

District I
1625 N. French Dr., Hobbs, NM 88240
District II
811 South First, Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
2040 South Pacheco, Santa Fe, NM 87505

State of New Mexico
Energy Minerals and Natural Resources

Oil Conservation Division
2040 South Pacheco
Santa Fe, NM 87505

Form C-141
Revised March 17, 1999

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

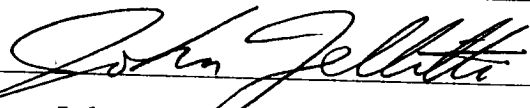
Release Notification and Corrective Action

OPERATOR			☐ Initial Report	☐ Final Report
Name of Company Mallon Oil Company		Contact John Zellitti		
Address P.O. Box 2797 Durango, CO 81302		Telephone No. (970) 382-9100		
Facility Name East Blanco Salt Water Disposal		Facility Type Produced water injection		
Surface Owner Jicarilla Apache Tribe		Mineral Owner Jicarilla Apache Tribe		Lease No. 458

LOCATION OF RELEASE

Unit Letter O	Section 7	Township 30N	Range 03W	Feet from the 790	North/South Line South	Feet from the 1450	East/West Line East	County Rio Arriba County
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NATURE OF RELEASE

Type of Release Produced Water	Volume of Release ±17 bbls	Volume Recovered 0 bbls
Source of Release Water Pipeline	Date and Hour of Occurrence 5:00 pm 10/6/99	Date and Hour of Discovery 5:00pm 10/6/99
Was Immediate Notice Given? ☒ Yes ☐ No ☐ Not Required	If YES, To Whom? Jicarilla Environmental Protection Office, Jicarilla Oil and Gas, NM Oil Conservation Division	
By Whom? Duane C. Winkler	Date and Hour 8:00am 10/7/99	
Was a Watercourse Reached? ☐ Yes ☒ No	If YES, Volume Impacting the Watercourse.	
If a Watercourse was Impacted, Describe Fully.*		
Describe Cause of Problem and Remedial Action Taken.*		
Leak in discharge line from SWD Pump		
Describe Area Affected and Cleanup Action Taken.*		
Contained on Pipeline Row. Scraped and contained contaminated soil for land farming.		
I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to NMOCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the NMOCD marked as "Final Report" does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.		
Signature: 	OIL CONSERVATION DIVISION	
Printed Name: John Zellitti	Approved by District Supervisor:	
Title: Production Engineer	Approval Date:	Expiration Date:
Date: 10/18/99	Phone: (970) 382-9100	Conditions of Approval:
* Attach Additional Sheets If Necessary		Attached ☐



THE JICARILLA APACHE TRIBE

ENVIRONMENTAL PROTECTION OFFICE

October 14, 1999

Mallon Oil Company
P.O. Box 2797
Durango, Colorado 81302
Attn: Terry Linderman, Field Superintendent

Re: Compliance Order 1099- Water Disposal Facility SE/4, T30N, R3W

Dear Mr. Linderman:

By notice of this letter, the Jicarilla Apache Tribe Environmental Protection Office hereby issue Compliance Order No. 1099 to correct violations at the Water Disposal Facility-SE/4, Sec.7, T30, R3W.

The result of this action was due in part to an undesirable event (Major Spill) that occurred on 10/6/99 at the above site. The spill occurred in an environmental sensitive area with a direct point of discharge into a livestock watering facility. The spill was caused by a corrosion stress factor of the underground pipeline used to transport the produced water containing hydrogen sulfide gas into an injection well.

The primary concern centers on the fact that this incident along with other two spills within the past three months has deemed it necessary for the Environmental Protection Office to recommend the following course of actions as per Compliance Order No. 1099:

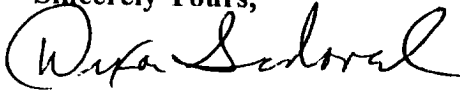
- Submit a new tank bottom test sample from each tank and submit copy to EPO office. The previous request was never received by EPO.
- Submit a water sample and soil test at the point of entry in a nearby pond.



- Submit a draft copy of a plan for a Lined Containment System on the outer perimeter of the Water Disposal Facility. A previous attempt to construct a retaining wall containment system is not acceptable as proven by the recent spill.
- The evidence of severe corrosion of the pipeline suggests that a Mechanical Integrity Test needs to be conducted on the discharge line from pump house to injection well. A Maximum Allowable Operating Pressure (MAOP) test will also need to be conducted on the line once a month to determine pipe strength. The Mechanical Integrity Test will determine the current thickness and maximum operating strength of the pipe that is currently in place.

Please contact the Environmental Protection Office as soon as possible to address the items of environmental concern. The order is self-explanatory in providing ample to respond to the request. The lack of action on your part will necessitate enforcement action to recover mitigation expenses. If there are questions, please call (505) 759-3242.

Sincerely Yours,



Dixon Sandoval, Environmental Specialist

Cc: Kurt Sandoval, Program Director-EPO

Joe Muniz, Executive Director-Natural Resource Department



THE JICARILLA APACHE TRIBE

ENVIRONMENTAL OFFICE

COMPLIANCE ORDER Unlined Surface Impoundment Ordinance

To: Mallon Oil Company
P.O. Box 2797
Durango, Colorado 81302
Attn: Terry Linderman

Re: Location of Unlined Surface Impoundment(s): Water Disposal Facility-SE/4, Sec. 7, T30N, R3W

Under the authority of Title 14, Chapter 3, § 6 of the Jicarilla Apache Tribal Code (Ordinance No. 95-O-308-3) the Environmental Protection Office of the Jicarilla Apache Tribe hereby orders you to cease the following violation(s) of Title 14, Chapter 3:

- ☐ § 4: Construction of New Unlined Surface Impoundment
- ☐ § 5: Failure to Close Unlined Surface Impoundment in Environmentally Sensitive Area on or before 12-31-96.
- ☐ § 5: Failure to Close Other Unlined Surface Impoundment on or before 12-31-98.
- ☐ § 5A/B: Violation of Requirements in BLM NTL 94-1 FDO/ADO:
(Specify): _____
- ☐ § 5C: Failure to Submit Complete Site Assessment Plan
- ☐ § 5D: Failure to Submit Complete Remediation Plan
- ☐ § 5D: Beginning Remediation/Closure Activity Before Remediation Plan Approved by JAT-EPO
- ☐ § 5E: Failure to Submit Complete Final Closure Plan
- ☐ § 5E: Failure to Submit Complete Final Closure Report
- ☐ § 5F: Failure to Submit Copies of BLM Sundry Notices
- ☐ § 5G: Failure to Report RCRA Subtitle C Nonexempt Wastes
- ☒ Other: Failure to Submit tank bottom sample as per C. Order dated 8/11/99
Failure to construct a lined containment system to prevent spill
Mechanical integrity testing of underground pipe required

You are hereby ordered to take the following actions to correct the violation(s):

- Submit Tank bottom water sample independent of 8/28/99 sample test.
 - Submit copy of containment liner system
 - Conduct a Mechanical Integrity Test on discharge line of pump house.
 - Remove contaminated soil from spill of 10/6/99 to off-reservation.
- The violation(s) identified in this order must be corrected before 5:00 p.m. on the 20th day of October, 1999.

THIS ORDER SHALL BE FINAL AND BINDING UNLESS YOU FILE AN APPEAL WITH THE JICARILLA APACHE TRIBAL COURT WITHIN 15 DAYS AFTER YOUR RECEIPT OF THIS NOTICE, AS PROVIDED IN § 7 OF ORDINANCE NO. 95-O-308-3.

Dated: 10/14/99

ENVIRONMENTAL PROTECTION OFFICE

By: _____

Program Director



Mallon Oil Company

Denver/Colorado ♦ Durango/Colorado ♦ Carlsbad/New Mexico

a Mallon Resources Subsidiary

October 19, 1999

Dixon Sandoval
Environmental Protection Office
Jicarilla Apache Tribe
P.O. Box 507
Dulice, NM 87528

Re: Compliance Order 1099 – Water Disposal Facility
SE ¼ Sec.7, T30N, R3W, Rio Arriba County

Dear Mr. Sandoval,

Please accept this letter as written response to your letter dated October 14, 1999 (Compliance Order No.1099 to correct violations at the East Blanco Salt Water Disposal Facility). Your concerns are addressed as follows:

1. On August 26, 1999, Blagg Engineering met with Dixon Sandoval at the SWD facility for the purpose of sampling. At that time it was decided not to sample individual tanks and was agreed upon to sample only the water effluent prior to the charge pump (The results of this test are attached). Also, please find attached, the results of water samples taken by Mallon Oil and analyzed by BJ Services on August 20, 1999 for each water storage tank.
2. A containment system is being constructed at the SWD facility to prevent potential spills from reaching fresh water supplies. A dyke will be constructed around the water injection plant and lined. Also, a half moon dyke will be constructed on the injection line right-of-way prior to the drainage which leads to the fresh water pond located west of the injection plant.

3. A mechanical integrity test was preformed on October 19, 1999 to a maximum working pressure of 800 psig and was held for one hour. A 24 hour pressure chart recorder was used to document the test and will be submitted to the EPO as soon as the chart comes into the Durango office from the field.
4. During the clean up of the water injection line leak on October 6, 1999 and in accordance with the request of the EPO, contaminated dirt was stock piled for testing. The dirt was sampled and sent to Envirotech Labs for analyses. The results of the test show Total Petroleum Hydrocarbons at 15.3 mg/kg concentration. This is well within the limit of 100 mg/kg concentration set by the EPO and at this time Mallon Oil is requesting to utilize the dirt in the construction of the containment dykes.

If there are any questions, please contact me at our Durango office (970-382-9100).

Respectfully,

A handwritten signature in black ink, appearing to read "John Zellitti". The signature is fluid and cursive, with a long horizontal stroke extending to the left.

John Zellitti
Production Engineer

District I
1625 N. French Dr., Hobbs, NM 88240
District II
811 South First, Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
2040 South Pacheco, Santa Fe, NM 87505

State of New Mexico
Energy Minerals and Natural Resources
Oil Conservation Division
2040 South Pacheco
Santa Fe, NM 87505

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Revised March 17, 1999

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Release Notification and Corrective Action

OPERATOR

☐ Initial Report ☐ Final Report

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Address P.O. Box 2797 Durango, CO 81302	Telephone No. (970) 382-9100
Facility Name East Blanco Salt Water Disposal	Facility Type Produced water injection
Surface Owner Jicarilla Apache Tribe	Mineral Owner Jicarilla Apache Tribe
Lease No. 458	

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By Whom? Duane C. Winkler	Date and Hour 8:00am 10/7/99	
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If a Watercourse was Impacted, Describe Fully.*		

Describe Cause of Problem and Remedial Action Taken.*

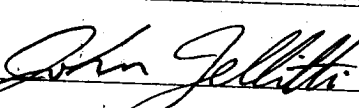
Leak in discharge line from SWD Pump

Describe Area Affected and Cleanup Action Taken.*

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OIL CONSERVATION DIVISION

Signature: 

Printed Name: John Zellitti

Title: Production Engineer

Date: 10/18/99

Phone: (970) 382-9100

Approved by
District Supervisor:

Approval Date:

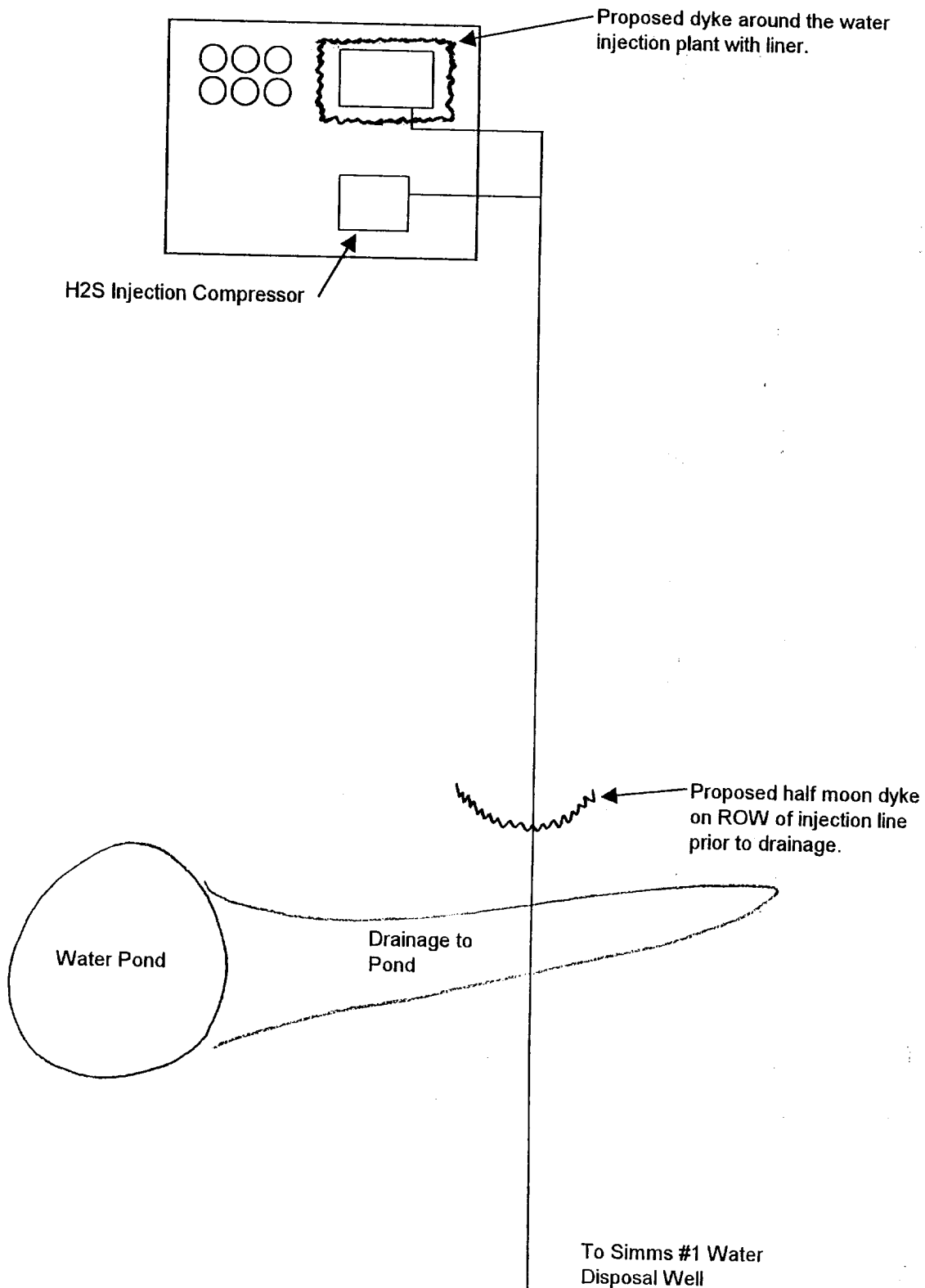
Expiration Date:

Conditions of Approval:

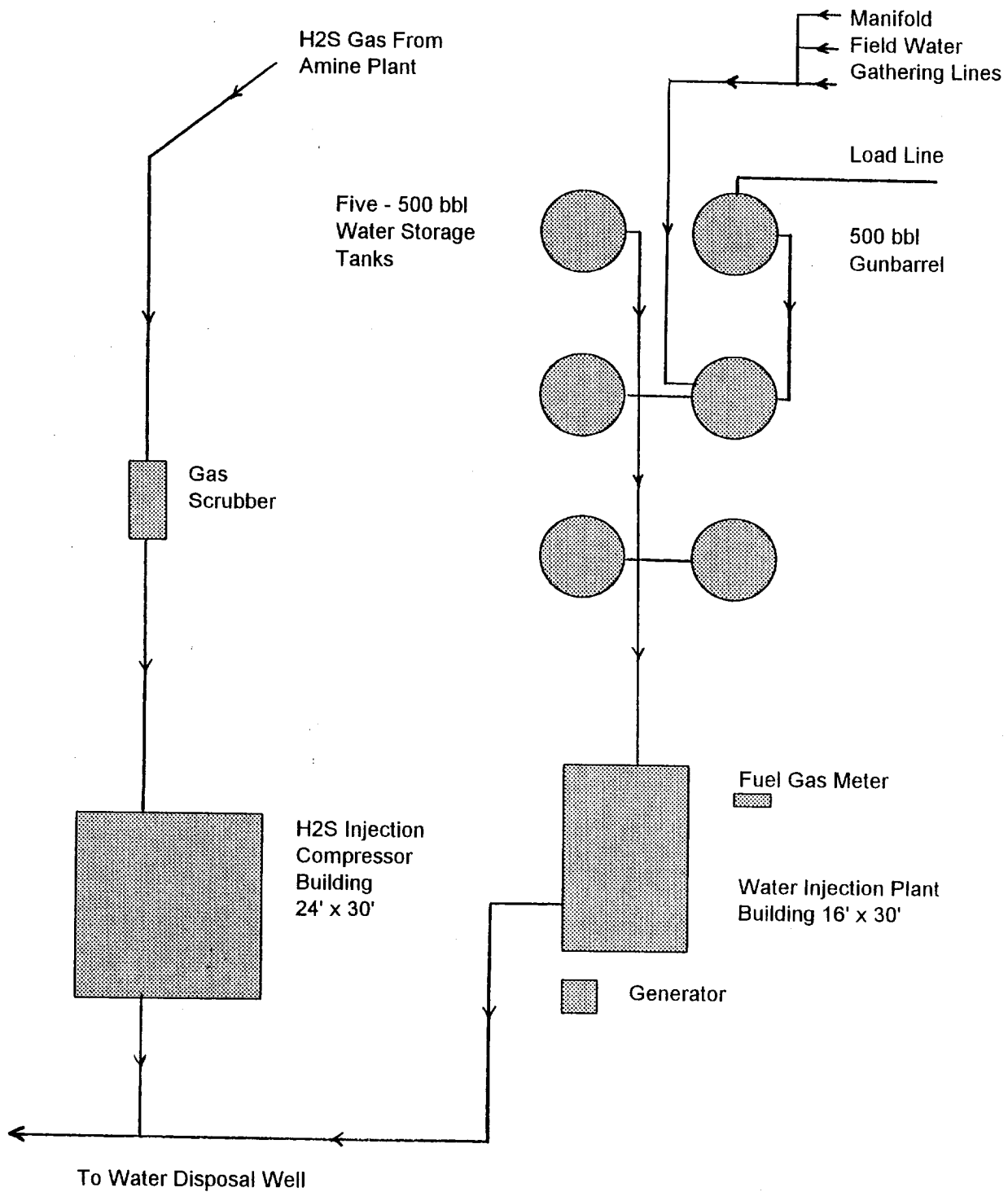
Attached ☐

* Attach Additional Sheets If Necessary

**Mallon Oil Company
East Blanco Water / H2S Disposal Plant
Rio Arriba County, NM
Proposed Containment Dykes**



Mallon Oil Company
East Blanco Water / H₂S Disposal Plant
Rio Arriba County, NM



ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

October 14, 1999

Mr. John Zelletti
Mallon Oil
P.O. Box 2797
Durango, Colorado 81302

(970) 382-9100
(970) 382-7650

Project No.: 99070
Job No.: 907001

Dear Mr. Zelleti,

Enclosed are the analytical results for the samples collected from the location designated as "Jicarilla Pond". Two water samples and one soil sample were collected by Mallon Oil designated personnel on 10/06/99, and delivered to the Envirotech laboratory on 10/06/99 for Total Petroleum Hydrocarbons (TPH) analysis per USEPA Method 8015 Modified (soil sample only), and for Total Chloride analysis per USEPA Method 9077 (water samples only).

The samples were documented on Envirotech Chain of Custody No. 7432 and assigned Laboratory Nos. G188 (Pond #1 West Side), G189 (Pond #1 East Side), and G190 (Dirt from Spoils Pile) for tracking purposes.

The samples were analyzed on 10/13/99 using USEPA or equivalent methods.

Should you have any questions or require additional information, please do not hesitate to contact us at (505) 632-0615. It has been our pleasure doing business with you and we hope you will consider Envirotech, Inc. for any of your future environmental contracting needs.

Respectfully submitted,
Envirotech, Inc.


Stacy W. Sandler
Environmental Scientist/Laboratory Manager

enclosure

SWS\sws\99070\907001lb1.wpd

CHAIN OF CUSTODY RECORD

7432

Client / Project Name Mallon Q.1			Project Location Jicarilla Pond			ANALYSIS / PARAMETERS					
Sampler: Dale Griffin (330-6211) Client No. 907001						Remarks 					
Sample No./ Identification	Sample Date	Sample Time	Lab Number	Sample Matrix	No. of Containers	Chloride	Hydrocarbons	Heavy Metals	Other	Remarks	
Pond #1 West Side	10/6/99	—	G188	Water	1	✓	Chlorides & Hydrocarbons	Std. Analysis			
Pond #1 East Side	10/6/99	—	G189	Soil	1	✓	"	Std. Analysis			
Dirt From Spoils Pile	10/6/99	—	G190	Soil	1	✓	"	Std. Analysis			
Note: NOT Refrigerated when received - delivered did not know if refrigerated. Told Client samples may need to be retaken.											
Relinquished by: (Signature)			Date			Time			Received by: (Signature)		
<i>[Signature]</i>			10/12/99			3:50 PM			<i>[Signature]</i>		
Relinquished by: (Signature)			Date			Time			Received by: (Signature)		
<i>[Signature]</i>											
Relinquished by: (Signature)			Date			Time			Received by: (Signature)		
<i>[Signature]</i>											

ENVIROTECH INC.

5796 U.S. Highway 64
Farmington, New Mexico 87401
(505) 632-0615

Sample Receipt

Y N N/A

Received Intact

Cool - Ice/Blue Ice

ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

EPA METHOD 8015 Modified Nonhalogenated Volatile Organics Total Petroleum Hydrocarbons

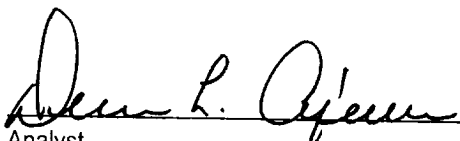
Client:	Maloon Oil	Project #:	907001
Sample ID:	Dirt from Spoils Pile	Date Reported:	10-14-99
Laboratory Number:	G190	Date Sampled:	10-06-99
Chain of Custody No:	7432	Date Received:	10-12-99
Sample Matrix:	Soil	Date Extracted:	10-13-99
Preservative:	Cool	Date Analyzed:	10-13-99
Condition:	Cool and Intact	Analysis Requested:	8015 TPH

Parameter	Concentration (mg/Kg)	Det. Limit (mg/Kg)
Gasoline Range (C5 - C10)	7.2	0.2
Diesel Range (C10 - C28)	8.1	0.1
Total Petroleum Hydrocarbons	15.3	0.2

ND - Parameter not detected at the stated detection limit.

References: Method 8015B, Nonhalogenated Volatile Organics, Test Methods for Evaluating Solid Waste, SW-846, USEPA, December 1996.

Comments: Jicarilla Pond.


Analyst


Review

ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

Total Chloride

Client:	Mallon Oil	Project #:	907001
Sample ID:	Pond #1 West Side	Date Reported:	10-14-99
Lab ID#:	G188	Date Sampled:	10-06-99
Sample Matrix:	Water	Date Received:	10-12-99
Preservative:	None	Date Analyzed:	10-13-99
Condition:	Intact	Chain of Custody:	7432

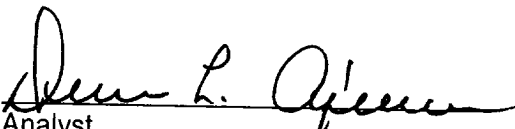
Parameter	Concentration (mg/L)
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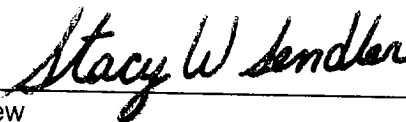
Total Chloride

7.1

Reference: Method 9077 Test Methods for Total Chlorine. USEPA SW-846, Sept. 1994.

Comments: Jicarilla Pond.


Analyst


Review

BJ SERVICES COMPANY**WATER ANALYSIS #WA000004****FARMINGTON LAB****GENERAL INFORMATION**

OPERATOR: MALLON OIL CO.	DEPTH:
WELL: N/A Tank #1	DATE SAMPLED: 08/20/99
FIELD:	DATE RECEIVED: 08/23/99
SUBMITTED BY: N.A.	COUNTY: RIO ARriba STATE: NM
WORKED BY: M. LOGAN	FORMATION: N/A
PHONE NUMBER: 327-6222	

SAMPLE DESCRIPTION

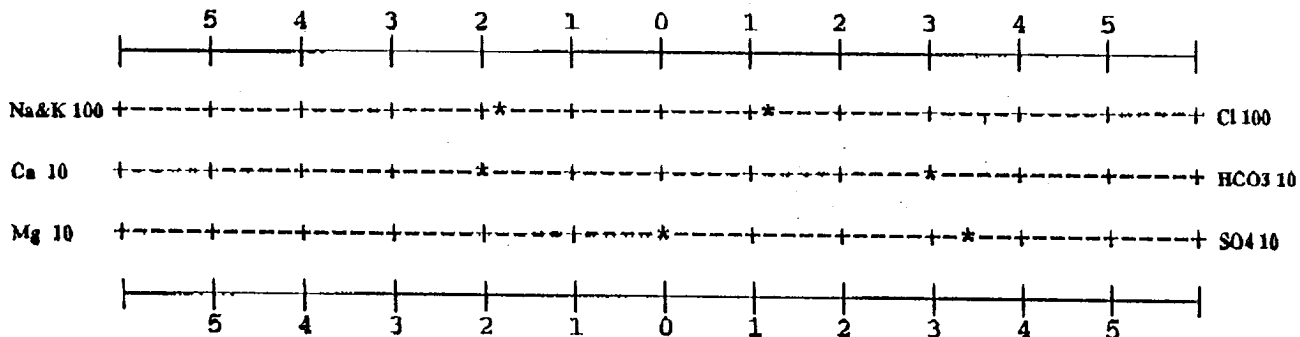
TANK #1

PHYSICAL AND CHEMICAL DETERMINATIONS

SPECIFIC GRAVITY:	1.000	@ 72°F	PH:	8.84
RESISTIVITY (MEASURED):	1.400	ohms @ 72°F		
IRON (FE++) :	0	ppm	SULFATE:	1,600 ppm
CALCIUM:	384	ppm	TOTAL HARDNESS	1,001 ppm
MAGNESIUM:	10	ppm	BICARBONATE:	1,891 ppm
CHLORIDE:	4,609	ppm	SODIUM CHLORIDE (Calc)	7,582 ppm
SODIUM+POTASS:	5,411	ppm	TOT. DISSOLVED SOLIDS:	14,511 ppm
IODINE:			POTASSIUM:	14 PPM

REMARKS

H2S PRESENT

STIFF TYPE PLOT (IN MEQ/L)**ANALYST**

M. LOGAN

BJ SERVICES COMPANY

WATER ANALYSIS #FW01W619**FARMINGTON LAB**

GENERAL INFORMATION

OPERATOR: MALLON OIL
WELL: TANK #2
FIELD:
SUBMITTED BY:M.O.C
WORKED BY :MIKE LOGAN
PHONE NUMBER:

DEPTH:
DATE SAMPLED: 08/20/99
DATE RECEIVED: 08/20/99
COUNTY: RIO ARRIBA STATE: NM
FORMATION:

SAMPLE DESCRIPTION

water for analysis

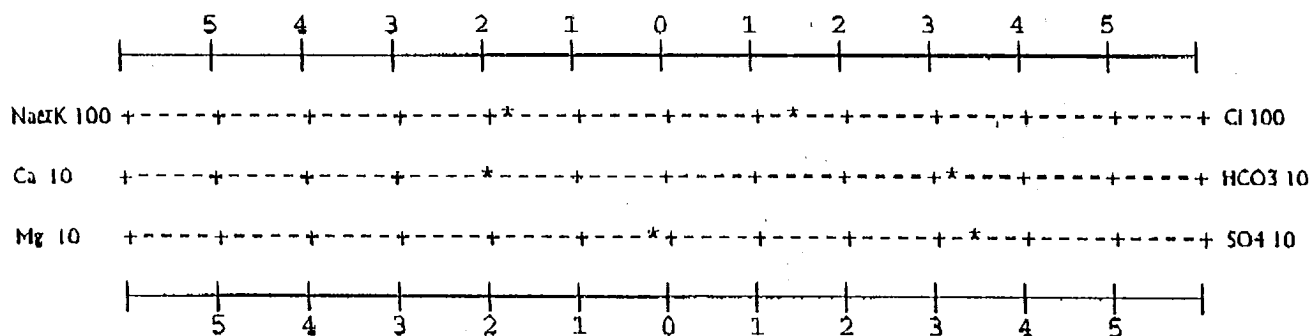
PHYSICAL AND CHEMICAL DETERMINATIONS

SPECIFIC GRAVITY:	1.000	@ 72°F	PH:	8.96
RESISTIVITY (MEASURED):	1.400	ohms @ 75°F		
IRON (FE++) :	0	ppm	SULFATE:	1,600 ppm
CALCIUM:	392	ppm	TOTAL HARDNESS	1,041 ppm
MAGNESIUM:	15	ppm	BICARBONATE:	1,952 ppm
CHLORIDE:	4,963	ppm	SODIUM CHLORIDE (Calc)	8,165 ppm
SODIUM+POTASS:	4,241	ppm	TOT. DISSOLVED SOLIDS:	13,797 ppm
H2S: GOOD TRACE			POTASSIUM CHLORIDE:	11

REMARKS

TANK #2

STIFF TYPE PLOT (IN MEQ/L)



ANALYST

MIKE LOGAN

BJ SERVICES COMPANY

WATER ANALYSIS #FW01W620

FARMINGTON LAB

GENERAL INFORMATION

OPERATOR: MALLON OIL
WELL: TANK #3
FIELD:
SUBMITTED BY: M.O.C.
WORKED BY : MIKE LOGAN
PHONE NUMBER:

DEPTH:
DATE SAMPLED: 08/20/99
DATE RECEIVED: 08/20/99
COUNTY: RIO ARriba STATE: NM
FORMATION:

SAMPLE DESCRIPTION

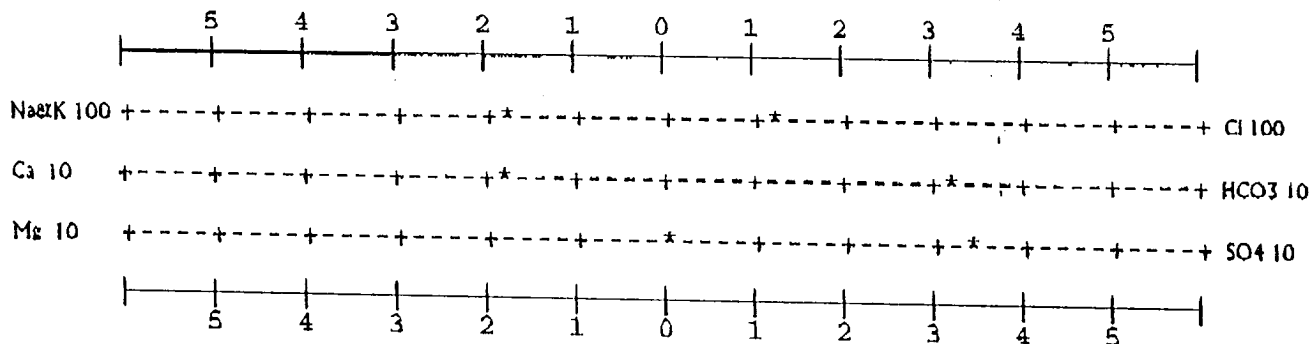
water for analysis
tank #3

PHYSICAL AND CHEMICAL DETERMINATIONS

SPECIFIC GRAVITY:	1.000	@ 74°F	PH:	9.12
RESISTIVITY (MEASURED):	1.400	ohms @ 75°F		
IRON (FE++) :	0 ppm	SULFATE:		1,600 ppm
CALCIUM:	344 ppm	TOTAL HARDNESS		881 ppm
MAGNESIUM:	5 ppm	BICARBONATE:		2,013 ppm
CHLORIDE:	4,609 ppm	SODIUM CHLORIDE (Calc)		7,582 ppm
SODIUM+POTASS:	4,108 ppm	TOT. DISSOLVED SOLIDS:		13,210 ppm
H2S: GOOD TRACE		POTASSIUM CHLORIDE:		11

REMARKS

STIFF TYPE PLOT (IN MEQ/L)



ANALYST

MIKE LOGAN

BJ SERVICES COMPANY

WATER ANALYSIS #FW01W621

FARMINGTON LAB

GENERAL INFORMATION

OPERATOR: MALLON OIL
WELL: TANK #4
FIELD:
SUBMITTED BY: M.O.C.
WORKED BY : MIKE LOGAN
PHONE NUMBER:

DEPTH;
DATE SAMPLED: 08/20/99
DATE RECEIVED: 08/20/99
COUNTY: RIO ARRIBA STATE: NM
FORMATION:

SAMPLE DESCRIPTION

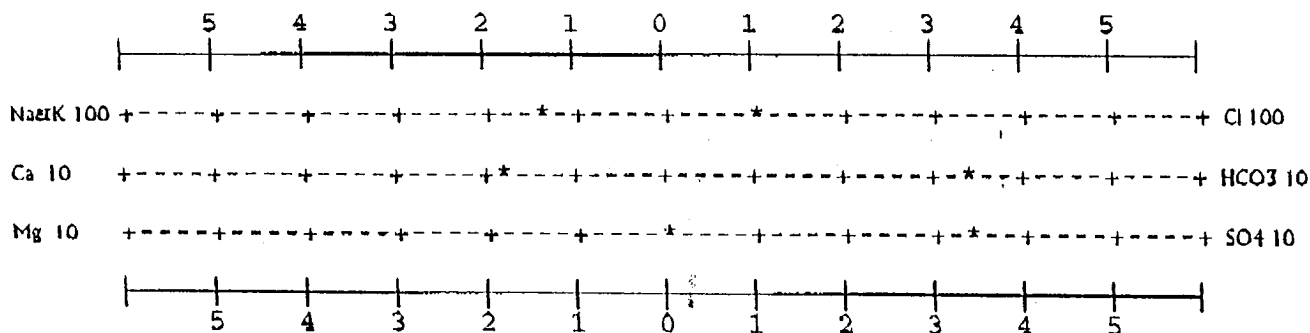
water for analysis
tank #4

PHYSICAL AND CHEMICAL DETERMINATIONS

SPECIFIC GRAVITY:	1.000	@ 74°F	PH:	9.18
RESISTIVITY (MEASURED):	1.400	ohms @ 75°F		
IRON (FE++) :	0 ppm	SULFATE:		1,600 ppm
CALCIUM:	368 ppm	TOTAL HARDNESS		941 ppm
MAGNESIUM:	5 ppm	BICARBONATE:		2,074 ppm
CHLORIDE:	3,545 ppm	SODIUM CHLORIDE (Calc)		5,832 ppm
SODIUM+POTASS:	3,414 ppm	TOT. DISSOLVED SOLIDS:		11,574 ppm
H2S: GOOD TRACE		POTASSIUM CHLORIDE:		11

REMARKS

STIFF TYPE PLOT (IN MEQ/L)



ANALYST

MIKE LOGAN

BJ SERVICES COMPANY
WATER ANALYSIS #FW01W622
FARMINGTON LAB

GENERAL INFORMATION

OPERATOR: MALLON OIL	DEPTH:
WELL: SEDIMENT TANK	DATE SAMPLED: 08/20/99
FIELD:	DATE RECEIVED: 08/20/99
SUBMITTED BY: M.O.C.	COUNTY: RIO ARRIBA STATE: NM
WORKED BY: MIKE LOGAN	FORMATION:
PHONE NUMBER:	

SAMPLE DESCRIPTION

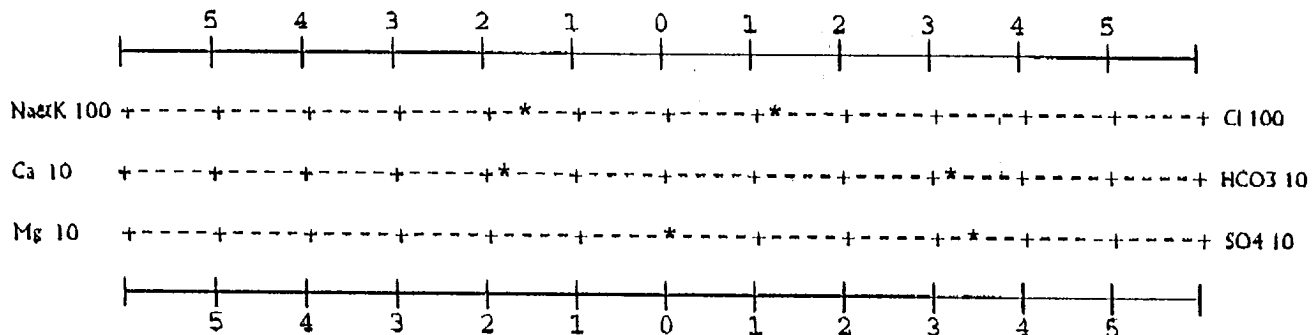
water for analysis
 SEDIMENT TANK

PHYSICAL AND CHEMICAL DETERMINATIONS

SPECIFIC GRAVITY:	1.000	@ 74°F	PH:	8.35
RESISTIVITY (MEASURED):	1.400	ohms @ 75°F		
IRON (FE++) :	0 ppm	SULFATE:		1,600 ppm
CALCIUM:	376 ppm	TOTAL HARDNESS		981 ppm
MAGNESIUM:	10 ppm	BICARBONATE:		1,952 ppm
CHLORIDE:	4,254 ppm	SODIUM CHLORIDE (Calc)		6,998 ppm
SODIUM+POTASS:	3,809 ppm	TOT. DISSOLVED SOLIDS:		12,596 ppm
H2S: GOOD TRACE		POTASSIUM CHLORIDE:		12

REMARKS

STIFF TYPE PLOT (IN MEQ/L)



ANALYST

MIKE LOGAN

BJ SERVICES COMPANY

WATER ANALYSIS #FW01W623

FARMINGTON LAB

GENERAL INFORMATION

OPERATOR: MALLON OIL
WELL: CHARGE PUMP
FIELD:
SUBMITTED BY: M.O.C.
WORKED BY : MIKE LOGAN
PHONE NUMBER:

DEPTH:
DATE SAMPLED: 08/20/99
DATE RECEIVED: 08/20/99
COUNTY: RIO ARRIBA STATE: NM
FORMATION:

SAMPLE DESCRIPTION

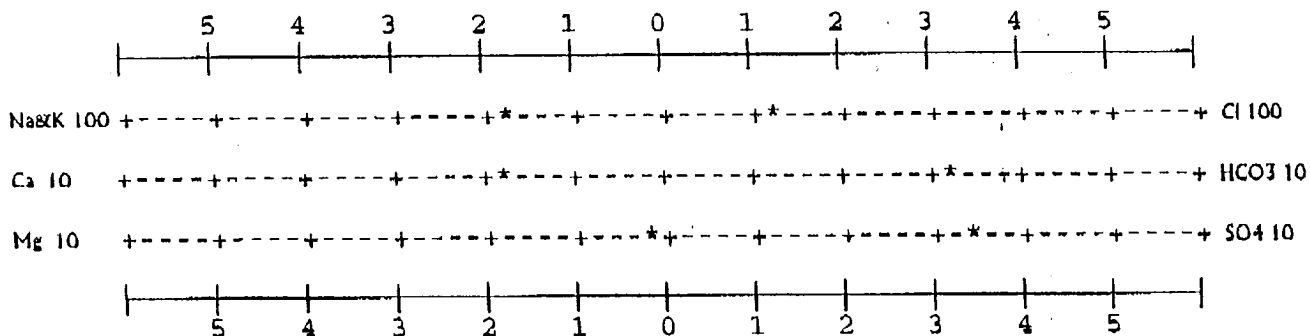
water for analysis
CHARGE PUMP

PHYSICAL AND CHEMICAL DETERMINATIONS

SPECIFIC GRAVITY:	1.000	@ 74°F	PH:	9.09
RESISTIVITY (MEASURED):	1.400	ohms @ 75°F		
IRON (FE++) :	0 ppm	SULFATE:		1,600 ppm
CALCIUM:	360 ppm	TOTAL HARDNESS		1,041 ppm
MAGNESIUM:	34 ppm	BICARBONATE:		2,013 ppm
CHLORIDE:	4,609 ppm	SODIUM CHLORIDE (Calc)		7,582 ppm
SODIUM+POTASS:	4,034 ppm	TOT. DISSOLVED SOLIDS:		13,297 ppm
H2S: GOOD TRACE		POTASSIUM CHLORIDE:		13

REMARKS

STIFF TYPE PLOT (IN MEQ/L)



ANALYST

MIKE LOGAN

BLAGG ENGINEERING, INC.

P.O. Box 87, Bloomfield, New Mexico 87413

Phone: (505)632-1199 Fax: (505)632-3903

September 23, 1999

Mr. Terry Lindeman
Mallon Oil Company
P.O. Box 2797
Durango, Colorado 81302

Re: Jicarilla SWD Effluent & Pond Sample Results
SE/4 Sec 7 - T30N - R3W
Rio Arriba County, New Mexico

Dear Mr. Lindeman:

Pursuant to your request, on August 26, 1999 Blagg Engineering, Inc. (BEI) sampled produced water effluent prior to injection at the Mallon Oil Company Jicarilla SWD facility. Additionally, a down gradient stock pond was also sampled on this date. A Jicarilla Apache Environmental Protection Office representative, Mr. Dickson Sandoval, was present during the sample events. Due to laboratory requirements for additional sample, BEI obtained extra samples on September 2, 1999 from both sample sites. The sampling and testing was conducted to assist Mallon Oil Company and the Jicarilla Apache Tribe in determining hydrocarbon impacts in produced water and in the pond.

The water samples were submitted to Onsite Technologies, Ltd. Laboratories for analysis of total petroleum hydrocarbons using U.S. EPA Method 8015, and for light end hydrocarbons BTEX following U.S. EPA Method 8021. Test results for the sampling were as follows:

Table 1

Mallon Oil Jicarilla SWD Disposal Facility
Water Sample Test Results
Sampled 8/26/99 - 9/2/99

Sample ID	TPH Method 8015 mg/L	Benzene Method 8021 ug/L	Toluene Method 8021 ug/L	Eth-Benzene Method 8021 ug/L	Xylenes Method 8021 ug/L
Tank Effluent	39.6	310	880	120	970
Pond	ND	ND	ND	ND	ND

mg/L = milligrams/Liter (ppm)

ug/L = micrograms/Liter (ppb)

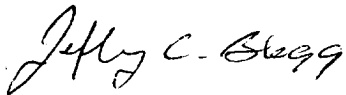
ND = not detected

Laboratory test reports are attached.

There are no regulatory standards for produced water effluent discharged into an approved disposal well. The pond test results indicate there were no hydrocarbons identified at this down gradient livestock tank.

It has been a pleasure to provide services for your use. Please contact myself if you have questions or need additional information.

Respectfully submitted,
Blagg Engineering, Inc.

A handwritten signature in cursive script that reads "Jeffrey C. Blagg".

Jeffrey C. Blagg, President
NMPE 11607

Attachment: Lab Reports

jcb/mallon3.rpt.wpd

OFF: (505) 325-5667



LAB: (505) 325-1556

September 16, 1999

Jeff Blagg
Blagg Engineering
P.O. Box 87
Bloomfield, NM 87413
TEL: (505) 632-1199
FAX

RE: Mallon Jicarilla SWD

Order No.: 9909007

Dear Jeff Blagg,

On Site Technologies, LTD. received 2 samples on 09/02/1999 for the analyses presented in the following report.

The Samples were analyzed for the following tests:

Diesel Range Organics (SW8015B)

There were no problems with the analyses and all data for associated QC met EPA or laboratory specifications except where noted in the Case Narrative.

If you have any questions regarding these tests results, please feel free to call.

Sincerely,

A handwritten signature in black ink, appearing to read "David Cox", is written over a horizontal line.

David Cox

Date: _____
Page: _____ of _____

612 E. Murray Dr. • P.O. Box 2606 • Farmington, NM 87499
LAB: (505) 325-5667 • FAX: (505) 327-1496

[illegible]

OFF: (505) 325-5667



LAB: (505) 325-1556

On Site Technologies, LTD.

Date: 16-Sep-99

CLIENT: Blagg Engineering
Project: Mallon Jicarilla SWD
Lab Order: 9909007

CASE NARRATIVE

Samples were analyzed using the methods outlined in the following references:

Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, 3rd Edition

All method blanks, laboratory spikes, and/or matrix spikes met quality assurance objectives.

OFF: (505) 325-5667



LAB: (505) 325-1556

ANALYTICAL REPORT

Date: 16-Sep-99

Client:	Blagg Engineering	Client Sample Info:	Mallon Jicarilla SWD
Work Order:	9909007	Client Sample ID:	Tank Effluent
Lab ID:	9909007-01A	Matrix:	AQUEOUS
Project:	Mallon Jicarilla SWD	Collection Date:	09/02/1999 10:35:00 AM
		COC Record:	10062

Parameter	Result	PQL	Qual	Units	DF	Date Analyzed
DIESEL RANGE ORGANICS		SW8015B				
T/R Hydrocarbons: C10-C28	34.6	0.25		mg/L	1	Analyst: HR 09/14/1999

Qualifiers:

PQL - Practical Quantitation Limit

ND - Not Detected at Practical Quantitation Limit

J - Analyte detected below Practical Quantitation Limit

B - Analyte detected in the associated Method Blank

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

E - Value above quantitation range

Surr: - Surrogate

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- TECHNOLOGY BLENDING INDUSTRY WITH THE ENVIRONMENT -

1 of 1

OFF: (505) 325-5667



LAB: (505) 325-1556

ANALYTICAL REPORT

Date: 16-Sep-99

Client:	Blagg Engineering	Client Sample Info:	Mallon Jicarilla SWD
Work Order:	9909007	Client Sample ID:	Pond
Lab ID:	9909007-02A	Matrix:	AQUEOUS
Project:	Mallon Jicarilla SWD	Collection Date:	09/02/1999 11:00:00 AM
		COC Record:	10062

Parameter	Result	PQL	Qual	Units	DF	Date Analyzed
DIESEL RANGE ORGANICS		SW8015B				Analyst: HR
T/R Hydrocarbons: C10-C28	ND	0.26		mg/L	1	09/14/1999

Qualifiers:

PQL - Practical Quantitation Limit

ND - Not Detected at Practical Quantitation Limit

J - Analyte detected below Practical Quantitation Limit

B - Analyte detected in the associated Method Blank

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

E - Value above quantitation range

Surr: - Surrogate

1 of 1

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- TECHNOLOGY BLENDING INDUSTRY WITH THE ENVIRONMENT -

On Site Technologies, LTD.

Date: 16-Sep-99

CLIENT: Blagg Engineering
Work Order: 9909007
Project: Mallon Jicarilla SWD

QC SUMMARY REPORT

Method Blank

Sample ID: MB-117	Batch ID: 117	Test Code: SW8015B	Units: mg/L	Analysis Date 09/13/1999	Prep Date: 09/08/1999
Client ID:	9909007	Run ID: GC-2_990913A		SeqNo: 19547	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC
	ND				
T/R Hydrocarbons: C10-C28				LowLimit	HighLimit
				RPD Ref Val	%RPD
				RPDLimit	Qual

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits

S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank

On Site Technologies, LTD.

Date: 16-Sep-99

CLIENT: Blagg Engineering

Work Order: 9909007

Project: Mallon Jicarilla SWD

QC SUMMARY REPORT

Sample Duplicate

Sample ID: 9909017-01DD	Batch ID: 117	Test Code: SW8015B	Units: mg/L	Analysis Date 09/14/1999	Prep Date: 09/13/1999
Client ID: 9909007	Run ID: GC-2_990913A	PQL	SPK value	SeqNo: 19554	
Analyte	Result	%REC	SPK Ref Val	LowLimit	HighLimit
T/R Hydrocarbons: C10-C28	ND	0.25	0	0	0
				%RPD	RPDLimit
				0.0%	20
				0	0
				0	0
				0.0%	20

Qualifiers:

ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank

On Site Technologies, LTD.

Date: 16-Sep-99

CLIENT: Blagg Engineering

Work Order: 9909007

Project: Mallon Jicarilla SWD

QC SUMMARY REPORT

Laboratory Control Spike - generic

Sample ID: LCS-117	Batch ID: 117	Test Code: SW8015B	Units: mg/L	Analysis Date 09/14/1999	Prep Date: 09/09/1999
Client ID:	9909007	Run ID: GC-2_990913A		SeqNo: 19549	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC
T/R Hydrocarbons: C10-C28	4.992	0.25	5.02	0	99.4%
				70	130
				LowLimit	HighLimit
				RPD Ref Val	%RPD
				RPDLimit	Qual
Sample ID: LCSD	Batch ID: 117	Test Code: SW8015B	Units: mg/L	Analysis Date 09/14/1999	Prep Date: 09/09/1999
Client ID:	9909007	Run ID: GC-2_990913A		SeqNo: 19550	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC
T/R Hydrocarbons: C10-C28	4.741	0.25	5.02	0	94.5%
				70	130
				LowLimit	HighLimit
				RPD Ref Val	%RPD
				RPDLimit	Qual
				4.992	5.1%
				20	

Qualifiers:

ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank

On Site Technologies, LTD.

Date: 16-Sep-99

CLIENT: Blagg Engineering

Work Order: 9909007

Project: Mallon Jicarilla SWD

QC SUMMARY REPORT

Continuing Calibration Verification Standard

Sample ID: CCV1 DRO_99091	Batch ID: 117	Test Code: SW8015B	Units: mg/L	Analysis Date 09/14/1999	Prep Date:
Client ID:	9909007	Run ID: GC-2_990913A		SeqNo: 19548	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual
T/R Hydrocarbons: C10-C28	4.764	0.25	5.02	0	94.9% 85 115
Sample ID: CCV2 DRO_99091	Batch ID: 117	Test Code: SW8015B	Units: mg/L	Analysis Date 09/14/1999	Prep Date:
Client ID:	9909007	Run ID: GC-2_990913A		SeqNo: 19556	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual
T/R Hydrocarbons: C10-C28	5.699	0.25	5.02	0	113.5% 85 115

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits

S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank

OFF: (505) 325-5667



LAB: (505) 325-1556

September 15, 1999

Jeff Blagg
Blagg Engineering
P.O. Box 87
Bloomfield, NM 87413
TEL: (505) 632-1199
FAX

RE: Mallon Jicarilla SWD

Order No.: 9908059

Dear Jeff Blagg,

On Site Technologies, LTD. received 2 samples on 8/27/99 for the analyses presented in the following report.

The Samples were analyzed for the following tests:

Aromatic Volatiles by GC/PID (SW8021B)

Gasoline Range Organics (SW8015B)

There were no problems with the analyses and all data for associated QC met EPA or laboratory specifications except where noted in the Case Narrative.

If you have any questions regarding these tests results, please feel free to call.

Sincerely,

A handwritten signature in black ink, appearing to be 'David Cox', with a stylized flourish at the end.

David Cox

612 E. Murray Dr. • P.O. Box 2606 • Farmington, NM 87499
LAB: (505) 325-5667 • FAX: (505) 327-1496

[illegible]

OFF: (505) 325-5667



LAB: (505) 325-1556

On Site Technologies, LTD.

Date: 15-Sep-99

CLIENT: Blagg Engineering
Project: Mallon Jicarilla SWD
Lab Order: 9908059

CASE NARRATIVE

Samples were analyzed using the methods outlined in the following references:

Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, 3rd Edition

All method blanks, laboratory spikes, and/or matrix spikes met quality assurance objectives.

OFF: (505) 325-5667



LAB: (505) 325-1556

ANALYTICAL REPORT

Date: 16-Sep-99

Client:	Blagg Engineering	Client Sample Info:	Mallon Jicarilla SWD
Work Order:	9908059	Client Sample ID:	Tank Effluent
Lab ID:	9908059-01A	Matrix:	AQUEOUS
Project:	Mallon Jicarilla SWD	Collection Date:	08/26/1999 12:30:00 PM
		COC Record:	10272

Parameter	Result	PQL	Qual	Units	DF	Date Analyzed
GASOLINE RANGE ORGANICS		SW8015B				
T/R Hydrocarbons: C6-C10	4960	450		µg/L	10	Analyst: HR 09/09/1999
AROMATIC VOLATILES BY GC/PID		SW8021B				Analyst: HR
Benzene	310	5		µg/L	10	09/03/1999
Toluene	880	5		µg/L	10	09/03/1999
Ethylbenzene	120	5		µg/L	10	09/03/1999
m,p-Xylene	730	10		µg/L	10	09/03/1999
o-Xylene	240	5		µg/L	10	09/03/1999

Qualifiers:

- PQL - Practical Quantitation Limit
- ND - Not Detected at Practical Quantitation Limit
- J - Analyte detected below Practical Quantitation Limit
- B - Analyte detected in the associated Method Blank

- S - Spike Recovery outside accepted recovery limits
- R - RPD outside accepted recovery limits
- E - Value above quantitation range
- Surr: - Surrogate

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- TECHNOLOGY BLENDING INDUSTRY WITH THE ENVIRONMENT -

OFF: (505) 325-5667



LAB: (505) 325-1556

ANALYTICAL REPORT

Date: 16-Sep-99

Client:	Blagg Engineering	Client Sample Info:	Mallon Jicarilla SWD
Work Order:	9908059	Client Sample ID:	Pond
Lab ID:	9908059-02A	Matrix:	AQUEOUS
Project:	Mallon Jicarilla SWD	Collection Date:	08/26/1999 1:00:00 PM
		COC Record:	10272

Parameter	Result	PQL	Qual	Units	DF	Date Analyzed
GASOLINE RANGE ORGANICS		SW8015B				
T/R Hydrocarbons: C6-C10	ND	180		µg/L	1	Analyst: HR 09/08/1999
AROMATIC VOLATILES BY GC/PID		SW8021B				Analyst: DC
Benzene	ND	0.5		µg/L	1	09/02/1999
Toluene	ND	0.5		µg/L	1	09/02/1999
Ethylbenzene	ND	0.5		µg/L	1	09/02/1999
m,p-Xylene	ND	1		µg/L	1	09/02/1999
o-Xylene	ND	0.5		µg/L	1	09/02/1999

Qualifiers:

PQL - Practical Quantitation Limit

ND - Not Detected at Practical Quantitation Limit

J - Analyte detected below Practical Quantitation Limit

B - Analyte detected in the associated Method Blank

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

E - Value above quantitation range

Surr: - Surrogate

1 of 1

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- TECHNOLOGY BLENDING INDUSTRY WITH THE ENVIRONMENT -

On Site Technologies, LTD.

Date: 15-Sep-99

CLIENT: Blagg Engineering
 Work Order: 9908059
 Project: Mallon Jicarilla SWD

QC SUMMARY REPORT

Method Blank

Sample ID: MB1	Batch ID: GC-1_990902	Test Code: SW8021B	Units: µg/L	Analysis Date 9/2/99	Prep Date:						
Client ID:	9908059	Run ID: GC-1_990902B		SeqNo: 19146							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	.0366										J
Ethylbenzene	.0702										J
m,p-Xylene	.1259										J
Methyl tert-Butyl Ether	ND										
o-Xylene	.1153										J
Toluene	.1935										J

Sample ID: MB1	Batch ID: GC-1_990903	Test Code: SW8021B	Units: µg/L	Analysis Date 9/3/99	Prep Date:						
Client ID:	9908059	Run ID: GC-1_990903A		SeqNo: 19240							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	.0302		0.5								J
Ethylbenzene	ND		0.5								
m,p-Xylene	ND		1								
Methyl tert-Butyl Ether	ND		1								
o-Xylene	.0586		0.5								J
Toluene	.1135		0.5								J

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank

On Site Technologies, LTD.

Date: 15-Sep-99

CLIENT: Blagg Engineering

Work Order: 9908059

Project: Mallon Jicarilla SWD

QC SUMMARY REPORT

Sample Matrix Spike

Sample ID: 9908059-01AMS		Batch ID: GC-1_990902	Test Code: SW8021B	Units: µg/L	Analysis Date 9/2/99		Prep Date:	
Client ID: Tank Effluent		Run ID: 9908059	QC-1_990902B		SeqNo: 19147			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val
Benzene	4229	50	4000	314.2	97.9%	80	116	
Ethylbenzene	4060	50	4000	326.2	93.4%	80	118	
m,p-Xylene	8184	100	8000	851.1	91.7%	77	116	
Methyl tert-Butyl Ether	4291	100	4000	0	107.3%	62	122	
o-Xylene	4245	50	4000	298.7	98.7%	83	117	
Toluene	4852	50	4000	914.2	98.4%	80	116	

Sample ID: 9908059-01AMSD		Batch ID: GC-1_990902	Test Code: SW8021B	Units: µg/L	Analysis Date 9/2/99		Prep Date:	
Client ID: Tank Effluent		Run ID: 9908059	GC-1_990902B		SeqNo: 19148			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val
Benzene	4158	50	4000	314.2	96.1%	80	116	4229
Ethylbenzene	3996	50	4000	326.2	91.7%	80	118	4060
m,p-Xylene	8057	100	8000	851.1	90.1%	77	116	8184
Methyl tert-Butyl Ether	4387	100	4000	0	109.7%	62	122	4291
o-Xylene	4144	50	4000	298.7	96.1%	83	117	4245
Toluene	4768	50	4000	914.2	96.3%	80	116	4852

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits

S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank

CLIENT: Blagg Engineering
Work Order: 9908059
Project: Mallon Jicarilla SWD

QC SUMMARY REPORT
 Sample Matrix Spike

Sample ID: 9909008-02AMS		Batch ID: GC-1_990903		Test Code: SW8021B		Units: µg/L		Analysis Date 9/3/99		Prep Date:	
Client ID: 9908059		Run ID: GC-1_990903A		PQL		SPK value		SeqNo: 19241			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	2070	10	800	1300	96.2%	80	116				
Ethylbenzene	1499	10	800	720	97.4%	80	118				
m,p-Xylene	3094	20	1600	1600	93.4%	77	116				
Methyl tert-Butyl Ether	1133	20	800	350	97.9%	62	122				
o-Xylene	1295	10	800	480	101.9%	83	117				
Toluene	3236	10	800	2500	92.0%	80	116				

Sample ID: 9909008-02AMSD		Batch ID: GC-1_990903		Test Code: SW8021B		Units: µg/L		Analysis Date 9/3/99		Prep Date:	
Client ID: 9908059		Run ID: GC-1_990903A		PQL		SPK value		SeqNo: 19242			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	2018	10	800	1300	89.7%	80	116	2070	2.5%	8	
Ethylbenzene	1460	10	800	720	92.5%	80	118	1499	2.6%	9	
m,p-Xylene	3005	20	1600	1600	87.8%	77	116	3094	2.9%	9	
Methyl tert-Butyl Ether	1124	20	800	350	96.7%	62	122	1133	0.8%	7	
o-Xylene	1260	10	800	480	97.5%	83	117	1295	2.7%	9	
Toluene	3147	10	800	2500	80.9%	80	116	3236	2.8%	9	

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 B - Analyte detected in the associated Method Blank

On Site Technologies, LTD.

Date: 15-Sep-99

CLIENT: Blagg Engineering

Work Order: 9908059

Project: Mallon Jicarilla SWD

QC SUMMARY REPORT

Laboratory Control Spike - generic

Sample ID: LCS WATER		Batch ID: GC-1_990902		Test Code: SW8021B		Units: µg/L		Analysis Date 9/2/99		Prep Date:	
Client ID:		9908059		Run ID: GC-1_990902B				SeqNo: 19145			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	39.25	0.5	40	0.0366	98.0%	87	119				
Ethylbenzene	39.39	0.5	40	0.0702	98.3%	89	117				
m,p-Xylene	74.66	1	80	0.1259	93.2%	88	114				
Methyl tert-Butyl Ether	40.25	1	40	0	100.6%	69	129				
o-Xylene	39.7	0.5	40	0.1153	99.0%	90	116				
Toluene	39.38	0.5	40	0.1935	98.0%	90	115				

Sample ID: LCS WATER		Batch ID: GC-1_990903		Test Code: SW8021B		Units: µg/L		Analysis Date 9/3/99		Prep Date:	
Client ID:		9908059		Run ID: GC-1_990903A				SeqNo: 19239			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	40.43	0.5	40	0.0302	101.0%	87	119				
Ethylbenzene	40.66	0.5	40	0	101.6%	89	117				
m,p-Xylene	76.91	1	80	0	96.1%	88	114				
Methyl tert-Butyl Ether	41.76	1	40	0	104.4%	69	129				
o-Xylene	40.84	0.5	40	0.0586	102.0%	90	116				
Toluene	40.49	0.5	40	0.1135	100.9%	90	115				

Qualifiers: ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank

On Site Technologies, LTD.

Date: 15-Sep-99

CLIENT: Blagg Engineering

Work Order: 9908059

Project: Mallon Jicarilla SWD

QC SUMMARY REPORT

Continuing Calibration Verification Standard

Sample ID: CCV1 BTEX_9906		Batch ID: GC-1_990902	Test Code: SW8021B	Units: µg/L	Analysis Date 9/2/99		Prep Date:	
Client ID: 9908059		Run ID: GC-1_990902B	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit
Analyte	Result							
Benzene	20.29		0.5	20	0	101.4%	85	115
Ethylbenzene	20.5		0.5	20	0	102.5%	85	115
m,p-Xylene	38.79		1	40	0	97.0%	85	115
Methyl tert-Butyl Ether	20.72		1	20	0	103.6%	85	115
o-Xylene	20.62		0.5	20	0	103.1%	85	115
Toluene	20.41		0.5	20	0	102.1%	85	115
1,4-Difluorobenzene	89.46		0	100	0	89.5%	80	120
4-Bromochlorobenzene	86.94		0	100	0	86.9%	80	120
Fluorobenzene	87.8		0	100	0	87.8%	80	120

Sample ID: CCV2 BTEX_9906		Batch ID: GC-1_990902	Test Code: SW8021B	Units: µg/L	Analysis Date 9/2/99		Prep Date:	
Client ID: 9908059		Run ID: GC-1_990902B	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit
Analyte	Result							
Benzene	19.86		0.5	20	0	99.3%	85	115
Ethylbenzene	19.97		0.5	20	0	99.8%	85	115
m,p-Xylene	37.78		1	40	0	94.5%	85	115
Methyl tert-Butyl Ether	21.38		1	20	0	106.9%	85	115
o-Xylene	20.2		0.5	20	0	101.0%	85	115
Toluene	19.9		0.5	20	0	99.5%	85	115
1,4-Difluorobenzene	89.35		0	100	0	89.4%	80	120
4-Bromochlorobenzene	87.6		0	100	0	87.6%	80	120
Fluorobenzene	87.76		0	100	0	87.8%	80	120

Qualifiers: ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank

CLIENT: Blagg Engineering
 Work Order: 9908059
 Project: Mallon Jicarilla SWD

QC SUMMARY REPORT

Continuing Calibration Verification Standard

Sample ID: CCV3 BTEX_9906		Batch ID: GC-1_990902	Test Code: SW8021B	Units: µg/L	Analysis Date 9/2/99		Prep Date:	
Client ID: 9908059		Run ID: GC-1_990902B	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit
Analyte	Result							
Benzene	37.86		0.5	40	0	94.7%	85	115
Ethylbenzene	37.9		0.5	40	0	94.8%	85	115
m,p-Xylene	71.82		1	80	0	89.8%	85	115
Methyl tert-Butyl Ether	40.79		1	40	0	102.0%	85	115
o-Xylene	38.3		0.5	40	0	95.7%	85	115
Toluene	38.01		0.5	40	0	95.0%	85	115
1,4-Difluorobenzene	88.4		0	100	0	88.4%	80	120
4-Bromochlorobenzene	87.11		0	100	0	87.1%	80	120
Fluorobenzene	87.42		0	100	0	87.4%	80	120

Sample ID: CCV1 BTEX_9906		Batch ID: GC-1_990903	Test Code: SW8021B	Units: µg/L	Analysis Date 9/3/99		Prep Date:	
Client ID: 9908059		Run ID: GC-1_990903A	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit
Analyte	Result							
Benzene	21.61		0.5	20	0	108.0%	85	115
Ethylbenzene	21.86		0.5	20	0	109.3%	85	115
m,p-Xylene	41.23		1	40	0	103.1%	85	115
Methyl tert-Butyl Ether	21.54		1	20	0	107.7%	85	115
o-Xylene	21.82		0.5	20	0	109.1%	85	115
Toluene	21.62		0.5	20	0	108.1%	85	115
1,4-Difluorobenzene	89.26		0	100	0	89.3%	80	120
4-Bromochlorobenzene	89.78		0	100	0	89.8%	80	120
Fluorobenzene	88.08		0	100	0	88.1%	80	120

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank

CLIENT: Blagg Engineering

Work Order: 9908059

Project: Mallon Jicarilla SWD

QC SUMMARY REPORT

Continuing Calibration Verification Standard

Sample ID: CCV2 BTEX_9906		Batch ID: GC-1_990903	Test Code: SW8021B	Units: µg/L		Analysis Date 9/3/99		Prep Date:	
Client ID: 9908059		Run ID: GC-1_990903A	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	SeqNo: 19237
Analyte	Result								
Benzene	20.42		0.5	20	0	102.1%	85	115	
Ethylbenzene	20.52		0.5	20	0	102.6%	85	115	
m,p-Xylene	38.83		1	40	0	97.1%	85	115	
Methyl tert-Butyl Ether	22.34		1	20	0	111.7%	85	115	
o-Xylene	20.68		0.5	20	0	103.4%	85	115	
Toluene	20.46		0.5	20	0	102.3%	85	115	
1,4-Difluorobenzene	89.27		0	100	0	89.3%	80	120	
4-Bromochlorobenzene	87.44		0	100	0	87.4%	80	120	
Fluorobenzene	87.96		0	100	0	88.0%	80	120	

Sample ID: CCV3 BTEX_9906		Batch ID: GC-1_990903	Test Code: SW8021B	Units: µg/L		Analysis Date 9/3/99		Prep Date:	
Client ID: 9908059		Run ID: GC-1_990903A	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	SeqNo: 19238
Analyte	Result								
Benzene	19.52		0.5	20	0	97.6%	85	115	
Ethylbenzene	20.68		0.5	20	0	103.4%	85	115	
m,p-Xylene	39.43		1	40	0	98.6%	85	115	
Methyl tert-Butyl Ether	20.12		1	20	0	100.6%	85	115	
o-Xylene	20.86		0.5	20	0	104.3%	85	115	
Toluene	20.59		0.5	20	0	103.0%	85	115	
1,4-Difluorobenzene	89.34		0	100	0	89.3%	80	120	
4-Bromochlorobenzene	85.28		0	100	0	85.3%	80	120	
Fluorobenzene	87.72		0	100	0	87.7%	80	120	

Qualifiers:

ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank

On Site Technologies, LTD.

Date: 15-Sep-99

CLIENT: Blagg Engineering
Work Order: 9908059
Project: Mallon Jicarilla SWD
Test No: SW8021B

QC SUMMARY REPORT SURROGATE RECOVERIES

Aromatic Volatiles by GC/PID

Sample ID	14FBZ	4BCBZ	FLBZ					
9908059-01A	86.4	85.8	86.3					
9908059-01AMS	88	87.8	87					
9908059-01AMSD	88	87.9	87.1					
9908059-02A	89.7	87.1	88.9					
9909006-01A	90	86.5	88.6					
9909006-02A	89.7	86.8	89					
9909006-03A	89.8	87.2	88.9					
9909006-04A	89.6	85.9	88.9					
9909006-05A	89.7	87.4	88.8					
9909006-06A	89.7	87.4	89					
9909008-01A	89.8	86.8	88.6					
9909008-02A	88.7	88	86.7					
9909008-02AMS	88.3	89	86.6					
9909008-02AMSD	88.2	88.5	86.7					
9909008-03A	89.1	87	89.8					
9909009-01A	89.6	87.1	89.2					
9909009-02A	89.6	87.1	89.2					
9909009-04A	89.7	86.2	89.3					
9909009-05A	89.8	86.4	88.9					
9909009-08A	88.4	83.8	87.4					
9909009-10A	89.9	86.6	89					
9909009-11A	90	87.7	88.8					
9909009-12A	89.9	87.7	89.1					
9909009-15A	89.9	87.8	88.9					
9909009-16A	89.9	87.6	89					
9909009-17A	89.9	87.8	89					
9909009-18A	89.6	87.4	89					

Acronym

Surrogate

QC Limits

14FBZ

= 1,4-Difluorobenzene

80-120

4BCBZ

= 4-Bromochlorobenzene

80-120

FLBZ

= Fluorobenzene

80-120

* Surrogate recovery outside acceptance limits

CLIENT: Blagg Engineering
Work Order: 9908059
Project: Mallon Jicarilla SWD
Test No: SW8021B

QC SUMMARY REPORT SURROGATE RECOVERIES

Aromatic Volatiles by GC/PID

Sample ID	14FBZ	4BCBZ	FLBZ					
9909009-19A	90.2	86	89.4					
9909009-20A	90.1	87	89.1					
9909009-21A	89.5	88.1	89					
CCV1 BTEX_99061	89.3	89.8	88.1					
CCV2 BTEX_99061	89.3	87.4	88					
CCV3 BTEX_99061	89.3	85.3	87.7					
LCS WATER	88.6	88.8	87.4					
MB1	89.4	89.3	89.3					

Acronym	Surrogate	QC Limits
14FBZ	= 1,4-Difluorobenzene	80-120
4BCBZ	= 4-Bromochlorobenzene	80-120
FLBZ	= Fluorobenzene	80-120

* Surrogate recovery outside acceptance limits

On Site Technologies, LTD.

Date: 15-Sep-99

CLIENT: Blagg Engineering
Work Order: 9908059
Project: Mallon Jicarilla SWD

QC SUMMARY REPORT

Method Blank

Sample ID: MBLank	Batch ID: 8015GRO_W-	Test Code: SW8015B	Units: µg/L	Analysis Date: 9/9/99	Prep Date:
Client ID:	9908059	Run ID: GC-1_990909A		SeqNo: 19347	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual
T/R Hydrocarbons: C6-C10	ND	45			
Sample ID: MBLank	Batch ID: 8015GRO_W-	Test Code: SW8015B	Units: µg/L	Analysis Date: 9/10/99	Prep Date:
Client ID:	9908059	Run ID: GC-1_990910A		SeqNo: 19361	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual
T/R Hydrocarbons: C6-C10	ND	45			
Sample ID: MBLank	Batch ID: 8015GRO_W-	Test Code: SW8015B	Units: µg/L	Analysis Date: 9/8/99	Prep Date:
Client ID:	9908059	Run ID: GC-1_990908A		SeqNo: 19316	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual
T/R Hydrocarbons: C6-C10	ND	180			

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits

S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank

On Site Technologies, LTD.

CLIENT: Blagg Engineering

Work Order: 9908059

Project: Mallon Jicarilla SWD

Date: 15-Sep-99

QC SUMMARY REPORT

Sample Matrix Spike

Sample ID: 9909009-09AMS	Batch ID: 8015GRO_W-	Test Code: SW8015B	Units: µg/L	Analysis Date 9/9/99	Prep Date:
Client ID: 9908059	Run ID: GC-1_990909A			SeqNo: 19358	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual
T/R Hydrocarbons: C6-C10	251100	4500	180200	77920	96.1% 70 130
Sample ID: 9909009-09AMS	Batch ID: 8015GRO_W-	Test Code: SW8015B	Units: µg/L	Analysis Date 9/10/99	Prep Date:
Client ID: 9908059	Run ID: GC-1_990910A			SeqNo: 19371	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual
T/R Hydrocarbons: C6-C10	245600	4500	180200	77920	93.1% 70 130
Sample ID: 9909009-09AMSD	Batch ID: 8015GRO_W-	Test Code: SW8015B	Units: µg/L	Analysis Date 9/9/99	Prep Date:
Client ID: 9908059	Run ID: GC-1_990909A			SeqNo: 19359	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual
T/R Hydrocarbons: C6-C10	247800	4500	180200	77920	94.3% 70 130 251100 1.3% 15
Sample ID: 9909009-09AMSD	Batch ID: 8015GRO_W-	Test Code: SW8015B	Units: µg/L	Analysis Date 9/10/99	Prep Date:
Client ID: 9908059	Run ID: GC-1_990910A			SeqNo: 19372	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual
T/R Hydrocarbons: C6-C10	238500	4500	180200	77920	89.1% 70 130 251100 5.1% 15
Sample ID: 9909009-08AMS	Batch ID: 8015GRO_W-	Test Code: SW8015B	Units: µg/L	Analysis Date 9/8/99	Prep Date:
Client ID: 9908059	Run ID: GC-1_990908A			SeqNo: 19329	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual
T/R Hydrocarbons: C6-C10	240900	18000	180200	75270	91.9% 70 130

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits

S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank

On Site Technologies, LTD.

Date: 15-Sep-99

CLIENT: Blagg Engineering

Work Order: 9908059

Project: Mallon Jicarilla SWD

QC SUMMARY REPORT

Laboratory Control Spike - generic

Sample ID: LCS Water	Batch ID: 8015GRO_W-	Test Code: SW8015B	Units: µg/L	Analysis Date 9/9/99	Prep Date:
Client ID:	9908059	Run ID: GC-1_990909A		SeqNo: 19349	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual
T/R Hydrocarbons: C6-C10	1676	45	1802	0	93.0% 70 130
Sample ID: LCS Water	Batch ID: 8015GRO_W-	Test Code: SW8015B	Units: µg/L	Analysis Date 9/10/99	Prep Date:
Client ID:	9908059	Run ID: GC-1_990910A		SeqNo: 19363	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual
T/R Hydrocarbons: C6-C10	1760	45	1802	0	97.6% 70 130
Sample ID: LCS Water	Batch ID: 8015GRO_W-	Test Code: SW8015B	Units: µg/L	Analysis Date 9/8/99	Prep Date:
Client ID:	9908059	Run ID: GC-1_990908A		SeqNo: 19318	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val %RPD RPDLimit Qual
T/R Hydrocarbons: C6-C10	1647	180	1802	0	91.4% 70 130

Qualifiers:

ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank

On Site Technologies, LTD.

Date: 15-Sep-99

CLIENT: Blagg Engineering
Work Order: 9908059
Project: Mallon Jicarilla SWD

QC SUMMARY REPORT

Continuing Calibration Verification Standard

Sample ID: CCV1 GRO_99083		Batch ID: 8015GRO_W-		Test Code: SW8015B		Units: µg/L		Analysis Date 9/9/99		Prep Date:	
Client ID:		9908059		Run ID:		GC-1_990909A		SeqNo: 19348			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
T/R Hydrocarbons: C6-C10	1713	45	1812	0	94.5%	85	115				
Trifluorotoluene	91.85	0	100	0	91.9%	70	130				
Sample ID: CCV1 GRO_99083		Batch ID: 8015GRO_W-		Test Code: SW8015B		Units: µg/L		Analysis Date 9/10/99		Prep Date:	
Client ID:		9908059		Run ID:		GC-1_990910A		SeqNo: 19362			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
T/R Hydrocarbons: C6-C10	1765	45	1812	0	97.4%	85	115				
Sample ID: CCV2 GRO_99083		Batch ID: 8015GRO_W-		Test Code: SW8015B		Units: µg/L		Analysis Date 9/9/99		Prep Date:	
Client ID:		9908059		Run ID:		GC-1_990909A		SeqNo: 19360			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
T/R Hydrocarbons: C6-C10	1665	45	1812	0	91.9%	85	115				
Trifluorotoluene	92.83	0	100	0	92.8%	70	130				
Sample ID: CCV2 GRO_99083		Batch ID: 8015GRO_W-		Test Code: SW8015B		Units: µg/L		Analysis Date 9/10/99		Prep Date:	
Client ID:		9908059		Run ID:		GC-1_990910A		SeqNo: 19373			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
T/R Hydrocarbons: C6-C10	1664	45	1812	0	91.8%	85	115				

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits

S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank

CLIENT: Blagg Engineering
Work Order: 9908059
Project: Mallon Jicarilla SWD

QC SUMMARY REPORT
 Continuing Calibration Verification Standard

Sample ID: CCV1 GRO_99083		Batch ID: 8015GRO_W-		Test Code: SW8015B		Units: µg/L		Analysis Date 9/8/99		Prep Date:	
Client ID: 9908059		Run ID: 9908059		GC-1_990908A				SeqNo: 19317			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
T/R Hydrocarbons: C6-C10 Trifluorotoluene	1679	180	1812	0	92.7%	85	115				
	83.8	0	100	0	83.8%	70	130				
Sample ID: CCV2 GRO_9908		Batch ID: 8015GRO_W-		Test Code: SW8015B		Units: µg/L		Analysis Date 9/8/99		Prep Date:	
Client ID: 9908059		Run ID: 9908059		GC-1_990908A				SeqNo: 19331			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
T/R Hydrocarbons: C6-C10 Trifluorotoluene	1636	180	1812	0	90.3%	85	115				
	82.2	0	100	0	82.2%	70	130				