



DEPARTMENT OF THE NAVY
 U S NAVAL STATION ROOSEVELT ROADS
 PSC 1008 BOX 3001
 FPO AA 34051-0001

5090

Ser N02C-A63/0069

24 JAN 2001

Environmental Quality Board
 Water Quality Area
 P.O. Box 11488
 Santurce, PR 00910

Attention: Ms. Denise Laabes

**SUBJECT: PHASE 1 & 2 WORK PLAN FOR PILOT TEST TO EVALUATE
 ENHANCEMENT OF PRODUCT RECOVERY USING PNEUMATIC
 FRACTURING AND PUMPING TECHNIQUES**

This letter is in response to your letter of March 3, 2000 requesting analysis on groundwater prior to and after pneumatic fracturing at the Tow Way Fuel Farm on the Naval Station, Roosevelt Roads. As stated in our response letter of May 19, 2000, samples were not collected from the RW-1 area since this area had already been fractured at the time of receipt of your letter. Also monitoring well PW-4 had been previously destroyed, therefore no samples were collected from this well. Instead, nearby monitoring well MW-4 was sampled after pneumatic fracturing.

Groundwater samples were collected from five monitoring wells in the PW-6 area prior to pneumatic fracturing. The samples were analyzed for pH, temperature, nitrates (NO^{-3}), nitrites (NO^{-2}), and total petroleum hydrocarbons (TPH). The table below gives the results of the analysis for each monitoring well.

Pre-Fracture Groundwater Analytical Results for PW-6 Area					
Parameter	MW-1	PW-2	PW-3	UGW-1	PW-5
PH (unitless)	6.75	7.09	7.09	7.16	7.60
Temperature	29.5°C	30.2°C	31.4°C	31.5°C	31.1°C
Nitrate (NO^{-3})*	0.02	<0.01	0.03	<0.01	0.05
Nitrite (NO^{-2})*	<0.01	<0.01	<0.01	<0.01	<0.01
TPH*	158	2,890	216	1,180	631

* - Analytical results are in mg/L.

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After pneumatic fracturing in the PW-6 area was completed, groundwater samples from six monitor wells were collected and analyzed. The samples were analyzed for pH, temperature, nitrates (NO^{-3}), nitrites (NO^{-2}), and total petroleum hydrocarbons (TPH). A summary of the results is presented in the following table. Certified Analyses Results from the laboratory are enclosed with this letter.

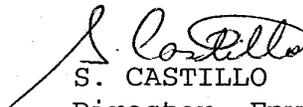
Post-Fracture Groundwater Analytical Results for PW-6 Area						
Parameter	MW-1	PW-2	PW-3	UGW-1	MW-4	PW-5
PH (unitless)	7.15	6.25	7.10	6.80	6.25	6.82
Temperature	32.5°C	32.1°C	32.9°C	32.1°C	32.1°C	33.5°C
Nitrate (NO^{-3}) *	0.02	0.03	0.05	<0.01	0.06	0.06
Nitrite (NO^{-2}) *	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
TPH*	934	342	399	1,060	756	978

* - Analytical results are in mg/L.

No significant anomalies were detected in the analytical results. This information verifies the benign impact associated with the use of inert gas (nitrogen) during pneumatic fracturing.

If you have any questions, please contact Mrs. Madeline Rivera, Environmental Program Manager, Environmental Engineering Division, Public Works Department, at (787) 865-4429/3155.

Sincerely,



S. CASTILLO
Director, Environmental
Engineering Division
By direction of the
Commanding Officer

Enclosure

5090

Ser N02C-A63/0069

24 JAN 2001

Copy to:
Commander
Atlantic Division (Code 18221)
Naval Facilities Engineering Command
1510 Gilbert Street
Norfolk, VA 23511-2699

Mr. Mark E. Kimes
Baker Environmental, Inc.
Airport Office Park, Building 3
420 Rouser Road
Coraopolis, PA 15108



Analyses Report

for
J.A. Jones

Project Description: DO #9, Pilot Study

HTL Report Number: 00-03-178 *8 pages*

Date of Submittal: April 19, 2000

Attention: Bill Bucille

HIGH TECHNOLOGY LABORATORY

TEL: (787) 792-1200
Fax: (787) 792-9280

Environmental & Analytical Services

P.O. Box 366950 San Juan, P.R. 00936-6950

CUSTOMER: J. A. Jones
 CONTACT PERSON: Pancho Mendez
 HTL CONTACT PERSON: Vicente Perez
 PROJECT DESCRIPTION: DO #9, Pilot study
 REPORT TO: Bill Buccille PHONE: 412-595-1400
 ADDRESS: McLaren Hart FAX: 412-395-1410
2 North Shore
Suite 100 Pittsburg PA 15212

RUSH (72 HRS.)
 RUSH (48 HRS.)
 RUSH (5 Days) 00-03-178

CUSTOMER REPRESENTATIVE: (name, signature) Francisco J. Mendez
 NAME: Francisco J. Mendez
 SIGNATURE: [Signature]
 RECEIVED BY: _____

DATE: _____
 TIME: _____
 SPLIT SAMPLE: YES NO

SAMPLERS NAME: _____
 SAMPLING SITE LOCATION: N/A
 SAMPLING SITE DESCRIPTION: A

WEATHER CONDITIONS: N/A SUNNY CLOUDY RAINY

ADDITIONAL FORMS:
 COC: _____
 AFI: _____
 NONE:

TEMP (°C)	PH (PH UNITS)	ALKALINITY BICARBONATE	BOD	BORON	CHLORIDE	COLOR Cr (VI)	CONDUCTIVITY	FLUORIDE	HARDNESS	MBAS	SULFATE	TDS	TSS	TURBIDITY	SS	NH ₃ NO ₂ -NO ₃	TKN	T. PHOSPHOROUS	COO	OIL & GREASE	PHENOLICS	CYANIDE	SULFIDE	USED OIL	TOX	BTEX	THM	VOC	SVOC	METALS	RCRA	OTHER	

COMMENTS: NOVA: El Sr. Burgos se cancela el 3/31/00 10:15 por multiplicar los parámetros NO2, NO3, TRACIA

DATE/TIME AS START: N/A
 DATE/TIME AS FINISH: A

19- N/A 22- N/A 1- N/A
 20- N/A 23- N/A 2- N/A
 21- N/A 24- N/A 3- N/A

VOC: TIO THM TCLP TCL DW60 GRO OTHERS:
 SVOC: TIO PEST(TIO) TCLP TCLP-PEST TCL PCB'S DRO OTHERS:
 METALS: PRASA TCLP TAL PP OTHERS: Ag Al As Ba Be, Ca Cd
 Co Cr Cu Fe Hg K Mg Mn Mo Na Ni Pb Se Sn Ti V Zn

DATE/TIME: 3-30-00 15:15
 REPORT COPY: [Signature]
 DATE/TIME: 02/30/00 14:00
 SAMPLE TRANSPORT: ICE COOL OTHER

Report Certification

Report No. 00-03-178

April 19, 2000

Customer: J.A. Jones
Address: P.O. Box 420122
Roosevelt Roads, PR 00742-0122

Attention: Bill Bucille

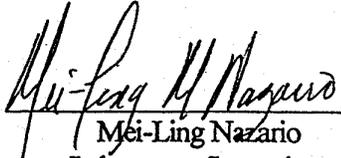
Dear Mr. Bucille:

Enclosed please find the report for the analyses you requested. A brief description of the procedures followed by the various analytical divisions at High Technology Laboratory (HTL) are found on the following pages. Results for the analyses performed at each analytical division are presented in separate pages.

The quality control data and other supporting documentation pertaining to these analyses, are kept on file at the laboratory for a period of three (3) years. These records will be made available to you upon request.

The results reported herein were obtained according to the analytical procedures described in our Laboratory SOP's and/or standard methods approved by regulatory agencies. At HTL, our laboratory and administrative procedures are supervised by qualified personnel and are performed following the guidelines of our Quality Assurance Manual.




Mei-Ling Nazario
Laboratory Supervisor
Lic. No. 3872

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HIGH TECHNOLOGY LABORATORY

P.O. Box 366950, San Juan, PR 00936-6950
Tel. (787) 793-7288 ; Fax 792-9280

Report No. 00-03-178

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Summary

At HTL Environmental and Analytical Services analyses are performed by three (3) analytical divisions:

Wet Chemistry: Performs analysis for Inorganic and Organic (non-chromatographic) parameters

Metals: Performs analysis of Metals and some elements (such as Boron, Phosphorous and Silica) by Atomic Absorption Spectroscopy (FAAS, GFAAS and CVAAS) and/or Atomic Emission Spectroscopy (ICP-AES)

Organics: Performs analysis of Volatile and Semivolatile Organic Compounds (VOC and SVOC), Pesticides, Herbicides and Polychlorinated Biphenyl's (PCB's) using Gas Chromatography (GC) methods including GC/MS (GC/Mass Spectrometry)

The analyses performed by these analytical divisions are done following laboratory SOP's and/or methods approved by the Environmental Protection Agency (EPA) to obtain data that satisfies the requirements of:

40 CFR Part 136 Guidelines Establishing Test Procedures for the Analyses of Pollutants

40 CFR Part 141 National Primary Drinking Water Regulations

40 CFR Parts 122 through 270 Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (SW-846); Test procedures and guidelines which are recommended for use in conducting the evaluation and measurements needed to comply with the Resource Conservation and Recovery Act (RCRA) Public Law 94-580 (as amended).

Reporting Limits (RL)

The RL for each parameter is the minimum concentration of a substance that can be reported with 99% confidence that the analyte concentration is greater than zero. This limit is determined from analysis of standards containing the analyte. The RL is greater or equal to the MDL (Method Detection Limit) as defined in the 40 CFR. Results expressed as "nd" or "< RL" means that either the analyte was not detected or the amount determined is below the RL for that particular parameter, therefore, an accurate value can not be determine.

QAU Statement

Data reduction for each analysis was performed by the analyst (technician) performing the test followed by peer review of a person knowledgeable in that particular procedure and finally a data validation and QC (Quality Control) release was performed by the division supervisor or designee.

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Analyses Results

Wet-Chemistry Analytical Division

J.A. Jones

HTL Sample No.: 00-03-178-01
Sample ID: MW-1

Date Sampled: March 29, 2000
Date Received: March 30, 2000

Parameter	Method	Sample Type	Date Analyzed	Units	Reporting Limit	Final Result
Nitrate	353.2	G	3/22/00	mg/L	0.01	0.02
Nitrite	353.2	G	3/22/00	mg/L	0.01	< 0.01
Total Petroleum Hydrocarbon (TPH)	418.1	G	3/22/00	mg/L	10.0	158

G = Grab

mg/L = Milligrams per Liter (ppm)

The results presented in this table were generated after analysis and data reduction by qualified personnel assigned to the Wet-Chemistry Analytical Division as per QAU statement described in the summary page.



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Analyses Results
Wet-Chemistry Analytical Division
J.A. Jones

HTL Sample No.: 00-03-178-02
Sample ID: PW-2

Date Sampled: March 29, 2000
Date Received: March 30, 2000

Parameter	Method	Sample Type	Date Analyzed	Units	Reporting Limit	Final Result
Nitrate	353.2	G	3/22/00	mg/L	0.01	< 0.01
Nitrite	353.2	G	3/22/00	mg/L	0.01	< 0.01
Total Petroleum Hydrocarbon (TPH)	418.1	G	3/22/00	mg/L	10.0	2,890

G = Grab

mg/L = Milligrams per Liter (ppm)

The results presented in this table were generated after analysis and data reduction by qualified personnel assigned to the Wet-Chemistry Analytical Division as per QAU statement described in the summary page.



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Analyses Results
Wet-Chemistry Analytical Division
J.A. Jones

HTL Sample No.: 00-03-178-03
Sample ID: PW-3

Date Sampled: March 29, 2000
Date Received: March 30, 2000

Parameter	Method	Sample Type	Date Analyzed	Units	Reporting Limit	Final Result
Nitrate	353.2	G	3/22/00	mg/L	0.01	0.03
Nitrite	353.2	G	3/22/00	mg/L	0.01	< 0.01
Total Petroleum Hydrocarbon (TPH)	418.1	G	3/22/00	mg/L	10.0	216

G = Grab

mg/L = Milligrams per Liter (ppm)

The results presented in this table were generated after analysis and data reduction by qualified personnel assigned to the Wet-Chemistry Analytical Division as per QAU statement described in the summary page.



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Analyses Results
Wet-Chemistry Analytical Division
J.A. Jones

HTL Sample No.: 00-03-178-04
Sample ID: UGW-1

Date Sampled: March 29, 2000
Date Received: March 30, 2000

Parameter	Method	Sample Type	Date Analyzed	Units	Reporting Limit	Final Result
Nitrate	353.2	G	3/22/00	mg/L	0.01	< 0.01
Nitrite	353.2	G	3/22/00	mg/L	0.01	< 0.01
Total Petroleum Hydrocarbon (TPH)	418.1	G	3/22/00	mg/L	10.0	1,180

G = Grab

mg/L = Milligrams per Liter (ppm)

The results presented in this table were generated after analysis and data reduction by qualified personnel assigned to the Wet-Chemistry Analytical Division as per QAU statement described in the summary page.



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Analyses Results
Wet-Chemistry Analytical Division
J.A. Jones

HTL Sample No.: 00-03-178-05
Sample ID: MTMW-1

Date Sampled: March 29, 2000
Date Received: March 30, 2000

Parameter	Method	Sample Type	Date Analyzed	Units	Reporting Limit	Final Result
Nitrate	353.2	G	3/22/00	mg/L	0.01	0.01
Nitrite	353.2	G	3/22/00	mg/L	0.01	<0.01
Total Petroleum Hydrocarbon (TPH)	418.1	G	3/22/00	mg/L	10.0	588

G = Grab

mg/L = Milligrams per Liter (ppm)

The results presented in this table were generated after analysis and data reduction by qualified personnel assigned to the Wet-Chemistry Analytical Division as per QAU statement described in the summary page.



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Analyses Results
Wet-Chemistry Analytical Division
J.A. Jones

HTL Sample No.: 00-03-178-06
Sample ID: PW-5

Date Sampled: March 29, 2000
Date Received: March 30, 2000

Parameter	Method	Sample Type	Date Analyzed	Units	Reporting Limit	Final Result
Nitrate	353.2	G	3/22/00	mg/L	0.01	0.05
Nitrite	353.2	G	3/22/00	mg/L	0.01	< 0.01
Total Petroleum Hydrocarbon (TPH)	418.1	G	3/22/00	mg/L	10.0	631

G = Grab

mg/L = Milligrams per Liter (ppm)

The results presented in this table were generated after analysis and data reduction by qualified personnel assigned to the Wet-Chemistry Analytical Division as per QAU statement described in the summary page.



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CARIBTEC LABORATORIES, INC.

PO Box 362242

SAN JUAN, PUERTO RICO 00936-2242

Page 3 of 5

REPORT OF ANALYSIS

SOURCE: Baker Environmental, Inc.
Airport Office Park, Bldg #3
420 Rouser Road
Coraopolis, PA 15108

CLIENT CONTACT: Mr. John Andy

SAMPLE IDENTIFICATION: 114305-PW-05

DATE RECEIVED: AUGUST 25, 2000

PARAMETER	RESULT	UNITS	METHOD	MDL
Petroleum Residual Organic-8015B				
GRO (C8-C10) Range	160	mg/l	UST	5.000
DRO (C10-C28) Range	818	mg/l	UST	5.000
TRO (C28-C40) Range	BDL	mg/l	UST	5,000
TOTAL PRO (C8-C40)	978	mg/l	UST	5.000

Date Extracted: 09/01/00

Date analyzed: 09/05/00

SAMPLE IDENTIFICATION: 114306-PW-03

DATE RECEIVED: AUGUST 25, 2000

PARAMETER	RESULT	UNITS	METHOD	MDL
Petroleum Residual Organic-8015B				
GRO (C8-C10) Range	46.6	mg/l	UST	5.000
DRO (C10-C28) Range	352	mg/l	UST	5.000
TRO (C28-C40) Range	BDL	mg/l	UST	5,000
TOTAL PRO (C8-C40)	399	mg/l	UST	5.000

Date Extracted: 09/01/00

Date analyzed: 09/05/00

SAMPLE IDENTIFICATION: 114307-MW-01

DATE RECEIVED: AUGUST 25, 2000

PARAMETER	RESULT	UNITS	METHOD	MDL
Petroleum Residual Organic-8015B				
GRO (C8-C10) Range	189	mg/l	UST	5.000
DRO (C10-C28) Range	745	mg/l	UST	5.000
TRO (C28-C40) Range	BDL	mg/l	UST	5,000
TOTAL PRO (C8-C40)	934	mg/l	UST	5.000

Date Extracted: 09/01/00

Date analyzed: 09/05/00



CARIBTEC LABORATORIES, INC.

PO Box 362242
SAN JUAN, PUERTO RICO 00936-2242

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REPORT OF ANALYSIS

SOURCE: Baker Environmental, Inc.
Airport Office Park, Bldg #3
420 Rouser Road
Coraopolis, PA 15108

CLIENT CONTACT: Mr. John Andy

SAMPLE IDENTIFICATION: 114307-MW-01

DATE RECEIVED: AUGUST 25, 2000

PARAMETER	RESULT	UNITS	METHOD	MDL
Petroleum Residual Organic-8015B				
GRO (C8-C10) Range	189	mg/l	UST	5.000
DRO (C10-C28) Range	745	mg/l	UST	5.000
TRO (C28-C40) Range	BDL	mg/l	UST	5.000
TOTAL PRO (C8-C40)	934	mg/l	UST	5.000

Date Extracted: 09/01/00

Date analyzed: 09/05/00

SAMPLE IDENTIFICATION: 114308-PW-02

DATE RECEIVED: AUGUST 25, 2000

PARAMETER	RESULT	UNITS	METHOD	MDL
Petroleum Residual Organic-8015B				
GRO (C8-C10) Range	53.7	mg/l	UST	5.000
DRO (C10-C28) Range	288	mg/l	UST	5.000
TRO (C28-C40) Range	BDL	mg/l	UST	5.000
TOTAL PRO (C8-C40)	342	mg/l	UST	5.000

Date Extracted: 09/01/00

Date analyzed: 09/05/00

SAMPLE IDENTIFICATION: 114309-UGW-01

DATE RECEIVED: AUGUST 25, 2000

PARAMETER	RESULT	UNITS	METHOD	MDL
Petroleum Residual Organic-8015B				
GRO (C8-C10) Range	191	mg/l	UST	5.000
DRO (C10-C28) Range	867	mg/l	UST	5.000
TRO (C28-C40) Range	BDL	mg/l	UST	5.000
TOTAL PRO (C8-C40)	1060	mg/l	UST	5.000

Date Extracted: 09/01/00

Date analyzed: 09/05/00



CARIBTEC LABORATORIES, INC.

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Page 5 of 5

REPORT OF ANALYSIS

SOURCE: Baker Environmental, Inc.
Airport Office Park, Bldg #3
420 Rouser Road
Coraopolis, PA 15108

CLIENT CONTACT: Mr. John Andy

SAMPLE IDENTIFICATION: 114310-MW-04

DATE RECEIVED: AUGUST 25, 2000

PARAMETER	RESULT	UNITS	METHOD	MDL
Petroleum Residual Organic-8015B				
GRO (C8-C10) Range	122	mg/l	UST	5.000
DRO (C10-C28) Range	634	mg/l	UST	5.000
TRO (C28-C40) Range	BDL	mg/l	UST	5.000
TOTAL PRO (C8-C40)	756	mg/l	UST	5.000

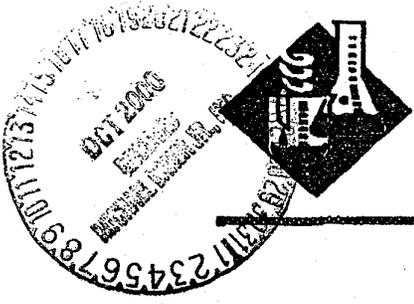
Date Extracted: 09/01/00

Date analyzed: 09/05/00



DATE REPORTED: 17 September, 2000

BY



CARIBTEC LABORATORIES, INC.

PO Box 382242
SAN JUAN, PUERTO RICO 00938-2242

REPORT OF ANALYSIS CORRECTED

Source: Baker Environmental, Inc.
Airport Office Park, Building 3
420 Rouser Road
Corapolis, PA 15108

Contact: Mr. John Andy

Date Received: 25 August, 2000

Sample Identification : 1) 114299-MTMW-1
2) 114300-MTMW-2
3) 114301-MTMW-3
4) 114302-AW-1
5) 114303-AW-2

PARAMETER	Units	1	2	3	4	5
Nitrate	mg/l	-0.71	0.07	-0.03	<0.01	0.20
Nitrite	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01

Sample Identification : 1) 114304-UGW-3
2) 114305-PW-05 →
3) 114306-PW-03 ✓
4) 114307-MW-01 ✓
5) 114303-PW-02 ✓

PARAMETER	Units	1	2	3	4	5
Nitrate	mg/l	0.11	0.06	0.05	0.02	0.03
Nitrite	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01

Sample Identification: 1) 114308-UGW-1
2) 114310-MW-04

PARAMETER	Units	1	2
Nitrate	mg/l	<0.01	0.06
Nitrite	mg/l	<0.01	<0.01

Date Reported: 17 September, 2000

By: _____

Tel: 787-764-7606, Fax: 787-763-7733

