

ENVIRONMENTAL PLUS, INC.

STATE APPROVED LAND FARM AND ENVIRONMENTAL SERVICES

5 August 2005

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



13231

Re: Closure Proposal Chesapeake Energy Ruth 20-2 – Reference #160011 UL-D (NW¼ of the NW¼) of Section 20, Township 16 South, Range 36 East 1172 Latitude N 32° 54' 48.033" and Longitude W 103° 22' 57.430"

Dear Mr. Johnson:

#### **Introduction**

Environmental Plus, Inc. (EPI), on behalf of Mr. Bradley Blevins, Chesapeake Energy Corporation (Chesapeake), submits this letter report documenting the work completed at the above referenced release site. The release site is situated on land owned by the State of New Mexico and is located approximately 2.4 miles southwest of Lovington, New Mexico (reference *Figure 1*). Information obtained from the New Mexico Office of the State Engineer's website and a United States Geological Survey (USGS) database indicates there are two water supply wells located within a 1,000-foot radius of the release site (reference Figure 2). In addition, there are more than twenty wells located within a one-mile radius of the release site. Groundwater level data for the well labeled USGS #1 was recorded at 70.5 feet below ground surface (bgs) in February 1991. The average depth to water for all wells with recorded groundwater level data is approximately 71 feet bgs (reference *Table 1*). Based on this information, it is estimated that the depth to groundwater at the site is between 50 and 100 feet bgs. The attached site information and metrics form ranks the site in accordance with the <u>NMOCD</u> Guidelines for Remediation of Leaks, Spills and Releases (August 13, 1993).

The release of 500 gallons of diesel fuel was the result of the fuel line located between the diesel tank and the generator being cut by vandals and the diesel fuel being allowed to flow out onto the caliche pad. Upon being notified of the release, Chesapeake retained EPI to conduct emergency response measures at the site. EPI mobilized to the site and excavated the saturated soil and stockpiled it on plastic until such time that remediation activities could commence. Upon completion of initial excavation activities, three composite samples were collected from the base of the excavation and submitted to an independent laboratory for quantification or total petroleum hydrocarbons (TPH) and benzene, ethylbenzene, toluene and total xylenes (BTEX constituents). Analytical results for these samples indicated TPH concentrations ranging from 3,440 parts per million (ppm) to 8,790 ppm with an average concentration of 5,350 ppm remaining in the excavation (reference *Table 1*). In addition, reported BTEX constituent concentrations ranged from 0.887 ppm to 3.11 ppm with an average concentration of 1.64 ppm (reference *Table 1*).

#### **Field Work**

EPI returned to the site on June 8, 2005 and initiated remediation activities. Excavation of the hydrocarbon impacted soil (approximately 100 cubic yards) continued until field analyses indicated

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remedial concentrations had been achieved. Field analyses were conducted utilizing a MiniRae<sup>©</sup> photoionization detector (PID) equipped with a 9.7 electron volt (eV) lamp. The field analyses indicated organic vapor concentrations ranged from 10.1 parts per million (ppm) to 73.5 ppm, with an average concentration of 33.5 ppm. At that time, soil samples were collected from the excavation and submitted for quantification of total petroleum hydrocarbons (TPH) and benzene, toluene, ethylbenzene and total xylenes (BTEX constituents).

Analytical results, received on July 14, 2005 indicated remedial goals had not been achieved and, as such, additional excavation activities commenced on July 25, 2005 to excavate the areas from which analytical results indicated contaminant levels exceeded NMOCD remedial guidelines. An additional 40 cubic yards of soil were excavated during this phase of the remedial activities. Excavation activities continued until field analyses utilizing a MiniRae<sup>®</sup> PID equipped with a 9.7 eV lamp indicated remedial concentrations had been achieved. The field analyses indicated organic vapor concentrations ranged from 0.5 ppm to 3.0 ppm, with an average concentration of 1.1 ppm. At that time, soil samples were collected from the excavation and submitted for quantification of TPH and BTEX constituents.

#### **Analytical Results**

Eleven soil samples were collected from the excavation on July 11, 2005 and submitted to an independent laboratory for quantification of TPH and BTEX constituents. Analytical results for two of the soil samples (SP-1 and SP-2) reported contaminant concentrations at or below each analyte's respective method detection limit (MDL). Analytical results for two additional samples (SP-4 and SP-8) reported contaminant concentrations below the NMOCD remedial guidelines. The only contaminants detected in these samples were diesel range organics (DRO) at concentrations of 90.4 milligrams per kilogram (mg/Kg) in sample SP-4 and 27.8 mg/Kg in sample SP-8.

Analytical results for the remaining seven soil samples (SP-2, SP-3, SP-5, SP-6, SP-9, SP-10 and SP-11) indicated TPH concentrations ranging from 108 mg/Kg to 3,410 mg/Kg, with an average concentration of 835 mg/Kg (reference *Table 1*). Of these samples, the only contaminants detected in three of the samples (SP-3, SP-5 and SP-11) were DRO, ranging in concentrations from 108 mg/Kg to 213 mg/Kg, with an average concentration of 163 mg/Kg (reference *Table 1*). The remaining four samples (SP-2, SP-6, SP-9 and SP-10) had gasoline range organic (GRO) concentrations ranging from 14.7 mg/Kg to 166 mg/Kg and DRO concentrations ranging from 315 mg/Kg to 3,240 mg/Kg (reference *Table 1*). BTEX constituents were not detected at or above each analyte's respective MDL in any of these seven soil samples.

Based on the fact that contaminant concentrations exceeded the NMOCD remedial goals in seven of the sampling points, additional excavation activities were completed. The additional excavation activities were completed in the areas where contaminant concentrations exceeded the NMOCD remedial goals. When field analyses indicated the successful removal of the impacted soil, five additional soil samples were collected from these areas.

Analytical results for three of these five samples (SP-5, SP-10 and SP-11) reported contaminant concentrations as ND at or above each analyte's respective MDL (reference *Table 1*). Analytical results for the remaining two samples (SP-6 and SP-9) indicated TPH concentrations of 138 mg/Kg and 276 mg/Kg, respectively (reference *Table 1*). The only contaminants detected in sample SP-6 were

DRO, while GRO and DRO were detected in sample SP-9. BTEX constituents were not detected in any sample at or above each analyte's respective MDL.

#### **Discussion**

Based on NMOCD guidelines, the remedial goals for this site are as follows:

Analyte	Remedial Goal
Benzene	10 mg/Kg
BTEX constituents	50 mg/Kg
ТРН	100 mg/Kg

Based on these remedial goals, analytical results indicate four areas with contamination remaining above the remedial goals. TPH concentrations for these areas ranged from 108 mg/Kg to 861 mg/Kg (reference *Figure 4*). Contaminant concentrations in three of these areas, SP-3, SP-6 and SP-9, only slightly exceed these remedial goals. TPH concentrations for these areas are 108 mg/Kg, 138 mg/Kg and 276 mg/Kg, respectively. Analytical results for the sample collected from the fourth area, SP-2, indicate TPH concentrations of 861 mg/Kg (reference *Figure 4*).

The remedial goals for this site are based on the fact that there are two water supply wells, L 00209C and USGS #1, located within a 1,000-foot radius of the release site (reference *Figure 2* and *Table 2*). Well L 00209C is an irrigation well and is owned by <u>The College of The Southwest</u> and well USGS #1 is either an irrigation or stock well. However, groundwater in this area flows southeasterly and these wells area located northeast (L00209C) and northwest (USGS #1) of the release site and, thus are located upgradient and will not be impacted by the release.

Based on this and the fact that the depth to groundwater is between 50 and 100 feet below the extent of contamination and there are no bodies of surface water located within a 200-foot radius of the release site, it is suggested that there is minimal to no risk to human health or the environment. Therefore, the TPH remedial goal should be changed from 100 mg/Kg to 1,000 mg/Kg.

#### **Conclusions and Recommendations**

Based on field and laboratory analyses and the fact that there is minimal threat to human health or the environment as evidenced by the discussion presented above, it is recommended that the excavation be backfilled with caliche obtained from an off site source. Upon completion of the backfilling activities, it is further recommended the site file be closed and a *No Further Action Required* letter be issued to Chesapeake Energy.

Chesapeake

Should you any questions or concerns, please feel free to contact me at (505) 394-3481 or via e-mail at <u>iolness@envplus.net</u> or Mr. Bradley Blevins at (505) 391-1462 ext. 24 or via e-mail at <u>bblevins@chkenergy.com</u>. All official communication should be addressed to:

Mr. Bradley Blevins Chesapeake Energy 5014 Carlsbad Highway Hobbs, New Mexico 88240

Sincerely,

ENVIRONMENTAL PLUS, INC.

Iain Olness, P.G. Hydrogeologist

cc: Bradley Blevins, Chesapeake Energy – Hobbs, NM
 Curtis Blake, Chesapeake Energy – Hobbs, NM
 Jace Marshall, Chesapeake Energy – Oklahoma City, OK
 Cody Morrow, New Mexico State Land Office, Surface Resource Division – Albuquerque, NM

	<b>A</b>	Incident Date:	NMOCD Not	ified:					
		03 June 2005	04 June 2005						
Che	esapeake								
	tion and Metrics								
Site: BRC Federal Well #1 Battery Assigned Site Reference #: 160010									
	esapeake Energy	<b>_</b>							
	5014 Carlsbad Highwa	1V		- 1,44					
	s: 5014 Carlsbad Highw								
	: Hobbs, New Mexico		18,1 1 18881						
	Bradley Blevins								
Representative		-1462 ext. 24							
Telephone:	()								
	eleased (bbls): 500 gallo	ons	Recovered (bbls): 0 ga	llons					
		OCD verbally within 24 h		· · · · · · · · · · · · · · · · · · ·					
		oplies to unauthorized rele							
5-25 bi	ols: Submit form C-141 wit	thin 15 days (Also applies	to unauthorized release	es of 50-500 mcf Natural Gas)					
	Pit (LSP) Name: Ruth								
Source of conta	mination: Fuel line supp	lying diesel to a generator v	was vandalized and all the	diesel fuel was released onto the surface.					
	e., BLM, ST, Fee, Other	: State of New Mexico							
	s: 75 feet by 45 feet								
LSP Area: ≈3,	150 ft <sup>2</sup>								
Location of Ref	ference Point (RP):								
Location distan	ice and direction from R	<b>P</b> :							
Latitude: N 32°	54' 48.033"								
Longitude: W	03° 22' 57.430"			· · · · · · · · · · · · · · · · · · ·					
	e mean sea level: 3,938								
Feet from Sout	h Section Line:								
Feet from West	Section Line:								
Location-Unit	or 1/41/4: NW1/4 of the NV	W <sup>1</sup> /4 Uni	t Letter: D						
Location-Section	on: 20								
Location- Town	nship: T16S								
Location- Rang			_ 1						
			· · · · · · · · · · · · · · · · · · ·						
Surface water	oody within 1000 ' radiu	s of site: none	· · · • · · · · · · · · · · · · · · · ·						
	wells within 1000' radi		#1 as illustrated on Fig	ure 2)					
				rigation well – L 00209C and USGS					
			strated on Figure 2)						
Public water su	pply wells within 1000'								
	d surface to ground wat								
	mination (DC): < 10 fee			· · · · · · · · · · · · · · · · · · ·					
	d water (DG – DC = Dt								
	round Water	2. Wellhead Pr	cotection Area	3. Distance to Surface Water Body					
	<50 feet: 20 points	If <1000' from water se		<200 horizontal feet: 20 points					
	50 to 99 feet: 10 points	private domestic water		200-100 horizontal feet: 10 points					
		If >1000' from water se							
-	>100 feet: 0 points	private domestic water	source: 0 points	>1000 horizontal feet: 0 points					
Ground water S		Wellhead Protection A	rea Score= 20	Surface Water Score= 0					
Site Rank (1+2+									
<u> </u>		te Ranking Score and A	Acceptable Concentration	tions					
Parameter	>19		0-19	0-9					
	10 ppm	10	0 ppm	10 ppm					
Benzene <sup>1</sup>				50 ppm					
Benzene <sup>1</sup> BTEX <sup>1</sup>	50 ppm	5	0 ppm	50 ppm					
BTEX <sup>1</sup> TPH		1,0	00 ppm	50 ppm 5,000 ppm					

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

	5 5	Chesapeake 29 C
State of New Mexico Energy Minerals and Natural Resources	8.18.000 B.	Form C-141 Revised October 10, 2003
Oil Conservation Division 1220 South St. Francis Dr. Santa Fe, NM 87505	N Hareer or	Submit 2 Copies to appropriate District Office in accordance with Rule 116 on back side of form

Release	Notification	and Corrective	Action
Inciense	TYONHCATION	and corrective	ACHOH

						<b>OPERATO</b>	R	🛛 Initial	Report	Final Report	
Name of Co			nergy			Contact: Bradley Blevins					
Address: 50						Telephone No.: (505) 391-1462 ext. 24					
Facility Nar	ne: Ruth 2	0-2				Facility Type:	Tank Battery			,	
and the second second second second	Surface Owner: State of New Mexico - Mineral Owner Leased by Dale Gandy					State of New	Mexico	Lease No	<b>.:</b> V0-47	/19-0000	
LOCATIO					ION	NOF RELE	ASE	30	,025	36866	
Unit Letter D	Section 20	<b>Township</b> 16 S	Range 36 E	Feet from the	North/South Line Feet from the		East/West Li	10	County Lea		
	<b>_</b>	L	Latitu			33" Longitude: W 103° 22' 57.430" E OF RELEASE					
Type of Relea	se: Diesel I	Fuel					lease: 500 gallons	Volume Re	covered:	0 gallons	
Source of Re	ease: Tank						r of Occurrence:	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		iscovery:	
Was Immedi	to Notico (	iwon?				03 June 2005, If YES, To W		04 June 200	)5		
vi as minieur	al <u>e</u> i turce v		Yës 🔲 1	No 🖾 Not Requ	ired	Not Applicable					
By Whom? N	ot Applicab	le				Date and Hou	r: Not Applicable				
Was a Water	course Rea	ched?				If YES, Volur	ne Impacting the			·	
		ĻĻ	Yes 🖾 N	Ňo		Not Applicable					
the diesel allo Describe Are the caliche pa excavated on laboratory and required for cl above the NM clean soil and	wed to flow a Affected i d at the site. June 8, 2005 ilyses. Anal- oser. Additi OCD remer returned to	onto the calic and Cleanup Saturated soi and, based o tical results r onal excavation the excavation	the pad. Sa Action Ta I has been n field ana eccived or on activitie has been h	turated soil was so ken.* Approximat excavated and stoo lyses, it was detern	raped tely 3, kpile nined dicate teted 1 avate	up and placed o 150 square feet o d on plastic on si that remedial guid ed remedial guid by the end of Jun d soil will be trai	n plastic pending a of surface area wa te until a remediat idelines had been elines had not been elines had not been e 2005 and sample asported to an app	a decision as how s impacted by the ion plan is devel achieved and sam achieved and a s will be collector roved lad treatm	v to remed e release, oped. Ad mples wer dditional d dditional e ed to verifi ent facilit	all of which was on ditional soil was e collected for excavation would be fy soil impacted y or blended with	
regulations all public health should their o	operators a or the enviro perations ha ment. In ad	re required to mment. The reverse of the reduced to action the reduced to a reduced	report and acceptance lequately i CD accepta	fue and complete for file certain rele of a C-141 report nvestigate and rem ince of a C-141 rep	ase no by the	otifications and p e NMOCD mark e contamination	erform corrective ed as "Final Repor hat pose a threat t	actions for relea t" does not reliev o ground water,	ses which /e the ope surface wa	may endanger rator of liability ater, human health	
						OIL CONSERVATION DIVISION					
Signature:											
Printed Nam	e: Bradley H	Blevins				Approved by District Supervisor:					
Title: Field T	chnician					Approval Date:		Expiration I	)ate:		
E-mail Addr	ess: bblevin	s@chkenergy	com		!	Conditions of Approval:				d []	
Date:	_	]	Phone: (50	5) 391-1462 ext. 2	4						

\* Attach Additional Sheets If Necessary

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Ruth 20-2 160011 () Chesapeake



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#### TABLE 1

#### Summary of Excavation Soil Field Analyses and Laboratory Analytical Results

Sample ID	Depth (feet)	Sample Date	PID Reading (ppm)	Benzene (mg/Kg)	Toluene (mg/Kg)	Ethylbenzene (mg/Kg)	Total Xylenes (mg/Kg)	Total BTEX (mg/Kg)	TPH (as gasoline) (mg/Kg)	TPH (as diesel) (mg/Kg)	Total TPH (mg/Kg)
							<u></u>				
Ruth 20-2 S. Flowpath	Comp	08-Jun-05	NA	<0.0250	0.0711	0.510	2.53	3.11	1,590	7,200	8,790
Ruth 20-2 W. Half Pooling Area	Comp	08-Jun-05	NA	<0.0250	0.0683	0,134	0.685	0.887	507	3,300	3,810
Ruth 20-2 E. Half Pooling Area	Comp	08-Jun-05	NA	<0.0250	0.0518	0.0877	0.781	0.921	470	2,970	3,440
SP-1	ľ	11-Jul-05	23.5	<0.0250	<0.0250	<0.0250	<0.0500	<0.125	<10.0	<10.0	<10.0
SP-2	1	11-Jul-05	10.1	<0.0250	<0.0250	<0.0250	<0.0500	<0.125	14.7	846	861
SP-3	1	11-Jul-05	10.4	<0.0250	<0.0250	<0.0250	<0.0500	<0.125	<10.0	108	108
SP-4	1	11-Jul-05	<b>24</b> .1	<0.0250	<0.0250	<0.0250	<0.0500	<0.125	<10.0	90.4	90.4
SP-5	1	11-Jul-05	38.9	<0.0250	<0.0250	<0.0250	<0.0500	<0.125	<10.0	169	169
ar-a	2	26-Jul-05	0.7	<0.0250	<0.0250	<0.0250	<0.0500	<0.125	<10.0	<10.0	<10.0
SP-6	1	11-Jul-05	41.4	<0.0250	<0.0250	<0.0250	<0.0500	<0.125	30.9	724	755
3r-0	6	26-Jul-05	0.9	<0.0250	<0.0250	<0.0250	<0.0500	<0.125	<10.0	138	138
SP-7	1	11-Jul-05	25.0	<0.0250	<0.0250	<0.0250	<0.0500	<0.125	<10.0	<10.0	<10.0

#### Chesapeake Energy Ruth 20-2 Release Site (Ref.# 160011)

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Ruth 20-2 160011

Chesapeake

#### TABLE 1

#### Summary of Excavation Soil Field Analyses and Laboratory Analytical Results

Sample ID	Depth (feet)	Sample Date	PID Reading (ppm)	Benzene (mg/Kg)	Toluene (mg/Kg)	Ethylbenzene (mg/Kg)	Total Xylenes (mg/Kg)	Total BTEX (mg/Kg)	TPH (as gasoline) (mg/Kg)	TPH (as diesel) (mg/Kg)	Total TPH (mg/Kg)
SP-8	. 1 .	11-Jul-05	39.6	<0.0250	<0.0250	<0.0250	<0.0500	<0.125	<10.0	27.8	27.8
SP-9	1	11-Jul-05	46.2	<0.0250	<0.0250	<0.0250	<0.0500	<0.125	16.9	315	332
	6	26-Jul-05	3.0	<0.0250	<0.0250	<0.0250	<0.0500	<0.125	12.4	264	276
SP-10	1	11-Jul-05	73.5	<0.0250	<0.0250	<0.0250	<0.0500	<0.125	166	3,240	3,410
31-10	2	26-Jul-05	0.5	<0.0250	<0.0250	<0.0250	<0.0500	<0.125	<10.0	<10.0	<10.0
SP-11	1.	11-Jul-05	31.6	<0.0250	<0.0250	<0.0250	<0.0500	<0.125	<10.0	213	213
51-11	2	26-Jul-05	0.6	<0.0250	<0.0250	<0.0250	<0.0500	<0.125	<10.0	<10.0	<10.0
NMOCD Reme	dial Thres	sholds	100	10				50			100

Chesapeake Energy Ruth 20-2 Release Site (Ref.# 160011)

<sup>1</sup>Bolded values are in excess of NMOCD Remediation Thresholds

<sup>2</sup> NA=Not Applicable

<sup>3</sup>Chloride and Sulfate residuals may not be capable of impacting local groundwater above the NMWQCC standards of 250 mg/L and 650 mg/L respectively.

#### TABLE 2

#### Well Data

#### Chesapeake Energy Ruth 20-2 (Ref. #160011).

Well Number	Diversion <sup>A</sup>	Øwhér	Use	Twsp	Rng	Sec q q q	Lutitude	Loughude	Date Measured	Well Depth	Depth to Water (ft bgs)
U05856	With the second second	Prome Enterprise	STR	-16 S	- 36 2 -	[20] 2	N/32*54-0.66	W 103 22 35 46"	05-Mar-66	105	T.S. (Cogs)
107165	(	G: Cáltie Company	STK	16 8	36 2	20 2 3 1	NU329-541-26-839	W 1030 200 35 47"			and an and and the second
L 07165 EXPL	0.79	G. Coffle Company	RAD	168	- 36 E	20	N 32° 54' 0.63"	W 103° 23' 6.6"	and a star of the star of the star	And the second second	
LOTAIZ EXPL	A. 10	C.Cattle Commun	EKP	16'S	36.1	20	N 32" 54 0.63"	W 103" 23" 0.6"	the state of the s		Tone Service Mar
E 07443 EXPL		G Cattle Company	BEP	* 16 B	36 E	20, 4	N 32º 34' 0.661	W 103* 22*33.467	A Wanter and	ALC: STATE	1998 Card 94
L08898	Martin (Orange )	Roger C. Hanks	PRO	16 ST	36 B	20 114	N 32º 54" 39 88"	W107 23 6 64"	31 Jul-82	147	70
L 10572	3. 3	A A Yates Petroleum	OIL	16-3	36 B	20 221	N 329 54 39.94	W 1039 22 10 911	27-Jun-96	150	1. A 70 1 4
Lions -	254 10 7-72	Yutes Peimleum	PRO	16 3	36 E.	20 2 2 1	N 32" 54" 39.940-	W 1038 22 19.918	27-Jun 96	150	70
🐨 USOS #1	y.T.H.M. M. Milatipa M.M.M.M.M.M.		date or uport and	16 S	66 E	20-11-1-	i, man aligheir gub. mag uliat 1. Mai 2. Mar Chir annar	Water and the set	27-1-6-91	Standing and and state	70:47
USOS #2			A STATE OF STREET	16 5	36 E	20 423		ALC: A STORE	31-Mar-81		7534
1.0318	رد بالاه این	T M Blackmon	DOM *	16 8	36 E	16 231	N-32º 551-19:33"	W 103 21/33.28	1. 1. A.H. 1. 4. C. 1. 4.	1	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1
L 03318 APPRO EXP		T. M. Blackmon		16 S	36 E	16 231	N 32° 55' 19.33"	W 103° 21' 33.28"			<u> </u>
L 04487 APPRO	3	Kenneth Cox	DOM	16 S	36 E	16 222	N 32º 55' 32.49"	W 103° 21' 17.73"	01-Jun-60	110	82
L DOME EXP	10 m	T.M. Bieckman	STK -	16 B: 1	1. 36 B	16 2	N 32 31 19 33"	W 101921-3328	la sa sa rina	10 - 92 C 22 C 23	\$ \$ 1 C + 2 - 3
1/00409	些" <u>"</u> 例0一些"影	Chesepeake Operating	PRO	16 5	36 B	16 234	N 32º 55' 19:33"	W 109 21 33 28	No. A DO TO	193	internation the second
USOS NO	n Edward Se. of	the start of selection and starting water and the selection of the selecti	المتحمد والمرجو	- 16 S	- 36 E	16.231	Fire and the part of the	the first of the second second	27-Reb-91	p. Maria to 1	161.33
C 00209 B	203.9	College of the SW Foundation	TIRR .	16.8	36 B	17:323	N 32" 55" 6.07"	W 103° 22' 51.08"	alan and a state of the second	127	မွန္တားမွန္ကာ ဘူး
L00209 C	287.7	College of the SW Foundation	URR	16 S	36 2	17:43	N 32* 54: 53*	W 103º 22751.08"		128	1. 7 7 7 7
102056	3	Noble Drilling Company	RRO	16 \$	36 8	17. 11	N 32º 551-32.22"	W 103* 23' 6.68"	.06-Mar-53	130	60
LO2056 APPRO	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	Noble Drilling Company,	Self to a n		1 36 E	17 14	N 32° 55; 32.22"	W 103 23 6,68"	06-Mar-53	130	<b>5</b> 0
L 04437	3	Roy Boland	DOM	16 S	36 E	17 3.	N 32° 54' 52.96"	W 103º 23' 6.65"	30-May-60	120	95
L 04437 APPRO		Roy Boland		16 S	36 E	17 3	N 32º 54' 52.96"	W 103º 23' 6.65"	30-May-60	120	95
L 05530 EXP	T. X. Olever a	Bary Lee Hobbs	DOM.	16 S	36 B	17 222	N 32° 35' 32-31	W 10P 22 19.98	1 apr 1 10 10 10	Hand and and the	La La e
£ 97649		Hulda R: Heide	PRO	16.5	36 E	17	N 22º 94 52.96	W 103* 23' 5.85"	05-Feb-77	140	terchant and the
LOTSI	<b>3</b>	Berry Lee Hobbs	MÓQ	168	36 B	17-211	N 32* 55' 32.27"	W 103° 22' 35.55"	18-Jan-78	22	A-A-A-BA
09689 EXP.	And De moridade	Calvin of Io Am Holloway	DOM	16'S AST	36 2	17 212	N 32* 35: 32.27%	W103* 22/35:55	Las Marts Street Fre	markes niver the	taga na bar ta
-1.10010 BOP	× 1° 10 27 5	Inerco Oll Company	RRO	16.5	36 2	17-13	N 329 55 19 13"	W 103° 23' 6.67'	and and the second	and the second sec	15.5. 19. 1
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LOIOST AFFR.C.	Brand and	C.C. Chambers	DOM	10 <b>16 S</b>	1. 36 49	18 22	N 32 15 32.19	W 1039 23 22 19"	02-Apr-51	G. B.C.	State and soft and
	i hearing and a	Ere - Rimer H. Stenruld	DOM	<b>16</b> 5	36 E	18 4 29	N 329 35 6 002	W 103* 28 22 17* 2	21-Jan-62	136 - 1	
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£05132	in the Barry and	Greage Wayne Summaid	DOM	1 <b>6 8</b>	36 E	42.	N32°.55 6.02"	W103°23'22.178	30 May 67	<b>:95</b>	70
D 00934	5.4. B. S. S	E.H. Sumuld	DOM	-16 S		18 421	N/32*35'502"	W 103 23 22.17	12-May-72	118	2
1,06963	2	Ricky Jones	DONC	A5 B	36 B	18.444	N 972-541-52-932	W 103°23'22'16"	24 Aug 72	120 / -	12 AN 88 - 2
L 06967	<u>ez (0 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - </u>	Oscal V. Neidick	ØOM	16 S	36 B	18/443	N 32 54 52.93	W10P/23/22.16	For Real Anna Pre-		the emount of
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1.09729	n et <b>l</b>	R. H. Sumuld	EXO5	2 16 ST !	96 B	18 4 2	N 32° 53' 6.000	W 103° 23' 22.17"		N. A. 198. 7	Francisco I. A.
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E 10712	and Quarter	Chestpecke Operating	PRO	168		181.42 Car 10	N 32° 55 6.02"	W 103°23'22.17	01-Sep-97	165	60
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LOID4 APPRO	31	George Spires	DOM	16 8	- 36 E	19 13	N 32 54 26.72	W10P247#1	15-Dec-30	7.75	1.1945
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1 02783 APPRO	Star Bar Barna and	Vemon N. Key	an and the second	16 8	36 B.	19.1.4.2	N 32º 54' 26.74"	W 10P 23: 53:17	19-Feb-55	13. J 891. CT	50 ····

() Chesapeake .

Chesapeake

#### TABLE 2

#### Well Data

#### Chesapeake Energy Ruth 20-2 (Ref. #160011)

Well Number	Diversion <sup>A</sup>	version <sup>A</sup> Owner		ton <sup>A</sup> Owner		rsion <sup>A</sup> Owner		Twsp	Rig	Sec q q q	Latitude	Löngttude	Date Measured	Well Depth (ft bgs)	Depth to Water (ft bgs)
D04801	S	Cieorge Spices	DOM	16 \$7.1	36 F	12 12	N 329 541 39 81	W 103* 23'.53.18"		i. Kara	le A <sup>Sana</sup> tina }				
C. C. 2E04895	Tour FS and a f	Create Spires	DOM	16 S	36 E.	19 12 11	N 32° 54' 39.81	W 103° 23' 53 18"	05 May 62	1 <b>100</b> []	Brillian				
LOSIO9 IXP	and 0 had	Joe Grado	DOM .	16 5	36E	196 1 4 2	N 32º 54:26.74"	W 103 23 53 17%	F. S. Barres	Pars 2 1	S 84. 1				
1.06689 KXP.	1. 10 Se &	Walter Hannan	DOM	16 S.	36 E	19 114	N 32° 54' 39.78%	W 103P 2457 4		1	Parts - BARGAR				
L 06937	- 3 30	I	DOM	216.8	5.36 D); (	19. 2.2.4	N 329 54 39.85%	W 1092/231 22 15	25-Apr 72	110	- <b>69</b>				
L 07444 EXPL-1	0	G. Cattle Company	BXP	<b>16 S</b>	96 E	19 23 I, j	N 329 54 26 76	W 1039 23 37 641	13-Oct-75	130	i na internet				
- 107444 EXPI/2	ann unn geralte an	G. Cattle Company	ESP	16 8	16BC	19 231	NG7 54 26 76"	W 103 23 37.64	13-Oct-75	140.1	Linne with Mirroray I				
E 07444 EXPL-3	127 June 14	G. Cattle Company	EXC .	-216 824	36 8	19 231	N 32º 54' 26.76"	W 103P 23: 37.64	14 Oct-75	7. 178%。而	120				
L 08744	TOBET	Roger Price	DOM	14 416 ST.	36 B	19: 33.	N 32? 54 0.59	W 1039 24'7 42"	A set manufact	108	79				
E10209	<b>3</b>	SKenny Inckson	DOM	16 8 · · ·	36 E -	19 1 2 2	N 32" 54 39.81	W-105° 23' 53.48"	03-Aug-91	128	<b>94</b>				
D00150 ENGLD -8	0	Chestpeake Operating	PRO	A 16 S A	26 E	19 213	N 32º 54: 39.83	W 103" 23: 37.66"	( in my the sty	<b>80</b>	R. O. Ser Speed				
1:00139	A SOM	Nertourg Producing Company	[:::PRO	C. 16 S.	36 F.	19:21年 二	N 32° 34' 39,83"	W 103º 23' 37.66"	Lt.	125	See Wheel is				
USOS #7	y a sec of the second	and the second	L. W. Alsonation and According Strategy and	16 9 C I	12 36 B	19 111	And the second second second	States States States and	31-Mar-81	能多些影響的	59,95				
USOS#8		Contraction of the second se		168	1. 36 B 1	19 211	to superior of the second second	and the second	16.Feb-61	L'ESSER.	59.9				
USOS #	ing a state and and a state of the state of	The second s	and the second sec	16 9	196 B	19 21 1	har a groe of a series of a series of the se	and the second	63-Mar-76	han the second s	54.9				
USOS#10		and the state of the		168	36 2	19 214	No. St. of Sugar Street	C. Stork W	15-Peb-71	家会交流	TE (64.05)				
USOS#IL		the second s		168	36 E	19 413	New Street Street	和"····································	30-Sep-81	1.18 2	66.54				
L 03965	3	Robert Ralph Sims	DOM	16 S	36 E	21 244	N 32º 54' 26.96"	W 103° 21' 17.68"	18-Aug-58	95	60				
L 03966 APPRO		5		16 S	36 E	21 224	N 32° 54' 40.06"	W 103º 21' 17.68"	18-Aug-58	95	60				
L 05269	3	Raph E. Collins	DOM	16 S	36 E	21 224	N 32º 54' 40.06"	W 103º 21' 17.68"	19-Oct-63	110	90				
USGS #12				16 S		21 232	3		01-Fcb-96		66.58				
1.01508 APPRO	i na san	Lawton Ol Group	PRO	16 S	1.36B	30 32	N 32" 53.47.54"	W 103 23 22.07	24-Oct-52	1457	1. and 80 the 1.				
L 01932	And States and States	Coorge Spines	DOM	16.9	SAGE L	30.12	N 327 53 47 53	W 103 23 33.08	12-ful-62	104	90				
L'06334	0	Marcum Drilling Company	PRO	16 S	36 E	30 311	N 32º 53' 21.38"	W 103º 24' 7.28"	02-Jun-68	135	75				
L 06334 (E) 1	Q	Humble Oil & Refining Co.	PRO	16 S	36 E	30 311	N 32º 53' 21.38"	W 103º 24' 7.28"							
USOS #13	1 the seal and seal of	Carl State of the Second States		16 8.4	36 E	30 124	World and the second states of	to the second with the	10 Mar-76	1 · · · · · · · · · · · · · · · · · · ·	W 75.23				

\*= Data obtained from the New Mexico Office of the State Engineer Website (http://waters.ose.state.nm.us.7001/iWATERS/wr\_RegisServlett)

Well locations shown on Figure 2

A = in acre feet per annum

IND = Industrial

IRR = Irrigation

DOM = Domestic

EXP = Exploration

quarters are 1=NW, 2=NE, 3=SW, 4=SE; quarters are biggest to smallest



Photograph #1: Release area, looking easterly.



Photograph #2: Release area, looking easterly.



Photograph #3: Diesel tank and generator, looking northeasterly. Note cut fuel line between diesel tank and generator.



Photograph #4: Saturated soil stockpiled on plastic and fenced.



Photograph #5: Final excavation, look westerly.



Photograph #6: Final excavation, looking northeasterly.

## LETTER OF TRANSMITTAL



Date:	11 August 2005
To:	
Company Name:	NMOCD
Address:	1625 North French
City / State / Zip:	Hobbs, NM 88240
From:	lain Olness
CC:	Brad Blevins, Chesapeake-Hobbs, NM
	Curtis Blake, Chesapeake-Hobbs, NM
	Jace Marshall, Chesapeake-Tulsa, OK
Project #:	160012
Project Name:	Ruth 20-2
Subject:	Closure Proposal

# of originals # c	of copies	Description
1		Closure Proposal

Dear Mr. Johnson:

Enclosed is the *Closure Proposal* for the above-referenced site amended to include the changes the NMOCD required. Upon your approval, the proposal will be implemented and final *Closure Documentation* will be submitted upon the successful removal of the remaining impacted soil.

Should you have any questions or concerns, please feel free to contact me at (505) 394-3481 or via email at iolness@envplus.net.

Signed: 200

ived

P. O. Box 1558 Eunice, NM 88240 (505) 394-3481 Fax: (505) 394-2601

Y:\Clients\Chesapeake Energy Corp (160)\160011 (Ruth 20-2)\CORRESPONDENCE\LJ 081105 LOT.doc



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SESSER'S

11 August 2005

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

Re: Closure Proposal Chesapeake Energy Ruth 20-2 – Reference #160011 UL-D (NW¼ of the NW¼) of Section 20, Township 16 South, Range 36 East Latitude N 32° 54' 48.033" and Longitude W 103° 22' 57.430"

Dear Mr. Johnson:

#### Introduction

Environmental Plus, Inc. (EPI), on behalf of Mr. Bradley Blevins, Chesapeake Energy Corporation (Chesapeake), submits this letter report documenting the work completed at the above-referenced release site. The release site is situated on land owned by the State of New Mexico and is located approximately 2.4 miles southwest of Lovington, New Mexico (reference *Figure 1*). Information obtained from the New Mexico Office of the State Engineer's website and a United States Geological Survey (USGS) database indicates there are two water supply wells located within a 1,000-foot radius of the release site (reference Figure 2). In addition, there are more than twenty wells located within a one-mile radius of the release site. Groundwater level data for the well labeled USGS #1 was recorded at 70.5 feet below ground surface (bgs) in February 1991. The average depth to water for all wells with recorded groundwater level data is approximately 71 feet bgs (reference *Table 1*). Based on this information, it is estimated that the depth to groundwater at the site is between 50 and 100 feet bgs. The attached site information and metrics form ranks the site in accordance with the <u>NMOCD</u> Guidelines for Remediation of Leaks, Spills and Releases (August 13, 1993).

The release of 500 gallons of diesel fuel was the result of the fuel line located between the diesel tank and the generator being cut by vandals and the diesel fuel being allowed to flow out onto the caliche pad. Upon being notified of the release, Chesapeake retained EPI to conduct emergency response measures at the site. EPI mobilized to the site and excavated the saturated soil and stockpiled it on plastic until such time that remediation activities could commence. Upon completion of initial excavation activities, three composite samples were collected from the base of the excavation and submitted to an independent laboratory for quantification or total petroleum hydrocarbons (TPH) and benzene, ethylbenzene, toluene and total xylenes (BTEX constituents). Analytical results for these samples indicated TPH concentrations ranging from 3,440 parts per million (ppm) to 8,790 ppm with an average concentration of 5,350 ppm remaining in the excavation (reference *Table 1*). In addition, reported BTEX constituent concentrations ranged from 0.887 ppm to 3.11 ppm with an average concentration of 1.64 ppm (reference *Table 1*).

#### Field Work

EPI returned to the site on June 8, 2005 and initiated remediation activities. Excavation of the hydrocarbon impacted soil (approximately 100 cubic yards) continued until field analyses indicated

remedial concentrations had been achieved. Field analyses were conducted utilizing a MiniRae<sup>®®</sup> photoionization detector (PID) equipped with a 9.7 electron volt (eV) lamp. The field analyses indicated organic vapor concentrations ranged from 10.1 parts per million (ppm) to 73.5 ppm, with an average concentration of 33.5 ppm. At that time, soil samples were collected from the excavation and submitted for quantification of total petroleum hydrocarbons (TPH) and benzene, toluene, ethylbenzene and total xylenes (BTEX constituents).

Analytical results, received on July 14, 2005 indicated remedial goals had not been achieved and, as such, additional excavation activities commenced on July 25, 2005 to excavate the areas from which analytical results indicated contaminant levels exceeded NMOCD remedial guidelines. An additional 40 cubic yards of soil were excavated during this phase of the remedial activities. Excavation activities continued until field analyses utilizing a MiniRae<sup>®</sup> PID equipped with a 9.7 eV lamp indicated remedial concentrations had been achieved. The field analyses indicated organic vapor concentrations ranged from 0.5 ppm to 3.0 ppm, with an average concentration of 1.1 ppm. At that time, soil samples were collected from the excavation and submitted for quantification of TPH and BTEX constituents.

#### **Analytical Results**

Eleven soil samples were collected from the excavation on July 11, 2005 and submitted to an independent laboratory for quantification of TPH and BTEX constituents. Analytical results for two of the soil samples (SP-1 and SP-2) reported contaminant concentrations at or below each analyte's respective method detection limit (MDL). Analytical results for two additional samples (SP-4 and SP-8) reported contaminant concentrations below the NMOCD remedial guidelines. The only contaminants detected in these samples were diesel range organics (DRO) at concentrations of 90.4 milligrams per kilogram (mg/Kg) in sample SP-4 and 27.8 mg/Kg in sample SP-8.

Analytical results for the remaining seven soil samples (SP-2, SP-3, SP-5, SP-6, SP-9, SP-10 and SP-11) indicated TPH concentrations ranging from 108 mg/Kg to 3,410 mg/Kg, with an average concentration of 835 mg/Kg (reference *Table 1*). Of these samples, the only contaminants detected in three of the samples (SP-3, SP-5 and SP-11) were DRO, ranging in concentrations from 108 mg/Kg to 213 mg/Kg, with an average concentration of 163 mg/Kg (reference *Table 1*). The remaining four samples (SP-2, SP-6, SP-9 and SP-10) had gasoline range organic (GRO) concentrations ranging from 14.7 mg/Kg to 166 mg/Kg and DRO concentrations ranging from 315 mg/Kg to 3,240 mg/Kg (reference *Table 1*). BTEX constituents were not detected at or above each analyte's respective MDL in any of these seven soil samples.

Based on the fact that contaminant concentrations exceeded the NMOCD remedial goals in seven of the sampling points, additional excavation activities were completed. The additional excavation activities were completed in the areas where contaminant concentrations exceeded the NMOCD remedial goals. When field analyses indicated the successful removal of the impacted soil, five additional soil samples were collected from these areas.

Analytical results for three of these five samples (SP-5, SP-10 and SP-11) reported contaminant concentrations as ND at or above each analyte's respective MDL (reference *Table 1*). Analytical results for the remaining two samples (SP-6 and SP-9) indicated TPH concentrations of 138 mg/Kg and 276 mg/Kg, respectively (reference *Table 1*). The only contaminants detected in sample SP-6 were

DRO, while GRO and DRO were detected in sample SP-9. BTEX constituents were not detected in any sample at or above each analyte's respective MDL.

#### **Discussion**

Based on NMOCD guidelines, the remedial goals for this site are as follows:

Analyte	Remedial Goal
Benzene	10 mg/Kg
BTEX constituents	50 mg/Kg
ТРН	100 mg/Kg

Based on these remedial goals, analytical results indicate four areas with contamination remaining above the remedial goals. TPH concentrations for these areas ranged from 108 mg/Kg to 861 mg/Kg (reference *Figure 4*). Contaminant concentrations in three of these areas, SP-3, SP-6 and SP-9, only slightly exceed these remedial goals. TPH concentrations for these areas are 108 mg/Kg, 138 mg/Kg and 276 mg/Kg, respectively. Analytical results for the sample collected from the fourth area, SP-2, indicate TPH concentrations of 861 mg/Kg (reference *Figure 4*).

The remedial goals for this site are based on the fact that there are two water supply wells, L 00209C and USGS #1, located within a 1,000-foot radius of the release site (reference *Figure 2* and *Table 2*). Well L 00209C is an irrigation well and is owned by <u>The College of The Southwest</u> and well USGS #1 is either an irrigation or stock well. However, groundwater in this area flows southeasterly and these wells area located northeast (L00209C) and northwest (USGS #1) of the release site and, thus are located upgradient and will not be impacted by the release.

#### **Conclusions and Recommendations**

Based on field and laboratory analyses, it is recommended that the northern portion of the excavation be backfilled with caliche obtained from an off site source. The southern portion of the excavation located near the pit will remain open until such time that the pit is closed according to the State of New Mexico Rules. At the time the pit is closed, soil impacted above the NMOCD remedial guidelines will be excavated and transported to an off site treatment/disposal facility. Soil samples will be collected from the area where additional excavation activities will occur and submitted to verify the removal of the impacted soil. Upon receipt of analytical results confirming the removal of the impacted soil, the final excavation will be backfilled with caliche obtained from an off site source. Upon completion of the additional excavation and subsequent backfilling activities, it is recommended the site file be closed and a *No Further Action Required* letter be issued to Chesapeake Energy. A letter documenting the successful removal of the additional impacted soil will be submitted prior to final backfilling activities at the site.

Ruth 20-2 16001



Should you any questions or concerns, please feel free to contact me at (505) 394-3481 or via e-mail at <u>iolness@envplus.net</u> or Mr. Bradley Blevins at (505) 391-1462 ext. 24 or via e-mail at <u>bblevins@chkenergy.com</u>. All official communication should be addressed to:

Mr. Bradley Blevins Chesapeake Energy 5014 Carlsbad Highway Hobbs, New Mexico 88240

Sincerely,

ENVIRONMENTAL PLUS, INC.

Vones

Iain Olness, P.G. Hydrogeologist

cc: Bradley Blevins, Chesapeake Energy – Hobbs, NM
 Curtis Blake, Chesapeake Energy – Hobbs, NM
 Jace Marshall, Chesapeake Energy – Oklahoma City, OK
 Cody Morrow, New Mexico State Land Office, Surface Resource Division – Albuquerque, NM

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		Incident Date:	NMOCD No	tified
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Ch	esapeake	05 June 2005		
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	tion and Metrics	l	1. 1.0% D. 6	1/2010
	eral Well #1 Battery	A	ssigned Site Reference #:	160010
	nesapeake Energy			
	: 5014 Carlsbad Highwa			
	ss: 5014 Carlsbad Highv			
	Hobbs, New Mexico	88240		
	: Bradley Blevins			
Representative	<b>Telephone:</b> (505) 391	-1462 ext. 24		
Telephone:				
Fluid volume re	eleased (bbls): 500 gallo		Recovered (bbls): 0 g	
			n 24 hrs and submit form C-1 and releases >500 mcf Natural	
			applies to unauthorized releas	ses of 50-500 mcf Natural Gas)
	Pit (LSP) Name: Ruth			
				e diesel fuel was released onto the surface.
	.e., BLM, ST, Fee, Other	: State of New M	exico	
	ns: 75 feet by 45 feet		<u> </u>	
LSP Area: ≈3,				
	ference Point (RP):			
	nce and direction from R	<u>P:</u>		
Latitude: N 32°				<u> </u>
Longitude: W	103° 22' 57.430"			1
<b>Elevation abov</b>	e mean sea level: 3,938			the first site
Feet from Sout	h Section Line:			1 MOO
Feet from West	t Section Line:			
	or 1/41/4: NW1/4 of the N	W1⁄4	Unit Letter: D	
Location-Secti	ion: 20			
Location- Tow	nship: T16S			
Location- Rang	ge: R36E			
Surface water '	body within 1000 ' radiu	s of site none	n	
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igneuturur w	ater wend within 1000 I		as illustrated on Figure 2)	ingation well – E 00207C and 0505
Public water si	upply wells within 1000'			······································
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If Depth to GW If Depth to GW Ground water S	<50 feet: 20 points 50 to 99 feet: 10 points >100 feet: 0 points core = 10	private domestic If >1000' from v private domestic	water source: 20 points vater source, or; >200' from	200-100 horizontal feet: 10 points
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If Depth to GW If Depth to GW Ground water S Site Rank (1+2- Parameter	<50 feet: 20 points 50 to 99 feet: 10 points >100 feet: 0 points <i>Core</i> = 10 +3) = 10 <b>Total Si</b> >19	private domestic If >1000' from v private domestic Wellhead Protec	water source: 20 points vater source, or; >200' from water source: 0 points tion Area Score= 20 and Acceptable Concentra 10-19 10 ppm	200-100 horizontal feet: 10 points >1000 horizontal feet: 0 points Surface Water Score= 0 ations 0-9 10 ppm
If Depth to GW If Depth to GW Ground water S Site Rank (1+2- Parameter Benzene <sup>1</sup>	<50 feet: 20 points 50 to 99 feet: 10 points >100 feet: 0 points core = 10 +3) = 10 <b>Total Si</b> >19 10 ppm	private domestic If >1000' from v private domestic Wellhead Protec	water source: 20 points vater source, or; >200' from water source: 0 points tion Area Score= 20 and Acceptable Concentre 10-19	200-100 horizontal feet: 10 points >1000 horizontal feet: 0 points Surface Water Score= 0 ations 0-9

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		Relea	ise Notificat				o <b>n</b>				
					OPERATO	f .	🛛 Initial Re	port Final Repo			
ame of Company: Chesa		nergy			Contact: Brad	ey Blevins					
Address: 5014 Carlsbad H Facility Name: Ruth 20-2	ighway	······			Lelephone No. Facility Type:	: (505) 391-1462 Tank Battery	2 ext. 24				
	Owner: State of New Mexico - Mineral Owner: State of New Mexico Lease No.: V0-471										
<u></u>			LOCAT	ION	OF RELE	ASE					
	wuship	Range	Feet from the		th/South Line	Feet from the	East/West Line	County			
D 20	16 <u>S</u>	36 E						Lea			
ype of Release: Diesel Fuel ource of Release: Tank					Date and Hou 03 June 2005,			Volume Recovered: 0 gallons Date and Hour of Discovery: 04 June 2005			
Was Immediate Notice Give		Ves []	No 🛛 Not Requ	ired	If YES, To Whom? Not Applicable						
By Whom? Not Applicable						r: Not Applicable					
				Date and not	a not applicable						
		Yes 🖂 I	No			ne Impacting the					
Vas a Watercourse Reache					If YES, Volu	ne Impacting the					
Was a Watercourse Reacher if a Watercourse was Impac Describe Cause of Problem he diesel allowed to flow ont	ted, Desc and Rem	ribe Fully edial Acti	•.* Not Applicable ••• Taken.* The sit		If YES, Volu Not Applicabl	ne Impacting the e the fuel line from t	Watercourse: the diesel tank to th				
Was a Watercourse Reacher f a Watercourse was Impac Describe Cause of Problem a	cted, Desc and Remo o the calic Cleanup urated soit d, based o al results r l excavati guidélines	ribe Fully edial Acti- he pad. Sa Action Tr l has been n field ana eccived of on activiti- thas been	y.* Not Applicable on Taken.* The sit animated soil was so iken.* Approximat excavated and stoo ilyses, it was detem b June 17, 2005, in es should be compl	raped tely 3, kpile nined dicate eted 1	If YES, Volu Not Applicabl vandalized and up and placed o 150 square feet 1 on plastic on si that remedial guid or remedial guid y the end of Jur	the fuel line from the fuel line from the fuel line from the fuel line from the fuel for the fuel line from the fuel fuel from the fuel fuel for the fuel fuel fuel fuel fuel fuel fuel fue	Watercourse: the diesel tank to the decision as how to impacted by the re- ion plan is develop achieved and samp n achieved and add is will be collected	e remediate the site. elease, all of which was on ed. Additional soil was les were collected for tional excavation would b to verify soil impacted			
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#### TABLE 1

#### Summary of Excavation Soil Field Analyses and Laboratory Analytical Results

#### Chesapeake Energy Ruth 20-2 Release Site (Ref.# 160011)

Sample ID	Depth (feet)	Sample Date	PID Reading (ppm)	Benzene (mg/Kg)	Toluene (mg/Kg)	Ethylbenzene (mg/Kg)	Total Xylenes (mg/Kg)	Total BTEX (mg/Kg)	TPH (as gasoline) (mg/Kg)	TPH (as diesel) (mg/Kg)	Total TPH (mg/Kg)
Ruth 20-2 S. Flowpath	Comp	08-Jun-05	NA	<0.0250	0.0711	0.510	2.53	3.11	1,590	7,200	8,790
Ruth 20-2 W. Half Pooling Area	Comp	08-Jun-05	NA	<0.0250	0.0683	0.134	0.685	0.887	507	3,300	3,810
Ruth 20-2 E. Half Pooling Area	Comp	08-Jun-05	NA	<0.0250	0.0518	0.0877	0.781	0.921	470	2,970	3,440
SP-1	1	11-Jul-05	23.5	<0.0250	<0.0250	<0.0250	<0.0500	<0.125	<10.0	<10.0	<10.0
SP-2	1	11-Jul-05	10.1	<0.0250	<0.0250	<0.0250	<0.0500	<0.125	14.7	846	861
SP-3	1	11-Jul-05	10.4	<0.0250	<0.0250	<0.0250	<0.0500	<0.125	<10.0	108	108
SP-4	1	11-Jul-05	<b>24</b> .1	<0.0250	<0.0250	<0.0250	<0.0500	<0.125	<10.0	90.4	90.4
SP-5	1	11-Jul-05	38.9	<0.0250	<0.0250	<0.0250	<0.0500	<0.125	<10.0	169	169
51-5	2	26-Jul-05	0.7	<0.0250	<0.0250	<0.0250	<0.0500	<0.125	<10.0	<10.0	<10.0
SP-6	1	11-Jul-05	41.4	<0.0250	<0.0250	<0.0250	<0.0500	<0.125	30.9	724	755
51-0	6	26-Jul-05	0.9	<0.0250	<0.0250	<0.0250	<0.0500	<0.125	<10.0	138	138
SP-7	1	11-Jul-05	25.0	<0.0250	<0.0250	<0.0250	<0.0500	<0.125	<10.0	<10.0	<10.0

Ruth 20-2 160011

Chesapeake

#### TABLE 1

#### Summary of Excavation Soil Field Analyses and Laboratory Analytical Results

Sample ID	Depth (fect)	Sample Date	PID Reading (ppm)	Benzene (mg/Kg)	Toluene (mg/Kg)	Ethylbenzene (mg/Kg)	Total Xylenes (mg/Kg)	Total BTEX (mg/Kg)	TPH (as gasoline) (mg/Kg)	TPH (as diesel) (mg/Kg)	Total TPH (mg/Kg)
SP-8	1	11-Jul-05	39.6	<0.0250	<0.0250	<0.0250	<0.0500	<0.125	<10.0	27.8	27.8
SP-9	1	11-Jul-05	46.2	<0.0250	<0.0250	<0.0250	<0.0500	<0.125	16.9	315	332
51 - 7	6	26-Jul-05	3.0	<0.0250	<0.0250	<0.0250	<0.0500	<0.125	12.4	264	276
SP-10	1	11-Jul-05	73.5	<0.0250	<0.0250	<0.0250	<0.0500	<0.125	166	3,240	3,410
Sr-10	2	26-Jul-05	0.5	<0.0250	<0.0250	<0.0250	<0.0500	<0.125	<10.0	<10.0	<10.0
SP-11	1	11-Jul-05	31.6	<0.0250	<0.0250	<0.0250	<0.0500	<0.125	<10.0	213	213
55-11	2	26-Jul-05	0.6	<0.0250	<0.0250	<0.0250	<0.0500	<0.125	<10.0	<10.0	<10.0
NMOCD Reme	NMOCD Remedial Thresholds		100	10				50			100

Chesapeake Energy Ruth 20-2 Release Site (Ref.# 160011)

<sup>1</sup>Bolded values are in excess of NMOCD Remediation Thresholds

<sup>2</sup> NA=Not Applicable

<sup>3</sup>Chloride and Sulfate residuals may not be capable of impacting local groundwater above the NMWQCC standards of 250 mg/L and 650 mg/L respectively.

ALL CALL

Ruth 20-2 160011

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#### TABLE 2

#### Well Data

#### Chesapeake Energy Ruth 20-2 (Ref. #160011)

Well Number	Diversion <sup>A</sup>	Owner	Use	Twsp	Rng	Sec q q q	Latitude	Longtude	Date Measured	Well Depth (ft bgs)	Depth to Water (ft bgs)	
	an an air an	Payne Enterprise	STK	- 16 S	36 E	20.4	N 32º 54 0.66"	W 103º 22' 35 46"	05-Mar-66	106.	Let 90 menne	
1.87165	a to contract the second	G.Cattle Company	STK	16 S. 4	36 E	20 231	N 32° 54' 26.83''	W 103° 22' 35:47"			9	
L 07165 EXPL	×9	G. Cattle Company	EXP	168	-36 E	20	N 32° 34' 0.63"	W 103°23' 6.6"	the second second		harmonia and a second	
LO7402 EXPL	10	G. Calle Company	EXP	16 S	36 E	20	N 32" 54 0.63"	W-103" 23' 6.6"	1	The second second	The store start	
107443 EXPL	····· ·· ·· ··· ··· ··· ···· ····	G. Calle Company.	EXP	16 8	36 E	20. 41	N-32 34 0.661	W-103º 22: 35.46"	and the second second	PER 1	agent and an and an	
1/08899	. 10	Roper C. Hanks	PRO	16 85	36 E	20 114	N 329-341-39,887	W 103 23 6.64	31 Jul-82	142	Pharm 70 and	
E 10572		Yates Petroleum.	OIL	16.8	36 B	20 22.1	N 32 54 39.94"	W 103 22 19.91	27-Jun-96	150	70	
L 10785	din in	Yntes Beipoleum	PRO	16 8	36 E	20 221	N 325 94 39 94	W 103 22 19.91	27-Jun-96	130	70	
USOS #1	No of a spice constant. Manality a submit of a	a mana mana ya ina mana na nanya kamana kana kana kana kana kana kana k	and the second sec	16 \$	36 E	20 111	and the independence of the second	The state of the second s	27-Feb-91	10.00 CT - 4.99	70:47	
USOS #2				16 5		20, 423	1.5		31-Mar-81	Provent and the second	Comments on Life Contractores	
1 03318	3	T.M. Binckmon	DOM	16 S		16 231	N 329 55 19.33"	W 103 21:33.28"	State of Contents	Sector sector sector		
.03318 APPRO EXP		T. M. Blackmon	and a state of the	16 S	36 E	16 231	N 32° 55' 19.33"	W 103° 21' 33.28"		<u> </u>		
L 04487 APPRO	3	Kenneth Cox	DOM	16 \$	36 E	16: 222	N 32° 55' 32.49"	W 103° 21' 17.73"	01-Jun-60	110	82	
1-06368 EXP	0	T.M. Blackmon	SIK	16 8	36 E	16: 2	N 32° 35' 19 33"	W 103 21 33 28"				
1.00409	0	Chesapeake Operating	PRO	16 \$	36 E	16 231	N 32º 55' 19 33"	W 103° 21' 33.28"		193	finantaniti ana ana ana ana ana ana ana ana ana an	
USGS #3	CONSTRUCTION OF A DESCRIPTION OF A DESCR			16.5		16 231	A ( Date ( Lat) ( Lat) ( Date ( Lat) ( Lat)		27-Feb-91	All and the second second	61.33	
L 00209 B	203.9	College of the SW Foundation	URB	168	The second s	17 323	N 32" 55' 6.07"	W 103° 22' 51.08"		127	if the state of the second	
L/00209 C	237.7	College of the SW Foundation	IRR	16 S	36 8	17 43	N 37° 54' 53"	W 103° 22' 51.08"	a and a start of the	128		
1.02056	S. S.	Noble Brilling Company	PRO	165	36 E	17 11	N 32° 55' 32.22"	W 103 23 6.68"	06-Mar-53	130	60	
LO2056 APPRO	e	Noble Dilling Company	****	16.5	36 E	47 1.1	14.00		06-Mar-53	130		
L 04437	3	Roy Boland	DOM	16 S	36 E	17 3	N 32° 55 32.22"	W 103° 23' 6.68"	1 19 100 1 100 H 100	1:00	60	
L 04437 APPRO	3	· · · · · · · · · · · · · · · · · · ·	DON	16 \$	36 E	17 3	N 32° 54' 52.96"	W 103° 23' 6.65"	30-May-60		95	
LOSSO EXP	Taking (	Roy Boland	DOM	16.5	.30 E		N 32° 54' 52.96"	W 103° 23' 6.65"	30-May-60	120	<b>95</b> ,	
£07649	6	Beny Lee Hobbs Huide & Heidel	PRO	16 S	36 B		N 32° 35, 32, 3"	W 102 22 19.98		1. Jacob 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.	· · ·	
L 6//5/		ar er ere seren seren an er	DOM	16'8	The states of the second second	and a start of the	N 32 <sup>6</sup> 54' 32 96"	W 103* 23 6.65"	05-Beb-77	140	ali ali seg 19 per sen e Sur in acategos altar ana terraradi da sib	
LOSEPEXP		Berry Lee Hobbs	Particular and Particular and Particular	and a start a star	36 B		N 32° 55' 32 27"	W 103° 22' 35.55"		E	fin an gada a ch 1 dial Gainthead a' 1 dial - Gainthead a'	
	() () () () () () () () () () () () () (	Calvin or Jo Ann Holloway	DOM	16 S	36 E	17 21-2	N 32° 55, 32,27"	W 103° 22535 55"	66243	Sec. 2		
LIONERP	A Star Contact of the second	Ineco Oll Company	RRO	16 5	36 E	176 (1.3)	N 329 55 19,13"	W 163° 23: 6.67"			1 . N. 6	
USOS #4		a series of the		16 8	36 E	48-4-1-4	and the second sec	and was builded and build	26 Feb-91		<b>63.2</b> A	
USGS #S	where where the state of the st	and the second second	a a a a a a a a a a a a a a a a a a a	16 8	36 E	17 133	in the state of th	<u> </u>	10-100-09	1	67.82	
1.01086	TOLE OF A STATE	C.C. Champers	DOM	46.8	36 E	18 22	N 32º 35' 32.19"	W 103 23 22 19"	02-Apt-51	75	Annonement-terrenterent	
1.01087 APPRO.	<u>3</u>	C.C. Chambers	DOM	16.5	36 Đ	18/ 22	N 32° 55' 32.19"	W 103º 23' 22 19"	02-Apr.51	75	The search adjusticity a spectral	
L 04598	<b>3</b> and a second second	Chiner H. Summald	Dom	16 \$	36 B	to the start date that the	N 324 55 6.027	W 103*23 22.17*	21-Jan-62	136	75	
1.04598 APPRO	Sa pres a ranna fu mb	Emer H. Sunruld	istan "ungiplanistan) han si Pananan "Pana han si Pananan "Pana	168	Transfer of the second s	18 42	N 32° 55' 6.02"	W 103° 23' 22.17*	- 21-Jan 62	<b>136</b>	<b>45</b>	
	31	George Wayne Sumuld	DOM.	16 S			N 37° 54' 52.93'	W 103° 23' 22 16"	y mat or a		Jane and Article	20
94609 APRRO EXP		George Wayne Sunnuld		16 S	8 13	18 443	N 32° 54' 52 93"	W 103° 23' 22.16"	Ť ,	6	t	
E 08132	3	George Wayne Sumruld	DOM	16'8	36 E	18 42	N 32° 55' 6,02"	W 103° 23' 22.47"	30-May-67	<b>95</b>	70	. V.
1.00934	3.1	R. FL Storrald	DOM .	16,8			N 32:35.6.02	W 103°23' 22.17"	12 May 72	118	68	4. s
1/06963	3~	Ricky Jones	DOM	16 5	36 E	18.444	N 37º 54"52 99"	W 103° 28: 22.16"	24 Aug 72	120 J	80	1. C
106967		Oscar V. Neidick	DOM	<b>16 \$</b>		18 443	N 32° 54' 52.93°	W 1039 23 22 16	The impost of the 4		the set he	18.2
1070637	tweet ritter Billion desaure	Odel Huck	DOM	165.4	36 Đ	18 442	N 326 94 32 938	W 103 23, 22 16	26-App-00	120	80	~
]. (79] (		Wayne Summid	\$1X -	168	<b>∵%∄</b> _"	18 42	N 32° 55' 6.02"	W103*23-22172	p ca processiones and p ". Innerside Max ".	WHATEN	Sevennes das Bils Incorne	
1009729		B.H. Sumula	1309	16 S	36 B	18 42	N37 35 6.02	W 103° 23' 22.17"		Sec. 12.53	and the second s	
1.09730		E. H. Sumuld	<b>D</b> XP	168	36 2	18 42	N 32° 551 6:02"	W-103*23'22.17"			Levense viersel	
E/10712	0	Chesopeake Opbreting	PRO	16 8	36 E	1 <b>B</b> 42.	N 32° 55 6.02	W 103 23 22.17	01-Sep-97	165	(60)	
USOS #6	La Carlos Antonio	and the second s		16 S	- 36 B.	18 11 1	6-2-2 C 7 E	The second s	26-Jun-96	labi si ji	54.94	
LOIOSA APPRO	3	Cientine Spines	DOM	16 8	36 B	19 13	N 32º 54' 26.72"	W 103224 7 412	15 Dec-50	76	45	
1.02783	3	Vemon N.Key	DOM	16 S	36 B	192142	N 32* 54' 26.74"	W 103º 23' 53 17"	19-Feb-35	80	50	
LO2783 APPRO	and the states of the second	Vemon N. Key		1168	1 36 16 -1	19 142		W10223'53 17"***	19 Feb.35	80	50	

Mr. Larry Johnson 5 August 2005

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() Chesapeake

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#### TABLE 2

#### Well Data

#### Chesapeake Energy Ruth 20-2 (Ref. #160011)

Well Number Diversion <sup>A</sup>		Owner	Uść.	Twsp	Rig	Sec q q q	Latitude	Löngtnide	Date Measured	Well Depth (R bgs)	Depth to Water (ft bgs)
104801	No. 1	Secrepe Spines	DOM	16 S	36 E	12 12	N 32° 54' 39 81."	W 103* 23' 53.18"	Carrier and the second se	a second and a second s	ij+ (; istrationalist Matrix Matrix atmaxat
1-04895	inerita and	George Spires	DOM :	16 S	36 E	19 12	N 32° 54' 39.81	W 103° 23 53 18"	05-May-62	1 . LOOK 1	
LOSCO HAP	7.8.0	Toe Cristo	- DOM	16 3	36 B	19 142	N 32º 54 26.74%	W 103: 23: 43:17.	Two y when when "	te anne vit f	
L 06689 EXP	and Others of	Weber Hannan	DOM .	1 26 Stal	\$ <b>36 B</b>	19 114	N 32° 54' 39.78"	W 103 24 7.4	1	1 Section and	1
1.06937	1.23	Dale Candy	DOM	- 16 St. 1	36 B	19 224	N 32º 54/39.85"	W 103º 23' 22 15"	-25 Apr 72	110	
1.07444 EXPL-1	0	G. Cattle Company	EXP.	16 S ]	36/E	19 234	N 32 54 28.76	W 103 23 37 64	13 Oct-75	130	وتبيعه ومدروه
TO 444 EXPL-2,		G Cattle Company	EXP	16.9	36 E	19 231	N 32º 54 26 75	W 103 23 37 64	13-Oct-75	1407.4	i un principal di anti-
1/07444 EXPL-1	بېلونون ورو د دونو د ورو د د د دوه د خدې ورو د	G. Cattle Company	EXP	1 10 5	36 E	19 231	N 32º 54' 20.76"	W 103P 23137 64"	14-Oct-75	178	120
108744	3	Roger Price	DOM.	16.5	36 E	19 33	N 329 54 D.59"	W-103* 24:7:42	and the second s	108	79
1,10209	3. 4.	Kenny Jackson	DOM	168	36 E	19 122	N 32º 54' 39.81	W 103°23'53.18"	03-Aug-91	128	94
L 00150 ENGLD -8	0	Chesapeake Operating	PRO	16.8	36 E	19 213	N 32º 54' 39.83"	W 103 23 37.66	L. dec	80	are an area
1:00150		Nearburg Producing Company	PRO	168	36 P.	19 211	N 32º 54 39.83	W 103º 23' 37.66"	1	125	9400 - 14 - 14 - 14 11, 1
USOS #7		the second second second second second	L	16 8	- 36 B	1951314	Finets de Prof	para principal and the second	31-Mar-81	Yet.	59.25
USOS #8		and the second s		16 S	36 B	19 21 I.	Se	and the second second	16-Feb-61		59.9
USGS #9	ant have a comment	H The Local A state of the stat	1938 . R.C., C., S &	16S.	36 B	19 211	Anna an an an an an gang	Bound to also an and and the second	03-Mar-76	And a start and a start of the second start of	64.9
USOS #10	and the second sec	an a	a alternation	16 5	1 36 E	19 214	an a	an a	15-Feb-71		64.05
USOS#1L	int		america data si mad	16 87	the second power of	19 413	a contraction of the second	an te and the state of the stat	30-Sep-81	1	66.54
L 03966	3	Robert Ralph Sims	DOM	16 S	36 E	21 244	N 32º 54' 26.96"	W 103º 21' 17.68"	18-Aug-58	95	60
L 03966 APPRO				16 S	36 E	21 224	N 32º 54' 40.06"	W 103º 21' 17.68"	18-Aug-58	95	60
L 05269	3	Ralph E. Collins	DOM	16 S	36 E	21 2 2 4	N 32º 54' 40.06"	W 103º 21' 17.68"	19-Oct-63	110	90
USGS #12		•	,	16 S	36 E	21 232			01-Feb-96		66.58
- LOISON APPRO	3.33	Lawinn Ol Group	PRO	16 S			N 320 531 47 547	W 103-23 22.07	24-Oct-52	145	180
L 04932	10. 10. 10	Coone Spires	DOM	16.5	THE STATE STATES	Laudd C. (		W 103* 23' 53.08"	12-Jul-62	164 1	-to
L 06334	0	Marcum Drilling Company	PRO	16 S	Annual Constant Streeting	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	N 32º 53' 21.38"	W 103º 24' 7.28"	02-Jun-68	135	75
L 06334 (E) 1	.0	Humble Oil & Refining Co.	PRO	16 S	36 E		N 32º 53' 21.38"	W 103° 24' 7.28"			
USO8#13	<u></u>		1	16 S		30.124		ar a change that the state of	10 Mar 76	delines gast a server s	75.23

\*= Data oblained from the New Mexico Office of the State Engineer Website (http://iwaters.ose.state.nm.us/2001/WATERS/wr\_RegisServlet1)

Well locations shown on Figure 2

 $^{A}$  = in acre feet per annum

IND = Industrial

IRR = Irrigation

DOM = Domestic

EXP = Exploration

quarters are 1=NW, 2=NE, 3=SW, 4=SE; quarters are biggest to smallest

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Photograph #1: Release area, looking easterly.



Photograph #2: Release area, looking easterly.







Photograph #3: Diesel tank and generator, looking northeasterly. Note cut fuel line between diesel tank and generator.



Photograph #4: Saturated soil stockpiled on plastic and fenced.

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Photograph #5: Final excavation, look westerly.



Photograph #6: Final excavation, looking northeasterly.

