Shell Canada Limited

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TEL (403) 691-3111

IEG File: 5435-03
Via Fax; Original Via Mail

March 27, 2003

Executive Assistant
Northwest Territories Water Board
P.O. Box 1500
Yellowknife NT
X1A 2R3

RE: Annual Report 2002 – Water Licence N7L1-1770
Shell Canada Limited West Channel Remediation Program

As per Part B of Water Licence N7L1-1770 (expiry July 31, 2003), the following Annual Report summarizes the Shell Canada Limited West Channel remediation program operating field season, which began on May 23, 2002 and ended on September 25, 2002:

1a. **The Total Quantity Of Fresh Water Obtained From All Sources**
A total of 3.8m³ of fresh water was obtained from the Mackenzie River at 68° 28' 33"N latitude and 135° 33'25"W longitude.

1b. **The Total Quantity Of Each And All Waste Discharged**
No wastewater was discharged to the Mackenzie River. Technical staff visited the site daily, and as the project included only emergency camp facilities, associated waste was transported to Aklavik/Inuvik for disposal.

1c. **Results of Any Sampling Program**
As per Part D – Clause 6 of the Water Licence, laboratory analyses were conducted for effluent water samples during the project and submitted to Scott Gallupe, Inspector, of the DIAND North Mackenzie – Inuvik District Office.

1d. **Summary Of Any Modifications Carried Out On The Project As Described In The Project Description**
Based on a review of the available site information from the 2001 operating season and the previous investigations, the In-situ Bio-Circulation Cell (IBCC) remediation process was deemed ineffective.

After the 2001 operating season, the results and potential options for the 2002 operating season were presented to the residents of Aklavik for their input. These options were:

1. Risk based closure;
2. Long term monitoring;
3. Excavate and treat soil on-site;
4. Excavate and transport soil offsite for disposal; and

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5. Combined risk assessment for low concentrations and excavation and removal for higher concentrations.

The residents of Aklavik indicated that IEG should proceed with engineering studies to finalize options, and continue to use the Multiphase extraction system (MPE) adjacent to the river as indicated in the project description. The strategy for the 2002-operating season included:

1. A portable multiphase extraction (MPE) system to remove the lighter end hydrocarbon plume (gasoline) near the river;
2. Engineering Study 1 to delineate the spatial extent of hydrocarbon contamination;
3. Engineering Study 2 to determine the feasibility of utilizing land farm technology to remediate the heavier end hydrocarbon plume (diesel) in a pilot scale biocell;
4. Engineering Study 3 to determine the remedial end points and to help establish the most effective remedial pathways in a bench scale treatability test;
5. CCME Level 1 Ecological Risk Assessment; and
6. Engineering Study 4 to determine the potential feasibility of low temperature thermal remediation.

1e. **List Of Any Spills And Unauthorized Discharges**

There was a single unauthorized discharge during the field season of 2002. During July 11-17, 2002, approximately 2.0m3 of filtered water from the groundwater holding tank was discharged into the Mackenzie River prior to receipt of analysis. All of the discharged water was passed through the carbon filtration system prior to discharge. This was reported by R. H. Hetman-Shell to District Manager – INAC in the absence of the Inspector.

Circumstances

On July 8, 2002 samples from the sediment tank and the discharge point of the carbon filtration unit were collected for analysis. Baub Kyle of IEG received the analytical results on July 23, 2002 (Appendix A). They indicated all analysis for TPH, and BTEX was below the discharge criterion specified in the water licence, licence number N7L1-1770. Upon further investigation additional lab analysis was requested for lead, TSS and ammonia. The lead analysis also came back below the criteria specified on the water licence. Unfortunately, insufficient sample volumes from the incident prevented analysis for TSS and samples were not preserved to facilitate ammonia analysis. The samples in containers that were readily available, but not laboratory standard. The laboratory results indicate that there is a high probability that the discharged water would have met discharge criteria for TPH, BTEX and lead. Please refer to the attached laboratory results for more information.

Cause

The probable cause for discharge was that the MPE was accumulating greater volumes of water in the sediment tank than anticipated, and the automatic valves that allow water to go to carbon filtration were not functioning properly. Thus, the valves were manually tripped to allow for the release of treated water, and to prevent untreated water from being spilled. It was discharged to the river as the hose was connected to the river to allow for river water to be pumped into the tank during set up.

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1f. **A Description Of Any Trenches Excavated**

During the installation phase of the project, a single hole was excavated. This hole was used to acquire the contaminated soil used to construct the pilot scale landfarm. The excavation was a depth of approximately 0.9 m below grade, and approximately 2.44 m in diameter. Please refer to Drawing 1 for the location and general shape of the excavation.

1g. **Details On The Restoration Of Any Trenches**

Grading was performed by pushing pack the edges of the excavation to reduce the steepness of the excavation edges. The excavation was also flagged with marking tape.

1h. **Any Revisions To The Approved Emergency Response Plan**

There have been no changes to the Emergency Response Plan. Shell Canada Limited provided a copy of the N7L1-1770 Contingency Plan for the West Channel Remediation Program to the Water Board under separate cover on March 13, 2002.

Should you have any further questions or comments in this regard, please contact me by phone at (403) 691-2521, by fax at (403) 269-7948, or by email at randy.hetman@shell.ca.

Regards,

Randy Hetman
DAR/Construction Manager
Shell Canada Limited

cc. Alan MacDonald, IEG

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APPENDIX A

ANALYTICAL RESULTS
(re: 1(e) – List of Any Spills and Unauthorized Discharges)

ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Sample Details/Parameters	Result	Qualifier	D.L.	Units	Extracted	Analyzed	By	Batch
L72227-1 TOP 6" #1 A								
Sample Date: 08-JUL-02								
Matrix: SOIL								
CCME TVHs and TEHs								
CCME Total Hydrocarbons								
F1 (C6-C10)	170		5	mg/kg		22-JUL-02		
F1-BTEX	150		5	mg/kg		22-JUL-02		
F2 (C10-C16)	510		5	mg/kg		22-JUL-02		
F3 (C16-C34)	460		5	mg/kg		22-JUL-02		
F4 (C34-C50)	180		5	mg/kg		22-JUL-02		
Total Hydrocarbons (C6-C50)	1300		5	mg/kg		22-JUL-02		
Chrom. to baseline at nC50	NO					22-JUL-02		
CCME Total Extractable Hydrocarbons								
Prep/Analysis Dates					12-JUL-02	15-JUL-02	RLB	R84850
BTEX								
Benzene	<0.01		0.01	mg/kg	12-JUL-02	22-JUL-02	MSK	R85579
Toluene	0.01		0.01	mg/kg	12-JUL-02	22-JUL-02	MSK	R85579
Ethylbenzene	0.07		0.01	mg/kg	12-JUL-02	22-JUL-02	MSK	R85579
Xylenes	20		0.01	mg/kg	12-JUL-02	22-JUL-02	MSK	R85579
% Moisture	17		0.1	%				R84515
C11-C60 GC/FID Scan	5800		5	mg/kg	18-JUL-02	19-JUL-02	RLB	R85028
C11-C60 Scan (Silica gel)	6000		5	mg/kg	18-JUL-02	19-JUL-02	RLB	R85028
Loss on Ignition	6		0	%	16-JUL-02	17-JUL-02	SR	R84998
L72227-2 CHUNK #2								
Sample Date: 08-JUL-02								
Matrix: SOIL								
CCME TVHs and TEHs								
CCME Total Hydrocarbons								
F1 (C6-C10)	160		5	mg/kg		22-JUL-02		
F1-BTEX	150		5	mg/kg		22-JUL-02		
F2 (C10-C16)	11000		5	mg/kg		22-JUL-02		
F3 (C16-C34)	1000		5	mg/kg		22-JUL-02		
F4 (C34-C50)	240		5	mg/kg		22-JUL-02		
Total Hydrocarbons (C6-C50)	12000		5	mg/kg		22-JUL-02		
Chrom. to baseline at nC50	NO					22-JUL-02		
CCME Total Extractable Hydrocarbons								
Prep/Analysis Dates					12-JUL-02	15-JUL-02	RLB	R84850
BTEX								
Benzene	<0.01		0.01	mg/kg	12-JUL-02	22-JUL-02	MSK	R85579
Toluene	0.02		0.01	mg/kg	12-JUL-02	22-JUL-02	MSK	R85579
Ethylbenzene	<0.01		0.01	mg/kg	12-JUL-02	22-JUL-02	MSK	R85579
Xylenes	7.5		0.01	mg/kg	12-JUL-02	22-JUL-02	MSK	R85579
% Moisture	22		0.1	%				R84515
C11-C60 GC/FID Scan	32000		5	mg/kg	18-JUL-02	19-JUL-02	RLB	R85028
C11-C60 Scan (Silica gel)	34000		5	mg/kg	18-JUL-02	19-JUL-02	RLB	R85028
Loss on Ignition	7		0	%	16-JUL-02	17-JUL-02	SR	R84998
L72227-3 #5A-1' PASSIVE								
Sample Date: 08-JUL-02								
Matrix: SOIL								
CCME TVHs and TEHs								
CCME Total Hydrocarbons								
F1 (C6-C10)	51		5	mg/kg		22-JUL-02		

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ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Sample Details/Parameters	Result	Qualifier	D.L.	Units	Extracted	Analyzed	By	Batch
L72227-3 #5A-1' PASSIVE								
Sample Date: 08-JUL-02								
Matrix: SOIL								
CCME TVHs and TEHs								
CCME Total Hydrocarbons								
F1-BTEX	48		5	mg/kg		22-JUL-02		
F2 (C10-C16)	1000		5	mg/kg		22-JUL-02		
F3 (C16-C34)	460		5	mg/kg		22-JUL-02		
F4 (C34-C50)	140		5	mg/kg		22-JUL-02		
Total Hydrocarbons (C6-C50)	1700		5	mg/kg		22-JUL-02		
Chrom. to baseline at nC50	NO					22-JUL-02		
CCME Total Extractable Hydrocarbons								
Prep/Analysis Dates					12-JUL-02	16-JUL-02	RLB	R84850
BTEX								
Benzene	<0.01		0.01	mg/kg	12-JUL-02	22-JUL-02	MSK	R85579
Toluene	<0.01		0.01	mg/kg	12-JUL-02	22-JUL-02	MSK	R85579
Ethylbenzene	<0.01		0.01	mg/kg	12-JUL-02	22-JUL-02	MSK	R85579
Xylenes	3.1		0.01	mg/kg	12-JUL-02	22-JUL-02	MSK	R85579
% Moisture	16		0.1	%				R84515
C11-C60 GC/FID Scan	7000		5	mg/kg	16-JUL-02	19-JUL-02	RLB	R85028
C11-C60 Scan (Silica gel)	7100		5	mg/kg	16-JUL-02	19-JUL-02	RLB	R85028
Loss on Ignition	7		0	%	16-JUL-02	17-JUL-02	SR	R84998
L72227-4 #3-1' PASSIVE								
Sample Date: 08-JUL-02								
Matrix: SOIL								
CCME TVHs and TEHs								
CCME Total Hydrocarbons								
F1 (C6-C10)	60		5	mg/kg		22-JUL-02		
F1-BTEX	57		5	mg/kg		22-JUL-02		
F2 (C10-C16)	1200		5	mg/kg		22-JUL-02		
F3 (C16-C34)	520		5	mg/kg		22-JUL-02		
F4 (C34-C50)	190		5	mg/kg		22-JUL-02		
Total Hydrocarbons (C6-C50)	2000		5	mg/kg		22-JUL-02		
Chrom. to baseline at nC50	NO					22-JUL-02		
CCME Total Extractable Hydrocarbons								
Prep/Analysis Dates					12-JUL-02	16-JUL-02	RLB	R84850
BTEX								
Benzene	<0.01		0.01	mg/kg	12-JUL-02	22-JUL-02	MSK	R85579
Toluene	<0.01		0.01	mg/kg	12-JUL-02	22-JUL-02	MSK	R85579
Ethylbenzene	<0.01		0.01	mg/kg	12-JUL-02	22-JUL-02	MSK	R85579
Xylenes	3.0		0.01	mg/kg	12-JUL-02	22-JUL-02	MSK	R85579
% Moisture	17		0.1	%				R84515
Loss on Ignition	7		0	%	16-JUL-02	17-JUL-02	SR	R84998
L72227-5 TANK H2O #1W								
Sample Date: 08-JUL-02	***Sample Qualifiers Refer to Reference Information***							
Matrix: WATER								
CCME BTEX,TVH AND TEH								
F2 (C10-C16)	<0.07		0.07	mg/L	15-JUL-02	17-JUL-02	MMY	R85187
CCME BTX,TVH (C6-C10)								
F1-BTEX	<0.1		0.1	mg/L	15-JUL-02	17-JUL-02	MSK	R84919
Benzene	<0.0005		0.0005	mg/L	15-JUL-02	17-JUL-02	MSK	R84919
Toluene	<0.0005		0.0005	mg/L	15-JUL-02	17-JUL-02	MSK	R84919

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ENVIRO-TEST CHEMICAL ANALYSIS REPORT

Sample Details/Parameters	Result	Qualifier	D.L.	Units	Extracted	Analyzed	By	Batch
L72227-5 TANK H2O #1W								
Sample Date: 08-JUL-02	***Sample Qualifiers Refer to Reference Information***							
Matrix: WATER								
CCME BTEX,TVH AND TEH								
CCME BTX,TVH (C6-C10)								
EthylBenzene	<0.0005		0.0005	mg/L	15-JUL-02	17-JUL-02	MSK	R84919
Xylenes	<0.0005		0.0005	mg/L	15-JUL-02	17-JUL-02	MSK	R84919
F1(C6-C10)	<0.1		0.1	mg/L	15-JUL-02	17-JUL-02	MSK	R84919
F1(C6-C10)	<0.1		0.1	mg/L	15-JUL-02	17-JUL-02	MSK	R84919
L72227-6 TANK H2O #2W								
Sample Date: 08-JUL-02	***Sample Qualifiers Refer to Reference Information***							
Matrix: WATER								
CCME BTEX,TVH AND TEH								
F2 (C10-C16)	0.3		0.12	mg/L	15-JUL-02	17-JUL-02	MMY	R85187
CCME BTX,TVH (C6-C10)								
F1-BTEX	<0.1		0.1	mg/L	15-JUL-02	17-JUL-02	MSK	R84919
Benzene	<0.0005		0.0005	mg/L	15-JUL-02	17-JUL-02	MSK	R84919
Toluene	<0.0005		0.0005	mg/L	15-JUL-02	17-JUL-02	MSK	R84919
EthylBenzene	<0.0005		0.0005	mg/L	15-JUL-02	17-JUL-02	MSK	R84919
Xylenes	<0.0005		0.0005	mg/L	15-JUL-02	17-JUL-02	MSK	R84919
F1(C6-C10)	<0.1		0.1	mg/L	15-JUL-02	17-JUL-02	MSK	R84919
F1(C6-C10)	<0.1		0.1	mg/L	15-JUL-02	17-JUL-02	MSK	R84919
L72227-7 ST 1								
Sample Date: 08-JUL-02	***Sample Qualifiers Refer to Reference Information***							
Matrix: WATER								
CCME BTEX,TVH AND TEH								
F2 (C10-C16)	1.0		0.17	mg/L	15-JUL-02	17-JUL-02	MMY	R85187
CCME BTX,TVH (C6-C10)								
F1-BTEX	<0.1		0.1	mg/L	15-JUL-02	17-JUL-02	MSK	R84919
Benzene	<0.0005		0.0005	mg/L	15-JUL-02	17-JUL-02	MSK	R84919
Toluene	<0.0005		0.0005	mg/L	15-JUL-02	17-JUL-02	MSK	R84919
EthylBenzene	<0.0005		0.0005	mg/L	15-JUL-02	17-JUL-02	MSK	R84919
Xylenes	<0.0005		0.0005	mg/L	15-JUL-02	17-JUL-02	MSK	R84919
F1(C6-C10)	<0.1		0.1	mg/L	15-JUL-02	17-JUL-02	MSK	R84919
F1(C6-C10)	<0.1		0.1	mg/L	15-JUL-02	17-JUL-02	MSK	R84919
L72227-8 ST 2								
Sample Date: 08-JUL-02	***Sample Qualifiers Refer to Reference Information***							
Matrix: WATER								
CCME BTEX,TVH AND TEH								
F2 (C10-C16)	0.9		0.15	mg/L	15-JUL-02	17-JUL-02	MMY	R85187
CCME BTX,TVH (C6-C10)								
F1-BTEX	<0.1		0.1	mg/L	15-JUL-02	17-JUL-02	MSK	R84919
Benzene	<0.0005		0.0005	mg/L	15-JUL-02	17-JUL-02	MSK	R84919
Toluene	<0.0005		0.0005	mg/L	15-JUL-02	17-JUL-02	MSK	R84919
EthylBenzene	<0.0005		0.0005	mg/L	15-JUL-02	17-JUL-02	MSK	R84919
Xylenes	<0.0005		0.0005	mg/L	15-JUL-02	17-JUL-02	MSK	R84919
F1(C6-C10)	<0.1		0.1	mg/L	15-JUL-02	17-JUL-02	MSK	R84919
F1(C6-C10)	<0.1		0.1	mg/L	15-JUL-02	17-JUL-02	MSK	R84919

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

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Reference Information

Qualifiers for Individual Samples Listed:

Sample Number	Client ID	Qualifier	Description
L72227-5	TANK H2O #1W	RWHS	Samples Received With Headspace
		UIC	RECEIVED IN IMPROPER CONTAINER WITH HEADSPACE - Unreliable: Improper Container
L72227-6	TANK H2O #2W	RWHS	Samples Received With Headspace
		UIC	RECEIVED IN IMPRPOER CONTAINER WITH HEADSPACE - Unreliable: Improper Container
L72227-7	ST 1	RWHS	Samples Received With Headspace
		UIC	RECEIVED IN IMPRPOER CONTAINER WITH HEADSPACE - Unreliable: Improper Container
L72227-8	ST 2	RWHS	Samples Received With Headspace
		UIC	RECEIVED IN IMPROPER CONTAINER WITH HEADSPACE - Unreliable: Improper Container

Methods Listed (if applicable):

ETL Test Code	Matrix	Test Description	Preparation Method Reference**	Analytical Method Reference**
BTX,TVH-CCME-CL	Water	CCME BTX,TVH (C6-C10)	EPA 5030B	EPA 5030/8015-P&T GC/FID
F1 includes BTEX contribution (water).				
ETL-BTX,TVH-CCME-CL	Soil	BTEX	EPA 5030B/5035	CCME CWS-PHC Dec-2000 - Pub# 1310
ETL-TEH-CCME-CL	Soil	CCME Total Extractable Hydrocarbons	EPA 3540C	CCME CWS-PHC Dec-2000 - Pub# 1310
HIS-C11/C60-CL	Soil	C11-C60 GC/FID Scan	EPA 3540C	EPA 3550/8000-GC-FID
HIS-SIL-C11/C60-CL	Soil	C11-C60 Scan (Silica gel)	EPA 3540C	EPA 3550/8000 GC-FID
LOI-ED	Soil	Loss on Ignition		LOI @ 500 C-Loss on Ignition at 500
PREP-MOISTURE-CL	Soil	% Moisture		Oven dry 105C-Gravimetric
TEH-CCME-F2-CL	Water	CCME TEH (C10-C16)	EPA 3550B	EPA 3510/8000-GC-FID

** Analytical Methods employed follow in-house standard operations procedures, which are generally based on US-EPA, ASTM, NIOSH and/or APHA methods.

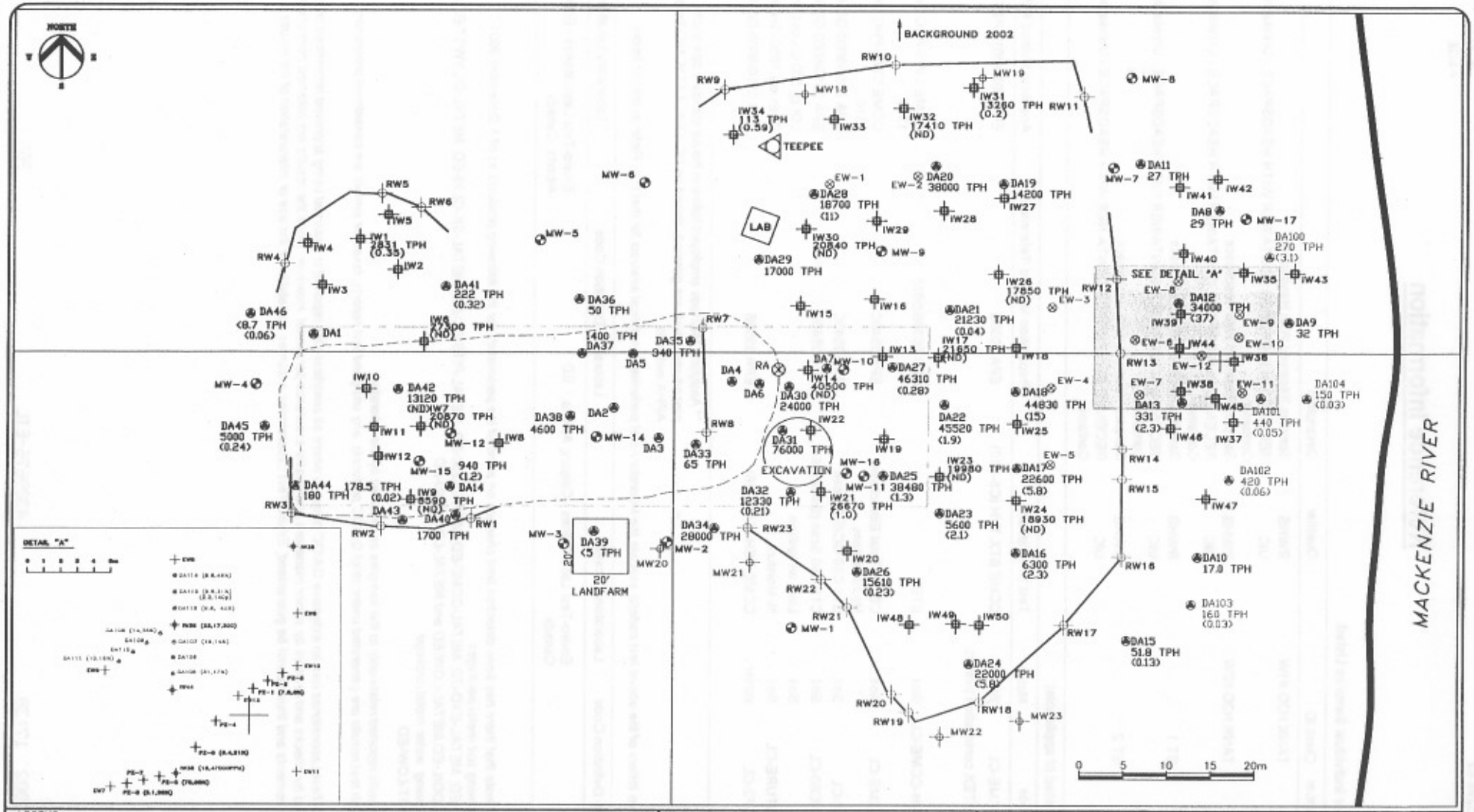
The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

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

"Please note that there has been detection limit changes on some of the parameters for the following products as of 1 December 2001."
The following soil metal packages:
METAL-ED, METAL-EXD-ED, METAL-CCME-ED, METAL-G50-ED, METAL-PITS-BC-ED, METAL-SK-GL99-ED, METAL-OILYWST-ED and METAL-REFINEDOIL-ED,METAL-LOW-ED and METAL-LOW-EXD-ED
The following water metal package:
MET-TOT-LOW-ED

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



LEGEND:

- DUTCH AUGER SAMPLE POINT
- RECOVERY WELL
- FORMER TANK FARM AREA
- INJECTION WELL
- ESTIMATED EXTENT OF WOODCHIPS
- RECOVERY TRENCH
- RA ⊗ RISK ASSESSMENT
- * IN-SITU BIOCIRCULATION CELL
- DA26 — BOREHOLE SAMPLE NUMBER
- 15610 TPH — TPH CONCENTRATION (mg/kg)
- (0.23) — BENZENE CONCENTRATION (mg/kg)
- (ND) — BELOW ANALYTICAL DETECTION LIMIT

NOTES:

1) SAMPLE RESULTS FROM SEPTIC SAMPLING PROGRAM

2) WHERE A LOCATION WAS SAMPLED AT VARIOUS DEPTH, THE GREATER CONCENTRATION IS DEPICTED

TITLE:

SUMMARY OF THE 2002 OPERATING SEASON

SITE: WEST CHANNEL STAGING POINT
MACKENZIE DELTA, NT
UTM 68°26.33N, 135°33.25W

DWG. NO.: 1

DATE: OCT. 30, 2002

JOB NO.: 5286-02

SCALE: 1:400