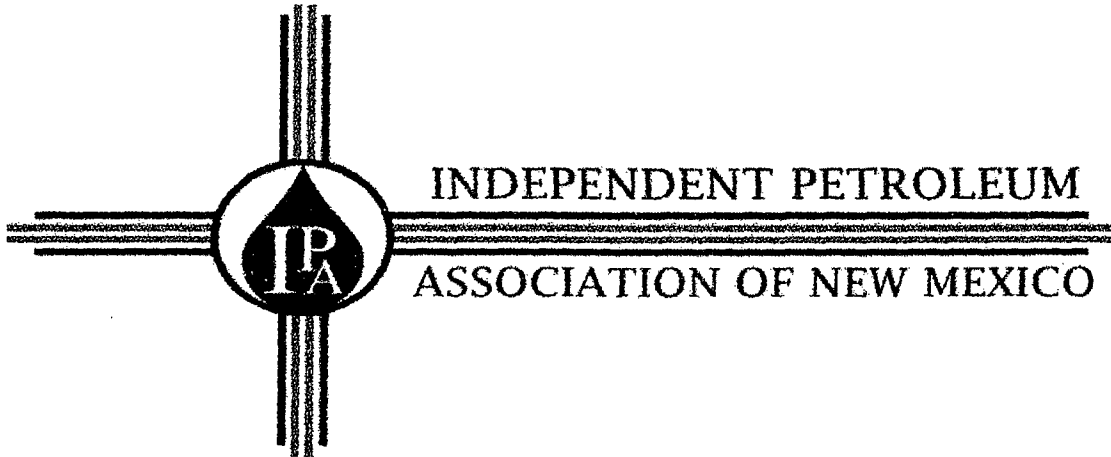




OCD CASE NOS. 14784 AND 14785

IPANM Petition to amend Title 19, Chapter 15,
part 17 (The PIT Rule)

May 14 – 18, 2012

IPANM exhibit 8
MULTIMED Models Runs
- Forty Two (42) pages -

HOBB2.OUT

1

AGENCY

U. S. ENVIRONMENTAL PROTECTION

EXPOSURE ASSESSMENT

MULTIMEDIA MODEL

MULTIMED (Version 1.01, June 1991)

1

Run options

HOBBS - PIT INFILTRATION MODEL - CALCULATIONS - 1.42 MM/YR

20 yr pulse. - loam cover - good liner - 100K chloride - 10' mixing zone
Chemical simulated is CHLORIDE

Option Chosen

Saturated and unsaturated zone models
DETERMIN

Run was

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

Page 1

1

HOBB2.OUT

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

PARAMETERS		VARIABLE NAME LIMITS		UNITS	DISTRIBUTION
MEAN	STD DEV	MIN	MAX		
3.60	-999.	0.100E-10	0.100E+05	cm/hr	CONSTANT
0.250	-999.	0.100E-08	0.990	--	CONSTANT
0.700	-999.	0.000E+00	-999.	m	CONSTANT
30.4	-999.	0.100E-08	-999.	m	CONSTANT

DATA FOR MATERIAL 1

VADOSE ZONE FUNCTION VARIABLES

PARAMETERS		VARIABLE NAME LIMITS		UNITS	DISTRIBUTION
MEAN	STD DEV	MIN	MAX		
0.116	-999.	0.100E-08	1.00	--	CONSTANT
				--	CONSTANT

HOBB2.OUT

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
 1

DATA FOR LAYER 1 ----- VADOSE TRANSPORT VARIABLES

PARAMETERS		VARIABLE NAME LIMITS		UNITS	DISTRIBUTION
MEAN	STD DEV	MIN	MAX		

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

CHEMICAL SPECIFIC VARIABLES

HOB2.OUT				UNITS	DISTRIBUTION
PARAMETERS	VARIABLE NAME LIMITS				
MEAN	STD DEV	MIN	MAX		

-999.				1/yr	DERIVED
-999.				1/yr	DERIVED
-999.				1/yr	DERIVED
-999.				1/yr	DERIVED
0.000E+00				1/M-yr	CONSTANT
0.000E+00				1/yr	CONSTANT
0.000E+00				1/M-yr	CONSTANT
20.0				C	CONSTANT
0.000E+00				ml/g	CONSTANT
-999.				--	DERIVED
0.000E+00				1/yr	CONSTANT
0.000E+00				cm2/s	CONSTANT
20.0				C	CONSTANT
0.000E+00				g/M	CONSTANT
0.000E+00				--	CONSTANT
0.000E+00				mm Hg	CONSTANT
0.000E+00				atm-m ³ /M	CONSTANT
0.000E+00				1/yr	DERIVED
-999.					CONSTANT
-999.					CONSTANT
1					

SOURCE SPECIFIC VARIABLES

HOB2.OUT				UNITS	DISTRIBUTION
PARAMETERS	VARIABLE NAME LIMITS				
MEAN	STD DEV	MIN	MAX		

0.142E-02				m/yr	CONSTANT
167.				m ²	CONSTANT

HOB2.OUT

20.0	-999.	Duration of pulse	0.100E-08	-999.	yr	CONSTANT
		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	0.100E+11		
		Source decay constant			1/yr	CONSTANT
0.000E+00	-999.		0.000E+00	-999.		
		Initial concentration at landfill			mg/l	CONSTANT
0.100E+06	-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			

AQUIFER SPECIFIC VARIABLES

PARAMETERS		VARIABLE NAME LIMITS		UNITS	DISTRIBUTION	
MEAN	STD DEV	MIN	MAX			
0.500E-01	-999.	Particle diameter	0.100E-08	100.	cm	CONSTANT
		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
30.4	-999.		1.00	-999.		
		Angle off center			degree	CONSTANT

0.000E+00 -999. 0.000E+00 360. HOB2.OUT
 well vertical distance
 0.000E+00 -999. 0.000E+00 1.00
 1

m

CONSTANT

TIME	CONCENTRATION
0.320E+04	0.15326E-02
0.330E+04	0.42136E+00
0.340E+04	0.34320E+01
0.350E+04	0.99008E+01
0.360E+04	0.18519E+02
0.370E+04	0.22778E+02
0.380E+04	0.26380E+02
0.390E+04	0.33283E+02
0.400E+04	0.39704E+02
0.410E+04	0.43082E+02
0.420E+04	0.47220E+02
0.430E+04	0.51421E+02
0.440E+04	0.53710E+02
0.450E+04	0.56020E+02
0.460E+04	0.57504E+02
0.470E+04	0.58177E+02
0.480E+04	0.58388E+02
0.490E+04	0.57853E+02
0.500E+04	0.56894E+02
0.510E+04	0.55484E+02

1

AGENCY U. S. ENVIRONMENTAL PROTECTION
EXPOSURE ASSESSMENT
MULTIMEDIA MODEL
MULTIMED (Version 1.01, June 1991)

1

Run options

MALJAMAR- PIT INFILTRATION MODEL - CALCULATIONS - 0.51 MM/YR

20 yr pulse. - loam cover - good liner - 100K chloride - 10' mixing zone
Chemical simulated is CHLORIDE

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

7

MALJ2.OUT

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

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

DATA FOR MATERIAL 1

 VADOSE ZONE FUNCTION VARIABLES

PARAMETERS		VARIABLE NAME LIMITS		UNITS	DISTRIBUTION
MEAN	STD DEV	MIN	MAX		
0.116	-999.	0.100E-08	1.00	--	CONSTANT
		Residual water content			
		Brook and Corey exponent, EN		--	CONSTANT

MALJ2.OUT

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
 1

DATA FOR LAYER 1

VADOSE TRANSPORT VARIABLES

PARAMETERS		VARIABLE NAME LIMITS		UNITS	DISTRIBUTION
MEAN	STD DEV	MIN	MAX		

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

CHEMICAL SPECIFIC VARIABLES

PARAMETERS		VARIABLE NAME LIMITS		UNITS	DISTRIBUTION
MEAN	STD DEV	MIN	MAX		
-999.	-999.	0.000E+00	0.100E+11	1/yr	DERIVED
-999.	-999.	0.000E+00	0.100E+11	1/yr	DERIVED
-999.	-999.	0.000E+00	0.100E+11	1/yr	DERIVED
0.000E+00	-999.	0.000E+00	-999.	1/M-yr	CONSTANT
0.000E+00	-999.	0.000E+00	-999.	1/yr	CONSTANT
0.000E+00	-999.	0.000E+00	-999.	1/M-yr	CONSTANT
20.0	-999.	0.000E+00	100.	C	CONSTANT
0.000E+00	-999.	0.000E+00	-999.	ml/g	CONSTANT
-999.	-999.	0.000E+00	0.100E+11	--	DERIVED
0.000E+00	-999.	0.000E+00	-999.	1/yr	CONSTANT
0.000E+00	-999.	0.000E+00	10.0	cm ² /s	CONSTANT
20.0	-999.	0.000E+00	100.	C	CONSTANT
0.000E+00	-999.	0.000E+00	-999.	g/M	CONSTANT
0.000E+00	-999.	0.100E-08	1.00	--	CONSTANT
0.000E+00	-999.	0.000E+00	100.	mm Hg	CONSTANT
0.000E+00	-999.	0.100E-09	1.00	atm-m ³ /M	CONSTANT
0.000E+00	0.000E+00	0.000E+00	1.00	1/yr	DERIVED
-999.	-999.	0.000E+00	1.00		CONSTANT
-999.	-999.	0.000E+00	1.00		CONSTANT

SOURCE SPECIFIC VARIABLES

PARAMETERS		VARIABLE NAME LIMITS		UNITS	DISTRIBUTION
MEAN	STD DEV	MIN	MAX		
0.510E-03	-999.	0.100E-09	0.100E+11	m/yr	CONSTANT
167.	-999.	0.100E-01	-999.	m ²	CONSTANT

MALJ2.OUT

20.0	-999.	Duration of pulse	0.100E-08	-999.	yr	CONSTANT
-999.	-999.	Spread of contaminant source	0.100E-08	0.100E+11	m	DERIVED
0.000E+00	-999.	Recharge rate	0.000E+00	0.100E+11	m/yr	CONSTANT
0.000E+00	-999.	Source decay constant	0.000E+00	-999.	1/yr	CONSTANT
0.100E+06	-999.	Initial concentration at landfill	0.000E+00	-999.	mg/l	CONSTANT
-999.	-999.	Length scale of facility	0.100E-08	0.100E+11	m	DERIVED
-999.	-999.	Width scale of facility	0.100E-08	0.100E+11	m	DERIVED
1.00	0.000E+00	Near field dilution	0.000E+00	1.00		DERIVED
1						

AQUIFER SPECIFIC VARIABLES

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

0.000E+00 -999. 0.000E+00 360. MALJ2.OUT
 well vertical distance
 0.000E+00 -999. 0.000E+00 1.00
 1

m CONSTANT

TIME	CONCENTRATION
0.880E+04	0.35324E-01
0.900E+04	0.53655E+00
0.920E+04	0.13534E+01
0.940E+04	0.21197E+01
0.960E+04	0.27875E+01
0.980E+04	0.32265E+01
0.100E+05	0.33018E+01
0.102E+05	0.38106E+01
0.104E+05	0.45600E+01
0.106E+05	0.52497E+01
0.108E+05	0.56788E+01
0.110E+05	0.57668E+01
0.112E+05	0.61188E+01
0.114E+05	0.65978E+01
0.116E+05	0.69687E+01
0.118E+05	0.70459E+01
0.120E+05	0.71920E+01
0.122E+05	0.74009E+01
0.124E+05	0.75034E+01
0.126E+05	0.75180E+01

MALJ3.OUT

1

AGENCY

U. S. ENVIRONMENTAL PROTECTION

EXPOSURE ASSESSMENT

MULTIMEDIA MODEL

MULTIMED (Version 1.01, June 1991)

1

Run options

MALJAMAR- PIT INFILTRATION MODEL - CALCULATIONS - 0.51 MM/YR

20 yr pulse. - loam cover - good liner - 100K chloride - 10' mixing zone
Chemical simulated is CHLORIDE

Option Chosen

Saturated and unsaturated zone models
DETERMIN

Run was

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

Page 1

13

MALJ3.OUT

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

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0.250	-999.	0.100E-08	0.990	--	CONSTANT
0.700	-999.	0.000E+00	-999.	m	CONSTANT
30.4	-999.	0.100E-08	-999.	m	CONSTANT

DATA FOR MATERIAL 1

VADOSE ZONE FUNCTION VARIABLES

PARAMETERS		VARIABLE NAME LIMITS		UNITS	DISTRIBUTION
MEAN	STD DEV	MIN	MAX		
0.116	-999.	0.100E-08	1.00	--	CONSTANT
				--	CONSTANT

MALJ3.OUT

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

1

DATA FOR LAYER 1

VADOSE TRANSPORT VARIABLES

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

CHEMICAL SPECIFIC VARIABLES

MALJ3.OUT

20.0	Duration of pulse	yr	CONSTANT
-999.	0.100E-08 -999.		
-999.	Spread of contaminant source	m	DERIVED
-999.	0.100E-08 0.100E+11		
0.000E+00	Recharge rate	m/yr	CONSTANT
-999.	0.000E+00 0.100E+11		
0.000E+00	Source decay constant	1/yr	CONSTANT
-999.	0.000E+00 -999.		
0.100E+06	Initial concentration at landfill	mg/l	CONSTANT
-999.	0.000E+00 -999.		
-999.	Length scale of facility	m	DERIVED
-999.	0.100E-08 0.100E+11		
-999.	Width scale of facility	m	DERIVED
-999.	0.100E-08 0.100E+11		
1.00	Near field dilution		DERIVED
1	0.000E+00 0.000E+00 1.00		

AQUIFER SPECIFIC VARIABLES

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

0.000E+00 -999. 0.000E+00 360. MALJ3.OUT
 well vertical distance
 0.000E+00 -999. 0.000E+00 1.00
 1

m CONSTANT

TIME	CONCENTRATION
0.120E+05	0.71920E+01
0.122E+05	0.74009E+01
0.124E+05	0.75034E+01
0.126E+05	0.75180E+01
0.128E+05	0.75203E+01
0.130E+05	0.75189E+01
0.132E+05	0.74505E+01
0.134E+05	0.73253E+01
0.136E+05	0.72421E+01
0.138E+05	0.70365E+01
0.140E+05	0.69084E+01
0.142E+05	0.66366E+01
0.144E+05	0.64772E+01
0.146E+05	0.61440E+01
0.148E+05	0.59534E+01
0.150E+05	0.56750E+01
0.152E+05	0.52874E+01
0.154E+05	0.51376E+01
0.156E+05	0.48144E+01
0.158E+05	0.43823E+01

1

AGENCY U. S. ENVIRONMENTAL PROTECTION
EXPOSURE ASSESSMENT
MULTIMEDIA MODEL
MULTIMED (Version 1.01, June 1991)

1

Run options

CARLSBAD- PIT INFILTRATION MODEL - CALCULATIONS - 1.53 MM/YR.

20 yr pulse. - loam cover - good liner - 100K chloride - 10' mixing zone
Chemical simulated is CHLORIDE

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

CARLS2.OUT

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

PARAMETERS		VARIABLE NAME LIMITS		UNITS	DISTRIBUTION
MEAN	STD DEV	MIN	MAX		
3.60	-999.	0.100E-10	0.100E+05	cm/hr	CONSTANT
0.250	-999.	0.100E-08	0.990	--	CONSTANT
0.700	-999.	0.000E+00	-999.	m	CONSTANT
30.4	-999.	0.100E-08	-999.	m	CONSTANT

DATA FOR MATERIAL 1

VADOSE ZONE FUNCTION VARIABLES

PARAMETERS		VARIABLE NAME LIMITS		UNITS	DISTRIBUTION
MEAN	STD DEV	MIN	MAX		
0.116	-999.	0.100E-08	1.00	--	CONSTANT
				--	CONSTANT

CARLS2.OUT

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

1

DATA FOR LAYER 1

----- VADOSE TRANSPORT VARIABLES

PARAMETERS		VARIABLE NAME LIMITS		UNITS	DISTRIBUTION
MEAN	STD DEV	MIN	MAX		

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

1

CHEMICAL SPECIFIC VARIABLES

PARAMETERS		VARIABLE NAME LIMITS		UNITS	DISTRIBUTION
MEAN	STD DEV	MIN	MAX		

-999.		Solid phase decay coefficient		1/yr	DERIVED
-999.	-999.	0.000E+00	0.100E+11		
-999.		Dissolved phase decay coefficient		1/yr	DERIVED
-999.	-999.	0.000E+00	0.100E+11		
-999.		Overall chemical decay coefficient		1/yr	DERIVED
-999.	-999.	0.000E+00	0.100E+11		
0.000E+00	-999.	Acid catalyzed hydrolysis rate		1/M-yr	CONSTANT
0.000E+00	-999.	0.000E+00	-999.		
0.000E+00	-999.	Neutral hydrolysis rate constant		1/yr	CONSTANT
0.000E+00	-999.	0.000E+00	-999.		
0.000E+00	-999.	Base catalyzed hydrolysis rate		1/M-yr	CONSTANT
0.000E+00	-999.	0.000E+00	-999.		
20.0	-999.	Reference temperature		C	CONSTANT
0.000E+00	-999.	0.000E+00	100.		
0.000E+00	-999.	Normalized distribution coefficient		ml/g	CONSTANT
-999.	-999.	0.000E+00	-999.		
-999.	-999.	Distribution coefficient		--	DERIVED
0.000E+00	-999.	0.000E+00	0.100E+11		
0.000E+00	-999.	Biodegradation coefficient (sat. zone)		1/yr	CONSTANT
0.000E+00	-999.	0.000E+00	-999.		
0.000E+00	-999.	Air diffusion coefficient		cm ² /s	CONSTANT
0.000E+00	-999.	0.000E+00	10.0		
20.0	-999.	Reference temperature for air diffusion		C	CONSTANT
0.000E+00	-999.	0.000E+00	100.		
0.000E+00	-999.	Molecular weight		g/M	CONSTANT
0.000E+00	-999.	0.000E+00	-999.		
0.000E+00	-999.	Mole fraction of solute		--	CONSTANT
0.000E+00	-999.	0.100E-08	1.00		
0.000E+00	-999.	Vapor pressure of solute		mm Hg	CONSTANT
0.000E+00	-999.	0.000E+00	100.		
0.000E+00	-999.	Henry's law constant		atm-m ³ /M	CONSTANT
0.000E+00	-999.	0.100E-09	1.00		
0.000E+00	0.000E+00	Overall 1st order decay sat. zone		1/yr	DERIVED
0.000E+00	0.000E+00	0.000E+00	1.00		
-999.	-999.	Not currently used			CONSTANT
-999.	-999.	0.000E+00	1.00		
-999.	-999.	Not currently used			CONSTANT
-999.	-999.	0.000E+00	1.00		

1

SOURCE SPECIFIC VARIABLES

PARAMETERS		VARIABLE NAME LIMITS		UNITS	DISTRIBUTION
MEAN	STD DEV	MIN	MAX		

0.153E-02		Infiltration rate		m/yr	CONSTANT
0.153E-02	-999.	0.100E-09	0.100E+11		
167.		Area of waste disposal unit		m ²	CONSTANT
167.	-999.	0.100E-01	-999.		

CARLS2.OUT

MEAN	STD DEV	MIN	MAX	VARIABLE NAME	UNITS	DISTRIBUTION
20.0	-999.	0.100E-08	-999.	Duration of pulse	yr	CONSTANT
-999.	-999.	0.100E-08	0.100E+11	Spread of contaminant source	m	DERIVED
0.000E+00	-999.	0.000E+00	0.100E+11	Recharge rate	m/yr	CONSTANT
0.000E+00	-999.	0.000E+00	-999.	Source decay constant	1/yr	CONSTANT
0.100E+06	-999.	0.000E+00	-999.	Initial concentration at landfill	mg/l	CONSTANT
-999.	-999.	0.100E-08	0.100E+11	Length scale of facility	m	DERIVED
-999.	-999.	0.100E-08	0.100E+11	width scale of facility	m	DERIVED
1.00	0.000E+00	0.000E+00	1.00	Near field dilution		DERIVED

AQUIFER SPECIFIC VARIABLES

PARAMETERS		VARIABLE NAME LIMITS		UNITS	DISTRIBUTION	
MEAN	STD DEV	MIN	MAX			
0.500E-01	-999.	0.100E-08	100.	Particle diameter	cm	CONSTANT
0.300	-999.	0.100E-08	0.990	Aquifer porosity	--	CONSTANT
1.70	-999.	0.100E-01	5.00	Bulk density	g/cc	CONSTANT
21.0	-999.	0.100E-08	0.100E+06	Aquifer thickness	m	CONSTANT
3.05	-999.	0.100E-08	0.100E+06	Source thickness (mixing zone depth)	m	CONSTANT
30.0	-999.	0.100E-06	0.100E+09	Conductivity (hydraulic)	m/yr	CONSTANT
0.100E-02	-999.	0.100E-07	-999.	Gradient (hydraulic)		CONSTANT
-999.	-999.	0.100E-09	0.100E+09	Groundwater seepage velocity	m/yr	DERIVED
1.00	-999.	1.00	0.100E+09	Retardation coefficient	--	DERIVED
-999.	-999.	0.100E-02	0.100E+05	Longitudinal dispersivity	m	FUNCTION OF X
-999.	-999.	-999.	-999.	Transverse dispersivity	m	FUNCTION OF X
-999.	-999.	0.100E-02	0.100E+05	Vertical dispersivity	m	FUNCTION OF X
20.0	-999.	0.000E+00	100.	Temperature of aquifer	C	CONSTANT
7.00	-999.	0.300	14.0	pH	--	CONSTANT
0.000E+00	-999.	0.100E-05	1.00	Organic carbon content (fraction)		CONSTANT
30.4	-999.	1.00	-999.	well distance from site	m	CONSTANT
				Angle off center	degree	CONSTANT

CARLS2.OUT
 0.000E+00 -999. 0.000E+00 360.
 well vertical distance
 0.000E+00 -999. 0.000E+00 1.00
 1

m CONSTANT

TIME	CONCENTRATION
0.280E+04	0.00000E+00
0.290E+04	0.76711E-12
0.300E+04	0.11679E-01
0.310E+04	0.94474E+00
0.320E+04	0.56489E+01
0.330E+04	0.15742E+02
0.340E+04	0.23713E+02
0.350E+04	0.28137E+02
0.360E+04	0.34793E+02
0.370E+04	0.43884E+02
0.380E+04	0.48867E+02
0.390E+04	0.53813E+02
0.400E+04	0.59152E+02
0.410E+04	0.62222E+02
0.420E+04	0.65091E+02
0.430E+04	0.66821E+02
0.440E+04	0.67598E+02
0.450E+04	0.67630E+02
0.460E+04	0.66855E+02
0.470E+04	0.65342E+02

ART2.OUT

1

AGENCY

U. S. ENVIRONMENTAL PROTECTION

EXPOSURE ASSESSMENT

MULTIMEDIA MODEL

MULTIMED (Version 1.01, June 1991)

1

Run options

ARTESIA - PIT INFILTRATION MODEL - CALCULATIONS - 1.06 MM/YR

20 yr pulse. - loam cover - good liner - 100K chloride - 10' mixing zone
Chemical simulated is CHLORIDE

Option Chosen

Saturated and unsaturated zone models
DETERMIN

Run was

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

Page 1

25

ART2.OUT

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

PARAMETERS		VARIABLE NAME LIMITS		UNITS	DISTRIBUTION
MEAN	STD DEV	MIN	MAX		
3.60	-999.	0.100E-10	0.100E+05	cm/hr	CONSTANT
0.250	-999.	0.100E-08	0.990	--	CONSTANT
0.700	-999.	0.000E+00	-999.	m	CONSTANT
30.4	-999.	0.100E-08	-999.	m	CONSTANT

DATA FOR MATERIAL 1

VADOSE ZONE FUNCTION VARIABLES

PARAMETERS		VARIABLE NAME LIMITS		UNITS	DISTRIBUTION
MEAN	STD DEV	MIN	MAX		
0.116	-999.	0.100E-08	1.00	--	CONSTANT
				--	CONSTANT

ART2.OUT

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

1

DATA FOR LAYER 1

VADOSE TRANSPORT VARIABLES

PARAMETERS		VARIABLE NAME LIMITS		UNITS	DISTRIBUTION
MEAN	STD DEV	MIN	MAX		

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

1

CHEMICAL SPECIFIC VARIABLES

ART2.OUT

20.0	Duration of pulse	yr	CONSTANT
-999.	0.100E-08 -999.		
	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 0.100E+11		
	Source decay constant	1/yr	CONSTANT
0.000E+00	-999. 0.000E+00 -999.		
	Initial concentration at landfill	mg/l	CONSTANT
0.100E+06	-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

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

0.000E+00 -999. 0.000E+00 360. ART2.OUT
 well vertical distance
 0.000E+00 -999. 0.000E+00 1.00
 1

m CONSTANT

TIME	CONCENTRATION
0.420E+04	0.41146E-03
0.440E+04	0.13797E+01
0.460E+04	0.76763E+01
0.480E+04	0.13194E+02
0.500E+04	0.16189E+02
0.520E+04	0.22573E+02
0.540E+04	0.25325E+02
0.560E+04	0.29152E+02
0.580E+04	0.31021E+02
0.600E+04	0.32686E+02
0.620E+04	0.33131E+02
0.640E+04	0.32927E+02
0.660E+04	0.32004E+02
0.680E+04	0.30534E+02
0.700E+04	0.28648E+02
0.720E+04	0.26489E+02
0.740E+04	0.23691E+02
0.760E+04	0.21125E+02
0.780E+04	0.18658E+02
0.800E+04	0.15586E+02

1

AGENCY U. S. ENVIRONMENTAL PROTECTION
EXPOSURE ASSESSMENT
MULTIMEDIA MODEL
MULTIMED (Version 1.01, June 1991)

1
Run options

ROSWELL - PIT INFILTRATION MODEL - CALCULATIONS - 1.17 MM/YR

20 yr pulse, - loam cover - good liner - 100K chloride - 10' mixing zone
Chemical simulated is CHLORIDE

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

ROSW2.OUT
 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

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

DATA FOR MATERIAL 1

VADOSE ZONE FUNCTION VARIABLES

PARAMETERS		VARIABLE NAME LIMITS		UNITS	DISTRIBUTION
MEAN	STD DEV	MIN	MAX		
0.116	-999.	0.100E-08	1.00	--	CONSTANT
		Residual water content			
		Brook and Corey exponent, EN		--	CONSTANT

ROSW2.OUT

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

1

DATA FOR LAYER 1

VADOSE TRANSPORT VARIABLES

PARAMETERS		VARIABLE NAME LIMITS		UNITS	DISTRIBUTION
MEAN	STD DEV	MIN	MAX		
30.4	-999.	0.100E-08	-999.	m	CONSTANT
1.00	-999.	0.100E-02	0.100E+05	m	DERIVED
0.000E+00	-999.	0.000E+00	100.	--	CONSTANT
1.73	-999.	0.100E-01	5.00	g/cc	CONSTANT
0.000E+00	-999.	0.000E+00	-999.	1/yr	CONSTANT

CHEMICAL SPECIFIC VARIABLES

		ROSW2.OUT		UNITS	DISTRIBUTION
PARAMETERS	VARIABLE NAME 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		
0.000E+00	Acid catalyzed hydrolysis rate			1/M-yr	CONSTANT
-999.	-999.	0.000E+00	-999.		
0.000E+00	Neutral hydrolysis rate constant			1/yr	CONSTANT
-999.	-999.	0.000E+00	-999.		
0.000E+00	Base catalyzed hydrolysis rate			1/M-yr	CONSTANT
-999.	-999.	0.000E+00	-999.		
20.0	Reference temperature			C	CONSTANT
-999.	-999.	0.000E+00	100.		
0.000E+00	Normalized distribution coefficient			ml/g	CONSTANT
-999.	-999.	0.000E+00	-999.		
-999.	Distribution coefficient			--	DERIVED
-999.	-999.	0.000E+00	0.100E+11		
0.000E+00	Biodegradation coefficient (sat. zone)			1/yr	CONSTANT
-999.	-999.	0.000E+00	-999.		
0.000E+00	Air diffusion coefficient			cm2/s	CONSTANT
-999.	-999.	0.000E+00	10.0		
20.0	Reference temperature for air diffusion			C	CONSTANT
-999.	-999.	0.000E+00	100.		
0.000E+00	Molecular weight			g/M	CONSTANT
-999.	-999.	0.000E+00	-999.		
0.000E+00	Mole fraction of solute			--	CONSTANT
-999.	-999.	0.100E-08	1.00		
0.000E+00	Vapor pressure of solute			mm Hg	CONSTANT
-999.	-999.	0.000E+00	100.		
0.000E+00	Henry's law constant			atm-m^3/M	CONSTANT
-999.	-999.	0.100E-09	1.00		
0.000E+00	Overall 1st order decay sat. zone			1/yr	DERIVED
0.000E+00	0.000E+00 0.000E+00 1.00				
-999.	Not currently used				CONSTANT
-999.	-999.	0.000E+00	1.00		
-999.	Not currently used				CONSTANT
-999.	-999.	0.000E+00	1.00		

SOURCE SPECIFIC VARIABLES

PARAMETERS		VARIABLE NAME LIMITS		UNITS	DISTRIBUTION
MEAN	STD DEV	MIN	MAX		

Infiltration rate				m/yr	CONSTANT
0.117E-02	-999.	0.100E-09	0.100E+11		
Area of waste disposal unit				m^2	CONSTANT
167.	-999.	0.100E-01	-999.		

ROSW2.OUT

PARAMETERS	VARIABLE NAME	UNITS	DISTRIBUTION
20.0	Duration of pulse	yr	CONSTANT
-999.	Spread of contaminant source	m	DERIVED
-999.	Recharge rate	m/yr	CONSTANT
0.000E+00	Source decay constant	1/yr	CONSTANT
0.000E+00	Initial concentration at landfill	mg/l	CONSTANT
0.100E+06	Length scale of facility	m	DERIVED
-999.	Width scale of facility	m	DERIVED
-999.	Near field dilution		DERIVED
1.00			
1			

AQUIFER SPECIFIC VARIABLES

PARAMETERS				VARIABLE NAME	UNITS	DISTRIBUTION
MEAN	STD DEV	MIN	MAX	LIMITS		
0.500E-01	-999.	0.100E-08	100.	Particle diameter	cm	CONSTANT
0.300	-999.	0.100E-08	0.990	Aquifer porosity	--	CONSTANT
1.70	-999.	0.100E-01	5.00	Bulk density	g/cc	CONSTANT
21.0	-999.	0.100E-08	0.100E+06	Aquifer thickness	m	CONSTANT
3.05	-999.	0.100E-08	0.100E+06	Source thickness (mixing zone depth)	m	CONSTANT
30.0	-999.	0.100E-06	0.100E+09	Conductivity (hydraulic)	m/yr	CONSTANT
0.100E-02	-999.	0.100E-07	-999.	Gradient (hydraulic)		CONSTANT
-999.	-999.	0.100E-09	0.100E+09	Groundwater seepage velocity	m/yr	DERIVED
1.00	-999.	1.00	0.100E+09	Retardation coefficient	--	DERIVED
-999.	-999.	0.100E-02	0.100E+05	Longitudinal dispersivity	m	FUNCTION OF X
-999.	-999.	-999.	-999.	Transverse dispersivity	m	FUNCTION OF X
-999.	-999.	0.100E-02	0.100E+05	Vertical dispersivity	m	FUNCTION OF X
20.0	-999.	0.000E+00	100.	Temperature of aquifer	C	CONSTANT
7.00	-999.	0.300	14.0	pH	--	CONSTANT
0.000E+00	-999.	0.100E-05	1.00	Organic carbon content (fraction)		CONSTANT
30.4	-999.	1.00	-999.	Well distance from site	m	CONSTANT
				Angle off center	degree	CONSTANT

ROSW2.OUT
 0.000E+00 -999. 0.000E+00 360.
 well vertical distance
 0.000E+00 -999. 0.000E+00 1.00
 1

m

CONSTANT

TIME	CONCENTRATION
0.385E+04	0.44571E-03
0.395E+04	0.19420E+00
0.405E+04	0.17586E+01
0.415E+04	0.52642E+01
0.425E+04	0.99928E+01
0.435E+04	0.14240E+02
0.445E+04	0.16132E+02
0.455E+04	0.17978E+02
0.465E+04	0.21201E+02
0.475E+04	0.25837E+02
0.485E+04	0.28490E+02
0.495E+04	0.30011E+02
0.505E+04	0.32156E+02
0.515E+04	0.34900E+02
0.525E+04	0.36315E+02
0.535E+04	0.37326E+02
0.545E+04	0.38571E+02
0.555E+04	0.39252E+02
0.565E+04	0.39544E+02
0.575E+04	0.39661E+02

1

AGENCY

U. S. ENVIRONMENTAL PROTECTION

EXPOSURE ASSESSMENT

MULTIMEDIA MODEL

MULTIMED (Version 1.01, June 1991)

1

Run options

ROSWELL - PIT INFILTRATION MODEL - CALCULATIONS - 1.17 MM/YR

20 yr pulse. - loam cover - good liner - 100K chloride - 10' mixing zone
Chemical simulated is CHLORIDE

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

ROSW3.OUT

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

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

DATA FOR MATERIAL 1

VADOSE ZONE FUNCTION VARIABLES

PARAMETERS		VARIABLE NAME LIMITS		UNITS	DISTRIBUTION
MEAN	STD DEV	MIN	MAX		
0.116	-999.	0.100E-08	1.00	--	CONSTANT
		Residual water content			
		Brook and Corey exponent, EN		--	CONSTANT

ROSW3.OUT

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

1

DATA FOR LAYER 1

VADOSE TRANSPORT VARIABLES

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

CHEMICAL SPECIFIC VARIABLES

PARAMETERS		VARIABLE NAME LIMITS		UNITS	DISTRIBUTION
MEAN	STD DEV	MIN	MAX		

-999.		Solid phase decay coefficient		1/yr	DERIVED
-999.	-999.	0.000E+00	0.100E+11		
-999.		Dissolved phase decay coefficient		1/yr	DERIVED
-999.	-999.	0.000E+00	0.100E+11		
-999.		Overall chemical decay coefficient		1/yr	DERIVED
-999.	-999.	0.000E+00	0.100E+11		
0.000E+00		Acid catalyzed hydrolysis rate		1/M-yr	CONSTANT
-999.	-999.	0.000E+00	-999.		
0.000E+00		Neutral hydrolysis rate constant		1/yr	CONSTANT
-999.	-999.	0.000E+00	-999.		
0.000E+00		Base catalyzed hydrolysis rate		1/M-yr	CONSTANT
-999.	-999.	0.000E+00	-999.		
20.0		Reference temperature		C	CONSTANT
-999.	-999.	0.000E+00	100.		
0.000E+00		Normalized distribution coefficient		ml/g	CONSTANT
-999.	-999.	0.000E+00	-999.		
-999.		Distribution coefficient		--	DERIVED
-999.	-999.	0.000E+00	0.100E+11		
0.000E+00		Biodegradation coefficient (sat. zone)		1/yr	CONSTANT
-999.	-999.	0.000E+00	-999.		
0.000E+00		Air diffusion coefficient		cm ² /s	CONSTANT
-999.	-999.	0.000E+00	10.0		
20.0		Reference temperature for air diffusion		C	CONSTANT
-999.	-999.	0.000E+00	100.		
0.000E+00		Molecular weight		g/M	CONSTANT
-999.	-999.	0.000E+00	-999.		
0.000E+00		Mole fraction of solute		--	CONSTANT
-999.	-999.	0.100E-08	1.00		
0.000E+00		Vapor pressure of solute		mm Hg	CONSTANT
-999.	-999.	0.000E+00	100.		
0.000E+00		Henry's law constant		atm-m ³ /M	CONSTANT
-999.	-999.	0.100E-09	1.00		
0.000E+00		Overall 1st order decay sat. zone		1/yr	DERIVED
0.000E+00	0.000E+00	0.000E+00	1.00		
-999.	-999.	Not currently used			CONSTANT
-999.	-999.	0.000E+00	1.00		
-999.	-999.	Not currently used			CONSTANT
-999.	-999.	0.000E+00	1.00		

1

SOURCE SPECIFIC VARIABLES

PARAMETERS		VARIABLE NAME LIMITS		UNITS	DISTRIBUTION
MEAN	STD DEV	MIN	MAX		

0.117E-02		Infiltration rate		m/yr	CONSTANT
-999.	-999.	0.100E-09	0.100E+11		
167.		Area of waste disposal unit		m ²	CONSTANT
-999.	-999.	0.100E-01	-999.		

				ROSW3.OUT		
20.0	-999.	Duration of pulse	0.100E-08	-999.	yr	CONSTANT
-999.	-999.	Spread of contaminant source	0.100E-08	0.100E+11	m	DERIVED
0.000E+00	-999.	Recharge rate	0.000E+00	0.100E+11	m/yr	CONSTANT
0.000E+00	-999.	Source decay constant	0.000E+00	-999.	1/yr	CONSTANT
0.100E+06	-999.	Initial concentration at landfill	0.000E+00	-999.	mg/l	CONSTANT
-999.	-999.	Length scale of facility	0.100E-08	0.100E+11	m	DERIVED
-999.	-999.	Width scale of facility	0.100E-08	0.100E+11	m	DERIVED
1.00	0.000E+00	Near field dilution	0.000E+00	1.00		DERIVED
1						

AQUIFER SPECIFIC VARIABLES

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

ROSW3.OUT
 0.000E+00 -999. 0.000E+00 360.
 Well vertical distance
 0.000E+00 -999. 0.000E+00 1.00
 1

m CONSTANT

TIME	CONCENTRATION
0.575E+04	0.39661E+02
0.585E+04	0.39479E+02
0.595E+04	0.39008E+02
0.605E+04	0.38335E+02
0.615E+04	0.37486E+02
0.625E+04	0.36395E+02
0.635E+04	0.35278E+02
0.645E+04	0.33798E+02
0.655E+04	0.32386E+02
0.665E+04	0.30933E+02
0.675E+04	0.28982E+02
0.685E+04	0.27697E+02
0.695E+04	0.25843E+02
0.705E+04	0.23729E+02
0.715E+04	0.22469E+02
0.725E+04	0.20982E+02
0.735E+04	0.18462E+02
0.745E+04	0.16927E+02
0.755E+04	0.15849E+02
0.765E+04	0.14266E+02