

ETL Enviro•Test

A DIVISION OF ETL CHEMSPEC ANALYTICAL LIMITED

ANALYTICAL REPORT

PETRO CANADA
ATTN: TIM R. TAYLOR
PO BOX 2844
CALGARY AB T2P 3E3

DATE: 12-MAR-03

Lab Work Order #: L101603 Sampled By: CLIENT Date Received: 05-MAR-03
P.O. #: N/A
Job #: NUNA

Comments:

APPROVED BY:

for

LLOYD W HODGINS

Project Manager

THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE WRITTEN AUTHORITY OF THE LABORATORY.
ANY REMAINING SAMPLES WILL BE DISPOSED OF AFTER 30 DAYS FOLLOWING ANALYSIS. PLEASE CONTACT THE LAB IF YOU
REQUIRE ADDITIONAL SAMPLE STORAGE TIME.

LABORATORY ACCREDITATIONS:

- STANDARDS COUNCIL OF CANADA IN COOPERATION WITH THE CANADIAN ASSOCIATION FOR ENVIRONMENTAL ANALYTICAL LABORATORIES (CAEAL) FOR SPECIFIC TESTS AS REGISTERED BY THE COUNCIL (EDMONTON, CALGARY, GRANDE PRAIRIE, SASKATOON, WINNIPEG, THUNDER BAY, WATERLOO)
- AMERICAN INDUSTRIAL HYGIENE ASSOCIATION (AIHA) IN THE INDUSTRIAL HYGIENE PROGRAM (EDMONTON, WINNIPEG)
- STANDARDS COUNCIL OF CANADA IN COOPERATION WITH THE CANADIAN FOOD INSPECTION AGENCY (CFIA) FOR FERTILIZER AND FEED TESTING (SASKATOON) AND FOR MICROBIOLOGICAL TESTING IN FOOD (WINNIPEG)

LABORATORY RECOGNITIONS:

- STANDARDS COUNCIL OF CANADA - GLP COMPLIANT FACILITY (EDMONTON, OTTAWA)

Bay 7, 1313 - 44 Avenue N.E., Calgary, Alberta T2E 6L5, Tel. (403) 291-9897, Fax (403) 291-0298
Canada Wide Tel. 1-800-668-9878 www.envirotest.com

(Edmonton, Calgary, Grande Prairie, Saskatoon, Winnipeg, Thunder Bay, Ottawa, Waterloo, Montreal)

ENVIRO-TEST ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier	D.L.	Units	Extracted	Analyzed	By	Batch
L101603-1 SNP 1788-1								
Sample Date: 27-FEB-03								
Matrix: WATER								
HPC, Total & Fecal Coliform Count-MF								
MF - Fecal Coliforms	300		1	CFU/100mL	06-MAR-03	S V N	R114580	
MF - Heterotrophic Plate Count	30000		1	CFU/1mL	06-MAR-03	S V N	R114580	
MF - Total Coliforms	4100		1	CFU/100mL	06-MAR-03	S V N	R114580	
Ammonia-N	4.33		0.05	mg/L	06-MAR-03	SIW	R114395	
Biochemical Oxygen Demand	6		2	mg/L	11-MAR-03	HTT	R115033	
Oil and Grease	<1		1	mg/L	07-MAR-03	ZOW	R114625	
Total Suspended Solids	19		3	mg/L	07-MAR-03	HTT	R114772	
Routine Water: Major Ions, Fe & Mn								
Iron (Fe)-Dissolved	0.03		0.01	mg/L	06-MAR-03	WJR	R114419	
Chloride (Cl)	208		0.1	mg/L	06-MAR-03	06-MAR-03	LHH	R114588
Manganese(Mn)-Dissolved	<0.01		0.01	mg/L	06-MAR-03	WJR	R114419	
Nitrate+Nitrite-N	14.4		0.05	mg/L	06-MAR-03	06-MAR-03	LHH	R114588
Nitrate-N	2.77		0.05	mg/L	06-MAR-03	06-MAR-03	LHH	R114588
Nitrite-N	11.7		0.05	mg/L	06-MAR-03	06-MAR-03	LHH	R114588
Sulphate (SO4)	142		0.5	mg/L	06-MAR-03	06-MAR-03	LHH	R114588
pH, Conductivity and Total Alkalinity								
pH	7.4		0.1	pH	07-MAR-03	HTT	R11465	
Conductivity (EC)	1650		3	uS/cm	07-MAR-03	HTT	R11465	
Bicarbonate (HCO3)	381		5	mg/L	07-MAR-03	HTT	R114654	
Carbonate (CO3)	<5		5	mg/L	07-MAR-03	HTT	R114654	
Hydroxide (OH)	<5		5	mg/L	07-MAR-03	HTT	R114654	
Alkalinity, Total (as CaCO3)	312		5	mg/L	07-MAR-03	HTT	R114654	
Ion Balance Calculation								
Ion Balance	102			%	10-MAR-03			
TDS (Calculated)	973			mg/L	10-MAR-03			
Hardness (as CaCO3)	107			mg/L	10-MAR-03			
ICP metals for routine water								
Calcium (Ca)	25.9		0.5	mg/L	06-MAR-03	WJR	R114419	
Potassium (K)	33.1		0.1	mg/L	06-MAR-03	WJR	R114419	
Magnesium (Mg)	10.3		0.1	mg/L	06-MAR-03	WJR	R114419	
Sodium (Na)	302		1	mg/L	06-MAR-03	WJR	R114419	
L101603-2 SP #2								
Sample Date: 27-FEB-03								
Matrix: WATER								
HPC, Total & Fecal Coliform Count-MF								
MF - Fecal Coliforms	<1		1	CFU/100mL	06-MAR-03	S V N	R114580	
MF - Heterotrophic Plate Count	2		1	CFU/1mL	06-MAR-03	S V N	R114580	
MF - Total Coliforms	<1		1	CFU/100mL	06-MAR-03	S V N	R114580	
Total Suspended Solids	<3		3	mg/L	07-MAR-03	HTT	R114772	
Routine Water: Major Ions, Fe & Mn								
Iron (Fe)-Dissolved	0.02		0.01	mg/L	06-MAR-03	WJR	R114419	
Chloride (Cl)	15.6		0.1	mg/L	06-MAR-03	06-MAR-03	LHH	R114588
Manganese(Mn)-Dissolved	0.03		0.01	mg/L	06-MAR-03	WJR	R114419	
Nitrate+Nitrite-N	0.12		0.05	mg/L	06-MAR-03	06-MAR-03	LHH	R114588
Nitrate-N	0.12		0.05	mg/L	06-MAR-03	06-MAR-03	LHH	R114588
Nitrite-N	<0.05		0.05	mg/L	06-MAR-03	06-MAR-03	LHH	R114588
Sulphate (SO4)	1.9		0.5	mg/L	06-MAR-03	06-MAR-03	LHH	R114588

ENVIRO-TEST ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier	D.L.	Units	Extracted	Analyzed	By	Batch
L101603-2 SP #2								
Sample Date: 27-FEB-03								
Matrix: WATER								
Routine Water: Major Ions, Fe & Mn								
pH, Conductivity and Total Alkalinity								
pH	7.2		0.1	pH		07-MAR-03	HTT	R114654
Conductivity (EC)	231		3	uS/cm		07-MAR-03	HTT	R114654
Bicarbonate (HCO3)	116		5	mg/L		07-MAR-03	HTT	R114654
Carbonate (CO3)	<5		5	mg/L		07-MAR-03	HTT	R114654
Hydroxide (OH)	<5		5	mg/L		07-MAR-03	HTT	R114654
Alkalinity, Total (as CaCO3)	95		5	mg/L		07-MAR-03	HTT	R114654
Ion Balance Calculation								
Ion Balance	107			%		10-MAR-03		
TDS (Calculated)	123			mg/L		10-MAR-03		
Hardness (as CaCO3)	103			mg/L		10-MAR-03		
ICP metals for routine water								
Calcium (Ca)	26.6		0.5	mg/L		06-MAR-03	WJR	R114419
Potassium (K)	2.1		0.1	mg/L		06-MAR-03	WJR	R114419
Magnesium (Mg)	8.9		0.1	mg/L		06-MAR-03	WJR	R114419
Sodium (Na)	10		1	mg/L		06-MAR-03	WJR	R114419

Refer to Referenced Information for Qualifiers (if any) and Methodology

Reference Information

Methods Listed (if applicable):

ETL Test Code	Matrix	Test Description	Preparation Method Reference(Based On)	Analytical Method Reference(Based On)
BOD-CL	Water	Biochemical Oxygen Demand		APHA 5210 B-5 day Incub.-O2 electric
CL-CL	Water	Chloride (Cl)		APHA 4110 B-Ion Chromatography
ETL-ROUTINE-ICP-CL	Water	ICP metals for routine water		APHA 3120 B-ICP-OES
FCC-MF-ED	Water	Fecal Coliform Count-MF		Standards Methods #9222D
Fecal coliform- Standards Methods for the Examination of Water and Wastewater, Method No. 9222D Abbreviations: MF-membrane filtration, CFU-colony forming unit, TNTC-too numerous to count. Interpretation of Results: SATISFACTORY-When no fecal coliforms are detected. UNSATISFACTORY-When fecal coliforms are present indicates pollution of intestinal origin and should not be used for drinking without treatment. DOUBTFUL- When fecal coliforms are not detected but coliforms are present may or may not indicate bacteria of intestinal origin. If repeated analyses do not show source of pollution nearby, the water may be considered satisfactory if inspected by Medical Officer of Health or Health Inspector. Results for Fecal coliforms are presumptive and have not been confirmed by alternate culture media unless requested.				
FE-DIS-HIGH-CL	Water	Iron (Fe)-Dissolved		APHA 3120 B-ICP-OES
MN-DIS-HIGH-CL	Water	Manganese(Mn)-Dissolve		APHA 3120 B-ICP-OES
N2N3-CL	Water	Nitrate+Nitrite-N		APHA 4110 B-Ion Chromatography
NH4-CL	Water	Ammonia-N		APHA 4500 NH3F-Colorimetry
NO2-CL	Water	Nitrite-N		APHA 4110 B-Ion Chromatography
NO3-IC-CL	Water	Nitrate-N		APHA 4110 B-Ion Chromatography
OGG-ED	Water	Oil and Grease-Gravimetric		APHA 5520 B Hexane MTBE ext. Gravime
PH/EC/ALK-CL	Water	pH, Conductivity and Total Alkalinity		APHA 4500H,2510,2320
SO4-CL	Water	Sulfate (SO4)		APHA 4110 B-Ion Chromatograph
SOLIDS-TOTSUS-CL	Water	Total Suspended Solids		APHA 2540 D-Gravimetric
TCC-MF-ED	Water	Total Coliform Count-MF		Standard Methods #9222B

Total coliform-Standard Methods for the Examination of Water and Wastewater, Method 9222B.

Abbreviations: MF-membrane filtration, CFU-colony forming unit, TNTC-too numerous to count.

Interpretation of Results:

SATISFACTORY-When no coliforms are detected.

UNSATISFACTORY-When fecal coliforms are present indicates pollution of intestinal origin and should not be used for drinking without treatment.

DOUBTFUL-When fecal coliforms are not present but other coliforms are present may or may not indicate bacteria of intestinal origin. If repeated analysis do not show source of pollution nearby, the water may be considered satisfactory if inspected by Medical Officer of Health or Health Inspector.

Results are reported as presumptive for Total coliforms and have not been confirmed by an alternate culture media unless requested.

** Laboratory Methods employed follow in-house procedures, which are generally based on nationally or internationally accepted methodologies.

Chain of Custody numbers:

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location	Laboratory Definition Code	Laboratory Location
CL	Enviro-Test Laboratories - Calgary, Alberta, Canada	ED	Enviro-Test Laboratories - Edmonton, Alberta, Canada

Reference Information

GLOSSARY OF REPORT TERMS

Surr - A surrogate is an organic compound that is similar to the target analyte(s) in chemical composition and behavior but not normally detected in environmental samples. Prior to sample processing, samples are fortified with one or more surrogate compounds. The reported surrogate recovery value provides a measure of method efficiency. The Laboratory warning units are determined under column heading D.L.

mg/kg (units) - unit of concentration based on mass, parts per million

mg/L (units) - unit of concentration based on volume, parts per million

< - Less than

D.L. - Detection Limit

N/A - Result not available. Refer to qualifier code and definition for explanation

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

UNLESS OTHERWISE STATED, SAMPLES ARE NOT CORRECTED FOR CLIENT FIELD BLANKS.

Although test results are generated under strict QA/QC protocols, any unsigned test reports, faxes, or emails are considered preliminary.

Enviro-Test Laboratories has an extensive QA/QC program where all analytical data reported is analyzed using approved referenced procedures followed by checks and reviews by senior managers and quality assurance personnel. However, since the results are obtained from chemical measurements and thus cannot be guaranteed, Enviro-Test Laboratories assumes no liability for the use or interpretation of the results.

ENVIRO-TEST QC REPORT

Workorder: L101603

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<u>FCC-MF-ED</u>	<u>Water</u>							
Batch R114580	WG106446-2 MB MF - Fecal Coliforms		<1		CFU/100mL		1	06-MAR-03
<u>FE-DIS-HIGH-CL</u>	<u>Water</u>							
Batch R114419	WG106309-1 LCS Iron (Fe)-Dissolved		101		%		90-110	06-MAR-03
<u>HPC-MF-ED</u>	<u>Water</u>							
Batch R114580	WG106446-1 DUP MF - Heterotrophic Plate Count	L101603-1 30000	29000		CFU/1mL	4.1		06-MAR-03
WG106446-2 MB MF - Heterotrophic Plate Count			<1		CFU/1mL		1	06-MAR-03
<u>MN-DIS-HIGH-CL</u>	<u>Water</u>							
Batch R114419	WG106309-1 LCS Manganese(Mn)-Dissolved		101		%		90-110	06-MAR-03
<u>N2N3-CL</u>	<u>Water</u>							
Batch R114588	WG106452-2 DUP Nitrate+Nitrite-N	L101603-2 0.12	0.12	J	mg/L	0.00	0.15	06-MAR-03
WG106452-4 DUP Nitrate+Nitrite-N		L101711-5 <0.05	<0.05	RPD-NA	mg/L	N/A	13	06-MAR-03
WG106452-1 LCS Nitrate+Nitrite-N			97		%		90-106	06-MAR-03
WG106452-3 MS Nitrate+Nitrite-N		L101603-2 93		H	%		93-109	06-MAR-03
<u>NH4-CL</u>	<u>Water</u>							
Batch R114395	WG106275-3 DUP Ammonia-N	L101512-1 0.15	0.16	J	mg/L	0.01	0.15	06-MAR-03
WG106275-2 LCS Ammonia-N			93		%		90-110	06-MAR-03
WG106275-1 MB Ammonia-N			<0.05		mg/L		0.05	06-MAR-03
WG106275-4 MS Ammonia-N		L101512-1 105			%		84-108	06-MAR-03
<u>NO2-CL</u>	<u>Water</u>							

ENVIRO-TEST QC REPORT

Workorder: L101603

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
NO2-CL <u>Water</u>								
Batch	R114588							
WG106452-2	DUP	L101603-2						
Nitrite-N		<0.05	<0.05	RPD-NA	mg/L	N/A	13	06-MAR-03
WG106452-4	DUP	L101711-5						
Nitrite-N		<0.05	<0.05	RPD-NA	mg/L	N/A	13	06-MAR-03
WG106452-1	LCS							
Nitrite-N		96			%		91-107	06-MAR-03
WG106452-3	MS	L101603-2						
Nitrite-N		97			%		94-110	06-MAR-03
NO3-IC-CL <u>Water</u>								
Batch	R114588							
WG106452-2	DUP	L101603-2						
Nitrate-N		0.12	0.12	J	mg/L	0.00	0.15	06-MAR-03
WG106452-4	DUP	L101711-5						
Nitrate-N		<0.05	<0.05	RPD-NA	mg/L	N/A	13	06-MAR-03
WG106452-1	LCS							
Nitrate-N		97			%		90-106	06-MAR-03
WG106452-3	MS	L101603-2						
Nitrate-N		93	H		%		94-106	06-MAR-03
G-ED <u>Water</u>								
Batch	R114625							
WG106406-2	LCS							
Oil and Grease		90			%		79-100	07-MAR-03
WG106406-1	MB							
Oil and Grease		<1			mg/L		1	07-MAR-03
PH/EC/ALK-CL <u>Water</u>								
Batch	R114654							
WG106509-2	DUP	L101728-1						
Alkalinity, Total (as CaCO3)		434	442		mg/L	1.7	5	07-MAR-03
Bicarbonate (HCO3)		530	539		mg/L	1.7	25	07-MAR-03
Carbonate (CO3)		<5	<5	RPD-NA	mg/L	N/A	25	07-MAR-03
Conductivity (EC)		930	948		µS/cm	1.9	7.5	07-MAR-03
Hydroxide (OH)		<5	<5	RPD-NA	mg/L	N/A	25	07-MAR-03
pH		7.0	7.1	J	pH	0.0	0.1	07-MAR-03
WG106509-3	DUP	L101825-1						
Alkalinity, Total (as CaCO3)		393	396		mg/L	0.94	5	07-MAR-03
Bicarbonate (HCO3)		479	484		mg/L	0.94	25	07-MAR-03
Carbonate (CO3)		<5	<5	RPD-NA	mg/L	N/A	25	07-MAR-03
Conductivity (EC)		2370	2360		µS/cm	0.42	7.5	07-MAR-03
Hydroxide (OH)		<5	<5	RPD-NA	mg/L	N/A	25	07-MAR-03
H		7.2	7.3	J	pH	0.1	0.1	07-MAR-03
WG106509-1	LCS							

ENVIRO-TEST QC REPORT

Workorder: L101603

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<u>PH/EC/ALK-CL</u> <u>Water</u>								
Batch	R114654							
WG106509-1	LCS							
Alkalinity, Total (as CaCO3)			102		%		95-105	07-MAR-03
Conductivity (EC)			97		%		97-101	07-MAR-03
pH			7.0		pH		6.9-7.1	07-MAR-03
<u>SO4-CL</u> <u>Water</u>								
Batch	R114588							
WG106452-2	DUP	L101603-2						
Sulphate (SO4)		1.9	1.9	J	mg/L	0.0	1.5	06-MAR-03
WG106452-4	DUP	L101711-5						
Sulphate (SO4)		<0.5	<0.5	RPD-NA	mg/L	N/A	10	06-MAR-03
WG106452-1	LCS							
Sulphate (SO4)			98		%		90-108	06-MAR-03
WG106452-3	MS	L101603-2						
Sulphate (SO4)			93		%		90-112	06-MAR-03
<u>SOLIDS-TOTSUS-CL</u> <u>Water</u>								
Batch	R114772							
WG106626-2	DUP	L101594-1						
Total Suspended Solids		185	185		mg/L	0.0	10	07-MAR-03
WG106626-3	DUP	L101765-1						
Total Suspended Solids		86	78		mg/L	9.8	10	07-MAR-03
WG106626-4	DUP	L101860-2						
Total Suspended Solids		<3	<3	RPD-NA	mg/L	N/A	10	07-MAR-03
WG106626-1	LCS							
Total Suspended Solids			98		%		87-105	07-MAR-03
<u>TCC-MF-ED</u> <u>Water</u>								
Batch	R114580							
WG106446-1	DUP	L101603-1						
MF - Total Coliforms		4100	4900		CFU/100mL	18		06-MAR-03
WG106446-2	MB							
MF - Total Coliforms			<1		CFU/100mL	1		06-MAR-03

Product - Batch and Sample Number Relations:

BOD-CL	1		
	R115033	L101603-1	
CL-CL	1		
	R114588	L101603-1	L101603-2
ETL-ROUTINE-ICP-CL	1		
	R114419	L101603-1	L101603-2
FCC-MF-ED	1		
	R114580	L101603-1	L101603-2
FE-DIS-HIGH-CL	1		
	R114419	L101603-1	L101603-2

ENVIRO-TEST QC REPORT

Workorder: L101603

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
Product - Batch and Sample Number Relations:								
HPC-MF-ED	1							
	R114580	L101603-1	L101603-2					
MN-DIS-HIGH-CL	1							
	R114419	L101603-1	L101603-2					
N2N3-CL	1							
	R114588	L101603-1	L101603-2					
NH4-CL	1							
	R114395	L101603-1						
NO2-CL	1							
	R114588	L101603-1	L101603-2					
NO3-IC-CL	1							
	R114588	L101603-1	L101603-2					
OGG-ED	1							
	R114625	L101603-1						
PH/EC/ALK-CL	1							
	R114654	L101603-1	L101603-2					
SO4-CL	1							
	R114588	L101603-1	L101603-2					
SOLIDS-TOTSUS-CL	1							
	R114772	L101603-1	L101603-2					
CC-MF-ED	1							
	R114580	L101603-1	L101603-2					

ENVIRO-TEST QC REPORT

Page 6 of 6

Workorder # L101603

Legend:

Limit	95% Confidence Interval (Laboratory Warning Limits)
DUP	Duplicate
RPD	Relative Percent Difference ((higher result-lower result)/Average, expressed as %)
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Materials
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material

Qualifier:

RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.
A	Method blank exceeds acceptance limit. Blank correction not applied, unless the qualifier "RAMB" (result adjusted for method blank) appears in the Analytical Report.
B	Method blank result exceeds acceptance limit, however, it is less than 5% of sample concentration. Blank correction not applied.
D	Duplicate result may exceed limit due to increased variability for low level samples.
E	Matrix spike recovery may fall outside the acceptance limits due to high sample background.
F	Silver recovery low, likely due to elevated choride levels in sample.
G	Outlier - No assignable cause for nonconformity has been determined.
H	Result falls within the 99% Confidence Interval (Laboratory Control Limits)
J	Duplicate results and limit(s) are expressed in terms of absolute difference.

ETL Enviro•Test

A DIVISION OF ETL CHEMSPEC ANALYTICAL LIMITED

ANALYTICAL REPORT

PETRO CANADA
ATTN: KYNA RIGAL
PO BOX 2844
CALGARY AB T2P 3E3

DATE: 20-MAR-03

Lab Work Order #: L102487 Sampled By: CLIENT Date Received: 14-MAR-03

P.O. #: N/A

Job #: N/A

Comments:

APPROVED BY: Kelly Jera

for LLOYD W HODGINS

Project Manager

THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE WRITTEN AUTHORITY OF THE LABORATORY.
ANY REMAINING SAMPLES WILL BE DISPOSED OF AFTER 30 DAYS FOLLOWING ANALYSIS. PLEASE CONTACT THE LAB IF YOU
REQUIRE ADDITIONAL SAMPLE STORAGE TIME.

LABORATORY ACCREDITATIONS:

- STANDARDS COUNCIL OF CANADA IN COOPERATION WITH THE CANADIAN ASSOCIATION FOR ENVIRONMENTAL ANALYTICAL LABORATORIES (CAEAL) FOR SPECIFIC TESTS AS REGISTERED BY THE COUNCIL (EDMONTON, CALGARY, GRANDE PRAIRIE, SASKATOON, WINNIPEG, THUNDER BAY, WATERLOO)
- AMERICAN INDUSTRIAL HYGIENE ASSOCIATION (AIHA) IN THE INDUSTRIAL HYGIENE PROGRAM (EDMONTON, WINNIPEG)
- STANDARDS COUNCIL OF CANADA IN COOPERATION WITH THE CANADIAN FOOD INSPECTION AGENCY (CFIA) FOR FERTILIZER AND FEED TESTING (SASKATOON) AND FOR MICROBIOLOGICAL TESTING IN FOOD (WINNIPEG)
- LABORATORY RECOGNITIONS:
- STANDARDS COUNCIL OF CANADA - GLP COMPLIANT FACILITY (EDMONTON, OTTAWA)

Bay 7, 1313 - 44 Avenue N.E., Calgary, Alberta T2E 6L5, Tel. (403) 291-9897, Fax (403) 291-0298

Canada Wide Tel. 1-800-668-9878 www.envirotest.com

(Edmonton, Calgary, Grande Prairie, Saskatoon, Winnipeg, Thunder Bay, Ottawa, Waterloo, Montreal)

ENVIRO-TEST ANALYTICAL REPORT

Reference Information

Methods Listed (if applicable):

ETL Test Code	Matrix	Test Description	Preparation Method Reference(Based On)	Analytical Method Reference(Based On)
BOD-CBOD-CL	Water	Carbonaceous BOD		APHA 5210 B-5 day Incub.-O2 electrode
BOD-CL	Water	Biochemical Oxygen Demand		APHA 5210 B-5 day incub.-O2 electrode
CL-CL	Water	Chloride (Cl)		APHA 4110 B-Ion Chromatography
ETL-ROUTINE-ICP-CL	Water	ICP metals for routine water		APHA 3120 B-ICP-OES
N2N3-CL	Water	Nitrate+Nitrite-N		APHA 4110 B-Ion Chromatography
NO2-CL	Water	Nitrite-N		APHA 4110 B-Ion Chromatography
NO3-IC-CL	Water	Nitrate-N		APHA 4110 B-Ion Chromatography
OGG-ED	Water	Oil and Grease-Gravimetric		APHA 5520 B Hexane MTBE ext. Gravime
PH/EC/ALK-CL	Water	pH, Conductivity and Total Alkalinity		APHA 4500H,2510,2320
SO4-CL	Water	Sulfate (SO4)		APHA 4110 B-Ion Chromatography
SOLIDS-TOTSUS-CL	Water	Total Suspended Solids		APHA 2540 D-Gravimetric

** Laboratory Methods employed follow in-house procedures, which are generally based on nationally or internationally accepted methodologies.

Chain of Custody numbers:

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location	Laboratory Definition Code	Laboratory Location
CL	Enviro-Test Laboratories - Calgary, Alberta, Canada	ED	Enviro-Test Laboratories - Edmonton, Alberta, Canada

GLOSSARY OF REPORT TERMS

Surr - A surrogate is an organic compound that is similar to the target analyte(s) in chemical composition and behavior but not normally detected in environmental samples. Prior to sample processing, samples are fortified with one or more surrogate compounds.

The reported surrogate recovery value provides a measure of method efficiency. The Laboratory warning units are determined under column heading D.L.

mg/kg (units) - unit of concentration based on mass, parts per million

mg/L (units) - unit of concentration based on volume, parts per million

< - Less than

D.L. - Detection Limit

N/A - Result not available. Refer to qualifier code and definition for explanation

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

UNLESS OTHERWISE STATED, SAMPLES ARE NOT CORRECTED FOR CLIENT FIELD BLANKS.

Although test results are generated under strict QA/QC protocols, any unsigned test reports, faxes, or emails are considered preliminary.

Enviro-Test Laboratories has an extensive QA/QC program where all analytical data reported is analyzed using approved referenced procedures followed by checks and reviews by senior managers and quality assurance personnel. However, since the results are obtained from chemical measurements and thus cannot be guaranteed, Enviro-Test Laboratories assumes no liability for the use or interpretation of the results.

ENVIRO-TEST QC REPORT

Workorder: L102487

Client: PETRO CANADA
PO BOX 2844
CALGARY AB T2P 3E3

Contact: KYNA RIGAL

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<u>IOD-CL</u>	<u>Water</u>							
Batch	R115942							
WG107910-2	DUP	L102506-1						
Biochemical Oxygen Demand		322	326		mg/L	1.2	7.5	19-MAR-03
<u>CL-CL</u>	<u>Water</u>							
Batch	R115497							
WG107409-2	DUP	L102443-1						
Chloride (Cl)		66.2	66.4		mg/L	0.28	10	14-MAR-03
WG107409-4	DUP	L102444-1						
Chloride (Cl)		31.4	31.4		mg/L	0.12	10	14-MAR-03
WG107409-5	DUP	L102497-1						
Chloride (Cl)		67.8	66.9		mg/L	1.4	10	14-MAR-03
WG107409-1	LCS							
Chloride (Cl)			97		%		92-112	14-MAR-03
WG107409-3	MS	L102443-1						
Chloride (Cl)			99		%		91-107	14-MAR-03
<u>ETL-ROUTINE-ICP-CL</u>	<u>Water</u>							
Batch	R115558							
WG107451-2	DUP	L102433-1						
Calcium (Ca)		96.8	98.5		mg/L	1.8	10	17-MAR-03
Magnesium (Mg)		127	128		mg/L	1.3	10	17-MAR-03
Potassium (K)		155	159		mg/L	2.4	10	17-MAR-03
Sodium (Na)		46	47		mg/L	2.1	10	17-MAR-03
WG107451-1	LCS							
Calcium (Ca)			103		%		90-110	17-MAR-03
Magnesium (Mg)			99		%		90-110	17-MAR-03
Potassium (K)			100		%		90-110	17-MAR-03
Sodium (Na)			98		%		90-110	17-MAR-03
WG107451-3	MS	L102433-1						
Calcium (Ca)			104		%		90-114	17-MAR-03
Magnesium (Mg)			94		%		93-107	17-MAR-03
Potassium (K)			96		%		90-104	17-MAR-03
Sodium (Na)			96		%		97-105	17-MAR-03

ENVIRO-TEST QC REPORT

Workorder: L102487

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<u>2N3-CL</u>	<u>Water</u>							
Batch	R115497							
WG107409-2	DUP	L102443-1						
Nitrate+Nitrite-N		2.59	2.61		mg/L	0.93	13	14-MAR-03
WG107409-4	DUP	L102444-1						
Nitrate+Nitrite-N		1.44	1.44		mg/L	0.14	13	14-MAR-03
WG107409-5	DUP	L102497-1						
Nitrate+Nitrite-N		0.39	0.37		mg/L	3.5	13	14-MAR-03
WG107409-1	LCS							
Nitrate+Nitrite-N			99		%		90-106	14-MAR-03
WG107409-3	MS	L102443-1						
Nitrate+Nitrite-N			96		%		93-109	14-MAR-03
<u>O2-CL</u>	<u>Water</u>							
Batch	R115497							
WG107409-5	DUP	L102497-1						
Nitrite-N		0.27	0.26		mg/L	2.0	13	14-MAR-03
WG107409-1	LCS							
Nitrite-N			98		%		91-107	14-MAR-03
<u>O3-IC-CL</u>	<u>Water</u>							
Batch	R115497							
WG107409-5	DUP	L102497-1						
Nitrate-N		0.12	0.11	J	mg/L	0.01	0.15	14-MAR-03
WG107409-1	LCS							
Nitrate-N			99		%		90-106	14-MAR-03
<u>IGG-ED</u>	<u>Water</u>							
Batch	R115580							
WG107407-2	LCS							
Oil and Grease			92		%		79-100	17-MAR-03
WG107407-1	MB							
Oil and Grease			<1		mg/L		1	17-MAR-03
<u>H/EC/ALK-CL</u>	<u>Water</u>							
Batch	R115734							
WG107634-2	DUP	L102497-1						
Alkalinity, Total (as CaCO3)		374	369		mg/L	1.3	5	14-MAR-03
Bicarbonate (HCO3)		456	450		mg/L	1.3	25	14-MAR-03
Carbonate (CO3)		<5	<5	RPD-NA	mg/L	N/A	25	14-MAR-03
Conductivity (EC)		1210	1220		uS/cm	0.66	7.5	14-MAR-03
Hydroxide (OH)		<5	<5	RPD-NA	mg/L	N/A	25	14-MAR-03
pH		7.2	7.2	J	pH	0.0	0.1	14-MAR-03
WG107634-1	LCS							
Alkalinity, Total (as CaCO3)			102		%		95-105	14-MAR-03
Conductivity (EC)			100		%		97-101	14-MAR-03
pH			7.0		pH		6.9-7.1	14-MAR-03

ENVIRO-TEST QC REPORT

Workorder: L102487

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
D4-CL	<u>Water</u>							
Batch	R115497							
WG107409-5	DUP	L102497-1						
Sulphate (SO4)		179	177		mg/L	1.2	10	14-MAR-03
WG107409-1	LCS							
Sulphate (SO4)			98		%		90-108	14-MAR-03
SOLIDS-TOTSUS-CL	<u>Water</u>							
Batch	R115645							
WG107559-2	DUP	L102487-1						
Total Suspended Solids		35	38		mg/L	6.9	10	17-MAR-03
WG107559-3	DUP	L102506-1						
Total Suspended Solids		555	540		mg/L	2.7	10	17-MAR-03
WG107559-4	DUP	L102507-1						
Total Suspended Solids		120	117		mg/L	2.8	10	17-MAR-03
WG107559-1	LCS							
Total Suspended Solids			90		%		87-105	17-MAR-03
<u>Product - Batch and Sample Number Relations:</u>								
BOD-CBOD-CL	1							
	R115942	L102487-1						
COD-CL	1							
	R115942	L102487-1						
CL-CL	1							
	R115497	L102487-1						
ETL-ROUTINE-ICP-CL	1							
	R115558	L102487-1						
N2N3-CL	1							
	R115497	L102487-1						
NO2-CL	1							
	R115497	L102487-1						
NO3-IC-CL	1							
	R115497	L102487-1						
OGG-ED	1							
	R115580	L102487-1						
PH/EC/ALK-CL	1							
	R115734	L102487-1						
SO4-CL	1							
	R115497	L102487-1						
SOLIDS-TOTSUS-CL	1							
	R115645	L102487-1						

ENVIRO-TEST QC REPORT

Page 4 of 4

Workorder # L102487

Legend:

Limit	95% Confidence Interval (Laboratory Warning Limits)
DUP	Duplicate
RPD	Relative Percent Difference ((higher result-lower result)/Average, expressed as %)
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Materials
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material

Qualifier:

RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.
A	Method blank exceeds acceptance limit. Blank correction not applied, unless the qualifier "RAMB" (result adjusted for method blank) appears in the Analytical Report.
B	Method blank result exceeds acceptance limit, however, it is less than 5% of sample concentration. Blank correction not applied.
D	Duplicate result may exceed limit due to increased variability for low level samples.
E	Matrix spike recovery may fall outside the acceptance limits due to high sample background.
F	Silver recovery low, likely due to elevated chloride levels in sample.
G	Outlier - No assignable cause for nonconformity has been determined.
H	Result falls within the 99% Confidence Interval (Laboratory Control Limits)
J	Duplicate results and limit(s) are expressed in terms of absolute difference.

ETL Enviro•Test

A DIVISION OF *ETL CHEMSPEC ANALYTICAL LIMITED*

ANALYTICAL REPORT

PETRO CANADA
ATTN: TIM R. TAYLOR
P.O. BOX 2844 STN. M
CALGARY AB T2P 3E3

DATE: 31-MAR-03 Revision: 1

Lab Work Order #: L103315

Sampled By: JIM C

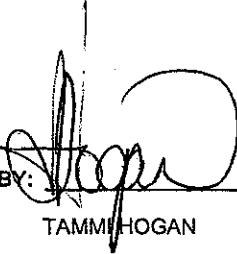
Date Received: 21-MAR-03

P.O. #:

Job #: NUNA

Comments:

APPROVED BY:



TAMMI HOGAN

Project Manager

THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE WRITTEN AUTHORITY OF THE LABORATORY.
ANY REMAINING SAMPLES WILL BE DISPOSED OF AFTER 30 DAYS FOLLOWING ANALYSIS. PLEASE CONTACT THE LAB IF YOU
REQUIRE ADDITIONAL SAMPLE STORAGE TIME.

LABORATORY ACCREDITATIONS:

- STANDARDS COUNCIL OF CANADA IN COOPERATION WITH THE CANADIAN ASSOCIATION FOR ENVIRONMENTAL ANALYTICAL LABORATORIES (CAEAL) FOR SPECIFIC TESTS AS REGISTERED BY THE COUNCIL (EDMONTON, CALGARY, GRANDE PRAIRIE, SASKATOON, WINNIPEG, THUNDER BAY, WATERLOO)
- AMERICAN INDUSTRIAL HYGIENE ASSOCIATION (AIHA) IN THE INDUSTRIAL HYGIENE PROGRAM (EDMONTON, WINNIPEG)
- STANDARDS COUNCIL OF CANADA IN COOPERATION WITH THE CANADIAN FOOD INSPECTION AGENCY (CFIA) FOR FERTILIZER AND FEED TESTING (SASKATOON) AND FOR MICROBIOLOGICAL TESTING IN FOOD (WINNIPEG)
- LABORATORY RECOGNITIONS:
- STANDARDS COUNCIL OF CANADA - GLP COMPLIANT FACILITY (EDMONTON, OTTAWA)

9936 - 67 Avenue, Edmonton, Alberta T6E 0P5, Tel. (780) 413-5227, Fax (780) 437-2311
Canada Wide Tel. 1-800-668-9878 www.envirotest.com

(Edmonton, Calgary, Grande Prairie, Saskatoon, Winnipeg, Thunder Bay, Ottawa, Waterloo, Montreal)

ENVIRO-TEST ANALYTICAL REPORT

ENVIRO-TEST ANALYTICAL REPORT

Sample Details/Parameters	Methodology	Result	Qualifier	QL	Units	Entered	Analyzed	By	Batch#
L103315-2 SP #2 KITCHEN Sample Date: 20-MAR-03 Matrix: WATER									
Routine Water Analysis									
ICP metals and SO4 for routine water									
Calcium (Ca)		28.6		0.5	mg/L		21-MAR-03	JTV	R116154
Potassium (K)		2.3		0.1	mg/L		21-MAR-03	JTV	R116154
Magnesium (Mg)		9.6		0.1	mg/L		21-MAR-03	JTV	R116154
Sodium (Na)		10		1	mg/L		21-MAR-03	JTV	R116154
Sulfate (SO4)		3.8		0.5	mg/L		21-MAR-03	JTV	R116154
Total & Fecal Coliform Count-MF									
MF - Fecal Coliforms		<1		1	CFU/100mL		21-MAR-03	S V N	R116165
MF - Total Coliforms		12		1	CFU/100mL		21-MAR-03	S V N	R116165
Refer to Referenced Information for Qualifiers (if any) and Methodology.									

Reference Information

Methods Listed (if applicable):

ETL Test Code	Matrix	Test Description	Preparation Method Reference(Based On)	Analytical Method Reference(Based On)
BOD-ED	Water	Biochemical Oxygen Demand (BOD)		APHA 5210 B-5 day incub.-O2 electrod
CL-ED	Water	Chloride (Cl)		APHA 4500 Cl E-Colorimetry
ETL-ROUTINE-ICP-ED	Water	ICP metals and SO4 for routine water		APHA 3120 B-ICP-OES
FCC-MF-ED	Water	Fecal Coliform Count-MF		Standards Methods #9222D

Fecal coliform- Standards Methods for the Examination of Water and Wastewater, Method No. 9222D

Abbreviations: MF-membrane filtration, CFU-colony forming unit, TNC-too numerous to count.

Interpretation of Results:

SATISFACTORY-When no fecal coliforms are detected.

UNSATISFACTORY-When fecal coliforms are present indicates pollution of intestinal origin and should not be used for drinking without treatment.

DOUBTFUL- When fecal coliforms are not detected but coliforms are present may or may not indicate bacteria of intestinal origin. If repeated analyses do not show source of pollution nearby, the water may be considered satisfactory if inspected by Medical Officer of Health or Health Inspector. Results for Fecal coliforms are presumptive and have not been confirmed by alternate culture media unless requested.

N2N3-ED	Water	Nitrate+Nitrite-N	APHA 4500 NO3H-Colorimetry
NH4-ED	Water	Ammonia-N	APHA4500NH3F Colorimetry
NO2-ED	Water	Nitrite-N	APHA 4500 NO2B-Colorimetry
NO3-ED	Water	Nitrate-N	APHA 4500 NO3H-Colorimetry
OGG-ED	Water	Oil and Grease-Gravimetric	APHA 5520 B Hexane MTBE ext. Gravime
PH/EC/ALK-ED	Water	pH, Conductivity and Total Alkalinity	APHA 4500-H, 2510, 2320
SOLIDS-TOTSUS-ED	Water	Total Suspended Solids	APHA 2540 D-Gravimetric
TCC-MF-ED	Water	Total Coliform Count-MF	Standard Methods #9222B

Total coliform-Standard Methods for the Examination of Water and Wastewater, Method 9222B.

Abbreviations: MF-membrane filtration, CFU-colony forming unit, TNC-too numerous to count.

Interpretation of Results:

SATISFACTORY-When no coliforms are detected.

UNSATISFACTORY-When fecal coliforms are present indicates pollution of intestinal origin and should not be used for drinking without treatment.

DOUBTFUL-When fecal coliforms are not present but other coliforms are present may or may not indicate bacteria of intestinal origin. If repeated analysis do not show source of pollution nearby, the water may be considered satisfactory if inspected by Medical Officer of Health or Health Inspector.

Results are reported as presumptive for Total coliforms and have not been confirmed by an alternate culture media unless requested.

** Laboratory Methods employed follow in-house procedures, which are generally based on nationally or internationally accepted methodologies.

Chain of Custody numbers:

L103315

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location	Laboratory Definition Code	Laboratory Location
ED	Enviro-Test Laboratories - Edmonton, Alberta, Canada		

Reference Information

GLOSSARY OF REPORT TERMS

Surr - A surrogate is an organic compound that is similar to the target analyte(s) in chemical composition and behavior but not normally detected in environmental samples. Prior to sample processing, samples are fortified with one or more surrogate compounds.

The reported surrogate recovery value provides a measure of method efficiency. The Laboratory warning units are determined under column heading D.L.

mg/kg (units) - unit of concentration based on mass, parts per million

mg/L (units) - unit of concentration based on volume, parts per million

< - Less than

D.L. - Detection Limit

N/A - Result not available. Refer to qualifier code and definition for explanation

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

UNLESS OTHERWISE STATED, SAMPLES ARE NOT CORRECTED FOR CLIENT FIELD BLANKS.

Although test results are generated under strict QA/QC protocols, any unsigned test reports, faxes, or emails are considered preliminary.

Enviro-Test Laboratories has an extensive QA/QC program where all analytical data reported is analyzed using approved referenced procedures followed by checks and reviews by senior managers and quality assurance personnel. However, since the results are obtained from chemical measurements and thus cannot be guaranteed, Enviro-Test Laboratories assumes no liability for the use or interpretation of the results.

ENVIRO-TEST QC REPORT

Workorder: L103315

Client: PETRO CANADA
P.O. BOX 2844 STN. M
CALGARY AB T2P 3E3

Contact: TIM R. TAYLOR

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<u>IOD-ED</u>	<u>Water</u>							
Batch	R116711							
WG108665-3	DUP	L103321-1						
Biochemical Oxygen Demand		<2	<2	RPD-NA	mg/L	N/A	14	21-MAR-03
WG108665-2	LCS				%		85-114	21-MAR-03
Biochemical Oxygen Demand			113					
WG108665-1	MB							
Biochemical Oxygen Demand			<2		mg/L		2	21-MAR-03
<u>CL-ED</u>	<u>Water</u>							
Batch	R116082							
WG108060-5	DUP	L103106-4						
Chloride (Cl)		25	25		mg/L	1.3	5	21-MAR-03
WG108060-2	LCS				%		94-107	21-MAR-03
Chloride (Cl)			104					
WG108060-3	LCS				%		94-107	21-MAR-03
Chloride (Cl)			100					
WG108060-1	MB							
Chloride (Cl)			<1		mg/L		1	21-MAR-03
WG108060-10	MS	L103288-4						
Chloride (Cl)			110	H	%		96-108	21-MAR-03
WG108060-7	MS	L103290-8			%		96-108	21-MAR-03
Chloride (Cl)			108					
WG108060-9	MS	L103315-2			%		96-108	21-MAR-03
Chloride (Cl)			110	H				
WG108060-11	MSD	WG108060-10						
Chloride (Cl)			111.878692		%	2.0	5	21-MAR-03
WG108060-8	MSD	WG108060-7						
Chloride (Cl)			108.453941		%	0.76	5	21-MAR-03
<u>ETL-ROUTINE-ICP-ED</u>	<u>Water</u>							
Batch	R116154							
WG108082-2	CRM							
Calcium (Ca)			101		%		89-111	21-MAR-03
Magnesium (Mg)			102		%		89-111	21-MAR-03
Potassium (K)			111		%		84-116	21-MAR-03
Sodium (Na)			101		%		89-111	21-MAR-03
Sulfate (SO4)			97		%		90-110	21-MAR-03
WG108082-4	DUP	L103308-1						
Calcium (Ca)		28.5	28.2		mg/L	1.0	6.1	21-MAR-03

ENVIRO-TEST QC REPORT

Workorder: L103315

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
TL-ROUTINE-ICP-ED <u>Water</u>								
Batch	R116154							
WG108082-4	DUP	L103308-1						
Magnesium (Mg)		11.4	11.3		mg/L	1.3	6.1	21-MAR-03
Potassium (K)		39.6	38.8		mg/L	2.0	18	21-MAR-03
Sodium (Na)		257	250		mg/L	2.5	5.9	21-MAR-03
Sulfate (SO4)		257	677		mg/L	0.23	6.1	21-MAR-03
WG108082-8	DUP	L103321-1						
Calcium (Ca)		19.7	19.6		mg/L	0.31	6.1	21-MAR-03
Magnesium (Mg)		6.9	6.9		mg/L	0.27	6.1	21-MAR-03
Potassium (K)		1.3	1.4		mg/L	11	18	21-MAR-03
Sodium (Na)		61	61		mg/L	0.51	5.9	21-MAR-03
Sulfate (SO4)		15.1	14.5		mg/L	3.8	6.1	21-MAR-03
WG108082-1	MB							
Calcium (Ca)			<0.5		mg/L		2.5	21-MAR-03
Magnesium (Mg)			<0.1		mg/L		0.5	21-MAR-03
Potassium (K)			<0.1		mg/L		0.5	21-MAR-03
Sodium (Na)			<1		mg/L		5	21-MAR-03
Sulfate (SO4)			<0.5		mg/L		2.5	21-MAR-03
WG108082-5	MS	L103308-1						
Calcium (Ca)			111		%		82-114	21-MAR-03
Magnesium (Mg)			113	H	%		88-111	21-MAR-03
Potassium (K)			113		%		87-122	21-MAR-03
Sodium (Na)			111		%		85-116	21-MAR-03
Sulfate (SO4)			-355	E	%		87-117	21-MAR-03
WG108082-9	MS	L103321-1						
Calcium (Ca)			108		%		82-114	21-MAR-03
Magnesium (Mg)			111	H	%		88-111	21-MAR-03
Potassium (K)			110		%		87-122	21-MAR-03
Sodium (Na)			109		%		85-116	21-MAR-03
Sulfate (SO4)			97		%		87-117	21-MAR-03
CC-MF-ED <u>Water</u>								
Batch	R116165							
WG108114-1	DUP	L103308-1						
MF - Fecal Coliforms		180	170		CFU/100mL	5.6		21-MAR-03
WG108114-2	MB							
MF - Fecal Coliforms			<1		CFU/100mL		1	21-MAR-03
I2N3-ED <u>Water</u>								
Batch	R116333							
WG108300-2	LCS							
Nitrate+Nitrite-N			93		%		91-104	24-MAR-03
WG108300-1	MB							

ENVIRO-TEST QC REPORT

Workorder: L103315

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
2N3-ED								
	<u>Water</u>							
Batch	R116333							
WG108300-1	MB							
Nitrate+Nitrite-N			<0.1		mg/L		0.1	24-MAR-03
WG108300-6	MS	L103321-1			%		90-108	24-MAR-03
Nitrate+Nitrite-N			103					
WG108300-7	MSD	WG108300-6						
Nitrate+Nitrite-N			104.945054		%	1.8	5	24-MAR-03
IH4-ED								
	<u>Water</u>							
Batch	R116542							
WG108381-7	DUP	L103578-3						
Ammonia-N		0.41	0.41		mg/L	0.074	7.7	25-MAR-03
IO2-ED								
	<u>Water</u>							
Batch	R116333							
WG108300-3	LCS							
Nitrite-N			101		%		94-108	24-MAR-03
WG108300-1	MB							
Nitrite-N			<0.05		mg/L		0.05	24-MAR-03
WG108300-4	MS	L103106-9						
Nitrite-N			102		%		95-107	24-MAR-03
WG108300-8	MS	L103106-10						
Nitrite-N			102		%		95-107	24-MAR-03
WG108300-5	MSD	WG108300-4						
Nitrite-N			99.4605394		%	2.5	5	24-MAR-03
WG108300-9	MSD	WG108300-8						
Nitrite-N			100.109890		%	2.2	5	24-MAR-03
DGG-ED								
	<u>Water</u>							
Batch	R116127							
WG108070-2	LCS							
Oil and Grease			95		%		79-100	21-MAR-03
WG108070-1	MB							
Oil and Grease			<1		mg/L		1	21-MAR-03
pH/EC/ALK-ED								
	<u>Water</u>							
Batch	R116372							
WG108356-10	DUP	L102646-1						
Alkalinity, Total (as CaCO ₃)		277	278		mg/L	0.18	5	24-MAR-03
Bicarbonate (HCO ₃)		338	339		mg/L	0.18	20	24-MAR-03
Carbonate (CO ₃)		<5	<5	RPD-NA	mg/L	N/A	20	24-MAR-03
Conductivity (EC)		541	544		uS/cm	0.51	5.5	24-MAR-03
Hydroxide (OH)		<5	<5	RPD-NA	mg/L	N/A	20	24-MAR-03
pH		7.9	7.9	J	pH	0.0	0.1	24-MAR-03
i108356-8	DUP	L103438-5						

ENVIRO-TEST QC REPORT

Workorder: L103315

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<u>H/EC/ALK-ED</u>	<u>Water</u>							
Batch	R116372							
WG108356-8	DUP	L103438-5						
Alkalinity, Total (as CaCO ₃)		346	345		mg/L	0.27	5	24-MAR-03
Bicarbonate (HCO ₃)		423	422		mg/L	0.27	20	24-MAR-03
Carbonate (CO ₃)		<5	<5	RPD-NA	mg/L	N/A	20	24-MAR-03
Conductivity (EC)		596	597		uS/cm	0.17	5.5	24-MAR-03
Hydroxide (OH)		<5	<5	RPD-NA	mg/L	N/A	20	24-MAR-03
pH		6.9	6.9	J	pH	0.0	0.1	24-MAR-03
WG108356-1	LCS							
pH			4.0		pH		3.9-4.1	24-MAR-03
WG108356-2	LCS							
pH			7.0		pH		6.9-7.1	24-MAR-03
WG108356-3	LCS							
pH			10.0		pH		9.9-10.1	24-MAR-03
WG108356-4	LCS							
Conductivity (EC)			107		%		102-110	24-MAR-03
WG108356-5	LCS							
Conductivity (EC)			103		%		99-107	24-MAR-03
WG108356-6	LCS							
Conductivity (EC)			95		%		93-102	24-MAR-03
WG108356-7	LCS							
Alkalinity, Total (as CaCO ₃)			102		%		96-109	24-MAR-03
<u>SOLIDS-TOTSUS-ED</u>	<u>Water</u>							
Batch	R116487							
WG108231-3	DUP	L102829-14						
Total Suspended Solids		13	16	J	mg/L	3	9.2	25-MAR-03
WG108231-2	LCS							
Total Suspended Solids			104		%		90-106	25-MAR-03
WG108231-1	MB							
Total Suspended Solids			<3		mg/L		3	25-MAR-03
<u>CC-MF-ED</u>	<u>Water</u>							
Batch	R116165							
WG108114-1	DUP	L103308-1						
MF - Total Coliforms		5900	5800		CFU/100mL	1.5		21-MAR-03
WG108114-2	MB							
MF - Total Coliforms			<1		CFU/100mL		1	21-MAR-03
Product - Batch and Sample Number Relations:								
BOD-ED		1						
	R116711		L103315-1					
CL-ED		1						
	R116082		L103315-1		L103315-2			

ENVIRO-TEST QC REPORT

Workorder: L103315

	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
Product - Batch and Sample Number Relations:								
ETL-ROUTINE-ICP-ED	1							
	R116154	L103315-1	L103315-2					
FCC-MF-ED	1							
	R116165	L103315-1	L103315-2					
N2N3-ED	1							
	R116333	L103315-1	L103315-2					
NH4-ED	1							
	R116542	L103315-1						
NO2-ED	1							
	R116333	L103315-1	L103315-2					
NO3-ED	1							
	R116333	L103315-1	L103315-2					
DGG-ED	1							
	R116127	L103315-1						
PH/EC/ALK-ED	1							
	R116372	L103315-1	L103315-2					
SOLIDS-TOTSUS-ED	1							
	R116487	L103315-1	L103315-2					
TCC-MF-ED	1							
	R116165	L103315-1	L103315-2					

Legend:

Limit 95% Confidence Interval (Laboratory Warning Limits)
DUP Duplicate
RPD Relative Percent Difference ((higher result-lower result)/Average, expressed as %)
N/A Not Available
LCS Laboratory Control Sample
SRM Standard Reference Materials
MS Matrix Spike
MSD Matrix Spike Duplicate
ADE Average Desorption Efficiency
MB Method Blank
IRM Internal Reference Material
CRM Certified Reference Material

Qualifier:

RPD-NA Relative Percent Difference Not Available due to result(s) being less than detection limit.
A Method blank exceeds acceptance limit. Blank correction not applied, unless the qualifier "RAMB"
(result adjusted for method blank) appears in the Analytical Report.
B Method blank result exceeds acceptance limit, however, it is less than 5% of sample concentration.
Blank correction not applied.
D Duplicate result may exceed limit due to increased variability for low level samples.
E Matrix spike recovery may fall outside the acceptance limits due to high sample background.
F Silver recovery low, likely due to elevated chloride levels in sample.
G Outlier - No assignable cause for nonconformity has been determined.
H Result falls within the 99% Confidence Interval (Laboratory Control Limits)
J Duplicate results and limit(s) are expressed in terms of absolute difference.



EnviroTest
LABORATORIES

CHAIN OF CUSTODY/ANALYTICAL REQUEST FORM

Petro-Canada

Service Requested: Regular Priority Emergency

Account Number: 10364

Sample ID	Sampled By	Date/Time Sampled	Sample Type			
SNP 1784-1	Jim C	Mar 20/03	SEWAGE (1 L PLASTIC)	X ✓		
SNP 1784-1	Jim C	Mar 20/03	SEWAGE (500 ML PLASTIC)	X ✓		
SNP 1784-1	Jim C	Mar 20/03	SEWAGE (300 ML STERILIZED)	X		
SNP 1784-1	Jim C	Mar 20/03	SEWAGE (500 ML PLASTIC PURPLE PRESERVATIVE)	X ✓		
SNP 1784-1	Jim C	Mar 20/03	SEWAGE (1 L AMBER GLASS YELLOW PRESERVATIVE)	X ✓		
			INLET SEWAGE (OPTIONAL 1 L PLASTIC)	X		
<i>Fitter Box</i>				REINQUISITIONED BY:	DATE:	RECEIVED BY:
				<i>B. Jones</i>	<i>20-MAR-03</i>	<i>20-MAR-03</i>
				TIME:		TIME:

ATTENTION: TIM R. TAYLOR
CLIENT INFORMATION:
REPORT TO PETRO-CANADA
1506 11TH AVENUE SW
CALGARY AB T2P 3E1

Phone: (403) 296-7770
Fax: (403) 296-5117
Email: traylor@petro-canada.com
Kraig@petro-canada.com

FOR LABORATORY USE ONLY

SAMPLE CONDITION UPON RECEIPT
OTHER (BREAKAGE, LEAKAGE, ETC.)

卷之三

CHAIN OF CUSTODY/ANALYTICAL REQUEST FORM

Petro-Canada

Service Requested: Regular _____ Priority _____ Emergency _____

Account Number: 10364

Sample ID	Sampled By	Date/Time Sampled	Sample Type
SP # 2	Tim C	Mar 20/03	DRINKING WATER (500 ML PLASTIC)
SP # 2	Tim C	Mar 20/03	DRINKING WATER (300 ML STERILIZED)
Kitchen			
		RELINQUISHED BY:	DATE: RECEIVED BY: DATE:
			TIME: 10:40

CLIENT INFORMATION

REPORT TO PETRO-CANADA

1506 1/2 AVENUE SW

CALGARY AB T2P 2E

ATTENTION: TIM R. TAYOR

Phone: (403) 296-7770

Fax: (403) 296-5177

Email: taylor.tim@petro-canada.com

INVOICE (SAME)

Project Number: NUNA

PO Number:

FOR LABORATORY USE ONLY

SAMPLE CONDITION UPON RECEIPT: FROZEN _____ COLD AMBIENT
 OTHER (BREAKAGE, LEAKAGE, ETC.):

NOTE: Quotation #

ETL Enviro·Test

A DIVISION OF ETL CHEMSPEC ANALYTICAL LIMITED

ANALYTICAL REPORT

PETRO CANADA
ATTN: TIM R. TAYLOR
150 6TH AVE SW
CALGARY AB T2P 3E3

DATE: 07-APR-03

Lab Work Order #: L104341

Sampled By: JIM C

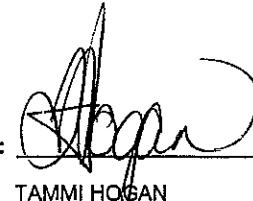
Date Received: 31-MAR-03

P.O. #:

Job #:

Comments:

APPROVED BY:



TAMMI HOGAN

Project Manager

THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE WRITTEN AUTHORITY OF THE LABORATORY.
ANY REMAINING SAMPLES WILL BE DISPOSED OF AFTER 30 DAYS FOLLOWING ANALYSIS. PLEASE CONTACT THE LAB IF YOU
REQUIRE ADDITIONAL SAMPLE STORAGE TIME.

LABORATORY ACCREDITATIONS:

- STANDARDS COUNCIL OF CANADA IN COOPERATION WITH THE CANADIAN ASSOCIATION FOR ENVIRONMENTAL ANALYTICAL LABORATORIES (CAEAL) FOR SPECIFIC TESTS AS REGISTERED BY THE COUNCIL (EDMONTON, CALGARY, GRANDE PRAIRIE, SASKATOON, WINNIPEG, THUNDER BAY, WATERLOO)
 - AMERICAN INDUSTRIAL HYGIENE ASSOCIATION (AIHA) IN THE INDUSTRIAL HYGIENE PROGRAM (EDMONTON, WINNIPEG)
 - STANDARDS COUNCIL OF CANADA IN COOPERATION WITH THE CANADIAN FOOD INSPECTION AGENCY (CFIA) FOR FERTILIZER AND FEED TESTING (SASKATOON) AND FOR MICROBIOLOGICAL TESTING IN FOOD (WINNIPEG)
- LABORATORY RECOGNITIONS:**
- STANDARDS COUNCIL OF CANADA - GLP COMPLIANT FACILITY (EDMONTON, OTTAWA)

9936 - 67 Avenue, Edmonton, Alberta T6E 0P5, Tel. (780) 413-5227, Fax (780) 437-2311
Canada Wide Tel. 1-800-668-9878 www.envirotest.com

(Edmonton, Calgary, Grande Prairie, Saskatoon, Winnipeg, Thunder Bay, Ottawa, Waterloo, Montreal)

ENVIRO-TEST ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier	D.L.	Units	Extracted	Analyzed	By	Batch
L104341-1 SNP 1788-1 FILTER BOX								
Sample Date: 27-MAR-03								
Matrix: WATER								
Ammonia-N	37.0		0.05	mg/L		03-APR-03	TL	R117588
Biochemical Oxygen Demand	40		2	mg/L		28-MAR-03	PTT	R117523
Oil and Grease	2		1	mg/L		03-APR-03	ZOW	R117626
Total Suspended Solids	216		3	mg/L		07-APR-03	EMN	R117960
Routine Water Analysis								
Chloride (Cl)	167		1	mg/L		31-MAR-03	OC/JT	R117038
Nitrate+Nitrite-N	5.0		0.1	mg/L		31-MAR-03	M8B	R117090
Nitrate-N	1.2		0.1	mg/L		31-MAR-03	M8B	R117090
Nitrite-N	3.87		0.05	mg/L		31-MAR-03	M8B	R117090
pH, Conductivity and Total Alkalinity								
pH	7.4		0.1	pH		05-APR-03	PTT	R117858
Conductivity (EC)	1680		0.2	uS/cm		05-APR-03	PTT	R117858
Bicarbonate (HCO3)	462		5	mg/L		05-APR-03	PTT	R117858
Carbonate (CO3)	<5		5	mg/L		05-APR-03	PTT	R117858
Hydroxide (OH)	<5		5	mg/L		05-APR-03	PTT	R117858
Alkalinity, Total (as CaCO3)	378		5	mg/L		05-APR-03	PTT	R117858
Ion Balance Calculation								
Ion Balance	95.0			%		07-APR-03		
TDS (Calculated)	895			mg/L		07-APR-03		
Hardness (as CaCO3)	102			mg/L		07-APR-03		
ICP metals and SO4 for routine water								
Calcium (Ca)	23.2		0.5	mg/L		31-MAR-03	JTV	R117091
Potassium (K)	39.1		0.1	mg/L		31-MAR-03	JTV	R117091
Magnesium (Mg)	10.6		0.1	mg/L		31-MAR-03	JTV	R117091
Sodium (Na)	227		1	mg/L		31-MAR-03	JTV	R117091
Sulfate (SO4)	179		0.5	mg/L		31-MAR-03	JTV	R117091
Total & Fecal Coliform Count-MF								
MF - Fecal Coliforms	140		1	CFU/100mL		29-MAR-03	S V N	R117040
MF - Total Coliforms		TNTC*	1	CFU/100mL		29-MAR-03	S V N	R117040
L104341-2 S.P. #2								
Sample Date: 27-MAR-03								
Matrix: WATER								
HPC, Total & Fecal Coliform Count-MF								
MF - Fecal Coliforms	<1		1	CFU/100mL		29-MAR-03	S V N	R117040
MF - Heterotrophic Plate Count	2		1	CFU/1mL		29-MAR-03	S V N	R117040
MF - Total Coliforms	2		1	CFU/100mL		29-MAR-03	S V N	R117040
Total Suspended Solids	<3		3	mg/L		07-APR-03	EMN	R117960
Routine Water: Major Ions, Fe & Mn								
Iron (Fe)-Extractable	0.07		0.06	mg/L		01-APR-03	HAS	R117276
Manganese(Mn)-Extractable	0.03		0.02	mg/L		01-APR-03	HAS	R117276
Chloride (Cl)	16		1	mg/L		31-MAR-03	OC/JT	R117038
Nitrate+Nitrite-N	<0.1		0.1	mg/L		31-MAR-03	M8B	R117090
Nitrate-N	<0.1		0.1	mg/L		31-MAR-03	M8B	R117090
Nitrite-N	<0.05		0.05	mg/L		31-MAR-03	M8B	R117090
pH, Conductivity and Total Alkalinity								
pH	7.5		0.1	pH		05-APR-03	PTT	R117858
Conductivity (EC)	262		0.2	uS/cm		05-APR-03	PTT	R117858
Bicarbonate (HCO3)	122		5	mg/L		05-APR-03	PTT	R117858
Carbonate (CO3)	<5		5	mg/L		05-APR-03	PTT	R117858

CHAIN OF CUSTODY/ANALYTICAL REQUEST FORM

Petro-Canada

Service Requested: Regular Priority Emergency

Account Number: 10364

Sample ID	Sampled By	Date/Time Sampled	Sample Type	ROUTINE / TSS/Fe & Mn	FECAL & TOTAL COLIFORMS/ HPC
SP-2	Tim C	Feb 27 12:45	DRINKING WATER (500 ML PLASTIC) DRINKING WATER (300 ML STERILIZED)	X	X
SP-2	Tim C				

RELINQUISHED BY:	DATE:	RECEIVED BY:	DATE:

CLIENT INFORMATION

REPORT TO PETRO-CANADA

1506 AVENUE SW

CALGARY AB T2P 3E3

ATTENTION: JIM TAYLOR

Phone: 403) 291-5770

Fax: (403) 291-5772

Email: jim.taylor@petro-canada.com

Invoice (SAME)

Project Number: 11011A PO Number:

Ship to: 1313 44 Avenue NE Calgary, Alberta T2E 6L5

Telephone: (403) 291-9897

Fax: (403) 291-0298

Toll Free: 1-800-668-9878

FOR LABORATORY USE ONLY

SAMPLE CONDITION UPON RECEIPT: FROZEN COLD AMBIENT
 OTHER (BREAKAGE, LEAKAGE, ETC.):

NOTE: Quotation #



ENVIRONMENTAL ENGINEERING

CHAIN OF CUSTODY/ANALYTICAL REQUEST FORM

Petro-Canada

Service Requested: Regular Priority Emergency

Account Number: 10364

Sample ID	Sampled By	Date/Time Sampled	Sample Type	RELINQUISHED BY:	DATE:	RECEIVED BY:	DATE:
SP # 2	Tim C.	Mar 10/03	DRINKING WATER (500 ML PLASTIC)		X		
SP # 2	Tim C	Mar 10/03	DRINKING WATER (300 ML STERILIZED)			X	
Kittles							

CLIENT INFORMATION:
REPORTED PERIOD CANADA
150 GAY AVENUE SW

CALGARY AB T2B 3E3
ATTENTION MR. TAYLOR
Phone: (403) 226-7770
Fax: (403) 226-3147
Email: travon@petro-canada.ca

卷之三

卷之三

INVOICE SAME

卷之三

PROJET MURALE

Ship to: 1313 44 Avenue NE Calgary, Alberta T2E 6L5
Telephone: (403) 291-9897
Fax: (403) 291-0298
Toll Free: 1-800-668-9878

FOR LABORATORY USE ONLY

SAMPLE CONDITION UPON RECEIPT: FROZEN _____ COLD _____ AMBIENT _____
OTHER (BREAKAGE, LEAKAGE, ETC.): _____

NOTE: Quotation #

Reference Information

GLOSSARY OF REPORT TERMS

Sur - A surrogate is an organic compound that is similar to the target analyte(s) in chemical composition and behavior but not normally detected in environmental samples. Prior to sample processing, samples are fortified with one or more surrogate compounds.

The reported surrogate recovery value provides a measure of method efficiency. The Laboratory warning units are determined under column heading D.L.

mg/kg (units) - unit of concentration based on mass, parts per million

mg/L (units) - unit of concentration based on volume, parts per million

< - Less than

D.L. - Detection Limit

N/A - Result not available. Refer to qualifier code and definition for explanation

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

UNLESS OTHERWISE STATED, SAMPLES ARE NOT CORRECTED FOR CLIENT FIELD BLANKS.

Although test results are generated under strict QA/QC protocols, any unsigned test reports, faxes, or emails are considered preliminary.

Enviro-Test Laboratories has an extensive QA/QC program where all analytical data reported is analyzed using approved referenced procedures followed by checks and reviews by senior managers and quality assurance personnel. However, since the results are obtained from chemical measurements and thus cannot be guaranteed, Enviro-Test Laboratories assumes no liability for the use or interpretation of the results.

ENVIRO-TEST QC REPORT

Workorder: L101860

Client: PETRO CANADA
PO BOX 2844
CALGARY AB T2P 3E3

Contact: TIM R. TAYLOR

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
OD-CL <u>Water</u>								
Batch	R115339							
WG107221-2	DUP	L101860-1						
Biochemical Oxygen Demand		41	42		mg/L	1.8	7.5	13-MAR-03
L-CL <u>Water</u>								
Batch	R114962							
WG106754-2	DUP	L101845-4						
Chloride (Cl)		2.9	2.9		mg/L	0.34	10	10-MAR-03
WG106754-4	DUP	L101860-2						
Chloride (Cl)		16.7	16.9		mg/L	0.96	10	10-MAR-03
WG106754-1	LCS							
Chloride (Cl)			99		%		92-112	10-MAR-03
WG106754-3	MS	L101845-4						
Chloride (Cl)		98			%		91-107	10-MAR-03
TL-ROUTINE-ICP-CL <u>Water</u>								
Batch	R114740							
WG106606-2	DUP	L101819-1						
Calcium (Ca)		10.1	9.9		mg/L	1.8	10	10-MAR-03
Magnesium (Mg)		4.0	4.0		mg/L	0.66	10	10-MAR-03
Potassium (K)		1.1	1.1		mg/L	2.2	10	10-MAR-03
Sodium (Na)		175	176		mg/L	0.59	10	10-MAR-03
WG106606-4	DUP	L101860-2						
Calcium (Ca)		27.5	27.2		mg/L	1.0	10	10-MAR-03
Magnesium (Mg)		9.3	9.2		mg/L	0.49	10	10-MAR-03
Potassium (K)		2.2	2.1		mg/L	7.3	10	10-MAR-03
Sodium (Na)		10	10		mg/L	1.9	10	10-MAR-03
WG106606-1	LCS							
Calcium (Ca)		106		%			90-110	10-MAR-03
Magnesium (Mg)		102		%			90-110	10-MAR-03
Potassium (K)		102		%			90-110	10-MAR-03
Sodium (Na)		101		%			90-110	10-MAR-03
WG106606-3	MS	L101819-1						
Calcium (Ca)		102		%			90-114	10-MAR-03
Magnesium (Mg)		99		%			93-107	10-MAR-03
Potassium (K)		101		%			90-104	10-MAR-03

ENVIRO-TEST QC REPORT

Workorder: L101860

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<u>TL-ROUTINE-ICP-CL</u>	<u>Water</u>							
Batch R114740								
WG106606-3 MS Sodium (Na)		L101819-1						
			108		%		87-113	10-MAR-03
<u>CC-MF-ED</u>	<u>Water</u>							
Batch R114729								
WG106546-4 DUP MF - Fecal Coliforms		L101860-1						
		800	810		CFU/100mL	0.99		08-MAR-03
WG106546-5 MB MF - Fecal Coliforms				<1			1	08-MAR-03
<u>E-DIS-HIGH-CL</u>	<u>Water</u>							
Batch R114740								
WG106606-2 DUP Iron (Fe)-Dissolved		L101819-1						
		<0.01	<0.01	RPD-NA	mg/L	N/A	7.5	10-MAR-03
WG106606-4 DUP Iron (Fe)-Dissolved		L101860-2						
		0.01	0.03	J	mg/L	0.02	0.031	10-MAR-03
WG106606-1 LCS Iron (Fe)-Dissolved				103	%		90-110	10-MAR-03
WG106606-3 MS Iron (Fe)-Dissolved		L101819-1						
			102		%		98-110	10-MAR-03
<u>DPC-MF-ED</u>	<u>Water</u>							
Batch R114729								
WG106546-1 DUP MF - Heterotrophic Plate Count		L101845-2						
		<1	<1	RPD-NA	CFU/1mL	N/A		08-MAR-03
WG106546-2 DUP MF - Heterotrophic Plate Count		L101845-5						
		<1	<1	RPD-NA	CFU/1mL	N/A		08-MAR-03
WG106546-3 DUP MF - Heterotrophic Plate Count		L101845-8						
		<1	<1	RPD-NA	CFU/1mL	N/A		08-MAR-03
WG106546-4 DUP MF - Heterotrophic Plate Count		L101860-1						
		*T N T C	*T N T C	RPD-NA	CFU/1mL	N/A		08-MAR-03
WG106546-5 MB MF - Heterotrophic Plate Count				<1			1	08-MAR-03
<u>MN-DIS-HIGH-CL</u>	<u>Water</u>							
Batch R114740								
WG106606-2 DUP Manganese(Mn)-Dissolved		L101819-1						
		<0.01	<0.01	RPD-NA	mg/L	N/A	10	10-MAR-03
WG106606-4 DUP Manganese(Mn)-Dissolved		L101860-2						
		0.01	0.01	J	mg/L	0.00	0.031	10-MAR-03
WG106606-1 LCS Manganese(Mn)-Dissolved				102	%		90-110	10-MAR-03
WG106606-3 MS Manganese(Mn)-Dissolved		L101819-1						
			101		%		93-105	10-MAR-03
<u>V2N3-CL</u>	<u>Water</u>							

ENVIRO-TEST QC REPORT

Workorder: L101860

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<u>I2N3-CL</u>	<u>Water</u>							
Batch R114962								
WG106754-2 DUP		L101845-4						
Nitrate+Nitrite-N		0.14	<0.05		RPD-NA	mg/L	N/A	13
WG106754-4 DUP		L101860-2						
Nitrate+Nitrite-N		0.13	0.13	J		mg/L	0.08	0.15
WG106754-1 LCS			100		%		90-106	10-MAR-03
WG106754-3 MS		L101845-4						
Nitrate+Nitrite-N		99			%		93-109	10-MAR-03
<u>I4-CL</u>	<u>Water</u>							
Batch R114864								
WG106732-3 DUP		L101724-1						
Ammonia-N		0.69	0.69			mg/L	0.0	7.5
WG106732-2 LCS			103		%		90-110	11-MAR-03
Ammonia-N								
WG106732-1 MB			<0.05			mg/L		0.05
Ammonia-N								
WG106732-4 MS		L101724-1						
Ammonia-N		98			%		84-108	11-MAR-03
<u>-CL</u>	<u>Water</u>							
Batch R114962								
WG106754-2 DUP		L101845-4						
Nitrite-N		<0.05	<0.05		RPD-NA	mg/L	N/A	13
WG106754-4 DUP		L101860-2						
Nitrite-N		0.05	0.05	J		mg/L	0.00	0.15
WG106754-1 LCS			97		%		91-107	10-MAR-03
Nitrite-N								
WG106754-3 MS		L101845-4						
Nitrite-N		104			%		94-110	10-MAR-03
<u>NO3-IC-CL</u>	<u>Water</u>							
Batch R114962								
WG106754-2 DUP		L101845-4						
Nitrate-N		0.14	<0.05		RPD-NA	mg/L	N/A	13
WG106754-4 DUP		L101860-2						
Nitrate-N		0.08	0.08		RPD-NA	mg/L	N/A	13
WG106754-1 LCS			100		%		90-106	10-MAR-03
Nitrate-N								
WG106754-3 MS		L101845-4						
Nitrate-N		99			%		94-106	10-MAR-03
<u>OGG-ED</u>	<u>Water</u>							

ENVIRO-TEST QC REPORT

Workorder: L101860

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<u>DGG-ED</u>	<u>Water</u>							
Batch	R115093							
WG106900-2	LCS							
Oil and Grease			84		%		79-100	12-MAR-03
WG106900-1	MB							
Oil and Grease			<1		mg/L		1	12-MAR-03
<u>pH/EC/ALK-CL</u>	<u>Water</u>							
Batch	R114939							
WG106801-1	LCS							
Alkalinity, Total (as CaCO ₃)			100		%		95-105	10-MAR-03
Conductivity (EC)			100		%		97-101	10-MAR-03
pH			7.0		pH		6.9-7.1	10-MAR-03
<u>SO4-CL</u>	<u>Water</u>							
Batch	R114962							
WG106754-2	DUP	L101845-4						
Sulphate (SO ₄)		45.1	46.0		mg/L	1.8	10	10-MAR-03
WG106754-4	DUP	L101860-2						
Sulphate (SO ₄)		2.2	2.2	J	mg/L	0.0	1.5	10-MAR-03
WG106754-1	LCS							
Sulphate (SO ₄)			101		%		90-108	10-MAR-03
WG106754-3	MS	L101845-4						
Sulphate (SO ₄)			107		%		90-112	10-MAR-03
<u>SOLIDS-TOTSUS-CL</u>	<u>Water</u>							
Batch	R114772							
WG106626-2	DUP	L101594-1						
Total Suspended Solids		185	185		mg/L	0.0	10	07-MAR-03
WG106626-3	DUP	L101765-1						
Total Suspended Solids		86	78		mg/L	9.8	10	07-MAR-03
WG106626-4	DUP	L101860-2						
Total Suspended Solids		<3	<3	RPD-NA	mg/L	N/A	10	07-MAR-03
WG106626-1	LCS							
Total Suspended Solids			98		%		87-105	07-MAR-03
<u>TCC-MF-ED</u>	<u>Water</u>							
Batch	R114729							
WG106546-4	DUP	L101860-1						
MF - Total Coliforms		*T N T C	*T N T C	RPD-NA	CFU/100mL	N/A		08-MAR-03
WG106546-5	MB							
MF - Total Coliforms			<1		CFU/100mL		1	08-MAR-03

Product - Batch and Sample Number Relations:

BOD-CL	1		
	R115339	L101860-1	
L-CL	1		
	R114962	L101860-1	L101860-2

ENVIRO-TEST QC REPORT

Workorder: L101860

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
Product - Batch and Sample Number Relations:								
ETL-ROUTINE-ICP-CL	1							
	R114740	L101860-1	L101860-2					
FCC-MF-ED	1							
	R114729	L101860-1	L101860-2					
FE-DIS-HIGH-CL	1							
	R114740	L101860-1	L101860-2					
HPC-MF-ED	1							
	R114729	L101860-1	L101860-2					
MN-DIS-HIGH-CL	1							
	R114740	L101860-1	L101860-2					
N2N3-CL	1							
	R114962	L101860-1	L101860-2					
NH4-CL	1							
	R114864	L101860-1						
NO2-CL	1							
	R114962	L101860-1	L101860-2					
NO3-IC-CL	1							
	R114962	L101860-1	L101860-2					
OGG-ED	1							
	R115093	L101860-1						
PAH/EC/ALK-CL	1							
	R114939	L101860-1	L101860-2					
SO4-CL	1							
	R114962	L101860-1	L101860-2					
SOLIDS-TOTSUS-CL	1							
	R114772	L101860-1	L101860-2					
TCC-MF-ED	1							
	R114729	L101860-1	L101860-2					

ENVIRO-TEST QC REPORT

Page 6 of 6

Workorder # L101860

Legend:

Limit	95% Confidence Interval (Laboratory Warning Limits)
DUP	Duplicate
RPD	Relative Percent Difference ((higher result-lower result)/Average, expressed as %)
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Materials
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material

Qualifier:

- RPD-NA Relative Percent Difference Not Available due to result(s) being less than detection limit.
- A Method blank exceeds acceptance limit. Blank correction not applied, unless the qualifier "RAMB" (result adjusted for method blank) appears in the Analytical Report.
- B Method blank result exceeds acceptance limit, however, it is less than 5% of sample concentration.
Blank correction not applied.
- D Duplicate result may exceed limit due to increased variability for low level samples.
- E Matrix spike recovery may fall outside the acceptance limits due to high sample background.
- F Silver recovery low, likely due to elevated chloride levels in sample.
- G Outlier - No assignable cause for nonconformity has been determined.
- H Result falls within the 99% Confidence Interval (Laboratory Control Limits)
- J Duplicate results and limit(s) are expressed in terms of absolute difference.

EnviroFest

A DIVISION OF E&T CHEMSPAC ANALYTICAL LIMITED

CHAIN OF CUSTODY / ANALYTICAL REQUEST FORM

Petro-Canada

Service Requested: _____ Priority Regular Emergency _____

Account Number: 10364

1/101660

T. H. Eg. Box 4

Sammie Tye

AUGUSTA 1861

SAMPLE CONDITION WHEN RECEIVED: Noticed and AMBIENT
OTHER (BREAKAGE, LEAKAGE, ETC.): None

Treatment	Effect (%)
Control	100
100 mg IAA	~110
100 mg IAA + 100 mg GA	~120
100 mg IAA + 100 mg GA + 100 mg CATECHOL	~130
100 mg IAA + 100 mg GA + 100 mg CATECHOL + 100 mg IAA	~140

卷之三

Ship to: 1313 44 Avenue NE Calgary, Alberta T2E 6L1
 Telephone: (403) 291-9891
 Fax: (403) 291-0291
 Toll Free: 1-800-668-9871

CHAIN OF CUSTODY/ANALYTICAL REQUEST FORM

Petro-Canada

Service Requested: Regular Priority Emergency

Account Number: 10364

Sample ID	Sampled By	Date/Time Sampled	Sample Type
1785-2	B.Kirke	Mar 6 8:45	DRINKING WATER (500 ML PLASTIC)
1785-2	B.Kirke	Mar 6 8:45	DRINKING WATER (300 ML STERILIZED)
		RELINQUISHED BY: <i>M. H. L. - EnviroTest</i>	RECEIVED BY: <i>R. J. Marchant</i>
		DATE: TIME:	DATE: TIME:

CLIENT INFORMATION:

REPORT TO: PETRO CANADA
 150 6TH AVENUE S.E.
 CALGARY, AB T2G 0Z2

ATTENTION: *Mr. D. Taylor*
 Phone: (403) 291-9891
 Fax: (403) 291-0291
 Email: *EnviroTest@envirotest.com*

INVOICE # *10364*

FOR LABORATORY USE ONLY

SAMPLE CONDITION UPON RECEIPT: FROZEN COLD AMBIENT
 OTHER (BREAKAGE, LEAKAGE, ETC.):

NOTE: Quotation #

ETL Enviro•Test

A DIVISION OF ETL CHEMSPEC ANALYTICAL LIMITED

ANALYTICAL REPORT

PETRO CANADA
ATTN: TIM R. TAYLOR
PO BOX 2844
CALGARY AB T2P 3E3

DATE: 19-MAR-03

Lab Work Order #: L102268 Sampled By: JIM C Date Received: 12-MAR-03

P.O. #: N/A

Job #: NUNA

Comments:

APPROVED BY: Kelly Jems

for LLOYD W HODGINS

Project Manager

THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE WRITTEN AUTHORITY OF THE LABORATORY.
ANY REMAINING SAMPLES WILL BE DISPOSED OF AFTER 30 DAYS FOLLOWING ANALYSIS. PLEASE CONTACT THE LAB IF YOU
REQUIRE ADDITIONAL SAMPLE STORAGE TIME.

LABORATORY ACCREDITATIONS:

- STANDARDS COUNCIL OF CANADA IN COOPERATION WITH THE CANADIAN ASSOCIATION FOR ENVIRONMENTAL ANALYTICAL LABORATORIES (CAEAL) FOR SPECIFIC TESTS AS REGISTERED BY THE COUNCIL (EDMONTON, CALGARY, GRANDE PRAIRIE, SASKATOON, WINNIPEG, THUNDER BAY, WATERLOO)
- AMERICAN INDUSTRIAL HYGIENE ASSOCIATION (AIHA) IN THE INDUSTRIAL HYGIENE PROGRAM (EDMONTON, WINNIPEG)
- STANDARDS COUNCIL OF CANADA IN COOPERATION WITH THE CANADIAN FOOD INSPECTION AGENCY (CFIA) FOR FERTILIZER AND FEED TESTING (SASKATOON) AND FOR MICROBIOLOGICAL TESTING IN FOOD (WINNIPEG)
- LABORATORY RECOGNITIONS:
- STANDARDS COUNCIL OF CANADA - GLP COMPLIANT FACILITY (EDMONTON, OTTAWA)

Bay 7, 1313 - 44 Avenue N.E., Calgary, Alberta T2E 6L5, Tel. (403) 291-9897, Fax (403) 291-0298

Canada Wide Tel. 1-800-668-9878 www.envirotest.com

(Edmonton, Calgary, Grande Prairie, Saskatoon, Winnipeg, Thunder Bay, Ottawa, Waterloo, Montreal)

ENVIRO-TEST ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier	D.L.	Units	Extracted	Analyzed	By	Batch
L102268-1 SP 1788-1								
Sample Date: 10-MAR-03								
Matrix: WATER								
HPC, Total & Fecal Coliform Count-MF								
MF - Fecal Coliforms	130		1	CFU/100mL		13-MAR-03	S V N	R115368
MF - Heterotrophic Plate Count	53000		1	CFU/1mL		13-MAR-03	S V N	R115368
MF - Total Coliforms	T N T C *		1	CFU/100mL		13-MAR-03	S V N	R115368
Ammonia-N	6.49		0.05	mg/L		13-MAR-03	SIW	R115182
Biochemical Oxygen Demand	12		2	mg/L		17-MAR-03	LHH	R115744
Oil and Grease	1		1	mg/L	14-MAR-03	17-MAR-03	ZOW	R115509
Total Suspended Solids	28		3	mg/L		17-MAR-03	HTT	R115645
Routine Water: Major Ions, Fe & Mn								
Iron (Fe)-Dissolved	0.02		0.01	mg/L		13-MAR-03	WJR	R115159
Chloride (Cl)	183		0.1	mg/L	13-MAR-03	13-MAR-03	LHH	R115158
Manganese(Mn)-Dissolved	<0.01		0.01	mg/L		13-MAR-03	WJR	R115159
Nitrate+Nitrite-N	21.1		0.05	mg/L	13-MAR-03	13-MAR-03	LHH	R115158
Nitrate-N	1.81		0.05	mg/L	13-MAR-03	13-MAR-03	LHH	R115158
Nitrite-N	19.3		0.05	mg/L	13-MAR-03	13-MAR-03	LHH	R115158
Sulphate (SO4)	190		0.5	mg/L	13-MAR-03	13-MAR-03	LHH	R115158
pH, Conductivity and Total Alkalinity								
pH	7.2		0.1	pH		13-MAR-03	HTT	R115127
Conductivity (EC)	1420		3	uS/cm		13-MAR-03	HTT	R115127
Bicarbonate (HCO3)	336		5	mg/L		13-MAR-03	HTT	R115127
Carbonate (CO3)	<5		5	mg/L		13-MAR-03	HTT	R115127
Hydroxide (OH)	<5		5	mg/L		13-MAR-03	HTT	R115127
Alkalinity, Total (as CaCO3)	275		5	mg/L		13-MAR-03	HTT	R115127
Ion Balance Calculation								
Ion Balance	102			%		14-MAR-03		
TDS (Calculated)	1010			mg/L		14-MAR-03		
Hardness (as CaCO3)	100			mg/L		14-MAR-03		
ICP metals for routine water								
Calcium (Ca)	23.1		0.5	mg/L		13-MAR-03	WJR	R115159
Potassium (K)	54.9		0.1	mg/L		13-MAR-03	WJR	R115159
Magnesium (Mg)	10.3		0.1	mg/L		13-MAR-03	WJR	R115159
Sodium (Na)	288		1	mg/L		13-MAR-03	WJR	R115159
L102268-2 SP #2								
Sample Date: 10-MAR-03								
Matrix: WATER								
HPC, Total & Fecal Coliform Count-MF								
MF - Fecal Coliforms	<1		1	CFU/100mL		13-MAR-03	S V N	R115368
MF - Heterotrophic Plate Count	5		1	CFU/1mL		13-MAR-03	S V N	R115368
MF - Total Coliforms	<1		1	CFU/100mL		13-MAR-03	S V N	R115368
Total Suspended Solids	<3		3	mg/L		17-MAR-03	HTT	R115645
Routine Water: Major Ions, Fe & Mn								
Iron (Fe)-Dissolved	0.02		0.01	mg/L		13-MAR-03	WJR	R115159
Chloride (Cl)	17.1		0.1	mg/L		17-MAR-03	LHH	R115661
Manganese(Mn)-Dissolved	0.02		0.01	mg/L		13-MAR-03	WJR	R115159
Nitrate+Nitrite-N	0.15		0.05	mg/L	13-MAR-03	13-MAR-03	LHH	R115158
Nitrate-N	0.10		0.05	mg/L	13-MAR-03	13-MAR-03	LHH	R115158
Nitrite-N	0.05		0.05	mg/L	13-MAR-03	13-MAR-03	LHH	R115158
Sulphate (SO4)	2.2		0.5	mg/L	13-MAR-03	13-MAR-03	LHH	R115158

ENVIRO-TEST ANALYTICAL REPORT

Reference Information

Methods Listed (if applicable):

ETL Test Code	Matrix	Test Description	Preparation Method Reference(Based On)	Analytical Method Reference(Based On)
BOD-CL	Water	Biochemical Oxygen Demand		APHA 5210 B-5 day Incub.-O2 electrode
CL-CL	Water	Chloride (Cl)		APHA 4110 B-Ion Chromatography
ETL-ROUTINE-ICP-CL	Water	ICP metals for routine water		APHA 3120 B-ICP-OES
FCC-MF-ED	Water	Fecal Coliform Count-MF		Standards Methods #9222D
Fecal coliform- Standards Methods for the Examination of Water and Wastewater, Method No. 9222D				
Abbreviations: MF-membrane filtration, CFU-colony forming unit, TNTC-too numerous to count.				
Interpretation of Results:				
SATISFACTORY-When no fecal coliforms are detected.				
UNSATISFACTORY-When fecal coliforms are present indicates pollution of intestinal origin and should not be used for drinking without treatment.				
DOUBTFUL- When fecal coliforms are not detected but coliforms are present may or may not indicate bacteria of intestinal origin. If repeated analyses do not show source of pollution nearby, the water may be considered satisfactory if inspected by Medical Officer of Health or Health Inspector.				
Results for Fecal coliforms are presumptive and have not been confirmed by alternate culture media unless requested.				
FE-DIS-HIGH-CL	Water	Iron (Fe)-Dissolved		APHA 3120 B-ICP-OES
MN-DIS-HIGH-CL	Water	Manganese(Mn)-Dissolve		APHA 3120 B-ICP-OES
N2N3-CL	Water	Nitrate+Nitrite-N		APHA 4110 B-Ion Chromatography
NH4-CL	Water	Ammonia-N		APHA 4500 NH3F-Colorimetry
NO2-CL	Water	Nitrite-N		APHA 4110 B-Ion Chromatography
NO3-IC-CL	Water	Nitrate-N		APHA 4110 B-Ion Chromatography
OGG-ED	Water	Oil and Grease-Gravimetric		APHA 5520 B Hexane MTBE ext. Gravime
PH/EC/ALK-CL	Water	pH, Conductivity and Total Alkalinity		APHA 4500H,2510,2320
SO4-CL	Water	Sulfate (SO4)		APHA 4110 B-Ion Chromatography
SOLIDS-TOTSUS-CL	Water	Total Suspended Solids		APHA 2540 D-Gravimetric
TCC-MF-ED	Water	Total Coliform Count-MF		Standard Methods #9222B

Total coliform-Standard Methods for the Examination of Water and Wastewater, Method 9222B.

Abbreviations: MF-membrane filtration, CFU-colony forming unit, TNTC-too numerous to count.

Interpretation of Results:

SATISFACTORY-When no coliforms are detected.

UNSATISFACTORY-When fecal coliforms are present indicates pollution of intestinal origin and should not be used for drinking without treatment.

DOUBTFUL-When fecal coliforms are not present but other coliforms are present may or may not indicate bacteria of intestinal origin. If repeated analysis do not show source of pollution nearby, the water may be considered satisfactory if inspected by Medical Officer of Health or Health Inspector.

Results are reported as presumptive for Total coliforms and have not been confirmed by an alternate culture media unless requested.

** Laboratory Methods employed follow in-house procedures, which are generally based on nationally or internationally accepted methodologies.

Chain of Custody numbers:

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location	Laboratory Definition Code	Laboratory Location
CL	Enviro-Test Laboratories - Calgary, Alberta, Canada	ED	Enviro-Test Laboratories - Edmonton, Alberta, Canada

Reference Information

GLOSSARY OF REPORT TERMS

Surr - A surrogate is an organic compound that is similar to the target analyte(s) in chemical composition and behavior but not normally detected in environmental samples. Prior to sample processing, samples are fortified with one or more surrogate compounds.

The reported surrogate recovery value provides a measure of method efficiency. The Laboratory warning units are determined under column heading D.L.

mg/Kg (units) - unit of concentration based on mass, parts per million

mg/L (units) - unit of concentration based on volume, parts per million

< - Less than

D.L. - Detection Limit

N/A - Result not available. Refer to qualifier code and definition for explanation

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

UNLESS OTHERWISE STATED, SAMPLES ARE NOT CORRECTED FOR CLIENT FIELD BLANKS.

Although test results are generated under strict QA/QC protocols, any unsigned test reports, faxes, or emails are considered preliminary.

Enviro-Test Laboratories has an extensive QA/QC program where all analytical data reported is analyzed using approved referenced procedures followed by checks and reviews by senior managers and quality assurance personnel. However, since the results are obtained from chemical measurements and thus cannot be guaranteed, Enviro-Test Laboratories assumes no liability for the use or interpretation of the results.

ENVIRO-TEST QC REPORT

Workorder: L102268

Client: PETRO CANADA
PO BOX 2844
CALGARY AB T2P 3E3

Contact: TIM R. TAYLOR

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<u>OD-CL</u> <u>Water</u>								
Batch	R115744							
WG107681-1 LCS								
Biochemical Oxygen Demand			105		%		85-107	17-MAR-03
<u>I-Cl</u> <u>Water</u>								
Batch	R115158							
WG107036-2 DUP		L102243-1						
Chloride (Cl)			26.1	26.0	mg/L	0.050	10	13-MAR-03
WG107036-4 DUP		L102283-3						
Chloride (Cl)			72.4	71.9	mg/L	0.62	10	13-MAR-03
WG107036-5 DUP		L102324-1						
Chloride (Cl)			49.5	49.5	mg/L	0.052	10	13-MAR-03
WG107036-6 DUP		L102329-1						
Chloride (Cl)			15.5	15.9	mg/L	2.9	10	13-MAR-03
G107036-1 LCS								
Chloride (Cl)				99	%		92-112	13-MAR-03
WG107036-3 MS		L102243-1						
Chloride (Cl)				99	%		91-107	13-MAR-03
<u>ETL-ROUTINE-ICP-CL</u> <u>Water</u>								
Batch	R115159							
WG107034-2 DUP		L102243-1						
Calcium (Ca)			56.0	55.3	mg/L	1.2	10	13-MAR-03
Magnesium (Mg)			17.0	16.9	mg/L	0.42	10	13-MAR-03
Potassium (K)			2.0	2.1	mg/L	2.3	10	13-MAR-03
Sodium (Na)			26	25	mg/L	1.2	10	13-MAR-03
WG107034-1 LCS								
Calcium (Ca)				104	%		90-110	13-MAR-03
Magnesium (Mg)				99	%		90-110	13-MAR-03
Potassium (K)				100	%		90-110	13-MAR-03
Sodium (Na)				99	%		90-110	13-MAR-03
WG107034-3 MS		L102243-1						
Calcium (Ca)				101	%		90-114	13-MAR-03
Magnesium (Mg)				100	%		93-107	13-MAR-03
Potassium (K)				103	%		90-104	13-MAR-03
Sodium (Na)				100	%		87-113	13-MAR-03

ENVIRO-TEST QC REPORT

Workorder: L102268

test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
TL-ROUTINE-ICP-CL	Water							
Batch	R115558							
WG107451-2	DUP	L102433-1						
Calcium (Ca)		96.6	98.5		mg/L	1.8	10	17-MAR-03
Magnesium (Mg)		127	128		mg/L	1.3	10	17-MAR-03
Potassium (K)		155	159		mg/L	2.4	10	17-MAR-03
Sodium (Na)		46	47		mg/L	2.1	10	17-MAR-03
WG107451-1	LCS							
Calcium (Ca)			103		%		90-110	17-MAR-03
Magnesium (Mg)			99		%		90-110	17-MAR-03
Potassium (K)			100		%		90-110	17-MAR-03
Sodium (Na)			98		%		90-110	17-MAR-03
WG107451-3	MS	L102433-1						
Calcium (Ca)			104		%		90-114	17-MAR-03
Magnesium (Mg)			94		%		93-107	17-MAR-03
Potassium (K)			96		%		90-104	17-MAR-03
Sodium (Na)			96		%		87-113	17-MAR-03
CC-MF-ED	Water							
Batch	R115368							
WG107189-1	MB							
MF - Fecal Coliforms			<1		CFU/100mL		1	13-MAR-03
WG107189-4	MB							
MF - Fecal Coliforms			<1		CFU/100mL		1	13-MAR-03
FE-DIS-HIGH-CL	Water							
Batch	R115159							
WG107034-2	DUP	L102243-1						
Iron (Fe)-Dissolved		<0.01	<0.01	RPD-NA	mg/L	N/A	7.5	13-MAR-03
WG107034-1	LCS							
Iron (Fe)-Dissolved			101		%		90-110	13-MAR-03
WG107034-3	MS	L102243-1						
Iron (Fe)-Dissolved			102		%		98-110	13-MAR-03
HPC-MF-ED	Water							
Batch	R115368							
WG107189-2	DUP	L102112-1						
MF - Heterotrophic Plate Count		<1	<1	RPD-NA	CFU/1mL	N/A		13-MAR-03
WG107189-4	MB							
MF - Heterotrophic Plate Count			<1		CFU/1mL		1	13-MAR-03
MN-DIS-HIGH-CL	Water							
Batch	R115159							
WG107034-2	DUP	L102243-1						
Manganese(Mn)-Dissolved		<0.01	<0.01	RPD-NA	mg/L	N/A	10	13-MAR-03
WG107034-1	LCS							

ENVIRO-TEST QC REPORT

Workorder: L102268

ENVIRO-TEST QC REPORT

Workorder: L102268

ENVIRO-TEST QC REPORT

Workorder: L102268

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
O4-CL <u>Water</u>								
Batch	R115158							
WG107036-2	DUP	L102243-1						
Sulphate (SO4)		60.2	60.2		mg/L	0.018	10	13-MAR-03
WG107036-4	DUP	L102283-3						
Sulphate (SO4)		63.4	62.9		mg/L	0.82	10	13-MAR-03
WG107036-6	DUP	L102329-1						
Sulphate (SO4)		71.9	74.1		mg/L	3.0	10	13-MAR-03
WG107036-1	LCS							
Sulphate (SO4)			102		%		90-108	13-MAR-03
WG107036-3	MS	L102243-1						
Sulphate (SO4)			104		%		90-112	13-MAR-03
OLIDS-TOTSUS-CL <u>Water</u>								
Batch	R115645							
WG107559-2	DUP	L102487-1						
Total Suspended Solids		35	38		mg/L	6.9	10	17-MAR-03
WG107559-3	DUP	L102506-1						
Total Suspended Solids		555	540		mg/L	2.7	10	17-MAR-03
WG107559-4	DUP	L102507-1						
Total Suspended Solids		120	117		mg/L	2.8	10	17-MAR-03
WG107559-1	LCS							
Total Suspended Solids			90		%		87-105	17-MAR-03
CC-MF-ED <u>Water</u>								
Batch	R115368							
WG107189-1	MB							
MF - Total Coliforms		<1			CFU/100mL		1	13-MAR-03
WG107189-4	MB							
MF - Total Coliforms		<1			CFU/100mL		1	13-MAR-03

Product - Batch and Sample Number Relations:

BOD-CL	1	
	R115744	L102268-1
CL-CL	1	
	R115158	L102268-1
CL-CL	1	
	R115661	L102268-2
ETL-ROUTINE-ICP-CL	1	
	R115159	L102268-1
ETL-ROUTINE-ICP-CL	1	
	R115558	L102268-2
FCC-MF-ED	1	
	R115368	L102268-1
FE-DIS-HIGH-CL	1	
	R115159	L102268-1
		L102268-2

ENVIRO-TEST QC REPORT

Workorder: L102268

test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
Product - Batch and Sample Number Relations:								
HPC-MF-ED	1							
	R115368	L102268-1	L102268-2					
VIN-DIS-HIGH-CL	1							
	R115159	L102268-1	L102268-2					
N2N3-CL	1							
	R115158	L102268-1	L102268-2					
NH4-CL	1							
	R115182	L102268-1						
NO2-CL	1							
	R115158	L102268-1	L102268-2					
NO3-IC-CL	1							
	R115158	L102268-1	L102268-2					
OGG-ED	1							
	R115509	L102268-1						
PH/EC/ALK-CL	1							
	R115127	L102268-1	L102268-2					
SO4-CL	1							
	R115158	L102268-1	L102268-2					
SOLIDS-TOTSUS-CL	1							
	R115645	L102268-1	L102268-2					
TCC-MF-ED	1							
	R115368	L102268-1	L102268-2					

ENVIRO-TEST QC REPORT

Page 7 of 7

Workorder # L102268

Legend:

Limit	95% Confidence Interval (Laboratory Warning Limits)
DUP	Duplicate
RPD	Relative Percent Difference ((higher result-lower result)/Average, expressed as %)
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Materials
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material

Qualifier:

RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.
A	Method blank exceeds acceptance limit. Blank correction not applied, unless the qualifier "RAMB" (result adjusted for method blank) appears in the Analytical Report.
B	Method blank result exceeds acceptance limit, however, it is less than 5% of sample concentration. Blank correction not applied.
D	Duplicate result may exceed limit due to increased variability for low level samples.
E	Matrix spike recovery may fall outside the acceptance limits due to high sample background.
F	Silver recovery low, likely due to elevated choride levels in sample.
G	Outlier - No assignable cause for nonconformity has been determined.
H	Result falls within the 99% Confidence Interval (Laboratory Control Limits)
J	Duplicate results and limit(s) are expressed in terms of absolute difference.



Environ Monit Assess

A DIVISION OF FLUOROCHEMISPEC ANALYTICAL LIMITED

CHAIN OF CUSTODY / ANALYTICAL REQUEST FORM

Petro-Canada

Service Requested: Regular Priority Emergency

Account Number: 10364

Sample ID	Sampled By	Date/Time Sampled	Sample Type	RELINQUISHED BY:	DATE:	RECEIVED BY:	DATE:
SP 1788-1	Tim C	Mar 10/03	SEWAGE (1 L PLASTIC)	X			
SP 1788-1	Tim C	Mar 10/03	SEWAGE (500 ML PLASTIC)		X		
SP 1788-1	Tim C	Mar 10/03	SEWAGE (300 ML STERILIZED)		X		
SP 1788-1	Tim C	Mar 10/03	SEWAGE (500 ML PLASTIC PURPLE PRESERVATIVE)		X		
SP 1788-1	Tim C	Mar 10/03	SEWAGE (1 L AMBER GLASS YELLOW PRESERVATIVE)		X		
SP 1788-1	Tim C	Mar 10/03	INLET SEWAGE (OPTIONAL 1 L PLASTIC)	X			
Filter Box							

CLIENT INFORMATION
REPORT NO. PETRO-CANAL

1516 AVENUE SW
CALGARY AB T2P 3E3

ATTENTION: TIM R. TAYLOR

Phone: (403) 296-7770

Toll Free: (800) 253-5747
Email: info@petro-canada.com
www.petro-canada.com

EOR LABORATORY USE ONLY

SAMPLE CONDITION UPON RECEIPT: FROZEN _____ COLD _____ AMBIENT _____

NOTE: Question #

ENVIRO-TEST ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier	D.L.	Units	Extracted	Analyzed	By	Batch
L101860-2 1788-2								
Sample Date: 06-MAR-03 08:45								
Matrix: WATER								
Routine Water: Major Ions, Fe & Mn								
pH, Conductivity and Total Alkalinity								
pH	7.3		0.1	pH		10-MAR-03	HTT	R114939
Conductivity (EC)	238		3	uS/cm		10-MAR-03	HTT	R114939
Bicarbonate (HCO3)	117		5	mg/L		10-MAR-03	HTT	R114939
Carbonate (CO3)	<5		5	mg/L		10-MAR-03	HTT	R114939
Hydroxide (OH)	<5		5	mg/L		10-MAR-03	HTT	R114939
Alkalinity, Total (as CaCO3)	96		5	mg/L		10-MAR-03	HTT	R114939
Ion Balance Calculation								
Ion Balance	108			%		11-MAR-03		
TDS (Calculated)	126			mg/L		11-MAR-03		
Hardness (as CaCO3)	107			mg/L		11-MAR-03		
ICP metals for routine water								
Calcium (Ca)	27.5		0.5	mg/L		10-MAR-03	WJR	R114740
Potassium (K)	2.2		0.1	mg/L		10-MAR-03	WJR	R114740
Magnesium (Mg)	9.3		0.1	mg/L		10-MAR-03	WJR	R114740
Sodium (Na)	10		1	mg/L		10-MAR-03	WJR	R114740

Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

Methods Listed (if applicable):

ETL Test Code	Matrix	Test Description	Preparation Method Reference(Based On)	Analytical Method Reference(Based On)
BOD-CL	Water	Biochemical Oxygen Demand		APHA 5210 B-5 day Incub.-O2 electro
CL-CL	Water	Chloride (Cl)		APHA 4110 B-Ion Chromatography
ETL-ROUTINE-ICP-CL	Water	ICP metals for routine water		APHA 3120 B-ICP-OES
FCC-MF-ED	Water	Fecal Coliform Count-MF		Standards Methods #9222D
Fecal coliform- Standards Methods for the Examination of Water and Wastewater, Method No. 9222D				
Abbreviations: MF-membrane filtration, CFU-colony forming unit, TNTC-too numerous to count.				
Interpretation of Results:				
SATISFACTORY-When no fecal coliforms are detected.				
UNSATISFACTORY-When fecal coliforms are present indicates pollution of intestinal origin and should not be used for drinking without treatment.				
DOUBTFUL- When fecal coliforms are not detected but coliforms are present may or may not indicate bacteria of intestinal origin. If repeated analyses do not show source of pollution nearby, the water may be considered satisfactory if inspected by Medical Officer of Health or Health Inspector.				
Results for Fecal coliforms are presumptive and have not been confirmed by alternate culture media unless requested.				
FE-DIS-HIGH-CL	Water	Iron (Fe)-Dissolved		APHA 3120 B-ICP-OES
MN-DIS-HIGH-CL	Water	Manganese(Mn)-Dissolve		APHA 3120 B-ICP-OES
N2N3-CL	Water	Nitrate+Nitrite-N		APHA 4110 B-Ion Chromatography
NH4-CL	Water	Ammonia-N		APHA 4500 NH3F-Colorimetry
NO2-CL	Water	Nitrite-N		APHA 4110 B-Ion Chromatography
NO3-IC-CL	Water	Nitrate-N		APHA 4110 B-Ion Chromatography
OGG-ED	Water	Oil and Grease-Gravimetric		APHA 5520 B Hexane MTBE ext. Gravime
PH/EC/ALK-CL	Water	pH, Conductivity and Total Alkalinity		APHA 4500H,2510,2320
SO4-CL	Water	Sulfate (SO4)		APHA 4110 B-Ion Chromatography
SOLIDS-TOTSUS-CL	Water	Total Suspended Solids		APHA 2540 D-Gravimetric
TCC-MF-ED	Water	Total Coliform Count-MF		Standard Methods #9222B

Total coliform-Standard Methods for the Examination of Water and Wastewater, Method 9222B.

Abbreviations: MF-membrane filtration, CFU-colony forming unit, TNTC-too numerous to count.

Interpretation of Results:

SATISFACTORY-When no coliforms are detected.

UNSATISFACTORY-When fecal coliforms are present indicates pollution of intestinal origin and should not be used for drinking without treatment.

DOUBTFUL- When fecal coliforms are not present but other coliforms are present may or may not indicate bacteria of intestinal origin. If repeated analysis do not show source of pollution nearby, the water may be considered satisfactory if inspected by Medical Officer of Health or Health Inspector.

Results are reported as presumptive for Total coliforms and have not been confirmed by an alternate culture media unless requested.

** Laboratory Methods employed follow in-house procedures, which are generally based on nationally or internationally accepted methodologies.

Chain of Custody numbers:

L101860

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location	Laboratory Definition Code	Laboratory Location
CL	Enviro-Test Laboratories - Calgary, Alberta, Canada		Enviro-Test Laboratories - Edmonton, Alberta, Canada

ENVIRO-TEST QC REPORT

Workorder: L104341

Client: PETRO CANADA
150 6TH AVE SW
CALGARY AB T2P 3E3

Contact: TIM R. TAYLOR

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
BOD-ED <u>Water</u>								
Batch	R117523							
WG109581-3	DUP	L104341-1						
Biochemical Oxygen Demand		40	42		mg/L	4.9	14	28-MAR-03
WG109581-2	LCS							
Biochemical Oxygen Demand			95		%		85-114	28-MAR-03
WG109581-1	MB							
Biochemical Oxygen Demand			<2		mg/L		2	28-MAR-03
CL-ED <u>Water</u>								
Batch	R117038							
WG109129-2	LCS							
Chloride (Cl)			101		%		94-107	31-MAR-03
WG109129-3	LCS							
Chloride (Cl)			102		%		94-107	31-MAR-03
WG109129-1	MB							
Chloride (Cl)			<1		mg/L		1	31-MAR-03
WG109129-4	MS	L104238-4						
Chloride (Cl)		114	G		%		96-108	31-MAR-03
WG109129-5	MSD	WG109129-4						
Chloride (Cl)			112.84		%	0.79	5	31-MAR-03
ETL-ROUTINE-ICP-ED <u>Water</u>								
Batch	R117091							
WG109137-2	CRM							
Calcium (Ca)			97		%		89-111	31-MAR-03
Magnesium (Mg)			99		%		89-111	31-MAR-03
Potassium (K)			96		%		84-116	31-MAR-03
Sodium (Na)			96		%		89-111	31-MAR-03
Sulfate (SO4)			103		%		90-110	31-MAR-03
WG109137-3	DUP	L104342-1						
Calcium (Ca)		30.3	28.7		mg/L	0.87	6.1	31-MAR-03
Magnesium (Mg)		11.8	11.2		mg/L	0.71	6.1	31-MAR-03
Potassium (K)		45.3	40.5		mg/L	1.0	18	31-MAR-03
Sodium (Na)		273	261		mg/L	0.46	5.9	31-MAR-03
Sulfate (SO4)		224	241		mg/L	2.1	6.1	31-MAR-03
WG109137-1	MB							
Calcium (Ca)			<0.5		mg/L		2.5	31-MAR-03
Magnesium (Mg)			<0.1		mg/L		0.5	31-MAR-03
Potassium (K)			<0.1		mg/L		0.5	31-MAR-03

ENVIRO-TEST QC REPORT

Workorder: L104341

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<u>TL-ROUTINE-ICP-ED</u>	<u>Water</u>							
Batch	R117091							
WG109137-1	MB							
Sodium (Na)			<1		mg/L		5	31-MAR-03
Sulfate (SO4)			<0.5		mg/L		2.5	31-MAR-03
WG109137-4	MS	L104342-1						
Calcium (Ca)			100		%		82-114	31-MAR-03
Magnesium (Mg)			102		%		88-111	31-MAR-03
Potassium (K)			94		%		87-122	31-MAR-03
Sodium (Na)			110		%		85-116	31-MAR-03
Sulfate (SO4)			105		%		87-117	31-MAR-03
<u>CC-MF-ED</u>	<u>Water</u>							
Batch	R117040							
WG109130-1	DUP	L104341-1						
MF - Fecal Coliforms			140		CFU/100mL	15		29-MAR-03
WG109130-3	DUP	L104342-1						
MF - Fecal Coliforms			580		CFU/100mL	6.0		29-MAR-03
WG109130-2	MB							
MF - Fecal Coliforms			<1		CFU/100mL		1	29-MAR-03
WG109130-4	MB							
MF - Fecal Coliforms			<1		CFU/100mL		1	29-MAR-03
<u>FE-EXT-HIGH-ED</u>	<u>Water</u>							
Batch	R117276							
WG109319-6	DUP	L104514-1						
Iron (Fe)-Extractable			<0.06		RPD-NA	mg/L	N/A	01-APR-03
WG109319-1	MB							
Iron (Fe)-Extractable			<0.06		mg/L		0.3	01-APR-03
WG109319-7	MS	L104514-1						
Iron (Fe)-Extractable			98		%		86-108	01-APR-03
<u>IPC-MF-ED</u>	<u>Water</u>							
Batch	R117040							
WG109130-4	MB							
MF - Heterotrophic Plate Count			<1		CFU/1mL		1	29-MAR-03
<u>MN-EXT-HIGH-ED</u>	<u>Water</u>							
Batch	R117276							
WG109319-6	DUP	L104514-1						
Manganese(Mn)-Extractable			<0.02		RPD-NA	mg/L	N/A	01-APR-03
WG109319-1	MB							
Manganese(Mn)-Extractable			<0.02		mg/L		0.1	01-APR-03
WG109319-7	MS	L104514-1						
Manganese(Mn)-Extractable			100		%		87-107	01-APR-03
<u>I2N3-ED</u>	<u>Water</u>							

ENVIRO-TEST ANALYTICAL REPORT

Sample Details/Parameters	Method	Result	Qualifier	SD/L	Units	Extracted	Analyzed	By	Batch
L104341-2 S.P. #2									
Sample Date: 27-MAR-03									
Matrix: WATER									
Routine Water: Major Ions, Fe & Mn									
pH, Conductivity and Total Alkalinity									
Hydroxide (OH)		<5		5	mg/L		05-APR-03	PTT	R117858
Alkalinity, Total (as CaCO ₃)		100		5	mg/L		05-APR-03	PTT	R117858
Ion Balance Calculation									
Ion Balance		102			%		07-APR-03		
TDS (Calculated)		128			mg/L		07-APR-03		
Hardness (as CaCO ₃)		105			mg/L		07-APR-03		
ICP metals and SO ₄ for routine water									
Calcium (Ca)		27.3		0.5	mg/L		31-MAR-03	JTV	R117091
Potassium (K)		2.0		0.1	mg/L		31-MAR-03	JTV	R117091
Magnesium (Mg)		9.0		0.1	mg/L		31-MAR-03	JTV	R117091
Sodium (Na)		10		1	mg/L		31-MAR-03	JTV	R117091
Sulfate (SO ₄)		3.9		0.5	mg/L		31-MAR-03	JTV	R117091
Refer to Referenced Information for Qualifiers (if any) and Methodology.									

Reference Information

Methods Listed (if applicable):

ETL Test Code	Matrix	Test Description	Preparation Method Reference(Based On)	Analytical Method Reference(Based On)
BOD-ED	Water	Biochemical Oxygen Demand (BOD)		APHA 5210 B-5 day Incub.-O2 electrode
CL-ED	Water	Chloride (Cl)		APHA 4500 Cl E-Colorimetry
ETL-ROUTINE-ICP-ED	Water	ICP metals and SO4 for routine water		APHA 3120 B-ICP-OES
FCC-MF-ED	Water	Fecal Coliform Count-MF		Standards Methods #9222D
		Fecal coliform- Standards Methods for the Examination of Water and Wastewater, Method No. 9222D Abbreviations: MF-membrane filtration, CFU-colony forming unit, TNTC-too numerous to count. Interpretation of Results: SATISFACTORY-When no fecal coliforms are detected. UNSATISFACTORY-When fecal coliforms are present indicates pollution of intestinal origin and should not be used for drinking without treatment. DOUBTFUL- When fecal coliforms are not detected but coliforms are present may or may not indicate bacteria of intestinal origin. If repeated analyses do not show source of pollution nearby, the water may be considered satisfactory if inspected by Medical Officer of Health or Health Inspector. Results for Fecal coliforms are presumptive and have not been confirmed by alternate culture media unless requested.		
FE-EXT-HIGH-ED	Water	Iron (Fe)-Extractable		EPA 200.7
MN-EXT-HIGH-ED	Water	Manganese(Mn)-Extractable		EPA 200.7
N2N3-ED	Water	Nitrate+Nitrite-N		APHA 4500 NO3H-Colorimetry
NH4-ED	Water	Ammonia-N		APHA4500NH3F Colorimetry
NO2-ED	Water	Nitrite-N		APHA 4500 NO2B-Colorimetry
NO3-ED	Water	Nitrate-N		APHA 4500 NO3H-Colorimetry
OGG-ED	Water	Oil and Grease-Gravimetric		APHA 5520 B Hexane MTBE ext. Gravime
PH/EC/ALK-ED	Water	pH, Conductivity and Total Alkalinity		APHA 4500-H, 2510, 2320
SOLIDS-TOTSUS-ED	Water	Total Suspended Solids		APHA 2540 D-Gravimetric
TCC-MF-ED	Water	Total Coliform Count-MF		Standard Methods #9222B

Total coliform-Standard Methods for the Examination of Water and Wastewater, Method 9222B.

Abbreviations: MF-membrane filtration, CFU-colony forming unit, TNTC-too numerous to count.

Interpretation of Results:

SATISFACTORY-When no coliforms are detected.

UNSATISFACTORY-When fecal coliforms are present indicates pollution of intestinal origin and should not be used for drinking without treatment.

DOUBTFUL-When fecal coliforms are not present but other coliforms are present may or may not indicate bacteria of intestinal origin. If repeated analysis do not show source of pollution nearby, the water may be considered satisfactory if inspected by Medical Officer of Health or Health Inspector.

Results are reported as presumptive for Total coliforms and have not been confirmed by an alternate culture media unless requested.

** Laboratory Methods employed follow in-house procedures, which are generally based on nationally or internationally accepted methodologies.

Chain of Custody numbers:

L104341

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location	Laboratory Definition Code	Laboratory Location
ED	Enviro-Test Laboratories - Edmonton, Alberta, Canada		

ETL Enviro•Test

A DIVISION OF ETL CHEMSPEC ANALYTICAL LIMITED

ANALYTICAL REPORT

PETRO CANADA
ATTN: TIM R. TAYLOR
PO BOX 2844
CALGARY AB T2P 3E3

DATE: 14-MAR-03

Lab Work Order #: L101860 Sampled By: R. KRINKE Date Received: 07-MAR-03
P.O. #: N/A
Job #: NUNA

Comments: NOTE: * T N T C = Too Numerous To Count.

APPROVED BY: Kelly Jens
for LLOYD W HODGINS
Project Manager

THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE WRITTEN AUTHORITY OF THE LABORATORY.
ANY REMAINING SAMPLES WILL BE DISPOSED OF AFTER 30 DAYS FOLLOWING ANALYSIS. PLEASE CONTACT THE LAB IF YOU
REQUIRE ADDITIONAL SAMPLE STORAGE TIME.

LABORATORY ACCREDITATIONS:

- STANDARDS COUNCIL OF CANADA IN COOPERATION WITH THE CANADIAN ASSOCIATION FOR ENVIRONMENTAL ANALYTICAL LABORATORIES (CAEAL) FOR SPECIFIC TESTS AS REGISTERED BY THE COUNCIL (EDMONTON, CALGARY, GRANDE PRAIRIE, SASKATOON, WINNIPEG, THUNDER BAY, WATERLOO)
 - AMERICAN INDUSTRIAL HYGIENE ASSOCIATION (AIHA) IN THE INDUSTRIAL HYGIENE PROGRAM (EDMONTON, WINNIPEG)
 - STANDARDS COUNCIL OF CANADA IN COOPERATION WITH THE CANADIAN FOOD INSPECTION AGENCY (CFIA) FOR FERTILIZER AND FEED TESTING (SASKATOON) AND FOR MICROBIOLOGICAL TESTING IN FOOD (WINNIPEG)
- LABORATORY RECOGNITIONS:
- STANDARDS COUNCIL OF CANADA - GLP COMPLIANT FACILITY (EDMONTON, OTTAWA)

Bay 7, 1313 - 44 Avenue N.E., Calgary, Alberta T2E 6L5, Tel. (403) 291-9897, Fax (403) 291-0298
Canada Wide Tel. 1-800-668-9878 www.envirotest.com

(Edmonton, Calgary, Grande Prairie, Saskatoon, Winnipeg, Thunder Bay, Ottawa, Waterloo, Montreal)

ENVIRO-TEST ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier	D.L.	Units	Extracted	Analyzed	By	Batch
L101860-1 1788-1								
Sample Date: 06-MAR-03 08:57								
Matrix: WATER								
HPC, Total & Fecal Coliform Count-MF								
MF - Fecal Coliforms	800		1	CFU/100mL		08-MAR-03	S V N	R114729
MF - Heterotrophic Plate Count	*T N T C		1	CFU/1mL		08-MAR-03	S V N	R114729
MF - Total Coliforms	*T N T C		1	CFU/100mL		08-MAR-03	S V N	R114729
Ammonia-N	8.92		0.05	mg/L		11-MAR-03	SIW	R114864
Biochemical Oxygen Demand	41		2	mg/L		13-MAR-03	DN/HT	R115339
Oil and Grease	<1		1	mg/L		12-MAR-03	ZOW	R115093
Total Suspended Solids	29		3	mg/L		07-MAR-03	HTT	R114772
Routine Water: Major Ions, Fe & Mn								
Iron (Fe)-Dissolved	0.04		0.01	mg/L		10-MAR-03	WJR	R114740
Chloride (Cl)	256		0.1	mg/L	10-MAR-03	10-MAR-03	LHH	R114962
Manganese(Mn)-Dissolved	<0.01		0.01	mg/L		10-MAR-03	WJR	R114740
Nitrate+Nitrite-N	12.5		0.05	mg/L	10-MAR-03	10-MAR-03	LHH	R114962
Nitrate-N	2.71		0.05	mg/L	10-MAR-03	10-MAR-03	LHH	R114962
Nitrite-N	9.82		0.05	mg/L	10-MAR-03	10-MAR-03	LHH	R114962
Sulphate (SO4)	132		0.5	mg/L	10-MAR-03	10-MAR-03	LHH	R114962
pH, Conductivity and Total Alkalinity								
pH	7.5		0.1	pH		10-MAR-03	HTT	R114939
Conductivity (EC)	1740		3	uS/cm		10-MAR-03	HTT	R114939
Bicarbonate (HCO3)	355		5	mg/L		10-MAR-03	HTT	R114939
Carbonate (CO3)	<5		5	mg/L		10-MAR-03	HTT	R114939
Hydroxide (OH)	<5		5	mg/L		10-MAR-03	HTT	R114939
Alkalinity, Total (as CaCO3)	291		5	mg/L		10-MAR-03	HTT	R114939
Ion Balance Calculation								
Ion Balance	101			%		11-MAR-03		
TDS (Calculated)	1010			mg/L		11-MAR-03		
Hardness (as CaCO3)	107			mg/L		11-MAR-03		
ICP metals for routine water								
Calcium (Ca)	25.7		0.5	mg/L		10-MAR-03	WJR	R114740
Potassium (K)	80.6		0.1	mg/L		10-MAR-03	WJR	R114740
Magnesium (Mg)	10.5		0.1	mg/L		10-MAR-03	WJR	R114740
Sodium (Na)	275		1	mg/L		10-MAR-03	WJR	R114740
L101860-2 1788-2								
Sample Date: 06-MAR-03 08:45								
Matrix: WATER								
HPC, Total & Fecal Coliform Count-MF								
MF - Fecal Coliforms	<1		1	CFU/100mL		08-MAR-03	S V N	R114729
MF - Heterotrophic Plate Count	82		1	CFU/1mL		08-MAR-03	S V N	R114729
MF - Total Coliforms	<1		1	CFU/100mL		08-MAR-03	S V N	R114729
Total Suspended Solids	<3		3	mg/L		07-MAR-03	HTT	R114772
Routine Water: Major Ions, Fe & Mn								
Iron (Fe)-Dissolved	0.01		0.01	mg/L		10-MAR-03	WJR	R114740
Chloride (Cl)	16.7		0.1	mg/L	10-MAR-03	10-MAR-03	LHH	R114962
Manganese(Mn)-Dissolved	0.01		0.01	mg/L		10-MAR-03	WJR	R114740
Nitrate+Nitrite-N	0.13		0.05	mg/L		10-MAR-03	LHH	R114962
Nitrate-N	0.08		0.05	mg/L		10-MAR-03	LHH	R114962
Nitrite-N	0.05		0.05	mg/L	10-MAR-03	10-MAR-03	LHH	R114962
Sulphate (SO4)	2.2		0.5	mg/L	10-MAR-03	10-MAR-03	LHH	R114962

Reference Information

GLOSSARY OF REPORT TERMS

Surr - A surrogate is an organic compound that is similar to the target analyte(s) in chemical composition and behavior but not normally detected in environmental samples. Prior to sample processing, samples are fortified with one or more surrogate compounds. The reported surrogate recovery value provides a measure of method efficiency. The Laboratory warning units are determined under column heading D.L.

mg/kg (units) - unit of concentration based on mass, parts per million

mg/L (units) - unit of concentration based on volume, parts per million

< - Less than

D.L. - Detection Limit

N/A - Result not available. Refer to qualifier code and definition for explanation

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

UNLESS OTHERWISE STATED, SAMPLES ARE NOT CORRECTED FOR CLIENT FIELD BLANKS.

Although test results are generated under strict QA/QC protocols, any unsigned test reports, faxes, or emails are considered preliminary.

Enviro-Test Laboratories has an extensive QA/QC program where all analytical data reported is analyzed using approved referenced procedures followed by checks and reviews by senior managers and quality assurance personnel. However, since the results are obtained from chemical measurements and thus cannot be guaranteed, Enviro-Test Laboratories assumes no liability for the use or interpretation of the results.

ENVIRO-TEST QC REPORT

Workorder: L104341

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
I_N3-ED	<u>Water</u>							
Batch	R117090							
WG109171-2	LCS							
Nitrate+Nitrite-N			97		%		91-104	31-MAR-03
WG109171-1	MB							
Nitrate+Nitrite-N			<0.1		mg/L		0.1	31-MAR-03
WG109171-4	MS	L104300-1						
Nitrate+Nitrite-N			99		%		90-108	31-MAR-03
WG109171-5	MSD	WG109171-4						
Nitrate+Nitrite-N			99.2		%	0.10	5	31-MAR-03
I_H4-ED	<u>Water</u>							
Batch	R117588							
WG109675-2	LCS							
Ammonia-N			100		%		89-116	03-APR-03
WG109675-1	MB							
Ammonia-N			<0.05		mg/L		0.05	03-APR-03
WG109675-4	MS	L104806-2						
Ammonia-N			125		%		65-132	03-APR-03
I_O2-ED	<u>Water</u>							
Batch	R117090							
WG109171-3	LCS							
Nitrite-N			100		%		94-108	31-MAR-03
WG109171-6	MS	L104341-1						
Nitrite-N			101		%		95-107	31-MAR-03
WG109171-7	MSD	WG109171-6						
Nitrite-N			102.3		%	1.1	5	31-MAR-03
DGG-ED	<u>Water</u>							
Batch	R117626							
WG109663-2	LCS							
Oil and Grease			88		%		79-100	03-APR-03
WG109663-1	MB							
Oil and Grease			<1		mg/L		1	03-APR-03
PH/EC/ALK-ED	<u>Water</u>							
Batch	R117858							
WG109973-10	DUP	L104059-2						
Alkalinity, Total (as CaCO ₃)		222	221		mg/L	0.26	5	05-APR-03
Bicarbonate (HCO ₃)		271	270		mg/L	0.26	20	05-APR-03
Carbonate (CO ₃)		<5	<5	RPD-NA	mg/L	N/A	20	05-APR-03
Conductivity (EC)		538	539		μS/cm	0.19	5.5	05-APR-03
Hydroxide (OH)		<5	<5	RPD-NA	mg/L	N/A	20	05-APR-03
pH		7.8	7.8	J	pH	0.0	0.1	05-APR-03
WG109973-8	DUP	L103785-15						
Alkalinity, Total (as CaCO ₃)		8	8	J	mg/L	0	15	05-APR-03

ENVIRO-TEST QC REPORT

Workorder: L104341

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
H/EC/ALK-ED	<u>Water</u>							
Batch	R117858							
WG109973-8	DUP	L103785-15						
Bicarbonate (HCO3)		10	10	J	mg/L	0	15	05-APR-03
Carbonate (CO3)		<5	<5	RPD-NA	mg/L	N/A	20	05-APR-03
Conductivity (EC)		24.5	24.6		µS/cm	0.31	5.5	05-APR-03
Hydroxide (OH)		<5	<5	RPD-NA	mg/L	N/A	20	05-APR-03
pH		6.5	6.5	J	pH	0.0	0.1	05-APR-03
WG109973-1	LCS							
pH			4.1		pH		3.9-4.1	05-APR-03
WG109973-2	LCS							
pH			7.1		pH		6.9-7.1	05-APR-03
WG109973-3	LCS							
pH			10.1		pH		9.9-10.1	05-APR-03
WG109973-4	LCS							
Conductivity (EC)		106			%		102-110	05-APR-03
WG109973-5	LCS							
Conductivity (EC)		104			%		99-107	05-APR-03
WG109973-6	LCS							
Conductivity (EC)		95			%		93-102	05-APR-03
WG109973-7	LCS							
Alkalinity, Total (as CaCO3)		108			%		96-109	05-APR-03
SOLIDS-TOTSUS-ED	<u>Water</u>							
Batch	R117960							
WG109988-3	DUP	L104549-1						
Total Suspended Solids		204	200		mg/L	2.0	8.7	07-APR-03
WG109988-2	LCS							
Total Suspended Solids			98		%		90-106	07-APR-03
WG109988-1	MB							
Total Suspended Solids			<3		mg/L		3	07-APR-03
TCC-MF-ED	<u>Water</u>							
Batch	R117040							
WG109130-1	DUP	L104341-1						
MF - Total Coliforms		T N T C *	T N T C *	RPD-NA	CFU/100mL	N/A		29-MAR-03
WG109130-3	DUP	L104342-1						
MF - Total Coliforms		T N T C *	T N T C *	RPD-NA	CFU/100mL	N/A		29-MAR-03
WG109130-2	MB							
MF - Total Coliforms			<1		CFU/100mL		1	29-MAR-03
WG109130-4	MB							
MF - Total Coliforms			<1		CFU/100mL		1	29-MAR-03

Product - Batch and Sample Number Relations:

BOD-ED	1	
	R117523	L104341-1

ENVIRO-TEST QC REI

Workorder: L104341

Test	Matrix	Reference	Result	Qualifier	Unit
Product - Batch and Sample Number Relations:					
CL-ED	1				
	R117038	L104341-1	L104341-2		
ETL-ROUTINE-ICP-ED	1				
	R117091	L104341-1	L104341-2		
FCC-MF-ED	1				
	R117040	L104341-1	L104341-2		
FE-EXT-HIGH-ED	1				
	R117276	L104341-2			
HPC-MF-ED	1				
	R117040	L104341-2			
MN-EXT-HIGH-ED	1				
	R117276	L104341-2			
N2N3-ED	1				
	R117090	L104341-1	L104341-2		
NH4-ED	1				
	R117588	L104341-1			
NO2-ED	1				
	R117090	L104341-1	L104341-2		
NO3-ED	1				
	R117090	L104341-1	L104341-2		
OGG-ED	1				
	R117626	L104341-1			
PH/EC/ALK-ED	1				
	R117858	L104341-1	L104341-2		
SOLIDS-TOTSUS-ED	1				
	R117960	L104341-1	L104341-2		
TCC-MF-ED	1				
	R117040	L104341-1	L104341-2		



MEMORIALS OF THE LATE JOHN BROWN

CHAIN OF CUSTODY / ANALYTICAL REQUEST FORM

Petro-Canada

Service Requested: Regular ✓ Priority _____ Emergency _____

Account Number: 10364

FOR LABORATORY USE ONLY

SAMPLE CONDITION UPON RECEIPT: FROZEN COLD AMBIENT

OTHER (BREAKAGE, LEAKAGE, ETC.): _____

NOTE: Quotation #

CLIENT INFORMATION

REPORTEIRO-FERRO-CANADA
1150 6TH AVENUE SW
CALGARY AB T2P 3E3

ATTENTION: TIM R TAYLOR

Phone: (403) 296-7770

Fax: (403) 296-5147
Email: taylor@petro-canada.com

NAME _____

Ship to: 1313 44 Avenue NE Calgary, Alberta T2E 6L5
 Telephone: (403) 291-9897
 Fax: (403) 291-0298
 Toll Free: 1-800-668-9878

CHAIN OF CUSTODY/ANALYTICAL REQUEST FORM

Petro-Canada

Service Requested: Regular Priority Emergency

Account Number: 10364

Sample ID	Sampled By	Date/Time Sampled	Sample Type
SP_#2	Tim C	March 27/03	DRINKING WATER (500 ML PLASTIC)
SP_#3	Tim C	Mar 27/03	DRINKING WATER (300 ML STERILIZED)
Kitchen			
			RELINQUISHED BY: _____
			DATE: _____
			TIME: _____
			RECEIVED BY: _____
			DATE: _____
			TIME: _____

CLIENT INFORMATION:
 REPORT TO PETRO-CANADA
 150 6th AVENUE SW
 CALGARY AB T2P 3E3

ATTENTION: TIM R. TAYLOR
 Phone: (403) 296-7770
 Fax: (403) 296-5147
 Email: ttaylor@petro-canada.com
 krigal@petro-canada.com

INVOICE: (SAME)

Project Number: NUNA PO Number:

FOR LABORATORY USE ONLY

SAMPLE CONDITION UPON RECEIPT: FROZEN _____ COLD _____ AMBIENT
 OTHER (BREAKAGE, LEAKAGE, ETC.):
NOTE: Quotation #

ETL Enviro·Test

A DIVISION OF ETL CHEMSPEC ANALYTICAL LIMITED

ANALYTICAL REPORT

PETRO CANADA
ATTN: TIM R TAYLOR
150 6TH AVE SW
CALGARY AB T2P 3E3

DATE: 11-APR-03

Lab Work Order #: L105114

Sampled By: JC

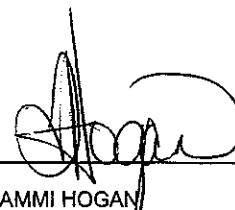
Date Received: 03-APR-03

P.O. #:

Job #: FILTER BOX

Comments:

APPROVED BY:



TAMMI HOGAN

Project Manager

THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE WRITTEN AUTHORITY OF THE LABORATORY.
ANY REMAINING SAMPLES WILL BE DISPOSED OF AFTER 30 DAYS FOLLOWING ANALYSIS. PLEASE CONTACT THE LAB IF YOU
REQUIRE ADDITIONAL SAMPLE STORAGE TIME.

LABORATORY ACCREDITATIONS:

- STANDARDS COUNCIL OF CANADA IN COOPERATION WITH THE CANADIAN ASSOCIATION FOR ENVIRONMENTAL ANALYTICAL LABORATORIES (CAEAL) FOR SPECIFIC TESTS AS REGISTERED BY THE COUNCIL (EDMONTON, CALGARY, GRANDE PRAIRIE, SASKATOON, WINNIPEG, THUNDER BAY, WATERLOO)
- AMERICAN INDUSTRIAL HYGIENE ASSOCIATION (AIHA) IN THE INDUSTRIAL HYGIENE PROGRAM (EDMONTON, WINNIPEG)
- STANDARDS COUNCIL OF CANADA IN COOPERATION WITH THE CANADIAN FOOD INSPECTION AGENCY (CFIA) FOR FERTILIZER AND FEED TESTING (SASKATOON) AND FOR MICROBIOLOGICAL TESTING IN FOOD (WINNIPEG)
- LABORATORY RECOGNITIONS:
- STANDARDS COUNCIL OF CANADA - GLP COMPLIANT FACILITY (EDMONTON, OTTAWA)

9936 - 67 Avenue, Edmonton, Alberta T6E 0P5, Tel. (780) 413-5227, Fax (780) 437-2311
Canada Wide Tel. 1-800-668-9878 www.envirotest.com

(Edmonton, Calgary, Grande Prairie, Saskatoon, Winnipeg, Thunder Bay, Ottawa, Waterloo, Montreal)

ENVIRO-TEST ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier	DIL	Units	Extracted	Analyzed	By	Batch
L105114-1 SNP 1788-1								
Sample Date: 03-APR-03								
Matrix: SEWAGE								
Ammonia-N	18.2		0.05	mg/L		06-APR-03	TL	R117811
Biochemical Oxygen Demand	18		2	mg/L		04-APR-03	PTT	R118313
Oil and Grease	<1		1	mg/L		07-APR-03	ZOW	R117977
Total Suspended Solids	48		3	mg/L		09-APR-03	EMN	R118243
Routine Water Analysis								
Chloride (Cl)	108		1	mg/L		04-APR-03	EOC	R117657
Nitrate+Nitrite-N	6.7		0.1	mg/L		04-APR-03	M8B	R117710
Nitrate-N	2.0		0.1	mg/L		04-APR-03	M8B	R117710
Nitrite-N	4.78		0.05	mg/L		04-APR-03	M8B	R117710
pH, Conductivity and Total Alkalinity								
pH	7.5		0.1	pH		10-APR-03	PTT	R118316
Conductivity (EC)	1410		0.2	uS/cm		10-APR-03	PTT	R118316
Bicarbonate (HCO3)	403		5	mg/L		10-APR-03	PTT	R118316
Carbonate (CO3)	<5		5	mg/L		10-APR-03	PTT	R118316
Hydroxide (OH)	<5		5	mg/L		10-APR-03	PTT	R118316
Alkalinity, Total (as CaCO3)	330		5	mg/L		10-APR-03	PTT	R118316
Ion Balance Calculation								
Ion Balance	107			%		11-APR-03		
TDS (Calculated)	817			mg/L		11-APR-03		
Hardness (as CaCO3)	115			mg/L		11-APR-03		
ICP metals and SO4 for routine water								
Calcium (Ca)	26.8		0.5	mg/L		04-APR-03	EOC	R117839
Potassium (K)	34.3		0.1	mg/L		04-APR-03	EOC	R117839
Magnesium (Mg)	11.6		0.1	mg/L		04-APR-03	EOC	R117839
Sodium (Na)	236		1	mg/L		04-APR-03	EOC	R117839
Sulfate (SO4)	172		0.5	mg/L		04-APR-03	EOC	R117839
Total & Fecal Coliform Count-MF								
MF - Fecal Coliforms	280		1	CFU/100mL		04-APR-03	S V N	R117845
MF - Total Coliforms	3300		1	CFU/100mL		04-APR-03	S V N	R117845

Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

Methods Listed (if applicable):

ETL Test Code	Matrix	Test Description	Preparation Method Reference(Based On)	Analytical Method Reference(Based On)
BOD-ED	Water	Biochemical Oxygen Demand (BOD)		APHA 5210 B-5 day Incub.-O2 electrod
CL-ED	Water	Chloride (Cl)		APHA 4500 Cl E-Colorimetry
ETL-ROUTINE-ICP-ED	Water	ICP metals and SO4 for routine water		APHA 3120 B-ICP-OES
N2N3-ED	Water	Nitrate+Nitrite-N		APHA 4500 NO3H-Colorimetry
NH4-ED	Water	Ammonia-N		APHA4500NH3F Colorimetry
NO2-ED	Water	Nitrite-N		APHA 4500 NO2B-Colorimetry
NO3-ED	Water	Nitrate-N		APHA 4500 NO3H-Colorimetry
OGG-ED	Water	Oil and Grease-Gravimetric		APHA 5520 B Hexane MTBE ext. Gravime
PH/EC/ALK-ED	Water	pH, Conductivity and Total Alkalinity		APHA 4500-H, 2510, 2320
SOLIDS-TOTSUS-ED	Water	Total Suspended Solids		APHA 2540 D-Gravimetric

** Laboratory Methods employed follow in-house procedures, which are generally based on nationally or internationally accepted methodologies.

Chain of Custody numbers:

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location	Laboratory Definition Code	Laboratory Location
ED	Enviro-Test Laboratories - Edmonton, Alberta, Canada		

GLOSSARY OF REPORT TERMS

Surrogate - A surrogate is an organic compound that is similar to the target analyte(s) in chemical composition and behavior but not normally detected in environmental samples. Prior to sample processing, samples are fortified with one or more surrogate compounds.

The reported surrogate recovery value provides a measure of method efficiency. The Laboratory warning units are determined under column heading D.L.

mg/kg (units) - unit of concentration based on mass, parts per million

mg/L (units) - unit of concentration based on volume, parts per million

< - Less than

D.L. - Detection Limit

N/A - Result not available. Refer to qualifier code and definition for explanation

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

UNLESS OTHERWISE STATED, SAMPLES ARE NOT CORRECTED FOR CLIENT FIELD BLANKS.

Although test results are generated under strict QA/QC protocols, any unsigned test reports, faxes, or emails are considered preliminary.

Enviro-Test Laboratories has an extensive QA/QC program where all analytical data reported is analyzed using approved referenced procedures followed by checks and reviews by senior managers and quality assurance personnel. However, since the results are obtained from chemical measurements and thus cannot be guaranteed, Enviro-Test Laboratories assumes no liability for the use or interpretation of the results.

ENVIRO-TEST QC REPORT

Workorder: L105114

Client: PETRO CANADA
150 6TH AVE SW
CALGARY AB T2P 3E3

Contact: TIM R TAYLOR

ENVIRO-TEST QC REPORT

Workorder: L105114

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
I2N3-ED	Water							
Batch R117710								
WG109849-2 LCS	Nitrate+Nitrite-N		98		%		91-104	04-APR-03
WG109849-1 MB	Nitrate+Nitrite-N		<0.1		mg/L		0.1	04-APR-03
WG109849-4 MS	Nitrate+Nitrite-N	L104990-1	93		%		90-108	04-APR-03
WG109849-5 MSD	Nitrate+Nitrite-N	WG109849-4	92		%	1.5	5	04-APR-03
IH4-ED	Water							
Batch R117811								
WG109926-3 DUP	Ammonia-N	L104180-1	16.4	16.4	mg/L	0.33	7.7	06-APR-03
WG109926-2 LCS	Ammonia-N		98		%		75-125	06-APR-03
WG109926-1 MB	Ammonia-N		<0.05		mg/L		0.05	06-APR-03
WG109926-4 MS	Ammonia-N	L104692-1	110		%		65-132	06-APR-03
NO2-ED	Water							
Batch R117710								
WG109849-3 LCS	Nitrite-N		101		%		94-108	04-APR-03
WG109849-6 MS	Nitrite-N	L105114-1	100		%		95-107	04-APR-03
WG109849-7 MSD	Nitrite-N	WG109849-6	100.3		%	0.70	5	04-APR-03
DGG-ED	Water							
Batch R117977								
WG110034-2 LCS	Oil and Grease		96		%		79-100	07-APR-03
WG110034-1 MB	Oil and Grease		<1		mg/L		1	07-APR-03
PH/EC/ALK-ED	Water							
Batch R118316								
WG110505-8 DUP	Alkalinity, Total (as CaCO ₃)	L105752-4	73	73	mg/L	0.48	5	10-APR-03
Bicarbonate (HCO ₃)			7	8	J	1	15	10-APR-03
Carbonate (CO ₃)			41	41	mg/L	0.37	20	10-APR-03
Conductivity (EC)			20500	20900	uS/cm	1.9	5.5	10-APR-03
Hydroxide (OH)			<5	<5	RPD-NA	mg/L	N/A	10-APR-03
pH			9.5	9.5	J	pH	0.1	10-APR-03

ENVIRO-TEST QC REPORT

Workorder: L105114

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
H/EC/ALK-ED	<u>Water</u>							
Batch	R118316							
WG110505-1	LCS							
pH			4.0		pH		3.9-4.1	10-APR-03
WG110505-2	LCS							
pH			7.0		pH		6.9-7.1	10-APR-03
WG110505-3	LCS							
pH			10.1		pH		9.9-10.1	10-APR-03
WG110505-4	LCS							
Conductivity (EC)			108		%		102-110	10-APR-03
WG110505-5	LCS							
Conductivity (EC)			103		%		99-107	10-APR-03
WG110505-6	LCS							
Conductivity (EC)			97		%		93-102	10-APR-03
WG110505-7	LCS							
Alkalinity, Total (as CaCO ₃)			106		%		96-109	10-APR-03
SOLIDS-TOTSUS-ED	<u>Water</u>							
Batch	R118243							
WG110313-3	DUP	L105144-1						
Total Suspended Solids		6		7	J	mg/L	1	9.2
WG110313-2	LCS							
Total Suspended Solids				96		%		90-106
WG110313-1	MB							
Total Suspended Solids				<3		mg/L		3
CC-MF-ED	<u>Waste</u>							
Batch	R117845							
WG109891-2	DUP	L105157-1						
MF - Fecal Coliforms		340		360		CFU/100mL	4.6	04-APR-03

Product - Batch and Sample Number Relations:

BOD-ED	1	
		R118313 L105114-1
CL-ED	1	
		R117657 L105114-1
ETL-ROUTINE-ICP-ED	1	
		R117839 L105114-1
N2N3-ED	1	
		R117710 L105114-1
NH4-ED	1	
		R117811 L105114-1
NO2-ED	1	
		R117710 L105114-1
NO3-ED	1	
		R117710 L105114-1

ENVIRO-TEST QC REPORT

Workorder: L105114

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
Product - Batch and Sample Number Relations:								
DGG-ED	1	R117977	L105114-1					
DH/EC/ALK-ED	1	R118316	L105114-1					
SOLIDS-TOTSUS-ED	1	R118243	L105114-1					
CC-MF-ED	24	R117845	L105114-1					
CC-MF-ED	24	R117845	L105114-1					

Legend:

Limit	95% Confidence Interval (Laboratory Warning Limits)
DUP	Duplicate
RPD	Relative Percent Difference ((higher result-lower result)/Average, expressed as %)
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Materials
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material

Qualifier:

RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.
A	Method blank exceeds acceptance limit. Blank correction not applied, unless the qualifier "RAMB" (result adjusted for method blank) appears in the Analytical Report.
B	Method blank result exceeds acceptance limit, however, it is less than 5% of sample concentration. Blank correction not applied.
D	Duplicate result may exceed limit due to increased variability for low level samples.
E	Matrix spike recovery may fall outside the acceptance limits due to high sample background.
F	Silver recovery low, likely due to elevated chloride levels in sample.
G	Outlier - No assignable cause for nonconformity has been determined.
H	Result falls within the 99% Confidence Interval (Laboratory Control Limits)
J	Duplicate results and limit(s) are expressed in terms of absolute difference.



EnviroTest

卷之三

CHAIN OF CUSTODY/ANALYTICAL REQUEST FORM

Petro-Canada

Service Requested: Regular Priority Emergency

Account Number: 10364

ATTENTION: JILL & JAY
CLERK INFORMATION
REPORT TO HERO-JAW
1508 1/2 AVENUE SW
CALGARY AB T2H 1E5

Phone: (403) 294-7770
Fax: (403) 296-5147
Email: travlor@telus.ca
www.oefeo-canada.com

INVOICES (SAMED)

EQUIPMENT USE ONLY

SAMPLE CONDITION UPON RECEIPT: FROZEN _____ COLD _____ AMBIENT
OTHER (BREAKAGE, LEAKAGE, ETC.):

ETL Enviro•Test

A DIVISION OF ETL CHEMSPEC ANALYTICAL LIMITED

ANALYTICAL REPORT

PETRO CANADA
ATTN: TIM R. TAYLOR
150 6TH AVE SW
CALGARY AB T2P 3E3

DATE: 17-APR-03 08:35 PM

Lab Work Order #: L106003

Sampled By: W.ADAMS

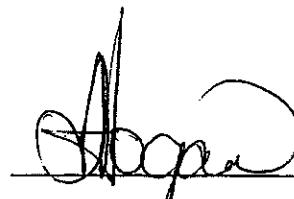
Date Received: 11-APR-03

P.O. #:

Job #: FILTER BOX SP2

Comments:

APPROVED BY:



TAMMI HOGAN
Project Manager

THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE WRITTEN AUTHORITY OF THE LABORATORY.
ANY REMAINING SAMPLES WILL BE DISPOSED OF AFTER 30 DAYS FOLLOWING ANALYSIS. PLEASE CONTACT THE LAB IF YOU
REQUIRE ADDITIONAL SAMPLE STORAGE TIME.

LABORATORY ACCREDITATIONS:

- STANDARDS COUNCIL OF CANADA IN COOPERATION WITH THE CANADIAN ASSOCIATION FOR ENVIRONMENTAL ANALYTICAL LABORATORIES (CAEAL) FOR SPECIFIC TESTS AS REGISTERED BY THE COUNCIL (EDMONTON, CALGARY, GRANDE PRAIRIE, SASKATOON, WINNIPEG, THUNDER BAY, WATERLOO)
- AMERICAN INDUSTRIAL HYGIENE ASSOCIATION (AIHA) IN THE INDUSTRIAL HYGIENE PROGRAM (EDMONTON, WINNIPEG)
- STANDARDS COUNCIL OF CANADA IN COOPERATION WITH THE CANADIAN FOOD INSPECTION AGENCY (CFIA) FOR FERTILIZER AND FEED TESTING (SASKATOON) AND FOR MICROBIOLOGICAL TESTING IN FOOD (WINNIPEG)
- LABORATORY RECOGNITIONS:
- STANDARDS COUNCIL OF CANADA - GLP COMPLIANT FACILITY (EDMONTON, OTTAWA)

9936 - 67 Avenue, Edmonton, Alberta T6E 0P5, Tel. (780) 413-5227, Fax (780) 437-2311
Canada Wide Tel. 1-800-668-9878 www.envirotest.com

(Edmonton, Calgary, Grande Prairie, Saskatoon, Winnipeg, Thunder Bay, Ottawa, Waterloo, Montreal)

ENVIRO-TEST ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier	Date	Units	Extracted	Analyzed	Reviewed	Batch
L106003-1 SEWAGE								
Sample Date: 10-APR-03 09:25								
Matrix: WATER								
Ammonia-N	14.4		0.05	mg/L	15-APR-03	TL	R118769	
Biochemical Oxygen Demand	13		2	mg/L	11-APR-03	PTT	R119098	
Oil and Grease	<1		1	mg/L	14-APR-03	ZOW	R118662	
Total Suspended Solids	29		3	mg/L	14-APR-03	EMN	R118691	
Routine Water Analysis								
Chloride (Cl)	174		1	mg/L	17-APR-03	EOC	R119155	
Nitrate+Nitrite-N	0.5		0.1	mg/L	11-APR-03	M8B	R118590	
Nitrate-N	0.2		0.1	mg/L	11-APR-03	M8B	R118590	
Nitrite-N	0.28		0.05	mg/L	11-APR-03	M8B	R118590	
pH, Conductivity and Total Alkalinity								
pH	7.3		0.1	pH	14-APR-03	PTT	R118684	
Conductivity (EC)	1520		0.2	uS/cm	14-APR-03	PTT	R118684	
Bicarbonate (HCO3)	352		5	mg/L	14-APR-03	PTT	R118684	
Carbonate (CO3)	<5		5	mg/L	14-APR-03	PTT	R118684	
Hydroxide (OH)	<5		5	mg/L	14-APR-03	PTT	R118684	
Alkalinity, Total (as CaCO3)	289		5	mg/L	14-APR-03	PTT	R118684	
Ion Balance Calculation								
Ion Balance	105			%	17-APR-03			
TDS (Calculated)	839			mg/L	17-APR-03			
Hardness (as CaCO3)	123			mg/L	17-APR-03			
ICP metals and SO4 for routine water								
Calcium (Ca)	29.0		0.5	mg/L	11-APR-03	EOC	R118490	
Potassium (K)	45.0		0.1	mg/L	11-APR-03	EOC	R118490	
Magnesium (Mg)	12.2		0.1	mg/L	11-APR-03	EOC	R118490	
Sodium (Na)	237		1	mg/L	11-APR-03	EOC	R118490	
Sulfate (SO4)	166		0.5	mg/L	11-APR-03	EOC	R118490	
Total & Fecal Coliform Count-MF								
MF - Fecal Coliforms	10		1	CFU/100mL	11-APR-03	S VN	R118521	
MF - Total Coliforms	14000		1	CFU/100mL	11-APR-03	S VN	R118521	

Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

Methods Listed (if applicable):

ETL Test Code	Matrix	Test Description	Preparation Method Reference(Based On)	Analytical Method Reference(Based On)
BOD-ED	Water	Biochemical Oxygen Demand (BOD)		APHA 5210 B-5 day Incub.-O2 electrod
CL-ED	Water	Chloride (Cl)		APHA 4500 Cl E-Colorimetry
ETL-ROUTINE-ICP-ED	Water	ICP metals and SO4 for routine water		APHA 3120 B-ICP-OES
FCC-MF-ED	Water	Fecal Coliform Count-MF		Standards Methods #9222D

Fecal coliform- Standards Methods for the Examination of Water and Wastewater, Method No. 9222D

Abbreviations: MF-membrane filtration, CFU-colony forming unit, TNTC-too numerous to count.

Interpretation of Results:

SATISFACTORY-When no fecal coliforms are detected.

UNSATISFACTORY-When fecal coliforms are present indicates pollution of intestinal origin and should not be used for drinking without treatment.

DOUBTFUL- When fecal coliforms are not detected but coliforms are present may or may not indicate bacteria of intestinal origin. If repeated analyses do not show source of pollution nearby, the water may be considered satisfactory if inspected by Medical Officer of Health or Health Inspector. Results for Fecal coliforms are presumptive and have not been confirmed by alternate culture media unless requested.

N2N3-ED	Water	Nitrate+Nitrite-N	APHA 4500 NO3H-Colorimetry
NH4-ED	Water	Ammonia-N	APHA 4500 NH3F Colorimetry
NO2-ED	Water	Nitrite-N	APHA 4500 NO2B-Colorimetry
NO3-ED	Water	Nitrate-N	APHA 4500 NO3H-Colorimetry
OGG-ED	Water	Oil and Grease-Gravimetric	APHA 5520 B Hexane MTBE ext. Gravime
PH/EC/ALK-ED	Water	pH, Conductivity and Total Alkalinity	APHA 4500-H, 2510, 2320
SOLIDS-TOTSUS-ED	Water	Total Suspended Solids	APHA 2540 D-Gravimetric
TCC-MF-ED	Water	Total Coliform Count-MF	Standard Methods #9222B

Total coliform-Standard Methods for the Examination of Water and Wastewater, Method 9222B.

Abbreviations: MF-membrane filtration, CFU-colony forming unit, TNTC-too numerous to count.

Interpretation of Results:

SATISFACTORY-When no coliforms are detected.

UNSATISFACTORY-When fecal coliforms are present indicates pollution of intestinal origin and should not be used for drinking without treatment.

DOUBTFUL-When fecal coliforms are not present but other coliforms are present may or may not indicate bacteria of intestinal origin. If repeated analysis do not show source of pollution nearby, the water may be considered satisfactory if inspected by Medical Officer of Health or Health Inspector.

Results are reported as presumptive for Total coliforms and have not been confirmed by an alternate culture media unless requested.

** Laboratory Methods employed follow in-house procedures, which are generally based on nationally or internationally accepted methodologies.

Chain of Custody numbers:

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location	Laboratory Definition Code	Laboratory Location
ED	Enviro-Test Laboratories - Edmonton, Alberta, Canada		

Reference Information

GLOSSARY OF REPORT TERMS

Surr - A surrogate is an organic compound that is similar to the target analyte(s) in chemical composition and behavior but not normally detected in environmental samples. Prior to sample processing, samples are fortified with one or more surrogate compounds.

The reported surrogate recovery value provides a measure of method efficiency. The Laboratory warning units are determined under column heading D.L.

mg/kg (units) - unit of concentration based on mass, parts per million

mg/L (units) - unit of concentration based on volume, parts per million

< - Less than

D.L. - Detection Limit

N/A - Result not available. Refer to qualifier code and definition for explanation

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

UNLESS OTHERWISE STATED, SAMPLES ARE NOT CORRECTED FOR CLIENT FIELD BLANKS.

Although test results are generated under strict QA/QC protocols, any unsigned test reports, faxes, or emails are considered preliminary.

Enviro-Test Laboratories has an extensive QA/QC program where all analytical data reported is analyzed using approved referenced procedures followed by checks and reviews by senior managers and quality assurance personnel. However, since the results are obtained from chemical measurements and thus cannot be guaranteed, Enviro-Test Laboratories assumes no liability for the use or interpretation of the results.

ENVIRO-TEST QC REPORT

Workorder: L106003

Client: PETRO CANADA
150 6TH AVE SW
CALGARY AB T2P 3E3

Contact: TIM R. TAYLOR

ENVIRO-TEST QC REPORT

Workorder: L106003

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<u>C-MF-ED</u>	<u>Water</u>							
Batch	R118521							
WG110702-1	MB							
MF - Fecal Coliforms			<1		CFU/100mL		1	11-APR-03
WG110702-2	MB							
MF - Fecal Coliforms			<1		CFU/100mL		1	11-APR-03
<u>N3-ED</u>	<u>Water</u>							
Batch	R118590							
WG110795-2	LCS							
Nitrate+Nitrite-N			99		%		91-104	11-APR-03
WG110795-1	MB							
Nitrate+Nitrite-N			<0.1		mg/L		0.1	11-APR-03
WG110795-4	MS	L105802-1						
Nitrate+Nitrite-N			92		%		90-108	11-APR-03
WG110795-5	MSD	WG110795-4						
Nitrate+Nitrite-N			91.3		%	1.1	5	11-APR-03
<u>H4-ED</u>	<u>Water</u>							
Batch	R118769							
WG110959-2	LCS							
Ammonia-N			105		%		89-116	15-APR-03
WG110959-1	MB							
Ammonia-N			<0.05		mg/L		0.05	15-APR-03
WG110959-4	MS	L106030-1						
Ammonia-N			144	H	%		65-132	15-APR-03
<u>O2-ED</u>	<u>Water</u>							
Batch	R118590							
WG110795-3	LCS							
Nitrite-N			99		%		94-108	11-APR-03
WG110795-1	MB							
Nitrite-N			<0.05		mg/L		0.05	11-APR-03
<u>OGG-ED</u>	<u>Water</u>							
Batch	R118662							
WG110847-2	LCS							
Oil and Grease			92		%		79-100	14-APR-03
WG110847-1	MB							
Oil and Grease			<1		mg/L		1	14-APR-03
<u>H/EC/ALK-ED</u>	<u>Water</u>							
Batch	R118684							
WG110892-12	DUP	L106003-1						
Alkalinity, Total (as CaCO ₃)		289	287		mg/L	0.64	5	14-APR-03
Bicarbonate (HCO ₃)		352	350		mg/L	0.64	20	14-APR-03
Carbonate (CO ₃)		<5	<5	RPD-NA	mg/L	N/A	20	14-APR-03
Conductivity (EC)		1520	1510		uS/cm	0.66	5.5	14-APR-03

ENVIRO-TEST QC REPORT

Workorder: L106003

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed	
H/EC/ALK-ED		<u>Water</u>							
Batch	R118684								
WG110892-12	DUP Hydroxide (OH)	L106003-1	<5	<5	RPD-NA	mg/L	N/A	20	14-APR-03
pH			7.3	7.3	J	pH	0.0	0.1	14-APR-03
WG110892-9	DUP Alkalinity, Total (as CaCO ₃)	L105787-3	53	55		mg/L	3.3	5	14-APR-03
Bicarbonate (HCO ₃)			65	67		mg/L	3.3	20	14-APR-03
Carbonate (CO ₃)			<5	<5	RPD-NA	mg/L	N/A	20	14-APR-03
Conductivity (EC)			148	148		uS/cm	0.0	5.5	14-APR-03
Hydroxide (OH)			<5	<5	RPD-NA	mg/L	N/A	20	14-APR-03
pH			7.2	7.2	J	pH	0.0	0.1	14-APR-03
WG110892-1	LCS pH			4.0		pH		3.9-4.1	14-APR-03
WG110892-2	LCS pH			7.0		pH		6.9-7.1	14-APR-03
WG110892-3	LCS pH			10.1		pH		9.9-10.1	14-APR-03
WG110892-4	LCS Conductivity (EC)			106		%		102-110	14-APR-03
G110892-5	LCS Conductivity (EC)			103		%		99-107	14-APR-03
WG110892-6	LCS Conductivity (EC)			101		%		93-102	14-APR-03
WG110892-7	LCS Alkalinity, Total (as CaCO ₃)			105		%		96-109	14-APR-03
SOLIDS-TOTSUS-ED		<u>Water</u>							
Batch	R118691								
WG110806-3	DUP Total Suspended Solids	L106119-1	72	66		mg/L	8.7	8.7	14-APR-03
WG110806-2	LCS Total Suspended Solids			96		%		90-106	14-APR-03
WG110806-1	MB Total Suspended Solids			<3		mg/L		3	14-APR-03
TCC-MF-ED		<u>Water</u>							
Batch	R118521								
WG110702-1	MB MF - Total Coliforms			<1		CFU/100mL		1	11-APR-03
WG110702-2	MB MF - Total Coliforms			<1		CFU/100mL		1	11-APR-03

Product - Batch and Sample Number Relations:

BOD-ED	1	
	R119098	L106003-1

ENVIRO-TEST QC REPORT

Workorder: L106003

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
Product - Batch and Sample Number Relations:								
CL-ED		1						
	R119155		L106003-1					
ETL-ROUTINE-ICP-ED		1						
	R118490		L106003-1					
FCC-MF-ED		1						
	R118521		L106003-1					
N2N3-ED		1						
	R118590		L106003-1					
NH4-ED		1						
	R118769		L106003-1					
NO2-ED		1						
	R118590		L106003-1					
NO3-ED		1						
	R118590		L106003-1					
OGG-ED		1						
	R118662		L106003-1					
PH/EC/ALK-ED		1						
	R118684		L106003-1					
SOLIDS-TOTSUS-ED		1						
	R118691		L106003-1					
TCC-MF-ED		1						
	R118521		L106003-1					

Workorder # L106003

Legend:

Limit	95% Confidence Interval (Laboratory Warning Limits)
DUP	Duplicate
RPD	Relative Percent Difference ((higher result-lower result)/Average, expressed as %)
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Materials
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material

Qualifier:

RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.
A	Method blank exceeds acceptance limit. Blank correction not applied, unless the qualifier "RAMB" (result adjusted for method blank) appears in the Analytical Report.
B	Method blank result exceeds acceptance limit, however, it is less than 5% of sample concentration. Blank correction not applied.
D	Duplicate result may exceed limit due to increased variability for low level samples.
E	Matrix spike recovery may fall outside the acceptance limits due to high sample background.
F	Silver recovery low, likely due to elevated chloride levels in sample.
G	Outlier - No assignable cause for nonconformity has been determined.
H	Result falls within the 99% Confidence Interval (Laboratory Control Limits)
J	Duplicate results and limit(s) are expressed in terms of absolute difference.

EN EnviroTest

GLENCOE MCGRAW-HILL • DIVISION OF THE McGRAW-HILL COMPANIES

CHAIN OF CUSTODY/ANALYTICAL REQUEST FORM

Petro-Canada

Service Requested: _____ Regular _____ Priority _____ Emergency _____

Account Number: 10364

CLIENT INFORMATION
REPORT TO: PETRO-CANADA
1150 6TH AVENUE SW
CALGARY, AB T2P 3E3

FOR LABORATORY USE ONLY

SAMPLE CONDITION UPON RECEIPT

OTHER (BREAKAGE, LEAKAGE, ETC.)

NOTE: Question #

FOR LABORATORY USE ONLY

SAMPLE CONDITION UPON RECEIPT: FROZEN COLD AMBIENT
OTHER (BREAKAGE, LEAKAGE, ETC.): _____

NOTE: Quotation #

Appendix C

Drilling Waste Report

Drilling Waste Disposal Summary

Petro Canada

Nuna I-30

Prepared By: Ian Kendziora Phone: (403) 266-4850

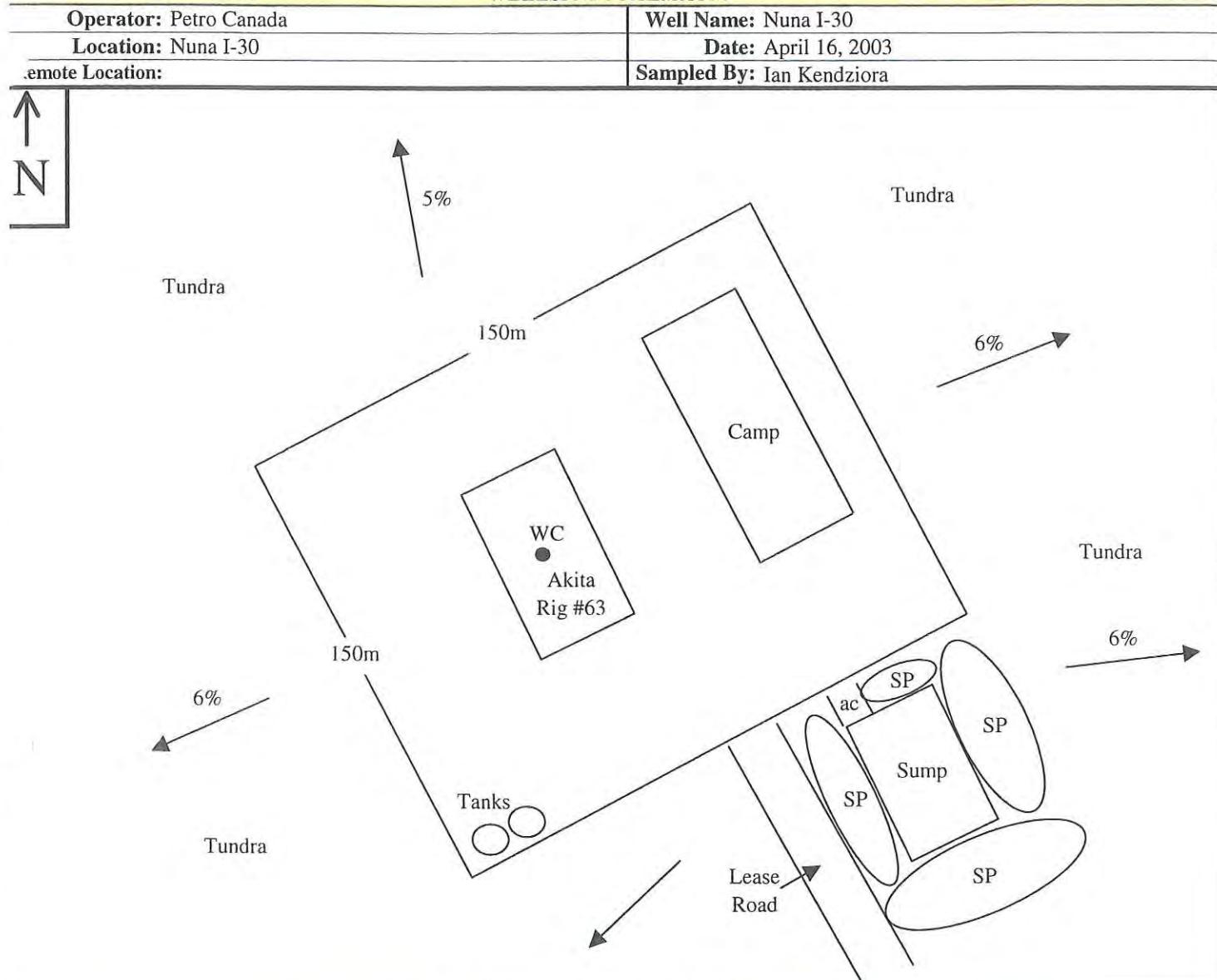
Newpark Environmental Services

#300, 635 - 6th Ave. S.W., Calgary, Alberta T2P 0T5

Phone: (403) 266-4850 Fax: (403) 266-4853

Newpark Environmental Services

WELLSITE SCHEMATIC



COMMENTS & AREA INFORMATION

Available Spread Area: 2.3 ha

The lease is surrounded by mossy tundra and some small willows.

LEGEND

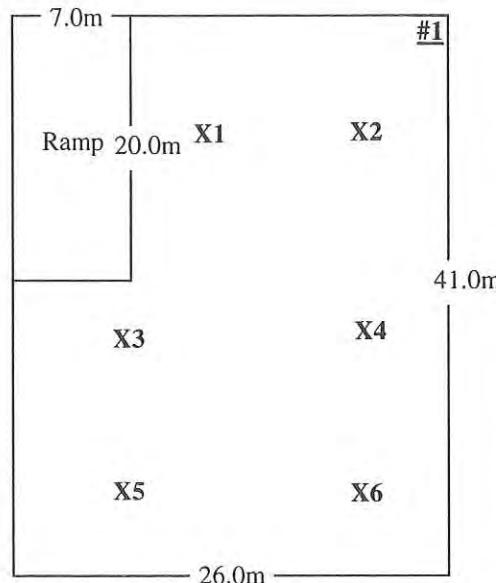
Access: ac	Cut / Fill: In Meters	"A" Horizon Soil Pile: A	Trench: tr	Fence: -----
A Soil Sample: XA	Berm: Berm	"B" Horizon Soil Pile: B	Well Center: WC	Flare Pit: fp
C Soil Sample: XC	Drainage: →	"C" Horizon Soil Pile: C	Spoil Pile: SP	

*Distances measured in meters

Newpark Environmental Services

ALBERTA SUMP SAMPLING REPORT

Operator: Petro Canada	Well Name: Nuna I-30
Location: Nuna I-30	Date: April 16, 2003
Remote Location:	Sampled By: Ian Kendziora



SAMPLE DEPTHS (m)					VOLUMES (m ³)					FIELD ANALYSIS											
#	Ice	Liquid	Solids	Total Waste	Pit	Free-Board	Ice	Liquid	Solids	Total Waste	Testing Parameters	Liquid	Solids	Total Waste	"A" Soil	"C" Soil					
X1				2.0	1	4				1111	Density (kg/m ³):										
X2				0.3	2						pH:										
X3				0.5	3						E.C. (dS/m):										
X4				1.0	4						Chloride (mg/l):										
X5				1.7	5						Sodium (mg/l):										
X6				1.7	Total					1111	Nitrogen (mg/l):										
X7					SAMPLING OBSERVATIONS						Calcium (mg/l):										
X8					Was sump dug with Cat or Hoe: Blast / Hoe						Magnesium (mg/l):										
X9					Temperature of Waste: °C						Soil Texture:										
X10											Soil Depth (cm):										
X11											VISIBLE HYDROCARBONS										
X12											There were no visible hydrocarbons present in the sump										
X13					Estimated Water Table Depth: >5 m						at the time of sampling.										
X14																					
X15					Treatment Required:																
X16																					
X17																					
X18					Comments: A surface sample was taken from the mud tanks. When the well is complete, there will be 220m ³ from the present mud system dumped into the sump. The depth of the sump was adjusted to represent the total waste when this mud is added.																
X19																					
X20																					

PC Devon NUNA I-30

Drilling Waste Sampling Report

Overview:

Newpark Environmental Services was contracted to perform sampling and assessment on the drilling wastes from the PC Devon NUNA I-30 well drilled in the winter of 2002 / 2003. The well site is located in the MacKenzie Delta region of the lowland taiga plains. The drilling waste generated at the above mentioned location is being managed and disposed of within a containment sump immediately off the Southeast side of the drilling location.

Sampling & Assessment:

On March 18, 2003, a parliamentary sample of the drilling waste produced from this well was assessed for visible contamination, frozen state, and volumes. A similar assessment was conducted on April 16, 2003. On both dates, it was noted that the waste within the pit contained mainly heavy solids and frozen liquids. Twice a composite sample of this waste was collected as per the sampling requirements of Appendix A of the water licence.

Analytical Results:

The first composite sample taken March 18, 2003 was analysed for the following parameters; soluble salts, total extractable hydrocarbons, trace elements (Metals) and toxicity. A second composite sample taken April 16, 2003 was also analysed for soluble salts, total extractable hydrocarbons, and trace elements (Metals). In addition, Petro Canada analysed for toxicity (Toxicity results will accompany a supplemental report upon receipt of lab analysis). The results of this analysis are summarized in Table #1. below.

Table 1. Total Waste Analytical Results

Parameter	Total Waste Composite (March 18, 2003)	Monthly Sample (April 12, 2003)	Total Waste Composite (April 16, 2003)	Surface Sample
Density (kg/m3)	1449	1270	1510	1264
Total Sodium (mg/l)	6580	3740	1960	
Total Sulphur (ug/g)	959	730	150	
Total Calcium (mg/l)	1390	786	368	
Reactive Chlorine (mg/l)	<0.1	<0.1	0.2	
Chlorides (mg/l)	50700	58100	10400	
Potassium (mg/l)	91700		7960	
pH	11.8		10.1	
EC (dS/m)			32.2	
Extractable Hydrocarbons (mg/kg)	1070		190	240
Volatile Hydrocarbons (mg/kg)			4	6
Cadmium (ug/g)	1.1		0.52	
Chromium (ug/g)	34.9		24.2	
Copper (ug/g)	61.6		35.9	
Iron (ug/g)			20800	
Lead (ug/g)	16		8.76	
Nickel (ug/g)	39.6		25.4	
Vanadium (ug/g)	43.5		34.8	
Zinc (ug/g)	123		67.6	
Microtox (EC50 @ 15 min.)	>91 (Pass)		5.7 (Fail)	
Microtox Charcoal (EC50 @ 15min.)			12 (Fail)	
96 Hour Trout Bioassay (LC 50)	52 (Fail)		71 (Fail)	

Table 2. PROPERTIES OF POTASSIUM CHLORIDE SOLUTIONS (KCl)

% KCl	Density (kg/m ³)	KCl (kg/m ³)	KCl (mg/L)	K ⁺ (mg/L)	Cl ⁻ (mg/L)	Final Volume Factor	Freezin g Point (° C)
1	1006	11.4	10050	5271	4779	1.004	0
2	1013	20.0	20220	10605	9615	1.008	-1
4	1026	39.9	40960	21482	19478	1.016	-2
6	1039	62.8	62210	32627	29583	1.024	-3
8	1052	82.8	84000	44056	39945	1.033	-4
10	1065	105.6	106300	55752	50548	1.043	-5
12	1079	128.4	129200	67762	61439	1.053	-6
14	1093	154.1	152700	80087	72613	1.064	-7
16	1106	176.9	176700	92674	84026	1.076	-8
18	1120	202.6	201300	105576	95724	1.088	-9
20	1135	225.4	226600	118845	107755	1.102	-10
22	1149	251.1	252400	132376	120024	1.115	-11
24	1160	279.6	279000	146327	132673	1.028	-12

Properties based on 20 °C and 100% purity

Mud System

The following table summarizes the total mud additives used.

Product Unit Size (kg/l) # Units

Product	Total Units	Unit Size	Product	Total Units	Unit Size
Alcomer 74 P	4	15 kg	MI Gel Untreated	859	40 kg
Calcium Carbonate	100	25 kg	Maxiseal	4	18.1 kg
Caustic Soda	31	22.7 kg	Piupelax W	340	1 L
Cell-O-Flake	32	11.3 kg	Polypac Reg	152	22.7 kg
Cl 40	320	20 L	Polypac UL	55	22.7 kg
Citric Acid	79	25 kg	Potassium Chloride	5902	25 kg
Defoam X	28	18.9 L	SAPP	8	22.7 kg
Desco CF	14	11.3 kg	Sawdust	232	40 lbs
Drill XT	300	1 L	Soda Ash	64	22.7 kg
Green-Cide	35	18.9 L	Sodium Bicarbonate	68	22.7 kg
IDCAP	253	25 kg	Thermpac UL	176	22.7 kg
ID Lube XL	2000	1 L	X-Cide 207	10	2.7 kg
Kelzan XCD	310	25 kg	Percol 728	6	25 kg
Kwik seal fine	25	18.1 kg	Fed Zan D	28	11.3 L
Lignite	37	22.7 kg	Fed Pac Reg	1	22.7 kg
MI Bar Bulk	219	1360 kg	Newgel	96	40 kg
Ultracap	107	22.7 kg	Ultrahib	58	208 L

Summary:

The interim chemistry of this waste and its frozen state show no concerns for on-site freeze down and burial. Hydrocarbon levels are very low and although the salt levels are elevated, they are well below concentrations that will create 'freeze down' difficulties, as indicated by the field assessment. Freeze point depression data for KCL systems indicates that the average waste will freeze down at -3 to -4 degrees Celsius.

Site Investigation and Downloading of Temperatures

Petro Canada

Nuna I-30

Prepared By:

Gordon Laptos

Phone: (403) 266-4850

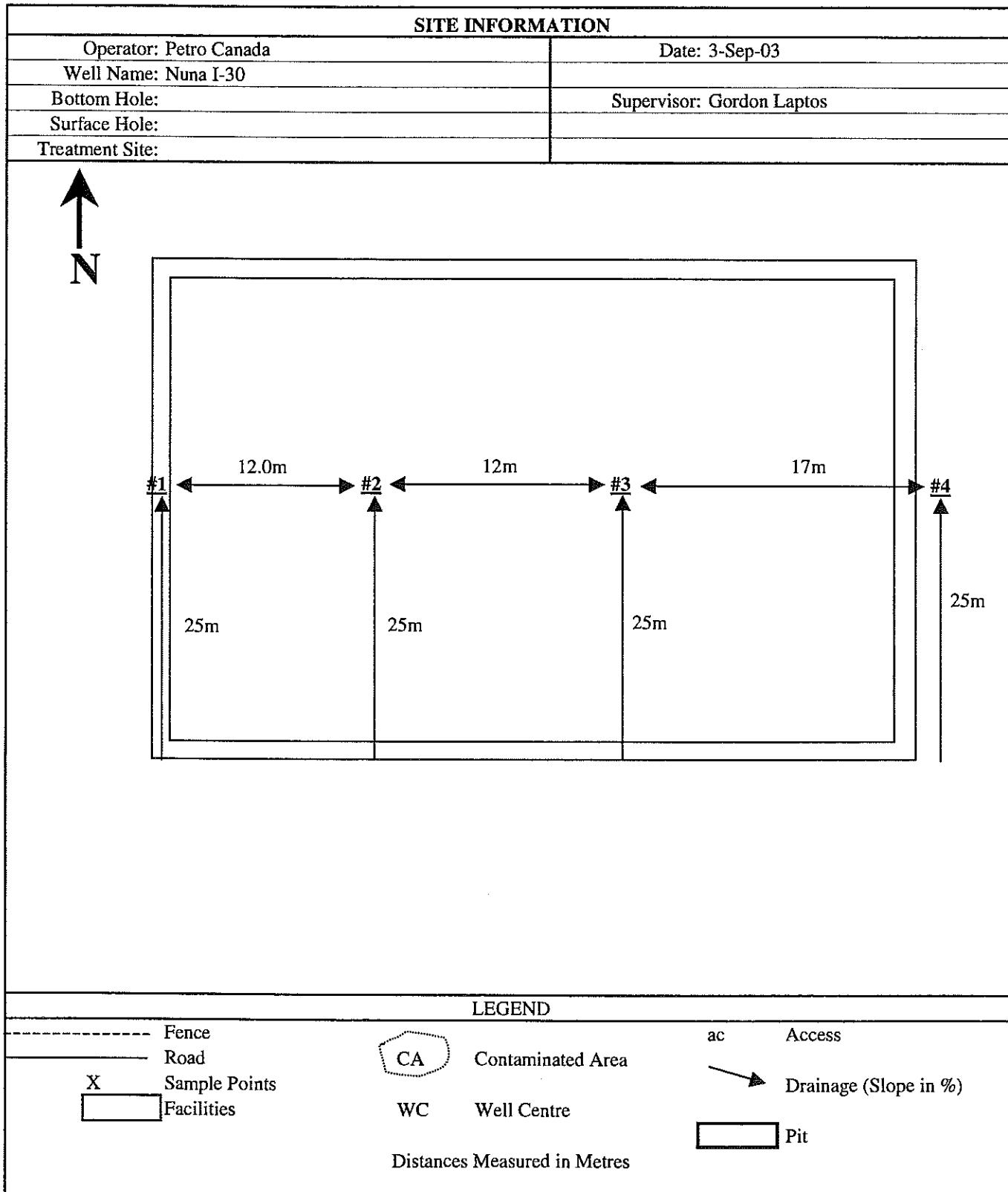
Newpark Environmental Services

#300, 635 - 6th Ave. S.W., Calgary, Alberta T2P 0T5

Phone: (403) 266-4850 Fax: (403) 266-4853

Newpark Environmental Services

General Area Schematic



Arctic Assessment Review

SITE INFORMATION					
Operator: Petro Canada Date: September 03 2003 Supervisor: Gord Laptos			Well Name: Nuna I-30 Bottom Hole: Surface Hole:		
SURFACE GROUND CONDITIONS					
		<input checked="" type="checkbox"/> Wet	<input type="checkbox"/> Dry	<input type="checkbox"/> Frozen	
LANDSCAPE CRITERIA (CONSISTENT WITH OFF-SITE?)					
Parameter		Capped Sump	Lease Site	Explain All NO Answers:	
1)	Drainage	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
2)	Erosion	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
3)	Contour	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
4)	Stability	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
5)	Debris	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Explain Any Debris:	
6)	Gravel	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Clay and native soils elevated on surface. Recently capped sump as of April 2003	
7)	Rock	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
VEGETATION CRITERIA (CONSISTENT WITH OFF-SITE?)					
Parameter		Capped Sump	Lease Site	Explain All NO Answers:	
1)	Species	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Recent well site, area is an elevated clay base virtually no vegetation has matured on the site.	
2)	Health	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
3)	Density	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
4)	Height	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
5)	Cover	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
6)	Bare Areas	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
VEGETATION TYPE					
Parameter		Capped Sump	Lease Site	Comments:	
1)	Cereal	<input type="checkbox"/>	<input type="checkbox"/>	Surrounding area has a good cover of natural vegetation comprised mostly of moss and native grass.	
2)	Oil Seed	<input type="checkbox"/>	<input type="checkbox"/>		
3)	Forage	<input type="checkbox"/>	<input type="checkbox"/>		
4)	Pasture	<input type="checkbox"/>	<input type="checkbox"/>		
5)	Trees/Bush	<input type="checkbox"/>	<input type="checkbox"/>		
6)	Lentil	<input type="checkbox"/>	<input type="checkbox"/>		
7)	Other	<input checked="" type="checkbox"/>	<input type="checkbox"/>		

Newpark Environmental Services**Arctic Assessment Review**

SITE INFORMATION					
Operator: Petro Canada		Well Name: Nuna I-30			
Date: September 03 2003		Bottom Hole:			
Supervisor: Gord Laptos		Surface Hole:			
SURFACE GROUND CONDITIONS					
			<input checked="" type="checkbox"/> Wet	<input type="checkbox"/> Dry	<input type="checkbox"/> Frozen
LANDSCAPE CRITERIA (CONSISTENT WITH OFF-SITE?)					
Parameter		Capped Sump	Lease Site	Explain All NO Answers:	
1)	Drainage	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
2)	Erosion	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
3)	Contour	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
4)	Stability	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
5)	Debris	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Explain Any Debris:	
6)	Gravel	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	Clay and native soils elevated on surface. Recently capped sump as of April 2003	
7)	Rock	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
VEGETATION CRITERIA (CONSISTENT WITH OFF-SITE?)					
Parameter		Capped Sump	Lease Site	Explain All NO Answers:	
1)	Species	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Recent well site, area is an elevated clay base virtually no vegetation has matured on the site.	
2)	Health	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
3)	Density	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
4)	Height	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
5)	Cover	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
6)	Bare Areas	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
VEGETATION TYPE					
Parameter		Capped Sump	Lease Site	Comments:	
1)	Cereal	<input type="checkbox"/>	<input type="checkbox"/>	Surrounding area has a good cover of natural vegetation comprised mostly of moss and native grass.	
2)	Oil Seed	<input type="checkbox"/>	<input type="checkbox"/>		
3)	Forage	<input type="checkbox"/>	<input type="checkbox"/>		
4)	Pasture	<input type="checkbox"/>	<input type="checkbox"/>		
5)	Trees/Bush	<input type="checkbox"/>	<input type="checkbox"/>		
6)	Lentil	<input type="checkbox"/>	<input type="checkbox"/>		
7)	Other	<input checked="" type="checkbox"/>	<input type="checkbox"/>		

Newpark Environmental Services

Daily Service Report

SITE INFORMATION			
Operator: Petro Canada	Date: September 03 2003	Tracking:	Province:
Well Name: Nuna I-30	AFE# / PO#:	<input type="checkbox"/> YES	<input type="checkbox"/> BC
Bottom Hole:	Supervisor: Gord Laptos	<input type="checkbox"/> NO	<input type="checkbox"/> AB
Surface Hole:	Labourer:	<input type="checkbox"/> INTERNAL	<input checked="" type="checkbox"/> NWT
Treatment Site:	Hoe Operator:		

DETAILS OF WORK PERFORMED

On September 3, 2003 I flew from Calgary to Inuvik. Once we landed in Inuvik we flew from the airport on Canadian Helicopters to conduct an on site acquisition of data from in place thermocouples and four (4) data loggers. Data loggers at area #1, #3, & #4 were function properly. The fourth unit at area #2 proved to be non-functioning due to an installation fault. The battery pack wire was pinched by the lid and discharged the battery to the case, most likely no data was collected at all by the unit. Site vegetation appraisal, plus photo documentation of site and surrounding area conditions.

DISPOSAL METHOD		CHARGES FOR NEWPARK PERSONNEL, EQUIPMENT, PRODUCT, ETC.		
<input type="checkbox"/> Composting		Description	Qty	Price
Construction:	<input type="checkbox"/>	Environmental Supervisor:	0.5	\$700.00
Turning:	<input type="checkbox"/>	Kilometers:		\$350.00
Monitoring Report	<input type="checkbox"/>	Environmental Supervisor Subsistence:	0.5	\$175.00
Event Completed:	<input type="checkbox"/>	Labourer:		\$87.50
Wood Fibre Hauled to Site (m ³):		Labourer Subsistence:		\$250.00
Wood Fibre Hauled to Site (t):		Pump Rental Including 300 Feet of Hose:		\$175.00
Loads of Wood Fibre Hauled:		Lab Analysis:		
Wood Waste Supplier:		ProActivate (25Kg sacks):		
<input type="checkbox"/> Reclamation		ProBioxyl (20L pails):		\$29.50
Pre-Site Assessment	<input type="checkbox"/>	Company Owned Equipment:		\$96.00
Post-Site Assessment	<input type="checkbox"/>	ALLU Bucket on Third Party Hoe - Hours:		
Environmental Supervisor	<input type="checkbox"/>	Project Management Fee:		
<input type="checkbox"/> Landfill / Facility		Professional Services - Hours:		
Volume Hauled Away (m ³):		Total Newpark Daily Costs:		\$437.50

CHARGES FOR THIRD PARTY EXPENSES (Field Tickets Must Be Attached)

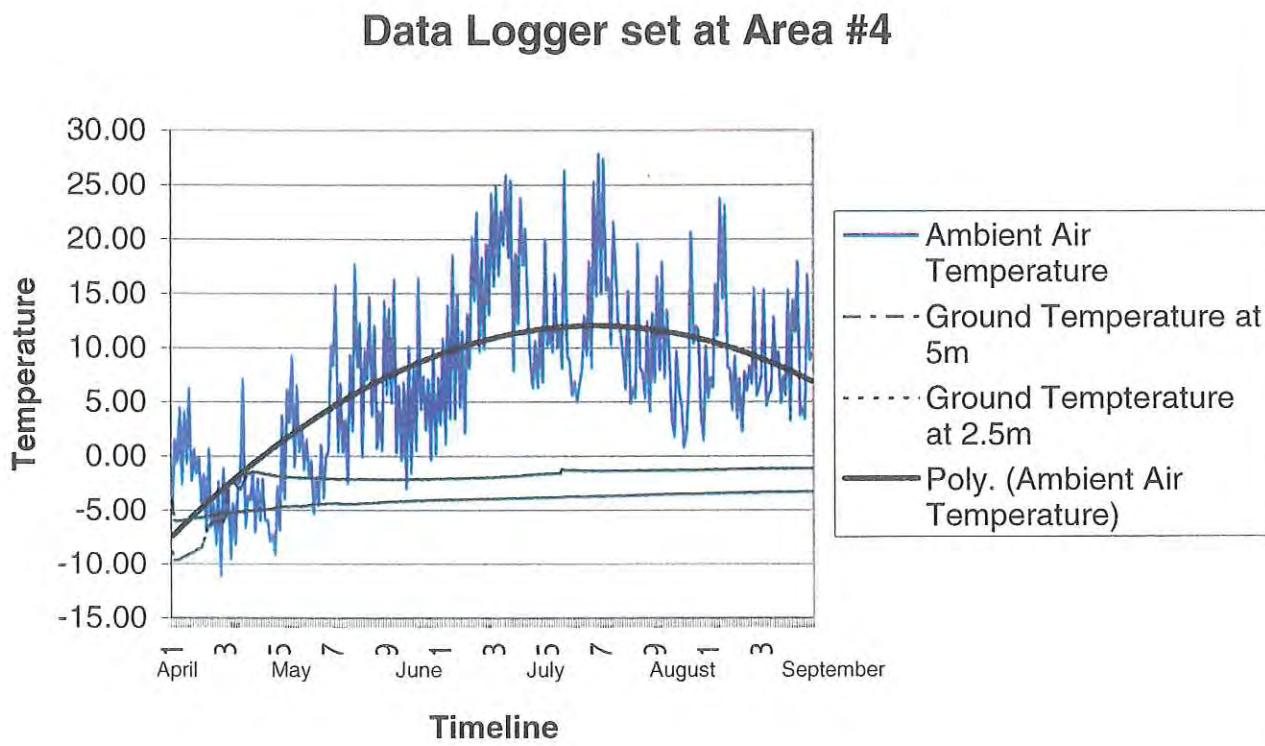
Vendor	Description	Ticket #	Cost w/o GST
Caltronics Communications Ltd.	Petro Canada's Share of Satellite Phone Rental	14121	\$41.67
Canadian North	Petro Canada's Share of Return Flight From Calgary to Inuvik		\$509.03
	Subtotal 3rd Party Charges:		\$550.70
	3rd Party Handling Charge:		\$55.07
	Total 3rd Party Charges:		\$605.77

CHARGES DIRECTLY BILLED TO THE OPERATOR

Vendor	Description	Ticket #	Cost w/o GST
	Total Direct Billed Charges:		\$0.00
	Total Daily Cost:		\$1,043.27

Petro Canada I-30

Off-Site Control Temperature Recordings



DATALOGGER #: 4
 DESCRIPTION : 206116 Petro Canada NUNA Drilling Sump
 SAMPLE RATE : 12:00:00 Date Installed: April 24, 2003?
 PRECISION : -DOUBLE- Located beyond toe of cap fill, plus air temperature probe
 LAST RECORDING: 03/09/03
 DATE TIME
 MM/DD/YY HH:MM:SS

EBA Temperature Bead Calibration (C)			0.05	0.04	0.04	0
	Depth of Thermistor (m)		Surface Temperature	3.5m	6m	Ambient Air Temperature
04/25/03	0:00:00	4/25/03 0:00	-4.60	-8.99	-6.36	-4.86
04/25/03	12:00:00	4/25/03 12:00	2.23	-9.01	-6.41	1.54
04/26/03	0:00:00	4/26/03 0:00	-0.54	-9.06	-6.47	-0.55
04/26/03	12:00:00	4/26/03 12:00	3.38	-9.08	-6.52	4.53
04/27/03	0:00:00	4/27/03 0:00	-2.34	-9.08	-6.52	-2.57
04/27/03	12:00:00	4/27/03 12:00	2.55	-9.10	-6.53	4.11
04/28/03	0:00:00	4/28/03 0:00	-0.80	-9.08	-6.53	-0.67
04/28/03	12:00:00	4/28/03 12:00	4.38	-9.10	-6.56	6.28
04/29/03	0:00:00	4/29/03 0:00	-1.98	-9.10	-6.58	-2.24
04/29/03	12:00:00	4/29/03 12:00	0.94	-9.08	-6.60	0.63
04/30/03	0:00:00	4/30/03 0:00	-1.61	-9.08	-6.60	-1.54
04/30/03	12:00:00	4/30/03 12:00	0.11	-8.99	-6.60	-0.13
05/01/03	0:00:00	5/1/03 0:00	-4.18	-8.61	-6.67	-4.23
05/01/03	12:00:00	5/1/03 12:00	-1.80	-8.83	-6.63	-1.70
05/02/03	0:00:00	5/2/03 0:00	-6.55	-8.83	-6.67	-6.75
05/02/03	12:00:00	5/2/03 12:00	-2.14	-8.83	-6.67	0.73
05/03/03	0:00:00	5/3/03 0:00	-6.42	-8.81	-6.71	-6.50
05/03/03	12:00:00	5/3/03 12:00	-4.64	-8.77	-6.71	-4.35
05/04/03	0:00:00	5/4/03 0:00	-8.08	-8.72	-6.71	-8.15
05/04/03	12:00:00	5/4/03 12:00	-2.34	-8.68	-6.71	-2.36
05/05/03	0:00:00	5/5/03 0:00	-11.05	-8.65	-6.72	-11.04
05/05/03	12:00:00	5/5/03 12:00	-0.82	-8.61	-6.76	-1.14
05/06/03	0:00:00	5/6/03 0:00	-5.09	-8.54	-6.76	-5.16
05/06/03	12:00:00	5/6/03 12:00	-2.32	-8.50	-6.78	-2.55
05/07/03	0:00:00	5/7/03 0:00	-9.43	-8.47	-6.76	-9.46
05/07/03	12:00:00	5/7/03 12:00	-6.10	-8.42	-6.78	-4.35
05/08/03	0:00:00	5/8/03 0:00	-8.08	-8.36	-6.78	-8.11
05/08/03	12:00:00	5/8/03 12:00	-2.07	-8.31	-6.80	-2.03
05/09/03	0:00:00	5/9/03 0:00	-2.58	-8.27	-6.80	-2.41
05/09/03	12:00:00	5/9/03 12:00	5.74	-8.22	-6.82	7.10
05/10/03	0:00:00	5/10/03 0:00	-6.45	-8.16	-6.84	-6.56
05/10/03	12:00:00	5/10/03 12:00	-3.08	-8.12	-6.86	-3.66
05/11/03	0:00:00	5/11/03 0:00	-3.97	-8.11	-6.86	-4.02
05/11/03	12:00:00	5/11/03 12:00	-2.04	-8.05	-6.84	-1.38
05/12/03	0:00:00	5/12/03 0:00	-6.75	-8.00	-6.86	-6.93
05/12/03	12:00:00	5/12/03 12:00	-2.64	-7.94	-6.86	-2.08
05/13/03	0:00:00	5/13/03 0:00	-5.78	-7.91	-6.89	-5.89
05/13/03	12:00:00	5/13/03 12:00	-2.52	-7.85	-6.86	-2.14
05/14/03	0:00:00	5/14/03 0:00	-5.76	-7.83	-6.89	-5.88
05/14/03	12:00:00	5/14/03 12:00	-5.83	-7.77	-6.89	-5.88
05/15/03	0:00:00	5/15/03 0:00	-7.62	-7.76	-6.89	-7.80

05/15/03	12:00:00	5/15/03 12:00	-5.99	-7.69	-6.89	-7.19
05/16/03	0:00:00	5/16/03 0:00	-8.83	-7.65	-6.89	-9.04
05/16/03	12:00:00	5/16/03 12:00	-3.76	-7.63	-6.93	-2.77
05/17/03	0:00:00	5/17/03 0:00	-4.64	-7.58	-6.89	-6.77
05/17/03	12:00:00	5/17/03 12:00	1.73	-7.54	-6.91	3.75
05/18/03	0:00:00	5/18/03 0:00	-2.72	-7.50	-6.89	-3.94
05/18/03	12:00:00	5/18/03 12:00	5.57	-7.46	-6.91	6.11
05/19/03	0:00:00	5/19/03 0:00	3.61	-7.42	-6.91	3.14
05/19/03	12:00:00	5/19/03 12:00	3.83	-7.41	-6.91	9.18
05/20/03	0:00:00	5/20/03 0:00	-0.84	-7.35	-6.89	-0.97
05/20/03	12:00:00	5/20/03 12:00	6.51	-7.35	-6.93	6.54
05/21/03	0:00:00	5/21/03 0:00	0.40	-7.26	-6.89	0.45
05/21/03	12:00:00	5/21/03 12:00	2.67	-7.24	-6.91	2.86
05/22/03	0:00:00	5/22/03 0:00	-1.11	-7.21	-6.89	-1.21
05/22/03	12:00:00	5/22/03 12:00	1.11	-7.17	-6.89	1.53
05/23/03	0:00:00	5/23/03 0:00	-1.76	-7.11	-6.88	-1.87
05/23/03	12:00:00	5/23/03 12:00	-1.01	-7.11	-6.89	-0.40
05/24/03	0:00:00	5/24/03 0:00	-5.03	-7.07	-6.93	-5.25
05/24/03	12:00:00	5/24/03 12:00	-1.07	-7.06	-6.88	-1.89
05/25/03	0:00:00	5/25/03 0:00	-4.50	-7.03	-6.91	-4.53
05/25/03	12:00:00	5/25/03 12:00	-0.18	-6.97	-6.88	1.05
05/26/03	0:00:00	5/26/03 0:00	-3.63	-6.97	-6.91	-3.84
05/26/03	12:00:00	5/26/03 12:00	1.67	-6.89	-6.88	-0.05
05/27/03	0:00:00	5/27/03 0:00	1.32	-6.88	-6.88	0.51
05/27/03	12:00:00	5/27/03 12:00	10.00	-6.84	-6.88	10.23
05/28/03	0:00:00	5/28/03 0:00	8.14	-6.80	-6.86	8.41
05/28/03	12:00:00	5/28/03 12:00	15.39	-6.78	-6.88	15.71
05/29/03	0:00:00	5/29/03 0:00	0.48	-6.72	-6.86	0.41
05/29/03	12:00:00	5/29/03 12:00	6.59	-6.72	-6.88	6.69
05/30/03	0:00:00	5/30/03 0:00	0.40	-6.69	-6.86	0.41
05/30/03	12:00:00	5/30/03 12:00	3.84	-6.67	-6.86	3.33
05/31/03	0:00:00	5/31/03 0:00	-1.16	-6.60	-6.84	-2.45
05/31/03	12:00:00	5/31/03 12:00	7.34	-6.58	-6.86	9.31
06/01/03	0:00:00	6/1/03 0:00	3.23	-6.56	-6.86	2.30
06/01/03	12:00:00	6/1/03 12:00	15.38	-6.53	-6.84	17.64
06/02/03	0:00:00	6/2/03 0:00	8.51	-6.50	-6.84	8.25
06/02/03	12:00:00	6/2/03 12:00	9.42	-6.46	-6.82	12.21
06/03/03	0:00:00	6/3/03 0:00	0.08	-6.41	-6.82	-0.03
06/03/03	12:00:00	6/3/03 12:00	7.66	-6.37	-6.80	9.69
06/04/03	0:00:00	6/4/03 0:00	8.70	-6.36	-6.80	7.04
06/04/03	12:00:00	6/4/03 12:00	9.86	-6.36	-6.82	14.63
06/05/03	0:00:00	6/5/03 0:00	4.42	-6.32	-6.80	3.75
06/05/03	12:00:00	6/5/03 12:00	11.11	-6.30	-6.80	11.99
06/06/03	0:00:00	6/6/03 0:00	0.78	-6.24	-6.76	0.74
06/06/03	12:00:00	6/6/03 12:00	3.38	-6.21	-6.78	4.09
06/07/03	0:00:00	6/7/03 0:00	0.76	-6.19	-6.76	0.57
06/07/03	12:00:00	6/7/03 12:00	11.99	-6.17	-6.76	14.31
06/08/03	0:00:00	6/8/03 0:00	7.02	-6.15	-6.78	5.71
06/08/03	12:00:00	6/8/03 12:00	8.59	-6.09	-6.72	13.60
06/09/03	0:00:00	6/9/03 0:00	5.14	-6.07	-6.73	4.93
06/09/03	12:00:00	6/9/03 12:00	12.52	-6.05	-6.73	16.27
06/10/03	0:00:00	6/10/03 0:00	0.47	-6.02	-6.71	0.37

06/10/03	12:00:00	6/10/03 12:00	5.46	-6.00	-6.72	6.51
06/11/03	0:00:00	6/11/03 0:00	-0.24	-5.96	-6.71	-0.33
06/11/03	12:00:00	6/11/03 12:00	3.90	-5.94	-6.71	6.76
06/12/03	0:00:00	6/12/03 0:00	-2.01	-5.88	-6.69	-2.98
06/12/03	12:00:00	6/12/03 12:00	4.94	-5.90	-6.71	10.11
06/13/03	0:00:00	6/13/03 0:00	0.30	-5.84	-6.69	-1.50
06/13/03	12:00:00	6/13/03 12:00	4.54	-5.84	-6.71	8.36
06/14/03	0:00:00	6/14/03 0:00	4.97	-5.81	-6.69	0.57
06/14/03	12:00:00	6/14/03 12:00	13.24	-5.79	-6.67	16.38
06/15/03	0:00:00	6/15/03 0:00	4.86	-5.73	-6.65	4.35
06/15/03	12:00:00	6/15/03 12:00	7.68	-5.70	-6.65	7.37
06/16/03	0:00:00	6/16/03 0:00	2.37	-5.69	-6.65	2.46
06/16/03	12:00:00	6/16/03 12:00	5.52	-5.68	-6.65	7.08
06/17/03	0:00:00	6/17/03 0:00	0.28	-5.68	-6.63	-0.29
06/17/03	12:00:00	6/17/03 12:00	7.05	-5.63	-6.60	9.86
06/18/03	0:00:00	6/18/03 0:00	0.15	-5.63	-6.60	0.25
06/18/03	12:00:00	6/18/03 12:00	4.85	-5.59	-6.58	7.26
06/19/03	0:00:00	6/19/03 0:00	6.57	-5.56	-6.58	2.94
06/19/03	12:00:00	6/19/03 12:00	6.49	-5.54	-6.58	10.85
06/20/03	0:00:00	6/20/03 0:00	1.27	-5.52	-6.56	1.15
06/20/03	12:00:00	6/20/03 12:00	8.94	-5.50	-6.56	13.88
06/21/03	0:00:00	6/21/03 0:00	4.58	-5.46	-6.54	3.48
06/21/03	12:00:00	6/21/03 12:00	17.30	-5.46	-6.56	18.50
06/22/03	0:00:00	6/22/03 0:00	5.00	-5.42	-6.54	3.46
06/22/03	12:00:00	6/22/03 12:00	13.52	-5.38	-6.53	14.84
06/23/03	0:00:00	6/23/03 0:00	6.86	-5.36	-6.52	4.51
06/23/03	12:00:00	6/23/03 12:00	6.38	-5.34	-6.52	11.50
06/24/03	0:00:00	6/24/03 0:00	5.42	-5.33	-6.50	2.17
06/24/03	12:00:00	6/24/03 12:00	11.40	-5.33	-6.52	13.12
06/25/03	0:00:00	6/25/03 0:00	9.91	-5.31	-6.47	8.12
06/25/03	12:00:00	6/25/03 12:00	18.71	-5.29	-6.50	20.19
06/26/03	0:00:00	6/26/03 0:00	16.57	-5.27	-6.50	14.33
06/26/03	12:00:00	6/26/03 12:00	20.86	-5.19	-6.41	22.43
06/27/03	0:00:00	6/27/03 0:00	12.20	-5.21	-6.46	9.70
06/27/03	12:00:00	6/27/03 12:00	16.51	-5.19	-6.46	18.28
06/28/03	0:00:00	6/28/03 0:00	12.07	-5.17	-6.43	9.93
06/28/03	12:00:00	6/28/03 12:00	17.80	-5.12	-6.37	19.49
06/29/03	0:00:00	6/29/03 0:00	14.20	-5.12	-6.41	13.08
06/29/03	12:00:00	6/29/03 12:00	22.01	-5.08	-6.37	24.17
06/30/03	0:00:00	6/30/03 0:00	18.88	-5.04	-6.36	15.70
06/30/03	12:00:00	6/30/03 12:00	23.48	-5.06	-6.36	24.83
07/01/03	0:00:00	7/1/03 0:00	19.33	-5.00	-6.36	16.66
07/01/03	12:00:00	7/1/03 12:00	23.13	-4.99	-6.36	22.57
07/02/03	0:00:00	7/2/03 0:00	19.59	-4.99	-6.34	19.46
07/02/03	12:00:00	7/2/03 12:00	25.56	-4.99	-6.36	25.89
07/03/03	0:00:00	7/3/03 0:00	18.32	-4.95	-6.32	18.31
07/03/03	12:00:00	7/3/03 12:00	24.83	-4.91	-6.32	25.42
07/04/03	0:00:00	7/4/03 0:00	8.13	-4.91	-6.32	7.93
07/04/03	12:00:00	7/4/03 12:00	15.83	-4.91	-6.34	18.66
07/05/03	0:00:00	7/5/03 0:00	14.82	-4.87	-6.32	12.25
07/05/03	12:00:00	7/5/03 12:00	23.60	-4.87	-6.28	23.79
07/06/03	0:00:00	7/6/03 0:00	19.33	-4.83	-6.26	17.62

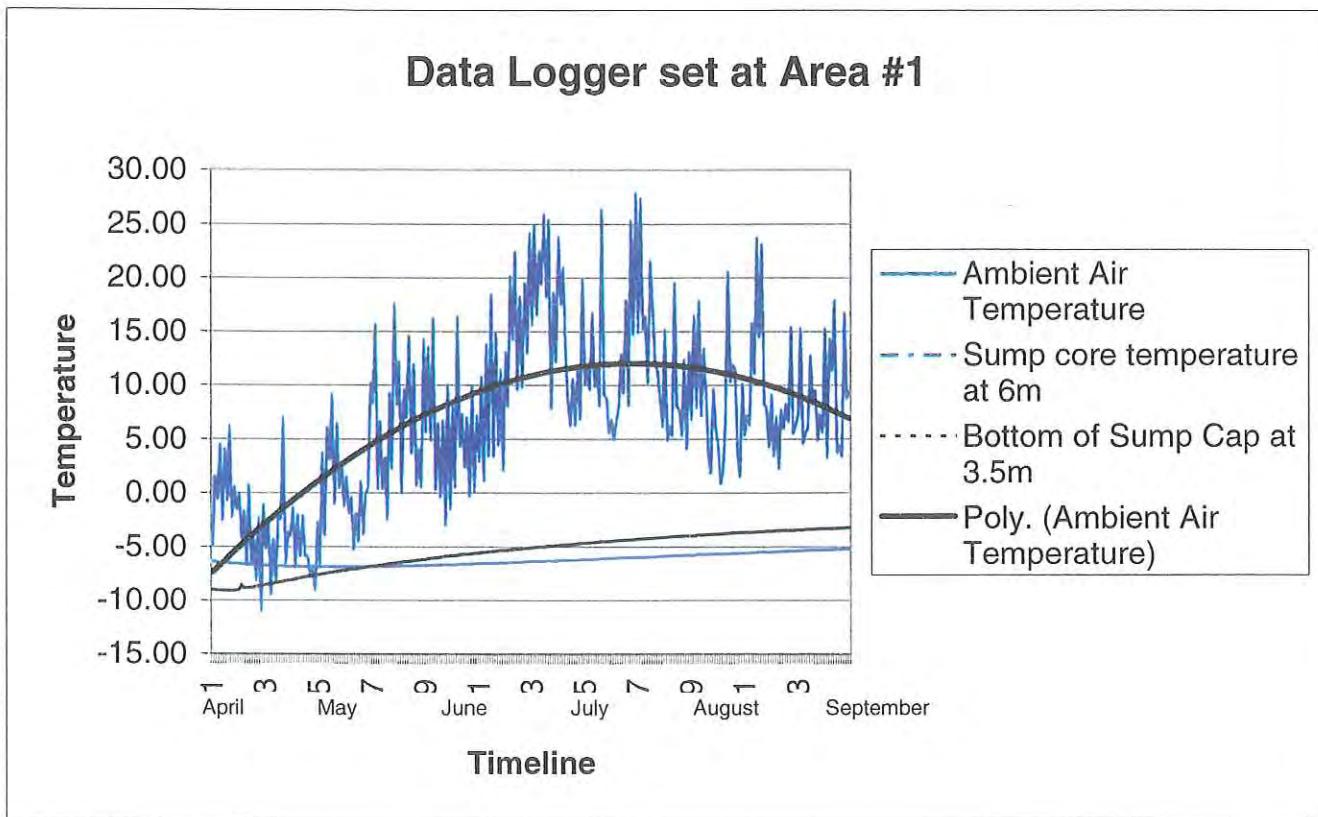
07/06/03	12:00:00	7/6/03 12:00	21.28	-4.82	-6.24	21.01
07/07/03	0:00:00	7/7/03 0:00	13.05	-4.80	-6.28	12.82
07/07/03	12:00:00	7/7/03 12:00	8.16	-4.78	-6.24	8.61
07/08/03	0:00:00	7/8/03 0:00	6.16	-4.76	-6.24	6.33
07/08/03	12:00:00	7/8/03 12:00	11.05	-4.76	-6.24	10.64
07/09/03	0:00:00	7/9/03 0:00	6.56	-4.74	-6.24	6.35
07/09/03	12:00:00	7/9/03 12:00	11.57	-4.74	-6.24	11.54
07/10/03	0:00:00	7/10/03 0:00	6.95	-4.66	-6.20	6.88
07/10/03	12:00:00	7/10/03 12:00	13.48	-4.66	-6.20	19.98
07/11/03	0:00:00	7/11/03 0:00	13.42	-4.66	-6.20	10.25
07/11/03	12:00:00	7/11/03 12:00	12.06	-4.65	-6.19	11.56
07/12/03	0:00:00	7/12/03 0:00	11.75	-4.63	-6.17	9.69
07/12/03	12:00:00	7/12/03 12:00	16.55	-4.63	-6.19	16.73
07/13/03	0:00:00	7/13/03 0:00	9.91	-4.59	-6.15	9.97
07/13/03	12:00:00	7/13/03 12:00	9.20	-4.57	-6.15	11.82
07/14/03	0:00:00	7/14/03 0:00	8.17	-4.55	-6.13	8.16
07/14/03	12:00:00	7/14/03 12:00	18.16	-4.48	-6.07	26.35
07/15/03	0:00:00	7/15/03 0:00	9.08	-4.51	-6.11	9.18
07/15/03	12:00:00	7/15/03 12:00	8.76	-4.49	-6.09	8.91
07/16/03	0:00:00	7/16/03 0:00	5.37	-4.49	-6.09	5.66
07/16/03	12:00:00	7/16/03 12:00	6.83	-4.47	-6.09	6.90
07/17/03	0:00:00	7/17/03 0:00	5.34	-4.45	-6.07	5.06
07/17/03	12:00:00	7/17/03 12:00	7.04	-4.42	-6.05	6.67
07/18/03	0:00:00	7/18/03 0:00	8.00	-4.42	-6.05	8.14
07/18/03	12:00:00	7/18/03 12:00	12.52	-4.38	-6.03	12.95
07/19/03	0:00:00	7/19/03 0:00	11.55	-4.37	-6.03	9.35
07/19/03	12:00:00	7/19/03 12:00	15.53	-4.35	-6.02	17.93
07/20/03	0:00:00	7/20/03 0:00	9.46	-4.35	-6.02	8.20
07/20/03	12:00:00	7/20/03 12:00	23.90	-4.31	-5.98	25.30
07/21/03	0:00:00	7/21/03 0:00	16.57	-4.31	-6.02	14.77
07/21/03	12:00:00	7/21/03 12:00	24.81	-4.29	-5.98	27.89
07/22/03	0:00:00	7/22/03 0:00	15.68	-4.27	-5.94	14.99
07/22/03	12:00:00	7/22/03 12:00	21.61	-4.27	-5.94	27.42
07/23/03	0:00:00	7/23/03 0:00	15.34	-4.27	-6.00	15.31
07/23/03	12:00:00	7/23/03 12:00	15.78	-4.24	-5.98	16.46
07/24/03	0:00:00	7/24/03 0:00	10.46	-4.21	-5.96	10.33
07/24/03	12:00:00	7/24/03 12:00	19.67	-4.19	-5.96	21.58
07/25/03	0:00:00	7/25/03 0:00	17.12	-4.17	-5.94	17.29
07/25/03	12:00:00	7/25/03 12:00	11.81	-4.17	-5.94	11.96
07/26/03	0:00:00	7/26/03 0:00	11.39	-4.15	-5.90	11.50
07/26/03	12:00:00	7/26/03 12:00	8.78	-4.13	-5.88	8.95
07/27/03	0:00:00	7/27/03 0:00	6.48	-4.13	-5.90	6.24
07/27/03	12:00:00	7/27/03 12:00	12.26	-4.11	-5.88	15.20
07/28/03	0:00:00	7/28/03 0:00	4.78	-4.09	-5.88	4.93
07/28/03	12:00:00	7/28/03 12:00	6.29	-4.07	-5.85	6.27
07/29/03	0:00:00	7/29/03 0:00	5.44	-4.07	-5.84	5.41
07/29/03	12:00:00	7/29/03 12:00	18.95	-4.03	-5.79	19.53
07/30/03	0:00:00	7/30/03 0:00	8.16	-4.00	-5.83	8.11
07/30/03	12:00:00	7/30/03 12:00	7.87	-4.03	-5.83	7.80
07/31/03	0:00:00	7/31/03 0:00	5.44	-3.99	-5.81	5.39
07/31/03	12:00:00	7/31/03 12:00	8.30	-3.98	-5.81	12.39
08/01/03	0:00:00	8/1/03 0:00	4.31	-3.98	-5.77	4.15

08/01/03	12:00:00	8/1/03 12:00	12.19	-3.98	-5.79	13.14
08/02/03	0:00:00	8/2/03 0:00	6.89	-3.96	-5.77	6.88
08/02/03	12:00:00	8/2/03 12:00	13.73	-3.96	-5.79	16.52
08/03/03	0:00:00	8/3/03 0:00	7.84	-3.92	-5.73	7.95
08/03/03	12:00:00	8/3/03 12:00	17.56	-3.88	-5.69	17.90
08/04/03	0:00:00	8/4/03 0:00	7.34	-3.88	-5.73	7.26
08/04/03	12:00:00	8/4/03 12:00	12.14	-3.90	-5.73	13.47
08/05/03	0:00:00	8/5/03 0:00	9.44	-3.86	-5.70	9.70
08/05/03	12:00:00	8/5/03 12:00	3.73	-3.86	-5.70	3.61
08/06/03	0:00:00	8/6/03 0:00	1.90	-3.84	-5.68	1.88
08/06/03	12:00:00	8/6/03 12:00	9.50	-3.81	-5.68	9.70
08/07/03	0:00:00	8/7/03 0:00	5.89	-3.81	-5.68	6.15
08/07/03	12:00:00	8/7/03 12:00	4.22	-3.81	-5.68	4.63
08/08/03	0:00:00	8/8/03 0:00	0.74	-3.80	-5.68	0.90
08/08/03	12:00:00	8/8/03 12:00	2.07	-3.77	-5.68	2.15
08/09/03	0:00:00	8/9/03 0:00	6.69	-3.75	-5.68	6.83
08/09/03	12:00:00	8/9/03 12:00	18.00	-3.75	-5.65	20.60
08/10/03	0:00:00	8/10/03 0:00	10.46	-3.74	-5.65	10.41
08/10/03	12:00:00	8/10/03 12:00	12.36	-3.71	-5.61	12.01
08/11/03	0:00:00	8/11/03 0:00	11.59	-3.71	-5.63	11.60
08/11/03	12:00:00	8/11/03 12:00	4.10	-3.68	-5.61	3.66
08/12/03	0:00:00	8/12/03 0:00	1.59	-3.68	-5.61	1.54
08/12/03	12:00:00	8/12/03 12:00	5.54	-3.65	-5.59	10.17
08/13/03	0:00:00	8/13/03 0:00	5.37	-3.65	-5.59	5.43
08/13/03	12:00:00	8/13/03 12:00	6.42	-3.65	-5.59	7.29
08/14/03	0:00:00	8/14/03 0:00	6.35	-3.64	-5.59	6.37
08/14/03	12:00:00	8/14/03 12:00	12.56	-3.64	-5.54	15.82
08/15/03	0:00:00	8/15/03 0:00	10.99	-3.64	-5.54	11.17
08/15/03	12:00:00	8/15/03 12:00	19.51	-3.59	-5.51	23.74
08/16/03	0:00:00	8/16/03 0:00	14.47	-3.61	-5.52	14.54
08/16/03	12:00:00	8/16/03 12:00	17.28	-3.61	-5.51	23.14
08/17/03	0:00:00	8/17/03 0:00	8.33	-3.59	-5.51	8.28
08/17/03	12:00:00	8/17/03 12:00	7.93	-3.54	-5.50	8.04
08/18/03	0:00:00	8/18/03 0:00	4.32	-3.54	-5.50	4.33
08/18/03	12:00:00	8/18/03 12:00	9.46	-3.54	-5.50	9.18
08/19/03	0:00:00	8/19/03 0:00	3.37	-3.52	-5.48	3.52
08/19/03	12:00:00	8/19/03 12:00	7.34	-3.52	-5.48	7.13
08/20/03	0:00:00	8/20/03 0:00	2.29	-3.49	-5.44	2.34
08/20/03	12:00:00	8/20/03 12:00	8.61	-3.50	-5.46	7.79
08/21/03	0:00:00	8/21/03 0:00	6.06	-3.49	-5.44	6.07
08/21/03	12:00:00	8/21/03 12:00	8.57	-3.46	-5.39	8.28
08/22/03	0:00:00	8/22/03 0:00	6.51	-3.48	-5.44	6.69
08/22/03	12:00:00	8/22/03 12:00	14.47	-3.46	-5.39	15.45
08/23/03	0:00:00	8/23/03 0:00	5.62	-3.46	-5.42	5.63
08/23/03	12:00:00	8/23/03 12:00	6.93	-3.44	-5.39	6.40
08/24/03	0:00:00	8/24/03 0:00	7.40	-3.42	-5.38	7.41
08/24/03	12:00:00	8/24/03 12:00	14.07	-3.42	-5.36	15.35
08/25/03	0:00:00	8/25/03 0:00	4.52	-3.40	-5.36	4.68
08/25/03	12:00:00	8/25/03 12:00	6.20	-3.38	-5.36	5.66
08/26/03	0:00:00	8/26/03 0:00	5.99	-3.38	-5.34	6.09
08/26/03	12:00:00	8/26/03 12:00	12.19	-3.38	-5.34	12.81
08/27/03	0:00:00	8/27/03 0:00	8.30	-3.36	-5.33	8.27

08/27/03	12:00:00	8/27/03 12:00	9.17	-3.34	-5.33	9.59
08/28/03	0:00:00	8/28/03 0:00	4.97	-3.34	-5.33	4.95
08/28/03	12:00:00	8/28/03 12:00	7.52	-3.32	-5.33	7.35
08/29/03	0:00:00	8/29/03 0:00	5.73	-3.32	-5.33	5.69
08/29/03	12:00:00	8/29/03 12:00	9.00	-3.31	-5.31	15.33
08/30/03	0:00:00	8/30/03 0:00	3.35	-3.31	-5.29	3.33
08/30/03	12:00:00	8/30/03 12:00	13.05	-3.31	-5.31	14.37
08/31/03	0:00:00	8/31/03 0:00	11.39	-3.31	-5.29	11.47
08/31/03	12:00:00	8/31/03 12:00	17.18	-3.29	-5.25	17.93
09/01/03	0:00:00	9/1/03 0:00	3.86	-3.27	-5.27	3.78
09/01/03	12:00:00	9/1/03 12:00	4.97	-3.27	-5.27	4.47
09/02/03	0:00:00	9/2/03 0:00	3.51	-3.25	-5.22	3.46
09/02/03	12:00:00	9/2/03 12:00	14.20	-3.25	-5.22	16.73
09/03/03	0:00:00	9/3/03 0:00	8.79	-3.24	-5.21	8.89
09/03/03	12:00:00	9/3/03 12:00	9.64	-3.24	-5.21	9.51

Petro Canada I-30

Sump Temperature Recordings



DATALOGGER #: 130
 DESCRIPTION : 2020232
 File Type : 836 2211000 323 Petro Canada NUNA Drilling Sump
 SAMPLE RATE : 12:00:00 Date Installed: April 24, 2003
 PRECISION : -DOUBLE- Control Sample
 LAST RECORDING: 03/09/03
 DATE TIME
 MM/DD/YY HH:MM:SS

EBA Temperature Bead Calibration (C)			0.02	0.03	0.02
	Depth of Thermistor (m)	Surface Temperature	2.5m	5m	
04/25/03	0:00:00	4/25/03 0:00	-1.32	-8.85	-4.00
04/25/03	12:00:00	4/25/03 12:00	-0.61	-9.63	-5.92
04/26/03	0:00:00	4/26/03 0:00	-1.28	-9.63	-6.02
04/26/03	12:00:00	4/26/03 12:00	-0.21	-9.56	-5.98
04/27/03	0:00:00	4/27/03 0:00	-0.53	-9.43	-5.93
04/27/03	12:00:00	4/27/03 12:00	-0.17	-9.30	-5.87
04/28/03	0:00:00	4/28/03 0:00	-0.21	-9.20	-5.86
04/28/03	12:00:00	4/28/03 12:00	-0.14	-9.05	-5.81
04/29/03	0:00:00	4/29/03 0:00	-0.01	-8.96	-5.77
04/29/03	12:00:00	4/29/03 12:00	-0.15	-8.84	-5.72
04/30/03	0:00:00	4/30/03 0:00	-0.22	-8.71	-5.70
04/30/03	12:00:00	4/30/03 12:00	-0.22	-8.60	-5.70
05/01/03	0:00:00	5/1/03 0:00	-0.27	-8.43	-5.67
05/01/03	12:00:00	5/1/03 12:00	-0.35	-7.84	-5.63
05/02/03	0:00:00	5/2/03 0:00	-1.28	-6.94	-5.58
05/02/03	12:00:00	5/2/03 12:00	-2.61	-6.48	-5.54
05/03/03	0:00:00	5/3/03 0:00	-2.22	-6.33	-5.52
05/03/03	12:00:00	5/3/03 12:00	-3.40	-6.20	-5.50
05/04/03	0:00:00	5/4/03 0:00	-3.33	-6.10	-5.46
05/04/03	12:00:00	5/4/03 12:00	-4.47	-6.10	-5.41
05/05/03	0:00:00	5/5/03 0:00	-3.94	-6.01	-5.36
05/05/03	12:00:00	5/5/03 12:00	-5.92	-6.03	-5.35
05/06/03	0:00:00	5/6/03 0:00	-2.88	-5.62	-5.33
05/06/03	12:00:00	5/6/03 12:00	-1.24	-3.49	-5.29
05/07/03	0:00:00	5/7/03 0:00	-2.67	-2.52	-5.24
05/07/03	12:00:00	5/7/03 12:00	-4.90	-2.39	-5.21
05/08/03	0:00:00	5/8/03 0:00	-4.31	-2.54	-5.19
05/08/03	12:00:00	5/8/03 12:00	-5.01	-2.80	-5.17
05/09/03	0:00:00	5/9/03 0:00	-2.63	-2.99	-5.16
05/09/03	12:00:00	5/9/03 12:00	-1.35	-2.54	-5.14
05/10/03	0:00:00	5/10/03 0:00	-1.26	-1.96	-5.10
05/10/03	12:00:00	5/10/03 12:00	-0.71	-1.67	-5.06
05/11/03	0:00:00	5/11/03 0:00	-3.94	-1.52	-5.04
05/11/03	12:00:00	5/11/03 12:00	-3.31	-1.45	-5.02
05/12/03	0:00:00	5/12/03 0:00	-2.20	-1.45	-5.01
05/12/03	12:00:00	5/12/03 12:00	-3.61	-1.45	-4.99
05/13/03	0:00:00	5/13/03 0:00	-2.67	-1.52	-4.99
05/13/03	12:00:00	5/13/03 12:00	-2.92	-1.55	-4.95
05/14/03	0:00:00	5/14/03 0:00	-2.69	-1.63	-4.93
05/14/03	12:00:00	5/14/03 12:00	-3.03	-1.67	-4.89

05/15/03	0:00:00	5/15/03 0:00	-3.90	-1.67	-4.87
05/15/03	12:00:00	5/15/03 12:00	-3.92	-1.78	-4.87
05/16/03	0:00:00	5/16/03 0:00	-3.79	-1.76	-4.80
05/16/03	12:00:00	5/16/03 12:00	-4.09	-1.83	-4.74
05/17/03	0:00:00	5/17/03 0:00	-2.65	-1.84	-4.70
05/17/03	12:00:00	5/17/03 12:00	-1.01	-1.88	-4.68
05/18/03	0:00:00	5/18/03 0:00	-1.12	-1.93	-4.68
05/18/03	12:00:00	5/18/03 12:00	-0.38	-1.90	-4.67
05/19/03	0:00:00	5/19/03 0:00	0.02	-1.93	-4.67
05/19/03	12:00:00	5/19/03 12:00	0.59	-1.94	-4.63
05/20/03	0:00:00	5/20/03 0:00	2.92	-1.96	-4.61
05/20/03	12:00:00	5/20/03 12:00	0.11	-1.96	-4.57
05/21/03	0:00:00	5/21/03 0:00	1.29	-1.98	-4.67
05/21/03	12:00:00	5/21/03 12:00	0.44	-1.98	-4.63
05/22/03	0:00:00	5/22/03 0:00	1.60	-2.00	-4.59
05/22/03	12:00:00	5/22/03 12:00	-0.17	-2.00	-4.57
05/23/03	0:00:00	5/23/03 0:00	0.01	-2.00	-4.51
05/23/03	12:00:00	5/23/03 12:00	-0.14	-2.01	-4.50
05/24/03	0:00:00	5/24/03 0:00	-0.14	-2.00	-4.44
05/24/03	12:00:00	5/24/03 12:00	-0.51	-2.01	-4.44
05/25/03	0:00:00	5/25/03 0:00	-1.48	-2.03	-4.43
05/25/03	12:00:00	5/25/03 12:00	-2.61	-2.01	-4.40
05/26/03	0:00:00	5/26/03 0:00	-0.81	-2.06	-4.43
05/26/03	12:00:00	5/26/03 12:00	-0.34	-2.05	-4.39
05/27/03	0:00:00	5/27/03 0:00	-0.49	-2.06	-4.39
05/27/03	12:00:00	5/27/03 12:00	-0.14	-2.09	-4.37
05/28/03	0:00:00	5/28/03 0:00	3.06	-2.09	-4.39
05/28/03	12:00:00	5/28/03 12:00	4.13	-2.09	-4.33
05/29/03	0:00:00	5/29/03 0:00	8.50	-2.13	-4.34
05/29/03	12:00:00	5/29/03 12:00	1.02	-2.11	-4.37
05/30/03	0:00:00	5/30/03 0:00	4.10	-2.09	-4.40
05/30/03	12:00:00	5/30/03 12:00	0.73	-2.11	-4.43
05/31/03	0:00:00	5/31/03 0:00	3.22	-2.15	-4.44
05/31/03	12:00:00	5/31/03 12:00	-0.10	-2.13	-4.43
06/01/03	0:00:00	6/1/03 0:00	1.68	-2.15	-4.43
06/01/03	12:00:00	6/1/03 12:00	1.72	-2.13	-4.43
06/02/03	0:00:00	6/2/03 0:00	11.05	-2.11	-4.40
06/02/03	12:00:00	6/2/03 12:00	8.54	-2.09	-4.39
06/03/03	0:00:00	6/3/03 0:00	10.07	-2.13	-4.39
06/03/03	12:00:00	6/3/03 12:00	1.58	-2.11	-4.34
06/04/03	0:00:00	6/4/03 0:00	8.90	-2.13	-4.33
06/04/03	12:00:00	6/4/03 12:00	6.32	-2.13	-4.33
06/05/03	0:00:00	6/5/03 0:00	11.49	-2.15	-4.33
06/05/03	12:00:00	6/5/03 12:00	3.75	-2.11	-4.29
06/06/03	0:00:00	6/6/03 0:00	11.58	-2.15	-4.31
06/06/03	12:00:00	6/6/03 12:00	1.68	-2.15	-4.27
06/07/03	0:00:00	6/7/03 0:00	4.49	-2.15	-4.26
06/07/03	12:00:00	6/7/03 12:00	1.82	-2.15	-4.23
06/08/03	0:00:00	6/8/03 0:00	12.16	-2.15	-4.21
06/08/03	12:00:00	6/8/03 12:00	8.16	-2.13	-4.19
06/09/03	0:00:00	6/9/03 0:00	11.16	-2.13	-4.17
06/09/03	12:00:00	6/9/03 12:00	5.01	-2.13	-4.19

06/10/03	0:00:00	6/10/03 0:00	10.87	-2.15	-4.17
06/10/03	12:00:00	6/10/03 12:00	0.94	-2.15	-4.17
06/11/03	0:00:00	6/11/03 0:00	6.86	-2.13	-4.15
06/11/03	12:00:00	6/11/03 12:00	-0.17	-2.15	-4.16
06/12/03	0:00:00	6/12/03 0:00	1.88	-2.13	-4.13
06/12/03	12:00:00	6/12/03 12:00	-0.65	-2.13	-4.13
06/13/03	0:00:00	6/13/03 0:00	5.10	-2.11	-4.11
06/13/03	12:00:00	6/13/03 12:00	-0.39	-2.13	-4.11
06/14/03	0:00:00	6/14/03 0:00	2.50	-2.09	-4.09
06/14/03	12:00:00	6/14/03 12:00	1.53	-2.11	-4.09
06/15/03	0:00:00	6/15/03 0:00	13.91	-2.13	-4.11
06/15/03	12:00:00	6/15/03 12:00	5.25	-2.11	-4.09
06/16/03	0:00:00	6/16/03 0:00	6.23	-2.09	-4.07
06/16/03	12:00:00	6/16/03 12:00	3.04	-2.13	-4.07
06/17/03	0:00:00	6/17/03 0:00	7.20	-2.09	-4.07
06/17/03	12:00:00	6/17/03 12:00	1.10	-2.11	-4.05
06/18/03	0:00:00	6/18/03 0:00	9.88	-2.09	-4.05
06/18/03	12:00:00	6/18/03 12:00	0.63	-2.09	-4.02
06/19/03	0:00:00	6/19/03 0:00	7.70	-2.09	-4.02
06/19/03	12:00:00	6/19/03 12:00	3.63	-2.09	-4.02
06/20/03	0:00:00	6/20/03 0:00	8.58	-2.06	-4.02
06/20/03	12:00:00	6/20/03 12:00	1.43	-2.06	-4.00
06/21/03	0:00:00	6/21/03 0:00	11.92	-2.05	-4.00
06/21/03	12:00:00	6/21/03 12:00	5.15	-2.05	-4.01
06/22/03	0:00:00	6/22/03 0:00	19.30	-2.05	-4.00
06/22/03	12:00:00	6/22/03 12:00	5.27	-2.03	-4.00
06/23/03	0:00:00	6/23/03 0:00	14.73	-2.05	-4.00
06/23/03	12:00:00	6/23/03 12:00	6.99	-2.03	-4.00
06/24/03	0:00:00	6/24/03 0:00	9.88	-2.01	-3.98
06/24/03	12:00:00	6/24/03 12:00	3.48	-2.03	-4.00
06/25/03	0:00:00	6/25/03 0:00	11.47	-2.00	-3.98
06/25/03	12:00:00	6/25/03 12:00	8.36	-2.00	-3.98
06/26/03	0:00:00	6/26/03 0:00	18.60	-2.00	-3.96
06/26/03	12:00:00	6/26/03 12:00	15.01	-2.00	-3.98
06/27/03	0:00:00	6/27/03 0:00	20.57	-1.98	-3.94
06/27/03	12:00:00	6/27/03 12:00	10.38	-1.96	-3.94
06/28/03	0:00:00	6/28/03 0:00	16.79	-1.98	-3.96
06/28/03	12:00:00	6/28/03 12:00	10.27	-1.94	-3.92
06/29/03	0:00:00	6/29/03 0:00	18.47	-1.94	-3.92
06/29/03	12:00:00	6/29/03 12:00	13.82	-1.96	-3.96
06/30/03	0:00:00	6/30/03 0:00	22.80	-1.93	-3.90
06/30/03	12:00:00	6/30/03 12:00	16.31	-1.90	-3.90
07/01/03	0:00:00	7/1/03 0:00	25.10	-1.93	-3.92
07/01/03	12:00:00	7/1/03 12:00	17.09	-1.88	-3.88
07/02/03	0:00:00	7/2/03 0:00	23.19	-1.88	-3.90
07/02/03	12:00:00	7/2/03 12:00	19.74	-1.86	-3.90
07/03/03	0:00:00	7/3/03 0:00	27.01	-1.86	-3.88
07/03/03	12:00:00	7/3/03 12:00	18.66	-1.84	-3.88
07/04/03	0:00:00	7/4/03 0:00	26.27	-1.83	-3.88
07/04/03	12:00:00	7/4/03 12:00	8.46	-1.80	-3.88
07/05/03	0:00:00	7/5/03 0:00	17.97	-1.80	-3.88
07/05/03	12:00:00	7/5/03 12:00	13.14	-1.78	-3.86

07/06/03	0:00:00	7/6/03 0:00	25.08	-1.76	-3.84
07/06/03	12:00:00	7/6/03 12:00	18.17	-1.74	-3.84
07/07/03	0:00:00	7/7/03 0:00	22.42	-1.74	-3.84
07/07/03	12:00:00	7/7/03 12:00	13.50	-1.72	-3.86
07/08/03	0:00:00	7/8/03 0:00	8.43	-1.67	-3.83
07/08/03	12:00:00	7/8/03 12:00	6.21	-1.67	-3.83
07/09/03	0:00:00	7/9/03 0:00	9.88	-1.67	-3.83
07/09/03	12:00:00	7/9/03 12:00	6.99	-1.65	-3.82
07/10/03	0:00:00	7/10/03 0:00	11.88	-1.63	-3.79
07/10/03	12:00:00	7/10/03 12:00	7.12	-1.63	-3.82
07/11/03	0:00:00	7/11/03 0:00	16.60	-1.59	-3.79
07/11/03	12:00:00	7/11/03 12:00	10.11	-1.61	-3.79
07/12/03	0:00:00	7/12/03 0:00	10.64	-1.59	-3.79
07/12/03	12:00:00	7/12/03 12:00	9.93	-1.57	-3.77
07/13/03	0:00:00	7/13/03 0:00	17.70	-1.59	-3.79
07/13/03	12:00:00	7/13/03 12:00	10.03	-1.55	-3.79
07/14/03	0:00:00	7/14/03 0:00	9.85	-1.16	-3.76
07/14/03	12:00:00	7/14/03 12:00	8.40	-1.29	-3.73
07/15/03	0:00:00	7/15/03 0:00	18.56	-1.27	-3.73
07/15/03	12:00:00	7/15/03 12:00	9.39	-1.29	-3.73
07/16/03	0:00:00	7/16/03 0:00	8.69	-1.29	-3.73
07/16/03	12:00:00	7/16/03 12:00	5.66	-1.29	-3.72
07/17/03	0:00:00	7/17/03 0:00	6.74	-1.31	-3.70
07/17/03	12:00:00	7/17/03 12:00	5.31	-1.31	-3.72
07/18/03	0:00:00	7/18/03 0:00	6.62	-1.33	-3.72
07/18/03	12:00:00	7/18/03 12:00	8.52	-1.34	-3.72
07/19/03	0:00:00	7/19/03 0:00	11.67	-1.34	-3.72
07/19/03	12:00:00	7/19/03 12:00	10.54	-1.34	-3.70
07/20/03	0:00:00	7/20/03 0:00	14.33	-1.34	-3.70
07/20/03	12:00:00	7/20/03 12:00	9.14	-1.35	-3.70
07/21/03	0:00:00	7/21/03 0:00	23.41	-1.35	-3.67
07/21/03	12:00:00	7/21/03 12:00	15.67	-1.33	-3.66
07/22/03	0:00:00	7/22/03 0:00	25.18	-1.37	-3.70
07/22/03	12:00:00	7/22/03 12:00	16.48	-1.34	-3.66
07/23/03	0:00:00	7/23/03 0:00	22.88	-1.34	-3.66
07/23/03	12:00:00	7/23/03 12:00	15.77	-1.34	-3.66
07/24/03	0:00:00	7/24/03 0:00	15.93	-1.35	-3.66
07/24/03	12:00:00	7/24/03 12:00	11.19	-1.34	-3.66
07/25/03	0:00:00	7/25/03 0:00	18.29	-1.34	-3.64
07/25/03	12:00:00	7/25/03 12:00	17.29	-1.34	-3.64
07/26/03	0:00:00	7/26/03 0:00	12.95	-1.34	-3.64
07/26/03	12:00:00	7/26/03 12:00	10.94	-1.35	-3.66
07/27/03	0:00:00	7/27/03 0:00	8.95	-1.34	-3.63
07/27/03	12:00:00	7/27/03 12:00	6.46	-1.33	-3.61
07/28/03	0:00:00	7/28/03 0:00	12.11	-1.34	-3.64
07/28/03	12:00:00	7/28/03 12:00	5.03	-1.34	-3.63
07/29/03	0:00:00	7/29/03 0:00	5.89	-1.34	-3.61
07/29/03	12:00:00	7/29/03 12:00	5.34	-1.33	-3.59
07/30/03	0:00:00	7/30/03 0:00	18.77	-1.33	-3.59
07/30/03	12:00:00	7/30/03 12:00	8.32	-1.34	-3.61
07/31/03	0:00:00	7/31/03 0:00	7.24	-1.31	-3.56
07/31/03	12:00:00	7/31/03 12:00	5.34	-1.34	-3.59

08/01/03	0:00:00	8/1/03 0:00	10.38	-1.33	-3.56
08/01/03	12:00:00	8/1/03 12:00	5.33	-1.29	-3.54
08/02/03	0:00:00	8/2/03 0:00	12.17	-1.31	-3.54
08/02/03	12:00:00	8/2/03 12:00	7.01	-1.29	-3.52
08/03/03	0:00:00	8/3/03 0:00	14.39	-1.33	-3.56
08/03/03	12:00:00	8/3/03 12:00	7.82	-1.31	-3.54
08/04/03	0:00:00	8/4/03 0:00	17.74	-1.27	-3.51
08/04/03	12:00:00	8/4/03 12:00	7.62	-1.29	-3.51
08/05/03	0:00:00	8/5/03 0:00	12.27	-1.29	-3.51
08/05/03	12:00:00	8/5/03 12:00	9.27	-1.31	-3.52
08/06/03	0:00:00	8/6/03 0:00	4.45	-1.31	-3.51
08/06/03	12:00:00	8/6/03 12:00	2.01	-1.29	-3.50
08/07/03	0:00:00	8/7/03 0:00	8.32	-1.27	-3.50
08/07/03	12:00:00	8/7/03 12:00	6.83	-1.27	-3.50
08/08/03	0:00:00	8/8/03 0:00	5.38	-1.29	-3.50
08/08/03	12:00:00	8/8/03 12:00	0.59	-1.27	-3.48
08/09/03	0:00:00	8/9/03 0:00	2.07	-1.27	-3.48
08/09/03	12:00:00	8/9/03 12:00	6.30	-1.25	-3.48
08/10/03	0:00:00	8/10/03 0:00	17.97	-1.31	-3.51
08/10/03	12:00:00	8/10/03 12:00	10.74	-1.29	-3.50
08/11/03	0:00:00	8/11/03 0:00	10.09	-1.27	-3.48
08/11/03	12:00:00	8/11/03 12:00	11.83	-1.25	-3.46
08/12/03	0:00:00	8/12/03 0:00	3.96	-1.27	-3.46
08/12/03	12:00:00	8/12/03 12:00	1.66	-1.23	-3.42
08/13/03	0:00:00	8/13/03 0:00	6.35	-1.23	-3.44
08/13/03	12:00:00	8/13/03 12:00	5.47	-1.25	-3.44
08/14/03	0:00:00	8/14/03 0:00	6.86	-1.23	-3.42
08/14/03	12:00:00	8/14/03 12:00	6.26	-1.21	-3.40
08/15/03	0:00:00	8/15/03 0:00	12.69	-1.23	-3.42
08/15/03	12:00:00	8/15/03 12:00	11.23	-1.23	-3.40
08/16/03	0:00:00	8/16/03 0:00	18.72	-1.23	-3.40
08/16/03	12:00:00	8/16/03 12:00	14.51	-1.25	-3.42
08/17/03	0:00:00	8/17/03 0:00	18.79	-1.19	-3.38
08/17/03	12:00:00	8/17/03 12:00	8.50	-1.21	-3.38
08/18/03	0:00:00	8/18/03 0:00	7.90	-1.19	-3.36
08/18/03	12:00:00	8/18/03 12:00	4.43	-1.21	-3.36
08/19/03	0:00:00	8/19/03 0:00	8.56	-1.19	-3.36
08/19/03	12:00:00	8/19/03 12:00	3.77	-1.19	-3.34
08/20/03	0:00:00	8/20/03 0:00	6.53	-1.21	-3.36
08/20/03	12:00:00	8/20/03 12:00	2.36	-1.19	-3.36
08/21/03	0:00:00	8/21/03 0:00	7.92	-1.18	-3.34
08/21/03	12:00:00	8/21/03 12:00	6.15	-1.16	-3.33
08/22/03	0:00:00	8/22/03 0:00	8.32	-1.18	-3.34
08/22/03	12:00:00	8/22/03 12:00	6.45	-1.16	-3.34
08/23/03	0:00:00	8/23/03 0:00	14.17	-1.19	-3.36
08/23/03	12:00:00	8/23/03 12:00	6.19	-1.15	-3.33
08/24/03	0:00:00	8/24/03 0:00	6.18	-1.13	-3.33
08/24/03	12:00:00	8/24/03 12:00	7.16	-1.15	-3.33
08/25/03	0:00:00	8/25/03 0:00	13.72	-1.16	-3.33
08/25/03	12:00:00	8/25/03 12:00	4.61	-1.16	-3.33
08/26/03	0:00:00	8/26/03 0:00	5.59	-1.15	-3.33
08/26/03	12:00:00	8/26/03 12:00	6.00	-1.13	-3.31

08/27/03	0:00:00	8/27/03 0:00	12.03	-1.13	-3.31
08/27/03	12:00:00	8/27/03 12:00	8.59	-1.13	-3.31
08/28/03	0:00:00	8/28/03 0:00	8.81	-1.15	-3.33
08/28/03	12:00:00	8/28/03 12:00	5.19	-1.15	-3.31
08/29/03	0:00:00	8/29/03 0:00	6.62	-1.16	-3.33
08/29/03	12:00:00	8/29/03 12:00	6.02	-1.11	-3.29
08/30/03	0:00:00	8/30/03 0:00	10.11	-1.15	-3.31
08/30/03	12:00:00	8/30/03 12:00	3.41	-1.13	-3.29
08/31/03	0:00:00	8/31/03 0:00	12.94	-1.15	-3.31
08/31/03	12:00:00	8/31/03 12:00	11.39	-1.13	-3.29
09/01/03	0:00:00	9/1/03 0:00	15.35	-1.15	-3.29
09/01/03	12:00:00	9/1/03 12:00	4.19	-1.13	-3.27
09/02/03	0:00:00	9/2/03 0:00	4.63	-1.13	-3.27
09/02/03	12:00:00	9/2/03 12:00	3.81	-1.13	-3.26
09/03/03	0:00:00	9/3/03 0:00	13.83	-1.13	-3.27
09/03/03	12:00:00	9/3/03 12:00	9.13	-1.11	-3.26

SERID=TTAYLOR JOB=155 QUEUE=GE-TEST DATE=4/8/2004 TIME=4:07:10 PM

DATALOGGER #: 4
 DESCRIPTION : 206116 Petro Canada NUNA Drilling Sump
 SAMPLE RATE : 12:00:00 Date Installed: April 24, 2003?
 PRECISION : -DOUBLE- Located beyond toe of cap fill, plus air temperature probe
 LAST RECORDING: 03/09/03
 DATE TIME
 MM/DD/YY HH:MM:SS

EBA Temperature Bead Calibration (C)			0.05	0.04	0.04	0
	Depth of Thermistor (m)	Surface Temperature	3.5m	6m	Ambient Air Temperature	
04/25/03	0:00:00 4/25/03 0:00	-4.60	-8.99	-6.36	-4.86	
04/25/03	12:00:00 4/25/03 12:00	2.23	-9.01	-6.41	1.54	
04/26/03	0:00:00 4/26/03 0:00	-0.54	-9.06	-6.47	-0.55	
04/26/03	12:00:00 4/26/03 12:00	3.38	-9.08	-6.52	4.53	
04/27/03	0:00:00 4/27/03 0:00	-2.34	-9.08	-6.52	-2.57	
04/27/03	12:00:00 4/27/03 12:00	2.55	-9.10	-6.53	4.11	
04/28/03	0:00:00 4/28/03 0:00	-0.80	-9.08	-6.53	-0.67	
04/28/03	12:00:00 4/28/03 12:00	4.38	-9.10	-6.56	6.28	
04/29/03	0:00:00 4/29/03 0:00	-1.98	-9.10	-6.58	-2.24	
04/29/03	12:00:00 4/29/03 12:00	0.94	-9.08	-6.60	0.63	
04/30/03	0:00:00 4/30/03 0:00	-1.61	-9.08	-6.60	-1.54	
04/30/03	12:00:00 4/30/03 12:00	0.11	-8.99	-6.60	-0.13	
05/01/03	0:00:00 5/1/03 0:00	-4.18	-8.61	-6.67	-4.23	
05/01/03	12:00:00 5/1/03 12:00	-1.80	-8.83	-6.63	-1.70	
05/02/03	0:00:00 5/2/03 0:00	-6.55	-8.83	-6.67	-6.75	
05/02/03	12:00:00 5/2/03 12:00	-2.14	-8.83	-6.67	0.73	
05/03/03	0:00:00 5/3/03 0:00	-6.42	-8.81	-6.71	-6.50	
05/03/03	12:00:00 5/3/03 12:00	-4.64	-8.77	-6.71	-4.35	
05/04/03	0:00:00 5/4/03 0:00	-8.08	-8.72	-6.71	-8.15	
05/04/03	12:00:00 5/4/03 12:00	-2.34	-8.68	-6.71	-2.36	
05/05/03	0:00:00 5/5/03 0:00	-11.05	-8.65	-6.72	-11.04	
05/05/03	12:00:00 5/5/03 12:00	-0.82	-8.61	-6.76	-1.14	
05/06/03	0:00:00 5/6/03 0:00	-5.09	-8.54	-6.76	-5.16	
05/06/03	12:00:00 5/6/03 12:00	-2.32	-8.50	-6.78	-2.55	
05/07/03	0:00:00 5/7/03 0:00	-9.43	-8.47	-6.76	-9.46	
05/07/03	12:00:00 5/7/03 12:00	-6.10	-8.42	-6.78	-4.35	
05/08/03	0:00:00 5/8/03 0:00	-8.08	-8.36	-6.78	-8.11	
05/08/03	12:00:00 5/8/03 12:00	-2.07	-8.31	-6.80	-2.03	
05/09/03	0:00:00 5/9/03 0:00	-2.58	-8.27	-6.80	-2.41	
05/09/03	12:00:00 5/9/03 12:00	5.74	-8.22	-6.82	7.10	
05/10/03	0:00:00 5/10/03 0:00	-6.45	-8.16	-6.84	-6.56	
05/10/03	12:00:00 5/10/03 12:00	-3.08	-8.12	-6.86	-3.66	
05/11/03	0:00:00 5/11/03 0:00	-3.97	-8.11	-6.86	-4.02	
05/11/03	12:00:00 5/11/03 12:00	-2.04	-8.05	-6.84	-1.38	
05/12/03	0:00:00 5/12/03 0:00	-6.75	-8.00	-6.86	-6.93	
05/12/03	12:00:00 5/12/03 12:00	-2.64	-7.94	-6.86	-2.08	
05/13/03	0:00:00 5/13/03 0:00	-5.78	-7.91	-6.89	-5.89	
05/13/03	12:00:00 5/13/03 12:00	-2.52	-7.85	-6.86	-2.14	
05/14/03	0:00:00 5/14/03 0:00	-5.76	-7.83	-6.89	-5.88	
05/14/03	12:00:00 5/14/03 12:00	-5.83	-7.77	-6.89	-5.88	
05/15/03	0:00:00 5/15/03 0:00	-7.62	-7.76	-6.89	-7.80	

05/15/03	12:00:00	5/15/03 12:00	-5.99	-7.69	-6.89	-7.19
05/16/03	0:00:00	5/16/03 0:00	-8.83	-7.65	-6.89	-9.04
05/16/03	12:00:00	5/16/03 12:00	-3.76	-7.63	-6.93	-2.77
05/17/03	0:00:00	5/17/03 0:00	-4.64	-7.58	-6.89	-6.77
05/17/03	12:00:00	5/17/03 12:00	1.73	-7.54	-6.91	3.75
05/18/03	0:00:00	5/18/03 0:00	-2.72	-7.50	-6.89	-3.94
05/18/03	12:00:00	5/18/03 12:00	5.57	-7.46	-6.91	6.11
05/19/03	0:00:00	5/19/03 0:00	3.61	-7.42	-6.91	3.14
05/19/03	12:00:00	5/19/03 12:00	3.83	-7.41	-6.91	9.18
05/20/03	0:00:00	5/20/03 0:00	-0.84	-7.35	-6.89	-0.97
05/20/03	12:00:00	5/20/03 12:00	6.51	-7.35	-6.93	6.54
05/21/03	0:00:00	5/21/03 0:00	0.40	-7.26	-6.89	0.45
05/21/03	12:00:00	5/21/03 12:00	2.67	-7.24	-6.91	2.86
05/22/03	0:00:00	5/22/03 0:00	-1.11	-7.21	-6.89	-1.21
05/22/03	12:00:00	5/22/03 12:00	1.11	-7.17	-6.89	1.53
05/23/03	0:00:00	5/23/03 0:00	-1.76	-7.11	-6.88	-1.87
05/23/03	12:00:00	5/23/03 12:00	-1.01	-7.11	-6.89	-0.40
05/24/03	0:00:00	5/24/03 0:00	-5.03	-7.07	-6.93	-5.25
05/24/03	12:00:00	5/24/03 12:00	-1.07	-7.06	-6.88	-1.89
05/25/03	0:00:00	5/25/03 0:00	-4.50	-7.03	-6.91	-4.53
05/25/03	12:00:00	5/25/03 12:00	-0.18	-6.97	-6.88	1.05
05/26/03	0:00:00	5/26/03 0:00	-3.63	-6.97	-6.91	-3.84
05/26/03	12:00:00	5/26/03 12:00	1.67	-6.89	-6.88	-0.05
05/27/03	0:00:00	5/27/03 0:00	1.32	-6.88	-6.88	0.51
05/27/03	12:00:00	5/27/03 12:00	10.00	-6.84	-6.88	10.23
05/28/03	0:00:00	5/28/03 0:00	8.14	-6.80	-6.86	8.41
05/28/03	12:00:00	5/28/03 12:00	15.39	-6.78	-6.88	15.71
05/29/03	0:00:00	5/29/03 0:00	0.48	-6.72	-6.86	0.41
05/29/03	12:00:00	5/29/03 12:00	6.59	-6.72	-6.88	6.69
05/30/03	0:00:00	5/30/03 0:00	0.40	-6.69	-6.86	0.41
05/30/03	12:00:00	5/30/03 12:00	3.84	-6.67	-6.86	3.33
05/31/03	0:00:00	5/31/03 0:00	-1.16	-6.60	-6.84	-2.45
05/31/03	12:00:00	5/31/03 12:00	7.34	-6.58	-6.86	9.31
06/01/03	0:00:00	6/1/03 0:00	3.23	-6.56	-6.86	2.30
06/01/03	12:00:00	6/1/03 12:00	15.38	-6.53	-6.84	17.64
06/02/03	0:00:00	6/2/03 0:00	8.51	-6.50	-6.84	8.25
06/02/03	12:00:00	6/2/03 12:00	9.42	-6.46	-6.82	12.21
06/03/03	0:00:00	6/3/03 0:00	0.08	-6.41	-6.82	-0.03
06/03/03	12:00:00	6/3/03 12:00	7.66	-6.37	-6.80	9.69
06/04/03	0:00:00	6/4/03 0:00	8.70	-6.36	-6.80	7.04
06/04/03	12:00:00	6/4/03 12:00	9.86	-6.36	-6.82	14.63
06/05/03	0:00:00	6/5/03 0:00	4.42	-6.32	-6.80	3.75
06/05/03	12:00:00	6/5/03 12:00	11.11	-6.30	-6.80	11.99
06/06/03	0:00:00	6/6/03 0:00	0.78	-6.24	-6.76	0.74
06/06/03	12:00:00	6/6/03 12:00	3.38	-6.21	-6.78	4.09
06/07/03	0:00:00	6/7/03 0:00	0.76	-6.19	-6.76	0.57
06/07/03	12:00:00	6/7/03 12:00	11.99	-6.17	-6.76	14.31
06/08/03	0:00:00	6/8/03 0:00	7.02	-6.15	-6.78	5.71
06/08/03	12:00:00	6/8/03 12:00	8.59	-6.09	-6.72	13.60
06/09/03	0:00:00	6/9/03 0:00	5.14	-6.07	-6.73	4.93
06/09/03	12:00:00	6/9/03 12:00	12.52	-6.05	-6.73	16.27
06/10/03	0:00:00	6/10/03 0:00	0.47	-6.02	-6.71	0.37

06/10/03	12:00:00	6/10/03 12:00	5.46	-6.00	-6.72	6.51
06/11/03	0:00:00	6/11/03 0:00	-0.24	-5.96	-6.71	-0.33
06/11/03	12:00:00	6/11/03 12:00	3.90	-5.94	-6.71	6.76
06/12/03	0:00:00	6/12/03 0:00	-2.01	-5.88	-6.69	-2.98
06/12/03	12:00:00	6/12/03 12:00	4.94	-5.90	-6.71	10.11
06/13/03	0:00:00	6/13/03 0:00	0.30	-5.84	-6.69	-1.50
06/13/03	12:00:00	6/13/03 12:00	4.54	-5.84	-6.71	8.36
06/14/03	0:00:00	6/14/03 0:00	4.97	-5.81	-6.69	0.57
06/14/03	12:00:00	6/14/03 12:00	13.24	-5.79	-6.67	16.38
06/15/03	0:00:00	6/15/03 0:00	4.86	-5.73	-6.65	4.35
06/15/03	12:00:00	6/15/03 12:00	7.68	-5.70	-6.65	7.37
06/16/03	0:00:00	6/16/03 0:00	2.37	-5.69	-6.65	2.46
06/16/03	12:00:00	6/16/03 12:00	5.52	-5.68	-6.65	7.08
06/17/03	0:00:00	6/17/03 0:00	0.28	-5.68	-6.63	-0.29
06/17/03	12:00:00	6/17/03 12:00	7.05	-5.63	-6.60	9.86
06/18/03	0:00:00	6/18/03 0:00	0.15	-5.63	-6.60	0.25
06/18/03	12:00:00	6/18/03 12:00	4.85	-5.59	-6.58	7.26
06/19/03	0:00:00	6/19/03 0:00	6.57	-5.56	-6.58	2.94
06/19/03	12:00:00	6/19/03 12:00	6.49	-5.54	-6.58	10.85
06/20/03	0:00:00	6/20/03 0:00	1.27	-5.52	-6.56	1.15
06/20/03	12:00:00	6/20/03 12:00	8.94	-5.50	-6.56	13.88
06/21/03	0:00:00	6/21/03 0:00	4.58	-5.46	-6.54	3.48
06/21/03	12:00:00	6/21/03 12:00	17.30	-5.46	-6.56	18.50
06/22/03	0:00:00	6/22/03 0:00	5.00	-5.42	-6.54	3.46
06/22/03	12:00:00	6/22/03 12:00	13.52	-5.38	-6.53	14.84
06/23/03	0:00:00	6/23/03 0:00	6.86	-5.36	-6.52	4.51
06/23/03	12:00:00	6/23/03 12:00	6.38	-5.34	-6.52	11.50
06/24/03	0:00:00	6/24/03 0:00	5.42	-5.33	-6.50	2.17
06/24/03	12:00:00	6/24/03 12:00	11.40	-5.33	-6.52	13.12
06/25/03	0:00:00	6/25/03 0:00	9.91	-5.31	-6.47	8.12
06/25/03	12:00:00	6/25/03 12:00	18.71	-5.29	-6.50	20.19
06/26/03	0:00:00	6/26/03 0:00	16.57	-5.27	-6.50	14.33
06/26/03	12:00:00	6/26/03 12:00	20.86	-5.19	-6.41	22.43
06/27/03	0:00:00	6/27/03 0:00	12.20	-5.21	-6.46	9.70
06/27/03	12:00:00	6/27/03 12:00	16.51	-5.19	-6.46	18.28
06/28/03	0:00:00	6/28/03 0:00	12.07	-5.17	-6.43	9.93
06/28/03	12:00:00	6/28/03 12:00	17.80	-5.12	-6.37	19.49
06/29/03	0:00:00	6/29/03 0:00	14.20	-5.12	-6.41	13.08
06/29/03	12:00:00	6/29/03 12:00	22.01	-5.08	-6.37	24.17
06/30/03	0:00:00	6/30/03 0:00	18.88	-5.04	-6.36	15.70
06/30/03	12:00:00	6/30/03 12:00	23.48	-5.06	-6.36	24.83
07/01/03	0:00:00	7/1/03 0:00	19.33	-5.00	-6.36	16.66
07/01/03	12:00:00	7/1/03 12:00	23.13	-4.99	-6.36	22.57
07/02/03	0:00:00	7/2/03 0:00	19.59	-4.99	-6.34	19.46
07/02/03	12:00:00	7/2/03 12:00	25.56	-4.99	-6.36	25.89
07/03/03	0:00:00	7/3/03 0:00	18.32	-4.95	-6.32	18.31
07/03/03	12:00:00	7/3/03 12:00	24.83	-4.91	-6.32	25.42
07/04/03	0:00:00	7/4/03 0:00	8.13	-4.91	-6.32	7.93
07/04/03	12:00:00	7/4/03 12:00	15.83	-4.91	-6.34	18.66
07/05/03	0:00:00	7/5/03 0:00	14.82	-4.87	-6.32	12.25
07/05/03	12:00:00	7/5/03 12:00	23.60	-4.87	-6.28	23.79
07/06/03	0:00:00	7/6/03 0:00	19.33	-4.83	-6.26	17.62

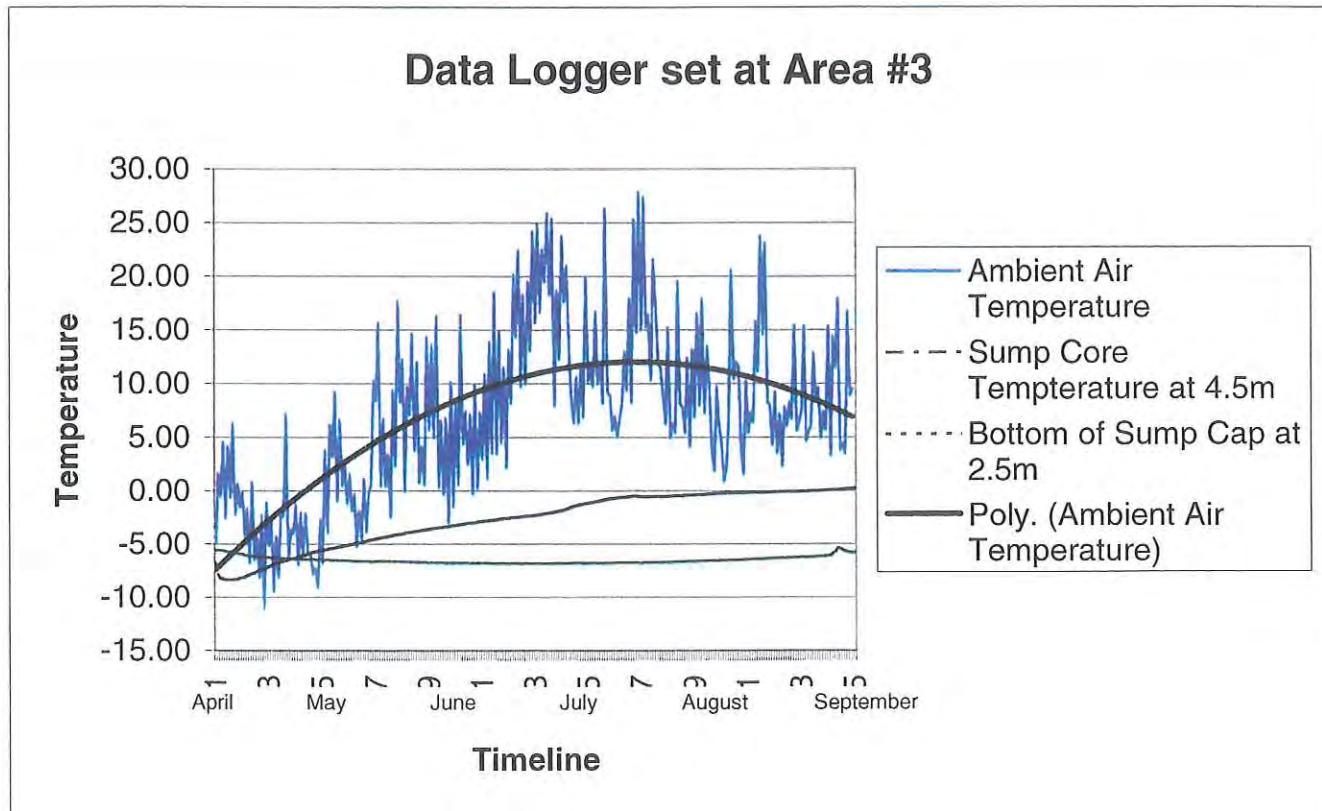
07/06/03	12:00:00	7/6/03 12:00	21.28	-4.82	-6.24	21.01
07/07/03	0:00:00	7/7/03 0:00	13.05	-4.80	-6.28	12.82
07/07/03	12:00:00	7/7/03 12:00	8.16	-4.78	-6.24	8.61
07/08/03	0:00:00	7/8/03 0:00	6.16	-4.76	-6.24	6.33
07/08/03	12:00:00	7/8/03 12:00	11.05	-4.76	-6.24	10.64
07/09/03	0:00:00	7/9/03 0:00	6.56	-4.74	-6.24	6.35
07/09/03	12:00:00	7/9/03 12:00	11.57	-4.74	-6.24	11.54
07/10/03	0:00:00	7/10/03 0:00	6.95	-4.66	-6.20	6.88
07/10/03	12:00:00	7/10/03 12:00	13.48	-4.66	-6.20	19.98
07/11/03	0:00:00	7/11/03 0:00	13.42	-4.66	-6.20	10.25
07/11/03	12:00:00	7/11/03 12:00	12.06	-4.65	-6.19	11.56
07/12/03	0:00:00	7/12/03 0:00	11.75	-4.63	-6.17	9.69
07/12/03	12:00:00	7/12/03 12:00	16.55	-4.63	-6.19	16.73
07/13/03	0:00:00	7/13/03 0:00	9.91	-4.59	-6.15	9.97
07/13/03	12:00:00	7/13/03 12:00	9.20	-4.57	-6.15	11.82
07/14/03	0:00:00	7/14/03 0:00	8.17	-4.55	-6.13	8.16
07/14/03	12:00:00	7/14/03 12:00	18.16	-4.48	-6.07	26.35
07/15/03	0:00:00	7/15/03 0:00	9.08	-4.51	-6.11	9.18
07/15/03	12:00:00	7/15/03 12:00	8.76	-4.49	-6.09	8.91
07/16/03	0:00:00	7/16/03 0:00	5.37	-4.49	-6.09	5.66
07/16/03	12:00:00	7/16/03 12:00	6.83	-4.47	-6.09	6.90
07/17/03	0:00:00	7/17/03 0:00	5.34	-4.45	-6.07	5.06
07/17/03	12:00:00	7/17/03 12:00	7.04	-4.42	-6.05	6.67
07/18/03	0:00:00	7/18/03 0:00	8.00	-4.42	-6.05	8.14
07/18/03	12:00:00	7/18/03 12:00	12.52	-4.38	-6.03	12.95
07/19/03	0:00:00	7/19/03 0:00	11.55	-4.37	-6.03	9.35
07/19/03	12:00:00	7/19/03 12:00	15.53	-4.35	-6.02	17.93
07/20/03	0:00:00	7/20/03 0:00	9.46	-4.35	-6.02	8.20
07/20/03	12:00:00	7/20/03 12:00	23.90	-4.31	-5.98	25.30
07/21/03	0:00:00	7/21/03 0:00	16.57	-4.31	-6.02	14.77
07/21/03	12:00:00	7/21/03 12:00	24.81	-4.29	-5.98	27.89
07/22/03	0:00:00	7/22/03 0:00	15.68	-4.27	-5.94	14.99
07/22/03	12:00:00	7/22/03 12:00	21.61	-4.27	-5.94	27.42
07/23/03	0:00:00	7/23/03 0:00	15.34	-4.27	-6.00	15.31
07/23/03	12:00:00	7/23/03 12:00	15.78	-4.24	-5.98	16.46
07/24/03	0:00:00	7/24/03 0:00	10.46	-4.21	-5.96	10.33
07/24/03	12:00:00	7/24/03 12:00	19.67	-4.19	-5.96	21.58
07/25/03	0:00:00	7/25/03 0:00	17.12	-4.17	-5.94	17.29
07/25/03	12:00:00	7/25/03 12:00	11.81	-4.17	-5.94	11.96
07/26/03	0:00:00	7/26/03 0:00	11.39	-4.15	-5.90	11.50
07/26/03	12:00:00	7/26/03 12:00	8.78	-4.13	-5.88	8.95
07/27/03	0:00:00	7/27/03 0:00	6.48	-4.13	-5.90	6.24
07/27/03	12:00:00	7/27/03 12:00	12.26	-4.11	-5.88	15.20
07/28/03	0:00:00	7/28/03 0:00	4.78	-4.09	-5.88	4.93
07/28/03	12:00:00	7/28/03 12:00	6.29	-4.07	-5.85	6.27
07/29/03	0:00:00	7/29/03 0:00	5.44	-4.07	-5.84	5.41
07/29/03	12:00:00	7/29/03 12:00	18.95	-4.03	-5.79	19.53
07/30/03	0:00:00	7/30/03 0:00	8.16	-4.00	-5.83	8.11
07/30/03	12:00:00	7/30/03 12:00	7.87	-4.03	-5.83	7.80
07/31/03	0:00:00	7/31/03 0:00	5.44	-3.99	-5.81	5.39
07/31/03	12:00:00	7/31/03 12:00	8.30	-3.98	-5.81	12.39
08/01/03	0:00:00	8/1/03 0:00	4.31	-3.98	-5.77	4.15

08/01/03	12:00:00	8/1/03 12:00	12.19	-3.98	-5.79	13.14
08/02/03	0:00:00	8/2/03 0:00	6.89	-3.96	-5.77	6.88
08/02/03	12:00:00	8/2/03 12:00	13.73	-3.96	-5.79	16.52
08/03/03	0:00:00	8/3/03 0:00	7.84	-3.92	-5.73	7.95
08/03/03	12:00:00	8/3/03 12:00	17.56	-3.88	-5.69	17.90
08/04/03	0:00:00	8/4/03 0:00	7.34	-3.88	-5.73	7.26
08/04/03	12:00:00	8/4/03 12:00	12.14	-3.90	-5.73	13.47
08/05/03	0:00:00	8/5/03 0:00	9.44	-3.86	-5.70	9.70
08/05/03	12:00:00	8/5/03 12:00	3.73	-3.86	-5.70	3.61
08/06/03	0:00:00	8/6/03 0:00	1.90	-3.84	-5.68	1.88
08/06/03	12:00:00	8/6/03 12:00	9.50	-3.81	-5.68	9.70
08/07/03	0:00:00	8/7/03 0:00	5.89	-3.81	-5.68	6.15
08/07/03	12:00:00	8/7/03 12:00	4.22	-3.81	-5.68	4.63
08/08/03	0:00:00	8/8/03 0:00	0.74	-3.80	-5.68	0.90
08/08/03	12:00:00	8/8/03 12:00	2.07	-3.77	-5.68	2.15
08/09/03	0:00:00	8/9/03 0:00	6.69	-3.75	-5.68	6.83
08/09/03	12:00:00	8/9/03 12:00	18.00	-3.75	-5.65	20.60
08/10/03	0:00:00	8/10/03 0:00	10.46	-3.74	-5.65	10.41
08/10/03	12:00:00	8/10/03 12:00	12.36	-3.71	-5.61	12.01
08/11/03	0:00:00	8/11/03 0:00	11.59	-3.71	-5.63	11.60
08/11/03	12:00:00	8/11/03 12:00	4.10	-3.68	-5.61	3.66
08/12/03	0:00:00	8/12/03 0:00	1.59	-3.68	-5.61	1.54
08/12/03	12:00:00	8/12/03 12:00	5.54	-3.65	-5.59	10.17
08/13/03	0:00:00	8/13/03 0:00	5.37	-3.65	-5.59	5.43
08/13/03	12:00:00	8/13/03 12:00	6.42	-3.65	-5.59	7.29
08/14/03	0:00:00	8/14/03 0:00	6.35	-3.64	-5.59	6.37
08/14/03	12:00:00	8/14/03 12:00	12.56	-3.64	-5.54	15.82
08/15/03	0:00:00	8/15/03 0:00	10.99	-3.64	-5.54	11.17
08/15/03	12:00:00	8/15/03 12:00	19.51	-3.59	-5.51	23.74
08/16/03	0:00:00	8/16/03 0:00	14.47	-3.61	-5.52	14.54
08/16/03	12:00:00	8/16/03 12:00	17.28	-3.61	-5.51	23.14
08/17/03	0:00:00	8/17/03 0:00	8.33	-3.59	-5.51	8.28
08/17/03	12:00:00	8/17/03 12:00	7.93	-3.54	-5.50	8.04
08/18/03	0:00:00	8/18/03 0:00	4.32	-3.54	-5.50	4.33
08/18/03	12:00:00	8/18/03 12:00	9.46	-3.54	-5.50	9.18
08/19/03	0:00:00	8/19/03 0:00	3.37	-3.52	-5.48	3.52
08/19/03	12:00:00	8/19/03 12:00	7.34	-3.52	-5.48	7.13
08/20/03	0:00:00	8/20/03 0:00	2.29	-3.49	-5.44	2.34
08/20/03	12:00:00	8/20/03 12:00	8.61	-3.50	-5.46	7.79
08/21/03	0:00:00	8/21/03 0:00	6.06	-3.49	-5.44	6.07
08/21/03	12:00:00	8/21/03 12:00	8.57	-3.46	-5.39	8.28
08/22/03	0:00:00	8/22/03 0:00	6.51	-3.48	-5.44	6.69
08/22/03	12:00:00	8/22/03 12:00	14.47	-3.46	-5.39	15.45
08/23/03	0:00:00	8/23/03 0:00	5.62	-3.46	-5.42	5.63
08/23/03	12:00:00	8/23/03 12:00	6.93	-3.44	-5.39	6.40
08/24/03	0:00:00	8/24/03 0:00	7.40	-3.42	-5.38	7.41
08/24/03	12:00:00	8/24/03 12:00	14.07	-3.42	-5.36	15.35
08/25/03	0:00:00	8/25/03 0:00	4.52	-3.40	-5.36	4.68
08/25/03	12:00:00	8/25/03 12:00	6.20	-3.38	-5.36	5.66
08/26/03	0:00:00	8/26/03 0:00	5.99	-3.38	-5.34	6.09
08/26/03	12:00:00	8/26/03 12:00	12.19	-3.38	-5.34	12.81
08/27/03	0:00:00	8/27/03 0:00	8.30	-3.36	-5.33	8.27

08/27/03	12:00:00	8/27/03 12:00	9.17	-3.34	-5.33	9.59
08/28/03	0:00:00	8/28/03 0:00	4.97	-3.34	-5.33	4.95
08/28/03	12:00:00	8/28/03 12:00	7.52	-3.32	-5.33	7.35
08/29/03	0:00:00	8/29/03 0:00	5.73	-3.32	-5.33	5.69
08/29/03	12:00:00	8/29/03 12:00	9.00	-3.31	-5.31	15.33
08/30/03	0:00:00	8/30/03 0:00	3.35	-3.31	-5.29	3.33
08/30/03	12:00:00	8/30/03 12:00	13.05	-3.31	-5.31	14.37
08/31/03	0:00:00	8/31/03 0:00	11.39	-3.31	-5.29	11.47
08/31/03	12:00:00	8/31/03 12:00	17.18	-3.29	-5.25	17.93
09/01/03	0:00:00	9/1/03 0:00	3.86	-3.27	-5.27	3.78
09/01/03	12:00:00	9/1/03 12:00	4.97	-3.27	-5.27	4.47
09/02/03	0:00:00	9/2/03 0:00	3.51	-3.25	-5.22	3.46
09/02/03	12:00:00	9/2/03 12:00	14.20	-3.25	-5.22	16.73
09/03/03	0:00:00	9/3/03 0:00	8.79	-3.24	-5.21	8.89
09/03/03	12:00:00	9/3/03 12:00	9.64	-3.24	-5.21	9.51

Petro Canada I-30

Sump Temperature Recordings



DATALOGGER #: 2
 DESCRIPTION : 206071
 File Type : 836 2211000 323
 SAMPLE RATE : 12:00:00
 PRECISION : -DOUBLE-
 LAST RECORDING: 03/09/03
 DATE TIME
 MM/DD/YY HH:MM:SS

Petro Canada NUNA Drilling Sump
 Date Installed: April 24, 2003
 Located within drill sump

EBA Temperature Bead Calibration (C)			0.04	0.02	0.03	0.02
Depth of Thermistor (m)		Surface	Temperature	2.5	4.5	7
04/24/03	12:00:00	4/24/03 12:00	0.04	-6.84	-5.64	Dead Bead?
04/25/03	0:00:00	4/25/03 0:00	-3.29	-7.93	-5.57	
04/25/03	12:00:00	4/25/03 12:00	1.21	-8.18	-5.59	
04/26/03	0:00:00	4/26/03 0:00	-0.39	-8.27	-5.62	
04/26/03	12:00:00	4/26/03 12:00	7.33	-8.36	-5.69	
04/27/03	0:00:00	4/27/03 0:00	-1.56	-8.38	-5.74	
04/27/03	12:00:00	4/27/03 12:00	5.13	-8.36	-5.76	
04/28/03	0:00:00	4/28/03 0:00	-0.43	-8.36	-5.84	
04/28/03	12:00:00	4/28/03 12:00	7.84	-8.33	-5.86	
04/29/03	0:00:00	4/29/03 0:00	-0.51	-8.29	-5.92	
04/29/03	12:00:00	4/29/03 12:00	0.55	-8.22	-5.92	
04/30/03	0:00:00	4/30/03 0:00	-1.48	-8.16	-5.95	
04/30/03	12:00:00	4/30/03 12:00	2.86	-8.11	-6.04	
05/01/03	0:00:00	5/1/03 0:00	-2.81	-8.01	-6.08	
05/01/03	12:00:00	5/1/03 12:00	-1.15	-7.92	-6.12	
05/02/03	0:00:00	5/2/03 0:00	-4.76	-7.81	-6.14	
05/02/03	12:00:00	5/2/03 12:00	-1.01	-7.73	-6.20	
05/03/03	0:00:00	5/3/03 0:00	-4.57	-7.63	-6.20	
05/03/03	12:00:00	5/3/03 12:00	-3.46	-7.54	-6.22	
05/04/03	0:00:00	5/4/03 0:00	-5.98	-7.44	-6.25	
05/04/03	12:00:00	5/4/03 12:00	-2.87	-7.37	-6.28	
05/05/03	0:00:00	5/5/03 0:00	-6.30	-7.26	-6.28	
05/05/03	12:00:00	5/5/03 12:00	4.86	-7.15	-6.28	
05/06/03	0:00:00	5/6/03 0:00	-2.99	-7.05	-6.31	
05/06/03	12:00:00	5/6/03 12:00	-1.46	-6.98	-6.33	
05/07/03	0:00:00	5/7/03 0:00	-7.38	-6.86	-6.33	
05/07/03	12:00:00	5/7/03 12:00	-2.84	-6.80	-6.35	
05/08/03	0:00:00	5/8/03 0:00	-5.15	-6.69	-6.35	
05/08/03	12:00:00	5/8/03 12:00	-0.36	-6.65	-6.38	
05/09/03	0:00:00	5/9/03 0:00	-1.17	-6.56	-6.38	
05/09/03	12:00:00	5/9/03 12:00	12.29	-6.48	-6.40	
05/10/03	0:00:00	5/10/03 0:00	-3.40	-6.41	-6.40	
05/10/03	12:00:00	5/10/03 12:00	-3.64	-6.38	-6.40	
05/11/03	0:00:00	5/11/03 0:00	-3.18	-6.38	-6.42	
05/11/03	12:00:00	5/11/03 12:00	1.07	-6.28	-6.46	
05/12/03	0:00:00	5/12/03 0:00	-4.83	-6.13	-6.42	
05/12/03	12:00:00	5/12/03 12:00	-1.24	-6.09	-6.46	
05/13/03	0:00:00	5/13/03 0:00	-3.94	-6.04	-6.46	
05/13/03	12:00:00	5/13/03 12:00	-1.41	-5.96	-6.47	
05/14/03	0:00:00	5/14/03 0:00	-3.89	-5.86	-6.46	

05/14/03	12:00:00	5/14/03 12:00	-4.24	-5.81	-6.47
05/15/03	0:00:00	5/15/03 0:00	-5.73	-5.75	-6.46
05/15/03	12:00:00	5/15/03 12:00	-2.69	-5.72	-6.51
05/16/03	0:00:00	5/16/03 0:00	-6.13	-5.67	-6.48
05/16/03	12:00:00	5/16/03 12:00	-0.75	-5.61	-6.51
05/17/03	0:00:00	5/17/03 0:00	0.37	-5.56	-6.51
05/17/03	12:00:00	5/17/03 12:00	4.89	-5.52	-6.51
05/18/03	0:00:00	5/18/03 0:00	0.04	-5.44	-6.53
05/18/03	12:00:00	5/18/03 12:00	7.97	-5.43	-6.54
05/19/03	0:00:00	5/19/03 0:00	4.11	-5.38	-6.55
05/19/03	12:00:00	5/19/03 12:00	9.50	-5.33	-6.55
05/20/03	0:00:00	5/20/03 0:00	0.91	-5.27	-6.57
05/20/03	12:00:00	5/20/03 12:00	10.48	-5.23	-6.57
05/21/03	0:00:00	5/21/03 0:00	1.58	-5.17	-6.59
05/21/03	12:00:00	5/21/03 12:00	5.98	-5.14	-6.59
05/22/03	0:00:00	5/22/03 0:00	-0.08	-5.06	-6.59
05/22/03	12:00:00	5/22/03 12:00	4.80	-5.02	-6.61
05/23/03	0:00:00	5/23/03 0:00	-0.91	-4.99	-6.61
05/23/03	12:00:00	5/23/03 12:00	0.49	-4.92	-6.62
05/24/03	0:00:00	5/24/03 0:00	-3.24	-4.89	-6.61
05/24/03	12:00:00	5/24/03 12:00	-1.30	-4.87	-6.62
05/25/03	0:00:00	5/25/03 0:00	-3.31	-4.80	-6.62
05/25/03	12:00:00	5/25/03 12:00	1.85	-4.74	-6.64
05/26/03	0:00:00	5/26/03 0:00	-2.38	-4.68	-6.64
05/26/03	12:00:00	5/26/03 12:00	4.13	-4.63	-6.66
05/27/03	0:00:00	5/27/03 0:00	3.34	-4.58	-6.66
05/27/03	12:00:00	5/27/03 12:00	9.90	-4.51	-6.61
05/28/03	0:00:00	5/28/03 0:00	10.98	-4.47	-6.62
05/28/03	12:00:00	5/28/03 12:00	16.14	-4.40	-6.61
05/29/03	0:00:00	5/29/03 0:00	2.24	-4.39	-6.62
05/29/03	12:00:00	5/29/03 12:00	7.60	-4.33	-6.61
05/30/03	0:00:00	5/30/03 0:00	1.07	-4.27	-6.62
05/30/03	12:00:00	5/30/03 12:00	5.01	-4.24	-6.64
05/31/03	0:00:00	5/31/03 0:00	0.23	-4.19	-6.62
05/31/03	12:00:00	5/31/03 12:00	6.05	-4.15	-6.62
06/01/03	0:00:00	6/1/03 0:00	4.45	-4.15	-6.66
06/01/03	12:00:00	6/1/03 12:00	14.69	-4.08	-6.64
06/02/03	0:00:00	6/2/03 0:00	12.21	-4.07	-6.68
06/02/03	12:00:00	6/2/03 12:00	12.15	-4.00	-6.68
06/03/03	0:00:00	6/3/03 0:00	5.21	-3.92	-6.66
06/03/03	12:00:00	6/3/03 12:00	11.82	-3.91	-6.68
06/04/03	0:00:00	6/4/03 0:00	10.72	-3.90	-6.70
06/04/03	12:00:00	6/4/03 12:00	13.27	-3.84	-6.70
06/05/03	0:00:00	6/5/03 0:00	7.67	-3.79	-6.68
06/05/03	12:00:00	6/5/03 12:00	13.58	-3.77	-6.72
06/06/03	0:00:00	6/6/03 0:00	1.76	-3.72	-6.72
06/06/03	12:00:00	6/6/03 12:00	6.32	-3.66	-6.68
06/07/03	0:00:00	6/7/03 0:00	3.02	-3.66	-6.73
06/07/03	12:00:00	6/7/03 12:00	13.66	-3.61	-6.74
06/08/03	0:00:00	6/8/03 0:00	15.49	-3.56	-6.72
06/08/03	12:00:00	6/8/03 12:00	11.30	-3.52	-6.74
06/09/03	0:00:00	6/9/03 0:00	7.08	-3.48	-6.73

06/09/03	12:00:00	6/9/03 12:00	11.90	-3.46	-6.74
06/10/03	0:00:00	6/10/03 0:00	1.42	-3.44	-6.77
06/10/03	12:00:00	6/10/03 12:00	8.01	-3.40	-6.74
06/11/03	0:00:00	6/11/03 0:00	0.15	-3.38	-6.77
06/11/03	12:00:00	6/11/03 12:00	4.80	-3.36	-6.79
06/12/03	0:00:00	6/12/03 0:00	-1.14	-3.29	-6.77
06/12/03	12:00:00	6/12/03 12:00	6.69	-3.25	-6.74
06/13/03	0:00:00	6/13/03 0:00	2.70	-3.25	-6.79
06/13/03	12:00:00	6/13/03 12:00	6.88	-3.17	-6.77
06/14/03	0:00:00	6/14/03 0:00	5.43	-3.17	-6.80
06/14/03	12:00:00	6/14/03 12:00	14.85	-3.11	-6.79
06/15/03	0:00:00	6/15/03 0:00	7.55	-3.08	-6.77
06/15/03	12:00:00	6/15/03 12:00	7.00	-3.03	-6.77
06/16/03	0:00:00	6/16/03 0:00	3.82	-3.05	-6.81
06/16/03	12:00:00	6/16/03 12:00	8.38	-3.00	-6.79
06/17/03	0:00:00	6/17/03 0:00	3.68	-3.00	-6.81
06/17/03	12:00:00	6/17/03 12:00	9.29	-2.92	-6.79
06/18/03	0:00:00	6/18/03 0:00	1.17	-2.89	-6.80
06/18/03	12:00:00	6/18/03 12:00	9.19	-2.88	-6.80
06/19/03	0:00:00	6/19/03 0:00	6.75	-2.84	-6.79
06/19/03	12:00:00	6/19/03 12:00	7.57	-2.83	-6.80
06/20/03	0:00:00	6/20/03 0:00	1.87	-2.80	-6.81
06/20/03	12:00:00	6/20/03 12:00	12.44	-2.75	-6.81
06/21/03	0:00:00	6/21/03 0:00	10.86	-2.74	-6.81
06/21/03	12:00:00	6/21/03 12:00	18.42	-2.71	-6.83
06/22/03	0:00:00	6/22/03 0:00	8.73	-2.68	-6.81
06/22/03	12:00:00	6/22/03 12:00	15.35	-2.63	-6.81
06/23/03	0:00:00	6/23/03 0:00	10.76	-2.59	-6.81
06/23/03	12:00:00	6/23/03 12:00	9.15	-2.58	-6.81
06/24/03	0:00:00	6/24/03 0:00	5.77	-2.58	-6.85
06/24/03	12:00:00	6/24/03 12:00	10.07	-2.51	-6.81
06/25/03	0:00:00	6/25/03 0:00	9.15	-2.51	-6.81
06/25/03	12:00:00	6/25/03 12:00	17.39	-2.49	-6.81
06/26/03	0:00:00	6/26/03 0:00	16.33	-2.47	-6.81
06/26/03	12:00:00	6/26/03 12:00	19.38	-2.44	-6.83
06/27/03	0:00:00	6/27/03 0:00	11.93	-2.42	-6.81
06/27/03	12:00:00	6/27/03 12:00	15.69	-2.39	-6.81
06/28/03	0:00:00	6/28/03 0:00	11.10	-2.35	-6.81
06/28/03	12:00:00	6/28/03 12:00	17.18	-2.35	-6.83
06/29/03	0:00:00	6/29/03 0:00	14.43	-2.32	-6.83
06/29/03	12:00:00	6/29/03 12:00	21.76	-2.28	-6.83
06/30/03	0:00:00	6/30/03 0:00	18.54	-2.25	-6.83
06/30/03	12:00:00	6/30/03 12:00	23.97	-2.22	-6.83
07/01/03	0:00:00	7/1/03 0:00	18.30	-2.17	-6.81
07/01/03	12:00:00	7/1/03 12:00	23.31	-2.16	-6.85
07/02/03	0:00:00	7/2/03 0:00	20.21	-2.12	-6.83
07/02/03	12:00:00	7/2/03 12:00	25.51	-2.09	-6.83
07/03/03	0:00:00	7/3/03 0:00	19.30	-2.02	-6.81
07/03/03	12:00:00	7/3/03 12:00	24.55	-1.99	-6.83
07/04/03	0:00:00	7/4/03 0:00	8.99	-1.94	-6.80
07/04/03	12:00:00	7/4/03 12:00	17.68	-1.89	-6.80
07/05/03	0:00:00	7/5/03 0:00	13.69	-1.84	-6.81

07/05/03	12:00:00	7/5/03 12:00	23.92	-1.79	-6.81
07/06/03	0:00:00	7/6/03 0:00	18.67	-1.71	-6.81
07/06/03	12:00:00	7/6/03 12:00	23.49	-1.64	-6.81
07/07/03	0:00:00	7/7/03 0:00	15.02	-1.52	-6.80
07/07/03	12:00:00	7/7/03 12:00	9.09	-1.44	-6.80
07/08/03	0:00:00	7/8/03 0:00	6.53	-1.38	-6.80
07/08/03	12:00:00	7/8/03 12:00	9.99	-1.35	-6.80
07/09/03	0:00:00	7/9/03 0:00	7.75	-1.28	-6.80
07/09/03	12:00:00	7/9/03 12:00	12.68	-1.26	-6.80
07/10/03	0:00:00	7/10/03 0:00	8.28	-1.20	-6.80
07/10/03	12:00:00	7/10/03 12:00	18.56	-1.17	-6.81
07/11/03	0:00:00	7/11/03 0:00	10.74	-1.11	-6.80
07/11/03	12:00:00	7/11/03 12:00	10.58	-1.08	-6.80
07/12/03	0:00:00	7/12/03 0:00	10.41	-1.01	-6.80
07/12/03	12:00:00	7/12/03 12:00	16.85	-0.97	-6.80
07/13/03	0:00:00	7/13/03 0:00	10.48	-0.93	-6.79
07/13/03	12:00:00	7/13/03 12:00	10.11	-0.86	-6.79
07/14/03	0:00:00	7/14/03 0:00	8.79	-0.81	-6.79
07/14/03	12:00:00	7/14/03 12:00	20.21	-0.78	-6.80
07/15/03	0:00:00	7/15/03 0:00	9.90	-0.73	-6.79
07/15/03	12:00:00	7/15/03 12:00	8.86	-0.72	-6.79
07/16/03	0:00:00	7/16/03 0:00	6.04	-0.69	-6.77
07/16/03	12:00:00	7/16/03 12:00	7.59	-0.65	-6.77
07/17/03	0:00:00	7/17/03 0:00	6.05	-0.63	-6.77
07/17/03	12:00:00	7/17/03 12:00	6.73	-0.62	-6.74
07/18/03	0:00:00	7/18/03 0:00	9.89	-0.62	-6.77
07/18/03	12:00:00	7/18/03 12:00	11.69	-0.59	-6.77
07/19/03	0:00:00	7/19/03 0:00	13.37	-0.54	-6.77
07/19/03	12:00:00	7/19/03 12:00	14.85	-0.51	-6.77
07/20/03	0:00:00	7/20/03 0:00	10.21	-0.49	-6.77
07/20/03	12:00:00	7/20/03 12:00	22.68	-0.53	-6.77
07/21/03	0:00:00	7/21/03 0:00	16.67	-0.51	-6.74
07/21/03	12:00:00	7/21/03 12:00	25.27	-0.57	-6.79
07/22/03	0:00:00	7/22/03 0:00	19.50	-0.55	-6.77
07/22/03	12:00:00	7/22/03 12:00	25.42	-0.53	-6.73
07/23/03	0:00:00	7/23/03 0:00	17.81	-0.55	-6.74
07/23/03	12:00:00	7/23/03 12:00	16.49	-0.53	-6.72
07/24/03	0:00:00	7/24/03 0:00	12.63	-0.55	-6.74
07/24/03	12:00:00	7/24/03 12:00	19.44	-0.54	-6.73
07/25/03	0:00:00	7/25/03 0:00	17.74	-0.54	-6.73
07/25/03	12:00:00	7/25/03 12:00	13.78	-0.55	-6.73
07/26/03	0:00:00	7/26/03 0:00	11.37	-0.53	-6.72
07/26/03	12:00:00	7/26/03 12:00	9.31	-0.53	-6.70
07/27/03	0:00:00	7/27/03 0:00	6.88	-0.51	-6.70
07/27/03	12:00:00	7/27/03 12:00	11.54	-0.53	-6.72
07/28/03	0:00:00	7/28/03 0:00	5.33	-0.47	-6.68
07/28/03	12:00:00	7/28/03 12:00	6.13	-0.49	-6.68
07/29/03	0:00:00	7/29/03 0:00	5.92	-0.47	-6.68
07/29/03	12:00:00	7/29/03 12:00	18.04	-0.49	-6.68
07/30/03	0:00:00	7/30/03 0:00	9.05	-0.47	-6.66
07/30/03	12:00:00	7/30/03 12:00	7.60	-0.43	-6.64
07/31/03	0:00:00	7/31/03 0:00	5.72	-0.41	-6.64

07/31/03	12:00:00	7/31/03 12:00	10.62	-0.41	-6.64
08/01/03	0:00:00	8/1/03 0:00	6.05	-0.41	-6.64
08/01/03	12:00:00	8/1/03 12:00	11.02	-0.39	-6.64
08/02/03	0:00:00	8/2/03 0:00	7.51	-0.38	-6.61
08/02/03	12:00:00	8/2/03 12:00	14.25	-0.38	-6.61
08/03/03	0:00:00	8/3/03 0:00	8.70	-0.38	-6.61
08/03/03	12:00:00	8/3/03 12:00	19.23	-0.38	-6.61
08/04/03	0:00:00	8/4/03 0:00	7.94	-0.31	-6.57
08/04/03	12:00:00	8/4/03 12:00	13.18	-0.31	-6.59
08/05/03	0:00:00	8/5/03 0:00	9.83	-0.29	-6.59
08/05/03	12:00:00	8/5/03 12:00	4.88	-0.25	-6.55
08/06/03	0:00:00	8/6/03 0:00	2.26	-0.25	-6.57
08/06/03	12:00:00	8/6/03 12:00	8.16	-0.27	-6.55
08/07/03	0:00:00	8/7/03 0:00	7.48	-0.23	-6.54
08/07/03	12:00:00	8/7/03 12:00	5.77	-0.23	-6.54
08/08/03	0:00:00	8/8/03 0:00	1.01	-0.22	-6.54
08/08/03	12:00:00	8/8/03 12:00	2.31	-0.22	-6.53
08/09/03	0:00:00	8/9/03 0:00	6.71	-0.22	-6.51
08/09/03	12:00:00	8/9/03 12:00	17.29	-0.21	-6.51
08/10/03	0:00:00	8/10/03 0:00	11.16	-0.21	-6.51
08/10/03	12:00:00	8/10/03 12:00	11.16	-0.21	-6.48
08/11/03	0:00:00	8/11/03 0:00	12.33	-0.21	-6.48
08/11/03	12:00:00	8/11/03 12:00	4.22	-0.17	-6.47
08/12/03	0:00:00	8/12/03 0:00	1.96	-0.19	-6.47
08/12/03	12:00:00	8/12/03 12:00	7.45	-0.19	-6.46
08/13/03	0:00:00	8/13/03 0:00	5.86	-0.15	-6.44
08/13/03	12:00:00	8/13/03 12:00	7.10	-0.14	-6.42
08/14/03	0:00:00	8/14/03 0:00	6.52	-0.15	-6.40
08/14/03	12:00:00	8/14/03 12:00	13.64	-0.15	-6.40
08/15/03	0:00:00	8/15/03 0:00	12.08	-0.15	-6.42
08/15/03	12:00:00	8/15/03 12:00	18.24	-0.17	-6.40
08/16/03	0:00:00	8/16/03 0:00	14.83	-0.14	-6.38
08/16/03	12:00:00	8/16/03 12:00	18.47	-0.14	-6.37
08/17/03	0:00:00	8/17/03 0:00	8.95	-0.14	-6.37
08/17/03	12:00:00	8/17/03 12:00	8.13	-0.13	-6.35
08/18/03	0:00:00	8/18/03 0:00	4.63	-0.10	-6.35
08/18/03	12:00:00	8/18/03 12:00	8.97	-0.11	-6.31
08/19/03	0:00:00	8/19/03 0:00	4.44	-0.10	-6.35
08/19/03	12:00:00	8/19/03 12:00	7.04	-0.08	-6.29
08/20/03	0:00:00	8/20/03 0:00	2.68	-0.10	-6.33
08/20/03	12:00:00	8/20/03 12:00	7.60	-0.10	-6.29
08/21/03	0:00:00	8/21/03 0:00	6.43	-0.06	-6.27
08/21/03	12:00:00	8/21/03 12:00	7.99	-0.08	-6.27
08/22/03	0:00:00	8/22/03 0:00	7.01	-0.08	-6.25
08/22/03	12:00:00	8/22/03 12:00	16.08	-0.08	-6.28
08/23/03	0:00:00	8/23/03 0:00	6.66	-0.06	-6.25
08/23/03	12:00:00	8/23/03 12:00	7.10	-0.06	-6.22
08/24/03	0:00:00	8/24/03 0:00	7.64	-0.05	-6.21
08/24/03	12:00:00	8/24/03 12:00	13.96	-0.05	-6.25
08/25/03	0:00:00	8/25/03 0:00	5.01	-0.03	-6.22
08/25/03	12:00:00	8/25/03 12:00	5.45	-0.01	-6.22
08/26/03	0:00:00	8/26/03 0:00	6.50	0.01	-6.18

08/26/03	12:00:00	8/26/03 12:00	12.05	0.01	-6.18
08/27/03	0:00:00	8/27/03 0:00	8.95	0.01	-6.16
08/27/03	12:00:00	8/27/03 12:00	9.05	0.03	-6.14
08/28/03	0:00:00	8/28/03 0:00	5.41	0.02	-6.18
08/28/03	12:00:00	8/28/03 12:00	6.94	0.05	-6.11
08/29/03	0:00:00	8/29/03 0:00	6.41	0.05	-6.11
08/29/03	12:00:00	8/29/03 12:00	11.37	0.08	-6.08
08/30/03	0:00:00	8/30/03 0:00	3.73	0.06	-5.91
08/30/03	12:00:00	8/30/03 12:00	11.86	0.08	-5.69
08/31/03	0:00:00	8/31/03 0:00	11.88	0.08	-5.43
08/31/03	12:00:00	8/31/03 12:00	15.12	0.11	-5.39
09/01/03	0:00:00	9/1/03 0:00	4.51	0.13	-5.55
09/01/03	12:00:00	9/1/03 12:00	5.09	0.17	-5.69
09/02/03	0:00:00	9/2/03 0:00	4.07	0.19	-5.74
09/02/03	12:00:00	9/2/03 12:00	12.79	0.21	-5.77
09/03/03	0:00:00	9/3/03 0:00	9.55	0.23	-5.80
09/03/03	12:00:00	9/3/03 12:00	9.90	0.21	-5.84

Appendix D

Spill Report

From: Rigal, Kyna
Sent: Monday, February 17, 2003 12:53 PM
To: 'msemmler@irc.inuvialuit.com'
Cc: Taylor, Tim R. Cgy; Hunt, John; Alistair Sims (E-mail); Di Quinzio, Lino; MACDENG; Osmak, Glenn; Peterson, Barry; Wray Adams (E-mail)
Subject: Nuna I-30 effluent spill

Dear Mardy,

Thank you for speaking with John Hunt and me on Friday with respect to the spill at Nuna I-30. As we discussed, 24 m³ of effluent was discharged into the drilling sump instead of the effluent sump. The effluent is meeting criteria as outlined in the water permit (licence No. N7L1-1788).

As per your request, here is a summary of the recent analytical from the Nuna I-30 effluent:

Effluent

Parameter	Criteria	5-Feb	6-Feb
BOD (mg/L)	80	26	22
TSS (mg/L)	100	14	45
pH	6 to 9	7	7.2
Fecal Coliforms (mg/L)	100	<1	34
Oil and Grease (mg/L)	5	<1	1

An N.W.T. Spill Report has been submitted.

If you need further information please do not hesitate to contact me directly at (403) 296-6368.

Sincerely,
Kyna

Kyna A. Rigal
Petro-Canada, EHS & Stakeholder Relations
Environmental Advisor
150 6 Avenue S.W.
Calgary, AB T2P 3E3
phone: (403) 296-6368
fax: (403) 296-5147