



Remediation Summary Report North Benson Queen Unit Tank Battery Produced Water Spill

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Prepared By: Date Prepared: Project Number: Etech Environmental & Safety Solutions, Inc. June 21, 2010 094-1749-000

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## **Executive Summary**

On August 3, 2008, a produced water release occurred at the Arena Resources, Inc. (Arena) NBQU Tank Battery facility located in Lea County, New Mexico. Before cleanup of the spills, a second release occurred on August 28, 2008 at the NBQU Tank Battery.

Arena Resources, Inc. (Arena) contracted Etech Environmental and Safety Solutions, Inc. (Etech) to; 1. Prepare and submit a corrective action plan (CAP) to the State of New Mexico, Oil Conservation Division (OCD) and, 2. Implement the CAP once approved. The approved CAP called for the construction of an on-site soil washing system to remove the chlorides from the soils. Once the soils reached a threshold level of 500 mg/kg or less of chlorides, the soils would be removed and the process repeated until all soils associated with the above releases had been mitigated. On October of 2008 Etech began excavation of the impacted soils and construction of the washing unit. Soils washing operations started in December of 2008 and were concluded in May of 2010. It should be noted that the unit was also used to wash chloride impacted soils from a flowline leak which had occurred at the NBQU Well # 16. A remediation report for that section was prepared and submitted to the OCD. The site was considered mitigated in August of 2009 and consequently is not part of this report

A three-tiered sampling and analysis plan was utilized to field screen and laboratory validate that the soils were remediated to the proper levels. All samples analyzed by Etech and by the third party laboratory confirmed the soils were cleaned to the objective levels of the corrective action plan.

Following the completion of the remediation of all of the excavated soils, the geotextile membrane and majority of the filter rock were removed from the treatment cell. As per approval from the OCD, the polyethylene liners were left in place. The cell was backfilled in 6-12 inch lifts and tire compacted to surface. The final surface area was contoured so that any water or spills would flow back towards the center of the site.

After completion of all of the activities, and the results of the analyses, the impacted soils from the two spills at the NBQU tank battery site have been successfully remediated.

## Introduction

On August 3, 2008, a produced water release occurred at the Arena Resources, Inc. (Arena) NBQU Tank Battery facility located in Lea County, New Mexico. Before cleanup of the spills, a second release occurred on August 28, 2008 at the NBQU Tank Battery. Particulars on each spill are as follows:

Site:		NBQU Tank Battery
Unit No:		NMNM70993X
Latitude:		N32 <sup>°</sup> 42' 57.100"
Longitude:		W103° 58" 17.900"
Quantity Relea	ased:	580 BBLs.
Cause:	Electrical storm shut d the water tank causing	own power to the facility. Sand tanks continued to send water to it to run over.
Site:		NBQU Tank Battery
Unit No:		NMNM70993X
Latitude:		N32° 42' 57.100"
Longitude:		W103° 58" 17.900"
Quantity Relea	ased:	120 BBLs.
Cause:	Linkstaine structure the sur-	orth tank. A fire ensued causing the tank adjacent to the south to

Arena Resources, Inc. (Arena) contracted Etech Environmental and Safety Solutions, Inc. (Etech) to; 1. Prepare and submit a corrective action plan (CAP) to the State of New Mexico, Oil Conservation Division and, 2. Implement the CAP once approved. The approved CAP called for the construction of an on-site soil washing system to remove the chlorides from the soils. Once the soils reached a threshold level of 500 mg/kg or less of chlorides, the soils would be removed and the process repeated until all soils associated with the above releases had been mitigated. On October of 2008 Etech began excavation of the impacted soils and construction of the washing unit. Soils washing operations started in December of 2008 and were concluded in May of 2010. It should be noted that the unit was also used to was chloride impacted soils from a flowline leak which had occurred at the NBQU Well # 16. A remediation report for that section was prepared and submitted to the OCD. The site was considered mitigated in August of 2009 and consequently is not part of this report. A site location map is provided in Attachment A. A copy of the final NM C-141 Spill Reports is provided in Attachment B.

## **Remediation Summary**

The process involved using freshwater as a solvent to remove the chlorides from the soil. Once the soil and water were added to the treatment cell, they were agitated to promote a uniform mixture then allowed to filter through a rock sieve covered with a geotextile membrane and flow to a separate collection area. The wash water was then transferred to a produced water tank at the facility and disposed of along with produced water from production operations at the fields produced water injection well. Photographs of the construction and cell operation are provided in Photos 1-6 on the following pages.



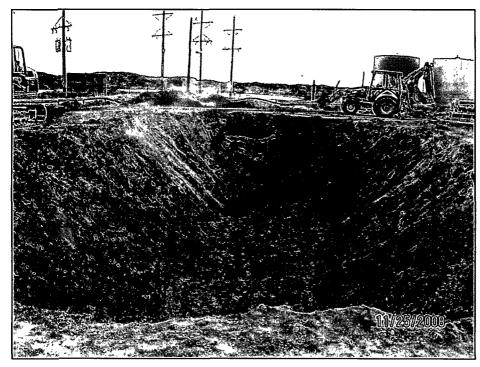


Photo 1: View of the cell following excavation.



Photo 2: View of the cell following the installation of the primary, 40 mil polyethylene liner.

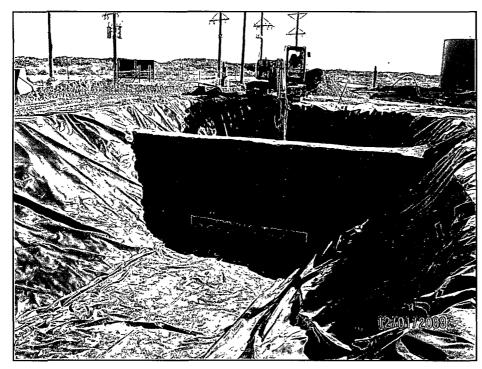


Photo 3: Vie w of the c ompleted di vider wall to allo w washing and the collection of rinsate.



Photo 4: View with secondary 40 mil polyethylene liner, filter rock, and geotextile membrane in place. Cell is ready to wash soil.



Photo 5 : Soil and water are bein g added to the washing side of the treatment cell.

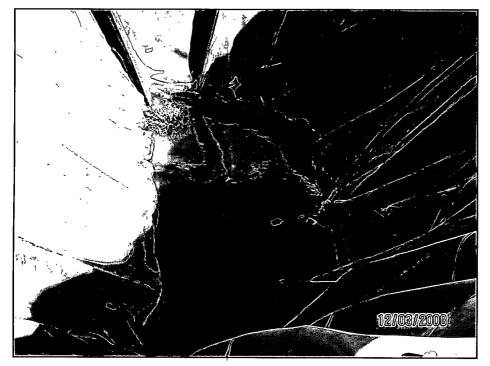


Photo 6: Vie w of water entering the collection ar ea from the other side of the wash area. Pump (middle right is used to transfer water to the produced water tank for disposal.

## **Validation Procedures and Analyses**

Samples were collected daily by Etech's operations technician. A 25 gram aliquot of soil was placed in a sample jar along with 100 ml of distilled water and 1/8 of a tsp of calcium sulfate. The sample was agitated for 1-2 minutes then allowed to settle. Once settled, the clear phase of the liquid was extracted and placed in a clean sample vial and a HACH Quantab ® low-range titrator was inserted into the liquid. When the titrator indicated it had reached its end point, the value was read on the titrator and the result recorded. When the titrator indicated the sample was near 100 mg/kg, the soil was removed and stockpiled. Otherwise, the soil was washed again until it reached the targeted results. A copy of the field analysis sheets is provided in Attachment C.

Samples were collected from the stockpiles and tested monthly at Etech using Standard Method 4500 CIB which is identical to the sample procedure used by third party laboratories for the analysis of chlorides. If the analytical results determined the washed soil it was within the CAP objectives of 500 mg/kg or less the stockpiled material was staged to a clean area. A copy of the in-house analytical results is provided in Attachment D.

Etech also periodically collected samples from the stockpiles and sent them to Cardinal laboratories in Hobbs, NM for validation analyses. A portion of these sampling events were also witnessed by a representative of the OCD. A copy of the results of all laboratory validation analyses are provided in Attachment E.

All samples analyzed by Etech and by the third party laboratory confirmed the soils were cleaned to the objective levels of the corrective action plan.

#### Closure

Following the completion of the remediation of all of the excavated soils, the geotextile membrane and majority of the filter rock were removed from the treatment cell. As per approval from the OCD, the polyethylene liners were left in place. However a two-foot deep trench was excavated around the perimeter of the soil-washing unit. The primary and secondary liners were trimmed and folded into this trench then backfilled. The rationale for this approach was that Arena had plans in place to potentially construct and install a produced water tank battery over this area. It was decided that it would be technically a sound idea to leave the liners in place in the event another major upset of this type occurred again, that there would be a lower level of containment underneath the tanks.

Once this was completed, the cell was backfilled in 6-12 inch lifts and tire compacted to surface. The final surface area was contoured so that any water or spills would flow back towards the center of the site. Photographs of the closure process are presented on the following pages.





Photo 7: View of the removal of the geotextile fabric in progress.

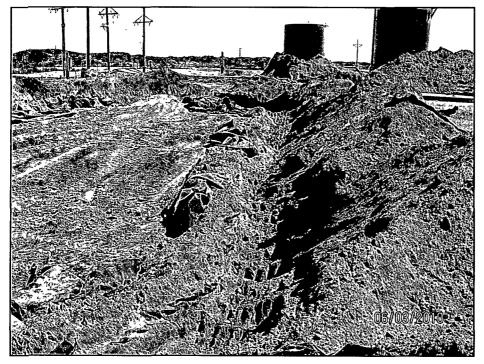


Photo 8: View of the trench for folding back the near surface sections of the primary and secondary liners. Note the near completion of the filling of the cell.

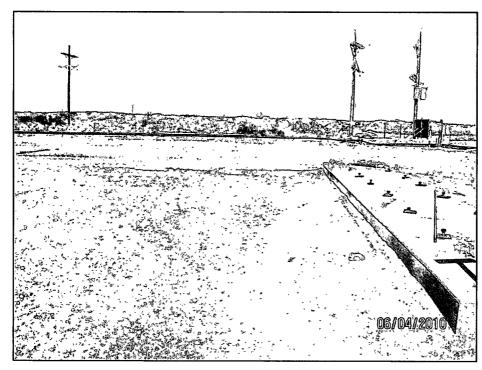


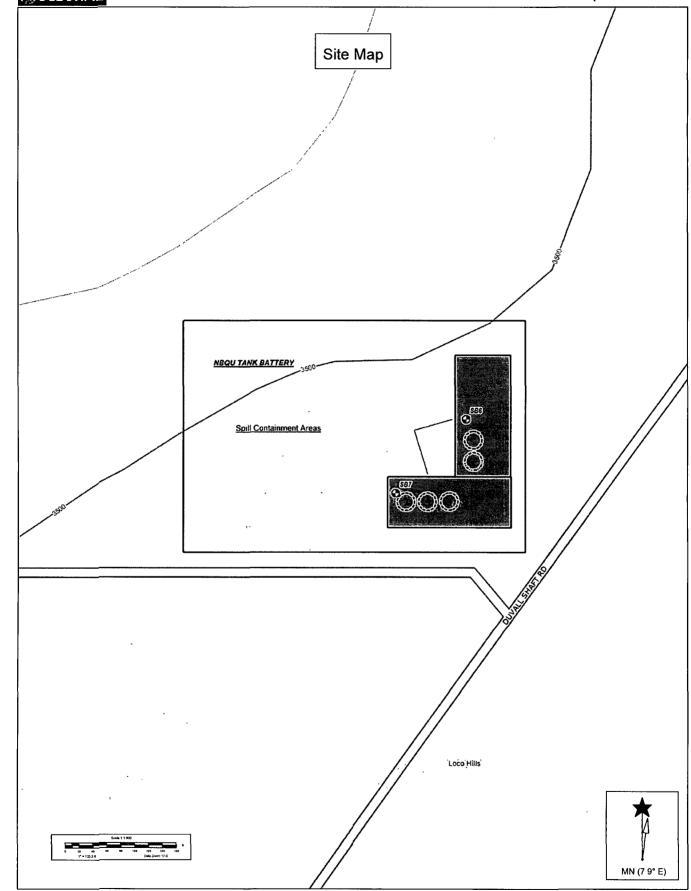
Photo 9: View looking east of the area where the treatment cell was located after completion of closure.

## Conclusion

After completion of all of the activities, and the results of the analyses, the impacted soils from the two spills at the NBQU tank battery site have been successfully remediated and complete.

Attachment A Site Map

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Attachment B Finalized C-141 Report

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District I 1625 N French District II 1301 W Grand District III 000 Rio Brazos District IV 1220 S St Fran	Avenue, Artes s Road, Aztec, cis Dr , Santa	na, NM 88210 NM 87410 Fe, NM 87505 ena Resourc	Rele	Energy Mir Oil C 1220 Sa	nerals a Conser South Inta Fe cation	vation Div St. Franc NM 875 and Co OPERAT Contact: Free	rrective A	ction	🔲 Initia	al Report	vised Oc Copies t Office i th Rule	Form C-141 tober 10, 2003 to appropriate in accordance e 116 on back side of form Final Report
Address: 21 Facility Nar			en Batter	V			lo.: 575-738-17. e: Oil and Produ					
Surface Ow	ner: BLM			Mineral C	wner: l	BLM			Lease N	lo.: 33129		u
				LOCA	TION	N OF REI	LEASE					
Unit Letter J	Section 28	Township 18S	Range 30E	Feet from the 1743		South Line FSL	Feet from the 784		Vest Line FEL	County	Lea	
	-		I			" Longitude OF REL1	e: W103 58' 24.4	4"	_			
Type of Rele	ase. Produce	d Water & O	Dil	INAI	UNE		Release: 700		Volume R	Recovered: 0		
Source of Re				Strike		Date and H	our of Occurrence	e:	Date and	Hour of Dis		
Was Immedi	ate Notice Gi					08/28/2008 0100 hrs         08/29/08 0700 hrs           If YES, To Whom?         08/29/08 0700 hrs						
	_=-		Yes	No Not Re	equired							
By Whom? F						Date and Hour 08/29/08 0800       If YES, Volume Impacting the Watercourse.						
Was a Water	course Reach		Yes 🛛	No		IT TES, volume impacting the watercourse.						
down to the s fire.	ise of Proble system casuir	m and Remed	dial Action to overflow	n Taken.*: Batter v and a a second v	where lig	ghtning stuck	o spills, one from the tank battery p	roduced	l water tanl	cs setting a p	oortion	of them on
constucted in	the excavate	ed area. The	cleaned so	bil was then used	to backf	ill the site on	00' x 6' vertical. 5 ce remediation wa	as comp	leted.			
regulations al public health should their o	Il operators a or the enviro operations ha nment. In ad	re required to onment. The we failed to a ldition, NMO	o report an acceptanc adequately )CD accep	d/or file certain r e of a C-141 repo investigate and r	elease no ort by the emediate	otifications and NMOCD m contamination	knowledge and un nd perform correc arked as "Final Re on that pose a thre e the operator of r	tive acti eport" d eat to gr	ons for rele oes not reli ound water	eases which eve the open , surface wa	may er rator of iter, hu	ndanger Fliability man health
	$\Lambda$		5	)			OIL CONS	SERV	ATION	DIVISIC	<u>N</u>	
Signature:	<u>  ou</u>	Not	zunso	n								
Printed Name	: Colleen Ro	obinson				Approved by	District Supervise	o <b>r</b> :		- 49		
Title: Regula	tory Affairs l	Liason				Approval Dat	e:	1	Expiration I	Date:		
-mail Add-	es: orohineo	n@arenareso	urcasino	om		Conditions of	Annrovel		_	A 4411	<b>L</b> J	
Date: 06/21/1			hone: 575-		— '	Conditions of Approval: Attached						

 Date:
 06/21/10
 Phone

 \* Attach Additional Sheets If Necessary

Attachment C Field Analysis Results

Date:	12/4/2008	Client:	Arena Reso	urces. Inc		
Site:	N. Benson Que	•			ect Number:	094-1749 & 1748 - 000
Technican:					t Number(s):	
Sample ID		Titrator Range	Dilution	Test Strip Result (ppm)	Final Result (ppm)	Notations
12/	/04/08	Α	4	76.0	304.00	Move to clean area- Sample to Lab
12/	/05/08	A	4	94.0	376.00	Move to clean area
12/	/08/08	Α	4	60.0	240.00	Move to clean area
12	/09/08	Α	4	104.0	416.00	Move to clean area
12	/11/08	А	4	68.0	272.00	Move to clean area
12	/12/08	Α	4	94.0	376.00	Move to clean area
12	/15/08	Α	4	34.0	136.00	Move to clean area
12	/16/08	Α	4	94.0	376.00	Move to clean area
12	/17/08	Α	4	94.0	376.00	Pump Frozen - Left in Cell
12	/19/08	A	4	34.0	136.00	Move to clean area
12	/23/08	А	4	46.0	184.00	Move to clean area
12	/24/08	А	4	68.0	272.00	Move to clean area - SD for Holiday
12	/31/08	Α	4	29.0	116.00	Move to clean area
01.	/05/09	Α	4	34.0	136.00	Move to clean area
01.	/06/09	Α	4	150.0	600.00	Rewash Soil
01.	/07/09	А	4	104.0	416.00	Move to clean area
01.	/08/09	Α	4	178.0	712.00	Rewash Soil
01.	/09/09	Α	4	94.0	376.00	Move to clean area
01.	/13/09	Α	4	60.0	240.00	Move to clean area
01	/14/09	А	4	94.0	376.00	Move to clean area
01	/15/09	Α	4	68.0	272.00	Move to clean area
01/	/16/09	Α	4	104.0	416.00	Move to clean area
01/	/19/09	А	4	60.0	240.00	Move to clean area
01,	/20/09	A	4	60.0	240.00	Move to clean area
01/	/21/09	Α	4	178.0	712.00	Rewash Soil
01/	/22/09	Α	4	94.0	376.00	Move to clean area
01/	/23/09	Α	4	60.0	240.00	Move to clean area
01/	/26/09	A	4	34.0	136.00	Move to clean area
01/	/28/09	A	4	40.0	160.00	Move to clean area
01/	/29/09	Α	4	60.0	240.00	Move to clean area
01/	/30/09	Α	4	68.0	272.00	Move to clean area
02	/02/09	А	4	94.0	376.00	Move to clean area
02/	/03/09	Α	4	104.0	416.00	Move to clean area

Titrator Range: A= 30-600 B=300-6000 ppm Soil Sample Volume: 25 Grams

Distilled Water Volume = 100 ml

Date:	2/4/200	9 Client:	Arena Reso	urces, Inc.					
Site:	N. Benson Qu	ieen Unit		Pro	Project Number: 094-1749 & 1748 - 000				
Technican:	Latta			Strip Lo	t Number(s):	A9167			
Sample ID		Titrator Range	Dilution	Test Strip Result (ppm)	Final Result (ppm)	Notations			
02	/04/09	A	4	193.0	772.00	Rewash Soil			
02	/05/09	A	4	178.0	712.00	Rewash Soil-Clean Filtration Area			
02	/06/09	A	4	164.0	656.00	Rewash Soil			
02	/09/09	A	4	53.0	212.00	Move to clean area			
02	/10/09	A	4	104.0	416.00	Move to clean area			
02	/12/09	A	4	68.0	272.00	Move to clean area			
02	/13/09	A	4	126.0	504.00	Rewash Soil			
02	/16/09	A	4	68.0	272.00	Move to clean area			
02	/17/09	A	4	85.0	340.00	Move to clean area			
02	/18/09	A	4	76.0	304.00	Move to clean area			
02	2/19/09	Α	4	94.0	376.00	Move to clean area			
02	2/23/09	A	4			Prod. water pump leaked and sprayed on some of t stacks on the south side containment Removed so for rewashing.			
03	/02/09	А	4	138.0	552.00	Rewashing Soil			
03	6/03/09	А	4	94.0	376.00	Rewashing Soil - Move to clean area			
03	/04/09	А	4	68.0	272.00	Rewashing Soil - Move to clean area			
03	/05/09	A	4	76.0	304.00	Rewashing Soil - Move to clean area			
03	/09/09	A	4	53.0	212.00	Move to clean area			
03	/25/09	A	4	94.0	376.00	Move to clean area			
03	/26/09	A	4	126.0	504.00	Rewash Soil			
03	/27/09	A	4	60.0	240.00	Move to clean area			
03	/30/09	А	4	193.0	772.00	Rewash Soil			
03	/31/09	A	4	126.0	504.00	Rewash Soil - Lg amount of silt			
04	/01/09	A	4	76.0	304.00	Move to clean area			
04	/02/09	А	4	68.0	272.00	Move to clean area			
04	/09/09	Α	4	76.0	304.00	Move to clean area			
04	/13/09	A	4	126.0	504.00	Rewash Soil			
04	/15/09	A	4	76.0	304.00	Move to clean area			
04	/20/09	A	4	29.0	116.00	Move to clean area			
04	/21/09	A	4	126.0	504.00	Rewash Soil			
04	/22/09	A	4	209.0	836.00	Rewash Soil			
04	/23/09	А	4	138.0	552.00	Rewash Soil - Lg amount of silts			
04	/28/09	A	4	104.0	416.00	Rewash Soil - Clear Drain Area			
04	/29/09	A	4	53.0	212.00	Move to clean area			

Titrator Range: A= 30-600 B=300-6000 ppm Soil Sample Volume: 25 Grams Distilled Water Volume = 100 ml

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Date:	4/30/2009	Client:	Arena Reso	urces, Inc.			
Site:	N. Benson Que	-	-		ect Number:	094-1749 & 1748 - 000	
Technican:	Latta			Strip Lo	t Number(s):		
Sample ID		Titrator Range	Dilution	Test Strip Result (ppm)	Final Result (ppm)	Notations	
04	/30/09	A	4	46.0		Move to clean area	
05/	/01/09	A	4	68.0	272.00	Move to clean area - SD to move to reclaim area	
06,	/10/09	A	4	34.0	136.00	Move to clean area	
06/	/11/09	A	4	68.0	272.00	Move to clean area	
06/	/15/09	А	4	85.0	340.00	Move to clean area	
06	/16/09	А	4	85.0	340.00	Move to clean area	
06	/29/09	A	4	40.0	160.00	Rewash soil	
06	/30/09	A	4	29.0	116.00	Move to clean area	
07	/01/09	A	4	65.0	260.00	Rewash soil	
07.	/07/09	A	4	76.0	304.00	Rewash soil	
07,	/08/09	A	4	60.0	240.00	Rewash soil	
07.	/09/09	A	4	76.0	304.00	Rewash soil	
07.	/10/09	A	4	245.0	980.00	Rewash soil	
07.	/10/09	A	4	94.0	376.00	Took sample to lab	
07,	/13/09	Α	4	164.0	656.00	Rewash soil	
07.	/14/09	A	4	76.0	304.00	Rewash soil	
07.	/20/09	A	4	60.0	240.00	Rewash soil	
08	/05/09	Α	4	29.0	116.00	Move to clean area	
	/06/09	A	4	46.0	184.00	Cleaning out wash pit	
	/18/09	A	4	29.0	116.00	Move to clean area	
08/	/19/09	A	4	60.0		Rewash soil	
08/	/20/09	A	4	29.0	116.00	Move to clean area	
08/	/21/09	A	4	34.0	136.00	Rewash soil	
08/	/24/09	A	4	29.0	116.00	Move to clean area	
08/	/25/09	A	4	40.0	160.00	Move to clean area	
08/	/26/09	A	4	40.0	160.00	Move to clean area	
	/27/09	A	4	245.0	980.00	Rewash soil	
	/28/09	A	4	126.0	504.00	Rewash soil	
	/01/09	A	4	53.0		Rewash soil	
	/03/09	A	4	34.0		Move to clean area	
	/08/09	A	4	138.0		Rewash soil	
09/	/09/09	A	4	104.0	416.00	Rewash soil	
09/	/10/09	A	4	85.0	340.00	Rewash soil	

Titrator Range: A= 30-600 B=300-6000 ppm Soil Sample Volume: 25 Grams Distilled Water Volume = 100 ml

Date:	9/11/2009	Client:	Arena Reso	urces, Inc				
Site:	N. Benson Que				ect Number:	094-1749 & 1748 - 000		
Technican:				Strip Lot Number(s): A9167				
Sample ID		Titrator Range	Dilution	Test Strip Result (ppm)	Final Result (ppm)	Notations		
09	/11/09	A	4	60.0	240.00	Rewash soil		
09	/14/09	A	4	29.0	116.00	Rewash soil		
09	/15/09	A	4	411.0	1644.00	Rewash soil		
09	/16/09	Α	4	193.0	772.00	Rewash soil		
09	/22/09	A	4	138.0	552.00	Rewash soil		
09	/23/09	Α	4	68.0	272.00	Rewash soil		
09	)/24/09	Α	4	40.0	160.00	Move to clean area		
09	/29/09	A	4	115.0	460.00	Rewash soil		
10	/05/09	A	4	104.0	416.00	Rewash soil		
10	/07/09	A	4	85.0	340.00	Rewash soil		
10	/12/09	Α	4	60.0	240.00	Rewash soil		
10	/14/09	A	4	34.0	136.00	Move to clean area		
10	/20/09	A	4	60.0	240.00	Rewash soil		
10	/26/09	Α	4	29.0	116.00	Rewash soil		
10	)/27/09	Α	4	85.0	340.00	Rewash soil		
10	/28/09	Α	4	60.0	240.00	Rewash soil		
10	/29/09	Α	4	46.0	184.00	Move to clean area		
11	/03/09	Α	4	29.0	116.00	Move to clean area		
11	/09/09	A	4	126.0	504.00	Rewash soil		
11	/10/09	Α	4	104.0	416.00	Rewash soil		
11	/12/09	A	4	46.0	184.00	Move to clean area		
11	/16/09	A	4	355.0	1420.00	Rewash soil		
11	/17/09	A	4	104.0	416.00	Rewash soil		
11	/18/09	А	4			Washed soil down and worked on pump		
11	/19/09	A	4	85.0	340.00	Rewash soil		
11	/20/09	A	4	53.0	212.00	Rewash soil		
11	/23/09	A	4	53.0	212.00	Rewash soil		
11	/24/09	A	4	34.0	136.00	Move to clean area		
1	/25/09	A	4	193.0	772.00	Rewash soil		
11	/30/09	A	4	245.0	980.00	Rewash soil		
12	/08/09	Α	4	53.0	212.00	Rewash soil		
12	/10/09	A	4	53.0	212.00	Rewash soil		
12	/11/09	A	4	53.0	212.00	Rewash soil		

Titrator Range: A= 30-600 B=300-6000 ppm

Soil Sample Volume: 25 Grams Distilled Water Volume = 100 ml



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Date:	12/14/2009	Client:	Arena Reso	urces, Inc.				
Site:	N Benson Que	- en Unit		Proj	Project Number: 094-1749 & 1748 - 000			
Technican: Latta				Strip Lo	t Number(s):	A9167		
Sample ID		Titrator Range	Dilution	Test Strip Result (ppm)	Final Result (ppm)	Notations		
12	/14/09	Α	4	29.0	116.00	Rewash soil		
12	/15/09	A	4	104.0	416.00	Rewash soil		
12	/16/09	A	4	138.0	552.00	Rewash soil		
12	/17/09	A	4	85.0	340.00	Rewash soil		
12	/18/09	A	4	95.0	380.00	Rewash soil		
12	/22/09	A	4	34.0	136.00	Move to clean area		
12	/23/09	Α	4	115.0	460.00	Rewash soil		
12	/30/09	Α	4	104.0	416.00	Rewash soil		
12	/31/09	A	4	40.0	160.00	Rewash soil		
		Α	4					
		A	4					
		A	4					
		A	4					
		A	4					
		A	4					
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Titrator Range: A= 30-600 B=300-6000 ppm Soil Sample Volume: 25 Grams Distilled Water Volume = 100 ml



						ysis Sheet					
Date:	1/4/2010	•	Arena Reso								
Site:	N. Benson Que	en Unit	n Unit Project Number: 094-1749 & 1748 - 000 Strip Lot Number(s): A9167								
Technican:	Latta			Strip Lo	A9167						
Sample ID		Titrator Range	Dilution	Test Strip Result (ppm)	Final Result (ppm)	Notations					
01/	/04/10	A	4	60.0	240.00	Rewash soil					
01/	/05/10	Α	4	29.0	116.00	Move to clean area					
01/	/06/10	A	4	34.0	136.00	Rewash soil					
01,	/11/10	Α	4	60.0	240.00	Rewash soil					
01	/12/10	Α	4	53.0	212.00	Rewash soil					
01	/13/10	A	4	46.0	184.00	Rewash soil					
01	/14/10	Α	4	85.0	340.00	Rewash soil					
01	/18/10	Α	4	138.0	552.00	Rewash soil					
01	/19/10	Α	4	60.0	240.00	Rewash soil					
01,	/20/10	Α	4	53.0	212.00	Rewash soil					
01.	/22/10	A	4	60.0	240.00	Rewash soil					
02	/02/10	Α	4	29.0	116.00	Move to clean area					
02	/05/10	A	4	178.0	712.00	Rewash soil					
02	/08/10	Α	4	164.0	656.00	Rewash soil					
02	/10/10	A	4	85.0	340.00	Rewash soil					
02	/11/10	A	4	60.0	240.00	Rewash soil					
02	/12/10	A	4	104.0	416.00	Rewash soil					
02	/15/10	A	4	76.0	304.00	Rewash soil					
02	/18/10	A	4	76.0	304.00	Rewash soil					
02	/19/10	Α	4	60.0	240.00	Rewash soil					
02	/22/10	A	4	29.0	116.00	Move to clean area					
02	/25/10	A	4	307.0		Rewash soil					
03/	/01/10	А	4	60.0		Rewash soil					
03/	/02/10	А	4	53.0		Rewash soil					
03/	/03/10	Α	4	53.0	212.00	Rewash soil					
03/	/04/10	A	4	40.0	160.00	Move to clean area					
03/	/05/10	Α	4	126.0	504.00	Rewash soil					
03/	/06/10	Α	4	76.0	304.00	Rewash soil					
03/	/08/10	Α	4	104.0	416.00	Rewash soil					
03/	/09/10	Α	4	60.0		Rewash soil					
03/	/10/10	Α	4	85.0	340.00	Rewash soil					
03/	/11/10	A	4	53.0		Rewash soil					
	/12/10	A	4	46.0		Rewash soil					

Titrator Range: A= 30-600 B=300-6000 ppm

Soil Sample Volume: 25 Grams

Distilled Water Volume = 100 ml



Date:	3/13/2010	Client:	Arena Reso	urces, Inc.					
Site:	N. Benson Que	•			ect Number:	094-1749 & 1748 - 000			
Technican:	Latta	Strip Lot Number(s): A9167							
Sample ID		Titrator Range	Dilution	Test Strip Result (ppm)	Final Result (ppm)	Notations			
03,	/13/10	Α	4	33.0	132.00	Move to clean area			
03/	/15/10	Α	4	115.0	460.00	Rewash soil			
03	/16/10	Α	4	245.0	980.00	Rewash soil			
03	/17/10	Α	4	85.0	340.00	Rewash soil			
03	/18/10	Α	4	46.0	184.00	Rewash soil			
03	/19/10	Α	4	60.0	240.00	Rewash soil			
03	/20/10	Α	4	40.0	160.00	Rewash soil			
03	/22/10	Α	4	126.0	504.00	Rewash soil			
03	/23/10	А	4	85.0	340.00	Rewash soil			
03	/24/10	Α	4	46.0	184.00	Rewash soil			
03	/25/10	A	4	71.0	284.00	Rewash soil			
03	/26/10	A	4	40.0	160.00	Move to clean area			
03	/29/10	А	4	214.0	856.00	Rewash soil			
03	/30/10	А	4	109.0	436.00	Rewash soil			
03	/31/10	Α	4	109.0	436.00	Rewash soil			
04	/01/10	А	4	60.0	240.00	Rewash soil			
04	/02/10	Α	4	109.0	436.00	Rewash soil			
04	/03/10	Α	4	46.0	184.00	Move to clean area			
04	/05/10	Α	4	606.0	2424.00	Rewash soil			
04	/06/10	А	4	214.0	856.00	Rewash soil			
04	/08/10	А	4	156.0	624.00	Rewash soil			
04	/09/10	А	4	63.0	252.00	Rewash soil			
04	/10/10	Α	4	99.0	396.00	Rewash soil			
04	/12/10	Α	4	63.0	252.00	Rewash soil			
04	/13/10	А	4	63.0	252.00	Rewash soil			
04	/14/10	А	4	53.0	212.00	Rewash soil			
04	/15/10	A	4	40.0	160.00	Move to clean area			
04	/19/10	A	4	231.0	924.00	Rewash soil			
04	/20/10	A	4	169.0	676.00	Rewash soil			
04	/21/10	A	4	109.0	436.00	Rewash soil			
04	/22/10	A	4	89.0	356.00	Move to clean area			
04	/23/10	A	4			No Sample - Changed out pump			
04,	/24/10	А	4	99.0	396.00	Rewash soil			

Titrator Range: A= 30-600 B=300-6000 ppm

Soil Sample Volume: 25 Grams Distilled Water Volume = 100 ml



					Surip Anal	lysis Sheet			
Date:	4/26/2010								
Site:	N. Benson Quee	N. Benson Queen Unit         Project Number: 094-1749 & 1748 - 000							
Technican:	Latta	Strip Lot Number(s): <u>A9167</u>							
Sample ID		Titrator Range	Dilution	Test Strip Result (ppm)	Final Result (ppm)	Notations			
04	/26/10	A	4	63.0	252.00	Rewash soil			
04	/27/10	А	4			No Sample - cleaned sump			
04	/28/10	A	4			No Sample - cleaned sump			
04	/29/10	А	4			No Sample - cleaned sump			
04	/30/10	A	4	71.0	284.00	Rewash soil			
05	/01/10	Α	4	33.0	132.00	Move to clean area			
05	/03/10	Α	4			No Sample - washing new batch			
05	/04/10	Α	4	416.0	1664.00	Rewash soil			
05	/05/10	Α	4	214.0	856.00	Rewash soil			
05	/07/10	А	4	289.0	1156.00	Rewash soil			
05	/08/10	А	4	214.0	856.00	Rewash soil			
05	/10/10	Α	4	214.0	856.00	Rewash soil			
05	/10/10	Α	4	126.0	504.00	Afternoon test			
05	/11/10	Α	4	169.0	676.00	Rewash soil			
05	/12/10	Α	4	99.0	396.00	Rewash soil			
05	/14/10	Α	4	120.0	480.00	Rewash soil			
05	/17/10	А	4	89.0	356.00	Rewash soil			
05	/18/10	А	4	63.0	252.00	Rewash soil			
05	/19/10	А	4	33.0	132.00	Rewash soil			
05	/20/10	Α	4	249.0	996.00	Rewash soil			
05	/21/10	Α	4	335.0	1340.00	Rewash soil			
05	/22/10	A	4	180.0	720.00	Rewash soil			
05	/23/10	A	4	71.0	284.00	Move to clean area			

Titrator Range: A= 30-600 B=300-6000 ppm Soil Sample Volume: 25 Grams Distilled Water Volume = 100 ml



# Attachment D In-House Analytical Data



Date:	5/24/2010			sources, In	nalysis : c				
Site:	NBQU Soil Washing		/ licita rtc.		ct Number:	094-1748 8	R 1749		
Pro. Mgr.	Fred Holmes			• •	ntaminant:				
Method:	Standard Method 4500			•	Standard:				
				. QA/QC					
Tre	eated Sample Lot (Date)	Milliliters of Sample Used	Dilution	AgNO3 0.028(N)	Result (mg/kg)	Lab Result (mg/kg)	Notations		
12/4/2008		10	4	0.700	277.928	272	Sample to Lab for Verification		
1/5/2009		10	4	0.600	238.224	N/A	Treated pile spot check. Passed		
1/14/2009		10	4	0.450	178.668	160	Treated pile monthly composite, sample to lab for verification		
2/3/2009		10	4	0.550	218 372	N/A	Treated pile spot check. Passed		
2/16/2009		10	4	1.200	476.448	432	Treated pile monthly composite, sample to lab for verification		
3/9/2009	· · · · · · · · · · · · · · · · · · ·	_10	4	0.500	198.52	160	Treated pile monthly composite, sample to lab for verification		
4/6/2009		10	4	0 600	238 224	N/A	Treated pile spot check. Passed		
4/29/2009	<b>-</b>	10	4	0.650	258.076	224	Treated pile monthly composite, sample to lab for verification		
6/1/2009	····	10	4	0.550	218.372	N/A	Treated pile spot check. Passed		
6/15/2009		10	4	0.250	99.26	96	Treated pile monthly composite, sample to lab for verification		
8/20/2009		10	4	0.500	198.52	160	Treated pile monthly composite, sample to lab for verification		
9/6/2009		10	4	0 450	178.668	144	Treated pile monthly composite, sample to lab for verification		
10/28/2009		10	4	0.400	158.816	144	Treated pile monthly composite, sample to lab for verification		
12/14/2009		10	4	0.600	238 224	256	Treated pile monthly composite, sample to lab for verification		
1/11/2010		10	4	0 700	277.928	256	Treated pile monthly composite, sample to lab for verification		
3/1/2010		10	4	0.600	238.224	208	Treated pile monthly composite, sample to lab for verification		
3/25/2010		10	4	0.800	317.632	272	Treated pile monthly composite, sample to lab for verification		
4/29/2010		10	4	0.900	357.336	368	Treated pile monthly composite, sample to lab for verification		
• (	Clearance Sampling For Pooled Areas	Milliliters of Sample Used	Dilution	AgNO3 0.028(N)	Result (mg/kg)	Lab Results (mg/kg)	Notations		
N. Pool Area	a Clearance	10	4	1.150	456.596	480	Clearance sample, split to lab		
N. Pool Are	a Clearance	10	4	0.400	158.816	144	Clearance sample, split to lab		
Storm Wate	r Drainage Clearance	10	4	0.450	178 668	176	Clearance sample, split to lab		

#### In-House Sample Analysis Sheet

 $F = (mI AgNO_3)(N)(35450)/mI$ . sample used

Soil Sample Volume: 25 Grams

Deionized Water Volume = 100 ml

Attachment E Third Party Laboratory Analyses Data



#### Project Sample Analysis Lab Validation Sheet

Date:	5/24/2010	Client:	Arena Re	sources, In	c						
Site:	NBQU Soil Washing	l		Proje	ct Number:	094-1748 8	& 1749				
Pro. Mgr.	Fred Holmes		Contaminant: Chlorides								
Method:	Standard Method 45	500-CIB		QA/QC	Standard:	500 mg/kg					
Tr	eated Sample Lot (Date)	Milliliters of Sample Used	Dilution	AgNO3 0.028(N)	Result (mg/kg)	Lab Result (mg/kg)	Notations				
	1/14/2009					160	Batch complete, moved to staging				
	2/16/2009					432	Batch complete, moved to staging				
	3/9/2009					160	Batch complete, moved to staging				
	4/29/2009					224	Batch complete, moved to staging				
	6/15/2009					192	Batch complete, moved to staging				
	6/17/2009					144	Batch complete, moved to staging				
	8/21/2009					1,120	Nonwashed soil				
	8/21/2009					96	Batch complete, moved to staging				
	8/25/2009					160	Batch complete, moved to staging				
	9/9/2009					144	Batch complete, moved to staging				
	10/30/2009					144	Batch complete, moved to staging				
	12/16/2009					256	Batch complete, moved to staging				
	1/13/2010					256	Batch complete, moved to staging				
	3/4/2010					208	Batch complete, moved to staging				
	3/29/2010					272	Batch complete, moved to staging				
	5/4/2010					368	Batch complete, moved to staging				

F = (ml AgNO<sub>3</sub>)(N)(35450)/ml. sample used Soil Sample Volume: 25 Grams

Deionized Water Volume = 100 ml



PHONE (575) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

May 5, 2010

Fred Holmes ETECH Environmental & Safety Solutions, Inc. P.O. Box 8469 Midland, TX 79708

Re: NBQIF

Enclosed are the results of analyses for sample number H19816, received by the laboratory on 05/04/10 at 3:45 pm.

Cardinal Laboratories is accredited through Texas NELAP for:

Method SW-846 8021 Method SW-846 8260 Method TX 1005 Benzene, Toluene, Ethyl Benzene, and Total Xylenes Benzene, Toluene, Ethyl Benzene, and Total Xylenes Total Petroleum Hydrocarbons

Certificate number T104704398-08-TX. Accreditation applies to solid and chemical materials and non-potable water matrices.

Cardinal Laboratories is accredited though the State of Colorado Department of Public Health and Environment for:

Method EPA 552.2	Haloacetic Acids (HAA-5)
Method EPA 524.2	Total Trihalomethanes (TTHM)
Method EPA 524.2	Regulated VOCs (V2, V3)

Accreditation applies to public drinking water matrices.

Total Number of Pages of Report: 3 (includes Chain of Custody)

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Sincerely Celey D. Keene

Laboratory Director



ANALYTICAL RESULTS FOR ETECH ENVIRONMENTAL & SAFETY SOLUTIONS, INC. ATTN: FRED HOLMES P.O. BOX 8469 MIDLAND, TX 79708 FAX TO: (432) 563-2213

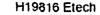
Receiving Date: 05/04/10 Reporting Date: 05/05/10 Project Number: 094001749000 Project Name: NBQIF Project Location: CARLSAD, NM Analysis Date: 05/05/10 Sampling Date: 05/04/10 Sample Type: SOIL Sample Condition: COOL & INTACT @ 6°C Sample Received By: JH Analyzed By: HM

		CI
LAB NO. S	AMPLE ID	(mg/kg)
H19816-1 A	PRIL COMPOSITE SAMPLE	368
V	ASHED SOIL	
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Quality Control		500
True Value QC		500
% Recovery		100
Relative Percer	It Difference	< 0.1

METHOD: Standard Methods4500-Cl'BNote: Analysis performed on a 1:4 w:v aqueous extract.

Chemist

Date



PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remody for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and teceived by Cardinal within thirty (30) days after completion of the applicable service, in no event shall Cardinal be liable for incidential or consequential damages, including, without limitation, business interruptions, toss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of a related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above-stated reasons or otherwise. Results relate only to the samples identified above. This report shall not be reproduced except in full with written approval of Cardinal Laboratories. ARDINAL LABORATORIES

101 East Marland, Hobbs, NM 88240

(575) 393-2326 Fax (575) 393-2476		Page of
Company Name: E-Tech	BILL TO	ANALYSIS REQUEST
Project Manager: Fred Holmes	P.O. #:	
Address: P. C. Bo, SY 69	Company:	
City: M: Jan J State: T, Zip: 79708 Phone #: 432-631-3757 Cell Fax #:	Attn:	
Phone #: 432-631-3757 Cell Fax #:	Address:	
Project #: 094001749000 Project Owner:	City:	
Project Name: NBQTF	State: Zip:	
Project Location: Carlsbad, MM	Phone #:	
Sampler Name: Jack / a deta	Fax #:	
POR LAB USE ONLY MATRIX Lab I.D. Sample I.D. MATRIX	PRESERV SAMPLING	chlor
H19816-) april composite sample	5-410 3:00Pm	
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service. In no event shall Cardinal be sable for incidential or consequential demoges, including intoxit limitation, business interruptions, lass of use, or loss of profits incurred by client, do subsidiaries, all as a successore aneno out of an elated to the performance of services bacevider by Contrast, repetitions of whether such claim is target intoxit and any of the store stable (response of otherwise).

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† Cardinal cannot accept verbal changes. Please fax written changes to 575-393-24∯6.

#26



April 1, 2010

Fred Holmes ETECH Environmental & Safety Solutions, Inc. P.O. Box 8469 Midland, TX 79708

Re: NBQIF (094 001749-000)

Enclosed are the results of analyses for sample number H19570, received by the laboratory on 03/2910 at 4:20 pm.

Cardinal Laboratories is accredited through Texas NELAP for:

Method SW-846 8021 Method SW-846 8260 Method TX 1005 Benzene, Toluene, Ethyl Benzene, and Total Xylenes Benzene, Toluene, Ethyl Benzene, and Total Xylenes Total Petroleum Hydrocarbons

Certificate number T104704398-08-TX. Accreditation applies to solid and chemical materials and non-potable water matrices.

Cardinal Laboratories is accredited though the State of Colorado Department of Public Health and Environment for:

Method EPA 552.2	
Method EPA 524.2	
Method EPA 524.2	

Haloacetic Acids (HAA-5) Total Trihalomethanes (TTHM) Regulated VOCs (V2, V3)

Accreditation applies to public drinking water matrices.

Total Number of Pages of Report: 3 (includes Chain of Custody)

Sincerely, 'eley D. eene

Laboratory Director



PHONE (575) 393-2326 • 101 E MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR ETECH ENVIRONMENTAL & SAFETY SOLUTIONS, INC. ATTN: FRED HOLMES P.O. BOX 8469 MIDLAND, TX 79708 FAX TO: (432) 563-2213

Receiving Date: 03/29/10 Reporting Date: 03/30/10 Project Number: 094 001749-000 (ARENA) Project Name: NBQIF Project Location: CARLSBAD, NM Analysis Date: 03/30/10 Sampling Date: 03/29/10 Sample Type: SOIL Sample Condition: COOL & INTACT @ 4°C Sample Received By: JH Analyzed By: HM

CI

LAB NO. S	SAMPLE ID	(mg/kg)
H19570-1 \	VASHED SOIL 094001749000	272
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		n Barran and Barra Angara a sa mananan an Alin da manada Mangana an Ana ang an Alin - Angara
<b>Quality Control</b>		500
True Value QC		500
% Recovery	n in den stand an den selfer i Menner af verser er er er en de segender och de stand i den selfer i den selfer	100
<b>Relative Perce</b>	nt Difference	< 0.1

METHOD: Standard Methods 4500-CI'B Note: Analysis performed on a 1:4 w:v aqueous extract.

Chemist

04/01/10 Date

H19570 Etech

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy (or any claim ariting, whether haved in contract or tort, whall be limited to the amount pull by client for analyses. All delms, including those for negligence and any other cause whatsoever shall be deemed wrived unless made in writing and received by Cardinal within thirty (30) days dater completion of the applicable sandoe. In no event shall Cardinal be liable for incidental or consequential damages, including whose thirther timitation, business interruptions, loss of use, or less of profils incurred by dient, its subsidiaries, affiliate or records subsidiaries, affiliate or related to the performance of sorrives hereunder by Cardinal, regardings out of or related on the performance of sorrives hereunder by Cardinal, especial divers of the subsidiaries and the samples identified above. This report shall not be reproduced except in full with written approval of Cardinal Laboratories.

CARDINAL LABORATORIES

	(575) 393-2326 F:																	Page_	of			
Company Name:		icon mental			···········	T	E	311	LTO						ANA	LYSI	S RE	QUE	ST			
Project Manager					*****************	P.C	). #:															
Address:						Co	mpany:															
City: Midlas	nd	State: T.	Zip:	79	9705	Att	n:															
Pnone #: 43.2 .		Fax #:				Ad	dress:															
	001749-000	Project Owner:	A	51	n0	Cit	y:															
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2476,

H26



March 8, 2010

Fred Holmes ETECH Environmental & Safety Solutions, Inc. P.O. Box 8469 Midland, TX 79708

Re: 094-001749-000 (Arena)

Enclosed are the results of analyses for sample number H19376, received by the laboratory on 03/04/10 at 3:35 pm.

Cardinal Laboratories is accredited through Texas NELAP for:

Method SW-846 8021 Method SW-846 8260 Method TX 1005 Benzene, Toluene, Ethyl Benzene, and Total Xylenes Benzene, Toluene, Ethyl Benzene, and Total Xylenes Total Petroleum Hydrocarbons

Certificate number T104704398-08-TX. Accreditation applies to solid and chemical materials and non-potable water matrices.

Cardinal Laboratories is accredited though the State of Colorado Department of Public Health and Environment for:

Method EPA 552.2HMethod EPA 524.2TMethod EPA 524.2T

Haloacetic Acids (HAA-5) Total Trihalomethanes (TTHM) Regulated VOCs (V2, V3)

Accreditation applies to public drinking water matrices.

Total Number of Pages of Report: 3 (includes Chain of Custody)

Sincerely eene

Laboratory Director

This report conforms with NELAP requirements.



ANALYTICAL RESULTS FOR ETECH ENVIRONMENTAL & SAFETY SOLUTIONS, INC. ATTN: FRED HOLMES P.O. BOX 8469 MIDLAND, TX 79708 FAX TO: (432) 563-2213

Receiving Date: 03/04/10 Reporting Date: 03/05/10 Project Number: 094-001749-000 (ARENA) Project Name: NBQIF Project Location: CARLSBAD, NM Analysis Date: 03/05/10 Sampling Date: 03/04/10 Sample Type: SOIL Sample Condition: INTACT @ 24°C Sample Received By: JH Analyzed By: HM

	CI
LAB NO. SAMPLE ID	(mg/kg)
H19376-1 WASHED SOIL	208
Quality Control	500
True Value QC	500
% Recovery	100
Relative Percent Difference	2.0
METHOD: Standard Methods	4500-CI'B

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

Chemist

H19376 Etech



PLEASE NOTE: Liability and Damages. Cardinal's flability and cleant's exclusive remedy for any claim, arising, whether based in contract or lort, shall be fimited to the amount paid by client for analyset All claims, including those for negligence and any other cause whatsoever shall be deemed whived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service. In no event shall Cardinal be liable for motionts or consequential damages, including, without limitation, business interruptions, loss of uso, or loss of profits incurred by client, its subsidiants affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above-stated reasons or otherwise. Result relate only to the samples identified above. This report shall not be reproduced except in full with written opproval of Cardinal taboratories. ARDINAL LABORATORIES

101 East Marland, Hobbs, NM 88240 (575) 393-2326 East (575) 393-2476

(575) 393-2326 Fax (575) 393-2	476												Page	of			
Company Name: E-Tech					BI	L TO					ANAL	YSIS	REQU	EST			
Project Manager: Fred Holmes				Р.(	O. #:												
Address:			-	Co	ompany:												
City: Milland State: Tx	Zip	. 7	9708	Att	tn:												
Phone #: Fax #:	,			Ad	Idress:												
Project #: 094-001749-000 Project Owner	:	ts a	19	Ci	ty:	lývilalyj lynder Versenser a											
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† Cardinal cannot accept verbal changes. Please fax written changes to 575-393-2476.

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PHONE (575) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

July 1, 2009

Fred Holmes Etech Environmental & Safety Solutions, Inc. P.O. Box 8469 Midland, TX 79708

Re: NBQU Injection - Soil Washing

Enclosed are the results of analyses for sample number H17718, received by the laboratory on 06/30/09 at 9:29 am.

Cardinal Laboratories is accredited through Texas NELAP for:

Method SW-846 8021 Method SW-846 8260 Method TX 1005 Benzene, Toluene, Ethyl Benzene, and Total Xylenes Benzene, Toluene, Ethyl Benzene, and Total Xylenes Total Petroleum Hydrocarbons

Certificate number T104704398-08-TX. Accreditation applies to solid and chemical materials and non-potable water matrices.

Total Number of Pages of Report: 3 (includes Chain of Custody)

Sincerelv

Celey D. Reene Laboratory Director



Receiving Date: 06/30/09 Reporting Date: 06/30/09 Project Number: 094-1749 Project Name: NBQU INJECTION-SOIL WASHING Project Location: EDDY COUNTY, NM

Analysis Date: 06/30/09 Sampling Date: 01/14/09 Sample Type: SOIL Sample Condition: INTACT @ 24°C Sample Received By: ML Analyzed By: HM

	CI
LAB NO. SAMPLE ID	(mg/kg)
H17718-1 01-14-2009	160
Quality Control	500
True Value QC	500
% Recovery	100
Relative Percent Difference	<0.1

4500-CI'B METHOD: Standard Methods Note: Analysis performed on a 1:4 w:v aqueous extract. Analyzed outside EPA recommended hold time, however sample results should not be affected.

Chemist

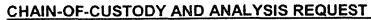
07/01/09 Date

### H17718 Etech

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the emount paid by client for analyses. All claims, including house for negligence and any other course whatoover shall be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service, in no event shall Cardinal be lable for incidental or consequential damages, including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidianes, affiliates or successors ensuing out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above-stated reasons or otherwise. Results relate only to the samples identified above. This report shall not be reproduced except in hull with written approval of Cardinal Laboratories.

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-	(505) 393-2326 Fax (5	05) 393-24	76																	-				
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Project Manage	r: Fred Holmes					`		P.(	). #:	94	1749000													
Address: P.O	. Box 8469		* ****					Co	mpa	ņy:														
City: Midland	State:	TX 2	Zip:			79	9708	All	<u>n:</u>															
Phone #: 432	-563-2200 Fax	#: 4	132-5	63-2	2213			Ad	dres	s:														
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Project Location	n: Eddy County, NM							Ph	one	#:														
Sampler Name:	Jay Latta - Fred Holmes							Fa	x #:															
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Page 1 of 1





PHONE (575) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR ETECH ENVIRONMENTAL & SAFETY SOLUTIONS, INC. ATTN: FRED HOLMES P.O. BOX 8469 MIDLAND, TX 79708 FAX TO: (432) 563-2213

Receiving Date: 10/30/09 Reporting Date: 11/02/09 Project Number: 094-1749-000 Project Name: NBQU INJECTION - SOIL WASHING Project Location: EDDY COUNTY, NM Analysis Date: 11/02/09 Sampling Date: 10/29/09 Sample Type: SOIL Sample Condition: INTACT Sample Received By: ML Analyzed By: HM

		CI
LAB NO.	SAMPLE ID	(mg/kg)
H18612-1	102909 WASH	144
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		*
Quality Cor	ntrol	500
True Value		500
% Recover	y ~ ~	100
Relative Pe	ercent Difference	2.0
•		
METHOD: St	andard Methods	4500-CI'B

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

Mene Chemist

Date

### H18612 Etech

PLEASE NOTE: Liability and Damages. Cardinal's fability and client's exclusive remedy for my claim arising, whether based in contract or tent, shall be limited to the amount paid by chent for analyzes. All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable services in no event shall Cardinal be liable for incidental or consequential damages, including, without hintigtion, business interruptions, loss of use, or loss of profils incurred by clean its subudantes, affiliates or successors arising out of or related to the performance of services mercured by Cardinal waintie sub-damines, and interruptions, loss of use, or loss of profils incurred by clean its subudantes, relate only to the samples identified above. This report shall not be reproduced except in full with written approval of Cardinal Laboratories.

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101 East Marland, Hobbs, NM 88240

### CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

Page 1 of 1

	(505) 393-2326 Fax (505) 393-2	476																			
Company Name					Ľ			LL TO						ANAL	YSIS	RE	QUE	ST			
Project Manage	r: Fred Holmes				Ľ	P. Ø.	. #: 94	1749000													
Address: P.O	- Box 8469				- 10	Çon	npany:										1				
City: Midland	State: TX	Zip:		79	708	Attn	n:														
Phone #: 432	-563-2200 Fax #:	432-6	563-2	2213		Add	iress:														
Project #: 094	-1749-000 Project Owne	r:				City				1			ł								
Project Name:	NBQU Injection - Soil Washing					Stat	te:	Zip:	-												
Project Location	h: Eddy County, NM	<b></b> .				Pho	one #:			1											
Sampler Name:	Jay Latta - Fred Holmes					Fax				1											
Lab I.D.	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	WATER WASTEWATER SOIL			ACID/BASE: A ICE / COOL B OTHER : A	DATE	TIME	TPH (8015)	TPH Ext (TX 1005)	Chlorides									
H18612-1	102909 Wash	c	1	<u>ن</u> کر کر کر ۳۰ م		¥.	×	29-Oct	1247		<u> </u>	x	1		†						
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† Cardinal cannot accept verbal changes. Please fax written changes to 575-393-2476.



PHONE (575) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

August 28, 2009

Fred Holmes ETECH Environmental & Safety Solutions, Inc. P.O. Box 8469 Midland, TX 79708

Re: NBQU Injection - Soil Washing

Enclosed are the results of analyses for sample number H18112, received by the laboratory on 08/28/09 at 7:25 am.

Cardinal Laboratories is accredited through Texas NELAP for:

Method SW-846 8021 Method SW-846 8260 Method TX 1005 Benzene, Toluene, Ethyl Benzene, and Total Xylenes Benzene, Toluene, Ethyl Benzene, and Total Xylenes Total Petroleum Hydrocarbons

Certificate number T104704398-08-TX. Accreditation applies to solid and chemical materials and non-potable water matrices.

Cardinal Laboratories is accredited though the State of Colorado Department of Public Health and Environment for:

Method EPA 552.2	Haloacetic Acids (HAA-5)
Method EPA 524.2	Total Trihalomethanes (TTHM)
Method EPA 524.2	Regulated VOCs (V2, V3)

Accreditation applies to public drinking water matrices.

Total Number of Pages of Report: 3 (includes Chain of Custody)

Sincerely Celey D. Keene

Celey D. Keene Laboratory Director



Receiving Date: 08/28/09 Reporting Date: 08/28/09 Project Number: 094-1749 Project Name: NBQU INJECTION - SOIL WASHING Project Location: EDDY COUNTY, NM Analysis Date: 08/28/09 Sampling Date: 08/25/09 Sample Type: SOIL Sample Condition: INTACT @ 10°C Sample Received By: AB Analyzed By: HM

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	Cl
LAB NO. SAMPLE ID	(mg/kg)
H18112-1 082509 WASH	160
Quality Control	500
True Value QC	500
% Recovery	100
Relative Percent Difference	2.0

METHOD: Standard Methods 4500-CI'B Note: Analysis performed on a 1:4 w:v aqueous extract.

Chemist

<u>R/28/09</u>

H18112 Etech



PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remody for any claim arising, whether based in contract or fort, shall be limited to the emount paid by client for analyses All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in whiting and received by Cardinal within thirty (30) days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including, without limitation, business interruptions, loss of use, or loss of profits incurred by Client, its subsidiaries affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above-stated reasons or otherwise. Result relate only to the samples identified above. This report shall not be reproduced except in full with written approval of Cardinal Laboratories.



# CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

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101 East Marland, Hobbs, NM 88240 (505) 393-2326 Fax (505) 393-2476 Page 1 of 1

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Project Manager:	Fred Holmes		*********		*****			1	P.0	. #:			749000							1						
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City: Midland	State	: TX :	Zip:		••••		797	'08	Attı	1:		*********														
Phone #: 432-563	3-2200 Fa	IX #:	432-	-563	-221	3			Add	ires	s:															
Project #: 094-174	49 Pr	oject Owner:	******						City										ļ							
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Project Location:	Eddy County, NM								Pho	ono	#:															
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+ Cardinal cannot accept verbal changes. Please fax written changes to 575-393-2476.



September 14, 2009

Fred Holmes ETECH Environmental & Safety Solutions, Inc. P.O. Box 8469 Midland, TX 79708

Re: NBQU Injection - Soil Washing

Enclosed are the results of analyses for sample number H18227, received by the laboratory on 09/11/09 at 8:00 am.

Cardinal Laboratories is accredited through Texas NELAP for:

Method SW-846 8021 Method SW-846 8260 Method TX 1005 Benzene, Toluene, Ethyl Benzene, and Total Xylenes Benzene, Toluene, Ethyl Benzene, and Total Xylenes Total Petroleum Hydrocarbons

Certificate number T104704398-08-TX. Accreditation applies to solid and chemical materials and non-potable water matrices.

Cardinal Laboratories is accredited though the State of Colorado Department of Public Health and Environment for:

Method EPA 552.2 Method EPA 524.2 Method EPA 524.2 Haloacetic Acids (HAA-5) Total Trihalomethanes (TTHM) Regulated VOCs (V2, V3)

Accreditation applies to public drinking water matrices.

Total Number of Pages of Report: 3 (includes Chain of Custody)

Sincerely,

Celey D. Keene Laboratory Director

This report conforms with NELAP requirements.



Receiving Date: 09/11/09 Reporting Date: 09/13/09 Project Number: 094-1749 Project Name: NBQU INJECTION - SOIL WASHING Project Location: EDDY COUNTY, NM Analysis Date: 09/11/09 Sampling Date: 09/09/09 Sample Type: SOIL Sample Condition: INTACT @ 22.5°C Sample Received By: CK Analyzed By: HM

		CI
LAB NO.		(mg/kg)
H18227-1	090909 WASH COMPOSITE	144
	fr d'Annony source announce at source de source d'an announce announce and announce and a ball or y day source d	
		•
Quality Con	trol	500
True Value		500
% Recovery		100
	rcent Difference	< 0.1

METHOD: Standard Methods4500-CI'BNote: Analysis performed on a 1:4 w:v aqueous extract.

Hure Chemist

09/14/09

Date

#### H18227 Etech



FLEASE NOTE: Liability and Damages. Cardinal's bability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All calms, including trace for negligence and any other cause whotscover shall be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service in no event shall cardinal be liable for incidential or consequencial camages, including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, effiliates or successors arising out or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above-stated masons or otherwise. Results relate only to the camptos identified above. This report shall not be reproduced except in full with written approval of Cardinal Laboratories.



CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

101 East Marland, Hobbs, NM 88240

(505) 393-2326 Fax (505) 393-2476

Page 1 of 1

Company Name: Elech Env. & Safe	aty Solutions, Inc.						1		. 1	BIL	LTO						ANA	LYSI	S RE	QUE	ST			
Project Manager: Fred Holmes						Ι	P.0	). #:		941	749000													
Address: P.O. Box 8469							Cor	mpa	any:	:						1								
City: Midland	State: TX Zi	p:			797	708	Atti	n:																
Phone #: 432-563-2200	Fax #: 43	2-56	3-22	13	-		Ado	dres	s:															
Project #: 094-1749	Project Owner:						City	y:																
Project Name: NBQU Injection - Soil	Washing						Sta	to:			Zip:				ļ									
Project Location: Eddy County, NM							Pho	one	#:															
Sampler Name: Jay Latta - Fred H	loimes		_					¢#:														2		
FOR LAB USE ONLY				M/	TRE	X		PRE	SE	RV	SAMPLI	NG												
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**†** Cardinal cannot accept verbal changes. Please fax written changes to 575-393-2476.

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PHONE (575) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

August 25, 2009

Fred Holmes ETECH Environmental & Safety Solutions, Inc. P.O. Box 8469 Midland, TX 79708

Re: North Benson Queen Injection Facility

Enclosed are the results of analyses for sample number H18061, received by the laboratory on 08/24/09 at 8:30 am.

Cardinal Laboratories is accredited through Texas NELAP for:

Method SW-846 8021. Method SW-846 8260 Method TX 1005 Benzene, Toluene, Ethyl Benzene, and Total Xylenes Benzene, Toluene, Ethyl Benzene, and Total Xylenes Total Petroleum Hydrocarbons

Certificate number T104704398-08-TX. Accreditation applies to solid and chemical materials and non-potable water matrices.

Cardinal Laboratories is accredited though the State of Colorado Department of Public Health and Environment for:

Method EPA 552.2	Haloacetic Acids (HAA-5)
Method EPA 524.2	Total Trihalomethanes (TTHM)
Method EPA 524.2	Regulated VOCs (V2, V3)

Accreditation applies to public drinking water matrices.

Total Number of Pages of Report: 3 (includes Chain of Custody)

Sincerely III

Celey D/Keene Laboratory Director

This report conforms with NELAP requirements.



Receiving Date: 08/24/09 Reporting Date: 08/24/09 Project Number: NOT GIVEN Project Name: NORTH BENSON QUEEN INJECTION FACILITY Project Location: NOT GIVEN Analysis Date: 08/24/09 Sampling Date: 08/21/09 Sample Type: SOIL Sample Condition: INTACT @ 21°C Sample Received By: ML Analyzed By: HM

	CI
LAB NO. SAMPLE ID	(mg/kg)
H18061-1 NON-WASHED SOIL	1,120
H18061-2 WASHED SOIL	96
Quality Control	500
True Value QC	500
% Recovery	100
Relative Percent Difference	< 0.1

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

Chemist

Pholog

Date

4500-CI'B

#### H18061 Etech

PLEASE NOTE: Liability and Damages. Cardinal's isobility and client's exclusive remody for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All claims, including those for nogligence and any other cause whatsoover shall be deemed walved unless made in writing and roce/ved by Cardinal within thirty (30) days after completion of the applicable service, in no event shall Cardinal be liable for incidential or consequential damages, including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or rotated to the performance of servicer by Cardinal, regardless of whether such claim is based upon any of the above-stated reasons or otherwise. Results relate only to the samples idontified above. This report shall not be reproduced except in full with written approval of Cardinal Laboratories. ARDINAL LABORATORIES 101 East Marland, Hobbs, NM 88240

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4500-CI'B

ANALYTICAL RESULTS FOR ETECH ENVIRONMENTAL & SAFETY SOLUTIONS, INC. ATTN: FRED HOLMES P.O. BOX 8469 MIDLAND, TX 79708 FAX TO: (432) 563-2213

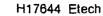
Receiving Date: 06/17/09 Reporting Date: 06/18/09 Project Number: 094-1749-000 Project Name: NBQU INJ. Project Location: NOT GIVEN Analysis Date: 06/18/09 Sampling Date: 06/17/09 Sample Type: SOIL Sample Condition: INTACT @ 33<sup>o</sup>C Sample Received By: ML Analyzed By: AB

	CI
LAB NO. SAMPLE ID	(mg/kg)
H17644-1 TREATED 0617	144
Quality Control	500
True Value QC	500
% Recovery	100
Relative Percent Difference	<0.1

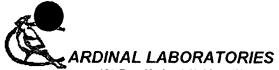
METHOD: Standard Methods Note: Analysis performed on a 1:4 w:v aqueous extract.

Chemist

010/13/09 Date



PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim ansing, whether based in contract or tort, shall be limited to the amount paid by client for analysos. All claims, including those for negligence and any other cause whatsoever shall be deemed warved unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including, without limitation, business interruptions, toss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardloss of whether such claim is based upon any of the above-stated reasons or otherwise. Results relate only to the samples identified above. This report shall not be reproduced except in full with writen approval of Cardinal Laboratories.



# CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

101 East Marland, Hobbs, NM 88240

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Page \_\_\_\_\_ of \_\_\_\_

Company Name: Etech Env. & Safety Solutions, Inc.	BILL TO	ANALYSIS REQUEST
Project Manager: Fred Holmes	P.O. #:0941749	
Address: P.O. Box 8469	Company:	
City: Midland State: TX Zip: 7970	8 Attn:	
Phone #: 432-563-2200 Fax #: 432-563-2213	Address:	
Project #: 094-1748-000 Project Owner:	City:	
Project-Name: NBQU INJ-	State: Zip:	
Project Location:	Phone #:	
Sampler Name:	Fax #:	
FOR LAB USE ONLY MATRIX	PRESERV. SAMPLING	
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PLEASE HOTE: Labelity and Damages. Cardinal's listicity and client's entirative remedy for any claim ansing whether based in cont		
analyses. An clasmic excluding those for negligence and any other cause whatbacever shall be deemed waved unless made in writing service. In no ovent shall Cardinal be latefellow incidental or consequential damages, including without imitation, business materization efficience or succession anning out of or related to the parformance of services horewolder by Candhal, repardiests of synthem such of the services in succession anning out of or related to the parformance of services horewolder by Candhal, repardiests of synthem such of the services of anning out of or related to the parformance of services horewolder by Candhal, repardiests of synthem such of the services of anning out of our related to the parformance of services horewolder by Candhal, repardiests of synthemic such of the services of	is, loss of use, or loss of profits incurred by chent, its subside	latios, and all costs of collections, including allornay's loss,
Sampler Relinquistied; Data: Data: Received By:	Phone Re	lesult: 🖸 Yes 🖾 No 🛛 Add'l Phone #:
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Relinduished By Dator 2 Scar Received By: August Cline Time: 50 pm (12)	Ition CHECKED BY: (Initials)	
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† Cardinal cannot accept verbal changes. Please fax written changes to 575-393-2476.



July 1, 2009

Fred Holmes Etech Environmental & Safety Solutions, Inc. P.O. Box 8469 Midland, TX 79708

Re. NBQU Injection - Soil Washing

Enclosed are the results of analyses for sample number H17722, received by the laboratory on 06/30/09 at 9:30 am.

Cardinal Laboratories is accredited through Texas NELAP for:

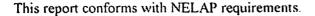
Method SW-846 8021 Method SW-846 8260 Method TX 1005 Benzene, Toluene, Ethyl Benzene, and Total Xylenes Benzene, Toluene, Ethyl Benzene, and Total Xylenes Total Petroleum Hydrocarbons

Certificate number T104704398-08-TX. Accreditation applies to solid and chemical materials and non-potable water matrices.

Total Number of Pages of Report: 3 (includes Chain of Custody)

Sincerely, June

Celey D. Keene Laboratory Director





Receiving Date: 06/30/09 Reporting Date: 06/30/09 Project Number: 094-1749 Project Name: NBQU INJECTION-SOIL WASHING Project Location: EDDY COUNTY, NM Analysis Date: 06/30/09 Sampling Date: 06/15/09 Sample Type: SOIL Sample Condition: INTACT @ 24<sup>0</sup>C Sample Received By: ML Analyzed By: HM

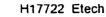
	CI
LAB NO. SAMPLE ID	(mg/kg)
H17722-1 06-15-2009	192
Quality Control	500
	500
True Value QC	
% Recovery	100
Relative Percent Difference	<0.1

METHOD: Standard Methods Note: Analysis performed on a 1:4 w:v aqueous extract.

for Chemist

07/01/09

4500-CI'B



PLEASE NOTE: Liability and Damages. Cardinal's tability and client's exclusive remedy for any claim arising, whother based in contract or tort, shall be limited to the amount paid by client for analyses. All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in witing and received by Cardinal within thirty (30) days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including, without limitation, business interruptions, loss of use, or boss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above-stated reasons or otherwise. Results rolate only to the samples identified above. This report shall not be reproduced except in full with written approval of Cardinal Laboratories.



# CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

101 East Marland, Hobbs, NM 88240

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Page 1 of 1

Company Name	Etech Env. & Safe	ty Solutions, Inc.						Т			B	ILL	ro						ANA	LYS	SR	EQUE	ST			
Project Manage	r: Fred Holmes								P.O.	. #:	9	41749	000						T			Ι	1			
Address: P.C	. Box 8469								Con	npa	ny:															
City: Midland	S	itate: TX	Zip	:			797	08	Attn	1:			-													
Phone #: 432	-563-2200	Fax #:	432	2-56	3-2:	213			Add	Ires	s:															
Project #: 094	-1749	Project Owner	:						City	r:				15 × 200 1000 0000.0												
Project Name:	NBQU Injection - Soil V	Vashing							Stat	te:		Zip:														
Project Locatio	n: Eddy County, NM			~ ***					Pho	ne	#:															
Sampler Namo:	Jay Latta - Fred Ho	olmes	~~~~	·	·····				Fax													ł				
FOR LAB USE ONLY	Sample I	. <b>D</b> .	(G)RAB OR (C)OMP.	# CONTAINERS	GROUNDWATER		TRIX	SLUDGE			SER COOL			TIME	IPH (8015)	TPH Ext (TX 1005)	Chiorides									
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July 1, 2009

Fred Holmes Etech Environmental & Safety Solutions, Inc. P.O. Box 8469 Midland, TX 79708

Re: NBQU Injection - Soil Washing

Enclosed are the results of analyses for sample number H17721, received by the laboratory on 06/30/09 at 9:30 am.

Cardinal Laboratories is accredited through Texas NELAP for:

Method SW-846 8021 Method SW-846 8260 Method TX 1005 Benzene, Toluene, Ethyl Benzene, and Total Xylenes Benzene, Toluene, Ethyl Benzene, and Total Xylenes Total Petroleum Hydrocarbons

Certificate number T104704398-08-TX. Accreditation applies to solid and chemical materials and non-potable water matrices.

Total Number of Pages of Report: 3 (includes Chain of Custody)

Sincerely, ane

Celey D. Keene Laboratory Director



Receiving Date: 06/30/09 Reporting Date: 06/30/09 Project Number: 094-1749 Project Name: NBQU INJECTION-SOIL WASHING Project Location: EDDY COUNTY, NM

Analysis Date: 06/30/09 Sampling Date: 04/29/09 Sample Type: SOIL Sample Condition: INTACT @ 24<sup>o</sup>C Sample Received By: ML Analyzed By: HM

	CI
LAB NO. SAMPLE ID	(mg/kg)
H17721-1 04-29-2009	224
	······
Quality Control	500
True Value QC	500
% Recovery	100
Relative Percent Difference	<0.1

METHOD: Standard Methods 4500-CI'B Note: Analysis performed on a 1:4 w:v aqueous extract. Analyzed outside EPA recommended hold time, however sample results should not be affected.

8 I M Chemist

07/01/09 Date



H17721 Etech

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive ramedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All claims, including those for negligence and any other cause whatsower chails be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiance, affiliates or successors adding use a client to the parformance of tarvices hereunder by Cardinal, regardless of whether such claim is based upon any of the above-stated reasons or otherwise. Results relate only to the samples identified above, This report shall not be reproduced except in full with written approval of Cardinal Laboratories.





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Page 1 of 1

Company Name	Etech Env. & Safety Solutions, Inc.							n,	E	11	LTO		:				ANA	LYSI	S RE	QUE	ST			
Project Manage	r: Fred Holmes						P.C	), #:		941	749000					[								
Address: P.O	. Box 8469						Coi	mpa	iny:									ļ						
City: Midland	State: TX	Zip:			79	708	Atte	n:																
Phone #: 432	-563-2200 Fax #:	432-5	63-2	213			Add	dres	5 <b>5</b> :	~ ~~~						ļ								
Project #: 094	1749 Project Owner	r:					City	<b>y</b> :																
Project Name:	NBQU Injection - Soil Washing						Sta	te:			Zip:	<b>-</b>												
Project Location	: Eddy County, NM						Pho	one	#:															
Sampler Name:	Jay Latta - Fred Holmes						Fax	-									1		1	}				
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† Cardinal cannot accept verbal changes. Please fax written changes to 575-393-2476.

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Receiving Date: 03/27/09 Reporting Date: 03/30/09 Project Numbner: 094-1749-000 Project Name: NBQU INJECTION FACILITY Project Location: CARLSBAD

Analysis Date: 03/30/09 Sampling Date: 03/26/09 Sample Type: SOIL Sample Condition: INTACT Sample Received By: NF Analyzed By: HM

	CI
LAB NO. SAMPLE ID	(mg/kg)
H17148-1 CLEAN	368
H17148-2 IN PROGRESS	400
Quality Control	500
True Value QC	500
% Recovery	100
Relative Percent Difference	< 0.1

METHOD: Standard Methods 4500-CI'B Note: Analyses performed on 1:4 w:v aqueous extracts.

Chemist

<u>03|</u>38/09

Date

#### H17148 Etech

PLEASE NOTE: Liability and Damages. Cardina's liability and clion's exclusive remody for any claim arising, whether based in contract or fort, shall be limited to the amount pax by client for analyse; All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above-stated reasons or otherwise. Result relate only to the samples identified above. This report shall not be reproduced except in full with written approval of Cardinal Laboratories. **RDINAL LABORATORIES** 

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	101 East Marland, Hobbs, NM 88				Page <u>1</u> of <u>1</u>						
	(505) 393-2326 Fax (505) 393-	2476	· · · · ·								
Company Name	Etech Env. & Safety Solutions, Inc.	2.	BILL TO	ANALYSIS REQUEST							
Project Manage	r: Fred Holmes		P.O. #: 0941749000								
Address: P.C	). Box 8469		Company: Etech								
City: Midland	State: TX	Zip: 79708	Attn:								
Phone #: 432	-563-2200 Fax #:	432-563-2213	Address:								
Project #: 094	-1749-000 Project Own	or:	City:								
Project Name:	NBQU Injection Facility		State: Zip:								
Project Location	n: Carlsbad		Phone #:								
Sampler Name:	Jay Latta		Fax #:								
FOR LAB USE ONLY		MATRIX	PRESERV. SAMPLING								
Lab I.D.	Sample I.D.	(G)RAB OR (C)OMP # CONTAINERS GROUNDWATER WASTEWATER Soil OIL	OTHER : ACIDIBASE: ICE / COOL OTHER : BWIL	TPH (8015) TPH Ext (TX 1005) Chlorides							

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PLEASE NOTE: Libbity and Damages, Cardina's tability and client's exclusive remedy for any claim arising whether based in centract or tort, shall be limited to the amount paid by the client for the	
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Terms and Conditions: interest will be charged on all accounts more than 30 days past due at the rate of 24% per annum from the original date of invosce. and all costs of collections, including attorney's fees

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 $\dagger$  Cardinal cannot accept verbal changes. Please fax written changes to 575-393-2476.  $^{-\ell}$ 

### CHAIN-OF-CUSTODY AND ANALYSIS REQUEST



July 1, 2009

Fred Holmes Etech Environmental & Safety Solutions, Inc. P.O. Box 8469 Midland, TX 79708

Re: NBQU Injection - Soil Washing

Enclosed are the results of analyses for sample number H17720, received by the laboratory on 06/30/09 at 9:30 am.

Cardinal Laboratories is accredited through Texas NELAP for:

Method SW-846 8021 Method SW-846 8260 Method TX 1005 Benzene, Toluene, Ethyl Benzene, and Total Xylenes Benzene, Toluene, Ethyl Benzene, and Total Xylenes Total Petroleum Hydrocarbons

Certificate number T104704398-08-TX. Accreditation applies to solid and chemical materials and non-potable water matrices.

Total Number of Pages of Report: 3 (includes Chain of Custody)

Sincerely,

Celey D.(Keene Laboratory Director



Receiving Date: 06/30/09 Reporting Date: 06/30/09 Project Number: 094-1749 Project Name: NBQU INJECTION-SOIL WASHING Project Location: EDDY COUNTY, NM Analysis Date: 06/30/09 Sampling Date: 03/09/09 Sample Type: SOIL Sample Condition: INTACT @ 24<sup>0</sup>C Sample Received By: ML Analyzed By: HM

LAB NO. SAMPLE ID	CI <sup></sup> (mg/kg)
H17720-1 03-09-2009	160
Quality Control	500
True Value QC	500
% Recovery	100
Relative Percent Difference	<0.1

METHOD: Standard Methods 4500-CI'B Note: Analysis performed on a 1:4 w:v aqueous extract. Analyzed outside EPA recommended hold time, however sample results should not be affected.

07/01/09

Date

#### H17720 Etech

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CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

101 East Marland, Hobbs, NM 88240 (505) 393-2326 Fax (505) 393-2476 Page <u>1</u> of <u>1</u>

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Project Manager	r: Fred Holmes				1			.0. ‡			1749000		T		Γ	Γ	Γ	Ι	1					
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Project #: 094	-1749	Project Owner:					c	ity:	****															
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† Cardinal cannot accept verbal changes. Please fax written changes to 575-393-2476.

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July 1, 2009

Fred Holmes Etech Environmental & Safety Solutions, Inc. P.O. Box 8469 Midland, TX 79708

Re: NBQU Injection - Soil Washing

Enclosed are the results of analyses for sample number H17719, received by the laboratory on 06/30/09 at 9:29 am.

Cardinal Laboratories is accredited through Texas NELAP for:

Method SW-846 8021 Method SW-846 8260 Method TX 1005 Benzene, Toluene, Ethyl Benzene, and Total Xylenes Benzene, Toluene, Ethyl Benzene, and Total Xylenes Total Petroleum Hydrocarbons

Certificate number T104704398-08-TX. Accreditation applies to solid and chemical materials and non-potable water matrices.

Total Number of Pages of Report: 3 (includes Chain of Custody)

Sincerely. len

Celey D. Keene Laboratory Director



Receiving Date: 06/30/09 Reporting Date: 06/30/09 Project Number: 094-1749 Project Name: NBQU INJECTION-SOIL WASHING Project Location: EDDY COUNTY, NM Analysis Date: 06/30/09 Sampling Date: 02/16/09 Sample Type: SOIL Sample Condition: INTACT @ 24<sup>0</sup>C Sample Received By: ML Analyzed By: HM

	CI
LAB NO. SAMPLE ID	(mg/kg)
H17719-1 02-16-2009	432
Quality Control	500
True Value QC	500
% Recovery	100
Relative Percent Difference	<0.1

#### METHOD: Standard Methods

4500-CI'B

Note: Analysis performed on a 1:4 w:v aqueous extract. Analyzed outside EPA recommended hold time, however sample results should not be affected.

Keen 1) Chemist

07/01/09

Date

### H17719 Etech

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# CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

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City:         Midland         State:         TX         Zip:         79708           Phone #:         432-563-2200         Fax #:         432-563-2213						—́⊂	Attn: Address:																			
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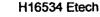
Receiving Date: 12/16/08 Reporting Date: 12/17/08 Project Number: 094-1749-000 Project Name: NBQU Project Location: CARLSBAD, NM Analysis Date: 12/17/08 Sampling Date: 12/15/08 Sample Type: SOIL Sample Condition: COOL & INTACT Sample Received By: ML Analyzed By: TR

LAB NO. SAMPLE ID	CF (mg/kg)
H16534-1 BATCH 12-15	240
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Quality Control	490
True Value QC	500
% Recovery	98.0
Relative Percent Difference	<0.1

METHOD: Standard Methods 4500-Cl B Note: Analysis performed on a 1:4 w:v aqueous extract.

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12-17-08 Date



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	(575) 393-2326 Fax (575) 393-2	476																	Page_	of			
Company Name: FIECH ENU.									BI	LL TO		ANALYSIS REQUEST											
Project Manager: F. HOLDIES								), #:											7				
Address: 💬	0. 30x 8469	_					Cor	mpar	ıy:									·					
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FOR LAB USE ONLY					MATRI	X		PRES	SERV	SAMPL	NG												
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† Cardinal cannot accept verbal changes. Please fax written changes to 575-393-2476.



Receiving Date: 12/04/08 Reporting Date: 12/04/08 Project Owner: NOT GIVEN Project Name: NORTH BENSON QUEEN INJECTION FACILITY Project Location: NOT GIVEN

Analysis Date: 12/04/08 Sampling Date: 12/04/08 Sample Type: SOIL Sample Condition: COOL & INTACT Sample Received By: AB Analyzed By: HM

		CI
LAB NO.	SAMPLE ID	(mg/kg)
H16470-1	POST SAMPLE #1	272
H16470-2	PRE SAMPLE	1,500
Quality Con		500
True Value	QC	500
% Recovery		100
Relative Pe	rcent Difference	2.0
METHOD: Sta	Indard Methods	4500-CI'B

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

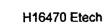
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12-05-08 Date

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ARDINAL LABORATORIES 101 East Marland, Hodds, NM 88240

(575) 393-2326 Fax (575) 393-2476		Page of										
Company Name: ETECH Environ Mental	BILL TO	ANALYSIS REQUEST										
Project Manager: Fred	P.O. #:											
Address:	Company:											
City: State: Zip:	Attn:											
Phone #: Fax #:	Address:											
Project #: Project Owner:	City:											
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† Cardinal cannot accept verbal changes. Please fax written changes to 575-393-2476.