

1R - 427-121

**APPROVALS**

**YEAR(S):**

2013

**Hansen, Edward J., EMNRD**

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**From:** Hansen, Edward J., EMNRD  
**Sent:** Wednesday, September 11, 2013 2:33 PM  
**To:** Hack Conder (hconder@riceswd.com)  
**Cc:** Leking, Geoffrey R, EMNRD; Laura Pena (lpna@riceswd.com); Katie Jones <kjones@riceswd.com> (kjones@riceswd.com); Scott Curtis (scurtis@riceswd.com)  
**Subject:** Remediation Plan (1R427-121) Termination - ROC EME J-10 Site

**RE: Termination Request  
for the Rice Operating Company's  
EME J-10 Site  
Unit Letter J, Section 10, T21S, R36E, NMPM, Lea County, New Mexico  
Remediation Plan (1R427-121) Termination**

Dear Mr. Conder:

The New Mexico Oil Conservation Division (OCD) has received Rice Operating Company's report and request to close the above-referenced site, dated September 5, 2013 (received September 9, 2013). The report is acceptable to the OCD.

The above-referenced report, submitted in accordance with 19.15.29 NMAC (Rule 29; formally, Rule 116), indicates that Rice Operating Company has met the requirements of 19.15.29 NMAC; therefore, the OCD approves the report and hereby notifies you that the remediation plan (1R427-121) is terminated in accordance with 19.15.29 NMAC.

Please be advised that OCD approval of this report does not relieve the owner/operator of responsibility should operations pose a threat to ground water, surface water, human health or the environment. In addition, OCD approval does not relieve the owner/operator of responsibility for compliance with any OCD, federal, state, or local laws and/or regulations.

If you have any questions regarding this matter, please contact me at 505-476-3489.

Edward J. Hansen  
Hydrologist  
Environmental Bureau

# **RICE** *Operating Company*

122 West Taylor • Hobbs, New Mexico 88240

Phone: (575) 393-9174 • Fax: (575) 397-1471

CERTIFIED MAIL

RETURN RECEIPT NO. 7007 2560 0000 4569 8937

September 5, 2013

**Mr. Edward Hansen**

New Mexico Energy, Minerals, & Natural Resources

Oil Conservation Division, Environmental Bureau

1220 S. St. Francis Drive

Santa Fe, New Mexico 87505

RE: Termination Request  
EME J-10 (1R427-121): UL/J, Sec. 10, T21S, R36E  
RICE Operating Company – Eunice Monument Eumont (EME) SWD System

Mr. Hansen:

Rice Operating Company (ROC) is the service provider (agent) for the EME Saltwater Disposal (SWD) System and has no ownership of any portion of the pipeline, well, or facility. The System is owned by a consortium of oil producers, System Parties, who provide all operating capital on a percentage ownership/usage basis.

## **Background and Previous Work**

In 2001, ROC initiated work on the former J-10 junction box. The site is located in UL J, Sec. 10, T21S, R36E. An updated survey of NM OSE records, conducted in 2013, indicate that groundwater would likely be encountered at a depth of approximately 196 +/- feet. The site was delineated using a backhoe to form a 13x12x8-ft deep excavation and soil samples were screened at regular intervals for chlorides. Each sample was field titrated for chlorides. Representative composite samples of the sidewalls and bottom were submitted to a commercial laboratory to be analyzed for chloride, TPH, and BTEX. The sidewall composite resulted in a chloride concentration of 259 mg/kg, gasoline range organics (GRO) concentration below detectable limits, a diesel range organics (DRO) concentration of 1,720 mg/kg, a benzene concentration of 2.21 mg/kg, toluene of 0.594 mg/kg, ethyl benzene of 0.223 mg/kg, and total xylenes of 1.49 mg/kg. The bottom composite sample resulted in a chloride concentration of 226 mg/kg, a GRO and benzene concentration below detectable limits, a DRO concentration of 513 mg/kg, a toluene of 0.352 mg/kg, ethyl benzene of 0.277 mg/kg and a total xylenes concentration of 1.34 mg/kg. A compacted clay layer was installed and will provide a barrier that will inhibit the downward migration of chlorides to groundwater. The total of 48 cubic yards of excavated soil was properly disposed of at a NMOCD approved facility. The excavation was backfilled to ground

RECEIVED OGD  
2013 SEP 10 10 14 AM

surface and contoured to the surrounding area. A new, watertight junction box was installed at the site and has since been eliminated. Vegetation has rebounded at this site so no further action is warranted. Vegetation above the liner will also provide a natural infiltration barrier for the site since plants capture water through their roots thereby reducing the volume of water moving through the vadose zone to groundwater.

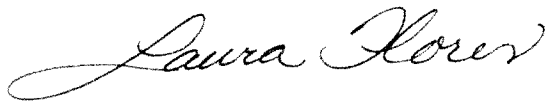
The junction box site maps, final report, laboratory analysis, disposal manifests and current photodocumentation are attached.

**Recommendations**

Site investigation demonstrates that residual chloride and hydrocarbons in the vadose zone will not with reasonable probability contaminate groundwater in excess of NMOCD standards. This site meets the requirements of the NMOCD-approved Revised Junction Box Upgrade Work Plan (July 16, 2003). As such, ROC request termination of the regulatory file, or similar closure status.

Please contact me at (575)393-9174 if you have any questions or wish to discuss this site. Thank you for your time and consideration.

Sincerely,  
RICE Operating Company

A handwritten signature in cursive script that reads "Laura Flores".

Laura Flores  
Environmental Project Assistant Manager

enclosures



## Site Maps

**RICE *Operating Company* (ROC)**  
112 West Taylor Hobbs, NM 88240  
Phone: (575) 393-9174 Fax: (575) 397-1471

# Site Location Map



***EME Jct J-10  
(1R427-121)***

**UL/J SECTION 10  
T21S, R36E  
LEA COUNTY, NM**



0 1 2  
Miles

Drawing date: 5/6/13 LS



# Area Map



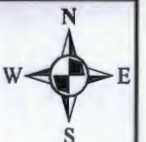
## Legend

- ACTIVE LINE
- ISOLATED-LOCATED
- ... ISOLATED-PROJECTED



***EME Jct J-10***  
***(1R427-121)***

UL/J SECTION 10  
T21S, R36E  
LEA COUNTY, NM



0 250 500  
Feet

Drawing date: 8/7/13 LS



# Junction Box Report

**RICE *Operating Company* (ROC)**  
112 West Taylor Hobbs, NM 88240  
Phone: (575) 393-9174 Fax: (575) 397-1471



**RICE OPERATING COMPANY  
JUNCTION BOX FINAL REPORT**

927-121

**BOX LOCATION**

SWD SYSTEM	JUNCTION	UNIT	SECTION	TOWNSHIP	RANGE	COUNTY	BOX DIMENSIONS - FEET		
EME	J-10	J	10	21S	38E	LEA	Length 12	Width 11	Depth 5

LAND TYPE: BLM \_\_\_\_\_ STATE \_\_\_\_\_ FEE LANDOWNER Millard Deck OTHER \_\_\_\_\_

Depth to Groundwater >100 feet NMOCD SITE ASSESSMENT RANKING SCORE: 0

Date Started 01/24/2001 Date Completed 01/24/2001 OCD Witness NO

Soil Excavated 48 cubic yards Excavation Length 13 Width 12 Depth 8 feet

Soil Disposed 48 cubic yards Offsite Facility Sundance Location Eunice, NM

**FINAL ANALYTICAL RESULTS:** Sample Date 01/24/2001 Sample Depth 8'

Procure 5-point composite sample of bottom and 4-point composite sample of sidewalls. TPH,  
BTEX and Chloride laboratory test results completed by using an approved lab and testing  
procedures pursuant to NMOCD guidelines.

Sample Location	Benzene mg/kg	Toluene mg/kg	Ethyl Benzene mg/kg	Total Xylenes mg/kg	GRO mg/kg	DRO mg/kg	Chlorides mg/kg
SIDEWALLS	2.21	0.594	0.223	1.49	<50	1720	259
BOTTOM	<0.2	0.352	0.277	1.34	<50	513	226

General Description of Remedial Action: Delineated vertical and lateral extent.

High impact soil was hauled to a permitted disposal facility. Installed a compacted clay liner and water tight junction box and backfilled with fresh soil. Natural attenuation will remediate the remaining hydrocarbon.

**CHLORIDE FIELD TESTS**

LOCATION	DEPTH	mg/kg
SIDEWALLS	4'	410
BOTTOM	8'	335

I HEREBY CERTIFY THAT THE INFORMATION ABOVE IS TRUE AND COMPLETE TO THE BEST OF MY  
KNOWLEDGE AND BELIEF.

DATE January 24, 2001 PRINTED NAME D. E. Anderson

SIGNATURE Chris Rodriguez TITLE Project Leader - Environmental



PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603

PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR  
RICE OPERATING CO.  
ATTN: JAMES STURGILL  
122 W. TAYLOR  
HOBBS, NM 88240  
FAX TO:

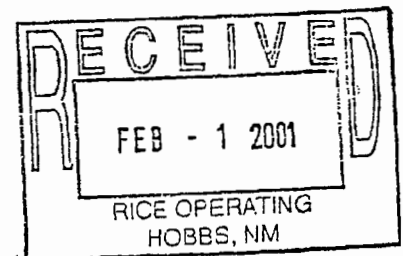
Receiving Date: 01/24/01  
Reporting Date: 01/25/01  
Project Number: J-10 BOTTOM & SIDES  
Project Name: J-10 BOTTOM & SIDES  
Project Location: SECTION 10 T21 R36E - EME

Sampling Date: 01/24/01  
Sample Type: SOIL  
Sample Condition: COOL & INTACT  
Sample Received By: BC  
Analyzed By: BC/AH

LAB NUMBER	SAMPLE ID	GRO	DRO	Cl*
		(C <sub>6</sub> -C <sub>10</sub> ) (mg/Kg)	(>C <sub>10</sub> -C <sub>28</sub> ) (mg/Kg)	
ANALYSIS DATE		01/24/01	01/24/01	01/25/01
H5549-1	SIDES	<50	1720	259
H5549-2	BOTTOM	<50	513	226
Quality Control		760	761	1051
True Value QC		800	800	1000
% Recovery		95.0	95.1	105
Relative Percent Difference		0.2	3.3	3.9

**METHODS:** TPH GRO & DRO: EPA SW-846 8015 M; Cl: Std. Methods 4500-ClB

\*Analysis performed on a 1:4 w:v aqueous extract.



Burgess J. Cooke  
Chemist

1/25/01  
Date

**H5549A.XLS**  
PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above-stated reasons or otherwise.



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PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

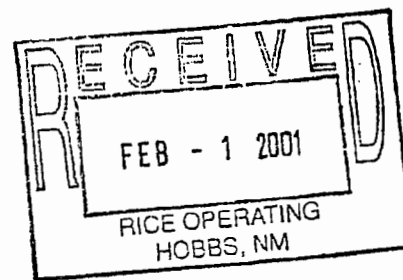
ANALYTICAL RESULTS FOR  
RICE OPERATING COMPANY  
ATTN: JAMES STURGILL  
122 W. TAYLOR  
HOBBS, NM 88240  
FAX TO:

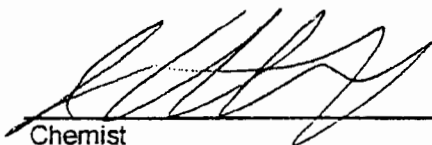
Receiving Date: 01/24/01  
Reporting Date: 01/25/01  
Project Number: J-10 BOTTOM & SIDES  
Project Name: J-10 BOTTOM & SIDES  
Project Location: SECTION 10 T21 R36E - EME

Sampling Date: 01/24/01  
Sample Type: SOIL  
Sample Condition: COOL, INTACT  
Sample Received By: BC  
Analyzed By: JA

LAB NUMBER	SAMPLE ID	BENZENE (mg/Kg)	TOLUENE (mg/Kg)	ETHYL BENZENE (mg/Kg)	TOTAL XYLENES (mg/Kg)
ANALYSIS DATE		01/23/01	01/23/01	01/23/01	01/23/01
H5549-1	SIDES	2.21	0.594	0.223	1.49
H5549-2	BOTTOM	<0.200	0.352	0.277	1.34
Quality Control		0.096	0.107	0.097	0.298
True Value QC		0.100	0.100	0.100	0.300
% Accuracy		96	107	97	99
Relative Percent Difference		2.2	0.7	2.2	2.1

METHOD: EPA SW 846-8020, 5030, Gas Chromatography



  
Chemist

1-25-01  
Date

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above-stated reasons or otherwise.

H5549SHOBBSRICEBTEXONLY



## CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

Page        of       

† Cardinal cannot accept verbal changes. Please fax written changes to 505-393-2476.

# Sundance Services, Inc.

P.O. Box 1737 ★ Eunice, NM 88231  
(505) 394-2511

11 36846

LEASE OPERATOR/SHIPPER/COMPANY:

LEASE NAME:

692

TRANSPORTER COMPANY:

TIME:

AM/PM

DATE:

VEHICLE NO.:

DRIVER NO.:

CHARGE TO:

## TYPE OF MATERIAL

☐ Production Water  
☐ Tank Bottoms  
☐ Other Material:

☐ Drilling Fluids  
☐ Contaminated soil  
☐ BS&W Content: \_\_\_\_\_

☐ Completion Fluids  
☐ C-117 No.: \_\_\_\_\_

Description: \_\_\_\_\_

VOLUME OF MATERIAL ☐ BBLs. \_\_\_\_\_ :

☐ YARD \_\_\_\_\_ :

☐ \_\_\_\_\_

AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS JOB TICKET, OPERATOR/SHIPPER REPRESENTS AND WARRANTS THAT THE WASTE MATERIAL SHIPPED HERewith IS MATERIAL EXEMPT FROM THE RESOURCE, CONSERVATION AND RECOVERY ACT OF 1976, AS AMENDED FROM TIME TO TIME, 40 U.S.C. § 6901, et seq., THE NM HEALTH AND SAF. CODE § 361.001, et seq., AND REGULATIONS RELATED THERETO, BY VIRTUE OF THE EXEMPTION AFFORDED DRILLING FLUIDS, PRODUCED WATERS, AND OTHER WASTE ASSOCIATED WITH THE EXPLORATION, DEVELOPMENT OR PRODUCTION OF CRUDE OIL OR NATURAL GAS OR GEOTHERMAL ENERGY.

ALSO AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS JOB TICKET, TRANSPORTER REPRESENTS AND WARRANTS THAT ONLY THE MATERIAL DELIVERED BY OPERATOR/SHIPPER TO TRANSPORTER IS NOW DELIVERED BY TRANSPORTER TO SUNDANCE SERVICES, INC.'S FACILITY FOR DISPOSAL.

*THIS WILL CERTIFY that the above Transporter loaded the material represented by this Transporter Statement at the above described location, and that it was tendered by the above described shipper. This will certify that no additional materials were added to this load, and that the material was delivered without incident.*

DRIVER: \_\_\_\_\_

(SIGNATURE)

FACILITY REPRESENTATIVE: \_\_\_\_\_

(SIGNATURE)

White-Sundance Canary-Sundance Acct#1 Pink-Sundance Acct#2 Gold-Transporter  
Revised 12/27/95



# Sundance Services, Inc.

P.O. Box 1737 ★ Eunice, NM 88231  
(505) 394-2511

112 38055

LEASE OPERATOR/SHIPPER/COMPANY:

LEASE NAME:

TRANSPORTER COMPANY:

TIME:

AM/PM

DATE:

VEHICLE NO.:

DRIVER NO.:

CHARGE TO:

## TYPE OF MATERIAL

- ☐ Production Water  
☐ Tank Bottoms  
☐ Other Material:

- ☐ Drilling Fluids  
☐ Contaminated soil  
☐ BS&W Content: \_\_\_\_\_

- ☐ Completion Fluids  
☐ C-117 No.: \_\_\_\_\_

Description: \_\_\_\_\_

VOLUME OF MATERIAL ☐ BBLs. \_\_\_\_\_ : ☐ YARD \_\_\_\_\_ : ☐ \_\_\_\_\_

AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS JOB TICKET, OPERATOR/SHIPPER REPRESENTS AND WARRANTS THAT THE WASTE MATERIAL SHIPPED HERewith IS MATERIAL EXEMPT FROM THE RESOURCE, CONSERVATION AND RECOVERY ACT OF 1976, AS AMENDED FROM TIME TO TIME, 40 U.S.C. § 6901, et seq., THE NM HEALTH AND SAF. CODE § 361.001, et seq., AND REGULATIONS RELATED THERETO, BY VIRTUE OF THE EXEMPTION AFFORDED DRILLING FLUIDS, PRODUCED WATERS, AND OTHER WASTE ASSOCIATED WITH THE EXPLORATION, DEVELOPMENT OR PRODUCTION OF CRUDE OIL OR NATURAL GAS OR GEOTHERMAL ENERGY.

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DRIVER: \_\_\_\_\_  
(SIGNATURE)

FACILITY REPRESENTATIVE: \_\_\_\_\_  
(SIGNATURE)

White-Sundance Canary-Sundance Acct#1 Pink-Sundance Acct#2 Gold-Transporter  
Revised 12/27/95

**Sundance Services, Inc.**P.O. Box 1737 ★ Eunice, NM 88231  
(505) 394-2511

NI 98856

LEASE OPERATOR/SHIPPER/COMPANY: \_\_\_\_\_

LEASE NAME: \_\_\_\_\_

TRANSPORTER COMPANY: \_\_\_\_\_

TIME: \_\_\_\_\_ AM/PM

DATE: \_\_\_\_\_

VEHICLE NO.: \_\_\_\_\_

DRIVER NO.: \_\_\_\_\_

CHARGE TO: \_\_\_\_\_

**TYPE OF MATERIAL**☐ Production Water☐ Drilling Fluids☐ Completion Fluids☐ Tank Bottoms☐ Contaminated soil☐ C-117 No.: \_\_\_\_\_☐ Other Material: \_\_\_\_\_☐ BS&W Content: \_\_\_\_\_

Description: \_\_\_\_\_

VOLUME OF MATERIAL ☐ BBLs. \_\_\_\_\_ :☒ YARD \_\_\_\_\_ :☐ \_\_\_\_\_

AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS JOB TICKET, OPERATOR/SHIPPER REPRESENTS AND WARRANTS THAT THE WASTE MATERIAL SHIPPED HERewith IS MATERIAL EXEMPT FROM THE RESOURCE, CONSERVATION AND RECOVERY ACT OF 1976, AS AMENDED FROM TIME TO TIME, 40 U.S.C. § 6901, et seq., THE NM HEALTH AND SAF. CODE § 361.001, et seq., AND REGULATIONS RELATED THERETO, BY VIRTUE OF THE EXEMPTION AFFORDED DRILLING FLUIDS, PRODUCED WATERS, AND OTHER WASTE ASSOCIATED WITH THE EXPLORATION, DEVELOPMENT OR PRODUCTION OF CRUDE OIL OR NATURAL GAS OR GEOTHERMAL ENERGY.

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DRIVER: \_\_\_\_\_

(SIGNATURE)

FACILITY REPRESENTATIVE: \_\_\_\_\_

(SIGNATURE)

**Sundance Services, Inc.**P.O. Box 1737 ★ Eunice, NM 88231  
(505) 394-2511

112 38905

LEASE OPERATOR/SHIPPER/COMPANY: KiceLEASE NAME: WIE 7-10-10 AFE-692TRANSPORTER COMPANY: West 2 works

TIME:

AM/PM

DATE: 7-01VEHICLE NO.: 1

DRIVER NO.:

CHARGE TO: KiceTYPE OF MATERIAL 8-10 T 21 R-36☐ Production Water☐ Drilling Fluids☐ Completion Fluids☐ Tank Bottoms☒ Contaminated soil☐ C-117 No.: \_\_\_\_\_☐ Other Material:☐ BS&W Content: \_\_\_\_\_Description: HydrotreatedVOLUME OF MATERIAL ☐ BBLs. \_\_\_\_\_☐ YARD 12☐ \_\_\_\_\_

AS A CONDITION TO SUNDANCE SERVICES, INC.'S ACCEPTANCE OF THE MATERIALS SHIPPED WITH THIS JOB TICKET, OPERATOR/SHIPPER REPRESENTS AND WARRANTS THAT THE WASTE MATERIAL SHIPPED HERewith IS MATERIAL EXEMPT FROM THE RESOURCE, CONSERVATION AND RECOVERY ACT OF 1976, AS AMENDED FROM TIME TO TIME, 40 U.S.C. § 6901, et seq., THE NM HEALTH AND SAF. CODE § 361.001, et seq., AND REGULATIONS RELATED THERETO, BY VIRTUE OF THE EXEMPTION AFFORDED DRILLING FLUIDS, PRODUCED WATERS, AND OTHER WASTE ASSOCIATED WITH THE EXPLORATION, DEVELOPMENT OR PRODUCTION OF CRUDE OIL OR NATURAL GAS OR GEOTHERMAL ENERGY.

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DRIVER: \_\_\_\_\_

(SIGNATURE)

FACILITY REPRESENTATIVE: H. K. K.

(SIGNATURE)

White-Sundance Canary-Sundance Acct#1 Pink-Sundance Acct#2 Gold-Transporter

Revised 12/27/95

# Current Photodocumentation

**RICE *Operating Company* (ROC)**  
112 West Taylor Hobbs, NM 88240  
Phone: (575) 393-9174 Fax: (575) 397-1471

# EME J-10 (1R427-121)

UL/J, Section 10, T21S, R36E



Facing east

7/16/2013



Facing north

7/16/2013



MULTIMED V1.01 DATE OF CALCULATIONS: 11-SEP-2013 TIME: 11: 1:20

U. S. ENVIRONMENTAL PROTECTION AGENCY

EXPOSURE ASSESSMENT

MULTIMEDIA MODEL

MULTIMED (Version 1.50, 2005)

Switched to Stehfest algorithm to avoid numerical problems  
with Convolution algorithm. Problems were caused by  
high source decay rate. Everything ok now, execution continuing...

1  
Run options  
--- -----

EME J-10

1R427-121  
Chemical simulated is Benzene

Option Chosen Saturated and unsaturated zone models  
Run was DETERMIN  
Infiltration Specified By User: 4.800E-03 m/yr  
Run was transient  
Well Times: Find Maximum Concentration  
Reject runs if Y coordinate outside plume  
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	57.30	1

## DATA FOR MATERIAL 1

-----

## VADOSE ZONE MATERIAL VARIABLES

-----		-----			
VARIABLE NAME		UNITS	DISTRIBUTION	PARAMETERS	
				MEAN	STD DEV
LIMITS					
MIN	MAX				
-----					
-999.	Saturated hydraulic conductivity	cm/hr	CONSTANT	3.60	-999.
-999.	Unsaturated zone porosity	--	CONSTANT	0.250	-999.

-999.	Air entry pressure head	m	CONSTANT	0.700	-999.
0.000	Depth of the unsaturated zone	m	CONSTANT	57.3	0.000

DATA FOR MATERIAL 1  
-----  
VADOSE ZONE FUNCTION VARIABLES

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

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		3
ITSGEN	- Time values generated or input		1
TMAX	- Max simulation time	--	0.0
WTFUN	- Weighting factor	--	1.2

# OPTIONS CHOSEN

-----

Stehfest numerical inversion algorithm  
 Exponentially decaying continuous source  
 Computer generated times for computing concentrations

1

## DATA FOR LAYER 1

-----

## VADOSE TRANSPORT VARIABLES

LIMITS		VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS	
MIN	MAX				MEAN	STD DEV
-999.	-999.	Thickness of layer	m	CONSTANT	57.3	-999.
-999.	-999.	Longitudinal dispersivity of layer	m	DERIVED	-999.	-999.
-999.	-999.	Percent organic matter	--	CONSTANT	0.000	-999.
-999.	-999.	Bulk density of soil for layer	g/cc	CONSTANT	1.99	-999.
-999.	-999.	Biological decay coefficient	1/yr	CONSTANT	0.000	-999.

## CHEMICAL SPECIFIC VARIABLES

LIMITS		VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS	
MIN	MAX				MEAN	STD DEV
-999.	-999.	Solid phase decay coefficient	1/yr	DERIVED	-999.	-999.
-999.	-999.	Dissolved phase decay coefficient	1/yr	DERIVED	-999.	-999.
-999.	-999.	Overall chemical decay coefficient	1/yr	DERIVED	-999.	-999.
-999.	-999.	Acid catalyzed hydrolysis rate	1/M-yr	CONSTANT	0.000	-999.
-999.	-999.	Neutral hydrolysis rate constant	1/yr	CONSTANT	0.000	-999.
-999.	-999.	Base catalyzed hydrolysis rate	1/M-yr	CONSTANT	0.000	-999.
-999.	-999.	Reference temperature	C	CONSTANT	25.0	-999.
-999.	-999.	Normalized distribution coefficient	ml/g	CONSTANT	0.000	-999.
-999.	-999.	Distribution coefficient	--	DERIVED	-999.	-999.
-999.	-999.	Biodegradation coefficient (sat. zone)	1/yr	CONSTANT	0.000	-999.
-999.	-999.	Air diffusion coefficient	cm <sup>2</sup> /s	CONSTANT	-999.	-999.
-999.	-999.	Reference temperature for air diffusion	C	CONSTANT	-999.	-999.
-999.	-999.	Molecular weight	g/M	CONSTANT	-999.	-999.



-999.	Mole fraction of solute	--	CONSTANT	-999.	-999.
-999.	-999.				
-999.	Vapor pressure of solute	mm Hg	CONSTANT	-999.	-999.
-999.	-999.				
-999.	Henry`s law constant	atm-m^3/M	CONSTANT	-999.	-999.
-999.	-999.				
0.000	Overall 1st order decay sat. zone	1/yr	DERIVED	0.000	0.000
0.000	1.00				
0.000	Not currently used		CONSTANT	0.000	0.000
0.000	0.000				
0.000	Not currently used		CONSTANT	0.000	0.000
0.000	0.000				
1					

SOURCE SPECIFIC VARIABLES

LIMITS		VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS	
MIN	MAX				MEAN	STD DEV
-999.	-999.	Infiltration rate	m/yr	CONSTANT	0.480E-02	-999.
-999.	-999.	Area of waste disposal unit	m^2	DERIVED	24.1	-999.
-999.	-999.	Duration of pulse	yr	DERIVED	10.0	-999.
-999.	-999.	Spread of contaminant source	m	DERIVED	-999.	-999.
-999.	-999.	Recharge rate	m/yr	CONSTANT	0.000	-999.
-999.	-999.	Source decay constant	1/yr	CONSTANT	0.250E-01	0.000
0.000	0.000	Initial concentration at landfill	mg/l	CONSTANT	2.21	-999.
-999.	-999.					

-999.	Length scale of facility	m	CONSTANT	6.10	-999.
-999.	-999.				
-999.	Width scale of facility	m	CONSTANT	3.96	-999.
-999.	-999.				
0.000	Near field dilution		DERIVED	1.00	0.000
1	1.00				

# AQUIFER SPECIFIC VARIABLES

LIMITS		VARIABLE NAME	UNITS	DISTRIBUTION	PARAMETERS	
MIN	MAX				MEAN	STD DEV
-999.	-999.	Particle diameter	cm	CONSTANT	-999.	-999.
-999.	-999.	Aquifer porosity	--	CONSTANT	0.300	-999.
-999.	-999.	Bulk density	g/cc	CONSTANT	1.86	-999.
-999.	-999.	Aquifer thickness	m	CONSTANT	6.10	-999.
-999.	-999.	Source thickness (mixing zone depth)	m	DERIVED	-999.	-999.
-999.	-999.	Conductivity (hydraulic)	m/yr	CONSTANT	315.	-999.
-999.	-999.	Gradient (hydraulic)		CONSTANT	0.300E-02	-999.
-999.	-999.	Groundwater seepage velocity	m/yr	DERIVED	-999.	-999.
-999.	-999.	Retardation coefficient	--	DERIVED	-999.	-999.
-999.	-999.	Longitudinal dispersivity	m	FUNCTION OF X	-999.	-999.

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

MAXIMUM WELL CONCENTRATION IS 0.7297E-02 AT 0.254E+04 YEARS