devon

SITE DELINEATION REPORT
AND
CLOSURE PROPOSAL

Little Kings #3
Drilling Reserve Pit
API # 30025364310000

UL-K (NE¼ of the SW¼) of Section 17, R35E, T22S
Latitude 32°23'25.6"N and Longitude 103°23'29.3"W
Elevation ~3,560 'amsl

~22 miles west of Eunice, Lea County, New Mexico

Date

March 2005
(Revised April 2005)

Prepared by

Environmental Plus, Inc.
2100 Avenue O
P.O. Box 1558
Eunice, New Mexico 88231
Tele 505•394•3481 FAX 505•394•2601
Eddress: enviplus1@aol.com

Devon - 6137
Incident - nPAC0603351234
Application - pAC0603351367

ENVIRONMENTAL PLUS, INC. Micro-Blaze Micro-Blaze Oxi™
STATE APPROVED LAND FARM AND ENVIRONMENTAL SERVICES

May 11, 2005

Mr. Larry Johnson
Environmental Engineer
New Mexico Oil Conservation Division
1625 North French
Hobbs, New Mexico 88240

Subject: Devon Energy Site Delineation Report and Closure Proposal (Revised)

Re: Little Kings #3 Drill Pit
UL-K (NE¼ of the SW¼) of Section 17, T22S, R35E
Latitude 32°23'25.6"N and Longitude 103°23'29.3"W
Landowner: State of New Mexico
Driving Directions: From the intersection of NMSRs 8 and 207 in Eunice, New Mexico, go west on 8 for 7.8 miles, then left on NMSR 176 for 9.7 miles, then left on caliche road 4.1 miles then left 1.0 miles, then right 1.1 miles, then left 0.5 miles, then right 0.3 miles, then

Dear Mr. Johnson,

Enclosed, please find two copies of the Devon Energy Site Delineation Report and Closure Proposal for the Little Kings #3 Drill Pit revised to include a formal risk assessment. Environmental Plus, Inc. (EPI) is submitting the documentation on behalf of Devon Energy and requests approval of the closure proposal.

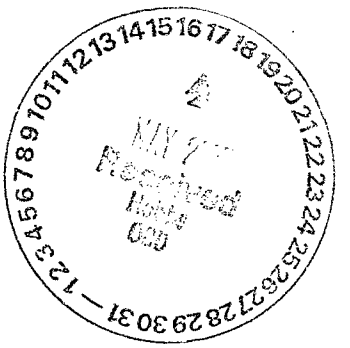
Should there be any questions please call Mr. Cody Miller or myself at the office or at 505.631.8447 and 505.390.7864, respectively or Joe Handley at 505.748.3371. All official communication should be addressed to:

Joe Handley
Devon Energy
PO Box 250
2401 Pecos Avenue
Artesia, New Mexico 88211-0250
e-mail: Joe.Handley@dvn.com

Sincerely,

Pat McCasland
EPI Technical Services Manager

cc: Paul Sheeley, NMOCD, w/enclosure (PSHEELEY@STATE.NM.US)
Joe Handley, Devon Energy, w/enclosure (Joe.Handley@dvn.com)
Cecil Thurmond, Devon Energy, w/enclosure (Cecil.Thurmond@dvn.com)
file



P.O. BOX 1558 ••• 2100 WEST AVE. O ••• EUNICE, NEW MEXICO 88231
TELEPHONE 505•394•3481 FAX 505•394•2601

ENVIRONMENTAL PLUS, INC.

STANDARD OF CARE

Site Delineation Report and Closure Proposal

Little Kings #3
Drilling Reserve Pit

The information provided in this report was collected consistent with the New Mexico Oil Conservation Division (NMOCD) Guidelines for Remediation of Leaks, Spills and Releases (August 13, 1993), the NMOCD Unlined Surface Impoundment Closure Guidelines (February 1993), and the Environmental Plus, Inc. (EPI) Standard Operating Procedures and Quality Assurance/Quality Control Plan. The conclusions are based on field observations and laboratory analytical reports as presented in the report. Recommendations follow NMOCD guidance and represent the professional opinions of EPI staff. These opinions were arrived at with currently accepted geologic, hydrogeologic and engineering practices at this time and location. The report was prepared or reviewed by a certified or registered EPI professional with a background in engineering, environmental, and/or the natural sciences.

This report was prepared by:

Pat McCasland — May 11, 2005
Date

This report was reviewed by:

_____ — _____
Date

Table of Contents

1.0 EXECUTIVE SUMMARY

This site is located in UL-K (NE¼ of the SW¼) of Section 17, R35E, T22S at Latitude 32°23'25.6"N and Longitude 103°23'29.3"W, approximately 22 miles west of Eunice, Lea County, New Mexico on property owned by the State of New Mexico. A topographical map is included in Attachment I. The site is a drilling reserve pit used during the drilling of the Devon Energy (Devon) Little Kings #3 well. According to the New Mexico Office of the State Engineer (NMOSE) Water Well Database, groundwater occurs approximately 185 feet below ground surface ('bgs) and is typical of the area east of San Simon Ridge. The area wells are plotted on the topographical map included in Attachment I and the NMOSE database report for T22S-R35E is included in Attachment IV. The nearest down gradient water well, i.e., #00595 (Cotton Well), is located approximately 4,642 feet southeast of the site. The site is located on the south side of a east trending surface drainage approximately 2,940 feet west of a non-perennial playa and is >1,000 horizontal feet from the feature. These site characteristics give the site a "0" point New Mexico Oil Conservation Division (NMOCD) ranking score that applies the following remedial guidelines for the "constituents/contaminants of concern" (CoCs):

CONSTITUENTS/CONTAMINANTS OF CONCERN	REMEDIAL GOAL
Benzene	10 mg/Kg
BTEX (mass sum of benzene, toluene, ethylbenzene, and xylenes	50 mg/Kg
Total Petroleum Hydrocarbon 8015m (TPH^{8015m})	5000 mg/Kg
Chloride residuals must not be capable of impacting local water resources above the New Mexico Water Quality Control Commission (WQCC) water quality standard of 250 mg/Liter.	

At the direction of the New Mexico Oil Conservation Division (NMOCD), Devon disposed of the pit contents and contracted Environmental Plus, Inc. (EPI) of Eunice, New Mexico to collect bottom and sidewall samples of the excavated pit to confirm adequate removal. Samples collected on November 1, 2004 determined that the benzene, BTEX, and TPH^{8015m} laboratory results were all less than the method detection limits and considered acceptable. However, the soil chloride residuals remained elevated in the excavation bottom and sidewalls except for the west sidewall (WSW). On November 11, 2004, EPI implemented the Devon Energy Little Kings #3 Pit Delineation Plan that had been verbally approved by the NMOCD on November 9, 2004. The objective of the plan was to delineate the horizontal and vertical extents of chloride impact via the collection of samples from trenches excavated vertically and horizontally out from the sidewalls and vertically in the excavation bottom. The laboratory results delineated the horizontal extents of chloride impact to be as follows:

Sample Location	Feet from Excavation Perimeter	Vertical Sampling Interval	Laboratory Chloride
	feet	'bgs	mg/Kg
East Sidewall North Trench	20'	3'	64
East Sidewall South Trench	15'	8'	288
Bottom Hole West Trench	--	12.6'	14795
Bottom Hole East Trench	--	6'	2655
North Sidewall East Trench	15'	6'	304
North Sidewall West Trench	33'	11'	272
South Sidewall West Trench	10'	7'	256
South Sidewall East Trench	10'	7'	272

The analytical results also indicated that further delineation would be required in the bottom of the excavated drill pit. On February 22, 2005, with the NMOCDs approval, two soil borings were advanced and sampled in the east and west halves of the excavated pit in the areas of the east and west bottom sample trenches. The 8-foot deep drill pit was contoured to allow drilling rig access. Refer to the sample location map included in Attachment I. The analytical results from the west bottom soil boring ranged from 160 mg/Kg at 13'bgs to 208 mg/Kg at 23'bgs. The east bottom soil boring chloride analytical results began with 5,838 mg/Kg at 13'bgs, increased to a maximum concentration of 26,392 mg/Kg at 18'bgs, and diminished to 48 mg/Kg at 38'bgs. These data support the conclusion that local groundwater has not been impacted. Based on the distribution of the chloride source term identified in the bottom and beyond the pit perimeter it is estimated that the volume of soil impacted above 250 mg/Kg chloride is 6,281 cubic yards (yd^3).

As an alternative to total removal, Devon proposes to isolate the impacted soil from the environment with a properly installed and configured 40 mil polyethylene liner at approximately 4-feet below the surface and cover with clean soil. This "barrier" will interrupt the vertical transport mechanism whereby the chloride source term could leach to groundwater, preclude upward flux of the chloride residuals that could impede revegetation and longtime vigor of the plants, and will be constructed to shed infiltrating precipitation away from the impacted soil thus precluding any down gradient surficial impacts. Even though the initial pit liner used during drilling the well has been removed, this process will effectively isolate the chloride source term and prevent future impacts to the local groundwater.

The procedure will be to excavate the impacted soil located beyond the current excavation perimeter down to a depth of 6'bgs and spread into a compacted 3.67-foot thick lift in the bottom of the 8-foot deep excavated pit. The lift will represent approximately 1,484 cubic yards of impacted soil. To confirm adequate lateral removal of the perimeter soil and establishment of a 4-foot clean buffer, chloride samples will be collected from the sides of the perimeter excavation and from the bottom at a point 4 lateral feet from the sides. This should confirm adequate removal and establishment of the 4-foot clean buffer. The impacted soil lift will be contoured to a 1:1.2 grade from the center to conduct infiltrating precipitation to the clean buffer zone. A diagram of the proposed excavation and liner installation is included in Attachment I.

To support this proposal, a conservative risk assessment, using the "RISC4" computer modeling software to simulate the fate and transport of the residual chloride source term, is provided. The risk assessment simulates groundwater impact with and without the installation of an impermeable barrier. The simulation without the barrier indicates groundwater will be impacted by the chloride in approximately 26-years at a maximum concentration of 359 mg/L. The simulation with the barrier shows that the groundwater will not be impacted.

Devon will implement this proposed plan upon NMOCD approval and will ensure that the NMOCD Hobbs office is notified at least 48 hours prior to construction activities, sampling, or liner installation.

2.0 Environmental Media Characterization

Chemical parameters of the soil and ground water were characterized consistent with the characterization and remediation/abatement goals and objectives set forth in the NMOCD guidelines published in the following documents:

- Pit and Below-Grade Tank Guidelines (November 1, 2004)
- Guidelines for Remediation of Leaks, Spills and Releases (August 13, 1993)
- Unlined Surface Impoundment Closure Guidelines (February 1993)

Acceptable thresholds for **contaminants/constituents of concern** (CoCs), i.e., TPH, chloride, benzene, and BTEX, i.e., the mass sum of benzene, toluene, ethylbenzene, and total xylenes, will be determined based on the NMOCD Ranking Criteria as follows:

- Depth to Ground water, i.e., distance from the lower most acceptable concentration to the ground water,
- Wellhead Protection Area, i.e., distance from fresh water supply wells, and
- Distance to Surface Water Body, i.e., horizontal distance to all down gradient surface water bodies.

2.1 Geological Description

The United States Geological Survey (USGS) Ground-Water Report 6, "Geology and Ground-Water Conditions in Southern Lea County, New Mexico," (A. Nicholson and A. Clebsch, 1961), describes the near surface geology of southern Lea County as an intergrade of the Quaternary Alluvium (QA) sediments, i.e., fine to medium sand, with the mostly eroded Cenozoic Ogallala (CO) formation. Typically, the QA and CO formations in the area are capped by a thick interbed of caliche.

2.2 Ecological Description

The area is typical of the Upper Chihuahuan Desert Biome consisting primarily of hummocky sand hills covered with Harvard Shin Oak (Querqus harvardi) interspersed with Honey Mesquite (Prosopis glandulosa) along with typical desert grasses and weeds. Mammals represented, include Orrd's and Merriam's Kangaroo Rat, Deer Mouse, White Throated Wood Rat, Cottontail Rabbit, Black Tailed Jackrabbit, and the Mule Deer. Reptiles, Amphibians, and Birds are numerous and

typical of area. A survey of Listed, Threatened, or Endangered species was not conducted.

2.3 Area Ground Water

According to the New Mexico Office of the State Engineer Groundwater Well Database, groundwater occurs at approximately 185'bg and is consistent with the USGS Report #6. The ground water elevation decreases generally to the southeast.

2.4 Area Water Wells

The New Mexico Office of the State Engineer database shows four water wells in the area; however all are more than 1,000 feet from the site. Well #00753 is located approximately 3 miles east in Section 14 with a 1990 water level of approximately 185'bgs.

Groundwater Level Data									
Well Number	Tws	Rng	Sec	Easting	Northing	Date	Well	Water	Relative to Site
CP 00593 DCL	22S	35E	6	650479	3587383			na	9,400 ft north
CP 00594 DCL	22S	35E	34	654607	3580615			na	
CP 00595 DCL	22S	35E	20	652145	3583793			na	4,642 ft southeast
CP 00753	22S	35E	14	656947	3585482	7/18/1990	215	185	~3 miles east

Source: New Mexico Office of the State Engineer Database

2.5 Area Surface Water Bodies

The site is located on the south side of a east trending surface drainage approximately 2,940 feet west of a non-perennial playa and is >1,000 horizontal feet from the feature (reference Attachment I).

3.0 NMOCD Site Ranking

Based on the proximity of the site to protectable area water wells, surface water bodies, and depth to ground water, the site has an NMOCD ranking score of "0" points with the soil remedial goals highlighted below in the Site Ranking Matrix.

1. Ground Water	2. Wellhead Protection Area	3. Distance to Surface Water Body
If Depth to GW <50 feet: *20 points*	If <1000' from water source, or;<200' from private domestic water source: *20 points*	<200 horizontal feet: *20 points*
If Depth to GW 50 to 99 feet: *10 points*		200-100 horizontal feet: *10 points*
If Depth to GW >100 feet: *0 points*	If >1000' from water source, or; >200' from private domestic water source: *0 points*	>1000 horizontal feet: *0 points*
Ground water Score = 0	*Wellhead Protection Area Score= 0*	*Surface Water Score= 0*
Site Rank (1+2+3) = 0 + 0 + 0 = 0 points		

Total Site Ranking Score and Acceptable Remedial Goal Concentrations			
Parameter	>19	10-19	**0-9**
Benzene[1]	10 ppm	10 ppm	**10 ppm**
BTEX[1]	50 ppm	50 ppm	**50 ppm**
TPH	100 ppm	1000 ppm	**5000 ppm**

4.0 Soil Investigation Activities

Devon retained Environmental Plus, Inc. (EPI) of Eunice, New Mexico to collect bottom and sidewall samples of the excavated pit to confirm adequate removal. Samples collected on November 1, 2004 determined that the benzene, BTEX, and TPH^{8015m} laboratory results were all less than the method detection limits and considered acceptable. However, the soil chloride residuals remained elevated in the excavation bottom and sidewalls except for the west sidewall (WSW). On November 11, 2004, EPI implemented the Devon Energy Little Kings #3 Pit Delineation Plan that had been verbally approved by the NMOCD on November 9, 2004. The objective of the plan was to delineate the horizontal and vertical extents of chloride impact via the collection of samples from trenches excavated vertically and horizontally out from the sidewalls and vertically in the excavation bottom (refer to sample location map included in Attachment I). The laboratory results delineated the horizontal extents of chloride impact to be as follows:

Sample Location	Feet from Excavation Perimeter	Vertical Sampling Interval	Laboratory Chloride
	feet	'bgs	mg/Kg
East Sidewall North Trench	20'	3'	64
East Sidewall South Trench	15'	8'	288
Bottom Hole West Trench	--	12.6'	14795
Bottom Hole East Trench	--	6'	2655
North Sidewall East Trench	15'	6'	304
North Sidewall West Trench	33'	11'	272
South Sidewall West Trench	10'	7'	256
South Sidewall East Trench	10'	7'	272

The analytical results also indicated that further delineation would be required in the bottom of the excavated drill pit. On February 22, 2005, with the NMOCDs approval, two soil borings were advanced and sampled in the east and west halves of the excavated pit in the areas of the east and west bottom sample trenches. The 8-foot deep drill pit was contoured to allow drilling rig access. Refer to the sample location map included in Attachment I. The analytical results from the west bottom (BHSBW) soil boring ranged from 160 mg/Kg at 13'bgs to 208 mg/Kg at 23'bgs. The east bottom soil boring (BHSBE) chloride analytical results began with 5,838 mg/Kg at 13'bgs, increased to a maximum concentration of 26,392 mg/Kg at 18'bgs, and diminished to 48 mg/Kg at 38'bgs. These data support the conclusion that local groundwater has not been impacted. Based on the distribution of the chloride source term identified in the bottom and beyond the pit perimeter it is estimated that the volume of soil impacted above 250 mg/Kg chloride is 6,281 cubic yards (yd^3). The site map included in Attachment I illustrates the horizontal distribution of the impacted soil. The analytical information is summarized and illustrated and the laboratory reports provided in Attachment III.

5.0 Groundwater Investigation

The soil investigation does not indicate ground water impact in excess of the WQCC standards and therefore does not warrant a groundwater investigation.

6.0 Remediation Proposal and Risk Assessment

As an alternative to total removal of 6,281 yd^3 of soil, Devon proposes to isolate the impacted soil from the environment with a properly installed and configured 40 mil polyethylene liner at approximately 4-feet below the surface and cover with clean soil. This "barrier" will interrupt the vertical transport mechanism whereby the chloride source term could leach to groundwater, as well as, preclude upward flux of the chloride residuals that could impede revegetation of the surface and long-term vigor of the plants. The excavation bottom over which the liner will be installed will be contoured to shed infiltrating precipitation away from the impacted soil thus precluding any down gradient surficial impacts. Even though the initial pit liner used during drilling the well has been removed, this process will effectively isolate the chloride source term and prevent future impacts to the local groundwater and is supported by a risk assessment. The construction procedure and risk assessment are discussed below.

6.6 Construction

The procedure will be to excavate the impacted soil located beyond the current excavation perimeter down to a depth of 6'bgs and spread into a compacted 3.67-foot thick lift in the bottom of the 8-foot deep excavated pit. The lift will represent approximately 1,484 cubic yards of impacted soil. To confirm adequate lateral removal of the perimeter soil and establishment of a 4-foot clean perimeter buffer, chloride samples will be collected from the sides of the perimeter excavation and from the bottom at points 4 lateral feet from the sides. This should confirm adequate removal and establishment of the 4-foot clean buffer. The center of the impacted soil lift will be approximately 1-foot higher than the clean buffer zone perimeter to ensure infiltrating precipitation will be shed to the perimeter. The liner will be cushioned above and below with a 6-inch thick layer of sand or a felt backed geotextile liner to protect it from abrasion and puncture. The final dimensions of the lined excavation will be approximately 150' x 120' (17,976 ft^2). A diagram of the proposed excavation and liner installation is included in Attachment I. After the liner is installed and cushioned, the excavation will be brought to grade with clean soil, contoured to the nature grade, and reseeded with a seed blend agreeable to the landowner.

6.7 Risk Assessment

To support the remediation proposal, a conservative risk assessment was conducted using the "RISC4" computer modeling software to simulate the fate and transport of the residual chloride source term. To illustrate the effectiveness of the 40 mil thick polyethylene liner, the risk assessment simulates groundwater impact with and without the installation of an impermeable barrier. Input variables for both simulations are summarized in Attachment V.

6.7.1 Simulation without Barrier

The simulation without the barrier indicates groundwater will be impacted by the chloride in approximately 26-years at a maximum concentration of 359 mg/L. The chart below illustrates the impact.

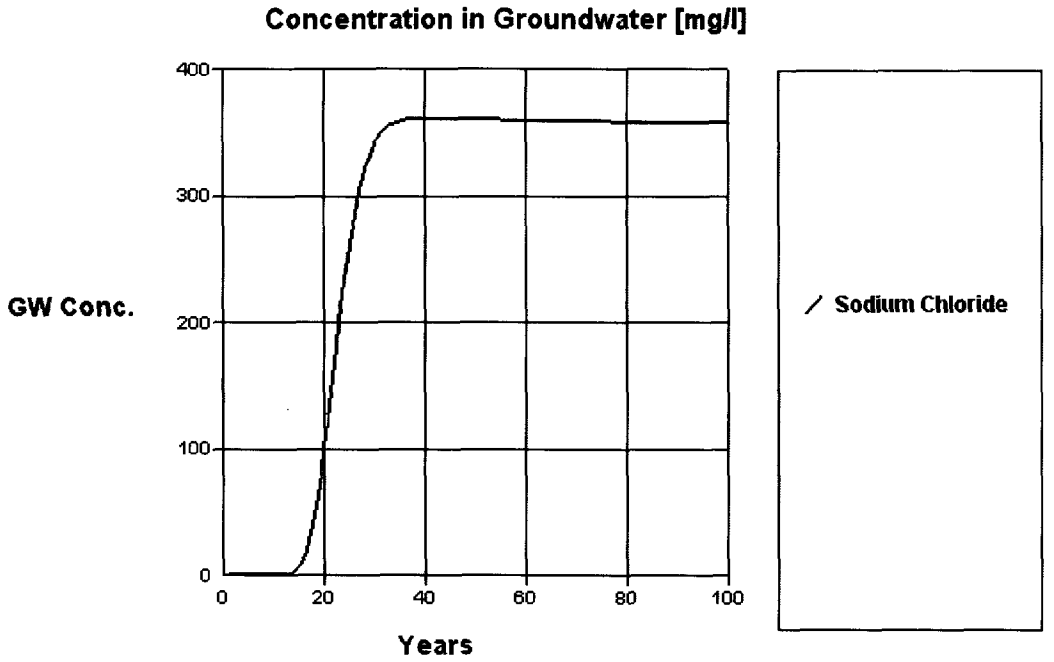


Figure 1 Simulation without Barrier

6.7.2 SIMULATION WITH BARRIER

The simulation with the barrier shows that the groundwater will not be impacted and is illustrated by the chart below, generated by the RISC4 software.

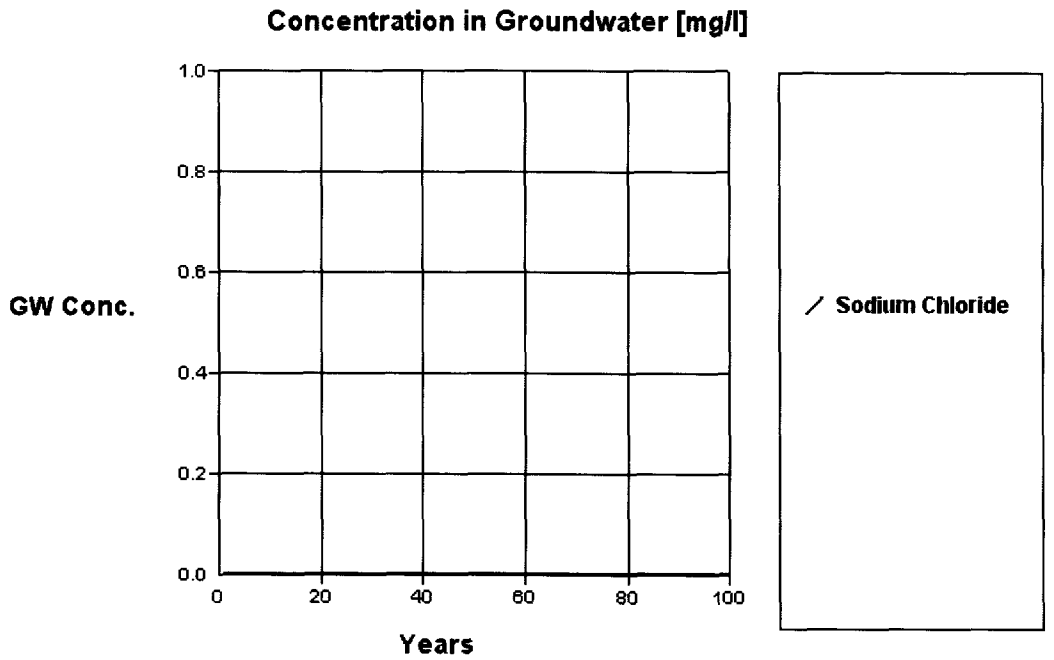
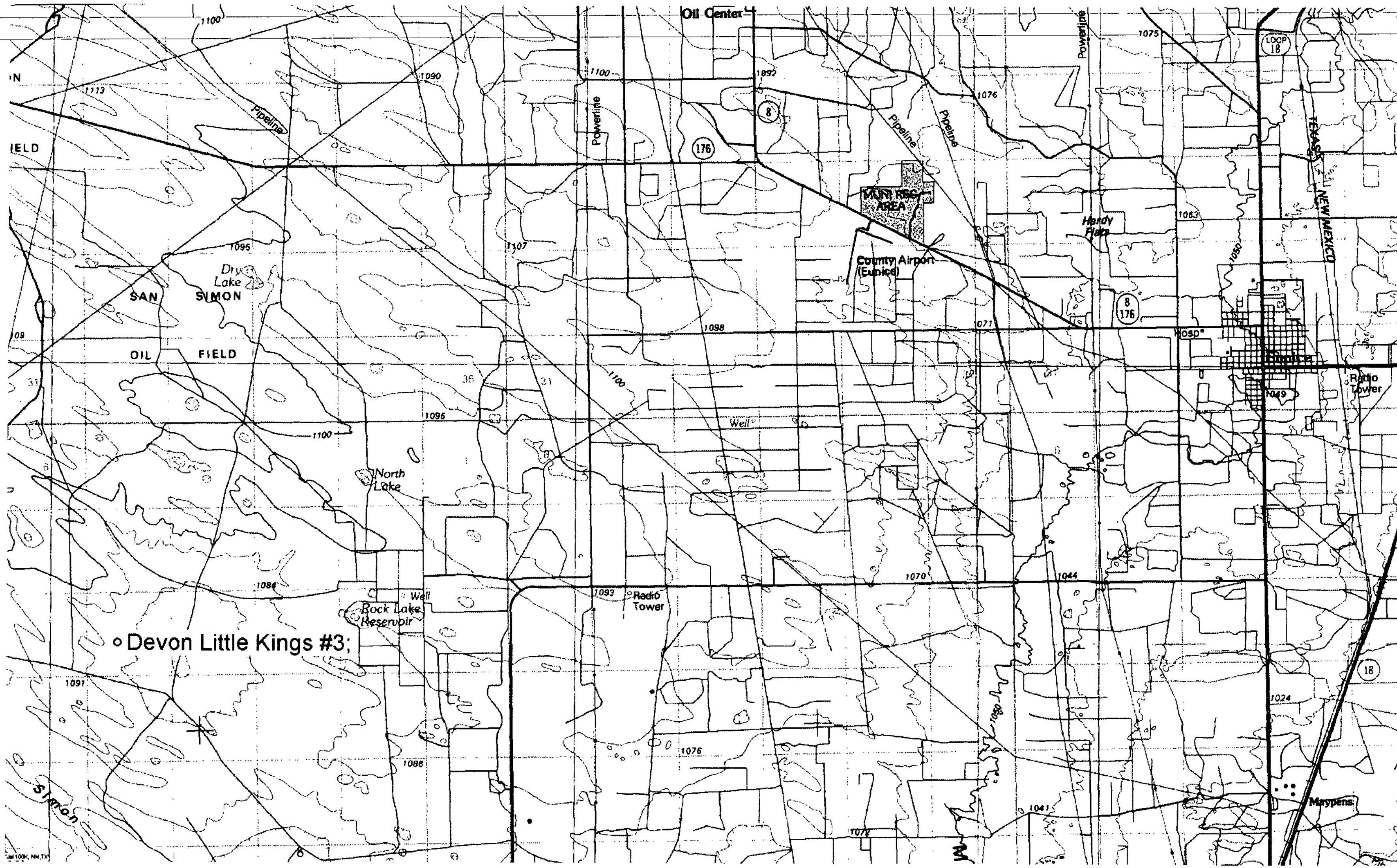


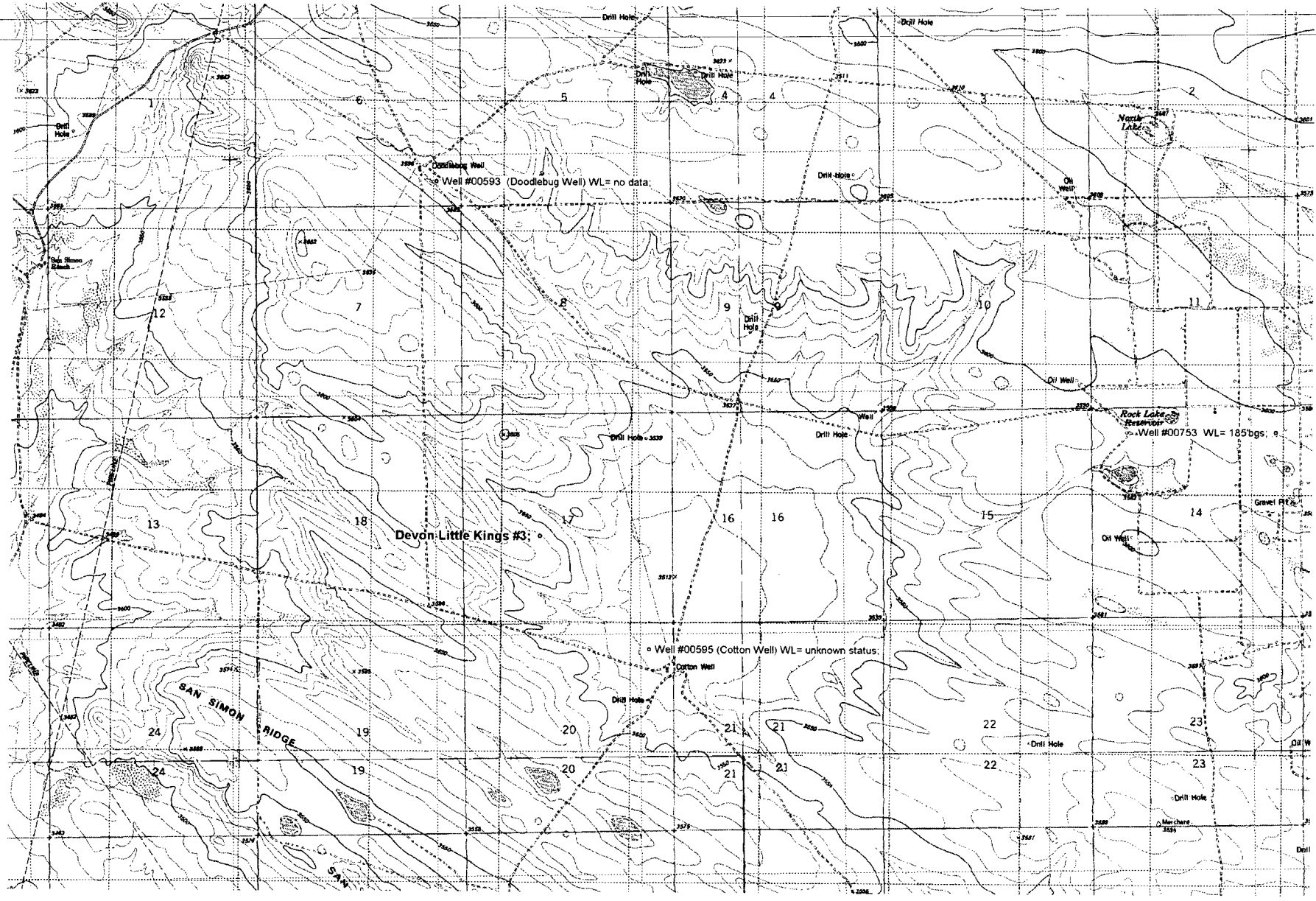
Figure 2 Simulation with Barrier

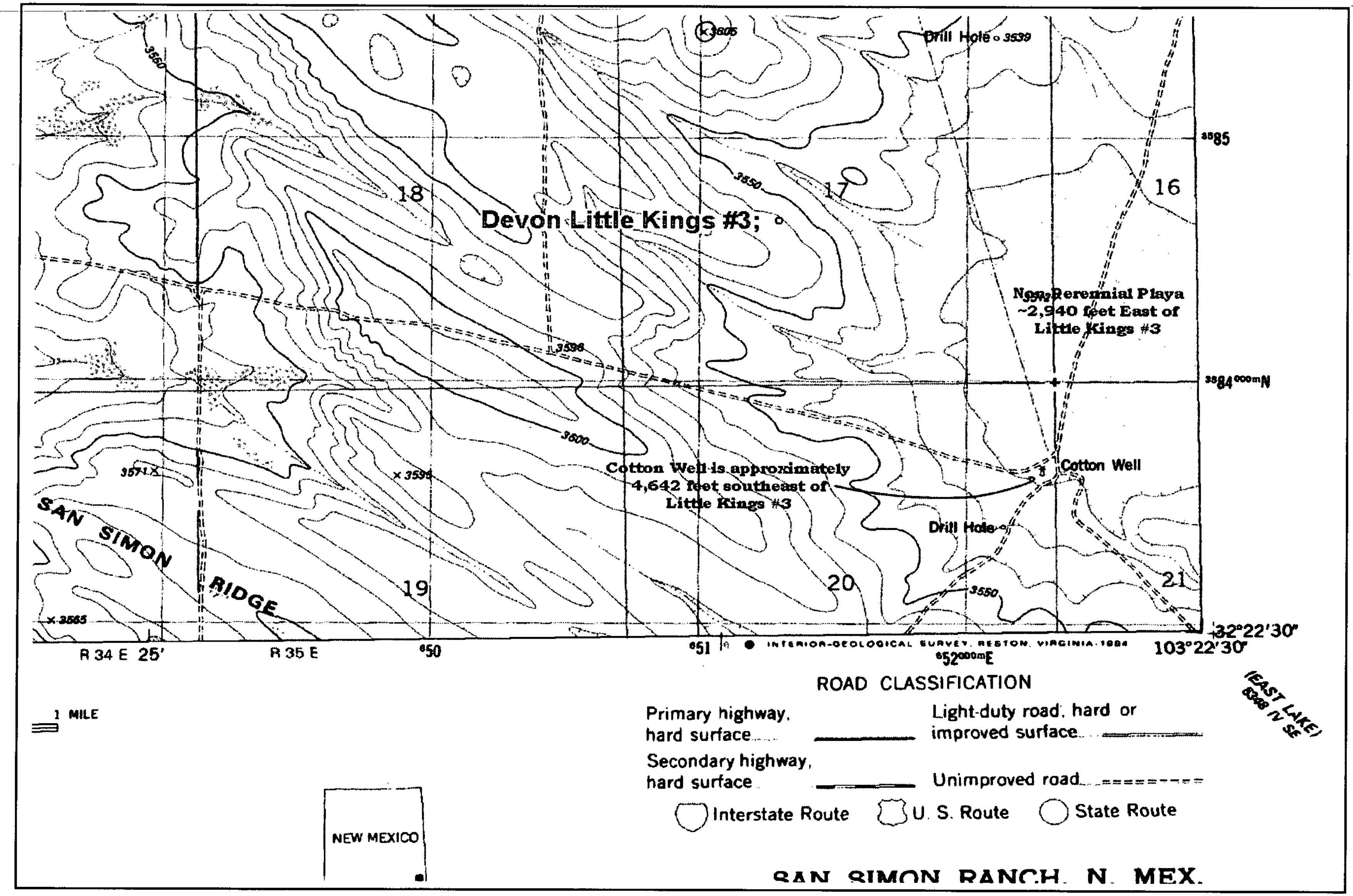
7.0 REQUEST FOR APPROVAL

Devon will implement this proposed plan upon NMOCD approval and will ensure that the NMOCD Hobbs office is notified at least 48 hours prior to construction activities, sampling, or liner installation. Following implementation, a summary report documenting these closure activities will be submitted to the NMOCD requesting that "no further action" be required at the site.

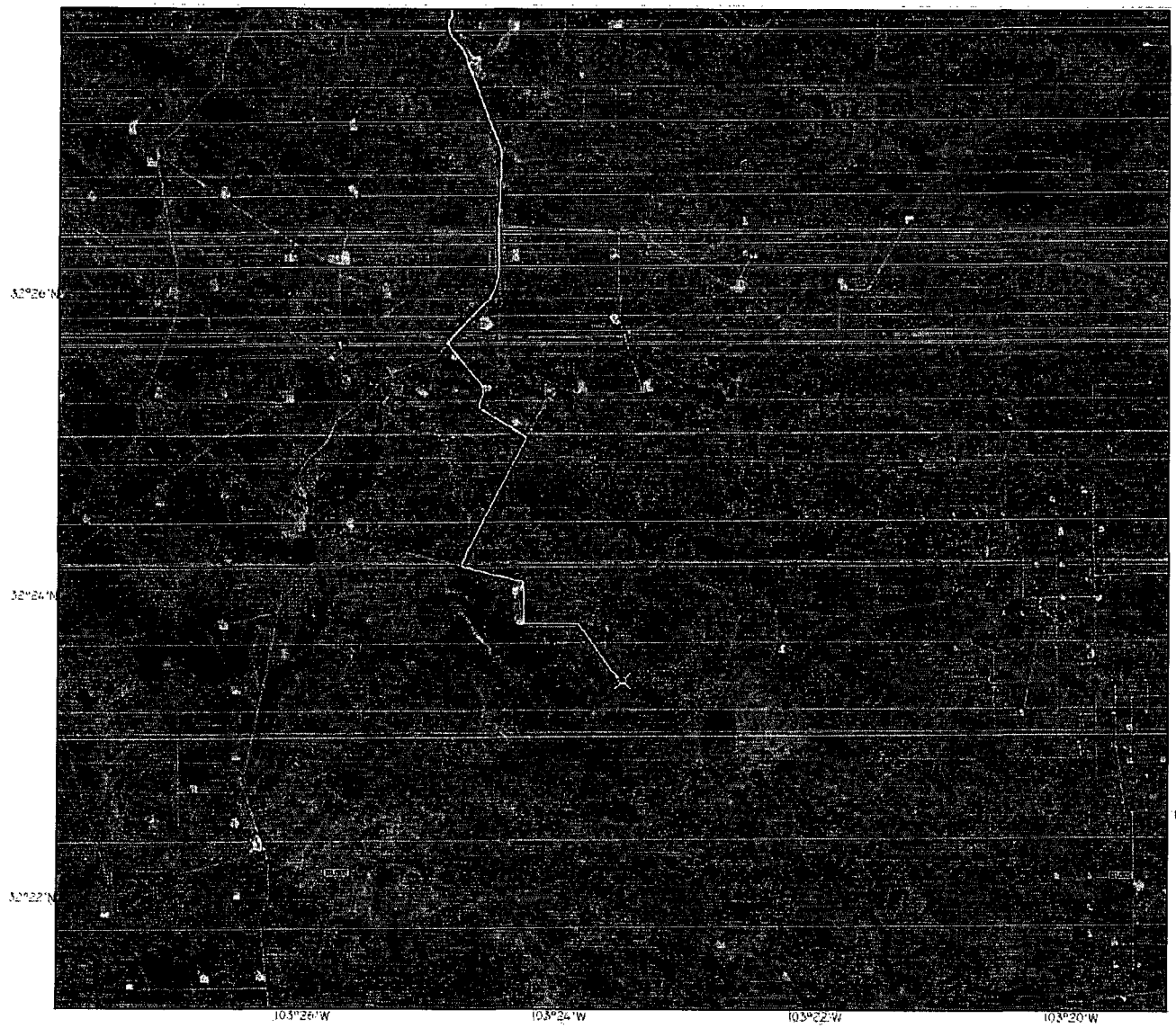
ATTACHMENT I: SITE MAPS


Oil Center
Powerline
Pipeline
Pipeline
Pipeline
Powerline
MUNI REC AREA
Hardy Flats
County Airport (Eunice)
Dry Lake
SAN SIMON
OIL FIELD
TEXAS
NEW MEXICO
Radio Tower
Well
North Lake
Well
Rock Lake Reservoir
Radio Tower
Devon Little Kings #3;
Maypens
Simon


Well #00593 (Doodlebug Well) WL= no data;
Devon Little Kings #3;
Well #00753 WL= 185'bgs;
Well #00595 (Cotton Well) WL= unknown status;
SAN SIMON RIDGE
Rock Lake Reservoir
North Lake
Drill Hole
Oil Well
Cotton Well
Gravel Pit



Drill Hole 3539
3605
3560
3585
16
18
17
3550
Devon Little Kings #3;
Non-Perennial Playa
~2,940 feet East of
Little Kings #3
3596
3584000mN
3600
Cotton Well
Cotton Well is approximately
4,642 feet southeast of
Little Kings #3
3571
× 3595
Drill Hole
SAN SIMON RIDGE
19
20
21
3550
× 3565
32°22'30"
103°22'30"
R 34 E 25'
R 35 E
650
651
INTERIOR-GEOLOGICAL SURVEY, RESTON, VIRGINIA-1984
652000mE
ROAD CLASSIFICATION
1 MILE
Primary highway, hard surface
Light-duty road, hard or improved surface
Secondary highway, hard surface
Unimproved road
Interstate Route
U. S. Route
State Route
(EAST LAKE) 5348 IV SE
NEW MEXICO
SAN SIMON RANCH, N. MEX.



DEVON ENERGY
LITTLE KINGS
#3
RESERVE PIT
UL-K SEC 17
T22S R35E
LEA CO NM

N

SCALE 1:80,000

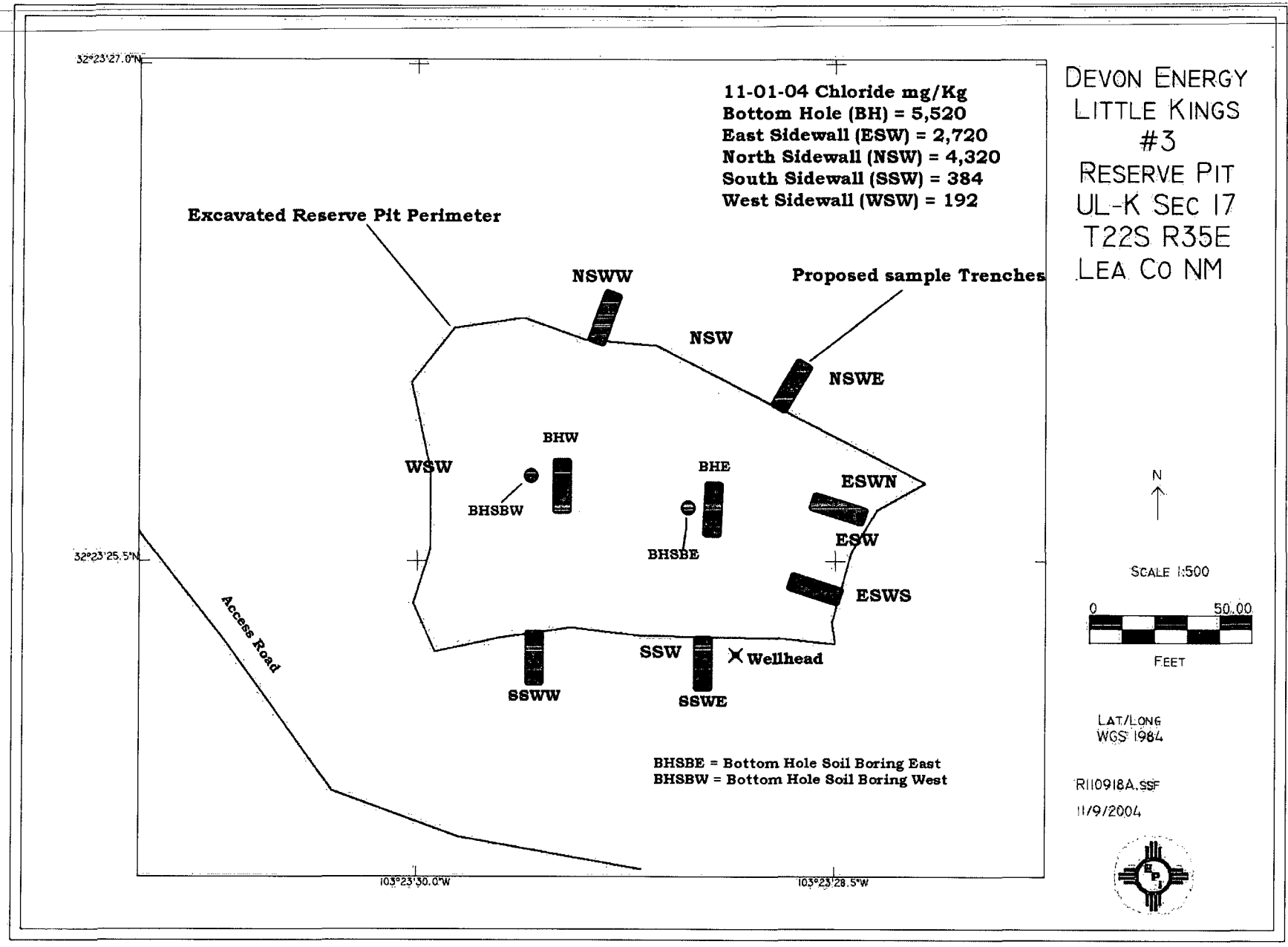
0 7,500

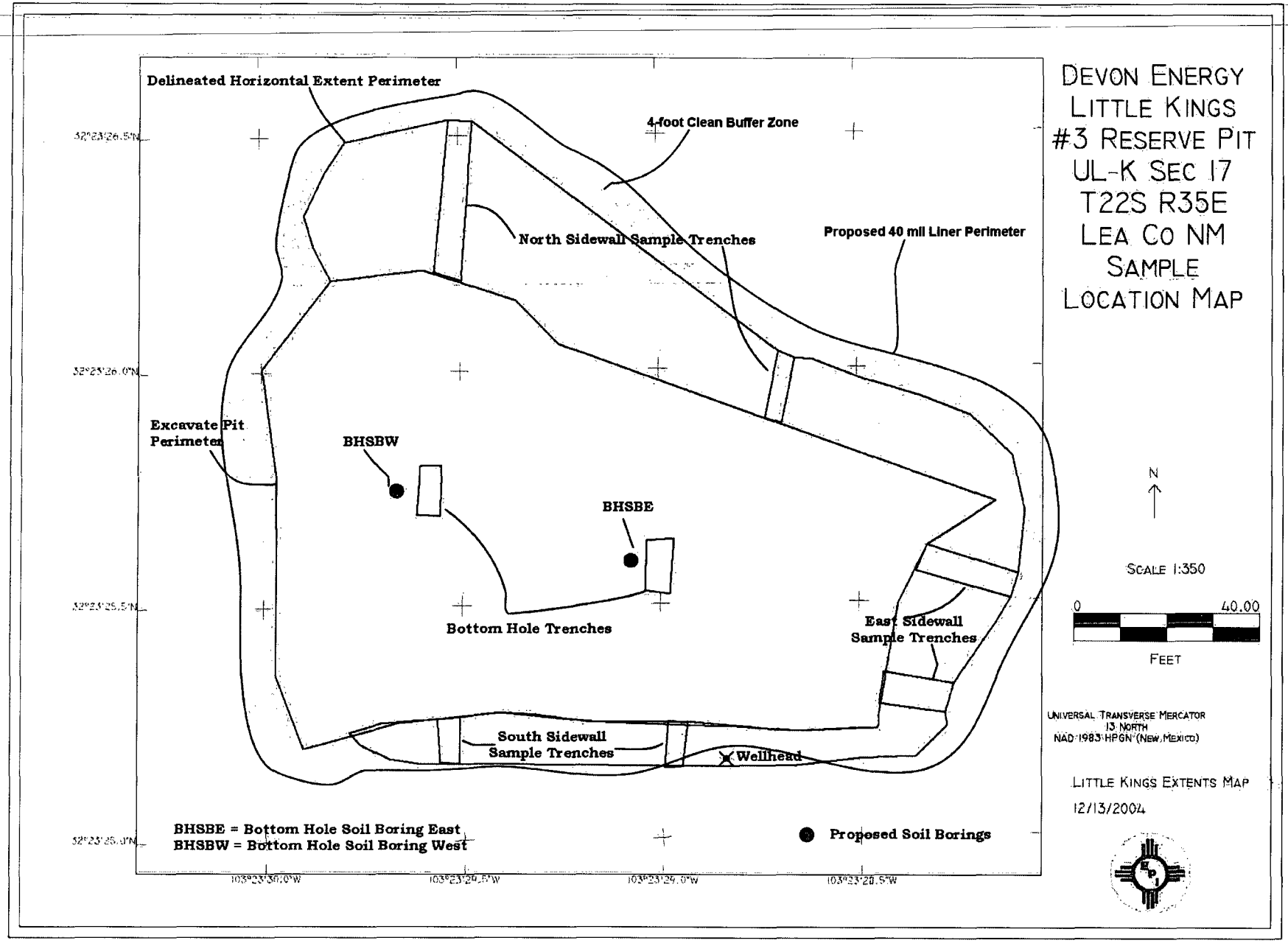
FEET

UNIVERSAL TRANSVERSE MERCATOR
13 NORTH
NAD 1983 HPGN (NEW MEXICO)

LITTLE KINGS EXTENTS MAP.SSF

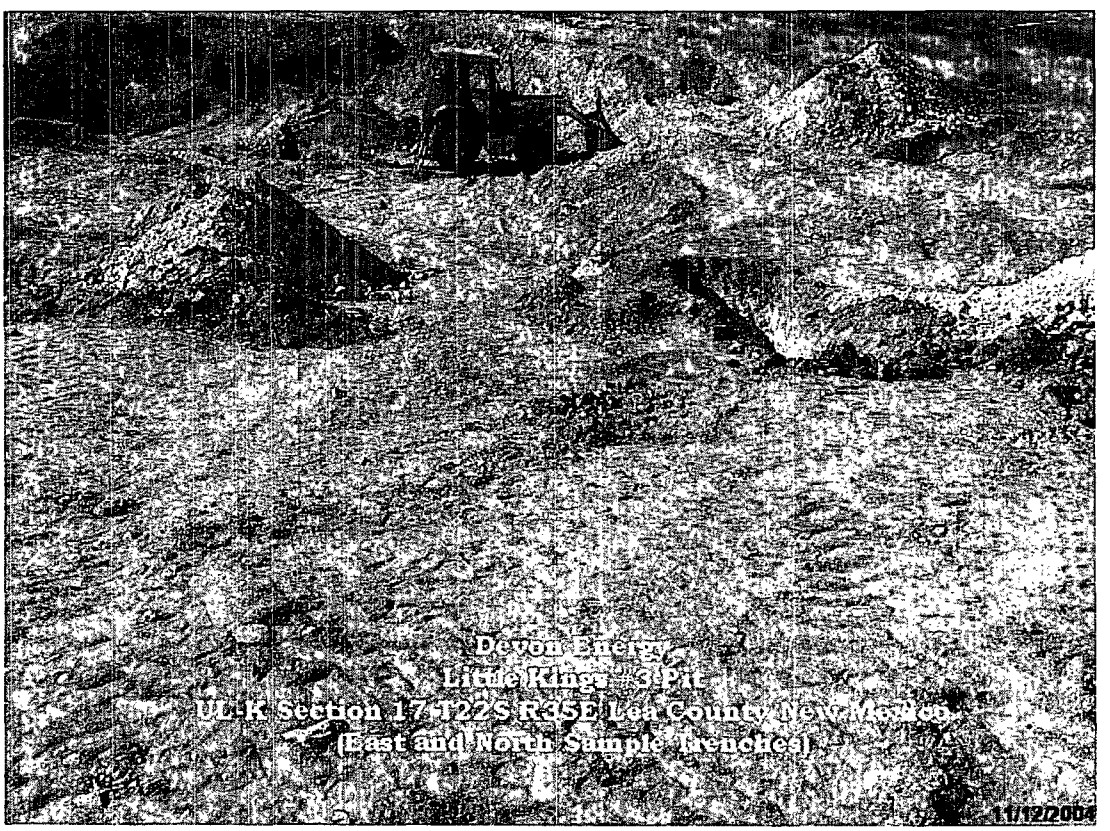
12/12/2004


11-01-04 Chloride mg/Kg
Bottom Hole (BH) = 5,520
East Sidewall (ESW) = 2,720
North Sidewall (NSW) = 4,320
South Sidewall (SSW) = 384
West Sidewall (WSW) = 192
Excavated Reserve Pit Perimeter
Proposed sample Trenches
NSWW
NSW
NSWE
WSW
BHW
BHE
BHSBW
BHSBE
ESWN
ESW
ESWS
SSW
SSWW
SSWE
Wellhead
Access Road
32°23'27.0"N
32°23'25.5"N
103°23'30.0"W
103°23'28.5"W
BHSBE = Bottom Hole Soil Boring East
BHSBW = Bottom Hole Soil Boring West
DEVON ENERGY
LITTLE KINGS
#3
RESERVE PIT
UL-K SEC 17
T22S R35E
LEA CO NM
N
SCALE 1:500
0
50.00
FEET
LAT/LONG
WGS 1984
RI10918A.SSF
11/9/2004

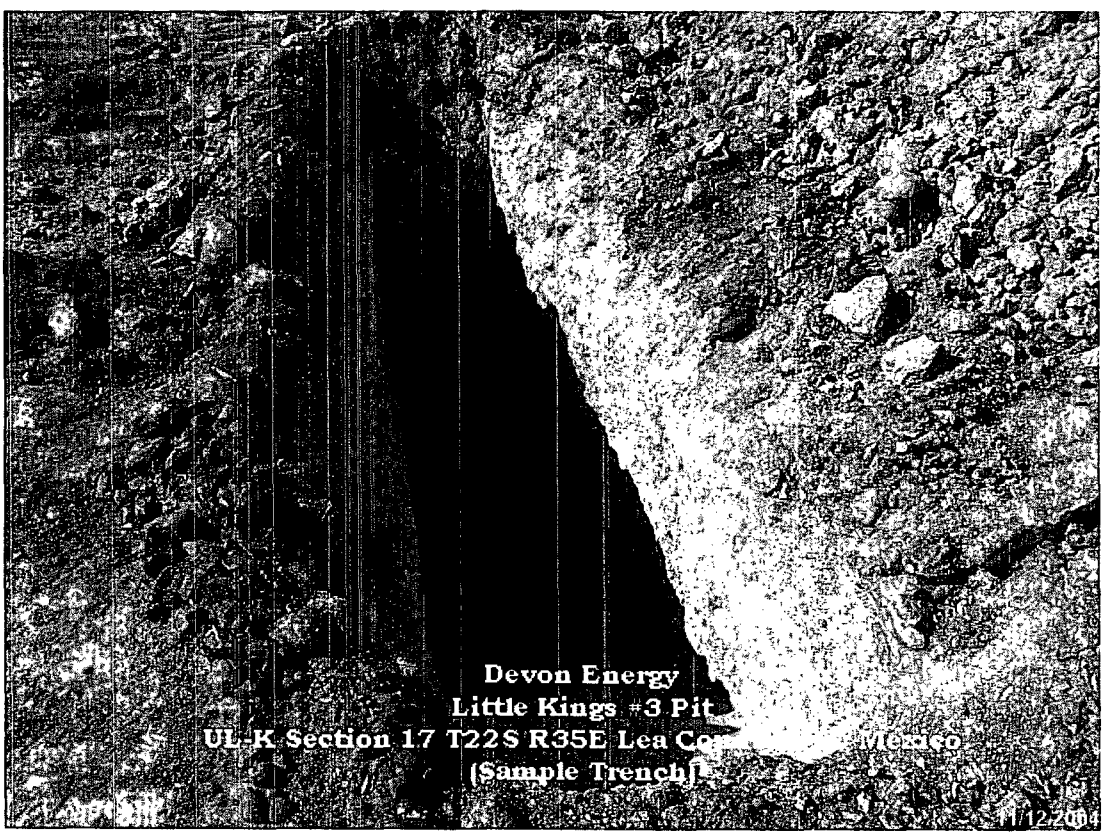

Delineated Horizontal Extent Perimeter
4-foot Clean Buffer Zone
North Sidewall Sample Trenches
Proposed 40 mil Liner Perimeter
Excavate Pit Perimeter
BHSBW
BHSBE
Bottom Hole Trenches
East Sidewall Sample Trenches
South Sidewall Sample Trenches
Wellhead
BHSBE = Bottom Hole Soil Boring East
BHSBW = Bottom Hole Soil Boring West
Proposed Soil Borings
32°23'26.5"N
32°23'26.0"N
32°23'25.5"N
32°23'25.0"N
103°23'30.0"W
103°23'29.5"W
103°23'29.0"W
103°23'28.5"W
DEVON ENERGY
LITTLE KINGS
#3 RESERVE PIT
UL-K SEC 17
T22S R35E
LEA CO NM
SAMPLE
LOCATION MAP
N
SCALE 1:350
0
40.00
FEET
UNIVERSAL TRANSVERSE MERCATOR
13 NORTH
NAD 1983 HPGN (NEW MEXICO)
LITTLE KINGS EXTENTS MAP
12/13/2004

ATTACHMENT II: PHOTOGRAPHS


Devon Energy
Little Kings #3 Pit
UL-K Section 17 T22S R35E Lea County New Mexico
(Bottom East Sample Trenches)


Devon Energy
Little Kings #3 Pit
UL-K Section 17 T22S R35E Lea County New Mexico
(East and North Sample Trenches)
11/12/2004


Devon Energy
Little Kings #3 Pit
UL-K Section 17 T22S R35E Lea County New Mexico
(Bottom Sample Trenches)
11/12/2004


Devon Energy
Little Kings #3 Pit
UL-K Section 17 T22S R35E Lea Co
(Sample Trench)
11/12/2004

ATTACHMENT III: ANALYTICAL REPORTS AND SUMMARY

Devon Energy

Little Kings #3 Drilling Reserve Pit Delineation Information

Sample Location	Description	Feet from Excavation Perimeter	Vertical Sampling Interval (FT. BGS[1])	SAMPLE ID#	Date	GRO[3]	DRO[4]	TPH[5]	BTEX	Benzene	Toluene	Ethylbenzene	m,p, & o Xylene	Field Chloride	Laboratory Chloride
						mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
East Sidewall	East Sidewall Composite	0	0-5	SDLK110104ESW	11/1/2004	<10.0	<10.0	<10.0	<0.015	<0.005	<0.005	<0.005	<0.005	na	2720
	North Trench	20' East	3	ESWN 3-20	11/12/2004	<10.0	<10.0	<10.0	<0.015	<0.005	<0.005	<0.005	<0.015	240	64
	South Trench	10' East	2	ESWS2-10	11/12/2004	na	na	na	na	na	na	na	na	4000	11596
		15' East	4	ESWS4-15	11/12/2004	na	na	na	na	na	na	na	na	520	656
			8	ESWS8-15	11/12/2004	<10.0	<10.0	<10.0	<0.015	<0.005	<0.005	<0.005	<0.015	240	288
Excavation Bottom	Bottom Composite	0	5	SDLK110104BH	11/1/2004	<10.0	<10.0	<10.0	<0.015	<0.005	<0.005	<0.005	<0.005	na	5520
	West Trench	0	3	BHW 3	11/11/2004	na	na	na	na	na	na	na	na	6800	10797
		0	6	BHW6	11/11/2004	na	na	na	na	na	na	na	na	2000	14076
		0	9	BHW 9	11/11/2004	na	na	na	na	na	na	na	na	4000	15995
		0	13	BHW 12.6	11/11/2004	na	na	na	na	na	na	na	na	8000	14795
	East Trench	0	3	BHE3	11/11/2004	na	na	na	na	na	na	na	na	2000	2031
		0	6	BHE6	11/11/2004	na	na	na	na	na	na	na	na	4000	2655
		0	9	BHE9	11/11/2004	na	na	na	na	na	na	na	na	4000	na
North Sidewall	North Sidewall Composite	0	0-5	SDLK110104NSW	11/1/2004	<10.0	<10.0	<10.0	<0.015	<0.005	<0.005	<0.005	<0.005	na	4320
	East Trench	6' North	3	NSWE3-6	11/11/2004	na	na	na	na	na	na	na	na	na	704
		15' North	6	NSWE6-15	11/11/2004	<10.0	<10.0	<10.0	<0.015	<0.005	<0.005	<0.005	<0.015	320	304
	West Trench	25' North	3	NSWW 3-25	11/12/2004	na	na	na	na	na	na	na	na	1600	na
			7	NSWW 7-25	11/12/2004	na	na	na	na	na	na	na	na	1600	1887
			8	NSWW 8-25	11/12/2004	na	na	na	na	na	na	na	na	na	848
			11	NSWW 11-25	11/12/2004	na	na	na	na	na	na	na	na	4000	13196
		30' North	6	NSWW 6-30	11/12/2004	na	na	na	na	na	na	na	na	na	3359
			11	NSWW 11-30	11/12/2004	na	na	na	na	na	na	na	na	480	608
		33' North	2	NSWW 2-33	11/12/2004	na	na	na	na	na	na	na	na	na	2319
			7	NSWW 7-33	11/12/2004	na	na	na	na	na	na	na	na	180	na
			9	NSWW 9-33	11/12/2004	na	na	na	na	na	na	na	na	200	736
			11	NSWW 11-33	11/12/2004	<10.0	<10.0	<10.0	<0.015	<0.005	<0.005	<0.005	<0.015	na	272
South Sidewall	South Sidewall Composite	0	0-5	SDLK110104SSW	11/1/2004	<10.0	<10.0	<10.0	<0.015	<0.005	<0.005	<0.005	<0.005	na	384
	West Trench	5' South	3	SSWW 3-5	11/11/2004	na	na	na	na	na	na	na	na	400	1328
		10' South	7	SSWW 7-10	11/11/2004	<10.0	<10.0	<10.0	<0.015	<0.005	<0.005	<0.005	<0.015	180	256
	East Trench	6' South	3	SSWE3-6	11/11/2004	na	na	na	na	na	na	na	na	400	960
		10' South	7	SSWE7-10	11/11/2004	<10.0	<10.0	<10.0	<0.015	<0.005	<0.005	<0.005	<0.015	200	272
West Sidewall	West Sidewall Composite	0	0-5	SDLK110104WSW	11/1/2004	<10.0	<10.0	<10.0	<0.015	<0.005	<0.005	<0.005	<0.005	na	192
Background Sample	South	300' South	3	Background	11/11/2004	na	na	na	na	na	na	na	na	80	
New Mexico Oil Conservation Division Site Remedial Goals								5000	50	*10*					WQCC[7]

[1]bgs – below ground surface

[3]GRO-Gasoline Range Organics C_6-C_{10}

[4]DRO-Diesel Range Organics C_{10}-C_{35}

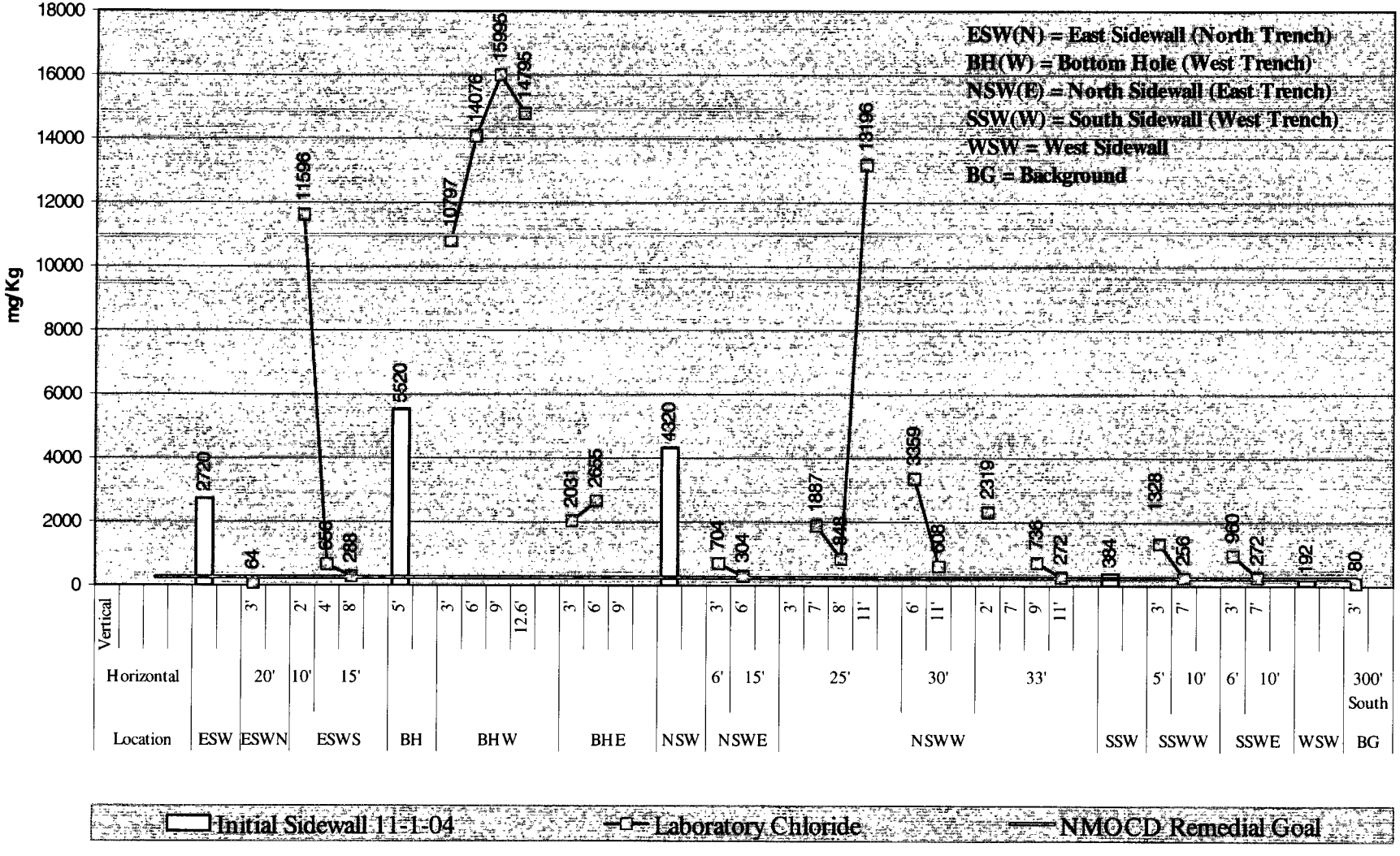
[5]TPH-Total Petroleum Hydrocarbon = GRO+DRO.

[6]Bolded values are in excess of the New Mexico Oil Conservation Division guideline threshold for the parameter

[7]Soil chloride residuals must not be capable of impacting groundwater or surface water above Water Quality Control Commission (WQCC) standard of 250 mg/L.

[8]na - not analyzed

Devon
Little Kings #3
Chloride Delineation



Devon Energy

Little Kings #3 Drilling Reserve Pit Delineation Information

Sample Location	Vertical Sampling Interval (FT. BGS[1])	SAMPLE ID#	Date	GRO[3]	DRO[4]	TPH[5]	BTEX	Benzene	Toluene	Ethylbenzene	m,p, & o Xylene	Field Chloride	Laboratory Chloride
				mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Bottom Hole Soil Boring East	13	DELK32-22-05BHSBE-5'	2/22/2005	na	na	na	na	na	na	na	na	3200	5838
	18	DELK32-22-05BHSBE-10'	2/22/2005	na	na	na	na	na	na	na	na	3400	26392
	23	DELK32-22-05BHSBE-15'	2/22/2005	na	na	na	na	na	na	na	na	2700	13196
	28	DELK32-22-05BHSBE-20'	2/22/2005	na	na	na	na	na	na	na	na	2800	7038
	33	DELK32-22-05BHSBE-25'	2/22/2005	na	na	na	na	na	na	na	na	300	96
	38	DELK32-22-05BHSBE-30'	2/22/2005	na	na	na	na	na	na	na	na	200	48
Bottom Hole Soil Boring West	13	DELK32-22-05BHSBW-5'	2/22/2005	na	na	na	na	na	na	na	na	380	160
	18	DELK32-22-05BHSBW-10'	2/22/2005	na	na	na	na	na	na	na	na	380	192
	23	DELK32-22-05BHSBW-15'	2/22/2005	na	na	na	na	na	na	na	na	380	208
Background Sample 300'southwest	3	DELK32-22-05BG	2/22/2005	na	na	na	na	na	na	na	na	400	48
New Mexico Oil Conservation Division Site Remedial Goals						5000	50	*10*					WQCC[7]

[1]bgs – below ground surface

[3]GRO-Gasoline Range Organics C_6-C_{10}

[4]DRO-Diesel Range Organics C_{10}-C_{35}

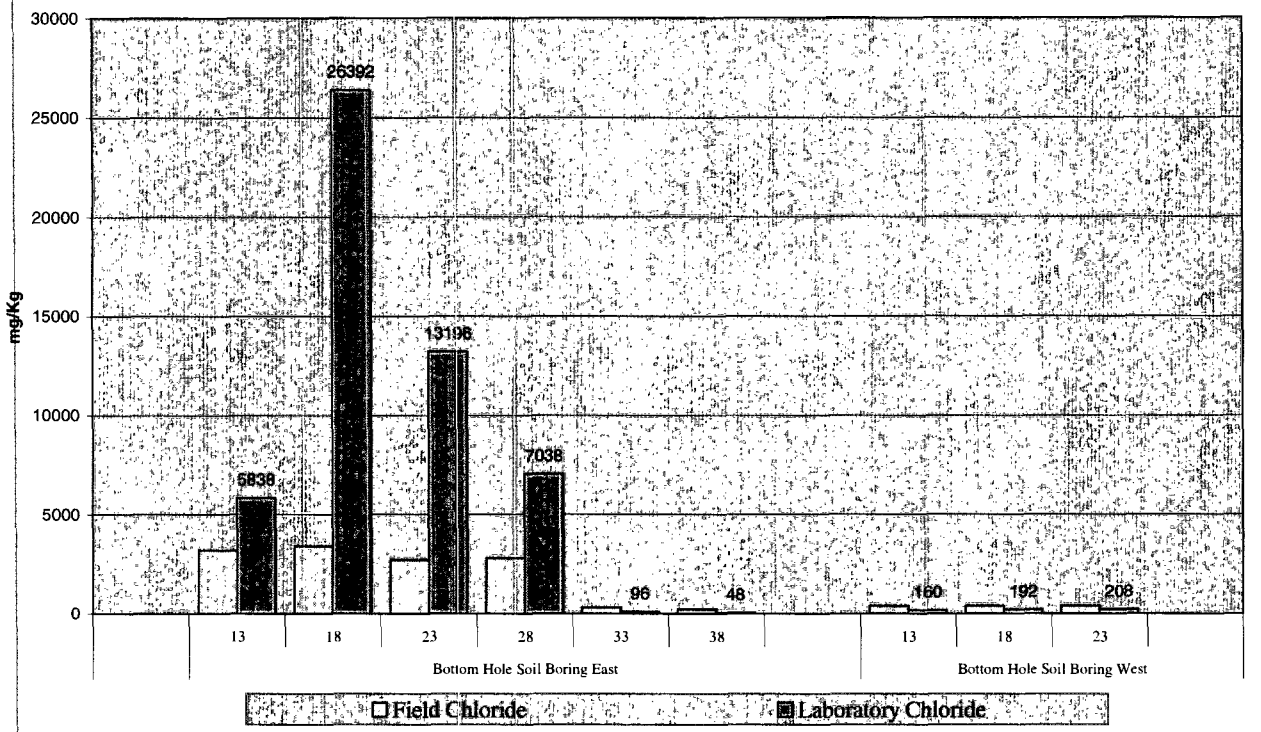
[5]TPH-Total Petroleum Hydrocarbon = GRO+DRO.

[6]Bolded values are in excess of the New Mexico Oil Conservation Division guideline threshold for the parameter

[7]Soil chloride residuals must not be capable of impacting groundwater or surface water above Water Quality Control Commission (WQCC) standard of 250 mg/L.

[8]na - not analyzed

Devon
Little Kings #3
Chloride Delineation



CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR
ENVIRONMENTAL PLUS, INC.
ATTN: PAT McCASLAND/IAIN OLNESS
P.O. BOX 1558
EUNICE, NM 88231
FAX TO: (505) 394-2601

Receiving Date: 11/01/04
Reporting Date: 11/04/04
Project Owner: DEVON ENERGY
Project Name: LITTLE KINGS #3
Project Location: NOT GIVEN

Sampling Date: 11/01/04
Sample Type: SOIL
Sample Condition: COOL & INTACT
Sample Received By: BC
Analyzed By: BC/AH

LAB NUMBER	SAMPLE ID	GRO (C_6-C_{10}) (mg/Kg)	DRO (>C_{10}-C_{28}) (mg/Kg)	Cl* (mg/Kg)
ANALYSIS DATE		11/01/04	11/01/04	11/02/04
H9309-1	SDLK110104BH	<10.0	<10.0	5520
H9309-2	SDLK110104ESW	<10.0	<10.0	2720
H9309-3	SDLK110104NSW	<10.0	<10.0	4320
H9309-4	SDLK110104SSW	<10.0	<10.0	384
H9309-5	SDLK110104WSW	<10.0	<10.0	192
Quality Control		740	802	1010
True Value QC		800	800	1000
% Recovery		92.6	100	101
Relative Percent Difference		2.3	1.5	1.0

METHODS: TPH GRO & DRO: EPA SW-846 8015 M; Cl^-: Std. Methods 4500-Cl^-B
*Analyses performed on 1:4 w:v aqueous extracts.

Chemist

11/4/04
Date

H9309A.XLS

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR
ENVIRONMENTAL PLUS, INC.
ATTN: PAT McCASLAND/IAIN OLNESS
P.O. BOX 1558
EUNICE, NM 88231
FAX TO: (505) 394-2601

Receiving Date: 11/01/04
Reporting Date: 11/04/04
Project Owner: DEVON ENERGY
Project Name: LITTLE KINGS #3
Project Location: NOT GIVEN

Sampling Date: 11/01/04
Sample Type: SOIL
Sample Condition: COOL & INTACT
Sample Received By: BC
Analyzed By: BC

LAB NUMBER	SAMPLE ID	BENZENE (mg/Kg)	TOLUENE (mg/Kg)	ETHYL BENZENE (mg/Kg)	TOTAL XYLENES (mg/Kg)
ANALYSIS DATE		11/01/04	11/01/04	11/01/04	11/01/04
H9309-1	SDLK110104BH	<0.005	<0.005	<0.005	<0.015
H9309-2	SDLK110104ESW	<0.005	<0.005	<0.005	<0.015
H9309-3	SDLK110104NSW	<0.005	<0.005	<0.005	<0.015
H9309-4	SDLK110104SSW	<0.005	<0.005	<0.005	<0.015
H9309-5	SDLK110104WSW	<0.005	<0.005	<0.005	<0.015
Quality Control		0.098	0.102	0.102	0.315
True Value QC		0.100	0.100	0.100	0.300
% Recovery		98.2	102	102	105.00
Relative Percent Difference		1.6	1.7	2.4	4.7

METHOD: EPA SW-846 8260

Chemist

11/4/04
Date

H9309B.XLS

Cardinal Laboratories Inc.

2111 Beechwood, Abilene, TX 79603
915-673-7001 Fax 915-673-7020

101 East Marland, Hobbs, NM 88240
505-393-2326 Fax 505-393-2476

Company Name	DEVON ENERGY
Project Manager	PAT MCCASLAND
Address	
City, State, Zip	
Phone#/Fax#	
Project #/Owner	
Project Name	Little Kings #3
Project Location	
Sampler Name	Roger Boone

Bill To

Environmental Plus Inc.

Analysis Request

LAB I.D.	SAMPLE I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	MATRIX: GROUND WATER	WASTEWATER	SOIL	CRUDE OIL	SLUDGE	OTHER:	PRESERV.: ACID/BASE	ICE/COOL	OTHER	SAMPLING: DATE	TIME	BTEX 8021B	TPH 8015Modified	Cl	SAR	EC
H9309-1	SDLK110104 BH	C	1			1					1		11-1	9:10	X	X	X		
-2	SDLK 110104 ESW	C	1			1					1		11-1	9:15	X	X	X		
-3	SDLK 110104 NSW	C	1			1					1		11-1	9:20	X	X	X		
-4	SDLK 110104 SSW	C	1			1					1		11-1	9:25	X	X	X		
-5	SDLK 110104 WSW	C	1			1					1		11-1	9:30	X	X	X		

Sampler Relinquished: Roger Boone	Date 11-1-04 Time 10:56	Received By:	Fax Results Iain Olness 505-394-2601
Relinquished by:	Date / Time	Received By: (lab staff) Burgess McCook	Remarks
Delivered by Sampler	Sample Cool & Intact: (Yes) No	Checked By:	

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR
ENVIRONMENTAL PLUS, INC.
ATTN: PAT McCASLAND
P.O. BOX 1558
EUNICE, NM 88231
FAX TO: (505) 394-2601

Receiving Date: 11/15/04
Reporting Date: 11/16/04
Project Owner: DEVON ENERGY
Project Name: LITTLE KING 3
Project Location: NOT GIVEN

Analysis Date: 11/16/04
Sampling Date: 11/11/04
Sample Type: SOIL
Sample Condition: COOL & INTACT
Sample Received By: BC
Analyzed By: AH

LAB NUMBER	SAMPLE ID	Cl^- (mg/Kg)
H9346-1	BHE 3	2031
H9346-2	BHE 6	2655
H9346-3	BHW 3	10797
H9346-4	BHW 6	14076
H9346-5	BHW 9	15995
H9346-6	BHW 12.6	14795
H9346-7	SSWE 3-6	960
H9346-8	SSWW 3-5	1328
H9346-9	NSWE 3-6	704
Quality Control		1010
True Value QC		1000
% Recovery		101
Relative Percent Difference		0

METHOD: Standard Methods	4500-ClB

Note: Analyses performed on 1:4 w:v aqueous extracts.

Amy Hill
Chemist

11/16/04
Date

h9346

Cardinal Laboratories Inc.

2111 Beechwood, Abilene, TX 79603 — 915-673-7001 Fax 915-673-7020

101 East Marland, Hobbs, NM 88240 — 505-393-2326 Fax 505-393-2476

Company Name	DEVON ENERGY
Project Manager	
Address	
City, State, Zip	
Phone#/Fax#	
Project #/Owner	
Project Name	LITTLE KINGS 3
Project Location	
Sampler Name	Eddie J Hayes

Bill To

ENVIRONMENTAL PLUS INC.

Analysis Request

LAB I.D.	SAMPLE I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	MATRIX: GROUND WATER	WASTEWATER	SOIL	CRUDE OIL	SLUDGE	OTHER:	PRESERV.: ACID/BASE	ICE/COOL	OTHER	SAMPLING: DATE	TIME	BTEX 8021B	TPH 8015Modified	Cl	SAR	EC
H43461	BHE3	G				✓							11/11				✓		
-2	BHE6	G				✓							✓				✓		
-3	BHW3	G				✓							✓				✓		
-4	BHW6	G				✓							✓				✓		
-5	BHW9	G				✓							✓				✓		
-6	BHW12.6	G				✓							✓				✓		
-7	SSWE3-6	G				✓							✓				✓		
-8	SSWW3-5	G				✓							✓				✓		
-9	NSWE3-6	G											✓				✓		
10																			

Sampler Relinquished: Eddie J Hayes	Time	Received By:	Fax results to Pat McCasland 505-394-2601
Relinquished by:	Date 11/11/11 Time 1334	Received By: (lab staff)	Remarks
Delivered by Sampler	Sample Cool & Intact (Yes) No	Checked By:	

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR
ENVIRONMENTAL PLUS, INC.
ATTN: PAT McCASLAND
P.O. BOX 1558
EUNICE, NM 88231
FAX TO: (505) 394-2601

Receiving Date: 11/15/04
Reporting Date: 11/16/04
Project Owner: DEVON
Project Name: LITTLE KINGS #3
Project Location: NOT GIVEN

Sampling Date: 11/11/04
Sample Type: SOIL
Sample Condition: COOL & INTACT
Sample Received By: BC
Analyzed By: BC/AH

LAB NUMBER	SAMPLE ID	GRO (C_6-C_{10}) (mg/Kg)	DRO (>C_{10}-C_{28}) (mg/Kg)	Cl* (mg/Kg)
ANALYSIS DATE		11/15/04	11/15/04	11/16/04
H9345-1	SSWE 7-10	<10.0	<10.0	272
H9345-2	SSWW 7-10	<10.0	<10.0	256
H9345-3	NSWE 6-15	<10.0	<10.0	304
H9345-4	NSWW 11-33	<10.0	<10.0	736
H9345-5	ESWN 3-20	<10.0	<10.0	64
H9345-6	ESWS 8-15	<10.0	<10.0	288
Quality Control		791	795	1010
True Value QC		800	800	1000
% Recovery		98.9	99.4	101
Relative Percent Difference		3.4	2.9	0.0

METHODS: TPH GRO & DRO: EPA SW-846 8015 M; Cl^-: Std. Methods 4500-ClB
*Analyses performed on 1:4 w:v aqueous extracts.

Chemist

11/16/04
Date

H9345A.XLS

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR
ENVIRONMENTAL PLUS, INC.
ATTN: PAT McCASLAND
P.O. BOX 1558
EUNICE, NM 88231
FAX TO: (505) 394-2601

Receiving Date: 11/15/04
Reporting Date: 11/16/04
Project Owner: DEVON
Project Name: LITTLE KINGS #3
Project Location: NOT GIVEN

Sampling Date: 11/11/04
Sample Type: SOIL
Sample Condition: COOL & INTACT
Sample Received By: BC
Analyzed By: BC

LAB NUMBER	SAMPLE ID	BENZENE (mg/Kg)	TOLUENE (mg/Kg)	ETHYL BENZENE (mg/Kg)	TOTAL XYLENES (mg/Kg)
ANALYSIS DATE		11/15/04	11/15/04	11/15/04	11/15/04
H9345-1	SSWE 7-10	<0.005	<0.005	<0.005	<0.015
H9345-2	SSWW 7-10	<0.005	<0.005	<0.005	<0.015
H9345-3	NSWE 6-15	<0.005	<0.005	<0.005	<0.015
H9345-4	NSWW 11-33	<0.005	<0.005	<0.005	<0.015
H9345-5	ESWN 3-20	<0.005	<0.005	<0.005	<0.015
H9345-6	ESWS 8-15	<0.005	<0.005	<0.005	<0.015
Quality Control		0.103	0.092	0.098	0.311
True Value QC		0.100	0.100	0.100	0.300
% Recovery		103	91.9	97.7	104
Relative Percent Difference		3.1	8.8	2.8	3.6

METHOD: EPA SW-846 8260

Chemist

11/16/04
Date

H9345B.XLS

Cardinal Laboratories Inc.

~~2111 Beechwood, Abilene, TX 79603~~
915-673-7001 Fax 915-673-7020

~~101 East Marland, Hobbs, NM 88240~~
505-393-2326 Fax 505-393-2476

		Bill To
Company Name	Devon	Environmental Plus Inc.
Project Manager		
Address		
City, State, Zip		
Phone#/Fax#		
Project #/Owner		
Project Name	Little Kings #3	
Project Location		
Sampler Name	[signature]	

Analysis Request

LAB I.D.	SAMPLE I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	MATRIX: GROUND WATER	MATRIX: WASTEWATER	MATRIX: SOIL	MATRIX: CUDE OIL	MATRIX: SLUDGE	MATRIX: OTHER:	PRESERV.: ACID/BASE	PRESERV.: ICE/COOL	PRESERV.: OTHER	SAMPLING: DATE	SAMPLING: TIME	BTEX 8021B	TPH 8015Modified	Cl	SAR	EC
H9384-1	SSWE 7-10	G				✓							11/11/04	1030	✓	✓	✓		
-2	SSWW 7-10	G				|							11/11/04	1105	✓	✓	✓		
-3	NSWE 6-15	G				|							11/11/04	210	✓	✓	✓		
-4	NSWW 11-33	G				|							11/12/04	930	✓	✓	✓		
-5	ESWN 3-20	G				|							11/12/04	1100	✓	✓	✓		
-6	ESWS 8-15	G				✓							11/12/04	115	✓	✓	✓		

Sampler Relinquished: [signature]	Time	Received By: [signature]	**Fax Results Pat McCasland 505-394-2601**
Relinquished by:	Date 11/15/04 Time 12:40	Received By: (lab staff) [signature]	Remarks
Delivered by Sampler	Sample Cool & Intact (Yes) No	Checked By:	

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR
ENVIRONMENTAL PLUS, INC.
ATTN: PAT McCASLAND
P.O. BOX 1558
EUNICE, NM 88231
FAX TO: (505) 394-2601

Receiving Date: 11/15/04
Reporting Date: 11/16/04
Project Owner: DEVON ENERGY
Project Name: LITTLE KING 3
Project Location: NOT GIVEN

Analysis Date: 11/16/04
Sampling Date: 11/12/04
Sample Type: SOIL
Sample Condition: COOL & INTACT
Sample Received By: BC
Analyzed By: AH

LAB NUMBER	SAMPLE ID	Cl^- (mg/Kg)
H9347-1	NSWW 7-25	1887
H9347-2	NSWW 8-25	848
H9347-3	NSWW 11-25	13196
H9347-4	NSWW 6-30	3359
H9347-5	NSWW 11-30	608
H9347-6	NSWW 2-33	2319
H9347-7	NSWW 11-33	272
H9347-8	ESWS 2-10	11596
H9347-9	ESWS 4-15	656
Quality Control		1010
True Value QC		1000
% Recovery		101
Relative Percent Difference		0

METHOD: Standard Methods	4500-ClˉB

Note: Analyses performed on 1:4 w:v aqueous extracts.

Amy Hill
Chemist

11/16/04
Date

h9347

Cardinal Laboratories Inc.

2111 Beechwood, Abilene, TX 79603
915-673-7001 Fax 915-673-7020

101 East Marland, Hobbs, NM 88240
505-393-2326 Fax 505-393-2476

Company Name	DEVON Energy
Project Manager	
Address	
City, State, Zip	
Phone#/Fax#	
Project #/Owner	
Project Name	Little King 3
Project Location	
Sampler Name	Eddie J Harper

Bill To

ENVIRONMENTAL PLUS INC.

Analysis Request

LAB I.D.	SAMPLE I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	MATRIX: GROUND WATER	MATRIX: WASTEWATER	MATRIX: SOIL	MATRIX: CRUDE OIL	MATRIX: SLUDGE	MATRIX: OTHER:	PRESERV.: ACID/BASE	PRESERV.: ICE/COOL	PRESERV.: OTHER	SAMPLING: DATE	SAMPLING: TIME	BTEX 8021B	TPH 8015Modified	Cl	SAR	EC							
H9347-1	NSWW 7-25	G				✓							11/12				✓									
-2	NSWW 8-25	G				✓							✓				✓									
-3	NSWW 11-25	G				✓							✓				✓									
-4	NSWW 6-30	G				✓							✓				✓									
-5	NSWW 11-30	C				✓							✓				✓									
-6	NSWW 2-33	G				✓							✓				✓									
-7	NSWW 11-33	G				✓							✓				✓									
-8	ESWS 2-10	G				✓							✓				✓									
-9	ESWS 4-15	G				✓							✓				✓									

Sampler Relinquished: Eddie J Harper

Time

Received By: [signature]

Fax results to Pat McCasland 505-394-2601

Remarks

Relinquished by:

Date 11/15/04

Time 10:50

Received By: (lab staff) [signature]

Delivered by Sampler

Sample Cool & Intact
Yes No

Checked By:

CARDINAL LABORATORIES

PHONE (325) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR
ENVIRONMENTAL PLUS, INC.
ATTN: PAT McCASLAND
P.O. BOX 1558
EUNICE, NM 88231
FAX TO: (505) 394-2601

Receiving Date: 02/23/05
Reporting Date: 02/24/05
Project Owner: DEVON ENERGY
Project Name: LITTLE KINGS #3 PIT
Project Location: NOT GIVEN

Analysis Date: 02/24/05
Sampling Date: 02/22/05
Sample Type: SOIL
Sample Condition: COOL & INTACT
Sample Received By: GP
Analyzed By: AH

LAB NUMBER	SAMPLE ID	Cl⁻ (mg/Kg)
H9581-1	DELK32-22-05BHSBE-5'	5838
H9581-2	DELK32-22-05BHSBE-10'	26392
H9581-3	DELK32-22-05BHSBE-15'	13196
H9581-4	DELK32-22-05BHSBE-20'	7038
H9581-5	DELK32-22-05BHSBE-25'	96
H9581-6	DELK32-22-05BHSBE-30'	48
H9581-7	DELK32-22-05BHSBW-5'	160
H9581-8	DELK32-22-05BHSBW-10'	192
H9581-9	DELK32-22-05BHSBW-15'	208
H9581-10	DELK32-22-05BG	48
Quality Control		900
True Value QC		1000
% Recovery		90.0
Relative Percent Difference		5.0

METHOD: Standard Methods	4500-ClB

Note: Analyses performed on 1:4 w:v aqueous extracts.

Amy Hill
Chemist

2/24/05
Date

Cardinal Laboratories Inc.

101 East Marland, Hobbs, NM 88240
505-393-2326 Fax 505-393-2476

2111 Beechwood, Abilene, TX 79603
915-673-7001 Fax 915-673-7020

Company Name	Environmental Plus, Inc.
EPI Project Manager	Pat McCasland
Billing Address	P.O. BOX 1558
City, State, Zip	Eunice New Mexico 88231
EPI Phone#/Fax#	505-394-3481 / 505-394-2601
Client Company	Devon Energy
Facility Name	Little Kings #3 Pit
Project Reference	Little Kings #3 Pit
EPI Sampler Name	Cody Fisher

Bill To

Devon Energy
PO Box 250
2401 Pecos Ave.
Artesia, NM 88211-0250
Att: Joe Handley

LAB I.D.		SAMPLE I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	MATRIX: GROUND WATER	WASTEWATER	SOIL	CRUDE OIL	SLUDGE	OTHER:	PRESERV.: ACID/BASE	ICE/COOL	OTHER	SAMPLING: DATE	TIME	BTEX 8021B	TPH 8015M	CHLORIDES (Cl)	SULFATES (SO_4^{-})	pH	TCLP	OTHER >>>
49581-1	1	DELK32-22-05BHSBE-5'					X							2/22/05	10:15			X				
-2	2	DELK32-22-05BHSBE-10'					X							2/22/05	10:30			X				
-3	3	DELK32-22-05BHSBE-15'					X							2/22/05	10:45			X				
-4	4	DELK32-22-05BHSBE-20'					X							2/22/05	11:00			X				
-5	5	DELK32-22-05BHSBE-25'					X							2/22/05	11:15			X				
-6	6	DELK32-22-05BHSBE-30'					X							2/22/05	11:30			X				
-7	7	DELK32-22-05BHSBW-5'					X							2/22/05	9:00			X				
-8	8	DELK32-22-05BHSBW-10'					X							2/22/05	9:30			X				
-9	9	DELK32-22-05BHSBW-15'					X							2/22/05	10:00			X				
-10	10	DELK32-22-05BG					X							2/22/05	8:45			X				

ANALYSIS REQUEST

Sampler Relinquished: Cody Fisher	Date 2-22-05 Time 8:00 PM	Received By:	Fax Results To Pat McCasland - EPI @ 505-394-2601
Relinquished By:	Date 02/22/2005 Time 4:00 PM	Received By: (lab staff)	REMARKS: Chain of custody requested. Send original reports to Pat McCasland - EPI.
Delivered by:	Sample Cool & Intact Yes / No	Checked By:	

CARDINAL LABORATORIES

PHONE (325) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR
ENVIRONMENTAL PLUS, INC.
ATTN: PAT McCASLAND
P.O. BOX 1558
EUNICE, NM 88231
FAX TO: (505) 394-2601

Receiving Date: 02/23/05
Reporting Date: 02/24/05
Project Owner: DEVON ENERGY
Project Name: LITTLE KINGS #3 PIT
Project Location: NOT GIVEN

Analysis Date: 02/24/05
Sampling Date: 02/22/05
Sample Type: SOIL
Sample Condition: COOL & INTACT
Sample Received By: GP
Analyzed By: AH

LAB NUMBER	SAMPLE ID	Cl⁻ (mg/Kg)
H9581-1	DELK32-22-05BHSBE-5'	5838
H9581-2	DELK32-22-05BHSBE-10'	26392
H9581-3	DELK32-22-05BHSBE-15'	13196
H9581-4	DELK32-22-05BHSBE-20'	7038
H9581-5	DELK32-22-05BHSBE-25'	96
H9581-6	DELK32-22-05BHSBE-30'	48
H9581-7	DELK32-22-05BHSBW-5'	160
H9581-8	DELK32-22-05BHSBW-10'	192
H9581-9	DELK32-22-05BHSBW-15'	208
H9581-10	DELK32-22-05BG	48
Quality Control		900
True Value QC		1000
% Recovery		90.0
Relative Percent Difference		5.0

METHOD: Standard Methods	4500-ClB

Note: Analyses performed on 1:4 w:v aqueous extracts.

Amy Hill
Chemist

2/24/05
Date

H9581

Cardinal Laboratories Inc.

101 East Marland, Hobbs, NM 88240
505-393-2326 Fax 505-393-2476

2111 Beechwood, Abilene, TX 79603
915-673-7001 Fax 915-673-7020

Company Name	Environmental Plus, Inc.
EPI Project Manager	Pat McCasland
Billing Address	P.O. BOX 1558
City, State, Zip	Eunice New Mexico 88231
EPI Phone#/Fax#	505-394-3481 / 505-394-2601
Client Company	Devon Energy
Facility Name	Little Kings #3 Pit
Project Reference	Little Kings #3 Pit
EPI Sampler Name	Cody Fisher

BILLING INFORMATION

Devon Energy
PO Box 250
2401 Pecos Ave.
Artesia, NM 88211-0250
Att: Joe Handley

ANALYSIS REQUEST

LAB I.D.		SAMPLE I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	MATRIX: GROUND WATER	WASTEWATER	SOIL	CRUDE OIL	SLUDGE	OTHER:	PRESERV.: ACID/BASE	ICE/COOL	OTHER	SAMPLING: DATE	TIME	BTEX 8021B	TPH 8015M	CHLORIDES (Cl)	SULFATES (SO_4^{-2})	pH	TCLP	OTHER >>>
49581-1	1	DELK32-22-05BHSBE-5'					X							2/22/05	10:15			X				
-2	2	DELK32-22-05BHSBE-10'					X							2/22/05	10:30			X				
-3	3	DELK32-22-05BHSBE-15'					X							2/22/05	10:45			X				
-4	4	DELK32-22-05BHSBE-20'					X							2/22/05	11:00			X				
-5	5	DELK32-22-05BHSBE-25'					X							2/22/05	11:15			X				
-6	6	DELK32-22-05BHSBE-30'					X							2/22/05	11:30			X				
-7	7	DELK32-22-05BHSBW-5'					X							2/22/05	9:00			X				
-8	8	DELK32-22-05BHSBW-10'					X							2/22/05	9:30			X				
-9	9	DELK32-22-05BHSBW-15'					X							2/22/05	10:00			X				
-10	10	DELK32-22-05BG					X							2/22/05	8:45			X				

Sampler Relinquished: Date 2-22-05 Time 8:00PM Received By:

Relinquished By: Date 2/22/2005 Time 2:00 PM Received By: (lab staff)

Delivered by: Sample Cool & Intact Yes No Checked By:

Fax Results To Pat McCasland - EPI @ 505-394-2601

REMARKS: Chain of custody requested. Send original reports to Pat McCasland - EPI.

ATTACHMENT IV: AREA WATER INFORMATION

New Mexico Office of the State Engineer
Well Reports and Downloads

Township: 22S Range: 35E Sections:

NAD27 X: Y: Zone: Search Radius:

County: Basin: Number: Suffix:

Owner Name: (First) (Last) Non-Domestic Domestic All

Well / Surface Data Report | Avg Depth to Water Report | Water Column Report | Clear Form | WATERS Menu | Help

AVERAGE DEPTH OF WATER REPORT 12/12/2004

								(Depth Water in Feet)		
Bsn	**Tws**	**Rng**	**Sec**	**Zone**	**X**	**Y**	**Wells**	**Min**	**Max**	**Avg**
CP	22S	35E	14				1	185	185	185

Record Count: 1

http://iwaters.ose.state.nm.us:7001/iWATERS/WellAndSurfaceDispatcher 12/12/2004

ATTACHMENT V: RISC4 INPUT VARIABLES

FATE AND TRANSPORT MODEL INPUT SUMMARY FILE
Model Description: Unsaturated zone model linked with saturated zone model
Title: Devon Little Kings #3
Simulation time (years): 100

		With Barrier	Without Barrier
Vadose Zone Source Parameters	Thickness of contamination (m)	6.1	6.1
	Depth to top of contamination (m).	3	3
	Length of source (m)	49	49
	Width of source (m).	37	37
Unsaturated Zone Properties	Total Porosity in vadose zone (cm3/cm3)	0.3	0.3
	Residual water content (cm3/cm3)	5.00E-02	5.00E-02
	Fraction organic carbon (g oc/g soil).	2.00E-03	2.00E-03
	Soil bulk density (g/cm3).	1.7	1.7
	Infiltration Rate (cm/yr).	5.00E-05	20
	Saturated conductivity (m/d)	5	5
	Van Genuchten's N.	2.7	2.7
	Thickness of vadose zone (m)	10	10
Lens Parameters	Thickness of lens (m).	6.1	6.1
	Total porosity in lens (cm3/cm3)	0.3	0.3
	Residual water content--lens (cm3/cm3)	5.00E-02	5.00E-02
	Saturated conductivity (m/d)	5	5
	Van Genuchten N in lens.	2.7	2.7
Aquifer Properties	Effective porosity (cm3/cm3)	0.3	0.3
	Fraction organic carbon (g oc/g soil).	2.00E-03	2.00E-03
	Hydraulic conductivity (m/d)	5	5
	Soil bulk density (g/cm3).	1.7	1.7
	Hydraulic gradient (m/m)	1.00E-03	1.00E-03
	***Longitudinal dispersivity (m). code calculated		
	***Transverse dispersivity (m). code calculated		
	***Vertical dispersivity (m). code calculated		
Receptor Well Location	Distance downgradient (m).	0.1	0.1
	Distance cross-gradient (m).	0	0
	Depth to top of well screen (m).	0	0
	Depth to bottom of well screen(m).	3	3
	Number of points used to calc. conc.	2	2
CHEMICAL DATA FOR: Sodium Chloride	Diffusion coefficient in air (cm2/s)	0	0
	Diffusion coefficient in water (cm2/s)	1.20E-05	1.20E-05
	Solubility (mg/l)	3.70E+02	3.70E+02
	Vapor pressure (mmHg)	0	0
	KOC (L/kg).	0	0
	Henry's Law coefficient (-).	0	0
	Molecular weight (g/mol).	58	58
	Degradation rate, saturated zone (1/d).	0	0
	Degradation rate, vadose zone (1/d).	0	0
Source Concentrations:	Source conc. for unsaturated zone model (mg/kg).	2.64E+04	2.64E+04

ATTACHMENT VI: SITE INFORMATION & METRICS FORM AND INFORMATIONAL NMOCD FORM C-141

devon	Site Information and Metrics	Incident Date:	NMOCD Notified:

SITE: **Little Kings #3**	Assigned Site Reference #:
Company: Devon Energy	**NATIONAL RESPONSE CENTER - 800.424.8802**
Street Address: PO Box 250	Notified Date/Time:
Mailing Address: 2401 Pecos Avenue	Notified by:
City, State, Zip: Artesia, New Mexico 88211-0250	Person Notified:
Representative: Joe Handley	NRC Report# :
Representative Telephone: 505.748.3371	
Telephone:	
Fluid volume released (bbls):	Recovered (bbls):

>25 bbls: Notify NMOCD verbally within 24 hrs and submit form C-141 within 15 days. (Also applies to unauthorized releases >500 mcf Natural Gas)

5-25 bbls: Submit form C-141 within 15 days (Also applies to unauthorized releases of 50-500 mcf Natural Gas)

Leak, Spill, or Pit (LSP) Name: Little Kings #3
Source of contamination: Drilling reserve pit
Land Owner, i.e., BLM, ST, Fee, Other: State of New Mexico
LSP Dimensions
LSP Area: ft^2
Location of Reference Point (RP)
Location distance and direction from RP
Latitude: 32°23'25.6"N
Longitude: 103°23'29.3"W
Elevation above mean sea level: 3,560 'amsl
Feet from South Section Line
Feet from West Section Line
Location- Unit or ¼¼: NE¼ of the SW¼ Unit Letter: K
Location- Section: 17
Location- Township: T22S
Location- Range: R35E
Surface water body within 1000 ' radius of site: none
Surface water body within 1000 ' radius of site:
Domestic water wells within 1000' radius of site: none
Domestic water wells within 1000' radius of site:
Agricultural water wells within 1000' radius of site: none
Agricultural water wells within 1000' radius of site:
Public water supply wells within 1000' radius of site: none
Public water supply wells within 1000' radius of site:
Depth from land surface to ground water (DG) 185'bgs
Depth of contamination (DC) - >12.6'bgs
Depth to ground water (DG - DC = DtGW) - ?

1. Ground Water	2. Wellhead Protection Area	3. Distance to Surface Water Body
If Depth to GW <50 feet: *20 points*	If <1000' from water source, or;<200' from private domestic water source: *20 points*	<200 horizontal feet: *20 points*
If Depth to GW 50 to 99 feet: *10 points*		200-100 horizontal feet: *10 points*
If Depth to GW >100 feet: *0 points*	If >1000' from water source, or; >200' from private domestic water source: *0 points*	>1000 horizontal feet: *0 points*
Ground water Score = 0	*Wellhead Protection Area Score= 0*	*Surface Water Score= 0*

Site Rank (1+2+3) = 0

Total Site Ranking Score and Acceptable Concentrations

Parameter	>19	10-19	**0-9**
Benzene[1]	10 ppm	10 ppm	**10 ppm**
BTEX[1]	50 ppm	50 ppm	**50 ppm**
TPH	100 ppm	1000 ppm	**5000 ppm**

[1]100 ppm field VOC headspace measurement may be substituted for lab analysis

District I
1625 N. French Dr., Hobbs, NM 88240
District II
1301 W. Grand Avenue, Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy Minerals and Natural Resources

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-141
Revised October 10, 2003

Submit 2 Copies to appropriate District Office in accordance with Rule 116 on back side of form

Release Notification and Corrective Action

OPERATOR

☐ Initial Report ☐ Final Report

Name of Company: **Devon Energy**	Contact: **Joe Handley**
Address: **PO Box 250 2401 Pecos Avenue Artesia, New Mexico 88211-0250**	Telephone No. **505.748.3371**
Facility Name **Little Kings #3**	Facility Type **Drilling reserve pit**
Surface Owner: **State of New Mexico**	Mineral Owner / Lease No.

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County: Lea
K	**17**	**T22S**	**R35E**					

Latitude: **32°23'25.6"N** **Longitude:** **103°23'29.3"W**

NATURE OF RELEASE

Type of Release **Drilling mud/fluids and well cuttings.**	Volume of Release	Volume Recovered
Source of Release **Drilling reserve pit**	Date and Hour of Occurrence	Date and Hour of Discovery
Was Immediate Notice Given? ☐ Yes ☐ No ☐ Not Required	If YES, To Whom? **Larry Johnson**	
By Whom?	Date and Hour	
Was a Watercourse Reached? ☐ Yes ☒ No	If YES, Volume Impacting the Watercourse. **NA**	

If a Watercourse was Impacted, Describe Fully.*
NA

Describe Cause of Problem and Remedial Action Taken.*
Drilling reserve pit

Describe Area Affected and Cleanup Action Taken.*
Excavate and dispose of drill pit contents. Remedial Goals: TPH 8015m = 5000 mg/Kg, Benzene = 10 mg/Kg, and BTEX, i.e., the mass sum of benzene, ethylbenzene, toluene, and xylenes = 50 mg/Kg.

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to NMOCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the NMOCD marked as "Final Report" does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Signature:	**OIL CONSERVATION DIVISION**	
Printed Name: Joe Handley	Approved by District Supervisor:	
E-mail Address: joe.handley@dvn.com	Approval Date:	Expiration Date:
Title: Supervising Manager	Conditions of Approval:	Attached ☐
Date: November 9, 2004 Phone: 505.748.3371		

Attach Additional Sheets If Necessary