVIATIONS	0.000 0.485	0.000 0.438	0.012 0.829	0.012 0.401	0.675 0.151	0.112 0.039

EVAPOTRANSPIRATION

TOTALS	0.521 1.827	0.503 2.118	0.500 1.674	0.675 1.206	1.855 0.890	1.999 0.553
STD. DEVIATIONS	0.551 1.326	0.533 1.322	0.498 1.036	0.603 0.918	1.283 0.781	1.435 0.457

LATERAL DRAINAGE COLLECTED FROM LAYER 3

TOTALS	0.0559 0.0187	0.0358 0.0166	0.0250 0.0815	0.0145 0.1657	0.0156 0.1421	0.0389 0.0951
STD. DEVIATIONS	0.1081 0.0991	0.0740 0.0560	0.0581 0.2109	0.0351 0.4239	0.0631 0.3160	0.2452 0.1950

PERCOLATION/LEAKAGE THROUGH LAYER 4

TOTALS	0.0101 0.0033	0.0076 0.0037	0.0064 0.0085	0.0046 0.0149	0.0037 0.0149	0.0040 0.0127
STD. DEVIATIONS	0.0160 0.0099	0.0124 0.0087	0.0109 0.0148	0.0080 0.0261	0.0070 0.0244	0.0134 0.0209

PERCOLATION/LEAKAGE THROUGH LAYER 6

TOTALS	0.0086 0.0070	0.0079 0.0066	0.0085 0.0063	0.0079 0.0072	0.0078 0.0077	0.0072 0.0085
STD. DEVIATIONS	0.0092 0.0085	0.0085 0.0083	0.0093 0.0078	0.0089 0.0079	0.0089 0.0080	0.0084 0.0088

AVERAGES OF MONTHLY AVERAGED DAILY HEADS (INCHES)

DAILY AVERAGE HEAD ON TOP OF LAYER 4

AVERAGES	0.4589 0.1309	0.3607 0.1477	0.2567 0.4242	0.1748 0.7810	0.1324 0.7897	0.1804 0.6230
STD. DEVIATIONS	0.7812 0.5247	0.6438 0.4195	0.4933 0.8097	0.3530 1.5138	0.3163 1.4101	0.8305 1.1007

DAILY AVERAGE HEAD ON TOP OF LAYER 6

AVERAGES	0.3211 0.2545	0.3229 0.2376	0.3175 0.2309	0.3047 0.2536	0.2868 0.2873	0.2707 0.3120
STD. DEVIATIONS	0.3782 0.3512	0.3857 0.3435	0.3852 0.3333	0.3772 0.3229	0.3622 0.3373	0.3551 0.3596

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AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1951 THROUGH 2000

	INCHES	CU. FEET	PERCENT
PRECIPITATION	16.12 (5.994)	29250.2	100.00
RUNOFF	0.954 (1.2292)	1732.32	5.922
EVAPOTRANSPIRATION	14.321 (4.1769)	25991.94	88.861
LATERAL DRAINAGE COLLECTED FROM LAYER 3	0.70532 (1.17344)	1280.148	4.37655
PERCOLATION/LEAKAGE THROUGH LAYER 4	0.09435 (0.11042)	171.238	0.58543
AVERAGE HEAD ON TOP OF LAYER 4	0.372 (0.472)		
PERCOLATION/LEAKAGE THROUGH LAYER 6	0.09107 (0.09637)	165.301	0.56513
AVERAGE HEAD ON TOP OF LAYER 6	0.283 (0.333)		
CHANGE IN WATER STORAGE	0.044 (1.3438)	80.46	0.275

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PEAK DAILY VALUES FOR YEARS 1951 THROUGH 2000

	(INCHES)	(CU. FT.)
PRECIPITATION	7.50	13612.500
RUNOFF	4.604	8356.8262
DRAINAGE COLLECTED FROM LAYER 3	0.20819	377.86533
PERCOLATION/LEAKAGE THROUGH LAYER 4	0.005563	10.09724
AVERAGE HEAD ON TOP OF LAYER 4	11.783	
MAXIMUM HEAD ON TOP OF LAYER 4	14.662	
LOCATION OF MAXIMUM HEAD IN LAYER 3 (DISTANCE FROM DRAIN)	9.3 FEET	
PERCOLATION/LEAKAGE THROUGH LAYER 6	0.001142	2.07289

44

AVERAGE HEAD ON TOP OF LAYER	6	1.643	
SNOW WATER		2.96	5372.9717
MAXIMUM VEG. SOIL WATER (VOL/VOL)			0.3687
MINIMUM VEG. SOIL WATER (VOL/VOL)			0.1124

*** Maximum heads are computed using McEnroe's equations. ***

Reference: Maximum Saturated Depth over Landfill Liner
by Bruce M. McEnroe, University of Kansas
ASCE Journal of Environmental Engineering
Vol. 119, No. 2, March 1993, pp. 262-270.

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FINAL WATER STORAGE AT END OF YEAR 2000

LAYER	(INCHES)	(VOL/VOL)
1	0.6304	0.1051
2	6.9045	0.1918
3	1.4091	0.2349
4	0.0000	0.0000
5	42.6136	0.2841
6	0.0000	0.0000
SNOW WATER	0.000	

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U. S. ENVIRONMENTAL PROTECTION AGENCY

EXPOSURE ASSESSMENT

MULTIMEDIA MODEL

MULTIMED (Version 1.01, June 1991)

1 Run options

Proposed Lea County Pit 100' to GW, Ksat of 1e-3 cm/sec

50 year ave. - loam cover - good liner - 60K chloride - 10' mixing zone
Chemical simulated is DEFAULT CHEMICAL

Option Chosen	Saturated and unsaturated zone models
Run was	DETERMIN

Infiltration input by user

Run was transient

Reject runs if Y coordinate outside plume

Do not reject runs if Z coordinate outside plume

Gaussian source used in saturated zone model

1 1

UNSATURATED ZONE FLOW MODEL PARAMETERS
(input parameter description and value)

NP - Total number of nodal points 240

NMAT - Number of different porous materials 1

KPROP - Van Genuchten or Brooks and Corey 1

IMSHGN - Spatial discretization option 1

NVFLAYR - Number of layers in flow model 1

OPTIONS CHOSEN

Van Genuchten functional coefficients
User defined coordinate system

1

Layer information

LAYER NO.	LAYER THICKNESS	MATERIAL PROPERTY
1	30.40	1

DATA FOR MATERIAL 1

VADOSE ZONE MATERIAL VARIABLES

LIMITS	VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS	
				MEAN	STD DEV
0.100E-10	Saturated hydraulic conductivity	cm/hr	CONSTANT	3.60	-999.
0.100E-08	Unsaturated zone porosity	--	CONSTANT	0.250	-999.
0.000E+00	Air entry pressure head	m	CONSTANT	0.700	-999.
0.100E-08	Depth of the unsaturated zone	m	CONSTANT	30.4	-999.

DATA FOR MATERIAL 1

VADOSE ZONE FUNCTION VARIABLES

LIMITS	VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS	
				MEAN	STD DEV
	MAX				
	Residual water content	--	CONSTANT	0.116	-999.
0.100E-08	1.00				
	Brook and Corey exponent, EN	--	CONSTANT	0.000E+00	-999.
0.000E+00	10.0				
	ALFA coefficient	1/cm	CONSTANT	0.500E-02	-999.
0.000E+00	1.00				
	Van Genuchten exponent, ENN	--	CONSTANT	1.09	-999.
1.00	5.00				
1					

UNSATURATED ZONE TRANSPORT MODEL PARAMETERS

NLAY - Number of different layers used 1
 NTSTPS - Number of time values concentration calc 40
 DUMMY - Not presently used 1
 ISOL - Type of scheme used in unsaturated zone 1
 N - Stehfest terms or number of increments 18
 NTEL - Points in Lagrangian interpolation 3
 NGPTS - Number of Gauss points 104
 NIT - Convolution integral segments 2
 IBOUND - Type of boundary condition 2
 ITSGEN - Time values generated or input 1
 TMAX - Max simulation time 0.0
 WTFUN - Weighting factor 1.2

OPTIONS CHOSEN

Stehfest numerical inversion algorithm
 Nondecaying pulse source
 Computer generated times for computing concentrations

DATA FOR LAYER 1

 VADOSE TRANSPORT VARIABLES

LIMITS		VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS	
MIN	MAX				MEAN	STD DEV
0.100E-08		Thickness of layer	m	CONSTANT	30.4	-999.
0.100E-02		Longitudinal dispersivity of layer	m	DERIVED	1.00	-999.
0.000E+00		Percent organic matter	--	CONSTANT	0.000E+00	-999.
0.100E-01		Bulk density of soil for layer	g/cc	CONSTANT	1.73	-999.
0.000E+00		Biological decay coefficient	1/yr	CONSTANT	0.000E+00	-999.
1						

LIMITS		VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS	
MIN	MAX				MEAN	STD DEV
		Solid phase decay coefficient	1/yr	DERIVED	-999.	-999.
0.000E+00	0.100E+11					
		Dissolved phase decay coefficient	1/yr	DERIVED	-999.	-999.
0.000E+00	0.100E+11					
		Overall chemical decay coefficient	1/yr	DERIVED	-999.	-999.
0.000E+00	0.100E+11					
		Acid catalyzed hydrolysis rate	1/M-yr	CONSTANT	0.000E+00	-999.
0.000E+00	-999.					
		Neutral hydrolysis rate constant	1/yr	CONSTANT	0.000E+00	-999.
0.000E+00	-999.					
		Base catalyzed hydrolysis rate	1/M-yr	CONSTANT	0.000E+00	-999.
0.000E+00	-999.					

0.100E-08	Spread of contaminant source	m	DERIVED	-999.	-999.
0.100E+11	Recharge rate	m/yr	CONSTANT	0.000E+00	-999.
0.000E+00	Source decay constant	1/yr	CONSTANT	0.000E+00	-999.
0.000E+00	Initial concentration at landfill	mg/l	CONSTANT	0.600E+05	-999.
0.000E+00	Length scale of facility	m	DERIVED	-999.	-999.
0.100E-08	Width scale of facility	m	DERIVED	-999.	-999.
0.100E-08	Near field dilution		DERIVED	1.00	0.000E+00
0.000E+00					

AQUIFER SPECIFIC VARIABLES

LIMITS		VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS	
MIN	MAX				MEAN	STD DEV
0.100E-08	100.	Particle diameter	cm	CONSTANT	0.500E-01	-999.
0.100E-08	0.990	Aquifer porosity	--	CONSTANT	0.300	-999.
0.100E-01	5.00	Bulk density	g/cc	CONSTANT	1.70	-999.
0.100E-08	0.100E+06	Aquifer thickness	m	CONSTANT	21.0	-999.
0.100E-08	0.100E+06	Source thickness (mixing zone depth)	m	CONSTANT	3.05	-999.
0.100E-06	0.100E+09	Conductivity (hydraulic)	m/yr	CONSTANT	30.0	-999.
0.100E-07	-999.	Gradient (hydraulic)		CONSTANT	0.100E-02	-999.
0.100E-09	0.100E+09	Groundwater seepage velocity	m/yr	DERIVED	-999.	-999.
1.00	0.100E+09	Retardation coefficient	--	DERIVED	1.00	-999.

0.100E-02	Longitudinal dispersivity	m	FUNCTION OF X	-999.	-999.
0.100E+05	Transverse dispersivity	m	FUNCTION OF X	-999.	-999.
-999.	Vertical dispersivity	m	FUNCTION OF X	-999.	-999.
0.100E-02	Temperature of aquifer	C	CONSTANT	20.0	-999.
0.000E+00	pH	--	CONSTANT	7.00	-999.
0.300	Organic carbon content (fraction)		CONSTANT	0.000E+00	-999.
0.100E-05	Well distance from site	m	CONSTANT	1.00	-999.
1.00	Angle off center	degree	CONSTANT	0.000E+00	-999.
0.000E+00	Well vertical distance	m	CONSTANT	0.000E+00	-999.
0.000E+00					

TIME	CONCENTRATION
0.180E+04	0.00000E+00
0.182E+04	0.00000E+00
0.184E+04	0.00000E+00
0.186E+04	0.00000E+00
0.188E+04	0.00000E+00
0.190E+04	0.70173E-15
0.192E+04	0.23165E+02
0.194E+04	0.73745E+02
0.196E+04	0.11367E+03
0.198E+04	0.15163E+03
0.200E+04	0.18938E+03
0.202E+04	0.22712E+03
0.204E+04	0.26486E+03
0.206E+04	0.30260E+03
0.208E+04	0.34033E+03
0.210E+04	0.37807E+03
0.212E+04	0.41581E+03
0.214E+04	0.45355E+03
0.216E+04	0.49128E+03
0.218E+04	0.51104E+03

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U. S. ENVIRONMENTAL PROTECTION AGENCY
EXPOSURE ASSESSMENT
MULTIMEDIA MODEL

MULTIMED (Version 1.01, June 1991)

1 Run options

Proposed Lea Co. Trench 100' to GW, Ksat of 1e-3 cm/sec

50 year ave. - loam cover - good liner - 60K chloride - 10' mixing zone
Chemical simulated is DEFAULT CHEMICAL

Option Chosen Saturated and unsaturated zone models
Run was DETERMIN

Infiltration input by user

Run was transient

Reject runs if Y coordinate outside plume

Do not reject runs if Z coordinate outside plume

Gaussian source used in saturated zone model

1

1

UNSATURATED ZONE FLOW MODEL PARAMETERS
(input parameter description and value)

NP - Total number of nodal points 240

NMAT - Number of different porous materials 1

KPROP - Van Genuchten or Brooks and Corey 1

IMSHGN - Spatial discretization option 1

NVFLAYR - Number of layers in flow model

1

OPTIONS CHOSEN

Van Genuchten functional coefficients
User defined coordinate system

1

Layer information

LAYER NO.	LAYER THICKNESS	MATERIAL PROPERTY
1	30.40	1

DATA FOR MATERIAL 1

VADOSE ZONE MATERIAL VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS		LIMITS	
			MEAN	STD DEV	MIN	MAX
Saturated hydraulic conductivity	cm/hr	CONSTANT	3.60	-999.	0.100E-10	0.100E+05
Unsaturated zone porosity	--	CONSTANT	0.250	-999.	0.100E+08	0.990
Air entry pressure head	m	CONSTANT	0.700	-999.	0.000E+00	999.
Depth of the unsaturated zone	m	CONSTANT	30.4	-999.	0.100E-08	999.

DATA FOR MATERIAL 1

VADOSE ZONE FUNCTION VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS		LIMITS	
			MEAN	STD DEV	MIN	MAX
Residual water content	--	CONSTANT	0.116	-999.	0.100E-08	
Brook and Corey exponent, EN	--	CONSTANT	0.000E+00	-999.	0.000E+00	
ALFA coefficient	1/cm	CONSTANT	0.500E-02	-999.	0.000E+00	
Van Genuchten exponent, ENN	--	CONSTANT	1.09	-999.	1.00	

UNSATURATED ZONE TRANSPORT MODEL PARAMETERS

NLAY - Number of different layers used 1
 NTSTPS - Number of time values concentration calc 40
 DUMMY - Not presently used 1
 ISOL - Type of scheme used in unsaturated zone 1
 N - Stehfest terms or number of increments 18
 NTEL - Points in Lagrangian interpolation 3
 NGPTS - Number of Gauss points 104
 NIT - Convolution integral segments 2
 IBOUND - Type of boundary condition 2
 ITSGEN - Time values generated or input 1
 TMAX - Max simulation time 0.0
 WTFUN - Weighting factor 1.2

OPTIONS CHOSEN

Stehfest numerical inversion algorithm
 Nondecaying pulse source
 Computer generated times for computing concentrations

DATA FOR LAYER 1

 VADOSE TRANSPORT VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS		LIMITS	
			MEAN	STD DEV	MIN	MAX
Thickness of layer	m	CONSTANT	30.4	-999.	0.100E-08	999.
Longitudinal dispersivity of layer	m	DERIVED	1.00	-999.	0.100E-02	0.100E+05
Percent organic matter	--	CONSTANT	0.000E+00	-999.	0.000E+00	100.
Bulk density of soil for layer	g/cc	CONSTANT	1.73	-999.	0.100E-01	5.00
Biological decay coefficient	1/yr	CONSTANT	0.000E+00	-999.	0.000E+00	999.

CHEMICAL SPECIFIC VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS		LIMITS	
			MEAN	STD DEV	MIN	MAX
Solid phase decay coefficient	1/yr	DERIVED	-999.	-999.	0.000E+00	0.100E+11
Dissolved phase decay coefficient	1/yr	DERIVED	-999.	-999.	0.000E+00	0.100E+11
Overall chemical decay coefficient	1/yr	DERIVED	-999.	-999.	0.000E+00	0.100E+11
Acid catalyzed hydrolysis rate	1/M-yr	CONSTANT	0.000E+00	-999.	0.000E+00	999.
Neutral hydrolysis rate constant	1/yr	CONSTANT	0.000E+00	-999.	0.000E+00	999.
Base catalyzed hydrolysis rate	1/M-yr	CONSTANT	0.000E+00	-999.	0.000E+00	999.
Reference temperature	C	CONSTANT	20.0	-999.	0.000E+00	100.
Normalized distribution coefficient	ml/g	CONSTANT	0.000E+00	-999.	0.000E+00	999.

		DERIVED	-999.	-999.	0.000E+00
0.100E+11	Distribution coefficient	DERIVED	-999.	-999.	0.000E+00
999.	Biodegradation coefficient (sat. zone)	CONSTANT	0.000E+00	-999.	0.000E+00
10.0	Air diffusion coefficient	CONSTANT	0.000E+00	-999.	0.000E+00
100.	Reference temperature for air diffusion	CONSTANT	20.0	-999.	0.000E+00
999.	Molecular weight	CONSTANT	0.000E+00	-999.	0.000E+00
1.00	Mole fraction of solute	CONSTANT	0.000E+00	-999.	0.100E-08
100.	Vapor pressure of solute	CONSTANT	0.000E+00	-999.	0.000E+00
1.00	Henry's law constant	CONSTANT	0.000E+00	-999.	0.100E-09
1.00	Overall 1st order decay sat. zone	DERIVED	0.000E+00	0.000E+00	0.000E+00
1.00	Not currently used	CONSTANT	-999.	-999.	0.000E+00
1.00	Not currently used	CONSTANT	-999.	-999.	0.000E+00

SOURCE SPECIFIC VARIABLES

	VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS		LIMITS	
				MEAN	STD DEV	MIN	MAX
0.100E+11	Infiltration rate	m/yr	CONSTANT	0.230E-02	-999.	0.100E-09	
999.	Area of waste disposal unit	m^2	CONSTANT	167.	-999.	0.100E-01	
999.	Duration of pulse	yr	CONSTANT	50.0	-999.	0.100E-08	
0.100E+11	Spread of contaminant source	m	DERIVED	-999.	-999.	0.100E-08	
0.100E+11	Recharge rate	m/yr	CONSTANT	0.000E+00	-999.	0.000E+00	
999.	Source decay constant	1/yr	CONSTANT	0.000E+00	-999.	0.000E+00	

	Initial concentration at landfill	mg/l	CONSTANT	0.600E+05	-999.	0.000E+00
999.	Length scale of facility	m	DERIVED	-999.	-999.	0.100E-08
0.100E+11	Width scale of facility	m	DERIVED	-999.	-999.	0.100E-08
0.100E+11	Near field dilution		DERIVED	1.00	0.000E+00	0.000E+00

1.00
1

AQUIFER SPECIFIC VARIABLES

	VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS		LIMITS
				MEAN	STD DEV	MIN

MAX

100.	Particle diameter	cm	CONSTANT	0.500E-01	-999.	0.100E-08
0.990	Aquifer porosity	--	CONSTANT	0.300	-999.	0.100E-08
5.00	Bulk density	g/cc	CONSTANT	1.70	-999.	0.100E-01
0.100E+06	Aquifer thickness	m	CONSTANT	21.0	-999.	0.100E-08
0.100E+06	Source thickness (mixing zone depth)	m	CONSTANT	3.05	-999.	0.100E-08
0.100E+09	Conductivity (hydraulic)	m/yr	CONSTANT	30.0	-999.	0.100E-06
999.	Gradient (hydraulic)		CONSTANT	0.100E-02	-999.	0.100E-07
0.100E+09	Groundwater seepage velocity	m/yr	DERIVED	-999.	-999.	0.100E-09
0.100E+09	Retardation coefficient	--	DERIVED	1.00	-999.	1.00
0.100E+05	Longitudinal dispersivity	m	FUNCTION OF X	-999.	-999.	0.100E-02
999.	Transverse dispersivity	m	FUNCTION OF X	-999.	-999.	-999.
0.100E+05	Vertical dispersivity	m	FUNCTION OF X	-999.	-999.	0.100E-02
100.	Temperature of aquifer	C	CONSTANT	20.0	-999.	0.000E+00

pH	CONSTANT	7.00	-999.	0.300
Organic carbon content (fraction)	CONSTANT	0.000E+00	-999.	0.100E-05
Well distance from site	CONSTANT	1.00	-999.	1.00
Angle off center	CONSTANT	0.000E+00	-999.	0.000E+00
Well vertical distance	CONSTANT	0.000E+00	-999.	0.000E+00

14.0

1.00

999.

360.

1.00

1

TIME	CONCENTRATION
0.220E+04	0.56052E+03
0.225E+04	0.65351E+03
0.230E+04	0.74356E+03
0.235E+04	0.83361E+03
0.240E+04	0.90171E+03
0.245E+04	0.97180E+03
0.250E+04	0.10318E+04
0.255E+04	0.10918E+04
0.260E+04	0.11272E+04
0.265E+04	0.11568E+04
0.270E+04	0.11854E+04
0.275E+04	0.11961E+04
0.280E+04	0.12000E+04
0.285E+04	0.12030E+04
0.290E+04	0.11868E+04
0.295E+04	0.11739E+04
0.300E+04	0.11463E+04
0.305E+04	0.11246E+04
0.310E+04	0.10912E+04
0.315E+04	0.10449E+04

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U. S. ENVIRONMENTAL PROTECTION AGENCY

EXPOSURE ASSESSMENT

MULTIMEDIA MODEL

MULTIMED (Version 1.01, June 1991)

1 Run options

Proposed Lea Co. Trench 160' to GW, Ksat of 1e-3 cm/sec

50 year ave. - loam cover - good liner - 60K chloride - 10' mixing zone
Chemical simulated is DEFAULT CHEMICAL

Option Chosen Saturated and unsaturated zone models
Run was DETERMIN

Infiltration input by user

Run was transient

Reject runs if Y coordinate outside plume

Do not reject runs if Z coordinate outside plume

Gaussian source used in saturated zone model

1 1

UNSATURATED ZONE FLOW MODEL PARAMETERS

(input parameter description and value)

NP - Total number of nodal points 240

NMAT - Number of different porous materials 1

KPROP - Van Genuchten or Brooks and Corey 1

IMSHGN - Spatial discretization option 1

NVFLAYR - Number of layers in flow model 1

OPTIONS CHOSEN

Van Genuchten functional coefficients
User defined coordinate system

1

Layer information

LAYER NO.	LAYER THICKNESS	MATERIAL PROPERTY
1	30.40	1

DATA FOR MATERIAL 1

VADOSE ZONE MATERIAL VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS		LIMITS	
			MEAN	STD DEV	MIN	MAX
Saturated hydraulic conductivity	cm/hr	CONSTANT	3.60	-999.	0.100E-10	0.100E+05
Unsaturated zone porosity	--	CONSTANT	0.250	-999.	0.100E-08	0.990
Air entry pressure head	m	CONSTANT	0.700	-999.	0.000E+00	999.
Depth of the unsaturated zone	m	CONSTANT	30.4	-999.	0.100E-08	999.

DATA FOR MATERIAL 1

VADOSE ZONE FUNCTION VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS		LIMITS	
			MEAN	STD DEV	MIN	MAX

1.00	Residual water content	--	CONSTANT	0.116	-999.	0.100E-08
10.0	Brook and Corey exponent, EN	--	CONSTANT	0.000E+00	-999.	0.000E+00
1.00	ALFA coefficient	1/cm	CONSTANT	0.500E-02	-999.	0.000E+00
5.00	Van Genuchten exponent, ENN	--	CONSTANT	1.09	-999.	1.00

UNSATURATED ZONE TRANSPORT MODEL PARAMETERS

NLAY	- Number of different layers used	1
NTSTPS	- Number of time values concentration calc	40
DUMMY	- Not presently used	1
ISOL	- Type of scheme used in unsaturated zone	1
N	- Stehfest terms or number of increments	18
NTEL	- points in Lagrangian interpolation	3
NGPTS	- Number of Gauss points	104
NIT	- Convolution integral segments	2
IBOUND	- Type of boundary condition	2
ITSGEN	- Time values generated or input	1
TMAX	- Max simulation time	0.0
WTFUN	- Weighting factor	1.2

OPTIONS CHOSEN

Stehfest numerical inversion algorithm
 Nondecaying pulse source
 Computer generated times for computing concentrations

DATA FOR LAYER 1

 VADOSE TRANSPORT VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS	LIMITS
---------------	-------	--------------	------------	--------

MEAN STD DEV MIN

MAX

999.	Thickness of layer	m	CONSTANT	30.4	-999.	0.100E-08
0.100E+05	Longitudinal dispersivity of layer	m	DERIVED	1.00	-999.	0.100E-02
100.	Percent organic matter	--	CONSTANT	0.000E+00	-999.	0.000E+00
5.00	Bulk density of soil for layer	g/cc	CONSTANT	1.73	-999.	0.100E-01
999.	Biological decay coefficient	1/yr	CONSTANT	0.000E+00	-999.	0.000E+00

CHEMICAL SPECIFIC VARIABLES

VARIABLE NAME

UNITS

DISTRIBUTION

PARAMETERS

LIMITS

MIN

STD DEV

MEAN

MAX

0.100E+11	Solid phase decay coefficient	1/yr	DERIVED	-999.	-999.	0.000E+00
0.100E+11	Dissolved phase decay coefficient	1/yr	DERIVED	-999.	-999.	0.000E+00
0.100E+11	Overall chemical decay coefficient	1/yr	DERIVED	-999.	-999.	0.000E+00
999.	Acid catalyzed hydrolysis rate	1/M-yr	CONSTANT	0.000E+00	-999.	0.000E+00
999.	Neutral hydrolysis rate constant	1/yr	CONSTANT	0.000E+00	-999.	0.000E+00
999.	Base catalyzed hydrolysis rate	1/M-yr	CONSTANT	0.000E+00	-999.	0.000E+00
100.	Reference temperature	C	CONSTANT	20.0	-999.	0.000E+00
999.	Normalized distribution coefficient	ml/g	CONSTANT	0.000E+00	-999.	0.000E+00
0.100E+11	Distribution coefficient	--	DERIVED	-999.	-999.	0.000E+00
999.	Biodegradation coefficient (sat. zone)	1/yr	CONSTANT	0.000E+00	-999.	0.000E+00

10.0	Air diffusion coefficient	cm ² /s	CONSTANT	0.000E+00 -999.	0.000E+00
100.	Reference temperature for air diffusion	C	CONSTANT	20.0 -999.	0.000E+00
999.	Molecular weight	g/M	CONSTANT	0.000E+00 -999.	0.000E+00
1.00	Mole fraction of solute	--	CONSTANT	0.000E+00 -999.	0.100E-08
100.	Vapor pressure of solute	mm Hg	CONSTANT	0.000E+00 -999.	0.000E+00
1.00	Henry's law constant	atm-m ³ /M	CONSTANT	0.000E+00 -999.	0.100E-09
1.00	Overall 1st order decay sat. zone	1/yr	DERIVED	0.000E+00 0.000E+00	0.000E+00
1.00	Not currently used		CONSTANT	-999. -999.	0.000E+00
1.00	Not currently used		CONSTANT	-999. -999.	0.000E+00

SOURCE SPECIFIC VARIABLES

MAX	VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS		LIMITS	
				MEAN	STD DEV	MIN	MAX
0.100E+11	Infiltration rate	m/yr	CONSTANT	0.230E-02	-999.	0.100E-09	
999.	Area of waste disposal unit	m ²	CONSTANT	167.	-999.	0.100E-01	
999.	Duration of pulse	yr	CONSTANT	50.0	-999.	0.100E-08	
0.100E+11	Spread of contaminant source	m	DERIVED	-999.	-999.	0.100E-08	
0.100E+11	Recharge rate	m/yr	CONSTANT	0.000E+00	-999.	0.000E+00	
999.	Source decay constant	1/yr	CONSTANT	0.000E+00	-999.	0.000E+00	
999.	Initial concentration at landfill	mg/l	CONSTANT	0.600E+05	-999.	0.000E+00	
0.100E+11	Length scale of facility	m	DERIVED	-999.	-999.	0.100E-08	

Width scale of facility m DERIVED -999. 0.100E-08
 Near field dilution DERIVED 1.00 0.000E+00 0.000E+00

1.00
 1

AQUIFER SPECIFIC VARIABLES

VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS		LIMITS	
			MEAN	STD DEV	MIN	MAX
Particle diameter	cm	CONSTANT	0.500E-01	-999.	0.100E-08	100.
Aquifer porosity	--	CONSTANT	0.300	-999.	0.100E-08	0.990
Bulk density	g/cc	CONSTANT	1.70	-999.	0.100E-01	5.00
Aquifer thickness	m	CONSTANT	21.0	-999.	0.100E-08	0.100E+06
Source thickness (mixing zone depth)	m	CONSTANT	3.05	-999.	0.100E-08	0.100E+06
Conductivity (hydraulic)	m/yr	CONSTANT	30.0	-999.	0.100E-06	0.100E+09
Gradient (hydraulic)		CONSTANT	0.100E-02	-999.	0.100E-07	999.
Groundwater seepage velocity	m/yr	DERIVED	-999.	-999.	0.100E-09	0.100E+09
Retardation coefficient	--	DERIVED	1.00	-999.	1.00	0.100E+09
Longitudinal dispersivity	m	FUNCTION OF X	-999.	-999.	0.100E-02	0.100E+05
Transverse dispersivity	m	FUNCTION OF X	-999.	-999.	-999.	999.
Vertical dispersivity	m	FUNCTION OF X	-999.	-999.	0.100E-02	0.100E+05
Temperature of aquifer	C	CONSTANT	20.0	-999.	0.000E+00	100.
pH	--	CONSTANT	7.00	-999.	0.300	14.0
Organic carbon content (fraction)		CONSTANT	0.000E+00	-999.	0.100E-05	1.00

Well distance from site m CONSTANT 1.00 -999. 1.00

Angle off center degree CONSTANT 0.000E+00 -999. 0.000E+00

Well vertical distance m CONSTANT 0.000E+00 -999. 0.000E+00

999.

360.

1.00

1

TIME	CONCENTRATION
0.320E+04	0.10071E+04
0.325E+04	0.95875E+03
0.330E+04	0.91922E+03
0.335E+04	0.86394E+03
0.340E+04	0.81535E+03
0.345E+04	0.76593E+03
0.350E+04	0.71505E+03
0.355E+04	0.66484E+03
0.360E+04	0.61691E+03
0.365E+04	0.56758E+03
0.370E+04	0.51903E+03
0.375E+04	0.48050E+03
0.380E+04	0.42847E+03
0.385E+04	0.38523E+03
0.390E+04	0.34195E+03
0.395E+04	0.29867E+03
0.400E+04	0.26338E+03
0.405E+04	0.22790E+03
0.410E+04	0.19303E+03
0.415E+04	0.15816E+03