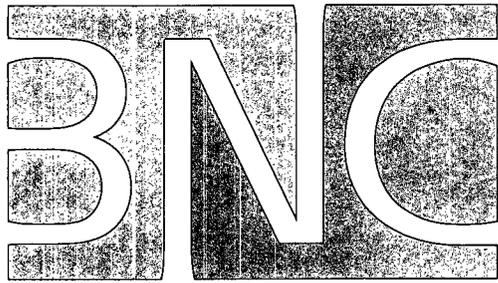


GW - 139

REPORTS

YEAR(S):

2003



BNC Environmental Services, Inc.

SOIL ASSESSMENT AND CLOSURE REPORT

**DUKE ENERGY FIELD SERVICES, L.P.
CP-1 COMPRESSOR STATION (GW-139)
EDDY COUNTY, NEW MEXICO**



AUSTIN | DALLAS | HOUSTON | MIDLAND

BNC Environmental Services, Inc.
BNC Engineering, LLC

SOIL ASSESSMENT AND CLOSURE REPORT

**DUKE ENERGY FIELD SERVICES, L.P.
CP-1 COMPRESSOR STATION (GW-139)
EDDY COUNTY, NEW MEXICO**

PREPARED FOR:

Mr. Steve Weathers
DUKE ENERGY FIELD SERVICES, L.P.
370 17th Street, Ste. 900
Denver, Colorado 80202

PREPARED BY:

BNC Environmental Services, Inc.
2135 S Loop 250 West
Midland, Texas 79703

A handwritten signature in black ink, appearing to read 'A M Hale', written over a horizontal line.

Aaron M. Hale, Project Geologist

A handwritten signature in black ink, appearing to read 'Thomas C Larson', written over a horizontal line.

Thomas C. Larson, Senior Geologist

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INTRODUCTION

BNC Environmental Services, Inc. (BNC) has prepared this Soil Assessment and Closure Report on behalf of Duke Energy Field Services (DEFS). This report summarizes closure activities performed at the DEFS CP-1 compressor station located south of Highway 31, approximately 1.25 miles northeast of Loving in Eddy County, New Mexico. DEFS formerly operated a natural gas compressor on the site. DEFS notified the NMOCD in January 2003 of their intent not to renew their discharge permit (GW-139) for this compressor. The New Mexico Oil Conservation Division (NMOCD) requested that a closure workplan be submitted before the discharge permit expired in April, 2003. A closure workplan was prepared by BNC, submitted to the NMOCD and subsequently approved on April 28, 2003.

DEFS and BNC implemented the NMOCD approved site closure workplan in June, 2003. Site activities were conducted from June thru August, 2003. All soil assessment and closure activities were conducted in accordance with NMOCD guidelines and the BNC closure workplan.

BNC, on behalf of DEFS, respectfully requests written acknowledgement from the NMOCD regarding approved closure activities performed at this site.

SECTION I

PROJECT BACKGROUND

The site is located south of Highway 31, approximately 1.25 miles northeast of Loving in Eddy County, New Mexico (FIGURE 1). The site is known as the CP-1 Compressor Station. The legal description of the referenced property is NE ¼ of SE ¼ of Section 15, Township 23 South, Range 28 East. Site coordinates are Latitude 32° 18.254' N, Longitude 104° 4.099' W. The compressor pad is adjacent to the Bird Creek Resources Inc., Caviness-Payne No. 1 lease.

DEFS submitted a letter to the NMOCD on January 7, 2003 informing the NMOCD of their intent not to renew the discharge permit (GW-139) for the CP-1 Compressor Station. The NMOCD sent a letter reply on January 13, 2003 requesting a closure workplan. The NMOCD requested the closure workplan be submitted for review prior to the April 28, 2003 expiration of the discharge permit.

BNC performed a site visit on April 3, 2002 to document existing site conditions. The site contained a built up compressor pad and associated piping (PICTURE 1). The dimensions of the caliche and gravel compressor pad were approximately 25 feet by 50 feet by 1 foot (above grade). All DEFS electrical equipment starting at the local electric company's electric meter has been removed for salvage. DEFS has also removed the engine oil AST and the associated secondary containment equipment.

BNC prepared a closure workplan based on the NMOCD document "Guidelines for Remediation of Leaks, Spills and Releases" dated August 13, 1993. This closure was submitted to the NMOCD on April 11, 2003 and subsequently approved by the NMOCD in a letter reply on April 28, 2003 (APPENDIX A). A site chronology is presented in APPENDIX B.

SECTION II REGULATORY FRAMEWORK AND SITE RANKING

The NMOCD has regulatory jurisdiction over oil and gas production operations, including discharge permits and associated closure activities in the State of New Mexico. This project is being conducted under the regulatory guidance of the NMOCD, which requires that hydrocarbon-affected soils be remediated in such a manner that the potential for future affects to groundwater or the environment are minimized. The NMOCD clean up levels are determined on a site-by-site basis, and are based on ranking criteria, which is outlined in the NMOCD "Guidelines for Remediation of Spills, Leaks, and Releases", dated August 13, 1993. These ranking criteria guidelines are based on site characteristics consisting of: depth to groundwater, wellhead protection (useable water sources), and distance to surface water.

There are currently no monitor wells or water wells on the site to determine an exact depth to groundwater. BNC reviewed the New Mexico Office of the State Engineer and the Interstate Stream Commission document "New Mexico Water Resource Atlas" dated December 2002. Plate 12.2 of this document shows the site is situated between the groundwater elevation contours 2,900 and 3,000 feet above sea level. For site ranking purposes, the groundwater elevation at the site is assumed to be 2,950 feet above sea level. The surface elevation of the site is approximately 3,005 feet above sea level. The estimated depth to groundwater based on the above information is 55 feet below ground surface.

The compressor site is located within the confines of the Bird Creek Resources CP-1 crude oil well lease. The land surface within the area of the lease is relatively flat and covered by bermed AST tank pads and hardened caliche roads/parking areas. In general, adjacent properties are relatively flat with a low relief, hilly, sandy and dry topography. The Pecos River is the closest surface water to the site. The Pecos River is located approximately 4,000 feet northeast of the compressor site. Oil wells are present in the overall adjacent area. Wellhead protection areas appear to be greater than 1,000 feet from the release site.

The table below illustrates the ranking criteria, used by the NMOCD and includes site specific characteristics at the CP-1 Compressor Station site.

Criteria	Site Characteristics	Ranking Score
Depth to Ground Water	50-99 feet	10
Wellhead Protection Area	>1,000 feet	0
Distance to Surface Water	>1,000 feet	0
	Total Ranking Score	10

Based on the CP-1 Compressor Station site characteristics and the "Guidelines for Remediation of Spills, Leaks and Releases" the site has a ranking score of 10. Consequently the ranking criteria clean-up levels of 10 mg/Kg Benzene, 50 mg/Kg total BTEX, and 1,000 mg/Kg TPH are established for remediation activities at the site.

DEFS mobilized June 11, 2003 to the site with a backhoe and removed the ancillary piping associated with the former compressor and stockpiled the compressor pad material adjacent to the former compressor pad location (FIGURE 2 and PICTURE 2).

Confirmation Sampling

BNC conducted soil confirmation sampling on July 8, 2003. BNC contacted Mr. Mike Stubblefield of the NMOCD two days in advance of this soil collection event. Mr. Stubblefield was onsite to witness sample collection activities. Two grab soil samples (North Pad and South Pad) were collected from the ground surface in the area where the pad was located (FIGURE 3) and submitted to TraceAnalysis, Inc. of Lubbock, Texas for BTEX by EPA Method 8021B and Total Petroleum Hydrocarbon (TPH) by EPA Method 8015 Modified.

Analytical results indicated that both soil confirmation soil samples were below detection levels for BTEX and the diesel range organic (DRO) range of TPH. Total TPH (GRO – DRO) concentrations were below regulatory cleanup levels in both samples (TABLE I). Copies of the certified analytical reports and chain-of-custody documentation are attached in APPENDIX C.

Stockpiled Soils

The stockpiled compressor pad material was placed adjacent to the location of the former compressor pad. Approximately 20 yards of pad material was stockpiled. A composite sample was taken from the stockpile for waste characterization. This sample was submitted to TraceAnalysis for BTEX and TPH analysis.

Analytical results indicated the composite soil sample collected from the soil stockpile were below detection levels for BTEX and DRO TPH. Total TPH (GRO – DRO) concentration was below regulatory cleanup levels in the sample (TABLE 1). Copies of the certified analytical reports and chain-of-custody documentation are attached in APPENDIX C.

Field Sampling and Laboratory Protocol

Soil samples were obtained by personnel utilizing appropriate sampling tools and wearing clean, disposable gloves. Each sample selected for laboratory analysis was placed in a new sterile glass container equipped with a teflon-lined lid furnished by the analytical laboratory. The containers were filled to capacity with soil, limiting the amount of head-space present. Soil samples obtained from the remedial excavation and from the excavated spoils piles were submitted to TraceAnalysis, Inc. in Lubbock, Texas (TraceAnalysis) for analysis. Each container was immediately labeled, placed on ice in an insulated cooler, and chilled to a temperature of approximately 40°F (4°C). The cooler was sealed for shipment to the laboratory. Proper chain of custody documentation accompanied the samples to the laboratory.

The laboratory was responsible for proper analytical QA/QC procedures. These procedures are generally transmitted with the laboratory reports or are on file at the laboratory. Soil samples obtained from the remedial excavation were analyzed for TPH by EPA Modified Method 8015B (DRO-GRO) and for BTEX by EPA Method 8021B. Soil samples were analyzed within 14 days of their collection.

Site Restoration

DEFS and BNC mobilized to the site on August 26, 2003. A backhoe was utilized to spread the former compressor pad material onsite. No evidence of the compressor pad currently exists at this location (PICTURE 3).

SECTION IV

SUMMARY OF FINDINGS

Based on soil assessment and remediation activities performed to date, BNC presents the following summary of findings:

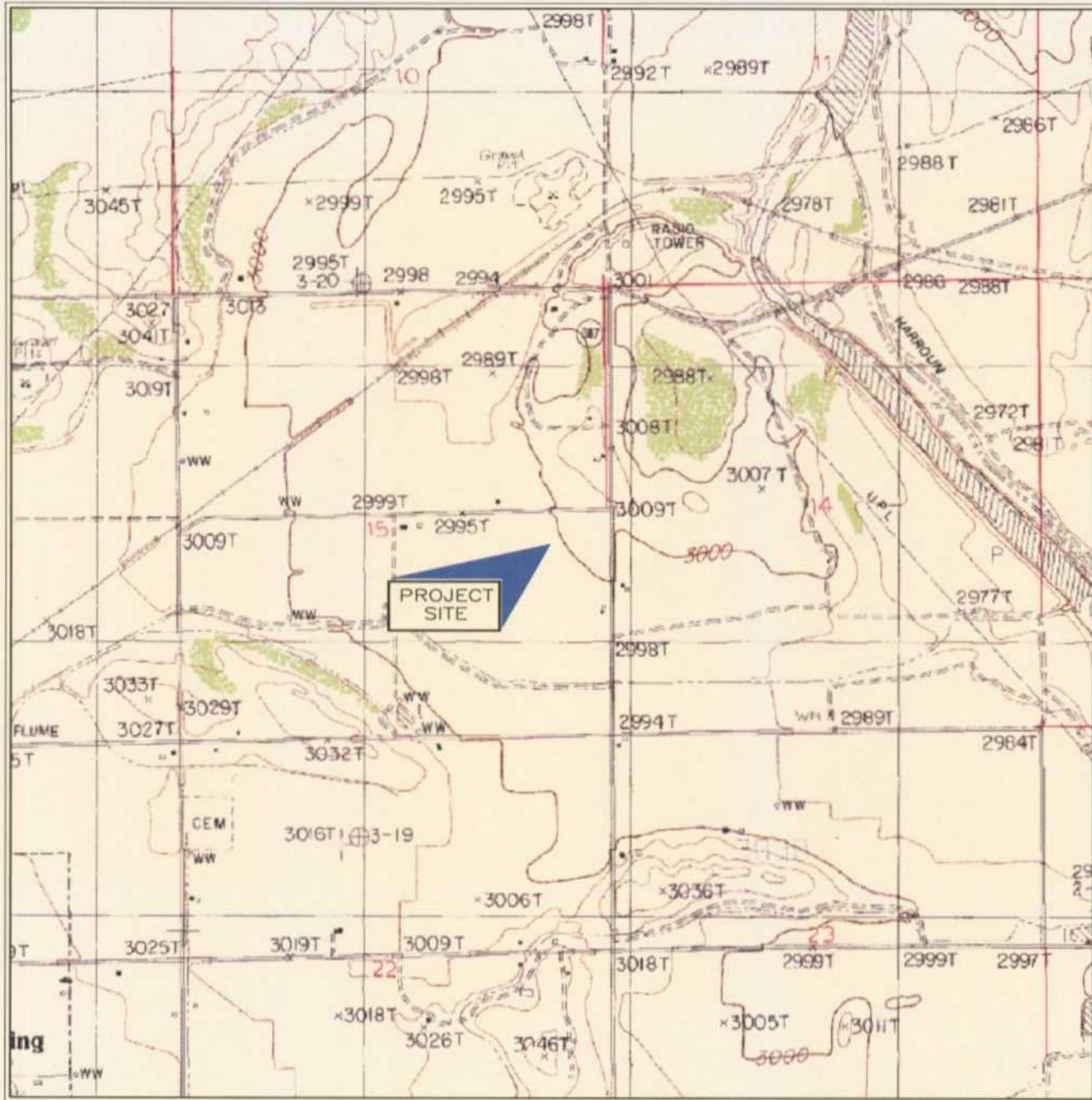
- All soil samples submitted for laboratory analysis were below NMOCD regulatory cleanup levels for BTEX and TPH. Sampling activities were witnessed by NMOCD personnel.
- All compressor pad equipment and ancillary piping were removed from the site to be recycled at other DEFS facilities.
- Hydrocarbon impacts were minimal.
- All site closure activities were performed in accordance with the NMOCD approved closure workplan prepared by BNC on April 11, 2003.

The results of the soil assessment and closure activities indicate that the former compressor pad site is eligible for NMOCD closure under the regulatory guidance of the NMOCD document "Guidelines for Remediation of Spills, Leaks, and Releases." No further action is recommended for this site. BNC, on behalf of DEFS, request written acknowledgement from the NMOCD concerning approved closure activities performed at this site.

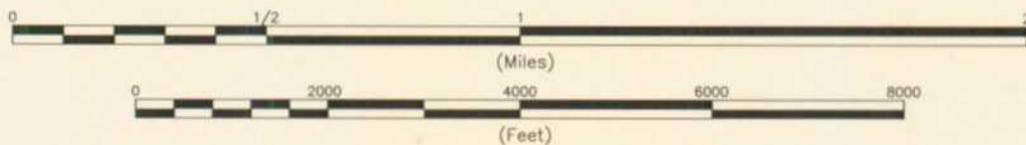
LOVING QUADRANGLE
NEW MEXICO

LAT=32°18.254N
LONG=104°4.099W

PROVISIONAL EDITION 1985



SCALE 1:24,000



NORTH

1019 SR 4/11/03

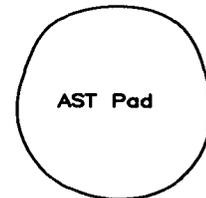
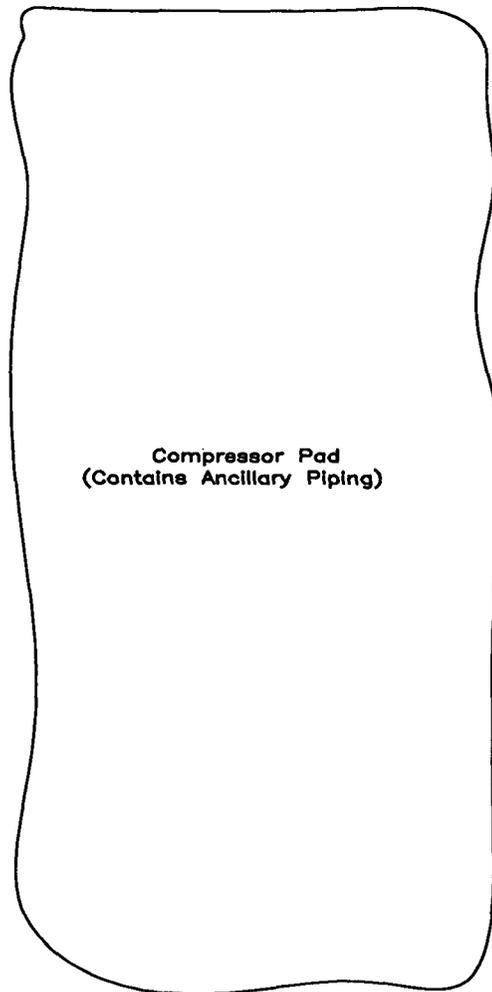
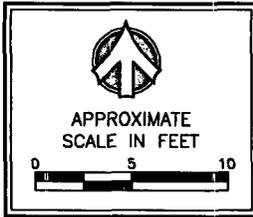


SITE LOCATION MAP

DUKE ENERGY FIELD SERVICES
CP-1 COMPRESSOR STATION
EDDY COUNTY, NEW MEXICO

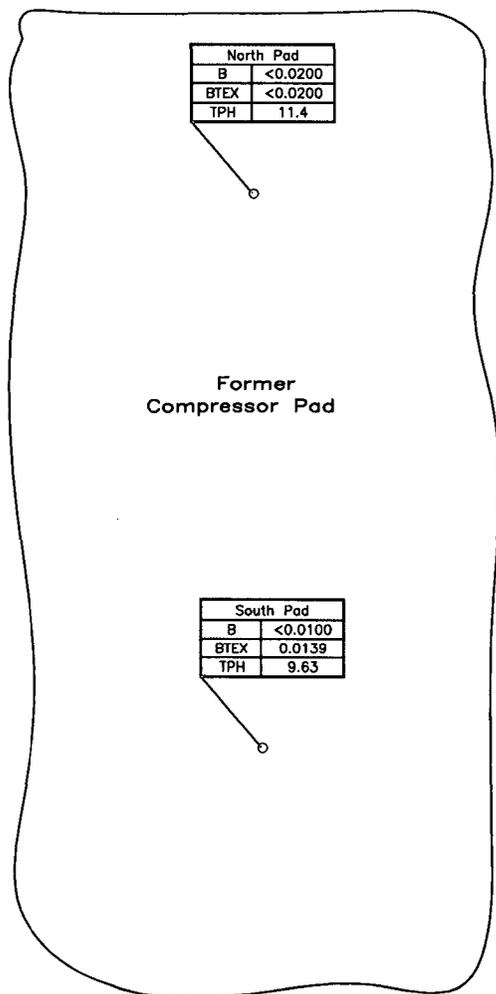
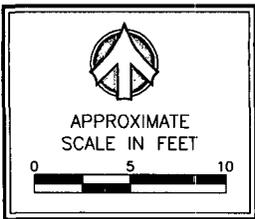
JOB No. 1019

FIGURE 1



SITE DETAILS
DUKE ENERGY FIELD SERVICES, LP
CP-1 COMPRESSOR STATION (GW-139) EDDY COUNTY, NEW MEXICO

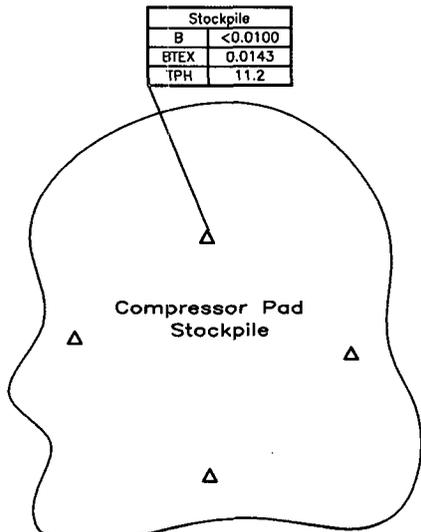
JOB No.
1019
FIGURE 2



North Pad	
B	<0.0200
BTEX	<0.0200
TPH	11.4

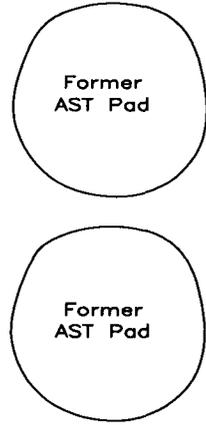
Former Compressor Pad

South Pad	
B	<0.0100
BTEX	0.0139
TPH	9.63



Stockpile	
B	<0.0100
BTEX	0.0143
TPH	11.2

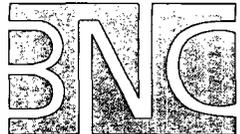
Compressor Pad Stockpile



Former AST Pad

Former AST Pad

LEGEND	
o	Grab Sample Location
▲	Composite Sample Locations
B	Benzene Concentration
BTEX	by EPA Method 8021B
TPH	by EPA Method 8015 Modified
Concentrations reported in mg/Kg.	



CONFIRMATION SOIL SAMPLING LOCATION MAP
 DUKE ENERGY FIELD SERVICES, LP
 CP-1 COMPRESSOR STATION (GW-139) EDDY COUNTY, NEW MEXICO

JOB No.
 1019
 FIGURE 3

TABLE I

SUMMARY OF SOIL ANALYTICAL DATA – BTEX/TPH
 DUKE ENERGY FIELD SERVICES, LP
 CP-1 COMPRESSOR STATION (GW-139)
 EDDY COUNTY, NEW MEXICO

SAMPLE ID	DATE	DEPTH or TYPE (feet)	BENZENE (mg/Kg)	TOLUENE (mg/Kg)	ETHYL-BENZENE (mg/Kg)	XYLENES (mg/Kg)	TOTAL BTEX (mg/Kg)	TPH (8015 Modified)		
								TPH DRO (mg/Kg)	TPH GRO (mg/Kg)	TPH (GRO/DRO) (mg/Kg)
New Mexico Oil Conservation Division Recommended Remediation Action Levels (Total Ranking Score 10)										
			10 mg/Kg	—	—	—	50.0 mg/Kg	—	—	1,000 mg/Kg
Pad Confirmation Samples										
North Pad	7/8/2003	surface	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<50.0	11.4	11.4
South Pad	7/8/2003	surface	<0.0100	0.0139	<0.0100	<0.0100	0.0139	<50.0	9.63	9.63
Soil Stockpile Sample										
Stockpile	7/8/2003	composite	<0.0100	0.0143	<0.0100	<0.0100	0.0143	<50.0	11.2	11.2

Notes:

BTEX analysis by EPA Method 8021.

TPH analysis by EPA Method 8015 Modified.

DUKE ENERGY FIELD SERVICES
CP-1 Compressor Station
Eddy County, New Mexico



Picture 1. CP-1 Compressor pad prior to demolition.



Picture 2. CP-1 Compressor pad after demolition.

DUKE ENERGY FIELD SERVICES
CP-1 Compressor Station
Eddy County, New Mexico



Picture 3. Former CP-1 Compressor pad location after site restoration.



NEW MEXICO ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT

BILL RICHARDSON
Governor
Joanna Prukop
Cabinet Secretary

April 28, 2003

Lori Wrotenbery
Director
Oil Conservation Division

Mr. Stephen Weathers
Duke Energy Field Services
P.O. Box 5493
Denver, Colorado 80217

**RE: Closure Work Plan
C-1 Compressor Station
Duke Energy Field Services
Eddy County, New Mexico**

Dear Mr. Weathers:

The New Mexico Oil Conservation Division (OCD) received the Closure Plan for the C-1 Compressor Station located in NE/4 SE/4 of Section 15, Township 23 South, Range 28 East, NMPM, Eddy County, New Mexico. The workplan, dated April 11, 2003, was submitted by your consultant, BNC Environmental Services, Inc. on behalf of Duke Energy Field Services. **The Closure plan is hereby approved, with the following conditions:**

- A notification will be provided to Mr. Stubblefield at least 48 hours prior to commencement of work.
- All of the items listed in the workplan, dated April 11, 2003, from BNC Environmental Services, Inc. on behalf of Duke Energy Field Services shall be adhered with during the closure process.
- Upon completion of the project a final report for the closure of the C-1 Compressor Station shall be submitted to the Santa Fe OCD office for approval within 30 days of final closure.

Note, that OCD approval does not limit Duke Energy Field Services to the work proposed should it later be found that contamination exists which is beyond the scope of this plan, or if Duke Energy Field Services has failed to completely define the extent of contamination. In addition, OCD approval does not relieve Duke Energy Field Services of responsibility for compliance with any other Federal, State, or other Local Laws and Regulations.

Mr. Stephen Weathers
Duke Energy Field Services
April 28, 2003
Page 2

If you have any questions regarding this matter feel free to call me at (505)-476-3489.

Sincerely,



W. Jack Ford, C.P.G.
Environmental Engineer
Environmental Bureau, OCD

cc: OCD Artesia District Office
Mr. Thomas C. Larson, BNC Environmental Services, Inc.

SITE CHRONOLOGY
DUKE ENERGY FIELD SERVICES
CP-1 COMPRESSOR STATION (GW-139)
Eddy County, New Mexico

January 7, 2003	Duke Energy Field Services (DEFS) informs the New Mexico Oil Conservation Division (NMOCD) in writing of their intent not to renew the discharge permit for this facility.
January 13, 2003	The NMOCD requests that DEFS provide a closure workplan be submitted prior to the April 28, 2003 expiration of the discharge permit
April 3, 2003	BNC Environmental Services, Inc. (BNC) employee meets with DEFS personnel at the site to evaluate current conditions to develop a suitable closure workplan to satisfy NMOCD regulations.
April 11, 2003	BNC submits the closure workplan to DEFS for submittal to the NMOCD.
April 28, 2003	NMOCD approves the closure workplan.
May 13, 2003	BNC submits a cost estimate to DEFS to implement the NMOCD approved closure workplan.
May 20, 2003	DEFS authorizes BNC to proceed with the field activities in the closure workplan.
May 21, 2003	BNC stakes the work area and notifies the New Mexico One Call utility location service.
June 11, 2003	DEFS removes the ancillary piping and stockpiles the compressor pad material adjacent to the former compressor pad location.
July 8, 2003	BNC collects compressor pad confirmation samples and stockpile characterization sample.
July 11, 2003	All soil samples reported below NMOCD action levels. DEFS intends to spread soils onsite.
August 26, 2003	DEFS spreads the stockpile on the former location of the compressor station.

Summary Report

Aaron Hale
BNC Midland
2135 South Loop 250 West
Midland, TX 79703

Report Date: July 11, 2003

Work Order: 3070916

Project Location: Loving,N.M.
Project Name: CP-1
Project Number: 1019

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
12344	North Pad	soil	2003-07-08	11:18	2003-07-09
12345	South Pad	soil	2003-07-08	11:22	2003-07-09
12346	Stockpile	soil	2003-07-08	11:15	2003-07-09

Sample - Field Code	BTEX				TPH DRO	TPH GRO
	Benzene (mg/Kg)	Toluene (mg/Kg)	Ethylbenzene (mg/Kg)	Xylene (isomers) (mg/Kg)	DRO (mg/Kg)	GRO (mg/Kg)
12344 - North Pad	<0.0200	<0.0200	<0.0200	<0.0200	<50.0	11.4
12345 - South Pad	<0.0100	0.0139	<0.0100	<0.0100	<50.0	9.63
12346 - Stockpile	<0.0100	0.0143	<0.0100	<0.0100	<50.0	11.2

TRACE ANALYSIS, INC.

6701 Aberdeen Avenue, Suite 9 Lubbock, Texas 79424 800•378•1296 806•794•1296 FAX 806•794•1298
155 McCutcheon, Suite H El Paso, Texas 79932 888•588•3443 915•585•3443 FAX 915•585•4944
E-Mail: lab@traceanalysis.com

Analytical and Quality Control Report

Aaron Hale
BNC Midland
2135 South Loop 250 West
Midland, TX 79703

Report Date: July 11, 2003

Work Order: 3070916

Project Location: Loving, N.M.
Project Name: CP-1
Project Number: 1019

Enclosed are the Analytical Report and Quality Control Report for the following sample(s) submitted to TraceAnalysis, Inc.

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
12344	North Pad	soil	2003-07-08	11:18	2003-07-09
12345	South Pad	soil	2003-07-08	11:22	2003-07-09
12346	Stockpile	soil	2003-07-08	11:15	2003-07-09

These results represent only the samples received in the laboratory. The Quality Control Report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

This report consists of a total of 8 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.



Dr. Blair Leftwich, Director

Analytical Report

Sample: 12344 - North Pad

Analysis: BTEX	Analytical Method: S 8021B	Prep Method: S 5035
QC Batch: 2848	Date Analyzed: 2003-07-09	Analyzed By:
Prep Batch: 2570	Date Prepared: 2003-07-09	Prepared By:

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene	1	<0.0200	mg/Kg	20	0.00100
Toluene		<0.0200	mg/Kg	20	0.00100
Ethylbenzene		<0.0200	mg/Kg	20	0.00100
Xylene (isomers)		<0.0200	mg/Kg	20	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)	2	0.985	mg/Kg	20	0.0500	98	58.9 - 129
4-Bromofluorobenzene (4-BFB)	3	1.10	mg/Kg	20	0.0500	110	44.4 - 133

Sample: 12344 - North Pad

Analysis: TPH DRO	Analytical Method: Mod. 8015B	Prep Method: N/A
QC Batch: 2865	Date Analyzed: 2003-07-09	Analyzed By: BP
Prep Batch: 2587	Date Prepared: 2003-07-09	Prepared By: WG

Parameter	Flag	RL Result	Units	Dilution	RL
DRO		<50.0	mg/Kg	1	50.0

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Triacontane		90.5	mg/Kg	1	150	60	45 - 152

Sample: 12344 - North Pad

Analysis: TPH GRO	Analytical Method: S 8015B	Prep Method: S 5035
QC Batch: 2850	Date Analyzed: 2003-07-09	Analyzed By:
Prep Batch: 2570	Date Prepared: 2003-07-09	Prepared By:

Parameter	Flag	RL Result	Units	Dilution	RL
GRO		11.4	mg/Kg	20	0.100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)	4	1.29	mg/Kg	20	0.0500	129	73 - 120
4-Bromofluorobenzene (4-BFB)	5	1.02	mg/Kg	20	0.0500	102	78 - 120

¹Sample diluted due to turbidity.

²Changed spike amount from 0.1 to 0.05 due to

³Changed spike amount from 0.1 to 0.05 due to

⁴High surrogate recovery due to peak interference.

⁵Changed spike amount from 0.1 to 0.05 due to dilution.

Sample: 12345 - South Pad

Analysis: BTEX Analytical Method: S 8021B Prep Method: S 5035
 QC Batch: 2848 Date Analyzed: 2003-07-09 Analyzed By:
 Prep Batch: 2570 Date Prepared: 2003-07-09 Prepared By:

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		<0.0100	mg/Kg	10	0.00100
Toluene		0.0139	mg/Kg	10	0.00100
Ethylbenzene		<0.0100	mg/Kg	10	0.00100
Xylene (isomers)		<0.0100	mg/Kg	10	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		1.16	mg/Kg	10	0.100	116	58.9 - 129
4-Bromofluorobenzene (4-BFB)		1.15	mg/Kg	10	0.100	115	44.4 - 133

Sample: 12345 - South Pad

Analysis: TPH DRO Analytical Method: Mod. 8015B Prep Method: N/A
 QC Batch: 2865 Date Analyzed: 2003-07-09 Analyzed By: BP
 Prep Batch: 2587 Date Prepared: 2003-07-09 Prepared By: WG

Parameter	Flag	RL Result	Units	Dilution	RL
DRO		<50.0	mg/Kg	1	50.0

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Triacontane		88.9	mg/Kg	1	150	59	45 - 152

Sample: 12345 - South Pad

Analysis: TPH GRO Analytical Method: S 8015B Prep Method: S 5035
 QC Batch: 2850 Date Analyzed: 2003-07-09 Analyzed By:
 Prep Batch: 2570 Date Prepared: 2003-07-09 Prepared By:

Parameter	Flag	RL Result	Units	Dilution	RL
GRO		9.63	mg/Kg	10	0.100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		1.20	mg/Kg	10	0.100	120	73 - 120
4-Bromofluorobenzene (4-BFB)		1.10	mg/Kg	10	0.100	110	78 - 120

Sample: 12346 - Stockpile

Analysis: BTEX Analytical Method: S 8021B Prep Method: S 5035
 QC Batch: 2848 Date Analyzed: 2003-07-09 Analyzed By:
 Prep Batch: 2570 Date Prepared: 2003-07-09 Prepared By:

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		<0.0100	mg/Kg	10	0.00100
Toluene		0.0143	mg/Kg	10	0.00100
Ethylbenzene		<0.0100	mg/Kg	10	0.00100
Xylene (isomers)		<0.0100	mg/Kg	10	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		1.18	mg/Kg	10	0.100	118	58.9 - 129
4-Bromofluorobenzene (4-BFB)		1.15	mg/Kg	10	0.100	115	44.4 - 133

Sample: 12346 - Stockpile

Analysis: TPH DRO Analytical Method: Mod. 8015B Prep Method: N/A
 QC Batch: 2865 Date Analyzed: 2003-07-09 Analyzed By: BP
 Prep Batch: 2587 Date Prepared: 2003-07-09 Prepared By: WG

Parameter	Flag	RL Result	Units	Dilution	RL
DRO		<50.0	mg/Kg	1	50.0

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Triacontane		108	mg/Kg	1	150	72	45 - 152

Sample: 12346 - Stockpile

Analysis: TPH GRO Analytical Method: S 8015B Prep Method: S 5035
 QC Batch: 2850 Date Analyzed: 2003-07-09 Analyzed By:
 Prep Batch: 2570 Date Prepared: 2003-07-09 Prepared By:

Parameter	Flag	RL Result	Units	Dilution	RL
GRO		11.2	mg/Kg	10	0.100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)	⁶	1.26	mg/Kg	10	0.100	126	73 - 120
4-Bromofluorobenzene (4-BFB)		1.10	mg/Kg	10	0.100	110	78 - 120

Method Blank (1) QC Batch: 2848

Parameter	Flag	Result	Units	RL
Benzene		<0.0100	mg/Kg	0.001
Toluene		<0.0100	mg/Kg	0.001
Ethylbenzene		<0.0100	mg/Kg	0.001
Xylene (isomers)		<0.0100	mg/Kg	0.001

⁶High surrogate recovery due to peak interference.

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		1.16	mg/Kg	10	0.100	116	58.9 - 129
4-Bromofluorobenzene (4-BFB)		1.03	mg/Kg	10	0.100	103	44.4 - 133

Method Blank (1) QC Batch: 2850

Parameter	Flag	Result	Units	RL
GRO		1.25	mg/Kg	0.1

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		1.01	mg/Kg	10	0.100	101	73 - 120
4-Bromofluorobenzene (4-BFB)		0.984	mg/Kg	10	0.100	98	78 - 120

Method Blank (1) QC Batch: 2865

Parameter	Flag	Result	Units	RL
DRO		<50.0	mg/Kg	50

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Triacontane		102	mg/Kg	1	150	68	45 - 152

Laboratory Control Spike (LCS-1) QC Batch: 2848

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Benzene	0.956	0.979	mg/Kg	10	0.100	<0.00131	96	2	83.4 - 112	35
Toluene	0.956	0.976	mg/Kg	10	0.100	<0.00365	96	2	82.6 - 112	36
Ethylbenzene	0.950	0.978	mg/Kg	10	0.100	<0.00492	95	3	80.3 - 114	40
Xylene (isomers)	2.87	2.92	mg/Kg	10	0.300	<0.00314	96	2	78.9 - 114	39

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	1.06	1.14	mg/Kg	10	0.100	106	114	74.7 - 114
4-Bromofluorobenzene (4-BFB)	⁷ 1.10	1.16	mg/Kg	10	0.100	110	116	76.2 - 110

Laboratory Control Spike (LCS-1) QC Batch: 2850

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
GRO	7.84	8.76	mg/Kg	10	1.00	<0.381	78	11	76.3 - 125	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

⁷High surrogate recovery due to prep. Average of ICV/CCV components within acceptable range.

Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	1.08	1.14	mg/Kg	10	0.100	108	114	73.7 - 114
4-Bromofluorobenzene (4-BFB) ⁸⁹	1.16	1.16	mg/Kg	10	0.100	116	116	76.2 - 110

Laboratory Control Spike (LCS-1) QC Batch: 2865

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
DRO	227	219	mg/Kg	1	250	<21.1	91	4	68 - 126	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
n-Triacontane	137	137	mg/Kg	1	150	92	91	33 - 144

Matrix Spike (MS-1) QC Batch: 2848

Param	MS Result	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Benzene	0.960	0.979	mg/Kg	10	0.100	<0.00131	96	2	58 - 107	22
Toluene	0.913	0.893	mg/Kg	10	0.100	<0.00365	91	2	59 - 110	20
Ethylbenzene	0.861	0.894	mg/Kg	10	0.100	<0.00492	86	4	58.4 - 113	15
Xylene (isomers)	2.58	2.69	mg/Kg	10	0.300	<0.00314	86	4	54.3 - 114	19

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	Rec. Limit
Trifluorotoluene (TFT) ¹⁰¹¹	1.15	1.17	mg/Kg	10	0.1	115	117	50.6 - 114
4-Bromofluorobenzene (4-BFB)	1.08	1.10	mg/Kg	10	0.1	108	110	52 - 110

Matrix Spike (MS-1) QC Batch: 2850

Param	MS Result	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
GRO	11.5	10.6	mg/Kg	10	1.00	<0.381	115	8	32.9 - 152	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	Rec. Limit
Trifluorotoluene (TFT) ¹²	0.850	0.762	mg/Kg	10	0.1	85	76	50.6 - 114
4-Bromofluorobenzene (4-BFB) ¹³¹⁴	1.21	1.07	mg/Kg	10	0.1	121	107	52 - 110

Matrix Spike (MS-1) QC Batch: 2865

⁸High surrogate recovery due to peak interference.
⁹High surrogate recovery due to peak interference.
¹⁰High surrogate recovery due to prep. Average of ICV/CCV components within acceptable range.
¹¹High surrogate recovery due to prep. Average of ICV/CCV components within acceptable range.
¹²Low surrogate recovery due to matrix interference. LCS/LCSD show the method to be in control.
¹³High surrogate recovery due to peak interference.
¹⁴High surrogate recovery due to peak interference.

Param	MS Result	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
DRO	¹⁵¹⁶ 336	337	mg/Kg	1	250	<21.1	134	0	65 - 114	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	Rec. Limit
n-Triacontane	86.6	88.1	mg/Kg	1	150	58	59	33 - 144

Standard (ICV-1) QC Batch: 2848

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/L	0.100	0.0973	97	85 - 115	2003-07-09
Toluene		mg/L	0.100	0.0987	99	85 - 115	2003-07-09
Ethylbenzene		mg/L	0.100	0.0988	99	85 - 115	2003-07-09
Xylene (isomers)		mg/L	0.300	0.292	97	85 - 115	2003-07-09

Standard (CCV-1) QC Batch: 2848

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/L	0.100	0.0915	92	85 - 115	2003-07-09
Toluene		mg/L	0.100	0.0919	92	85 - 115	2003-07-09
Ethylbenzene		mg/L	0.100	0.0911	91	85 - 115	2003-07-09
Xylene (isomers)		mg/L	0.300	0.275	92	85 - 115	2003-07-09

Standard (ICV-1) QC Batch: 2850

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		mg/L	1.00	0.950	95	85 - 115	2003-07-09

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limit
Trifluorotoluene (TFT)	¹⁷	0.132	mg/L	1	0.100	132	73 - 120
4-Bromofluorobenzene (4-BFB)	¹⁸	0.125	mg/L	1	0.100	125	78 - 120

Standard (CCV-1) QC Batch: 2850

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		mg/L	1.00	0.887	89	85 - 115	2003-07-09

¹⁵MS and MSD recovery out of range due to peak interference. LCS and LCSD show process within control.

¹⁶MS and MSD recovery out of range due to peak interference. LCS and LCSD show process within control.

¹⁷High surrogate recovery due to peak interference.

¹⁸High surrogate recovery due to peak interference.

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limit
Trifluorotoluene (TFT)		0.117	mg/L	1	0.100	117	73 - 120
4-Bromofluorobenzene (4-BFB)		0.119	mg/L	1	0.100	119	78 - 120

Standard (ICV-1) QC Batch: 2865

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		mg/Kg	250	229	92	75 - 125	2003-07-09

Standard (CCV-1) QC Batch: 2865

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		mg/Kg	250	230	92	75 - 125	2003-07-09

