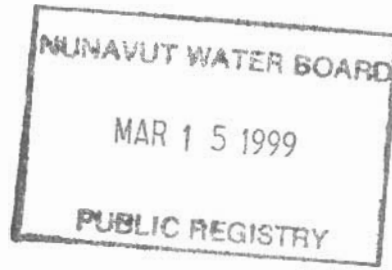


Thomas Kudloo
Chairman
Nunavut Water Board
P.O. Box 119
Gjoa Haven, NT
X0E 1J0



January 11, 1999

Dear Sir,

Re: 1998 Annual Water Licence Report , Licence Number N5L3-0087, Iqaluit, NT

As per Part B: General Conditions of the Iqaluit Water Licence the following report is submitted for your review and comments.

Section 1

- a) the monthly and annual quantities in cubic meters of fresh water obtained from all sources;
 - The total water obtained from Lake Geraldine for this report period was 391,555,000 liters. Refer to Appendix "A" for Processed, Trucked, Piped and Variances detailed by month.
- b) the annual quantity of Sewage solids removed from the new Sewage Disposal Facilities for disposal once built;
 - The new Sewage Facility has not yet been constructed, therefore; no solids were removed during this period. Construction of the new facility is planned to start 1999 pending funding approvals from M.A.C.A.
- c) a summary of new installations, modifications and minor maintenance work carried out on the Water Supply and Waste Disposal Facilities, including all associated structures;
 - Refer to Appendix "B" for details
- d) tabular summaries of all data generated under the "Surveillance Network Program";
 - Refer to Appendix "C" for detailed analysis reports as completed by Taiga Laboratories located in Yellowknife and Eviro-Test Laboratories used by Taiga to complete the required PCB and PAH testing of SNP site 87-005, 006 and 007.

- From 1992 to 1996 the Municipality participated in a federal funded program which tested for the presence of *Gyardia* and *Cryptosporidium* in the N.W.T. Although outside of the requirements of this license the Municipality chose to continue the program through 1997 and 1998. The Hyperion Laboratory results are included under Appendix "D" for information purposes.
 - For information purposes copies of the Water Truck Bacteriological test results as completed monthly by the Occupational Health Officer are included under Appendix "E".
- e) a summary of any abandonment and restoration work completed during the year and an outline of any work anticipated for the next year;
- No abandonment or restoration work was initiated this period.
- f) a summary of any studies requested by the Board that relate to Waste disposal, water use or reclamation, and a brief description of any future studies planned;
- ***Studies Initiated 1998***
 - Lagoon Liquid Level and Monitoring System Evaluation completed by Dillon Consulting March 1998 as requested by the DIAND Inspector. The report was previously submitted to the NWB and is included under Appendix "F" for information purposes.
 - Solid Waste Assessment of the Iqaluit Landfill Site completed and submitted, (formal comments have not yet been received from the Water Board).
 - ***Studies Planned for 1999***
 - Application for Water Licence Renewal.
 - Water Treatment Plant minor upgrades, (piping and pumps).
 - Planning and Design of a 100 lot subdivision on the Road to Nowhere.
 - Planning and Design of utilidor upgrade in the Downtown Core.
 - Planning and Design of utilidor extension to Lower Base Area.
 - Further studies planned for 1999 are to be identified during the licence renewal process.
- g) a list of unauthorized discharges;
- Refer to Appendix "G" for detailed information of spills reported and actioned by the Municipality.
- h) updates or revisions to the approved Sewage and solid Waste Operation and Maintenance Plans;
- The Municipality completed a training program with respect to neutralizing battery acid at the landfill site and received a quantity of caustic soda via the 1998 sealift.

The neutralizing program will be started during the summer of 1999 at which time the treated batteries will be palletized. The Municipality intends to ship the batteries via sealift to a recycling facility once a sufficient quantity has been gathered. Also a program to recycle copper, bronze and aluminum has been initiated and will continue in the same fashion.

- i) Any other details on water use or Waste disposal requested by the Board by November 1st of the year being reported.

N/A

END OF REPORT

APPENDIX "A"

Iqaluit Water Consumption Report

Municipality of Iqaluit
1998 Total Water Consumption:

Date:	Water Produced: (l)	Water Trucked: (l)	Water Piped: (l)	Unaccounted For Water Variance	Var: (%)
Jan 31/98	30,204,000.0	6,040,321.0	22,608,115.0	1,555,564.0	5.15%
Feb 28/98	27,024,000.0	5,824,369.0	22,608,115.0	(1,408,484.0)	-5.21%
Mar 31/98	34,627,000.0	6,450,628.0	22,686,999.0	5,489,373.0	15.85%
Apr 30/98	29,283,000.0	5,940,596.0	22,686,999.0	655,405.0	2.24%
May 31/98	32,958,000.0	6,418,241.0	20,106,500.0	6,433,259.0	19.52%
June 30/98	38,581,000.0	6,635,414.0	20,106,500.0	11,839,086.0	30.69%
July 31/98	36,888,000.0	6,515,198.0	22,362,498.0	8,010,304.0	21.72%
Aug 31/98	32,764,000.0	7,077,985.0	22,362,498.0	3,323,517.0	10.14%
Sept 30/98	37,666,000.0	7,122,293.0	27,547,500.0	2,996,207.0	7.95%
Oct 31/98	37,004,000.0	7,380,634.0	27,547,500.0	2,075,866.0	5.61%
Nov 30/98	27,046,000.0	7,230,851.0	19,335,169.0	479,980.0	1.77%
Dec 31/98	27,510,000.0	6,725,162.6	19,335,169.0	1,449,668.4	5.27%
Totals	391,555,000.0	79,361,692.6	269,293,562.0	42,899,745.4	10.96%

Notes:

Piped readings are completed during the first two weeks of every second month and are averaged by month for the purposes of this report.
Month by month variances may vary slightly.

APPENDIX "B"

Water and Sewage Works completed 1998 & Proposed for 1999

Summary of New Installation and Major Works Completed 1998

- Construction of 49 lot subdivision Tundra Valley and Apex Road.

Summary of Minor Works Completed 1998

- .1 Located and repaired minor water leaks between the following Access Vaults and Man Holes.
 - Av 215 to 216
 - MH 53 to MH 54
 - AV 402 to AV 404 (temporary repair completed December 1998)
- .2 Located and repaired collapsed sewage lines between the following Access Vaults and Man Holes.
 - MH 53 to MH 54
- .3 Annual flushing of all sewer trunk lines and Hydrant testing was completed during the month of June 1998.
- .4 Realign and refurbish the recirculation line from WTP to Lake Geraldine and associated heat exchangers and pumps. Asbuilt information will be submitted to the NWB when completed by Reid Crowthers and Associates.
- .5 Repair of Drainage Culverts within the North Forty Gravel Quarry.
- .6 Received and installed new SNP identification signs as requested by the D.I.A.N.D. Inspector.
- .7 Received identification and safety signage for Lake Geraldine via sealift. To be installed February of 1999.
- .8 As requested by the Inspector several attempts were made to install a level indicating rod mounted on a concrete base at the sewage lagoon. These attempts failed due to the build up of sediment in the area of the intake line which prevented the installation of the rod on a stable footing. At present the level is visually monitored using surveyed indication lines on a concrete pier located near the outfall. According to asbuilt information the concrete structure is anchored to bedrock and is considered to provide more accuracy than what the proposed system would produce. The present system of monitoring will be continued until

the construction of the new Sewage Treatment Plant is completed at which time the Lagoon will be abandoned and remediation plans developed. A copy of the report completed in March 1998 is included under Appendix "F" for information purposes.

- .9 As requested by Paul Smith of DIAND the slope located on the Northeast section of the Landfill Site had deteriorated and was allowing surface water to bypass the drainage valve. The Municipality responded by utilizing "own forces" to haul, place and compact pit run gravel from the North 40 pit to repair the berm. A section of berm 100m x 6m x 1.2m was constructed and the landfill drainage system is again operating as originally designed. Asbuilt sketches of the completed repairs are included in Appendix "H" for information purposes.
10. Water Modeling of the Iqaluit Utilidor System completed by Reid Crowther.

Summary of Anticipated Work for 1999

- .1 Begin construction of a new Sewage Treatment Facility.
- .2 Installation of identification and safety signs around Lake Geraldine as requested by the Occupational Health Officer.
- .3 Repair 50 mm piping through Lake Geraldine dam face and inspect intake piping.
- .4 Remove temporary repair installed December 1998 and replace section of water main between AV 402 and AV 404.
- .5 Construction of a 100 lot subdivision on the Road to Nowhere.
- .6 Construction of Upgrades to valves, pumps, and piping at the Water Treatment Plant.

APPENDIX "C"

Surveillance Network Program Sampling Results

**Municipality of Iqaluit
Surveillance Network Monthly Monitoring
As per Water licence No. N5L3-0087**

Variances from reporting requirements and explanations

General Information

- .1 Due to a shipping error samples for the month of July were not delivered to the Laboratory within the required twenty four hour time limit. As a result the bacteria samples for that period can not be considered as valid and are indicated as being expired in the analysis reports included in Appendix "C".
- .2 All SNP samples for the month of November could not be collected due to the SNP sites being frozen over.

Site Specific Information

- SNP SITE 0087-04 - No runoff from June through November.
- SNP SITE 0087-06 - No runoff from July through November.
- SNP SITE 0087-07 - No runoff in October (valve closed).

--	--	--	--	--	--	--

Appendix A Test Methodologies

Tier1-PAHs in Water

Preparation Method: Liquid/liquid extraction with DCM
Instrument Method: GC/MSD analysis
Method Reference: Extraction Method: EPA 3510 or EPA 3520 (modified)
Analytical Method: EPA 8270 (modified)

PCB's in Water

Preparation Method: Extraction with dichloromethane
Instrument Method: GC/ECD analysis
Method Reference: Extraction Method: EPA 3510 (modified)
Analytical Method: EPA 8082 (modified)

Minimum Detection Limit (MDL) - 0.050 ppb for all Aroclors

QA/QC Statement:

Accuracy is 93% (expressed as the average % recovery of PCB in water at a 5 ppb level).

Precision is +/- 16% (expressed as the relative standard deviation or RSD).

THIS IS THE LAST PAGE OF THE METHODOLOGY APPENDIX.

ENVIRO-TEST QA/QC REPORT

PCB's in Water

<u>Surrogate Recovery for E80635401B</u>	<u>%</u>
Decachlorobiphenyl	103

<u>Surrogate Recovery for E80635403B</u>	<u>%</u>
Decachlorobiphenyl	85

Tier1-PAHs in Water

Relative percent difference is expressed as RPD.

Percent Recovery is expressed as %.

THIS IS THE LAST PAGE OF THE QAQC REPORT

Lab Number	Sample Matrix	Field Sample ID	Collection Date	Received Date	Test Group ID	Parameter	Result	Units	Detection Limit	Analysis date	Location ID
980767	EFFLUENT	87-2	06/08/98	09-Jun-98 pH		pH	7.13		0.05	06/09/98	IOALU11 EFFL
980767	EFFLUENT	87-2	06/08/98	09-Jun-98 TSS		Tot-Suspended	31	mg/L	3	12/06/98	IOALU11 EFFL
980767	EFFLUENT	87-2	06/08/98	09-Jun-98 NH3-N		Ammonia N	17.4	mg/L	0.002	06/17/98	IOALU11 EFFL
980767	EFFLUENT	87-2	06/08/98	09-Jun-98 FC		Faecal Coliform	560000	CFU/dl	1	06/09/98	IOALU11 EFFL
980767	EFFLUENT	87-2	06/08/98	09-Jun-98 BOD5		Bio-Oxy Demand	82	mg/L	2	06/09/98	IOALU11 EFFL

Lab Number	Sample Matrix	Field Sample ID	Collection Date	Received Date	Test Group ID	Parameter	Result	Units	Detection Limit	Analysis date	Location ID
981849	EFFLUENT	Iqaluit 87-2	10/21/98	22 Oct 98 p1		pH	7.16		0.05	10/22/98	IQALUIT EFFL 87-2
981849	EFFLUENT	Iqaluit 87-2	10/21/98	22 Oct 98 TSS		Tot-Suspended-	42	mg/L	3	10/28/98	IQALUIT EFFL 87-2
981849	EFFLUENT	Iqaluit 87-2	10/21/98	22 Oct 98 NH3-N		Ammonia-N	26.8	mg/L	0.002	10/29/98	IQALUIT EFFL 87-2
981849	EFFLUENT	Iqaluit 87-2	10/21/98	22 Oct 98 FC		Faecal Coliform	6000000	CFU/dL	1	10/22/98	IQALUIT EFFL 87-2
981849	EFFLUENT	Iqaluit 87-2	10/21/98	22 Oct 98 BOD5		Bio-Oxy Demand	79	mg/L	2	10/22/98	IQALUIT EFFL 87-2

Lab Number	Sample Matrix	Field Sample ID	Collection Date	Received Date	TestGroupID	Parameter	Result	Units	Detection Limit	Analysis date	Location ID
981848	water	lqalut 87.5	10/21/98	22-Oct-98	pH	8.12			0.05	10/22/98	lqalut 87.5
981848	water	lqalut 87.5	10/21/98	22-Oct-98	Conductivity	123	uS/cm		0.3	10/22/98	lqalut 87.5
981848	water	lqalut 87.5	10/21/98	22-Oct-98	Tot-Suspended	3	mg/L		3	10/28/98	lqalut 87.5
981848	water	lqalut 87.5	10/21/98	22-Oct-98	Calcium	21.4	mg/L		0.05	10/23/98	lqalut 87.5
981848	water	lqalut 87.5	10/21/98	22-Oct-98	Magnesium	2.04	mg/L		0.01	10/27/98	lqalut 87.5
981848	water	lqalut 87.5	10/21/98	22-Oct-98	Sodium	1.14	mg/L		0.01	10/27/98	lqalut 87.5
981848	water	lqalut 87.5	10/21/98	22-Oct-98	Potassium	0.340	mg/L		0.02	10/27/98	lqalut 87.5
981848	water	lqalut 87.5	10/21/98	22-Oct-98	Sulphate	7	mg/L		3	11/09/98	lqalut 87.5
981848	water	lqalut 87.5	10/21/98	22-Oct-98	T-Phosphorous	0.005	mg/L		0.002	11/05/98	lqalut 87.5
981848	water	lqalut 87.5	10/21/98	22-Oct-98	NO3-N+NO2-N	0.243	mg/L		0.008	11/02/98	lqalut 87.5
981848	water	lqalut 87.5	10/21/98	22-Oct-98	Ammonia N	0.011	mg/L		0.002	10/29/98	lqalut 87.5
981848	water	lqalut 87.5	10/21/98	22-Oct-98	Phenols	2.00	ug/L		2	10/27/98	lqalut 87.5
981848	water	lqalut 87.5	10/21/98	22-Oct-98	Tot-Arsenic(water)	10.2	ug/L		0.2	10/28/98	lqalut 87.5
981848	water	lqalut 87.5	10/21/98	22-Oct-98	Tot-Mercury(water)	10.01	ug/L		0.01	10/30/98	lqalut 87.5
981848	water	lqalut 87.5	10/21/98	22-Oct-98	Tot-Cadmium(ICP-	10.1	ug/L		0.1	10/26/98	lqalut 87.5
981848	water	lqalut 87.5	10/21/98	22-Oct-98	Tot-Cobalt(ICP-MS)	10.1	ug/L		0.1	10/26/98	lqalut 87.5
981848	water	lqalut 87.5	10/21/98	22-Oct-98	Tot-Chromium(ICP-	1.2	ug/L		2	10/26/98	lqalut 87.5
981848	water	lqalut 87.5	10/21/98	22-Oct-98	Tot-Copper(ICP/MS)	0.8	ug/L		0.1	10/26/98	lqalut 87.5
981848	water	lqalut 87.5	10/21/98	22-Oct-98	Tot-Manganese(ICP-	3.1	ug/L		0.1	10/26/98	lqalut 87.5
981848	water	lqalut 87.5	10/21/98	22-Oct-98	Tot-Nickel(ICP-MS)	10.1	ug/L		0.1	10/26/98	lqalut 87.5
981848	water	lqalut 87.5	10/21/98	22-Oct-98	Tot-Lead(ICP-MS)	10.2	ug/L		0.1	10/26/98	lqalut 87.5
981848	water	lqalut 87.5	10/21/98	22-Oct-98	Tot-Zinc(ICP-MS)	110	ug/L		0.2	10/26/98	lqalut 87.5
981848	water	lqalut 87.5	10/21/98	22-Oct-98	Tot-Iron(AA)	0.120	mg/L		0.02	11/02/98	lqalut 87.5

Lab Number	Sample Matrix	Field Sample ID	Collection Date	Received Date	TestgroupID	Parameter	Result	Units	Detection Limit	Analysis date	Location ID
981582	water	WTP raw water	09/14/98	15-Sep-98	F	Fluoride	0.05	mg/L	0.05	10/03/98	WTP raw treated
981582	water	WTP raw water	09/14/98	15-Sep-98	Alkal	Alkalinity	8.2	mg/L	0.3	10/23/98	WTP raw treated
981582	water	WTP raw water	09/14/98	15-Sep-98	Cl	Chloride	1.2	mg/L	0.2	09/17/98	WTP raw treated
981582	water	WTP raw water	09/14/98	15-Sep-98	SO4	Sulphate	1.3	mg/L	3	09/17/98	WTP raw treated
981582	water	WTP raw water	09/14/98	15-Sep-98	Turb	Turbidity	0.4	NTU	0.1	09/23/98	WTP raw treated
981582	water	WTP raw water	09/14/98	15-Sep-98	TSS	Tot.Suspended	3	mg/L	3	09/23/98	WTP raw treated
981582	water	WTP raw water	09/14/98	15-Sep-98	11.1	Tot.Dissolved	10.0	mg/L	10	09/23/98	WTP raw treated
981582	water	WTP raw water	09/14/98	15-Sep-98	11.1	11.1	10.000	mg/L	0.0006	09/17/98	WTP raw treated
981582	water	WTP raw water	09/14/98	15-Sep-98	11.1	11.1	10.000	mg/L	0.0006	09/17/98	WTP raw treated
981582	water	WTP raw water	09/14/98	15-Sep-98	11.1	11.1	10.000	mg/L	0.0006	09/17/98	WTP raw treated
981582	water	WTP raw water	09/14/98	15-Sep-98	Phenols	Phenols	4.53	mg/L	0.001	10/14/98	WTP raw treated
981582	water	WTP raw water	09/14/98	15-Sep-98	OKG	Oil&Grease	not required	mg/L	0.2	09/29/98	WTP raw treated
981582	water	WTP raw water	09/14/98	15-Sep-98	T-11	Tot	10.2	ug/L	0.005	10/27/98	WTP raw treated
981582	water	WTP raw water	09/14/98	15-Sep-98	T-11	Tot-Arsenic(water)	10.1	ug/L	0.2	09/25/98	WTP raw treated
981582	water	WTP raw water	09/14/98	15-Sep-98	T-11	Tot-Cadmium(ICP-MS)	10.1	ug/L	0.1	09/18/98	WTP raw treated
981582	water	WTP raw water	09/14/98	15-Sep-98	T-11	Tot-Cobalt(ICP-MS)	10.1	ug/L	0.1	09/18/98	WTP raw treated
981582	water	WTP raw water	09/14/98	15-Sep-98	T-11	Tot-Chromium(ICP-MS)	0.3	ug/L	0.2	09/18/98	WTP raw treated
981582	water	WTP raw water	09/14/98	15-Sep-98	T-11	Tot-Copper(ICP-MS)	23.9	ug/L	0.1	09/18/98	WTP raw treated
981582	water	WTP raw water	09/14/98	15-Sep-98	T-11	Tot-Manganese(ICP-MS)	26.5	ug/L	0.1	09/18/98	WTP raw treated
981582	water	WTP raw water	09/14/98	15-Sep-98	T-11	Tot-Nickel(ICP-MS)	0.3	ug/L	0.1	09/18/98	WTP raw treated
981582	water	WTP raw water	09/14/98	15-Sep-98	T-11	Tot-Zinc(ICP-MS)	1.10	ug/L	0.2	09/18/98	WTP raw treated
981582	water	WTP raw water	09/14/98	15-Sep-98	T-11	Tot-Iron(AA)	0.195	ug/L	10	09/18/98	WTP raw treated
981582	water	WTP raw water	09/14/98	15-Sep-98	T-11	Tot-Barium(ICP-MS)	1.6	ug/L	0.02	09/22/98	WTP raw treated
981582	water	WTP raw water	09/14/98	15-Sep-98	T-11	Tot-Silver(ICP-MS)	10.1	ug/L	0.1	09/18/98	WTP raw treated
981582	water	WTP raw water	09/14/98	15-Sep-98	T-11	Tot-Selenium(ICP-MS)	1.1	ug/L	1	09/18/98	WTP raw treated

Lab Number	Sample Matrix	Field Sample ID	Collection Date	Received Date	TestGroupID	Parameter	Result	Units	Detection Limit	Analysis date	Location ID
981581	water	87-7	09/14/98	15-Sep-98	pH	pH	7.93	pH	0.05	09/18/98	87-7
981581	water	87-7	09/14/98	15-Sep-98	Conductivity	Conductivity	6750	uS/cm	0.3	09/18/98	87-7
981581	water	87-7	09/14/98	15-Sep-98	Tot Suspended	Tot Suspended	31	mg/L	0.3	09/18/98	87-7
981581	water	87-7	09/14/98	15-Sep-98	Calcium	Calcium	268	mg/L	0.05	09/16/98	87-7
981581	water	87-7	09/14/98	15-Sep-98	Magnesium	Magnesium	126	mg/L	0.01	09/16/98	87-7
981581	water	87-7	09/14/98	15-Sep-98	Sodium	Sodium	1000	mg/L	0.02	09/16/98	87-7
981581	water	87-7	09/14/98	15-Sep-98	Potassium	Potassium	14.4	mg/L	0.02	09/16/98	87-7
981581	water	87-7	09/14/98	15-Sep-98	Sulphate	Sulphate	826	mg/L	3	09/16/98	87-7
981581	water	87-7	09/14/98	15-Sep-98	T Phosphorus	T Phosphorus	0.023	mg/L	0.002	09/17/98	87-7
981581	water	87-7	09/14/98	15-Sep-98	NO3 Nitrate-N	NO3 Nitrate-N	0.064	mg/L	0.005	09/16/98	87-7
981581	water	87-7	09/14/98	15-Sep-98	Ammonia-N	Ammonia-N	2.74	mg/L	0.002	09/16/98	87-7
981581	water	87-7	09/14/98	15-Sep-98	Phenols	Phenols	3.82	mg/L	1	09/16/98	87-7
981581	water	87-7	09/14/98	15-Sep-98	Tot Arsenic(water)	Tot Arsenic(water)	0.4	ug/L	0.2	09/30/98	87-7
981581	water	87-7	09/14/98	15-Sep-98	Tot Mercury(water)	Tot Mercury(water)	10.01	ug/L	0.01	09/30/98	87-7
981581	water	87-7	09/14/98	15-Sep-98	Tot Cadmium(ICP)	Tot Cadmium(ICP)	10.1	ug/L	0.1	09/16/98	87-7
981581	water	87-7	09/14/98	15-Sep-98	Tot Cobalt(ICP-MS)	Tot Cobalt(ICP-MS)	5.0	ug/L	0.1	09/16/98	87-7
981581	water	87-7	09/14/98	15-Sep-98	Tot Chromium(ICP-MS)	Tot Chromium(ICP-MS)	10.2	ug/L	0.1	09/16/98	87-7
981581	water	87-7	09/14/98	15-Sep-98	Tot Copper(ICP-MS)	Tot Copper(ICP-MS)	11.4	ug/L	0.1	09/16/98	87-7
981581	water	87-7	09/14/98	15-Sep-98	Tot Manganese(ICP-MS)	Tot Manganese(ICP-MS)	926	ug/L	0.1	09/16/98	87-7
981581	water	87-7	09/14/98	15-Sep-98	Tot Nickel(ICP-MS)	Tot Nickel(ICP-MS)	8.5	ug/L	0.1	09/16/98	87-7
981581	water	87-7	09/14/98	15-Sep-98	Tot Lead(ICP-MS)	Tot Lead(ICP-MS)	0.7	ug/L	0.2	09/16/98	87-7
981581	water	87-7	09/14/98	15-Sep-98	Tot Zinc(ICP-MS)	Tot Zinc(ICP-MS)	150	ug/L	10	09/16/98	87-7
981581	water	87-7	09/14/98	15-Sep-98	Tot Iron(AA)	Tot Iron(AA)	2.87	mg/L	0.02	09/22/98	87-7

Lab Number	Sample Matrix	Field Sample ID	Collection Date	Received Date	Test Group ID	Parameter	Result	Units	Detection Limit	Analysis date	Location ID
981580	water	87-5	09/14/98	15-Sep-98	pH	pH	7.98	pH	0.05	09/18/98	87-5
981580	water	87-5	09/14/98	15-Sep-98	Conductivity	Conductivity	119	uS/cm	0.3	09/18/98	87-5
981580	water	87-5	09/14/98	15-Sep-98	Tot Suspended	Tot Suspended	3	mg/L	3	09/23/98	87-5
981580	water	87-5	09/14/98	15-Sep-98	Calcium	Calcium	18.0	mg/L	0.05	09/18/98	87-5
981580	water	87-5	09/14/98	15-Sep-98	Magnesium	Magnesium	1.81	mg/L	0.01	09/18/98	87-5
981580	water	87-5	09/14/98	15-Sep-98	Sodium	Sodium	1.12	mg/L	0.01	09/18/98	87-5
981580	water	87-5	09/14/98	15-Sep-98	Total Hardness	Total Hardness	11.90	mg/L	0.12	09/18/98	87-5
981580	water	87-5	09/14/98	15-Sep-98	Sulphate	Sulphate	5	mg/L	3	09/17/98	87-5
981580	water	87-5	09/14/98	15-Sep-98	Total Phosphorous	Total Phosphorous	0.009	mg/L	0.002	09/23/98	87-5
981580	water	87-5	09/14/98	15-Sep-98	NO3-N+NO2-N	NO3-N+NO2-N	0.217	mg/L	0.008	09/19/98	87-5
981580	water	87-5	09/14/98	15-Sep-98	NH3-N	NH3-N	0.010	mg/L	0.002	09/16/98	87-5
981580	water	87-5	09/14/98	15-Sep-98	Phenols	Phenols	1.00	ug/L	1	10/27/98	87-5
981580	water	87-5	09/14/98	15-Sep-98	Total Arsenic(water)	Total Arsenic(water)	0.02	ug/L	0.01	09/25/98	87-5
981580	water	87-5	09/14/98	15-Sep-98	Total Cadmium(water)	Total Cadmium(water)	0.01	ug/L	0.01	09/30/98	87-5
981580	water	87-5	09/14/98	15-Sep-98	Total Cobalt(ICP-MS)	Total Cobalt(ICP-MS)	0.1	ug/L	0.1	09/18/98	87-5
981580	water	87-5	09/14/98	15-Sep-98	Total Chromium(ICP-MS)	Total Chromium(ICP-MS)	0.5	ug/L	0.1	09/18/98	87-5
981580	water	87-5	09/14/98	15-Sep-98	Total Copper(ICP-MS)	Total Copper(ICP-MS)	2.2	ug/L	0.2	09/18/98	87-5
981580	water	87-5	09/14/98	15-Sep-98	Total Manganese(ICP-MS)	Total Manganese(ICP-MS)	0.8	ug/L	0.1	09/18/98	87-5
981580	water	87-5	09/14/98	15-Sep-98	Total Nickel(ICP-MS)	Total Nickel(ICP-MS)	0.3	ug/L	0.1	09/18/98	87-5
981580	water	87-5	09/14/98	15-Sep-98	Total Lead(ICP-MS)	Total Lead(ICP-MS)	1.02	ug/L	0.2	09/18/98	87-5
981580	water	87-5	09/14/98	15-Sep-98	Total Zinc(ICP-MS)	Total Zinc(ICP-MS)	1.10	ug/L	10	09/18/98	87-5
981580	water	87-5	09/14/98	15-Sep-98	Total Iron(AA)	Total Iron(AA)	0.027	mg/L	0.02	09/22/98	87-5

Lab Number	Sample Matrix	Field Sample ID	Collection Date	Received Date	Test Group ID	Parameter	Result	Units	Detection Limit	Analysis date	Location ID
9815/79	EFFLUENT	87.2	09/14/98	15-Sep-98 pH		pH	6.93		0.05	09/16/98	ICAT101 1111 R/2
9815/79	11111111	87.2	09/14/98	15-Sep-98 1:2:2		Tot Suspended	60	mg/l	1	09/17/98	ICAT101 1111 R/2
9815/79	11111111	87.2	09/14/98	15-Sep-98 NH3 N		Ammonia N	2.12	mg/l	0.002	09/16/98	ICAT101 1111 R/2
9815/79	EFFLUENT	87.2	09/14/98	15-Sep-98 EC		Faecal Coliform	1300000	CFU/dL	1	09/16/98	ICAT101 1111 R/2
9815/79	EFFLUENT	87.2	09/14/98	15-Sep-98 BOD5		Bio Oxy Demand	114	mg/l	2	09/16/98	ICAT101 1111 R/2

Lab Number	Sample Matrix	Field Sample ID	Collection Date	Received Date	Test Group ID	Parameter	Result	Units	Detection Limit	Analysis date	Location ID
981376	water	Iqaluit 87-5	08/24/98	25-Aug-98	pH	pH	7.81	pH	0.05	08/25/98	Iqaluit 87-5
981376	water	Iqaluit 87-5	08/24/98	25-Aug-98	Conductivity	Conductivity	111	uS/cm	0.3	08/25/98	Iqaluit 87-5
981376	water	Iqaluit 87-5	08/24/98	25-Aug-98	Tot-Suspended	Tot-Suspended	1.3	mg/L	3	08/25/98	Iqaluit 87-5
981376	water	Iqaluit 87-5	08/24/98	25-Aug-98	Calcium	Calcium	16.8	mg/L	0.05	08/31/98	Iqaluit 87-5
981376	water	Iqaluit 87-5	08/24/98	25-Aug-98	Magnesium	Magnesium	1.69	mg/L	0.01	08/31/98	Iqaluit 87-5
981376	water	Iqaluit 87-5	08/24/98	25-Aug-98	Sodium	Sodium	1.08	mg/L	0.02	09/01/98	Iqaluit 87-5
981376	water	Iqaluit 87-5	08/24/98	25-Aug-98	Potassium	Potassium	0.320	mg/L	0.02	09/01/98	Iqaluit 87-5
981376	water	Iqaluit 87-5	08/24/98	25-Aug-98	Sulphate	Sulphate	7	mg/L	3	09/02/98	Iqaluit 87-5
981376	water	Iqaluit 87-5	08/24/98	25-Aug-98	T-Phosphorous	T-Phosphorous	0.004	mg/L	0.002	09/09/98	Iqaluit 87-5
981376	water	Iqaluit 87-5	08/24/98	25-Aug-98	NO3-N+NO2-N	NO3-N+NO2-N	0.263	mg/L	0.008	09/08/98	Iqaluit 87-5
981376	water	Iqaluit 87-5	08/24/98	25-Aug-98	Ammonia N	Ammonia N	10.002	mg/L	0.002	08/27/98	Iqaluit 87-5
981376	water	Iqaluit 87-5	08/24/98	25-Aug-98	Phenols	Phenols	2.00	ug/L	2	08/27/98	Iqaluit 87-5
981376	water	Iqaluit 87-5	08/24/98	25-Aug-98	Tot-Arsenic(water)	Tot-Arsenic(water)	10.2	ug/L	0.2	08/26/98	Iqaluit 87-5
981376	water	Iqaluit 87-5	08/24/98	25-Aug-98	Tot-Mercury(water)	Tot-Mercury(water)	10.01	ug/L	0.01	08/25/98	Iqaluit 87-5
981376	water	Iqaluit 87-5	08/24/98	25-Aug-98	Tot-Chromium(ICP)	Tot-Chromium(ICP)	0.2	ug/L	0.1	08/27/98	Iqaluit 87-5
981376	water	Iqaluit 87-5	08/24/98	25-Aug-98	Tot-Cobalt(ICP-MS)	Tot-Cobalt(ICP-MS)	0.2	ug/L	0.1	08/27/98	Iqaluit 87-5
981376	water	Iqaluit 87-5	08/24/98	25-Aug-98	Tot-Chromium(ICP-MS)	Tot-Chromium(ICP-MS)	1.9	ug/L	0.1	08/27/98	Iqaluit 87-5
981376	water	Iqaluit 87-5	08/24/98	25-Aug-98	Tot-Manganese(ICP-MS)	Tot-Manganese(ICP-MS)	8.7	ug/L	0.1	08/27/98	Iqaluit 87-5
981376	water	Iqaluit 87-5	08/24/98	25-Aug-98	Tot-Nickel(ICP-MS)	Tot-Nickel(ICP-MS)	0.3	ug/L	0.1	08/27/98	Iqaluit 87-5
981376	water	Iqaluit 87-5	08/24/98	25-Aug-98	Tot-Lead(ICP-MS)	Tot-Lead(ICP-MS)	0.3	ug/L	0.2	08/27/98	Iqaluit 87-5
981376	water	Iqaluit 87-5	08/24/98	25-Aug-98	Tot-Zinc(ICP-MS)	Tot-Zinc(ICP-MS)	1.10	ug/L	10	08/27/98	Iqaluit 87-5
981376	water	Iqaluit 87-5	08/24/98	25-Aug-98	Tot-Iron(ICP-MS)	Tot-Iron(ICP-MS)	0.240	mg/L	0.01	08/27/98	Iqaluit 87-5

Lab Number	Sample Matrix	Field Sample ID	Collection Date	Received Date	Test/Group ID	Parameter	Result	Units	Detection Limit	Analysis date	Location ID
981375	water	lqalut 87-7	08/24/98	25-Aug-98	pH	7.91	pH		0.05	08/25/98	lqalut 87-7
981375	water	lqalut 87-7	08/24/98	25-Aug-98	Conductivity	6.7	mS/cm		0.3	08/25/98	lqalut 87-7
981375	water	lqalut 87-7	08/24/98	25-Aug-98	Tot-Suspended-	28	mg/L		0.05	08/25/98	lqalut 87-7
981375	water	lqalut 87-7	08/24/98	25-Aug-98	Calcium	696	mg/L		0.05	08/31/98	lqalut 87-7
981375	water	lqalut 87-7	08/24/98	25-Aug-98	Magnesium	260	mg/L		0.01	08/31/98	lqalut 87-7
981375	water	lqalut 87-7	08/24/98	25-Aug-98	Sodium	37.2	mg/L		0.02	08/31/98	lqalut 87-7
981375	water	lqalut 87-7	08/24/98	25-Aug-98	Potassium	140	mg/L		0.02	08/31/98	lqalut 87-7
981375	water	lqalut 87-7	08/24/98	25-Aug-98	Sulfate	831	mg/L		0.02	08/31/98	lqalut 87-7
981375	water	lqalut 87-7	08/24/98	25-Aug-98	Total Phosphate	0.113	mg/L		0.008	08/31/98	lqalut 87-7
981375	water	lqalut 87-7	08/24/98	25-Aug-98	NO3-N/NO2-N	0.023	mg/L		0.008	08/31/98	lqalut 87-7
981375	water	lqalut 87-7	08/24/98	25-Aug-98	Ammonia-N	0.004	mg/L		0.002	08/31/98	lqalut 87-7
981375	water	lqalut 87-7	08/24/98	25-Aug-98	Phenols	4.02	mg/L		0.02	08/31/98	lqalut 87-7
981375	water	lqalut 87-7	08/24/98	25-Aug-98	Total Arsenic (water)	10.2	ug/L		0.1	08/31/98	lqalut 87-7
981375	water	lqalut 87-7	08/24/98	25-Aug-98	Total Mercury(water)	10.01	ug/L		0.1	08/31/98	lqalut 87-7
981375	water	lqalut 87-7	08/24/98	25-Aug-98	Total Cadmium(ICP)	0.3	ug/L		0.1	08/31/98	lqalut 87-7
981375	water	lqalut 87-7	08/24/98	25-Aug-98	Total Chromium(ICP)	1.7	ug/L		0.1	08/31/98	lqalut 87-7
981375	water	lqalut 87-7	08/24/98	25-Aug-98	Total Copper(ICP/MS)	11.1	ug/L		0.1	08/31/98	lqalut 87-7
981375	water	lqalut 87-7	08/24/98	25-Aug-98	Total Manganese(ICP)	515	ug/L		0.1	08/31/98	lqalut 87-7
981375	water	lqalut 87-7	08/24/98	25-Aug-98	Total Nickel(ICP/MS)	13.8	ug/L		0.1	08/31/98	lqalut 87-7
981375	water	lqalut 87-7	08/24/98	25-Aug-98	Total Lead(ICP/MS)	0.9	ug/L		0.2	08/31/98	lqalut 87-7
981375	water	lqalut 87-7	08/24/98	25-Aug-98	Total Zinc(ICP/MS)	74.5	ug/L		10	08/31/98	lqalut 87-7
981375	water	lqalut 87-7	08/24/98	25-Aug-98	Total Iron(AA)	1.41	mg/L		0.02	08/31/98	lqalut 87-7

Lab Number	Sample Matrix	Field Sample ID	Collection Date	Received Date	Test Group ID	Parameter	Result	Units	Detection Limit	Analysis date	Location ID
981374	EFFLUENT	87-2	08/24/98	25-Aug-98 pH		pH	6.97		0.05	08/25/98	ICAT101111
981374	EFFLUENT	87-2	08/24/98	25-Aug-98 TSS		Tot.Suspended	112	mg/l	3	08/25/98	ICAT101111
981374	EFFLUENT	87-2	08/24/98	25-Aug-98 NH ₃ -N		Ammonia N	16.4	mg/l	0.003	08/27/98	ICAT101111
981374	EFFLUENT	87-2	08/24/98	25-Aug-98 FC		Fecal Coliform	890000	C-FU/dl	1	08/25/98	ICAT101111
981374	EFFLUENT	87-2	08/24/98	25-Aug-98 BOD5		Bio-Oxy-Demand	92	mg/l	2	08/26/98	ICAT101111

Lab Number	Sample Matrix	Field Sample ID	Collection Date	Received Date	TestGroupID	Parameter	Result	Units	Detection Limit	Analysis date	Location ID	
981312	WATER	87-7	07/24/98	17-Aug-98	Ca	Calcium	76.2	mg/L	0.05	08/20/98	ICAT LHI	
981312	WATER	87-7	07/24/98	17-Aug-98	ICP Cond	Conductivity	expired	uS/cm	0.3	09/21/98	ICAT LHI	
981312	WATER	87-7	07/24/98	17-Aug-98	ICP MS1	Tot Cadmium(ICP)	10.1	ug/L	0.1	08/21/98	ICAT LHI	
981312	WATER	87-7	07/24/98	17-Aug-98	ICP MS1	Tot Cobalt(ICP MS)	0.9	ug/L	0.1	08/27/98	ICAT LHI	
981312	WATER	87-7	07/24/98	17-Aug-98	ICP MS1	Tot Chromium(ICP)	1.7	ug/L	0.2	08/27/98	ICAT LHI	
981312	WATER	87-7	07/24/98	17-Aug-98	ICP MS1	Tot Copper(ICP MS)	2.4	ug/L	0.1	08/27/98	ICAT LHI	
981312	WATER	87-7	07/24/98	17-Aug-98	ICP MS1	Tot Iron(ICP)	1.2	ug/L	0.1	08/27/98	ICAT LHI	
981312	WATER	87-7	07/24/98	17-Aug-98	ICP MS1	Tot Manganese(ICP)	3.6	ug/L	0.1	08/27/98	ICAT LHI	
981312	WATER	87-7	07/24/98	17-Aug-98	ICP MS1	Tot Nickel(ICP MS)	3.8	ug/L	0.1	08/27/98	ICAT LHI	
981312	WATER	87-7	07/24/98	17-Aug-98	ICP MS1	Tot Lead(ICP MS)	10.2	ug/L	0.2	08/27/98	ICAT LHI	
981312	WATER	87-7	07/24/98	17-Aug-98	ICP MS1	Tot Zinc(ICP MS)	32.0	ug/L	10	0.02	08/27/98	ICAT LHI
981312	WATER	87-7	07/24/98	17-Aug-98	K	Potassium	13.8	mg/L	0.02	08/27/98	ICAT LHI	
981312	WATER	87-7	07/24/98	17-Aug-98	Mg	Magnesium	22.0	mg/L	0.01	08/20/98	ICAT LHI	
981312	WATER	87-7	07/24/98	17-Aug-98	Na	Sodium	97.8	mg/L	0.02	08/20/98	ICAT LHI	
981312	WATER	87-7	07/24/98	17-Aug-98	TH13 N	Ammonia N	0.014	mg/L	0.01	08/20/98	ICAT LHI	
981312	WATER	87-7	07/24/98	17-Aug-98	NO3 N+NO2 N	NO3 N+NO2 N	0.127	mg/L	0.005	08/20/98	ICAT LHI	
981312	WATER	87-7	07/24/98	17-Aug-98	pH	pH	expired	pH	2	0.005	08/20/98	ICAT LHI
981312	WATER	87-7	07/24/98	17-Aug-98	Phenols	Phenols	218	ug/L	3	0.002	08/20/98	ICAT LHI
981312	WATER	87-7	07/24/98	17-Aug-98	TAs(w)	Tot-Arsenic(water)	10.01	ug/L	0.2	0.002	08/20/98	ICAT LHI
981312	WATER	87-7	07/24/98	17-Aug-98	THq(w)	Tot-Mercury(water)	0.015	mg/L	0.002	0.002	08/20/98	ICAT LHI
981312	WATER	87-7	07/24/98	17-Aug-98	TP	T-Phosphorus	1.3	mg/L	3	0.002	08/20/98	ICAT LHI

Lab Number	Sample Matrix	Field Sample ID	Collection Date	Received Date	TestGroupID	Parameter	Result	Units	Detection Limit	Analysis date	Location ID
981311	WATER	87.5	07/24/98	17-Aug-98 pH		pH	expired	pH	0.05	09/18/98	ICAI U1T
981311	WATER	87.5	07/24/98	17-Aug-98 Cond		Conductivity	expired	uS/cm	0.3	09/21/98	ICAI U1T
981311	WATER	87.5	07/24/98	17-Aug-98 Ca		Calcium	16.4	mg/L	0.05	08/20/98	ICAI U1T
981311	WATER	87.5	07/24/98	17-Aug-98 Mg		Magnesium	1.44	mg/L	0.01	08/20/98	ICAI U1T
981311	WATER	87.5	07/24/98	17-Aug-98 K		Potassium	0.240	mg/L	0.02	08/20/98	ICAI U1T
981311	WATER	87.5	07/24/98	17-Aug-98 Na		Sodium	1.01	mg/L	0.02	08/20/98	ICAI U1T
981311	WATER	87.5	07/24/98	17-Aug-98 SO4		Sulphate	6	mg/L	3	08/20/98	ICAI U1T
981311	WATER	87.5	07/24/98	17-Aug-98 TSS		Tot-Suspended-	1.3	mg/L	3	08/20/98	ICAI U1T
981311	WATER	87.5	07/24/98	17-Aug-98 NO3+2-N		NO3-N+NO2-N	0.073	mg/L	0.008	08/18/98	ICAI U1T
981311	WATER	87.5	07/24/98	17-Aug-98 TP		T-Phosphorous	0.012	mg/L	0.002	08/25/98	ICAI U1T
981311	WATER	87.5	07/24/98	17-Aug-98 NH3-N		Ammonia N	0.167	mg/L	0.002	08/20/98	ICAI U1T
981311	WATER	87.5	07/24/98	17-Aug-98 Phenols		Phenols	1.2	ug/L	2	08/20/98	ICAI U1T
981311	WATER	87.5	07/24/98	17-Aug-98 THq(w)		Tot-Mercury(water)	1.0 01	ug/L	0.01	08/20/98	ICAI U1T
981311	WATER	87.5	07/24/98	17-Aug-98 TAs(w)		Tot-Arsenic(water)	1.0 2	ug/L	0.2	08/27/98	ICAI U1T
981311	WATER	87.5	07/24/98	17-Aug-98 ICP-MS1		Tot-Chromium(ICP-MS)	1.0 1	ug/L	0.1	08/27/98	ICAI U1T
981311	WATER	87.5	07/24/98	17-Aug-98 ICP-MS1		Tot-Cobalt(ICP-MS)	0.8	ug/L	0.1	08/27/98	ICAI U1T
981311	WATER	87.5	07/24/98	17-Aug-98 ICP-MS1		Tot-Cadmium(ICP-MS)	2.8	ug/L	0.2	08/27/98	ICAI U1T
981311	WATER	87.5	07/24/98	17-Aug-98 ICP-MS1		Tot-Chromium(ICP-MS)	35.6	ug/L	0.1	08/27/98	ICAI U1T
981311	WATER	87.5	07/24/98	17-Aug-98 ICP-MS1		Tot-Copper(ICP-MS)	0.7	ug/L	0.1	08/27/98	ICAI U1T
981311	WATER	87.5	07/24/98	17-Aug-98 ICP-MS1		Tot-Manganese(ICP-MS)	0.8	ug/L	0.2	08/27/98	ICAI U1T
981311	WATER	87.5	07/24/98	17-Aug-98 ICP-MS1		Tot-Nickel(ICP-MS)	0.7	ug/L	0.1	08/27/98	ICAI U1T
981311	WATER	87.5	07/24/98	17-Aug-98 ICP-MS1		Tot-Lead(ICP-MS)	1.10	ug/L	0.2	08/27/98	ICAI U1T
981311	WATER	87.5	07/24/98	17-Aug-98 ICP-MS1		Tot-Zinc(ICP-MS)	0.970	mg/L	10	08/27/98	ICAI U1T
981311	WATER	87.5	07/24/98	17-Aug-98 ICP-MS1		Tot-Iron(AA)	0.970	mg/L	0.02	09/01/98	ICAI U1T

Lab Number	Sample Matrix	Field Sample ID	Collection Date	Received Date	Test Group ID	Parameter	Result	Units	Detection Limit	Analysis date	Location ID
981313	SEWAGE	87.2	07/24/98	17-Aug-98 pH		pH	expired	pH	0.05	09/16/98 IQAL LUT	
981313	SEWAGE	87.2	07/24/98	17-Aug-98 TSS		Tot-Suspended-	N/A	mg/L	3	08/20/98 IQAL LUT	
981313	SEWAGE	87.2	07/24/98	17-Aug-98 NH3-N		Ammonia-N	15.3	mg/L	0.002	08/20/98 IQAL LUT	
981313	SEWAGE	87.2	07/24/98	17-Aug-98 FC		Faecal Coliform	Expired	CFU/dL	1	08/17/98 IQAL LUT	
981313	SEWAGE	87.2	07/24/98	17-Aug-98 BOD5		Bio-Oxy Demand	Expired	mg/L	2	08/17/98 IQAL LUT	

Lab Number	Sample Matrix	Field Sample ID	Collection Date	Received Date	TestGroupID	Parameter	Result	Units	Detection Limit	Analysis date	Location ID
980771	WATER	SNP-7	06/09/98	09-Jun-98	Ca	Calcium	47.7	mg/L	0.03	06/12/98	IC2ALUIT SNP-7
980771	WATER	SNP-7	06/09/98	09-Jun-98	Cond	Conductivity	800	uS/cm	0.3	06/09/98	IC2ALUIT SNP-7
980771	WATER	SNP-7	06/09/98	09-Jun-98	ICP-MS1	Tot-Cadmium(ICP-MS)	1.3	ug/L	0.1	06/12/98	IC2ALUIT SNP-7
980771	WATER	SNP-7	06/09/98	09-Jun-98	ICP-MS1	Tot-Cobalt(ICP-MS)	1.5	ug/L	0.1	06/12/98	IC2ALUIT SNP-7
980771	WATER	SNP-7	06/09/98	09-Jun-98	ICP-MS1	Tot-Chromium(ICP-MS)	2.0	ug/L	0.2	06/12/98	IC2ALUIT SNP-7
980771	WATER	SNP-7	06/09/98	09-Jun-98	ICP-MS1	Tot-Copper(ICP-MS)	8.7	ug/L	0.1	06/12/98	IC2ALUIT SNP-7
980771	WATER	SNP-7	06/09/98	09-Jun-98	ICP-MS1	Tot-Iron(ICP-MS)	1.22	ug/L	0.012	06/12/98	IC2ALUIT SNP-7
980771	WATER	SNP-7	06/09/98	09-Jun-98	ICP-MS1	Tot-Manganese(ICP-MS)	18.2	ug/L	0.1	06/12/98	IC2ALUIT SNP-7
980771	WATER	SNP-7	06/09/98	09-Jun-98	ICP-MS1	Tot-Nickel(ICP-MS)	5.5	ug/L	0.1	06/12/98	IC2ALUIT SNP-7
980771	WATER	SNP-7	06/09/98	09-Jun-98	ICP-MS1	Tot-Lead(ICP-MS)	4.4	ug/L	0.2	06/12/98	IC2ALUIT SNP-7
980771	WATER	SNP-7	06/09/98	09-Jun-98	ICP-MS1	Tot-Zinc(ICP-MS)	31.7	ug/L	0.5	06/12/98	IC2ALUIT SNP-7
980771	WATER	SNP-7	06/09/98	09-Jun-98	K	Potassium	14.2	mg/L	0.002	06/12/98	IC2ALUIT SNP-7
980771	WATER	SNP-7	06/09/98	09-Jun-98	Mn	Manganese	26.1	mg/L	0.005	06/12/98	IC2ALUIT SNP-7
980771	WATER	SNP-7	06/09/98	09-Jun-98	Pb	Lead	7.25	mg/L	0.002	06/12/98	IC2ALUIT SNP-7
980771	WATER	SNP-7	06/09/98	09-Jun-98	NH3-N	Ammonia N	1.47	mg/L	0.002	06/12/98	IC2ALUIT SNP-7
980771	WATER	SNP-7	06/09/98	09-Jun-98	NO3-N	NO3-N	0.089	mg/L	0.008	06/12/98	IC2ALUIT SNP-7
980771	WATER	SNP-7	06/09/98	09-Jun-98	pH	pH	7.50	pH	2	06/12/98	IC2ALUIT SNP-7
980771	WATER	SNP-7	06/09/98	09-Jun-98	Phosph.	Phosph.	3	ug/L	0.05	06/12/98	IC2ALUIT SNP-7
980771	WATER	SNP-7	06/09/98	09-Jun-98	Sulfate	Sulfate	239	mg/L	3	06/12/98	IC2ALUIT SNP-7
980771	WATER	SNP-7	06/09/98	09-Jun-98	TAS(w)	Tot Arsenic (water)	0.1	ug/L	0.2	06/12/98	IC2ALUIT SNP-7
980771	WATER	SNP-7	06/09/98	09-Jun-98	SC4	Tot Selenium (water)	1.001	ug/L	0.01	06/12/98	IC2ALUIT SNP-7
980771	WATER	SNP-7	06/09/98	09-Jun-98	TH(w)	Tot Mercury (water)	0.074	ug/L	0.002	06/12/98	IC2ALUIT SNP-7
980771	WATER	SNP-7	06/09/98	09-Jun-98	TP	Tot Phosphorus	8	mg/L	3	12/09/98	IC2ALUIT SNP-7

Lab Number	Sample Matrix	Field Sample ID	Collection Date	Received Date	TestGroupID	Parameter	Result	Units	Detection Limit	Analysis date	Location ID
980770	WATER	SNP-6	06/08/98	09-Jun-98	Ca	Calcium	388		0.03		
980770	WATER	SNP-6	06/08/98	09-Jun-98	Cond	Conductivity	63	ms/cm	0.3	06/17/98	ICALUIT SNP-6
980770	WATER	SNP-6	06/08/98	09-Jun-98	ICP-MS1	Tot.Cadmium(ICP-MS)	1.0	ug/L	0.1	06/09/98	ICALUIT SNP-6
980770	WATER	SNP-6	06/08/98	09-Jun-98	ICP-MS1	Tot.Cobalt(ICP-MS)	3.7	ug/L	0.1	06/12/98	ICALUIT SNP-6
980770	WATER	SNP-6	06/08/98	09-Jun-98	ICP-MS1	Tot.Chromium(ICP-MS)	7.5	ug/L	0.2	06/12/98	ICALUIT SNP-6
980770	WATER	SNP-6	06/08/98	09-Jun-98	ICP-MS1	Tot.Copper(ICP-MS)	23.4	ug/L	0.1	06/12/98	ICALUIT SNP-6
980770	WATER	SNP-6	06/08/98	09-Jun-98	ICP-MS1	Tot.Iron(AA)	2.09	ug/L	0.012	06/16/98	ICALUIT SNP-6
980770	WATER	SNP-6	06/08/98	09-Jun-98	ICP-MS1	Tot.Manganese(ICP-MS)	725	ug/L	0.1	06/12/98	ICALUIT SNP-6
980770	WATER	SNP-6	06/08/98	09-Jun-98	ICP-MS1	Tot.Nickel(ICP-MS)	10.9	ug/L	0.1	06/12/98	ICALUIT SNP-6
980770	WATER	SNP-6	06/08/98	09-Jun-98	ICP-MS1	Tot.Lead(ICP-MS)	8.7	ug/L	0.2	06/12/98	ICALUIT SNP-6
980770	WATER	SNP-6	06/08/98	09-Jun-98	ICP-MS1	Tot.Zinc(ICP-MS)	220	ug/L	0.5	06/12/98	ICALUIT SNP-6
980770	WATER	SNP-6	06/08/98	09-Jun-98	K	Potassium	152	mg/L	0.002	06/12/98	ICALUIT SNP-6
980770	WATER	SNP-6	06/08/98	09-Jun-98	Mg	Magnesium	102	mg/L	0.005	06/12/98	ICALUIT SNP-6
980770	WATER	SNP-6	06/08/98	09-Jun-98	Na	Sodium	795	mg/L	0.02	06/12/98	ICALUIT SNP-6
980770	WATER	SNP-6	06/08/98	09-Jun-98	NH3-N	Ammonia N	0.984	mg/L	0.002	06/17/98	ICALUIT SNP-6
980770	WATER	SNP-6	06/08/98	09-Jun-98	NO3-N	NO3-N+NO2-N	9.165	mg/L	0.008	06/16/98	ICALUIT SNP-6
980770	WATER	SNP-6	06/08/98	09-Jun-98	pH	pH	7.22	pH	0.05	06/09/98	ICALUIT SNP-6
980770	WATER	SNP-6	06/08/98	09-Jun-98	Phenols	Phenols	2	ug/L	2	06/24/98	ICALUIT SNP-6
980770	WATER	SNP-6	06/08/98	09-Jun-98	SO4	Sulphate	1520	mg/L	3	06/17/98	ICALUIT SNP-6
980770	WATER	SNP-6	06/08/98	09-Jun-98	TAs(w)	Tot.Arsenic(water)	1.02	ug/L	0.2	06/16/98	ICALUIT SNP-6
980770	WATER	SNP-6	06/08/98	09-Jun-98	Thg(w)	Tot.Mercury(water)	0.01	ug/L	0.01	06/17/98	ICALUIT SNP-6
980770	WATER	SNP-6	06/08/98	09-Jun-98	TP	T-Phosphorous	0.121	mg/L	0.002	06/17/98	ICALUIT SNP-6
980770	WATER	SNP-6	06/08/98	09-Jun-98	TSS	Tot-Suspended	25	mg/L	3	12/06/98	ICALUIT SNP-6

Lab Number	Sample Matrix	Field Sample ID	Collection Date	Received Date	Test Group ID	Parameter	Result	Unit	Detection Limit	Analysis date	Location ID
980769	WATER	87.5	06/08/98	09-Jun-98 pH		pH	87.5	pH	0.005	06/12/98 ICAL UTT 87.5	
980769	WATER	87.5	06/08/98	09-Jun-98 Cu		Copper (Cu)	10.4	ug/L	0.03	06/12/98 ICAL UTT 87.5	
980769	WATER	87.5	06/08/98	09-Jun-98 Mg		Magnesium	1.16	mg/L	0.005	06/12/98 ICAL UTT 87.5	
980769	WATER	87.5	06/08/98	09-Jun-98 K		Potassium	0.295	mg/L	0.007	06/12/98 ICAL UTT 87.5	
980769	WATER	87.5	06/08/98	09-Jun-98 Na		Sodium	1.01	mg/L	0.01	06/12/98 ICAL UTT 87.5	
980769	WATER	87.5	06/08/98	09-Jun-98 TSS		Total Solids	11	mg/L	3	06/12/98 ICAL UTT 87.5	
980769	WATER	87.5	06/08/98	09-Jun-98 NO3+2-N		NO3-N+NO2-N	0.159	mg/L	0.008	06/12/98 ICAL UTT 87.5	
980769	WATER	87.5	06/08/98	09-Jun-98 TP		Total Phosphorus	0.012	mg/L	0.002	06/12/98 ICAL UTT 87.5	
980769	WATER	87.5	06/08/98	09-Jun-98 NH3-N		Ammonia N	0.003	mg/L	0.002	06/12/98 ICAL UTT 87.5	
980769	WATER	87.5	06/08/98	09-Jun-98 Phenols		Phenols	1.2	ug/L	2	06/12/98 ICAL UTT 87.5	
980769	WATER	87.5	06/08/98	09-Jun-98 TSS(w)		Total Mercury(water)	10.01	ug/L	0.01	06/12/98 ICAL UTT 87.5	
980769	WATER	87.5	06/08/98	09-Jun-98 ICP-MS1		Total Arsenic(water)	10.2	ug/L	0.2	06/12/98 ICAL UTT 87.5	
980769	WATER	87.5	06/08/98	09-Jun-98 ICP-MS1		Total Cadmium(ICP-MS)	0.8	ug/L	0.1	06/12/98 ICAL UTT 87.5	
980769	WATER	87.5	06/08/98	09-Jun-98 ICP-MS1		Total Cobalt(ICP-MS)	0.3	ug/L	0.1	06/12/98 ICAL UTT 87.5	
980769	WATER	87.5	06/08/98	09-Jun-98 ICP-MS1		Total Chromium(ICP-MS)	2.1	ug/L	0.2	06/12/98 ICAL UTT 87.5	
980769	WATER	87.5	06/08/98	09-Jun-98 ICP-MS1		Total Copper(ICP-MS)	14.4	ug/L	0.1	06/12/98 ICAL UTT 87.5	
980769	WATER	87.5	06/08/98	09-Jun-98 ICP-MS1		Total Manganese(ICP-MS)	0.8	ug/L	0.1	06/12/98 ICAL UTT 87.5	
980769	WATER	87.5	06/08/98	09-Jun-98 ICP-MS1		Total Nickel(ICP-MS)	1.1	ug/L	0.2	06/12/98 ICAL UTT 87.5	
980769	WATER	87.5	06/08/98	09-Jun-98 ICP-MS1		Total Lead(ICP-MS)	8.6	ug/L	0.5	06/12/98 ICAL UTT 87.5	
980769	WATER	87.5	06/08/98	09-Jun-98 ICP-MS1		Total Zinc(ICP-MS)	0.359	mg/L	0.012	06/12/98 ICAL UTT 87.5	

Lab Number	Sample Matrix	Field Sample ID	Collection Date	Received Date	Test Group ID	Parameter	Result	Units	Detection Limit	Analysis date	Location ID
980766	TREATED WATER	ICALUIT WATER	06/08/98	09-Jun-98	f	Fluoride	10.05	mg/L	0.05	06/12/98	WATER SUPPLY
980768	TREATED WATER	ICALUIT WATER	06/08/98	09-Jun-98	Alkal	Alkalinity	13.6	mg/L	0.3	06/09/98	WATER SUPPLY
980768	TREATED WATER	ICALUIT WATER	06/08/98	09-Jun-98	Cl	Chloride	1.5	mg/L	0.2	06/17/98	WATER SUPPLY
980768	TREATED WATER	ICALUIT WATER	06/08/98	09-Jun-98	SO4	Sulphate	3	mg/L	3	06/17/98	WATER SUPPLY
980768	TREATED WATER	ICALUIT WATER	06/08/98	09-Jun-98	Turb	Turbidity	1.9	NTU	0.1	06/10/98	WATER SUPPLY
980768	TREATED WATER	ICALUIT WATER	06/08/98	09-Jun-98	TSS	Tot Suspended	10	mg/L	3	12/05/98	WATER SUPPLY
980768	TREATED WATER	ICALUIT WATER	06/08/98	09-Jun-98	11R	Tot Fe+2, Solab.	47	mg/L	10	12/05/98	WATER SUPPLY
980768	TREATED WATER	ICALUIT WATER	06/08/98	09-Jun-98	NO3+2-N	NO3 N+NO2-N	10.008	mg/L	0.008	06/15/98	WATER SUPPLY
980768	TREATED WATER	ICALUIT WATER	06/08/98	09-Jun-98	TCN(I)	Nitrite-N	0.001	mg/L	0.001	06/24/98	WATER SUPPLY
980768	TREATED WATER	ICALUIT WATER	06/08/98	09-Jun-98	Phenols	Tot Cyanide(Iox)	0.001	mg/L	0.001	06/24/98	WATER SUPPLY
980768	TREATED WATER	ICALUIT WATER	06/08/98	09-Jun-98	T-THM(w)	Phenols	L2	ug/L	2	06/16/98	WATER SUPPLY
980768	TREATED WATER	ICALUIT WATER	06/08/98	09-Jun-98	Tas(w)	Tot-	L5	ug/L	5	06/16/98	WATER SUPPLY
980768	TREATED WATER	ICALUIT WATER	06/08/98	09-Jun-98	ICP-MS1	Tot-Arsenic(water)	L0.2	ug/L	0.2	06/12/98	WATER SUPPLY
980768	TREATED WATER	ICALUIT WATER	06/08/98	09-Jun-98	ICP-MS1	Tot-Cadmium(ICP-	L0.1	ug/L	0.1	06/12/98	WATER SUPPLY
980768	TREATED WATER	ICALUIT WATER	06/08/98	09-Jun-98	ICP-MS1	Tot-Cobalt(ICP-MS)	0.1	ug/L	0.1	06/12/98	WATER SUPPLY
980768	TREATED WATER	ICALUIT WATER	06/08/98	09-Jun-98	ICP-MS1	Tot-Chromium(ICP-	0.3	ug/L	0.2	06/12/98	WATER SUPPLY
980768	TREATED WATER	ICALUIT WATER	06/08/98	09-Jun-98	ICP-MS1	Tot-Copper(ICP-MS)	8.2	ug/L	0.1	06/12/98	WATER SUPPLY
980768	TREATED WATER	ICALUIT WATER	06/08/98	09-Jun-98	ICP-MS1	Tot-Manganese(ICP-	34.7	ug/L	0.1	06/12/98	WATER SUPPLY
980768	TREATED WATER	ICALUIT WATER	06/08/98	09-Jun-98	ICP-MS1	Tot-Nickel(ICP-MS)	0.4	ug/L	0.1	06/12/98	WATER SUPPLY
980768	TREATED WATER	ICALUIT WATER	06/08/98	09-Jun-98	ICP-MS1	Tot-Lead(ICP-MS)	0.2	ug/L	0.2	06/12/98	WATER SUPPLY
980768	TREATED WATER	ICALUIT WATER	06/08/98	09-Jun-98	ICP-MS1	Tot-Zinc(ICP-MS)	1.7	ug/L	0.5	06/12/98	WATER SUPPLY
980768	TREATED WATER	ICALUIT WATER	06/08/98	09-Jun-98	ICP-MS1	Tot-Iron(AA)	0.154	ug/L	0.012	06/16/98	WATER SUPPLY
980768	TREATED WATER	ICALUIT WATER	06/08/98	09-Jun-98	TAg MS	Tot-Silver(ICP-MS)	L0.1	ug/L	0.1	06/12/98	WATER SUPPLY
980768	TREATED WATER	ICALUIT WATER	06/08/98	09-Jun-98	TBa MS	Tot-Barium(ICP-MS)	2.3	ug/L	0.1	06/12/98	WATER SUPPLY
980768	TREATED WATER	ICALUIT WATER	06/08/98	09-Jun-98	TSe MS	Tot-Selenium(ICP-	L10	ug/L	10	06/12/98	WATER SUPPLY

APPENDIX "D"

Hyperion Water Analysis Program 1992 to 1998

Water Filter Analysis Report Sheet

CONFIDENTIAL REPORT



HYPERION RESEARCH LTD.

350-12 St. SW, Medicine Hat, AB T1A 4T7

Fax and Telephone (403) 529-0847

Client: Mr. Fred Gray,
Municipality of Iqaluit
Box 460,
Iqaluit, N.W.T.,
X0A 0H0

Tel.: (819) 979-5635

Fax.: (819) 979-5910

Date of Sample Nov 12/92
Sample Location IQALUIT
Type of Sample RAW
Volume Filtered 3420 L
Temperature _____
pH _____
Turbidity _____

Microbiological Results

Giardia cysts	<u>-</u>
Cryptosporidium oocysts	<u>-</u>
Algae	<u>LOT 5</u>
Nematodes	<u>-</u>
Rotifers	<u>few</u>
Crustacea	<u>MANY</u>
Insecta	<u>-</u>

Comments:

Key: - not present
1+ 1-21 /1000 L
2+ 21-50 /1000 L
3+ 51-100 /1000 L
4+ 101-150 /1000 L
5+ 151-200 /1000 L
6+ 201-250 /1000 L

Lab Notes

Date Received Nov 16 /92
Time Received 10:00
Condition of Filter GOOD
Lab ID 1C
MAB CELLAB GIC
Control G. BTI C. HPC
Density Medium 1 M SUCROSE
Vol. Total Wash 1000 mL
Vol. Concentrated 1000 mL
Vol. Clarified 500 mL
Sediment Recovered _____
Cysts G. C.
Animal Inoc. YES
Comments _____

Results certified by:

P. Paul
Peter M. Wallis, Ph.D.

Water Filter Analysis Report Sheet

CONFIDENTIAL REPORT



HYPERION RESEARCH LTD.

350-12 St. SW, Medicine Hat, AB T1A 4T7

Fax and Telephone (403) 529-0847

Client: Mr. Fred Gray,
Municipality of Iqaluit
Box 460,
Iqaluit, N.W.T.,
X0A 0H0

Tel.: (819) 979-5635

Fax.: (819) 979-5910

Date of Sample Nov 10-11/92
Sample Location IQAUIT
Type of Sample RW
Volume Filtered 670L
Temperature _____
pH _____
Turbidity _____

Microbiological Results

Giardia cysts -
Cryptosporidium oocysts -
Algae LOTS
Nematodes -
Rotifers SOME
Crustacea SOME
Insecta -

Comments:

Key: - not present
1+ 1-21 /1000 L
2+ 21-50 /1000 L
3+ 51-100 /1000 L
4+ 101-150 /1000 L
5+ 151-200 /1000 L
6+ 201-250 /1000 L

Lab Notes

Date Received Nov 16/92
Time Received 10:00
Condition of Filter GOOD
Lab ID 18
MAB CELLAB GTC.
Control G. BTI C. HPC
Density Medium 1M SUCROSE
Vol. Total Wash 1000mL
Vol. Concentrated 1000mL
Vol. Clarified 500mL
Sediment Recovered 1.0mL
Cysts G. C.
Animal Inoc. YES
Comments

Results certified by:

P. Wallis
Peter M. Wallis, Ph.D.

Water Filter Analysis Report Sheet

CONFIDENTIAL REPORT



HYPERION RESEARCH LTD.

350-12 St. SW, Medicine Hat, AB T1A 4T7

Fax and Telephone (403) 529-0847

Client: Mr. Fred Gray,
Superintendent of Public Works,
Municipality of Iqaluit,
Iqaluit, NT X0A 0H0

Date of Sample July 7/8
Sample Location Water Treatment Plant Influent C
Type of Sample Raw
Volume Filtered 3900 L
Temperature 9°C
pH 5.8
Turbidity —

Tel.: (819) 979-5635**Fax.:** (819) 979-5910

Microbiological Results

Giardia cysts 1+
Cryptosporidium oocysts —
Algae lots
Nematodes +
Rotifers —
Crustacea —
Insecta —

Comments:

Key: - not present
1+ 1-21 /1000 L
2+ 21-50 /1000 L
3+ 51-100 /1000 L
4+ 101-150 /1000 L
5+ 151-200 /1000 L
6+ 201-250 /1000 L

Lab Notes

Date Received July 8
Time Received 1300
Condition of Filter warm
Lab ID IQR 8
MAb Hydrofluor
Control G. C.
Density Medium Paracell
Vol. Total Wash 1000 mL
Vol. Concentrated 400 mL 600 mL
Vol. Clarified 400 mL 600 mL
Sediment Recovered 50 mL
Cysts G. C.
Animal Inoc.
Comments

Neg animal

Results certified by:

Peter M. Wallis
Peter M. Wallis, Ph.D.

Water Filter Analysis Report Sheet

CONFIDENTIAL REPORT



HYPERION RESEARCH LTD.

350-12 St. SW, Medicine Hat, AB T1A 4T7

Fax and Telephone (403) 529-0847

Client: Mr. Fred Gray,
Superintendent of Public Works,
Municipality of Iqaluit,
Iqaluit, NT X0A 0H0

Date of Sample July 13/14
Sample Location Water Treatment Plant (Int'l. loop)
Type of Sample Raw
Volume Filtered 3500 L
Temperature 10°C
pH 6.4
Turbidity —

Tel.: (819) 979-5635**Fax.:** (819) 979-5910

Microbiological Results

Giardia cysts 1+
Cryptosporidium oocysts —
Algae 1+
Nematodes +
Rotifers —
Crustacea —
Insecta —

Comments:

Key: - not present
1+ 1-21 /1000 L
2+ 21-50 /1000 L
3+ 51-100 /1000 L
4+ 101-150 /1000 L
5+ 151-200 /1000 L
6+ 201-250 /1000 L

Lab Notes

Date Received July 15
Time Received 0930
Condition of Filter warm
Lab ID IQR 15
MAB HydroFlex
Control G. C.
Density Medium Percoll
Vol. Total Wash 1000µL
Vol. Concentrated 400 µL 600µL aliquots
Vol. Clarified 400 µL
Sediment Recovered 8µL
Cysts G. C.
Animal Inoc. weg animal biopsy
Comments

Results certified by:

Peter M. Wallis, Ph.D.
Peter M. Wallis, Ph.D.

Water Filter Analysis Report Sheet

CONFIDENTIAL REPORT



HYPERION RESEARCH LTD.

350-12 St. SW, Medicine Hat, AB T1A 4T7

Fax and Telephone (403) 529-0847

Client: Mr. Fred Gray,
Superintendent of Public Works,
Municipality of Iqaluit,
Iqaluit, NT X0A 0H0

Date of Sample July 27/28 1993
Sample Location WTP (Influent Corp)
Type of Sample Raw
Volume Filtered 3300 L
Temperature 11°C
pH 5.9
Turbidity —

Tel.: (819) 979-5635**Fax.:** (819) 979-5910

Microbiological Results

<i>Giardia</i> cysts	<u>—</u>
<i>Cryptosporidium</i> oocysts	<u>—</u>
Algae	<u>low</u>
Nematodes	<u>—</u>
Rotifers	<u>—</u>
Crustacea	<u>+</u>
Insecta	<u>—</u>

Comments:

Key:

-	not present
1+	1-21 /1000 L
2+	21-50 /1000 L
3+	51-100 /1000 L
4+	101-150 /1000 L
5+	151-200 /1000 L
6+	201-250 /1000 L

Lab Notes

Date Received July 28
Time Received 1200
Condition of Filter Cold
Lab ID IAK 27
MAB HydroFlow - Combo
Control G. SL14+ C.A.R. 4+
Density Medium SUCROSE
Vol. Total Wash 9000 mL
Vol. Concentrated 100 / 100 mL
Vol. Clarified 100 / 100 mL
Sediment Recovered 30 mL
Cysts G. C.
Animal Inoc. Yes
Comments

Results certified by:

Peter M. Wallis
Peter M. Wallis, Ph.D.

93

Fax and Telephone (403) 529-0847

Client: Mr. Fred Gray,
Superintendent of Public Works,
Municipality of Iqaluit,
Iqaluit, NT X0A 0H0

Date of Sample July 22/01
Sample Location Water Treatment Plant (Raw Water)
Type of Sample Water
Volume Filtered 1134 L
Temperature 11
pH 8.9
Turbidity —

Tel.: (819) 979-5635

Fax.: (819) 979-5910

Microbiological Results

Giardia cysts 1+
Cryptosporidium oocysts -
Algae —
Nematodes -
Rotifers —
Crustacea —
Insecta —

Comments:

Key: - not present
1+ 1-21 /1000 L
2+ 21-50 /1000 L
3+ 51-100 /1000 L
4+ 101-150 /1000 L
5+ 151-200 /1000 L
6+ 201-250 /1000 L

Lab Notes

Date Received July 20/01
Time Received 14:00
Condition of Filter clean
Lab ID 1089-01
MAB Hyphomicrobium
Control G. C.
Density Medium 100 ml
Vol. Total Wash 1000 ml
Vol. Concentrated 400 ml 600 ml
Vol. Clarified 400 ml 600 ml
Sediment Recovered 8 ml
Cysts G. C.
Animal Inoc.
Comments

Results certified by:

Peter M. Wallis
Peter M. Wallis, Ph.D.

Water Filter Analysis Report Sheet

CONFIDENTIAL REPORT



HYPERION RESEARCH LTD.

350-12 St. SW, Medicine Hat, AB T1A 4T7

Fax and Telephone (403) 529-0847

Client: Mr. Fred Gray,
Superintendent of Public Works,
Municipality of Iqaluit,
Iqaluit, NT X0A 0H0

Date of Sample May 15/16
Sample Location Water Treatment Plant
Type of Sample Raw
Volume Filtered 3600 L
Temperature 6 °C
pH 6.9
Turbidity /

Tel.: (819) 979-5635

Fax.: (819) 979-5910

Microbiological Results

Giardia cysts	<u>—</u>
Cryptosporidium oocysts	<u>—</u>
Algae	<u>high</u>
Nematodes	<u>—</u>
Rotifers	<u>—</u>
Crustacea	<u>+</u>
Insecta	<u>—</u>

Comments:

Key: - not present
1+ 1-21 /1000 L
2+ 21-50 /1000 L
3+ 51-100 /1000 L
4+ 101-150 /1000 L
5+ 151-200 /1000 L
6+ 201-250 /1000 L

Lab Notes

Date Received May 18
Time Received 0930
Condition of Filter old
Lab ID WTR
MAB S-3C + WAB
Control G. 4+ C. 3+
Density Medium 50/50 Percut / 1M Sucrose
Vol. Total Wash 1000 mL
Vol. Concentrated 275 mL
Vol. Clarified 275 mL
Sediment Recovered 4 mL
Cysts G. 0 C. 0
Animal Inoc. no
Comments

Results certified by:

Peter M. Wallis, Ph.D.

Water Filter Analysis Report Sheet

Confidential Report



HYPERION RESEARCH LTD.

350-12 St. SW, Medicine Hat, AB T1A 4T7 CANADA
Fax and Telephone (403) 529-0847

CLIENT: Mr. Fred Gray
Municipality of Iqaluit
Box 460
Iqaluit, NT
X0A 0H0
TEL: (819) 979-5648
FAX: (819) 979-4166

Date of Sample: May 24, 1994
Sample Location: WTP Influent
Type of Sample: raw
Volume Filtered: 3,800 L
Temperature: 8 °C
pH: 6.84
Turbidity: NTU

MICROBIOLOGICAL RESULTS

<i>Giardia</i> cysts	<u>1+</u>
<i>Cryptosporidium</i> oocysts	<u>n/a</u>
Algae	<u>high</u>
Nematodes	<u>neg</u>
Rotifers	<u>+</u>
Crustacea	<u>+</u>
Insecta	<u>neg</u>

COMMENTS

Key. not present
1+ 1-21/1000 L
2+ 21-50/1000 L
3+ 51-100/1000 L
4+ 101-150/1000 L
5+ 151-200/1000 L
6+ 201-250/1000 L

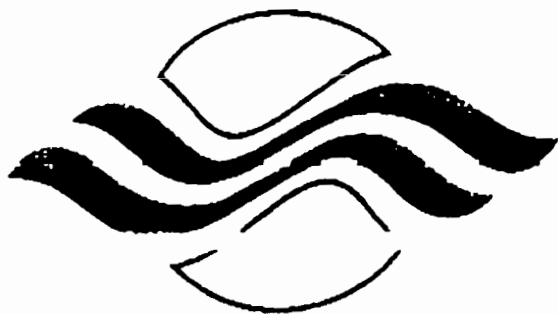
LAB NOTES

DATE RECEIVED: May 26, 1994
TIME RECEIVED: 0930
CONDITION OF FILTER: warm
LAB ID: WTPI
MAB: 5-3C
CONTROL: G. 4+ C.
DENSITY MEDIUM: Percoll/Sucrose: 50/50
TOTAL WASH (mL): 1,000

VOLUME	DETECTION	VIABILITY
PROPORTION (%)	<u>0</u> %	<u>0</u> %
CLARIFIED (mL)	<u>300</u>	
SEDIMENT (mL)	<u>8</u>	
SAMPLE EQUIV.	<u>1,140</u>	<u>0</u>
# CYSTS	<u>Giardia</u>	<u>Crypto.</u>
PI positive	<u>2</u>	
PI negative	<u>0</u>	
Total	<u>2</u>	<u>0</u>

Water Filter Analysis Report Sheet

Confidential Report



HYPERION RESEARCH LTD.

350-12 St. SW, Medicine Hat, AB T1A 4T7 CANADA
 Fax and Telephone (403) 529-0847

CLIENT: Mr. Fred Gray
 Municipality of Iqaluit
 Box 460
 Iqaluit, NT
 X0A 0H0

TEL: (819) 979-5648

FAX: (819) 979-4166

Date of Sample : May 30, 1994
 Sample Location : Lake Geraldine Influent
 - WTP
 Type of Sample: raw
 Volume Filtered: 9,000 L
 Temperature: 9.9 °C
 pH: 6.5
 Turbidity: NTU

MICROBIOLOGICAL RESULTS

<i>Giardia</i> cysts	neg
<i>Cryptosporidium</i> oocysts	neg
Algae	high
Nematodes	neg
Mollusks	neg
Crustacea	pos
Insects	pos

COMMENTS:

Key: - not present
 1+ 1-21/1000 L
 2+ 21-50/1000 L
 3+ 51-100/1000 L
 4+ 101-150/1000 L
 5+ 151-200/1000 L
 6+ 201-250/1000 L

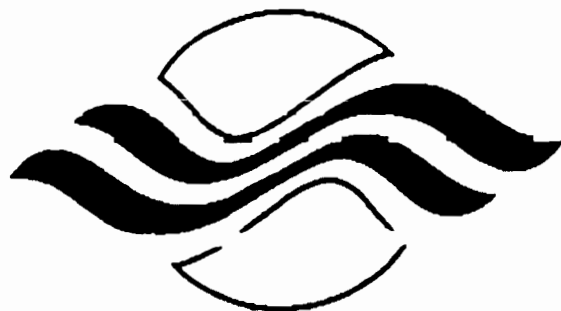
LAB NOTES

DATE RECEIVED: May 31, 1994
 TIME RECEIVED: 1400
 CONDITION OF FILTER: warm
 LAB ID: IPTR
 Mab: 5-3C + WAB
 CONTROL: G. 4+ C. 3+
 DENSITY MEDIUM: Percoll/Sucrose: 50/50
 TOTAL WASH (mL): 1,000

VOLUME	DETECTION	VIABILITY
PROPORTION (%)	0 %	0 %
CLARIFIED (mL)	100	
SEDIMENT (mL)	5	
SAMPLE EQUIV.	900	0
# CYSTS	<i>Giardia</i>	<i>Crypto.</i>
PI positive	0	0
PI negative	0	0
Total	0	0

Water Filter Analysis Report Sheet

Confidential Report



HYPERION RESEARCH LTD.

350-12 St. SW, Medicine Hat, AB T1A 4T7 CANADA
Fax and Telephone (403) 529 - 0847

CLIENT: Mr. Fred Gray
Municipality of Iqaluit
Box 460
Iqaluit, NT
X0A 0H0
TEL: (819) 979-5648
FAX: (819) 979-4166

Date of Sample: June 7, 1994
Sample Location: WTP
Type of Sample: raw
Volume Filtered: 3,200 L
Temperature: 10 °C
pH: 7.29
Turbidity: NTU

MICROBIOLOGICAL RESULTS

<i>Giardia</i> cysts	neg
<i>Cryptosporidium</i> oocysts	neg
Algae	high
Nematodes	neg
Rotifers	neg
Crustacean	+
Insecta	neg

COMMENTS

Key. - not present
1+ 1-21/1000 L
2+ 21-50/1000 L
3+ 51-100/1000 L
4+ 101-150/1000 L
5+ 151-200/1000 L
6+ 201-250/1000 L

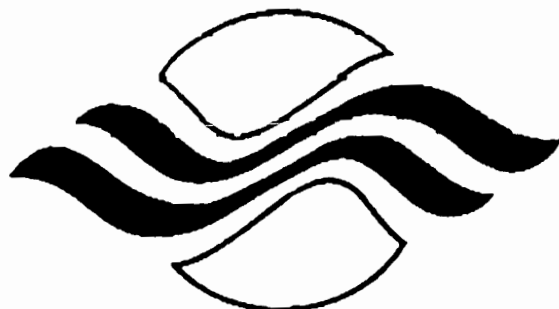
LAB NOTES

DATE RECEIVED: June 9, 1994
TIME RECEIVED: 1300
CONDITION OF FILTER: cold
LAB ID: ITPR
MAh 5-3C + WAB
CONTROL: G. 4+ C. 2+
DENSITY MEDIUM: Percoll/Sucrose: 50/50
TOTAL WASH (ml.): 1,000

VOLUME	DETECTION	VIABILITY
PROPORTION (%)	0 %	0 %
CLARIFIED (ml.)	300	
SEDIMENT (ml.)	5	
SAMPLE EQUIV.	060	0
# CYSTS	<i>Giardia</i>	<i>Crypto.</i>
PI positive	0	0
PI negative	0	u
Total	0	0

Water Filter Analysis Report Sheet

Confidential Report



HYPERION RESEARCH LTD.

350-12 St. SW, Medicine Hat, AB T1A 4T7 CANADA
 Fax and Telephone (403) 529-0847

CLIENT: Mr. Fred Gray
 Municipality of Iqaluit
 Box 460
 Iqaluit, NT
 X0A 0H0
 TEL.: (819) 979-5648
 FAX.: (819) 979-4166

Date of Sample : June 13, 1994
 Sample Location : WTP - Lake Geraldine
 Type of Sample: raw
 Volume Filtered: 3,500 L
 Temperature: 11 °C
 pH: 6.87
 Turbidity: NTU

MICROBIOLOGICAL RESULTS

<i>Giardia</i> cysts	<u>neg</u>
<i>Cryptosporidium</i> oocysts	<u>neg</u>
Algae	<u>low</u>
Nematodes	<u>+</u>
Rotifers	<u>neg</u>
Crustacea	<u>+</u>
Insecta	<u>neg</u>

COMMENTS.

Key: - not present
 1+ 1-21/1000 L
 2+ 21-50/1000 L
 3+ 51-100/1000 L
 4+ 101-150/1000 L
 5+ 151-200/1000 L
 6+ 201-250/1000 L

LAB NOTES

DATE RECEIVED: June 15, 1994
 TIME RECEIVED: 1300
 CONDITION OF FILTER: cold
 LAB ID: THR
 MAb: 5-3C + WAB
 CONTROL: G. 4+ C. 3+
 DENSITY MEDIUM: Percoll/Sucrose: 50/50
 TOTAL WASH (mL): 1,000

VOLUME	DETECTION	VIABILITY
PROPORTION (%)	0 %	0 %
CLARIFIED (mL)	300	
SEDIMENT (mL)	4	
SAMPLE EQUIV.	1,050	0
# CYSTS	Giar	Cryp
PI positive	0	0
PI negative	0	0
Total	0	0



HYPERION RESEARCH LTD.

350-12 St. SW, Medicine Hat, AB T1A 4T7 CANADA
Fax and Telephone (403) 529-0847

CLIENT: Mr. George Steel or Rene Roy
Municipality of Iqaluit
Box 450
Iqaluit, NT
X0A 0H0

TEL: (819) 979-5381

FAX: (819) 979-5922

Date of Sample: June 1/2, 1995

Sample Location: Main Water- STN 222

Type of Sample: treated

Volume Filtered: 1,000.0 L

Temperature: 18 °C

pH: 7

Turbidity: 0.46 NTU

MICROBIOLOGICAL RESULTS

<i>Giardia</i> cysts	neg
<i>Cryptosporidium</i> oocysts	neg
Algae	+
Nematodes	+
Rotifers	neg
Crustacea	neg
Insects	neg

COMMENTS:

found an algal present the had similar characteristics of cysts.

Key: - not present
1+ 1-21/1000 L
2+ 21-50/1000 L
3+ 51-100/1000 L
4+ 101-150/1000 L
5+ 151-200/1000 L
6+ 201-250/1000 L

LAB NOTES

DATE RECEIVED June 5, 1995

TIME RECEIVED: 0900

CONDITION OF FILTER: cold

LAB ID: MWS

MAb: 5-3C + 2-C9 + PI

CONTROL: G. 4+ C. 4+

DENSITY MEDIUM: Percoll/Sucrose: 50/50

TOTAL WASH (mL): 1,000

CLARIFIED (mL) 1000

SEDIMENT (mL) 3.0

RESUSPENSION VOL. (uL) 100

VOLUME	DETECTION	VIABILITY
Volume Used (uL)	100	
Sample Equivalent (L)	1,000.0	0.00
# CYSTS	<i>Giardia</i>	<i>Crypto.</i>
Counted	0	0
	0	0
Total	0	0

Analyst

R. D. L.

Water Filter Analysis Report Sheet

Confidential Report



HYPERION RESEARCH LTD.

350-12 St. SW, Medicine Hat, AB T1A 4T7 CANADA
Fax and Telephone (403) 529-0847

CLIENT: Mr. George Steel or Rene Roy
Municipality of Iqaluit
Box 460
Iqaluit, NT
X0A 0H0

TEL: (819) 979-5381

FAX: (819) 979-5922

Date of Sample : June 25, 1995

Sample Location : Lake Geraldine WTP

Type of Sample: raw

Volume Filtered: 1,000.0 L

Temperature: 8 °C

pH: 5.8

Turbidity: NIU

MICROBIOLOGICAL RESULTS

<i>Giardia</i> cysts	<u>neg</u>
<i>Cryptosporidium</i> oocysts	<u>neg</u>
Algae	<u>med</u>
Nematodes	<u>+</u>
Rotifers	<u>+</u>
Crustacea	<u>+</u>
Insecta	<u>+</u>

COMMENTS:

Key: - not present
1+ 1-21/1000 L
2+ 21-50/1000 L
3+ 51-100/1000 L
4+ 101-150/1000 L
5+ 151-200/1000 L
6+ 201-250/1000 L

LAB NOTES

DATE RECEIVED: June 27, 1995

TIME RECEIVED: 1000

CONDITION OF FILTER: warm

LAB ID: LG

MAb: 5-3C + 2-C9 + PI

CONTROL: G. 4+ C. 4+

DENSITY MEDIUM: Percoll/Sucrose: 50/50

TOTAL WASH (mL): 1,000

CLARIFIED (mL): 1000

SEDIMENT (mL): 14.0

RESUSPENSION VOL (uL) 100

VOLUME	DETECTION	VIABILITY
Volume Used (uL)	<u>100</u>	
Sample Equivalent (L)	<u>1,000.0</u>	<u>0.00</u>
# CYSTS	<i>Giardia</i>	<i>Crypto.</i>
Counted	<u>0</u>	<u>0</u>
	<u>0</u>	<u>0</u>
Total	<u>0</u>	<u>0</u>

Analyst:

R. Steel



HYPERION RESEARCH LTD.

350-12 St. SW, Medicine Hat, AB T1A 4T7 CANADA
Fax and Telephone (403) 529-0847

CLIENT: Mr. George Steel or Rene Roy
Municipality of Iqaluit
Box 460
Iqaluit, NT
X0A 0H0

TEL: (819) 978-5381

FAX: (819) 979-5922

Date of Sample: Aug 20, 1985

Sample Location: Lake Geraldine WTP

Type of Sample: raw

Volume Filtered: 2,000.0 L

Temperature: °C

pH: 6.4

Turbidity: NTU

MICROBIOLOGICAL RESULTS

<i>Giardia</i> cysts	neg
<i>Cryptosporidium</i> oocysts	neg
Algae	high
Nematodes	+
Rotifers	+
Crustacea	-
Insects	+

COMMENTS:

Key:	-	not present
1+	1-21/1000 L	
2+	21-50/1000 L	
3+	51-100/1000 L	
4+	101-150/1000 L	
5+	151-200/1000 L	
6+	201-250/1000 L	

LAB NOTES

DATE RECEIVED August 26, 1985

TIME RECEIVED 1510

CONDITION OF FILTER: warm

LAB ID: LG

MAb 5-3C + 2-C9 + PI

CONTROL: G. 4+ C. 4+

DENSITY MEDIUM: Percoll/Sucrose: 1.15

TOTAL WASH (mL): 900

CLARIFIED (mL): 450

SEDIMENT (mL): 9.0

RESUSPENSION VOL. (uL): 1000

VOLUME	DETECTION	VIABILITY
Volume Used (uL)	100	
Sample Equivalent (uL)	100.0	0.00
# CYSTS	<i>Giardia</i>	<i>Cryptosporidium</i>
Dead	0	0
Viable	0	0
Total	0	0

Analyst: P. D. L. L.

MUNICIPALITY OF IQALUIT





HYPERION RESEARCH LTD.

350-12 St. St. W. Medicine Hat, AB T1A 4T7 CANADA

Fax and Telephone (403) 529-0847

Client : Municipality of Calgary
 Vn. George Steer or Rene Roy
 Box 460
 Calgary, NT
 X0A 0H0

Telephone : (819) 979-5381

FAX : (819) 979-5922

Date of Sample : June 17, 1996

Sample Location : Calgary

Type of Sample : raw

Volume Filtered: 1 100.00 L

Temperature : 15.5 °C

pH : 6.64

Turbidity : 30 NTU

MICROBIOLOGICAL RESULTS

Giardia Cysts neg
Cryptosporidium Oocysts neg
 Algae med
 Nematodes neg
 Rotifers +
 Crustacea +
 Insecta neg

COMMENTS :

- not present
 1+ 1-20/1000L
 Key: 2+ 21-50/1000L
 3+ 51-100/1000L
 4+ 101-150/1000L
 5+ 151-200/1000L
 6+ 201-250/1000L

LAB NOTES

Date Received: June 18, 1996
 Time Received: 1550
 Condition of Filter: good
 Lab ID: IQ
 Customer #: 8
 Sample Number: 100
 Lab: Aqua-Glo Direct + Pi
 Control: G. 3 C. 4
 Density Medium: P/S 115
 Total Wash: 1000
 Clarified: 100
 Sediment: 800
 Resuspension Volume: 22

VOLUME	DETECTION	VIABILITY
Volume Used (uL)	1.00	
Sample Equivalent (uL)		
= CYSTS	<i>Giardia</i>	<i>Crypto.</i>
Dead	0	0
Viable	0	0
Total	0.00	

Analyst:



HYPERION RESEARCH LTD.

350-12 St. SW, Medicine Hat, AB T1A 4T7 CANADA

Fax and Telephone (403) 529-0847

Client : Municipality of Iqaluit
 Vn. George Steel or Rene Roy
 Box 460
 Iqaluit NT
 X0A 0H0

Telephone : (869) 979-5381
 FAX : (869) 979-5922

Date of Sample : June 24 1996
 Sample Location : Iqaluit
 Type of Sample : raw
 Volume Filtered: L
 Temperature : 25 °C
 pH : 6.9
 Turbidity : 7.0 NTU

MICROBIOLOGICAL RESULTS

Giardia Cysts neg
Cryptosporidium Oocysts neg
 Algae CW
 Nematodes +
 Rotifers neg
 Crustacea +
 Insecta neg

COMMENTS :

- not present
 1+ 1-20/1000L
 Key: 2+ 21-50/1000L
 3+ 51-100/1000L
 4+ 101-150/1000L
 5+ 151-200/1000L
 6+ 201-250/1000L

LAB NOTES

Date Received: June 25 1996
 Time Received 1430
 Concentration of Filter 600
 Lab ID: IQ
 Customer #: 8
 Sample Number: 101
 Lab: Aqua-Glo Direct + PI
 Control: 3 3- 0 3+
 Density Medium: P/S 1.15
 Total Wash: 1000
 Clarified 400
 Sediment 600
 Resuspension Volume 10

VOLUME	DETECTION	VIABILITY
Volume Used (uL)	100	
Sample Equivalent (uL)		
# CYSTS	<i>Giardia</i>	<i>Crypto.</i>
Dead	0	0
Viable	0	0
Total	0 00	

Analyst:



HYPERION RESEARCH LTD.

350-12 St. SW, Medicine Hat, AB T1A 4T7 CANADA

Fax and Telephone (403) 529-0847

Client : Municipality of Calgary
Vr. George Steel or Rene Roy
Box 460
Calcutt NT
XDA 0H0

Telephone : (819) 979-5381

FAX : (819) 979-5922

Date of Sample : July 8, 1996

Sample Location : Calcutt/Lake Geraldine

Type of Sample : raw

Volume Filtered: 1 200.00 L

Temperature : 13.5 °C

pH : 6.86

Turbidity : 7.25 NTU

MICROBIOLOGICAL RESULTS

Giardia Cysts neg

Cryptosporidium Oocysts neg

Algae cw

Nematodes neg

Rotifers neg

Crustacea -

Insecta neg

COMMENTS :

- not present
1+ 1-20/1000L
Key: 2+ 21-50/1000L
3+ 51-100/1000L
4+ 101-150/1000L
5+ 151-200/1000L
6+ 201-250/1000L

LAB NOTES

Date Received July 9, 1996

Time Received 1315

Condition of Filter 000

Lab ID 1Q

Customer # 8

Sample Number 102

Lab Aqua-Glo Direct + PI

Control G-3 C-3

Density Medium P/S 1.15

Total Wash 937

Clarified 100

Sediment 5.00

Resuspension Volume 100

VOLUME	DETECTION	VIABILITY
Volume Used (uL)	100.00	
Sample Equivalent (uL)		
# CYSTS	<i>Giardia</i>	<i>Crypto.</i>
Dead	0	0
Viable	0	0
Total	0.00	

Analyst:

R. D. Williams



Client : Municipality of Calgary
Vr. George Steel or Rene Roy
Box 460
Caluit, NT
XDA 0H0

Telephone : (819) 979-5381

FAX : (819) 979-5922

Date of Sample : July 15 1996
Sample Location : caluit
Type of Sample : raw
Volume Filtered: 1 000 00 L
Temperature : 15 °C
pH : 7.5
Turbidity : 3 NTU

MICROBIOLOGICAL RESULTS

Giardia Cysts neg
Cryptosporidium Oocysts neg
Algae med
Nematodes neg
Rotifers neg
Crustacea neg
Insecta -

COMMENTS :

- not present
Key: 1+ 1-20/1000L
2+ 21-50/1000L
3+ 51-100/1000L
4+ 101-150/1000L
5+ 151-200/1000L
6+ 201-250/1000L

LAB NOTES

Date Received: Ju 16 1996
Time Received : 1030
Condition of Filter : cc c
Lab ID : IQ
Customer # : 8
Sample Number : 103
Sub : Aqua-Glo Direct - PI
Control : G 4 C 4
Density Medium : 50% Sucrose
Total Wash : 1000
Clarified : 140
Sediment : 400
Resuspension Volume : 5

VOLUME	DETECTION	VIABILITY
Volume Used (uL)	5.00	
Sample Equivalent (uL)		
# CYSTS	<i>Giardia</i>	<i>Crypto.</i>
Dead	0	0
Viable	0	0
Total	0 00	

Analyst:



Client : Municipality of Iqaluit
Mr. George Steel or Rene Roy
Box 460
Iqaluit, NT
X0A 0H0

Telephone : (819) 979-5381
FAX : (819) 979-5922

Date of Sample : July 22, 1996
Sample Location : Iqaluit
Type of Sample : raw
Volume Filtered : 1 010 00 L
Temperature : 16.2 °C
pH : 6.64
Turbidity : 3.15 NTU

MICROBIOLOGICAL RESULTS

<i>Giardia</i> Cysts	neg
<i>Cryptosporidium</i> Oocysts	neg
Algae	neg
Nematodes	neg
Rotifers	neg
Crustacea	neg
Insecta	neg

COMMENTS :

Key : - not present
1- 1-20/1000L
2- 21-50/1000L
3- 51-100/1000L
4- 101-150/1000L
5- 151-200/1000L
6- 201-250/1000L

LAB NOTES

Date Received : July 23, 1996
Time Received : 1500
Condition of Filter : good
Lab ID : IQ
Customer # : 8
Sample Number : 104
Lab : Aqua-Gio Direct + PI
Control : G 3 C 3
Density Medium : 50% Sucrose
Total Wash : 1000
Clarified : 400
Sediment : 800
Resuspension Volume : 5

VOLUME	DETECTION	VIABILITY
Volume Used (uL)	5.00	
Sample Equivalent (uL)		
# CYSTS	<i>Giardia</i>	<i>Crypto.</i>
Dead	0	0
Viable	0	0
Total	0.00	

Analyst:

R. D. L. L.



Client : Municipality of Caluit
Mr. George Steel or Rene Roy
Box 460
Caluit, NT
X0A 0H0

Telephone : (819) 979-5381

FAX : (819) 979-5922

Date of Sample : August 14, 1998
Sample Location : Caluit
Type of Sample : raw
Volume Filtered: 1 100.00 L
Temperature : 12.1 °C
pH : 6.03
Turbidity : 3.3 NTU

MICROBIOLOGICAL RESULTS

Giardia Cysts neg
Cryptosporidium Oocysts neg
Algae med
Nematodes +
Rotifers +
Crustacea +
Insecta neg

COMMENTS :

- not present
Key: 1+ 1-20/1000L
2+ 21-50/1000L
3+ 51-100/1000L
4+ 101-150/1000L
5+ 151-200/1000L
6+ 201-250/1000L

LAB NOTES

Date Received August 15, 1998
Time Received 1215
Condition of Filter good
Lab ID IQ
Customer # 8
Sample Number 105
Media Acqua-Glo direct - PI
Control G 4- C 4+
Density Medium sucrose
Total Wash 800
Clarified 400
Sediment 500
Resuspension Volume 500

VOLUME	DETECTION	VIABILITY
Volume Used (uL)	200.00	
Sample Equivalent (uL)		
# CYSTS	<i>Giardia</i>	<i>Crypto.</i>
Dead	0	0
Viable	0	0
Total	0.00	

Analyst:

R. D. Ellis



Client : Municipality of Idaluit
Vr: George Steel or Rene Roy
Box 460
Idaluit NT
XCA 0H0

Telephone : (819) 979-5381

FAX : (819) 979-5922

Date of Sample : August 16 1996
Sample Location : Idaluit
Type of Sample : raw
Volume Filtered: 1 500.00 L
Temperature : 11 °C
pH : 7
Turbidity : 3.8 NTU

MICROBIOLOGICAL RESULTS

<i>Giardia</i> Cysts	1+
<i>Cryptosporidium</i> Oocysts	neg
Algae	med
Nematodes	+
Rotifers	+
Crustacea	neg
Insecta	neg

COMMENTS :

Key: - not present
1+ 1-20/1000L
2+ 21-50/1000L
3+ 51-100/1000L
4+ 101-150/1000L
5+ 151-200/1000L
6+ 201-250/1000L

LAB NOTES

Date Received: August 20 1996
Time Received : 1100
Condition of Filter : good
Lab ID : IQ
Customer # : 8
Sample Number : 106
Lab : Aqua-Glo Direct - PI
Control : G 4 C 4
Density Medium : 50% sucrose
Total Wash : 1000
Clarified : 300
Sediment : 400
Resuspension Volume : 9

VOLUME	DETECTION	VIABILITY
Volume Used (uL)	300	
Sample Equivalent (uL)		
# CYSTS	<i>Giardia</i>	<i>Crypto.</i>
Dead	0	0
Viable	+	0
Total	100	

Analyst: R. D. Ellis



Client : Municipality of Inuvik
Vr. George Steel or Rene Roy
Box 460
Inuvik, N.T.
XDA 0H0

Telephone : (819) 979-5381
FAX : (819) 979-5922

Date of Sample : August 26 1998
Sample Location : Inuvik
Type of Sample : raw
Volume Filtered: 1100.00 L
Temperature : 11 °C
pH : 6.89
Turbidity : 3.4 NTU

MICROBIOLOGICAL RESULTS

Giardia Cysts neg
Cryptosporidium Oocysts neg
Algae neg
Nematodes neg
Rotifers +
Crustacea +
Insecta neg

COMMENTS :

- not present
Key: 1- 1-20/1000L
2- 21-50/1000L
3- 51-100/1000L
4- 101-150/1000L
5- 151-200/1000L
6- 201-250/1000L

LAB NOTES

Date Received: August 27 1998
Time Received: 1600
Condition of Filter : good
Lab ID : IQ
Customer # : 8
Sample Number : 107
Lab : Aqua-Glo Direct - PI
Control : 3-4 0-4
Density Medium : 50% sucrose
Total Wash : 800
Clarified : 200
Sediment : 200
Resuspension Volume : 5

VOLUME	DETECTION	VIABILITY
Volume Used (uL)	500	
Sample Equivalent (uL)		
# CYSTS	<i>Giardia</i>	<i>Crypto.</i>
Dead	0	0
Viable	0	0
Total	0.00	

Analyst:



HYPERION RESEARCH LTD.

350-12 St. SW, Medicine Hat, AB T1A 4T7 CANADA
Fax and Telephone: (403) 529-0847

Client: Municipality of Iqaluit
Mr. George Steel or Rene Roy
Box 460
Iqaluit, NT
XCA JHC

Telephone: (819) 979-5381
FAX: (819) 979-5922

Date of Sample: May 26 1997

Sample Location: Water Treatment Plant

Type of Sample: raw

Volume Filtered (L): 1000

Temperature (°C): 7.7

pH: 6.59

Turbidity (NTU):

MICROBIOLOGICAL RESULTS

Giardia cysts /100 L: 0.00

Cryptosporidium oocysts /100 L: 0.00

Algae	med
Nematodes	neg
Rotifers	+
Crustacea	neg
Insecta	neg

Key for Algae to Insecta: - Absent, + Present.
++ Low, +++ Medium, ---- High

COMMENTS:

Analyst:

R. D. L. L.

LAB NOTES

Date Received: May 27 1997
Time Received: 1015
Condition of Filter: cold
Lab ID: 251
Customer #: 8
Sample Number: 200
Monoclonal Antibody: Dia Fluor Aquaglo
Control: G. 4 C. 4
Density Medium: P/S 115
Total Wash Vol. (mL): 950
Vol. Clarified (mL): 150
Sediment Vol. (mL): 1.50
Resuspension Vol. (μL): 10

	DETECTION	VIABILITY
Volume Used (μL):	2	
Sample Equivalent Vol. (L):	31.55	0.00
Detection Limit: *	3.17	cysts or oocysts/100 L
#	<i>Giardia</i>	<i>Crypto.</i>
CYSTS/OOCYSTS		
Dead	0	0
Viable	0	0
Total	0	0

*Detection Limit is calculated assuming a minimum of 1 cyst or oocyst observed in the Sample Equivalent Volume



HYPERION RESEARCH LTD.

350-12 St. SW Medicine Hat, AB T1A 4T7 CANADA
Fax and Telephone (403) 529-2847

Client : Municipality of Icalut
Mr. George Steel or Rene Roy
Box 460
Icalut, NT
XCA JHC

Telephone : (869) 979-5381
FAX : (869) 979-5922

Date of Sample : June 4 1997
Sample Location : Water Treatment Plant
Type of Sample : raw
Volume Filtered (L): 1000
Temperature (°C): 9.4
pH : 6.77
Turbidity (NTU):

MICROBIOLOGICAL RESULTS

Giardia cysts /100 L: 0.00
Cryptosporidium oocysts /100 L: 0.00

Algae high
Nematodes neg
Rotifers +
Crustacea +
Insecta neg

Key for Algae to Insecta: - Absent, + Present,
++ Low, +++ Medium, ---- High

COMMENTS :

LAB NOTES

Date Received: June 5, 1997
Time Received: 1045
Condition of Filter: warm
Lab ID: 266
Customer #: 8
Sample Number: 201
Monoclonal Antibody: CY3
Control: G. 4 C. 2
Density Medium: P/S 1.15
Total Wash Vol. (mL): 800
Vol. Clarified (mL): 50
Sediment Vol. (mL): 0.20
Resuspension Vol. (μL): 8

DETECTION VIABILITY

Volume Used (μL): 2
Sample Equivalent Vol. (L): 15.63 C. 00
Detection Limit: * 6.40 cysts or oocysts/100 L

#	<i>Giardia</i>	<i>Crypto.</i>
CYSTS/OOCYSTS		
Dead	0	0
Viable	0	0
Total	0	0

*Detection Limit is calculated assuming a minimum of 1 cyst or oocyst observed in the Sample Equivalent Volume.

Analyst:

R. D. Williams



HYPERION RESEARCH LTD.

350-12 St. SW, Medicine Hat, AB T1A 4T7 CANADA

Fax and Telephone: (403) 529-0847

Client : Municipality of Iqaluit
 Mr. George Steel or Rene Roy
 Box 460
 Iqaluit, NT
 XCA 0H0

Telephone : (819) 979-5381

FAX : (819) 979-5922

Date of Sample : June 9 1997

Sample Location : Water Treatment Plant

Type of Sample : raw

Volume Filtered (L): 1000

Temperature (°C): 4.9

pH: 6.64

Turbidity (NTU):

MICROBIOLOGICAL RESULTS

Giardia cysts /100 L: 0.00

Cryptosporidium oocysts /100 L: 0.00

Algae high

Nematodes neg

Rotifers +

Crustacea +

Insecta neg

Key for Algae to Insecta: - Absent, + Present,
 ++ Low, +++ Medium, ++++ High

COMMENTS :

Analyst:

LAB NOTES

Date Received: June 10 1997

Time Received: 0930

Condition of Filter: cold

Lab ID: 270

Customer #: 8

Sample Number: 202

Monoclonal Antibody: OY3

Control: G. 4 C. 0

Density Medium: P/S 1.15

Total Wash Vol. (mL): 800

Vol. Clarified (mL): 100

Sediment Vol. (mL): 1.50

Resuspension Vol. (µL): 100

DETECTION VIABILITY

Volume Used (µL): 100

Sample Equivalent Vol. (L): 125.00 0.00

Detection Limit: * 0.80 cysts or oocysts /100 L

Giardia *Crypto.*
 CYSTS/OOCYSTS

Dead 0 0

Viable 0 0

Total 0 0

*Detection Limit is calculated assuming a minimum of 1 cyst or oocyst observed in the Sample Equivalent Volume



HYPERION RESEARCH LTD.

350-12 St. SW, Medicine Hat, AB T1A 4T7 CANADA
Fax and Telephone: (403) 529-3847

Client : Municipality of Icauit
Mr. George Steel or Rene Roy
Box 460
Icauit, NT
XCA JHC

Telephone : (819) 979-5381
FAX : (819) 979-5922

Date of Sample : June 18 1997

Sample Location : Water Treatment Plant

Type of Sample : raw

Volume Filtered (L): 1000

Temperature (°C): 4.4

pH : 6.49

Turbidity (NTU):

MICROBIOLOGICAL RESULTS

Giardia cysts /100 L: 0.00

Cryptosporidium oocysts /100 L: 0.00

Algae high
Nematodes +
Rotifers +
Crustacea +
Insecta neg

Key for Algae to Insecta: - Absent, + Present,
++ Low, +++ Medium, ---- High

COMMENTS :

Analyst:

R. D. D. D.

LAB NOTES

Date Received: June 17 1997
Time Received: 1400
Condition of Filter: warm
Lab ID: 283
Customer #: 8
Sample Number: 203
Monoclonal Antibody: OY3 - EAPI
Control: G. 4 C. 4
Density Medium: P/S 115
Total Wash Vol (mL): 800
Vol. Clarified (mL): 150
Sediment Vol (mL): 200
Resuspension Vol (µL): 30

	DETECTION	VIABILITY
Volume Used (µL):	2	
Sample Equivalent Vol. (L):	12.50	0.00
Detection Limit: *	8.00	cysts or oocysts /100 L
#	<i>Giardia</i>	<i>Crypto.</i>
CYSTS/OOCYSTS		
Dead	0	0
Viable	0	0
Total	0	0

*Detection Limit is calculated assuming a minimum of 1 cyst or oocyst observed in the Sample Equivalent Volume.



HYPERION RESEARCH LTD.

250-12 St. SW, Medicine Hat, AB T1A 4T7 CANADA
Fax and Telephone (403) 529-3847

Client : Municipality of Icaluit
Mr. George Steel or Rene Roy
Box 460
Icaluit, NT
XCA JHC

Telephone : (819) 979-5381
FAX : (819) 979-5922

Date of Sample : June 23, 1997

Sample Location : Water Treatment Plant

Type of Sample : raw

Volume Filtered (L): 1000

Temperature (°C): 6.9

pH: 6.19

Turbidity (NTU):

MICROBIOLOGICAL RESULTS

Giardia cysts /100 L: 0.00

Cryptosporidium oocysts /100 L: 0.00

Algae +++
Nematodes +
Rotifers +
Crustacea ++
Insecta -

Key for Algae to Insecta: - Absent, + Present,
++ Low, +++ Medium, ---- High

COMMENTS:

Analyst:

[Signature]

LAB NOTES

Date Received: June 24, 1997
Time Received: 1030
Condition of Filter: warm
Lab ID: 298
Customer #: 8
Sample Number: 204
Monoclonal Antibody: AG-FC-PI
Control: G. 4 C. 4
Density Medium: P/S 115
Total Wash Vol. (mL): 1000
Vol. Clarified (mL): 100
Sediment Vol. (mL): 1.00
Resuspension Vol. (µL): 23

	DETECTION	VIABILITY
Volume Used (µL):	3	
Sample Equivalent Vol. (L):	13.04	0.00
Detection Limit: *	7.67	cysts or oocysts /100 L
#	<i>Giardia</i>	<i>Crypto.</i>
CYSTS/OOCYSTS		
Dead	0	0
Viable	0	0
Total	0	0

*Detection Limit is calculated assuming a minimum of 1 cyst or oocyst observed in the Sample Equivalent Volume.

Water Filter Analysis Report Sheet

Confidential Report



HYPERION RESEARCH LTD.

350-12 St. SW, Medicine Hat, AB T1A 4T7 CANADA

Fax and Telephone: (403) 529-2847

Client: Municipality of Iqaluit
Mr. George Steel or Rene Roy
Box 460
Iqaluit, NT
XCA JHC

Telephone: (819) 979-5381

FAX: (819) 979-5922

Date of Sample: June 30, 1997

Sample Location: Lake Geraldine at WTP

Type of Sample: raw

Volume Filtered (L): 2100

Temperature (°C): 5

pH: 8.1

Turbidity (NTU):

MICROBIOLOGICAL RESULTS

Giardia cysts /100 L: 0.00*Cryptosporidium* oocysts /100 L: 0.00

Algae ++

Nematodes -

Rotifers +

Crustacea -

Insecta -

Key for Algae to Insecta: - Absent, + Present.
++ Low, +++ Medium, ----- High

COMMENTS:

LAB NOTES

Date Received: July 2, 1997

Time Received: 1045

Condition of Filter: warm

Lab ID: 316

Customer #: 8

Sample Number: 205

Monoclonal Antibody: CY3 - DAP

Control: G. 4 C. 2

Density Medium: P/S 1.15

Total Wash Vol (mL): 800

Vol. Clarified (mL): 200

Sediment Vol (mL): 1.00

Resuspension Vol. (µL): 700

DETECTION VIABILITY

Volume Used (µL): 100

Sample Equivalent Vol. (L): 75.00 0.00

Detection Limit: * 1.33 cysts or oocysts/100 L

#	<i>Giardia</i>	<i>Crypto.</i>
CYSTS/OOCYSTS		

Dead 0 0

Viable 0 0

Total 0 0

Analyst:

*Detection Limit is calculated assuming a minimum of 1 cyst or oocyst observed in the Sample Equivalent Volume



HYPERION RESEARCH LTD.

350-12 St. SW Medicine Hat, AB T1A 4T7 CANADA
Fax and Telephone (403) 529-3847

Client : Municipality of Iqaluit
Mr. George Steel or Rene Roy
Box 460
Iqaluit, NT
XCA JHC

Telephone : (819) 979-5381
FAX : (819) 979-5922

Date of Sample : July 7, 1997

Sample Location : Lake Geraldine at WTP

Type of Sample : raw

Volume Filtered (L): 1200

Temperature (°C): 9.9

pH : 7.43

Turbidity (NTU):

MICROBIOLOGICAL RESULTS

Giardia cysts /100 L: 0.00

Cryptosporidium oocysts /100 L: 0.00

Algae	++++
Nematodes	-
Rotifers	+
Crustacea	+
Insecta	-

Key for Algae to Insecta: - Absent. + Present.
++ Low, +++ Medium, ++++ High

COMMENTS :

Analyst:

R. D. Williams

LAB NOTES

Date Received July 8, 1997
Time Received 1105
Condition of Filter warm
Lab ID: 326
Customer # 8
Sample Number 206
Monoclonal Antibody: CY3 - DAP
Control: G. 4 C. 2
Density Medium P/S 115
Total Wash Vol. (mL) 900
Vol. Clarified (mL) 100
Sediment Vol. (mL) 200
Resuspension Vol. (μL) 58

DETECTION VIABILITY

Volume Used (μL):	3	
Sample Equivalent Vol. (L):	6.90	0.00
Detection Limit: *	14.50	cysts or oocysts/100 L
# CYSTS/OOCYSTS	<i>Giardia</i>	<i>Crypto.</i>
Dead	0	0
Viable	0	0
Total	0	0

*Detection Limit is calculated assuming a minimum of 1 cyst or oocyst observed in the Sample Equivalent Volume.



HYPERION RESEARCH LTD.

350-12 St. SW, Medicine Hat, AB T1A 4T7 CANADA
Fax and Telephone (403) 529-3847

Client : Municipality of Iqaluit
Mr. George Steel or Rene Roy
Box 460
Iqaluit, NT
XCA JHC

Telephone : (819) 979-5381
FAX : (819) 979-5922

Date of Sample : July 14, 1997

Sample Location : WTP from Geraldine

Type of Sample : raw

Volume Filtered (L): 1750

Temperature (°C): 5

pH: 6.2

Turbidity (NTU):

MICROBIOLOGICAL RESULTS

Giardia cysts /100 L: 0.00

Cryptosporidium oocysts /100 L: 0.00

Algae +++

Nematodes -

Rotifers ++

Crustacea -

Insecta -

Key for Algae to Insecta: - Absent, + Present,
++ Low, +++ Medium, ++++ High

COMMENTS :

LAB NOTES

Date Received: July 15, 1997

Time Received: 0930

Condition of Filter: warm

Lab ID: 345

Customer #: 8

Sample Number: 207

Monoclonal Antibody: CY3 - DAPI

Control: G. 4 C. 3

Density Medium: P/S 1.15

Total Wash Vol (mL): 800

Vol. Clarified (mL): 50

Sediment Vol. (mL): 150

Resuspension Vol (µL): 800

DETECTION VIABILITY

Volume Used (µL): 30

Sample Equivalent Vol. (L): 4.10 0.00

Detection Limit: * 24.38 cysts or oocysts/100 L

#	<i>Giardia</i>	<i>Crypto.</i>
CYSTS/OOCYSTS		

Dead	0	0
------	---	---

Viable	0	0
--------	---	---

Total	0	0
-------	---	---

*Detection Limit is calculated assuming a minimum of 1 cyst or oocyst observed in the Sample Equivalent Volume.

Analyst:

R. D. Williams



HYPERION RESEARCH LTD.

350-12 St. SW, Medicine Hat, AB T1A 7T7 CANADA
 Fax and Telephone: (403) 529-0847 E-mail: hyperion@telusplanet.net

Client : Municipality of Iqaluit
 Chris Freda
 Box 460
 Iqaluit, NT
 X0A 0H0

Telephone : (867) 979-5648
 FAX : (867) 979-4166

Date of Sample : June 15 1998

Sample Location : WTP

Type of Sample : raw

Volume Filtered (L): 1000

Temperature (°C): 14

pH : 6.63

Turbidity (NTU):

MICROBIOLOGICAL RESULTS

Giardia Cysts: 0.0 /100 L

Cryptosporidium Oocysts: 0.0 /100 L

Algae +++++

Nematodes -

Rotifers +

Crustacea +

Insecta -

Key for Algae to Insecta: - Absent, + Present,
 ++ Low, +++ Medium, ++++ High

COMMENTS :

LAB NOTES

Date Received June 16, 1998 Time 0900

Condition of Filter cold Lab ID 299

Customer # 8 Sample Number 300

Monoclonal Antibody A/G Cy3 Direct + DAPI

Control G 4 C 4

Density Medium 50% sucrose

Total Wash Vol. mL 900

Vol. Clarified mL 50

Sediment Vol. mL 100

Resuspension Vol. µL 100

DETECTION VIABILITY

Volume Used (µL): 100

Sample Equivalent Vol. (L): 55.6 0.0

Detection Limit:* 1.80 cysts or oocysts 100 L

# CYSTS/OOCYSTS	<i>Giardia</i>	<i>Crypto.</i>
Dead	0	0
Viable	0	0
Total	0	0

*Detection Limit is calculated assuming a minimum of 1 cyst or oocyst observed in the Sample Equivalent Volume

Analyst:

[Signature]



HYPERION RESEARCH LTD.

350-12 St. SW, Medicine Hat, AB T1A 4T7 CANADA
 Fax and Telephone: (403) 529-0847 E-mail: hyperion@telusplanet.net

Client : Municipality of Iqaluit
 Chris Freda
 Box 460
 Iqaluit, NT
 X0A 0H0

Telephone : (867) 979-5648
 FAX : (867) 979-4166

Date of Sample : Aug 10 1998
 Sample Location : Water Treatment Plant
 Type of Sample : raw
 Volume Filtered (L): 1000
 Temperature (°C): 12.9
 pH : 6.0
 Turbidity (NTU): 3.57

MICROBIOLOGICAL RESULTS

Giardia Cysts: 0.0 /100 L
Cryptosporidium Oocysts: 0.0 /100 L

Algae +++++
 Nematodes -
 Rotifers +
 Crustacea +
 Insecta -

Key for Algae to Insecta: - Absent, + Present,
 ++ Low +++ Medium +++++ High

COMMENTS :

LAB NOTES

Date Received: Aug 11 1998 Time 0930
 Condition of Filter: cold Lab ID 398
 Customer # 6 Sample Number 301
 Monoclonal Antibody A/G Cy3 Direct + DAPI
 Control G: 4 C: 4
 Density Medium P/S 110
 Total Wash Vol (mL): 1500
 Vol. Clarified (mL): 225
 Sediment Vol. (mL): 100
 Resuspension Vol. (μL): 400

DETECTION VIABILITY		
Volume Used (μL):	100	
Sample Equivalent Vol. (L):	37.5	0.0
Detection Limit:*	2.67	cysts or oocysts/100 L
# CYSTS/OOCYSTS	<i>Giardia</i>	<i>Crypto.</i>
Dead	0	0
Viable	0	0
Total	0	0

*Detection Limit is calculated assuming a minimum of 1 cyst or oocyst observed in the Sample Equivalent Volume

Analyst:

R. D. Smith



HYPERION RESEARCH LTD.

350-12 St. SW, Medicine Hat, AB T1A 4T7 CANADA
 Fax and Telephone: (403) 529-0877 E-mail: hyperion@telusplanet.net

Client : Municipality of Iqaluit
 Chris Freda
 Box 460
 Iqaluit, NT
 X0A 0H0

Telephone : (867) 979-5648
 FAX : (867) 979-4166

Date of Sample : Oct 14 1998

Sample Location : WTP

Type of Sample : raw

Volume Filtered (L): 1000

Temperature (°C) :

pH :

Turbidity (NTU):

MICROBIOLOGICAL RESULTS

Giardia Cysts: 0.0 /100 L

Cryptosporidium Oocysts: 0.0 /100 L

Algae + + + +

Nematodes -

Rotifers +

Crustacea + +

Insecta -

Key for Algae to Insecta: - Absent, + Present.
 ++ Low, +++ Medium, ++++ High

COMMENTS :

LAB NOTES

Date Received Oct 15 1998 Time 0900
 Condition of Filter cold Lab ID 464
 Customer # 8 Sample Number 302
 Microclonal Antibody A/G Cy3 Direct + DAPI
 Control: G 4 C 4
 Density Medium P/S 1 15
 Total Wash Vol (mL) 1025
 Vol. Clarified (mL) 50
 Sediment Vol (mL) 0.50
 Resuspension Vol (μL) 100

DETECTION VIABILITY

Volume Used (μL): 50

Sample Equivalent Vol. (L): 24.4 0.0

Detection Limit:* 4.10 cysts or oocysts /100 L

= CYSTS/OOCYSTS	<i>Giardia</i>	<i>Crypto.</i>
Dead	0	0
Viable	0	0
Total	0	0

*Detection Limit is calculated assuming a minimum of 1 cyst or oocyst observed in the Sample Equivalent Volume

Analyst:

[Signature]

APPENDIX "E"

Water Truck Bacteriological Testing By Occupational Health Officer



To:

Municipality of Town of Town Public Works

Date: 16 01 98

Sample Date: 15 01 98

From: ENVIRONMENTAL HEALTH OFFICER
BAFFIN REGIONAL HEALTH BOARD
P.O. BAG 200, IQALUIT, N.T., X0A 0H0

Lab Date: 15/01/98

The bacteriological water samples listed below were analyzed and the results are as indicated.

As you are aware, counts above zero require immediate re-sampling. If you have any problems or questions, please call us at (819)979-7654 or fax us at (819)979-7659 between 8:30 AM - 5:00 PM.

Nicole Ritchie

Environmental Health Officer

CC:

JOHN SALADA - OPERATOR
MIKE FERRIS - MASA
PAUL SMITH - DIANI



FILE

JOHN SALATA - WTP
PAUL SMITH - DIAND
MIKE FERRELLS - MACA



ᐅᑭᓴᕐᕈᕋᕐ ᐃᓄᐱᕐᕈᕋᕐ ᓇᓂᓴᕐ
Baffin Regional Health Services

FILE

To:

Municipalities Of Tamil Nadu

Date: Feb 03 98

Sample Date: 24 03 98

From:

ENVIRONMENTAL HEALTH OFFICER
BAFFIN REGIONAL HEALTH BOARD
P.O. BAG 200, IQALUIT, N.T., X0A 0H0

Lab Date: 25 03 98

SUBMITTED WATER SAMPLE RESULTS

The bacteriological water samples listed below were analyzed and the results are as indicated.

Location of Sample	Total Coliform	Acceptable Yes/No	Comments
Treated	0	YES	
Raw	BGG	YES	
Truck 48	0	YES	
50	0	YES	
60	0	YES	

As you are aware, counts above zero require immediate re-sampling. If you have any problems or questions, please call us at (819)979-7654 or fax us at (819)979-7658 between 8:30 AM - 5:00 PM.

Sincerely,

Nicola Ratchew

Environmental Health Officer

CC:

JOHN SALADA - WTO
MIKE FERRIS - MAEA
PAUL SMITH - DIAND



Baffin Regional Health Services

Rock Burton
Public Works

Sample Date: 4/22/98

Lab Date: 4/23/98 4:00 PM

The bacteriological water samples listed below were analyzed and the results are as indicated.

As you are aware, counts above zero require immediate re-sampling. If you have any problems or questions, please call us at (819)979-7654 or fax us at (819)979-7659 between 8:30 AM - 5:00 PM.

3. Prinzip

John Salata, W.T.O.
cc: ~~Paul Smith~~ Paul Smith, D.I.A.N.D.
Mike Ferris, MACA

Environmental Health Officer



To:

From: ENVIRONMENTAL HEALTH OFFICER
BAFFIN REGIONAL HEALTH BOARD
P.O. BAG 200, IQALUIT, N.T., X0A 0H0

SUBMITTED WATER SAMPLE RESULTS

The bacteriological water samples listed below were analyzed and the results are as indicated.

Location of Sample	Total Coliform	Acceptable Yes/No	Comments
TRUCK # 50	0	YES	
TRUCK # 48	0	YES	
TRUCK # 60	0	YES	
TREATED	0	YES	
RAW	BGG	YES	EXPECTED.

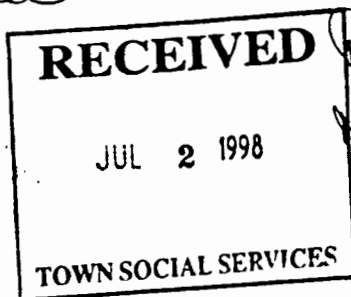
Sincerely,

Nicole Rutchin

Environmental Health Officer

CC:

cc: PAUL SMITH - DIAND
NETHUSELAH KUNUK - MAE



**ᐅᑭᓴᕐᕋᕐᕈᕐᕆ ᐱᕐᕈᕐᕋᕐᕆ ᕐᕋᕐᕆ ᕐᕋᕐᕆ ᕐᕋᕐᕆ ᕐᕋᕐᕆ
Baffin Regional Health Services**



Lab Date: 24 09 98

MAEA. MEDUSAAN Kuni.
DIAND. PAUL SMITH.



Municipality of Iqaluit

Environmental Health Officer



Lab Date: Nov 18/98

cc: Paul Smith, DIAND
Michele Bertol, MACA

[illegible]

Baffin Regional Health Services

To:

Rock Burton, Sup. Oper.

Date: Dec 22/98

Municipality of Tzamal

Sample Date: Dec 21/98

From:

ENVIRONMENTAL HEALTH OFFICER
BAFFIN REGIONAL HEALTH BOARD
P.O. BAG 200, IQALUIT, N.T., X0A 0H0

Lab Date: Dec 21/98

SUBMITTED WATER SAMPLE RESULTS

The bacteriological water samples listed below were analyzed and the results are as indicated.

[illegible]

As you are aware, counts above zero require immediate re-sampling. If you have any problems or questions, please call us at (819)979-7654 or fax us at (819)979-7659 between 8:30 AM - 5:00 PM.

Sincerely,

Sincerely,

Bonnie Bezel

cc: Paul Smith, DIAWD
Michèle Bertol, MACA.

Environmental Health Officer

APPENDIX "F"

Lagoon Liquid Level Evaluation By Dillon Consulting



MUNICIPALITY OF IQALUIT

ᓄᓇᓕᓃᓂ ᑭᓴᓴᓂᓂᓂ ᐃᓃᓂᐃᓂ

10 March 1998

Mr. Paul Smith
D.I.A.N.D.
P.O. Box 100
Iqaluit, NT
X0A 0H0

Dear Mr. Smith,

RE: Lagoon Liquid Level Assessments

Enclosed please find the Final Report prepared by Dillon Consulting on the Lagoon Liquid Levels. We trust this addresses your concerns on the operation of the lagoon, should you have questions or comments please do not hesitate to call.

Sincerely,

Ian Mosher, P. Eng.
Director, Engineering and Planning

09 Mar 98
Rock,
FYA

IAN
DILLON
CONSULTING

March 02, 1998

Municipality of Iqaluit
P.O. Box 460
Iqaluit, NT.
XOA OHO

Attention: Ian Mosher, P. Eng.
Engineering and Planning

**Lagoon Liquid Level Assessments,
Iqaluit, NT.**

Dear Mr. Mosher;

This letter documents the work undertaken on this assignment. On February 24, 1998, Mr. Gary Strong, P. Eng. Dillon Consulting Limited (Dillon), met with Mr. Ian Mosher, P. Eng. Town of Iqaluit, to discuss concerns with the operation of the sewage lagoon that were raised by Mr Paul Smith of the Department of Indian and Northern Development (DIAND). It was reported that DIAND is of the opinion that the lagoon is operating above the design liquid level and that there is insufficient freeboard. DIAND is concerned that the berms structural integrity may be compromised by this operational practice. An additional concern of DIAND is the inability of the DIAND inspector to determine the operating free board of the lagoon as there is no means to measure the liquid level of the lagoon to a reference point conveniently located at the discharge location.

On February 25, 1998 Mr. Strong with the assistance of the Town's Department of Public Works completed a survey to determine the operating freeboard of the lagoon. Mr. Paul Smith, DIAND, was present during the survey. Two holes were augured through the ice on the lagoon and the liquid level at each location was measured relative to the Overflow Spillway elevation, the dyke elevation, and the control vault (CV) elevation. The survey was not referenced to geodetic elevations. Using the Record Drawing Elevation for the Overflow Spillway as the base elevation, the following are the Record Drawing Elevations, and the elevations recorded on February 25, 1998.

Location	Record Drawing Elevations (m)	February 25, 1998 Elevations (m)
Overflow Spill Way	6.70	6.70
Control Vault	7.81	7.68
Top of Dyke	7.25	7.23
Liquid Level	6.50	6.59
Top of outflow pipe	5.80	n/a
2 nd Green Mark on Concrete Pier		6.89
Ice Thickness		1.08
Underside of Ice Elevation		5.51

5102
51st Street,
Suite 201,
Yellowknife, NT,
Canada
X1A 1S7
Telephone
(403) 920-4555
Fax
(403) 873-3328

Dillon Consulting
Limited



Mr. Mosher,
March 2, 1998
Page 2

The recorded elevations correspond to the record drawing elevations to within the accuracy of the surveys. During the recent survey there was snow cover, and -40°C temperatures. These conditions are not ideal for surveys and affect the accuracy of the results. Based on the elevations, the lagoon is operating at a level of 110 mm below the spill way, as compared to a design elevation of 200 mm. There was evidence that the overflow spillway was in operation at some time during the winter as there was a layer of frozen effluent on the Overflow Spillway.

The Town is concerned that lowering the operating level of the lagoon below the design elevation may result in the ice resting on the outlet pipe, and cause damage to the pipe. A section of this outlet structure from the record drawings is attached for reference. Currently the underside of ice is at or near the top of the outlet pipe. The ice at the outlet pipe may be thinner than the typical ice thickness due to the flow of liquid into the pipe, however this has not been measured. It may not be prudent to jeopardize the outlet pipe structure by lowering the liquid level of the lagoon below the design operating level.

The results of the survey were reported to the Town, and the control valve for the outlet pipe was operated to allow an increased level of effluent flow. This will lower the lagoon level to the design elevation.

The following is provided in direct response to the concerns raised by DIAND;

- A) DIAND is of the opinion that the lagoon is operating above the design liquid level and that there is insufficient freeboard.

The survey indicates that the lagoon was operating approximately 100 mm above the design elevation. The Town undertook immediate action to address this issue.

- B) DIAND is concerned that the berms structural integrity may be compromised by this operational practice.

The design elevation from the record drawings is 6.5 m. In 1991, Hardy BBT completed a geotechnical assessment of the dike. A copy is attached. This report concluded that with the inclusion of the overflow spillway, the dike "will provide adequate long term stability."

In the spring as the ice thickness decreases, the Town can lower the liquid level of the lagoon. This should prevent damage to the outlet pipe, and provide some comfort to DIAND that the lagoon will not have problems in the spring melt prior.

Mr Mosher,
March 2, 1998
Page 3

- c) An additional concern of DIAND is the inability of the DIAND inspector to determine the operating free board of the lagoon as there is no means to measure the liquid level of the lagoon to a reference point conveniently located at the discharge location.

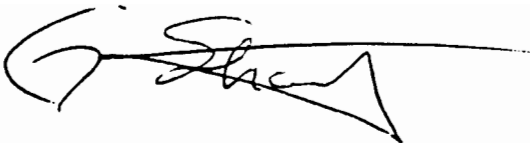
The 2nd green mark on the pier was surveyed on February 25, 1998. The relative elevation of this mark, and the Control Vault, can be used by DIAND to monitor the level of the ice or liquid at the outflow area. The Town has indicated that they will attempt to install a monitoring point at the inlet end of the lagoon where there is open water on a year round basis. This work at the inlet area can not be completed until the summer.

There are monitoring systems that are used in sewage treatment plants to monitor the level of liquid levels in the treatment systems. The monitoring systems operate on physical measurements using sonar, pressure differentials, and other means. The equipment is sensitive to temperature and are designed to be operating within a building environment. It would be difficult to establish a continual monitoring system that would provide meaningful data to the Town and can be operate through the range of temperatures and conditions that are experienced at the lagoon site.

We trust that this responds to the Town's and DIAND's concerns on the operation of the lagoon.

Yours sincerely

Dillon Consulting Limited



Gary Strong, P.Eng.

Project Manager

APPENDIX A



Hardy BBT Limited

CONSULTING ENGINEERING & ENVIRONMENTAL SERVICES

November 14, 1991

Our Ref: VG-05912

UMA Engineering Ltd.
17007 - 107 Avenue
Edmonton, Alberta
T5S 1G3

Attention: Mr. Ken Johnson, P.Eng.

Dear Sirs:

Re: West Dyke Sewage Lagoon Repair
Geotechnical Aspects of Dyke Reconstruction

As requested, Hardy BBT Limited (HBT) has carried out a geotechnical field review of dyke reconstruction at the above site. The purpose of this review was to assist UMA Engineering Ltd. (UMA) and the Municipality of Iqaluit in evaluating the acceptability of fill materials used in dyke reconstruction and to provide recommendations to minimize the risk of long term dyke instability. It is understood from discussions with UMA and Mr. John Cucheran of the Municipality of Iqaluit that lagoon pond levels will be regulated by a lagoon decant structure (seepage control vault) and an emergency overflow spillway. Therefore, provided seepage losses through the dyke are not excessive, consideration of seepage flows through the dyke to provide an acceptable balance of sewage lagoon inflows and outflows is of secondary concern at this time. It is with the above understanding that HBT design recommendations for dyke reconstruction have been made.

1.0 GENERAL BACKGROUND

The existing west dyke of the Municipality of Iqaluit sewage lagoon was breached along an approximately 18 m long section in the spring of 1991 at the location of a lagoon level control structure. The west dyke failure precipitated preparation of drawings for reconstruction of the dyke in the failed area by UMA, resulting in the cross-section shown in Figure 1. The dyke has a maximum height of approximately 4 m and a maximum crest elevation of 7.5 m. Maximum and minimum water levels on the upstream (lagoon) and downstream (ocean) sides of the lagoon are also shown.

It is understood from discussions with UMA that the design was based upon criteria that would result in re-construction of the dyke to original design based on drawings supplied by Reinders Northern Engineering Ltd. The latter design was influenced by a desire to provide

2227 DOUGLAS ROAD BURNABY BRITISH COLUMBIA V5C 5A9 TELEPHONE (604) 294 3811 FAX (604) 294 4664

GEOTECHNICAL AND MATERIALS ENGINEERING - ENVIRONMENTAL MATERIALS AND CHEMICAL SCIENCES
BONNYVILLE CALGARY EDMONTON FORT McMURRAY KAMLOOPS LETHBRIDGE LLOYDMINSTER MEDICINE HAT
NANAIMO PEACE RIVER PRINCE ALBERT PRINCE GEORGE RED DEER REGINA SASKATOON VANCOUVER VICTORIA



How is this known?

a relatively "leaky" (high permeability) dyke through use of a downstream toe drain. This would result in low piezometric surfaces caused by seepage through the dyke, and consequently increase overall dyke stability. The issue of dyke stability was of concern given the reported history of failures at various areas of the dyke over the past 12 years.

*why not
or for seal
of the dyke*

Materials specifications for "Class D2" granular material specified by UMA for use in re-construction of the main body of the dyke are shown in Figure 2 and are compared against grain size distributions determined by HBT and Thurber Engineering Ltd. on soil samples obtained from the "North 40" borrow pit (reference 1). Available borrow pit information indicates that screening of borrow pit materials was necessary to remove over (> 75 mm) and undersized (< 0.074 mm) particles in order to meet the Class D2 granular specification.

*why
Thurber &
Hardy
to be
the same
Lagoon?*

Dyke re-construction commenced following the UMA specifications and drawings, employing suitably screened and graded material to construct the main body of the dyke as well as a high permeability gravel underdrain ("French drain"). The underdrain was terminated 5 m from the dyke centreline on the lagoon side. Following completion of the underdrain, suitably screened, free draining material was placed during the initial phases of construction to form the main body of the dyke. The materials initially placed are understood to have followed UMA specifications for a Class D2 granular material. Continued placement of this free draining material was terminated when the screening plant at the North 40 borrow pit broke down. At this point, a decision was made by the Municipality of Iqaluit to continue dyke re-construction using an alternate 75 mm minus, slightly silty sand and gravel - material obtained from the North 40 borrow pit but having gradations outside the range of the original UMA specification for a Class D2 granular material.

Typical gradation curves on samples of the 75 mm minus silty sand and gravel obtained from the North 40 borrow pit during a 1990 HBT investigation (reference 1) as well as within the main body of the dyke (based on samples obtained during the present field study, discussed in section 3.0) are shown in Figure 3. As discussed in section 3.0, the gradational range of the silty sand and gravel lies outside the specification for a Class D2 granular material. Additional grain size data obtained by Thurber Engineering Ltd. are shown in Figure 4 for comparison with other HBT data. The Thurber data include one sample of "road material" with an anomalously high fines content equal to 30 percent. It is not clear whether this material was, in fact, placed within the dyke. Individual grain size curves, representing all data obtained for the present study are presented in Figures 5 and 6.

What?

French Drain?

Dyke re-construction was continued using the alternate 75 mm minus, slightly silty sand and gravel. Adequate compaction of much of this material was reported by UMA field personnel, achieving average dry densities in excess of 100 percent of the Standard Proctor maximum dry density (see section 4.0). During part of the construction phase, rains occurred and the material placed during this time became wet and difficult to compact. The moisture content in combination with the vibration of field compaction equipment were reported to have generated unstable conditions during placement of the material. Consequently,

French Drain min?



concerns were raised by UMA engineering personnel regarding the adequacy of compaction of this wet of optimum material and the effect of using this alternate material on long term dyke stability.

At this point, dyke construction was halted after having placed fill materials to within 1 to 2 m of the final proposed crest elevation. A decision was then made by the Municipality of Iqaluit to have HBT provide sub-consulting services to UMA to review the acceptability of construction materials used in dyke construction and geotechnical aspects of dyke stability.

2.0 HBT FIELD AND LABORATORY WORK

To assist in the above evaluation, a series of 4 test pits were excavated using a backhoe at the locations shown in Figure 7 through the partially completed dyke. The purpose of the test pits was to examine the gradational characteristics of fill materials placed, to provide estimates of the general state of compaction and to carry out a field percolation test to provide an estimate of the average permeability of the compacted fill. Soil samples obtained from the test pit excavations were logged by HBT engineering personnel and returned to an on site soil mechanics laboratory operated by personnel of Sheppard Hedges and Green Ltd. for gradational and moisture content analysis, as well as one Standard Proctor density test (ASTM specification D-692). One sample of the fill was also returned to the Vancouver laboratory of HBT for a laboratory permeability test.

In addition to the test pit and laboratory testing program, field observations of existing slopes of other dyked areas surrounding the sewage lagoon were carried out. These observations proved helpful in assessing recent performance of unbreached areas of the sewage lagoon dyke and evaluating long term, stable slope angles. Available borrow pit materials from the North 40 borrow pit were also examined.

3.0 SOIL AND GROUNDWATER CONDITIONS

Soil conditions encountered at the test pit locations consisted, in the main, of up to 2.5 m of dense, sand and gravel containing traces to some silt. The latter is representative of 75 mm minus, screened fill from the North 40 borrow area based on available grain size information and field observations of screened, North 40 borrow materials. Using the UMA design specification for a Class D2 granular material and comparing this with individual grain size curves obtained on recent test pit samples within the re-constructed areas of the dyke (see Figure 5), it is easy to see that the majority of materials placed during dyke re-construction do not meet the UMA design specification. In general, the UMA specification calls for a sandy gravel containing traces of silt, whereas actual materials placed are considerably finer consisting of a mixture of sand and gravel to gravelly sand containing traces to some silt. Fines contents in the material may also slightly exceed the specification for a Class D2 granular material, which specifies a maximum fines content of 8 percent.



Measured fines contents ranged between 1 and 13 percent at the locations tested (see Figure 3). However, variations in fines content elsewhere in the dyke should be expected due to variability in borrow source material. Moisture contents in the sand and gravel ranged between 5 and 7 percent, indicative of a moist, partially saturated material. For purposes of discussion, the above material will be referred to as Material Type 1.

At test pit 3 at the 1.5 m depth (see Appendix A), Material Type 1 was found to overlie a thin layer (generally 0.3 m thick or less) of relatively clean, dense sandy gravel containing traces of silt. The latter is more clearly representative of the UMA approved Class D2 granular fill, as shown in Figure 5. For purposes of discussion, the clean sandy gravel will be referred to as Material Type 2. Measured moisture contents in this material ranged between 2 and 4 percent. *but we it class D2? (Blair copy No.).*

At test pit 1, the sand and gravel fill was found to overlie dense sand containing some silt and gravel and is referred to as Material Type 3. The latter is believed to be representative of fill placed during the original dyke construction, prior to recent construction in the breached area of the west dyke. Measured moisture contents in this material were approximately 7 percent. ** * * origin*

At the base of test pits 2 and 3 at depths ranging between 1.8 and 2.5 m, gravel underdrain materials (Material Type 4) wrapped in filter cloth were encountered.

The majority of materials encountered at the test pit locations and placed during reconstruction of the main body of the dyke consisted of Material Type 1. As a result of the finer composition of placed fills than specified by UMA, fill placement is considerably more sensitive to placement moisture content and the permeability of these materials is lower than would be expected for a Class D2 granular material. The lower permeability would be expected to raise piezometric surfaces within the dyke. This fact has important implications with respect to long term dyke stability and is responsible for recommended changes in the original dyke design, discussed subsequently.

Seepage into the test pits was not observed during the time of the test pit excavations over the depths excavated. It is noted that the test pits were excavated when the sewage lagoon had been dewatered and low tide conditions were operative. *but the tide was out*

Test pit logs are presented in Appendix A, which summarize soil conditions and the results of all laboratory testing.

4.0 LABORATORY TESTING

The results of all gradational analyses carried out for the present study are presented in Appendix A and in Figures 2 to 6 for purposes of comparison with other available data.



A Standard Proctor density test (ASTM specification D-692) was also carried out by Sheppard Hedges and Green Ltd. on a sample of stockpiled fill material having the grain size distribution shown in Figure 4. This is considered representative of the siltier end of the alternate fill materials encountered during the test pit excavations. The Standard Proctor maximum dry density was measured to be 2067 kg/cu. m. (128.9 pcf) at an optimum moisture content of 9.9 percent. The data indicate that average field densities of compacted fill reported by UMA during initial phases of fill placement (2116 kg/cu.m) were in excess of 100 percent of the Standard Proctor maximum dry density.

A constant head, laboratory permeability test was carried out on a sample of sand and gravel fill containing 11 percent fines obtained at the 1 m depth in test pit 4. The grain size distribution for the permeability test sample is shown in Figure 4. The fill was compacted in a Standard Proctor mold to a dry density of 2117 kg/cu. m. which is representative of average field densities reported by UMA engineering personnel. The laboratory test gave a measured vertical permeability of 2.6×10^{-8} m/sec and is indicative of a low permeability material. This may be compared against a field permeability value of 4.5×10^{-7} m/sec measured during field percolation tests. It is common to measure laboratory permeabilities an order of magnitude lower than field permeability values. The available field and laboratory data suggest that permeabilities in the range of 10^{-7} to 10^{-8} m/sec are representative of the bulk permeability of the compacted fill and are in agreement with values reported in the engineering literature for similar materials.

5.0 ENGINEERING COMMENTS AND RECOMMENDATIONS

Based on field observations of the engineering characteristics of compacted fills placed during initial phases of dyke construction and discussions with UMA engineering personnel, sand and gravel fill available from the North 40 borrow pit (as represented by the envelope of grain size distributions shown in Figure 3) was judged to be suitable for completion of the breached area of the west dyke provided that:

1. The fill materials were screened to remove particles larger than a 75 mm particle size. *Done*
2. Fines contents were not excessive and were in general agreement with the band of grain size distributions indicated by the HBT test pit samples in Figure 3. *Done*
3. Fills were compacted in thin lifts at or slightly below their optimum moisture content to achieve at least 100 percent of their Standard Proctor maximum dry density. *Done*
4. Upstream (lagoon side) and downstream (ocean side) slopes were placed at 3:1 (horizontal to vertical) and 4:1 (horizontal to vertical) slopes, respectively. *3:1 & 4:1 - probably adequate*
5. Areas which had been excavated and subsequently refilled during the present test pit investigation were re-excavated and backfilled using properly compacted fill. *Done*



The slope angles recommended above are less than those specified by UMA in their original dyke design, and reflect the fact that a low permeability, slightly silty sand and gravel to gravelly sand fill material is to be used for the majority of dyke construction in contrast to the original UMA specification for a Class D2 granular material. This is expected to result in higher piezometric levels in the fill during steady state seepage through the dyke or during rapid tidal fluctuations (drawdown) on the downstream side. This may be contrasted to the original UMA design which specified more permeable fill materials, resulting in steeper allowable slopes. The fill is also considered slightly susceptible to pore water pressure generation over and above water pressures set up by steady state seepage or rapid drawdown due to freezing and thawing of the surficial layers of the fill. These freeze-thaw cycles are considered more likely on the ocean side of the dyke, since the lagoon side will be warmed by the presence of the lagoon sewage. This phenomenon of pore pressure increase is a result of thaw-consolidation mechanisms (reference 2).

what about salt water?

The recommended upstream and downstream dyke slopes were based on:

1. Observations of stable slopes in the east and west dyke areas, which were measured to be in the range of 3.5:1 to 4:1 (horizontal to vertical) for the ocean side, and 2.3:1 to 4:1 for the lagoon side. It is noted that there was no evidence of surficial slumping during the present field study. *~ for siltier ~~soil~~ material*
2. Preliminary stability calculations carried out by the writer while in Iqaluit based on infinite slope analysis, assuming seepage parallel to the slope (representative of rapid drawdown conditions) and making some allowance for excess pore pressures due to thaw consolidation.

?

Subsequently, more detailed stability calculations were carried out by HBT to examine upstream and downstream stability. Two cases were examined; one using piezometric water pressures representative of worst case conditions during rapid drawdown, excluding thaw-consolidation effects, and the second using pore pressures representative of rapid drawdown conditions (flow parallel to the slope) and including the effects of excess pore pressures generated by thaw consolidation. The latter were calculated using estimated thermal and consolidation properties for the compacted fill, and procedures outlined in reference 2. Conservative shear strength parameters were assumed for the compacted fill using an effective friction angle of 36 degrees.

The results of the stability calculations based on 3:1 and 4:1 upstream and downstream slopes, respectively, carried out using both circular arc (using the computer program G-SLOPE) and infinite slope analyses (taking into account the stabilizing effect of the surficial layer of rip rap) are summarized in Table 1.



TABLE 1
RESULTS OF STABILITY CALCULATIONS

Downstream Stability (rapid drawdown on ocean side)

Min. FS = 2.1 (infinite slope)
Min. FS = 2.7 (G-SLOPE)

Downstream Stability (rapid drawdown with thaw consolidation)

Min. FS = 1.9 (infinite slope)
Min. FS = 1.8 (G-SLOPE)

Upstream Stability (low lagoon levels)

Min. FS = 1.5 (infinite slope)
Min. FS = 1.9 (G-SLOPE)

Upstream Stability (low lagoon levels with thaw consolidation)

Min. FS = 1.4 (infinite slope)
Min. FS = 1.4 (G-SLOPE)

?

In summary, the results of the stability analyses indicate minimum factors of safety in the range of 1.4 to 1.9 for the upstream slopes, and 1.8 to 2.7 for the downstream slopes, depending on the pore pressure conditions assumed. These factors of safety indicate a somewhat conservative slope design, but this is considered appropriate in order to provide adequate assurance of long term dyke stability.

6.0 SPILLWAY STRUCTURE

Due to the significant fines content of fill placed during dyke construction, these materials are considered to be moderately frost susceptible. It is therefore recommended that the emergency overflow spillway be placed on a compacted pad of clean, crushed gravel over the anticipated depth of frost penetration for the area. Placement of this clean, free draining material will minimize the potential for frost heave and/or erosion of soil materials from under the structure due to the processes of freeze-thaw or rainwater inflow. It is also recommended that the crushed gravel be surrounded by a suitably graded soil filter or alternatively a filter cloth fabric to inhibit migration of soil fines into the gravel.





7.0 CONCLUSIONS

Based on observations of stable sewage lagoon dyke slopes in the area and the results of stability calculations, the recommended revised dyke design outlined in section 6.0 is judged will provide adequate long term stability. Locally available fill materials from the North 40 borrow area are considered suitable for dyke construction, provided they do not have an excessive fines content and are adequately compacted (as discussed in section 5.0). Due to the low permeability of the compacted fill, very low seepage through the dyke is anticipated. A detailed seepage analysis has not been carried out at this stage to confirm this, however. Careful control of lagoon levels will be required as a result of construction of a relatively low permeability dyke, since lagoon inflows are expected to be in excess of seepage outflows. The emergency overflow spillway should be placed on a pad of non frost susceptible crushed gravel.

8.0 CLOSURE

We trust the above information is sufficient for your present requirements. Should you have any questions or comments, please contact the undersigned.

Yours truly,

Hardy BBT Limited

Per:



W. Blair Gohl, Ph.D., P.Eng.
Geotechnical Project Engineer

Reviewed by:

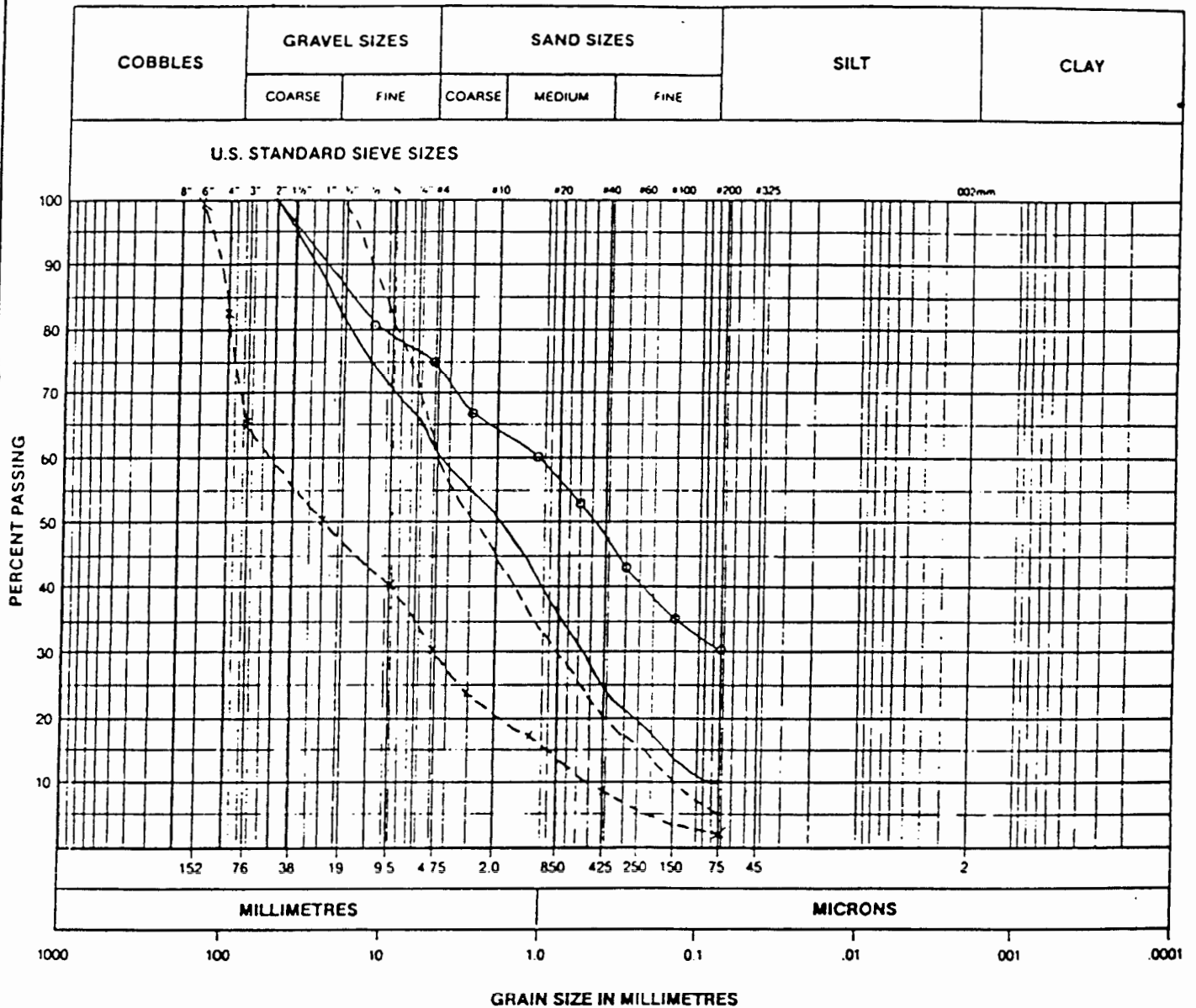
A. Hanna, P.Eng.
Manager, Northern Operations

LIST OF REFERENCES

1. Hardy BBT Ltd. (1990), "Iqaluit Granular Management Plan, Winter 1990 Field Program, Data Report", prepared for Municipality of Iqaluit, June, 1990.
2. Andersland, O.B. and D.M. Anderson (1978), "Geotechnical Engineering for Cold Regions", McGraw Hill Book Company.

wbg

WBG-Iqaluit Doc



LEGEND

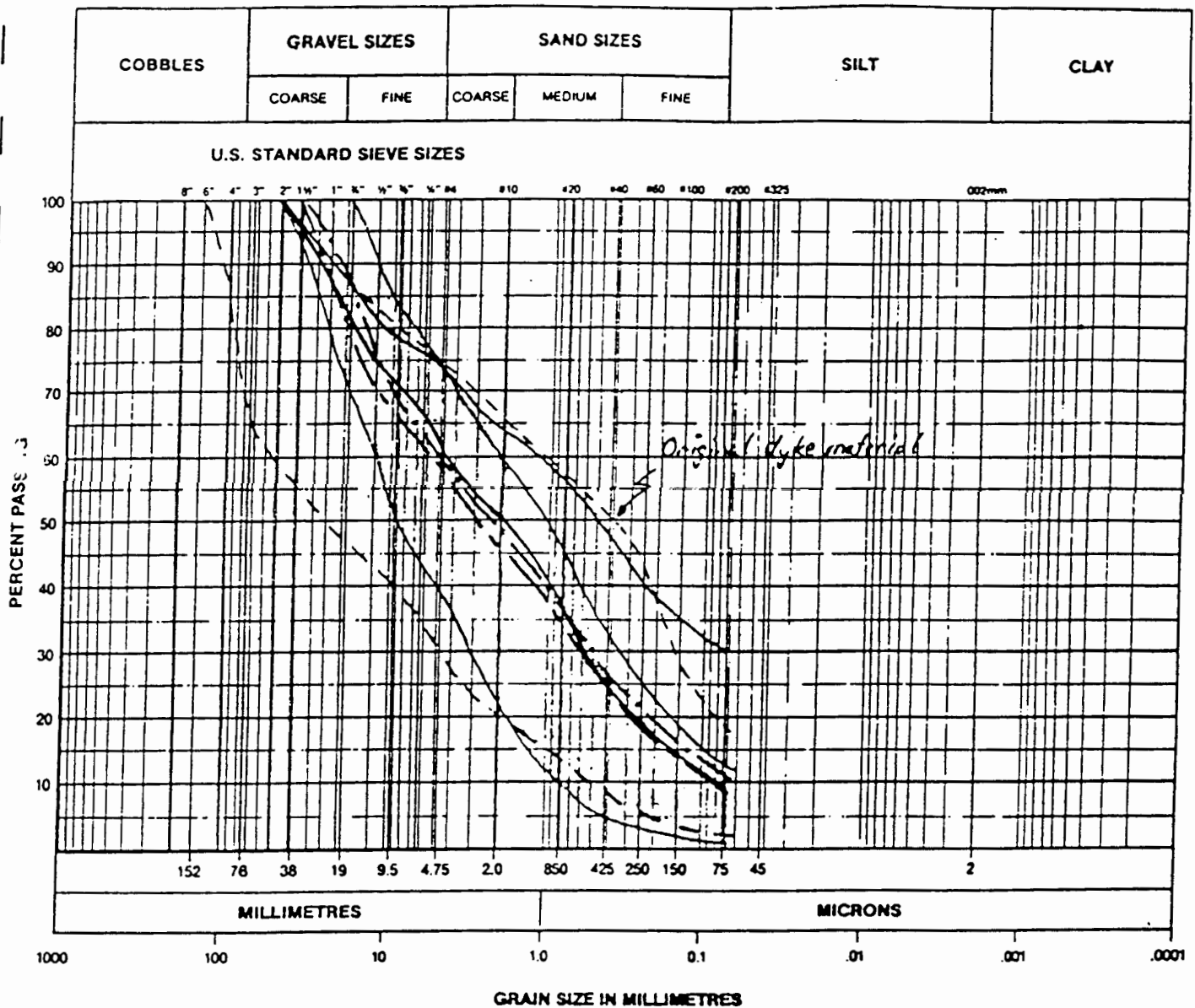
- THURBER 'EXISTING FILL MATERIAL'
- " STOCKPILED MATERIAL'
- x--x " 'PIT RUN FROM NORTH 40'
- " 'ROAD MATERIAL'



Hardy BBT Limited
CONSULTING ENGINEERING & PROFESSIONAL SERVICES

FIGURE 6 ALL THURBER GRAIN SIZE DATA

SCALE _____	DATE <u>OCT. 18/91</u>	MADE <u>DLG</u>	CHKD <u>WBG</u>	JOB No <u>VG05912</u>	FIGURE <u>6</u>
-------------	------------------------	-----------------	-----------------	-----------------------	-----------------



REMARKS: — Thurber "Road Material"
 — HBT TP4 (1.0 m) Perm. Test Sample
 — HBT Proctor Sample
 — Thurber "At Run From North 40"
 — Gradational Limits - HBT TP Samples

NOTE: UNIFIED SOIL CLASSIFICATION SYSTEM — HBT-TP1 (2.5 m)

SUMMARY

D ₁₀ = _____ mm	GRAVEL _____ %
D ₃₀ = _____ mm	SAND _____ %
D ₆₀ = _____ mm	SILT _____ %
C _u = _____ mm	CLAY _____ %
C _c = _____ mm	

— Thurber 'Existing Fill Material'



Hardy BBT Limited
 CONSULTING ENGINEERING & PROFESSIONAL SERVICES

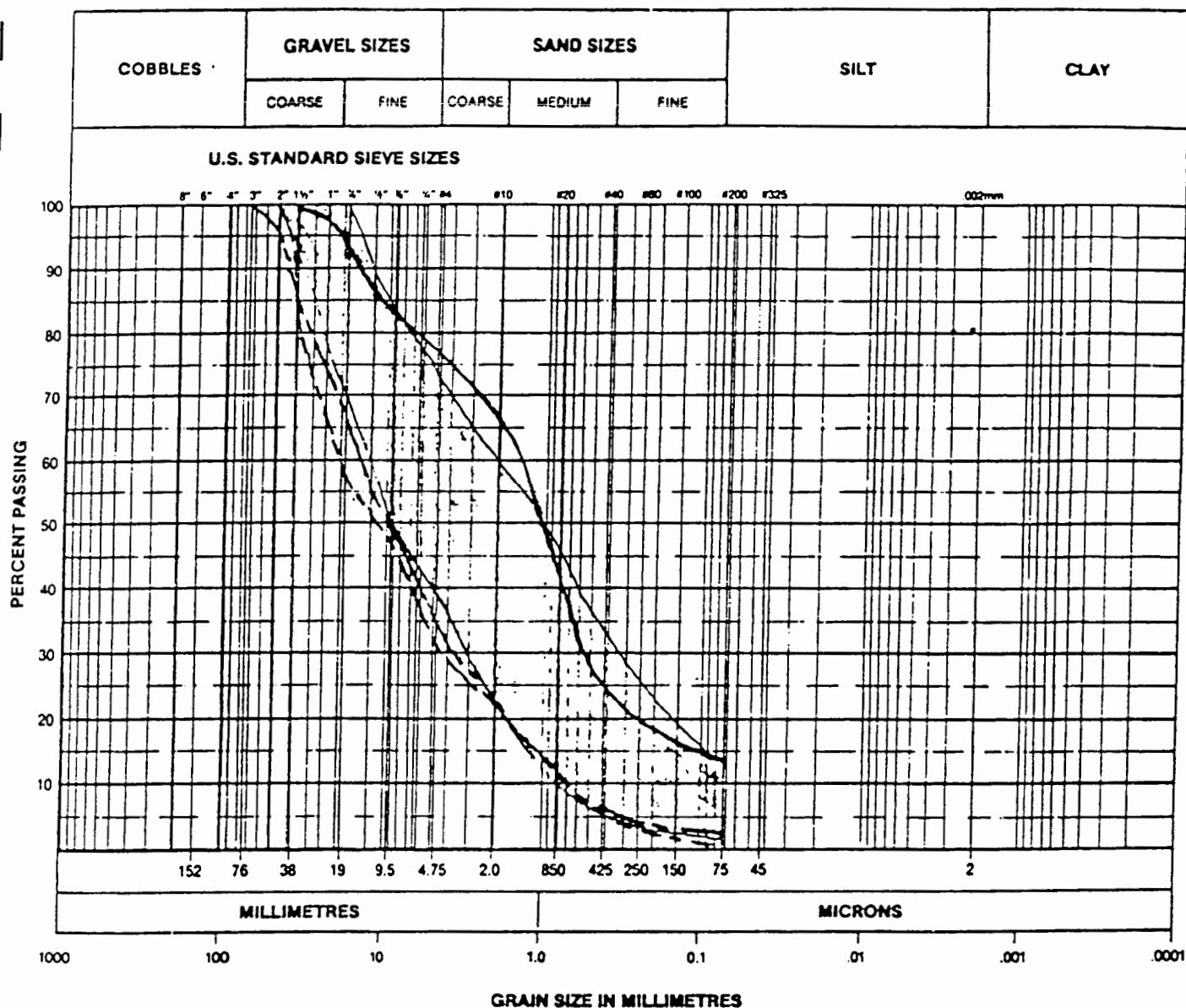
Grain Size Curves - Comparison of
 HBT and Thurber Data for Dyke Core
 Material

Test Hole No. _____ Sample _____ Depth _____

GRAIN SIZE DISTRIBUTION

JOB NO. VG-05912

Figure 4



REMARKS: — BH34 - Sa. 1 - North 40 Borrow Pit
 — BH33 - Sa. 1 - North 40 Borrow Pit
 — BH32 - Sa. 1 - North 40 Borrow Pit
 } Gradational Limits - HBT TP Samples

NOTE: UNIFIED SOIL CLASSIFICATION SYSTEM

SUMMARY	
D ₁₀ = _____ mm	GRAVEL _____ %
D ₃₀ = _____ mm	SAND _____ %
D ₆₀ = _____ mm	SILT _____ %
C _u = _____ mm	CLAY _____ %
C _c = _____ mm	



Hardy BBT Limited
 CONSULTING ENGINEERING & PROFESSIONAL SERVICES

Grain Size Curves - North 40 Borrow Pit
 (ref. HBT report CE01122, June, 1990)

Test Hole No. _____ Sample _____ Depth _____

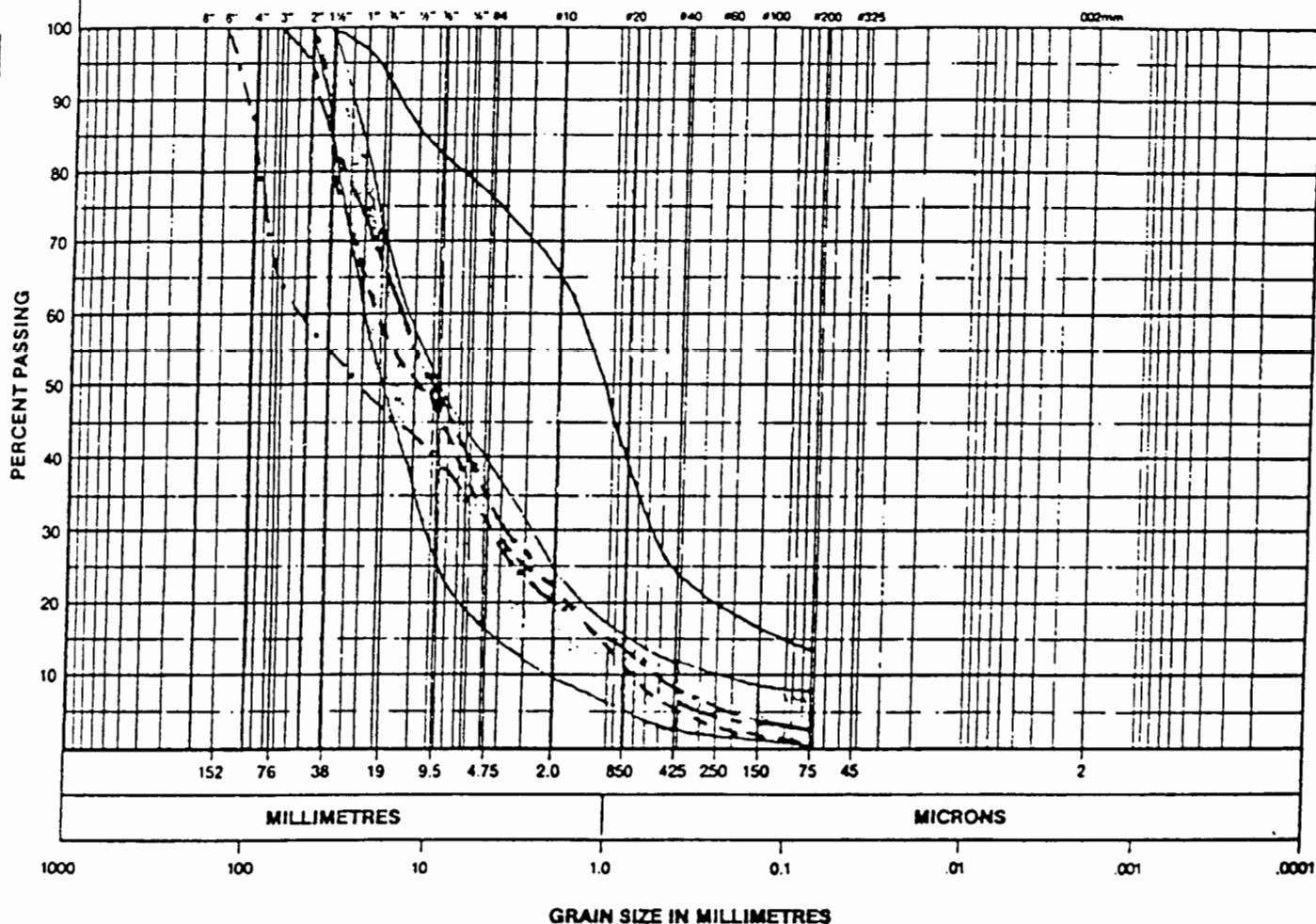
GRAIN SIZE DISTRIBUTION

JOB NO. **VG-05912**

Figure 3

COBBLES	GRAVEL SIZES		SAND SIZES			SILT	CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE		

U.S. STANDARD SIEVE SIZES



REMARKS: — BH34 - Se. 1 (HBT, 1990)
 — — BH33 - Se. 1 (HBT, 1990)
 — — BH32 - Se. 1 (HBT, 1990)
 — — Thurber "Pit Run From North 40"
 — — Gradational Limits (Class D2 Granular)

NOTE: UNIFIED SOIL CLASSIFICATION SYSTEM

SUMMARY

D ₁₀ = _____ mm	GRAVEL _____ %
D ₃₀ = _____ mm	SAND _____ %
D ₆₀ = _____ mm	SILT _____ %
C _u = _____ mm	CLAY _____ %
C _c = _____ mm	



Hardy BBT Limited
 CONSULTING ENGINEERING & PROFESSIONAL SERVICES

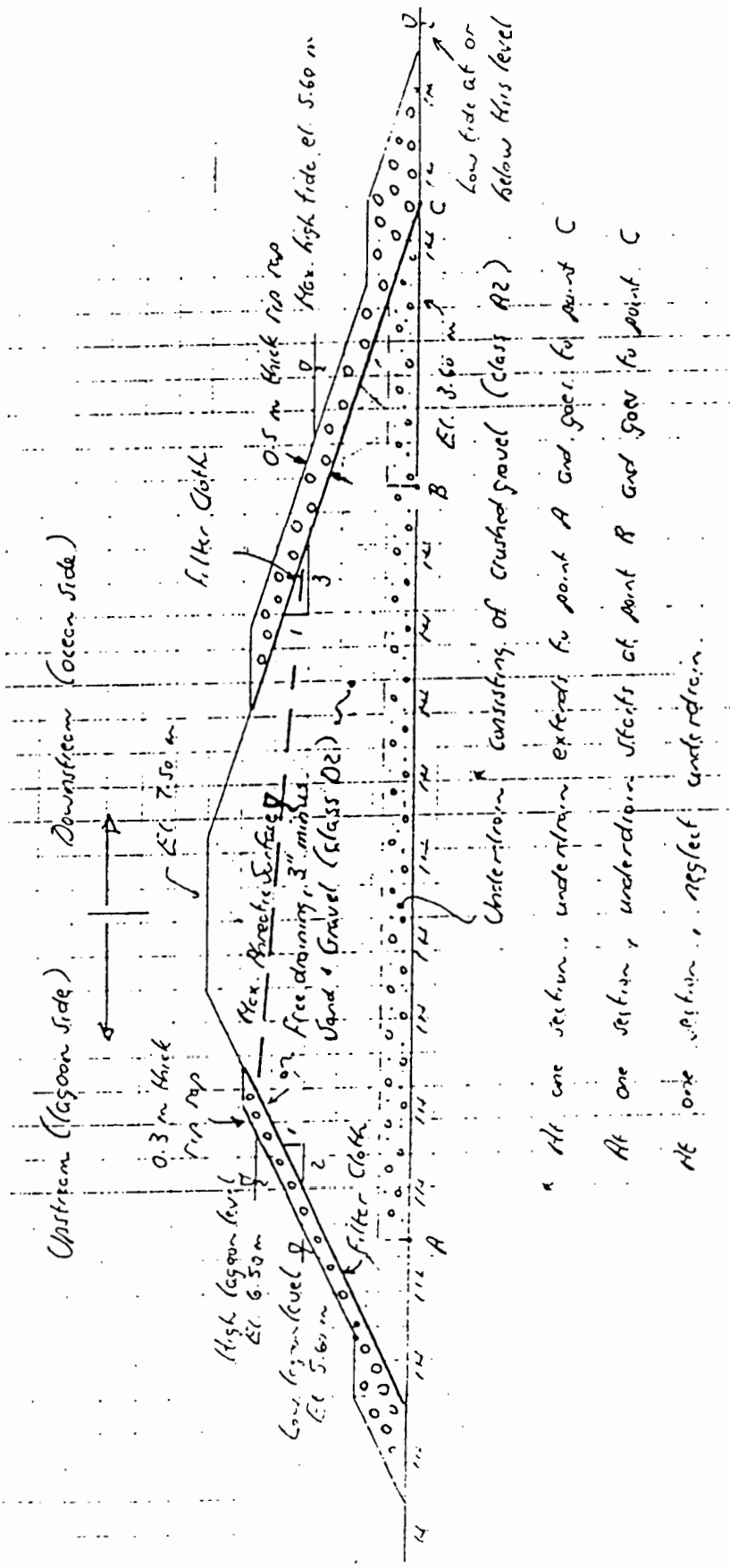
Grain Size Curves - Comparison of
 Class D2 Granular Specification With Data
 From North 40 Barrow Pit

Test Hole No. _____ Sample _____ Depth _____

GRAIN SIZE DISTRIBUTION

JOB NO. VG-05912

Figure 2



Underlain by crushed gravel (class A2) consisting of crushed gravel (class A2) extends to point A and goes to point C

At one section, underlain by filter cloth at point B and goes to point C

At one section, neglect underlain.

Low tide at or below this level

REVISIONS

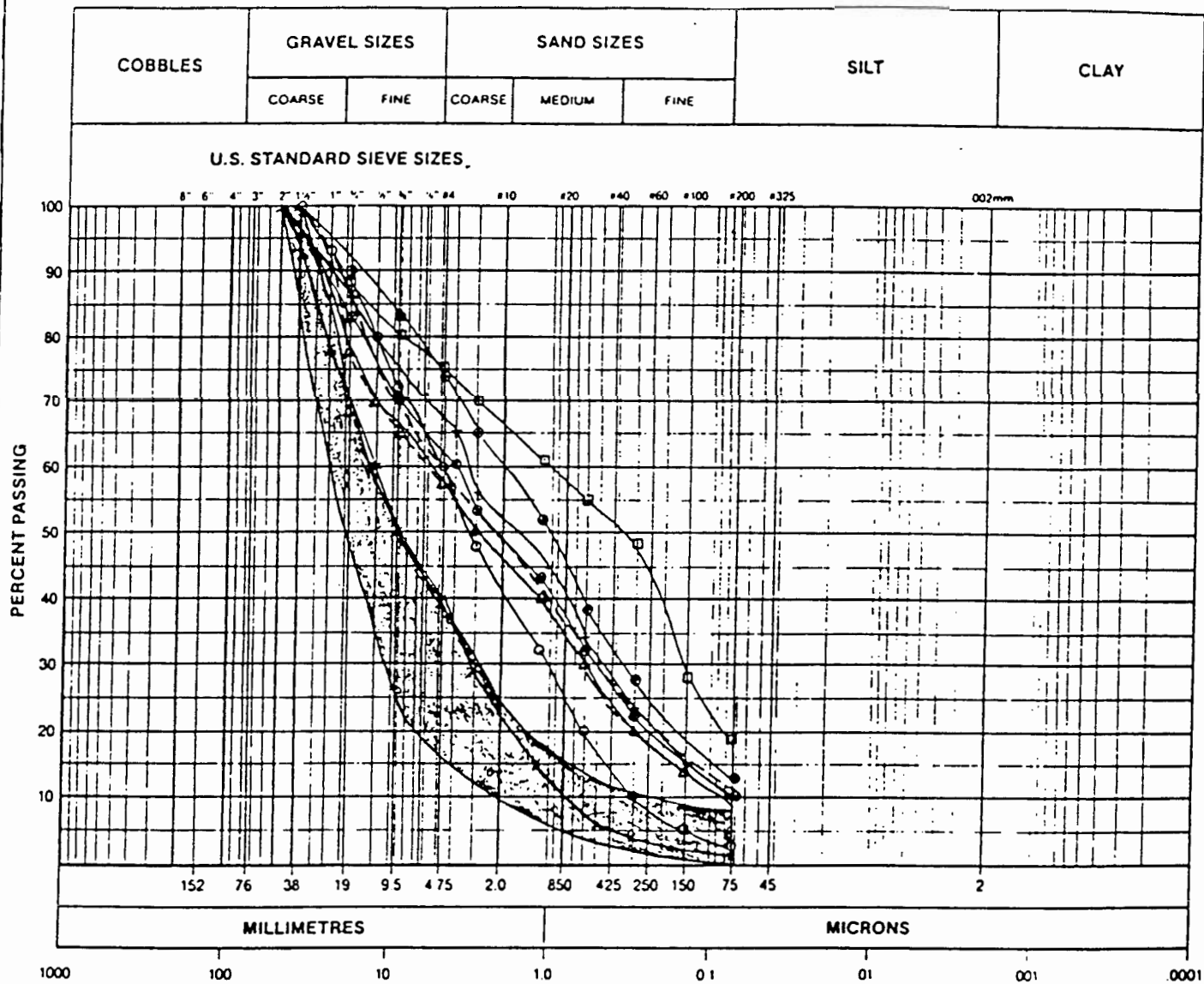
REFERENCES

Proposed Original Dyke Cross-Section
(after UHA Engineering)



Hardy BBT Limited
CONSULTING ENGINEERING & PROFESSIONAL SERVICES

SCALE 1:125	DATE Oct. 1/91	MADE WBG	CHKD	JOB No VG-05912	FIGURE 1
-------------	----------------	----------	------	-----------------	----------



LEGEND

- HBT TP1 (1.5m) □— HBT TP1 (2.5m)
- HBT TP2 (2.5m) ▲— HBT TP2 (0.8m) ●— HBT TP2 (1.9m)
- ×— HBT TP3 (1.8m) ●— HBT TP3 (1.0m)
- HBT TP4 (1.0m) - PERM. TEST
- HBT PROCTOR SAMPLE



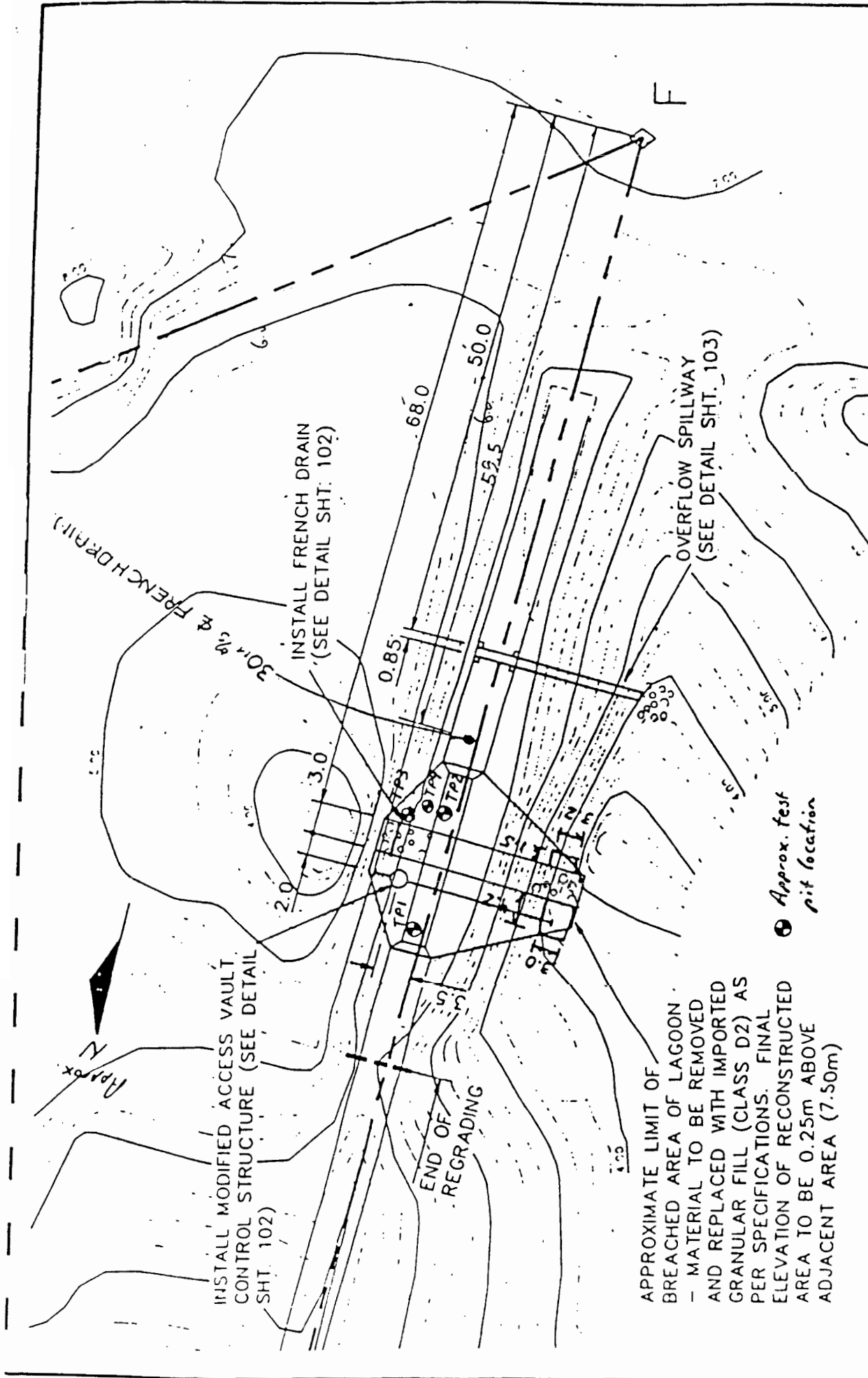
GRADATIONAL LIMITS (CLASS D2 GRANULAR)



Hardy BBT Limited
CONSULTING ENGINEERING & PROFESSIONAL SERVICES

FIGURE 5 ALL HARDY BBT LIMITED
GRAIN SIZE DATA

SCALE	DATE 26/12/91	MADE DCC	CHKD WBG	JOB No 1405012	FIGURE 5
-------	---------------	----------	----------	----------------	----------



 Hardy BBT Limited CONSULTING ENGINEERING & PROFESSIONAL SERVICES	TEST PIT LOCATION PLAN (ref. drawing of West Dyke re-construction, UMA Engineering)		Scale 1:50 Date Oct. 1, 1991 Drawn By WBG
	Figure 7		
	-B.T. 12 870X		



APPENDIX A

TEST PIT LOGS

TEST PIT 1

0 - 2.5 m depth: Dense, brown, SAND AND GRAVEL, trace to some silt, occasional cobble, moist (FILL)

@ 2.5 m depth: Dense, light brown, SAND, some silt and gravel, moist (original dyke material)

End of test pit at 2.5 m depth. No seepage into test pit during time of excavation on September 16, 1991.

Sa. 1 @ 1.5 m depth - gravelly SAND (35% gravel, 55% sand, 10% fines < 0.075 mm), moisture content = 5.9%

Sa. 2 @ 2.5 m depth - SAND, some gravel and silt (25% gravel, 55% sand, 20% fines < 0.075 mm), moisture content = 7.3%

TEST PIT 2

0 - 2.5 m depth: Dense, brown, SAND AND GRAVEL, trace to some silt, occasional cobble, rounded to subangular gravel, moist (FILL)

@ 2.5 m depth: Dense, brown, clean SAND AND GRAVEL, trace silt, moist (class D2 granular)

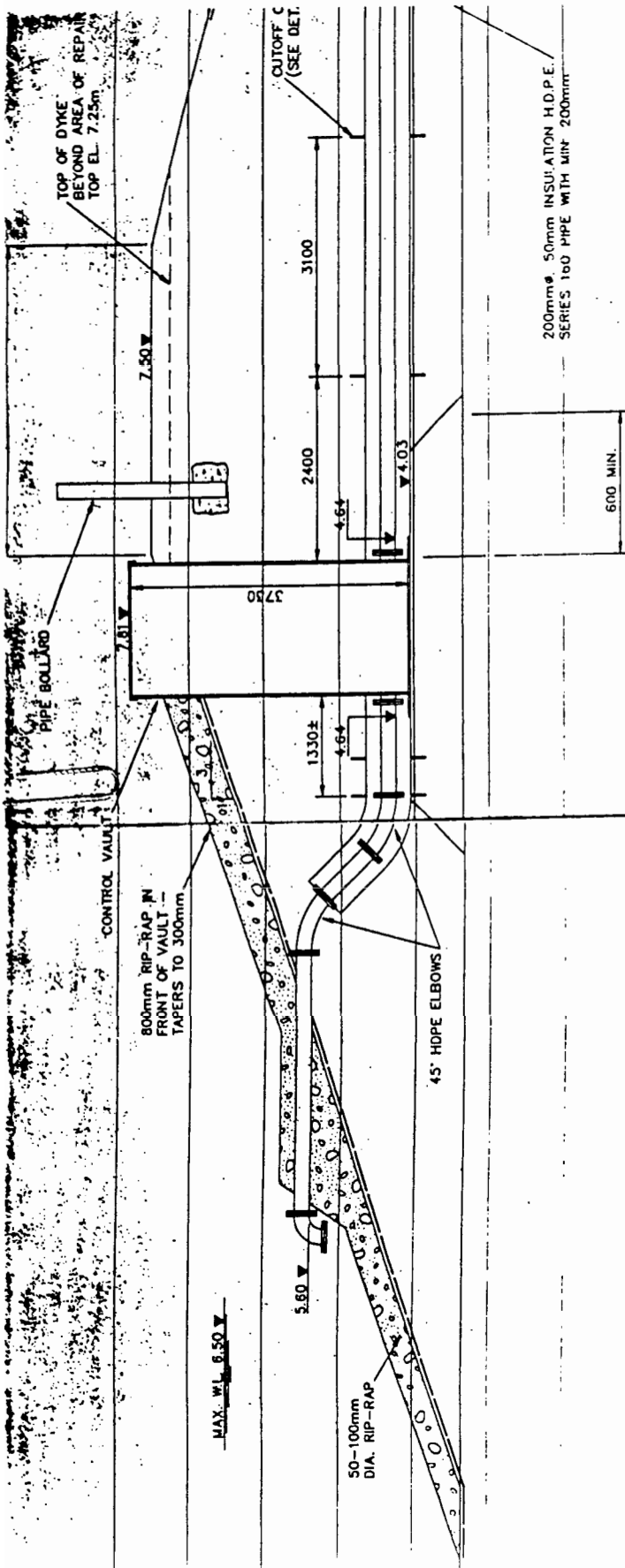
End of test pit at 2.5 m depth when hit filter cloth wrapped underdrain. No seepage into test pit during time of excavation on September 16, 1991.

Sa. 1 @ 0.8 m depth - SAND AND GRAVEL (40% gravel, 50% sand, 10% fines < 0.075 mm), moisture content = 5.7%

Sa. 2 @ 1.9 m depth - SAND, some gravel and silt (25% gravel, 63% sand, 12% fines < 0.075 mm), moisture content = 6.6%

Sa. 3 @ 2.5 m depth - SAND AND GRAVEL, trace silt (40% gravel, 57% sand, 3% fines < 0.075 mm), moisture content = 4.1%

APPENDIX B



DYKE RECONSTRUCTION

SCALE 1:50

TOP OF EXISTING DYKE
BEYOND AREA OF REPAIR
TOP EL. 7.25m

EXISTING

7.50

IMPORTED GRANULAR
FILL COMPACTED

TOP OF DYKE
BEYOND AREA OF REPAIR
TOP EL. 7.25m

CUTOFF COLLAR (TYP.)
(SEE DETAIL SHIT. 103)

150-300mm DIA. RIP-RAP

500

1.5% MIN.

INSULATION H.D.P.E.
WITH MIN. 200mm

1000

4000

1000

TOE DRAIN - 100mm
WITH GUSTIF

4.21%

8.00
7.00
6.00
5.00
4.00
3.00

SECTION

OF EXISTING DYKE
END AREA OF REPAIR
EL. 7.25m

EXISTING DYKE

APPENDIX "G"

1998 Spill Reports



N.W.T. SPILL REPORT (Oil, Gas, Hazardous Chemicals or other Materials)

24-Hour Report Line

24-ᓄ ᐃᓃᓴᓄᓐ ᐃᓄᓃᓴᓐ ᐃᓄᓃᓴᓐ ᐃᓄᓃᓴᓐ

Phone/ᐃᓄᓃᓴᓐ (403) 920-8130

Fax/ᐃᓄᓃᓴᓐ (403) 873-6924

ᓄᓄᓃᓴᓐ ᐃᓄᓃᓴᓐ ᐃᓄᓃᓴᓐ (ᐃᓄᓃᓴᓐ ᐃᓄᓃᓴᓐ ᐃᓄᓃᓴᓐ)

A Report date and time ᐃᓄᓃᓴᓐ ᐃᓄᓃᓴᓐ ᐃᓄᓃᓴᓐ JAN 5TH 1998		B Date and time of spill (if known) ᐃᓄᓃᓴᓐ ᐃᓄᓃᓴᓐ ᐃᓄᓃᓴᓐ JAN 4TH 1998 3PM		C Original report ᐃᓄᓃᓴᓐ ᐃᓄᓃᓴᓐ ☒	Spill number ᐃᓄᓃᓴᓐ _____
D Location and map coordinates (if known) and direction (if moving) ᓄᓄ ᐃᓄᓃᓴᓐ ᐃᓄᓃᓴᓐ ᐃᓄᓃᓴᓐ ᐃᓄᓃᓴᓐ ᐃᓄᓃᓴᓐ NAKASUK SCHOOL SEWER LINE					
E Party responsible for spill ᐃᓄᓃᓴᓐ ᐃᓄᓃᓴᓐ UNKNOWN POSSIBLE FREEZE OR BLOCKAGE					
F Product(s) spilled and estimated quantities (provide metric volumes/weights if possible) ᐃᓄᓃᓴᓐ ᐃᓄᓃᓴᓐ ᐃᓄᓃᓴᓐ ᐃᓄᓃᓴᓐ ᐃᓄᓃᓴᓐ 100 GALS					
G Cause of spill ᐃᓄᓃᓴᓐ ᐃᓄᓃᓴᓐ POSSIBLE FREEZE OR BLOCKAGE					
H Is spill terminated? ᐃᓄᓃᓴᓐ ᐃᓄᓃᓴᓐ ☒ yes/ᐃ ☐ no/ᐃᓄ		I If spill is continuing, give estimated rate ᐃᓄᓃᓴᓐ ᐃᓄᓃᓴᓐ ᐃᓄᓃᓴᓐ _____		J Is further spillage possible? ᐃᓄᓃᓴᓐ ᐃᓄᓃᓴᓐ ☒ yes/ᐃ ☐ no/ᐃᓄ	
K Extent of contaminated area (in square metres if possible) ᐃᓄᓃᓴᓐ ᐃᓄᓃᓴᓐ ᐃᓄᓃᓴᓐ 1050 M				L Factors affecting spill or recovery (weather conditions, terrain, snow cover, etc.) ᐃᓄᓃᓴᓐ ᐃᓄᓃᓴᓐ ᐃᓄᓃᓴᓐ ᐃᓄᓃᓴᓐ ᐃᓄᓃᓴᓐ ABSORBED BY SNOW	
M Containment (natural depression, dykes, etc.) ᐃᓄᓃᓴᓐ ᐃᓄᓃᓴᓐ ᐃᓄᓃᓴᓐ ᐃᓄᓃᓴᓐ SKIN SEWAGE FROZEN					
N Action, if any, taken or proposed to contain, recover, clean up or dispose of product(s) and contaminated materials ᐃᓄᓃᓴᓐ ᐃᓄᓃᓴᓐ ᐃᓄᓃᓴᓐ ᐃᓄᓃᓴᓐ ᐃᓄᓃᓴᓐ LOADER WILL REMOVE FROZEN SEWAGE FROM SITE.					
O Do you require assistance? ᐃᓄᓃᓴᓐ ᐃᓄᓃᓴᓐ ☒ no ☐ yes, describe: ᐃᓄᓃᓴᓐ ᐃᓄᓃᓴᓐ			P Possible hazards to persons, property, or environment; eg: fire, drinking water, fish or wildlife ᐃᓄᓃᓴᓐ ᐃᓄᓃᓴᓐ ᐃᓄᓃᓴᓐ NO		
Q Comments and/or recommendations ᐃᓄᓃᓴᓐ ᐃᓄᓃᓴᓐ ᐃᓄᓃᓴᓐ SEWAGE LINE SHOULD BE REPLACE WITH NEW H.D.P.E. PIPE.					FOR SPILL LINE USE ONLY ᐃᓄᓃᓴᓐ ᐃᓄᓃᓴᓐ ᐃᓄᓃᓴᓐ Lead Agency ᐃᓄᓃᓴᓐ ᐃᓄᓃᓴᓐ Spill significance ᐃᓄᓃᓴᓐ ᐃᓄᓃᓴᓐ Lead Agency contact and time ᐃᓄᓃᓴᓐ ᐃᓄᓃᓴᓐ ᐃᓄᓃᓴᓐ ᐃᓄᓃᓴᓐ Is this file now closed? ᐃᓄᓃᓴᓐ ᐃᓄᓃᓴᓐ
Reported by ᐃᓄᓃᓴᓐ CHRIS FREDA		Position, Employer, Location ᐃᓄᓃᓴᓐ ᐃᓄᓃᓴᓐ ᐃᓄᓃᓴᓐ UTILITOR FOREMAN		Telephone ᐃᓄᓃᓴᓐ 5648	
Reported to ᐃᓄᓃᓴᓐ ᐃᓄᓃᓴᓐ		Position, Employer, Location ᐃᓄᓃᓴᓐ ᐃᓄᓃᓴᓐ ᐃᓄᓃᓴᓐ		Telephone ᐃᓄᓃᓴᓐ	

[illegible]



N.W.T. SPILL REPORT (Oil, Gas, Hazardous Chemicals or other Materials)

24-Hour Report Line
24-ᓄᑦ ᐃᑲᑦᓴᓄᑦ ᐃᓂᑲᑦᐃᐃᑦᐃᑦᐃᑦᐃᑦ ᐃᑲᑦᐃᑦ
Phone/ᐃᑲᑦᐃᑦ (403) 920-8130
Fax/ᐃᑲᑦᐃᑦ (403) 873-6924

A Report date and time ᐃᑲᑦᐃᑦ/ᐃᑲᑦᐃᑦ ᐃᑲᑦᐃᑦᐃᑦᐃᑦᐃᑦ 2/03/98		B Date and time of spill (if known) ᐃᑲᑦᐃᑦ ᐃᑲᑦᐃᑦ ᐃᑲᑦᐃᑦᐃᑦᐃᑦᐃᑦ 28/02/98 6PM		C Original report ᐃᑲᑦᐃᑦᐃᑦ ᐃᑲᑦᐃᑦᐃᑦᐃᑦ Update no. _____ ᐃᑲᑦᐃᑦᐃᑦᐃᑦᐃᑦᐃᑦ _____		Spill number ᐃᑲᑦᐃᑦ ᐃᑲᑦᐃᑦ
D Location and map coordinates (if known) and direction (if moving) ᐃᑲᑦᐃᑦ ᐃᑲᑦᐃᑦ ᐃᑲᑦᐃᑦᐃᑦᐃᑦᐃᑦ ᐃᑲᑦᐃᑦ ᐃᑲᑦᐃᑦᐃᑦᐃᑦᐃᑦᐃᑦ (ᐃᑲᑦᐃᑦᐃᑦ) A.U. 223 → A.U. 224						
E Party responsible for spill ᐃᑲᑦᐃᑦ ᐃᑲᑦᐃᑦᐃᑦ MUNICIPALITY OF IQALUIT						
F Product(s) spilled and estimated quantities (provide metric volumes/weights if possible) ᐃᑲᑦᐃᑦ ᐃᑲᑦᐃᑦ ᐃᑲᑦᐃᑦᐃᑦᐃᑦ (ᐃᑲᑦᐃᑦ ᐃᑲᑦᐃᑦᐃᑦᐃᑦᐃᑦ ᐃᑲᑦᐃᑦᐃᑦ) SEWAGE 1000 LITRES						
G Cause of spill ᐃᑲᑦᐃᑦ ᐃᑲᑦᐃᑦ BLOCKAGE						
H Is spill terminated? ᐃᑲᑦᐃᑦ ᐃᑲᑦᐃᑦᐃᑦᐃᑦ? yes/ᐃ no/ᐃᑲ		I If spill is continuing, give estimated rate ᐃᑲᑦᐃᑦ ᐃᑲᑦᐃᑦ ᐃᑲᑦᐃᑦᐃᑦᐃᑦ N/A		J Is further spillage possible? ᐃᑲᑦᐃᑦᐃᑦᐃᑦᐃᑦᐃᑦ? yes/ᐃ no/ᐃᑲ		K Extent of contaminated area (in square metres if possible) ᐃᑲᑦᐃᑦ ᐃᑲᑦᐃᑦᐃᑦ ᐃᑲᑦᐃᑦᐃᑦᐃᑦ (ᐃᑲᑦᐃᑦᐃᑦ ᐃᑲᑦᐃᑦᐃᑦ) 25 M ²
L Factors affecting spill or recovery (weather conditions, terrain, snow cover, etc.) ᐃᑲᑦᐃᑦ ᐃᑲᑦᐃᑦᐃᑦ ᐃᑲᑦᐃᑦ ᐃᑲᑦᐃᑦᐃᑦᐃᑦᐃᑦ ᐃᑲᑦᐃᑦ ᐃᑲᑦᐃᑦᐃᑦᐃᑦᐃᑦ ᐃᑲᑦᐃᑦ ᐃᑲᑦᐃᑦᐃᑦᐃᑦᐃᑦ SNOW COVER					M Containment (natural depression, dykes, etc.) ᐃᑲᑦᐃᑦᐃᑦᐃᑦ ᐃᑲᑦᐃᑦ ᐃᑲᑦᐃᑦᐃᑦᐃᑦᐃᑦ ᐃᑲᑦᐃᑦ ᐃᑲᑦᐃᑦᐃᑦᐃᑦᐃᑦ NATURAL DEPRESSION	
N Action, if any, taken or proposed to contain, recover, clean up or dispose of product(s) and contaminated materials ᐃᑲᑦᐃᑦᐃᑦᐃᑦ, ᐃᑲᑦᐃᑦᐃᑦᐃᑦᐃᑦᐃᑦ ᐃᑲᑦᐃᑦ ᐃᑲᑦᐃᑦᐃᑦᐃᑦᐃᑦᐃᑦ ᐃᑲᑦᐃᑦᐃᑦᐃᑦᐃᑦᐃᑦᐃᑦ ᐃᑲᑦᐃᑦᐃᑦᐃᑦᐃᑦᐃᑦ ᐃᑲᑦᐃᑦᐃᑦᐃᑦᐃᑦᐃᑦ ᐃᑲᑦᐃᑦᐃᑦᐃᑦᐃᑦᐃᑦ WILL ATTEMPT TO REMOVE CONTAMINATED SNOW FROM DITCH						
O Do you require assistance? ᐃᑲᑦᐃᑦᐃᑦᐃᑦᐃᑦᐃᑦ? no yes, describe: ᐃᑲᑦᐃᑦ ᐃᑲᑦᐃᑦᐃᑦᐃᑦᐃᑦ				P Possible hazards to persons, property, or environment, eg: fire, drinking water, fish or wildlife ᐃᑲᑦᐃᑦᐃᑦᐃᑦᐃᑦᐃᑦᐃᑦ ᐃᑲᑦᐃᑦ, ᐃᑲᑦᐃᑦᐃᑦᐃᑦᐃᑦᐃᑦ ᐃᑲᑦᐃᑦ ᐃᑲᑦᐃᑦᐃᑦᐃᑦᐃᑦᐃᑦ ᐃᑲᑦᐃᑦᐃᑦᐃᑦᐃᑦᐃᑦᐃᑦ ᐃᑲᑦᐃᑦᐃᑦᐃᑦᐃᑦᐃᑦᐃᑦ N/A		
Q Comments and/or recommendations ᐃᑲᑦᐃᑦᐃᑦᐃᑦᐃᑦ ᐃᑲᑦᐃᑦᐃᑦᐃᑦᐃᑦᐃᑦ - FAXED COPY TO PAUL SMITH D.I.A.N.D. -						FOR SPILL LINE USE ONLY ᐃᑲᑦᐃᑦᐃᑦᐃᑦᐃᑦᐃᑦ ᐃᑲᑦᐃᑦᐃᑦᐃᑦᐃᑦᐃᑦ Lead Agency ᐃᑲᑦᐃᑦᐃᑦᐃᑦᐃᑦᐃᑦ ᐃᑲᑦᐃᑦᐃᑦᐃᑦᐃᑦᐃᑦ Spill significance ᐃᑲᑦᐃᑦᐃᑦᐃᑦᐃᑦᐃᑦ Lead Agency contact and time ᐃᑲᑦᐃᑦᐃᑦᐃᑦᐃᑦᐃᑦ ᐃᑲᑦᐃᑦᐃᑦᐃᑦᐃᑦᐃᑦᐃᑦ ᐃᑲᑦᐃᑦᐃᑦᐃᑦᐃᑦᐃᑦᐃᑦ ᐃᑲᑦᐃᑦᐃᑦᐃᑦᐃᑦᐃᑦ Is this file now closed? ᐃᑲᑦᐃᑦ ᐃᑲᑦᐃᑦᐃᑦᐃᑦᐃᑦᐃᑦᐃᑦ
Reported by ᐃᑲᑦᐃᑦᐃᑦ GARY MOORE		Position, Employer, Location ᐃᑲᑦᐃᑦᐃᑦ ᐃᑲᑦᐃᑦᐃᑦᐃᑦ, ᐃᑲᑦᐃᑦᐃᑦᐃᑦᐃᑦ, ᐃᑲᑦᐃᑦ UTILIDOR TECHNICIAN			Telephone ᐃᑲᑦᐃᑦ 979-5648	
Reported to ᐃᑲᑦᐃᑦᐃᑦᐃᑦᐃᑦᐃᑦ CHRIS FREDIA		Position, Employer, Location ᐃᑲᑦᐃᑦᐃᑦ ᐃᑲᑦᐃᑦᐃᑦᐃᑦ, ᐃᑲᑦᐃᑦᐃᑦᐃᑦᐃᑦ, ᐃᑲᑦᐃᑦ UTILIDOR FOREMAN			Telephone ᐃᑲᑦᐃᑦ 979-5648	

[illegible]



N.W.T. SPILL REPORT

(Oil, Gas, Hazardous Chemicals or other Materials)

24-Hour Report Line

24-ᓄᓐ ᐃᓪᓴᓄᓐ ᐃᓄᓪᓴᓐ ᐃᓄᓪᓴᓐ ᐃᓄᓪᓴᓐ

Phone/ᐃᓄᓪᓴᓐ (403) 920-8130

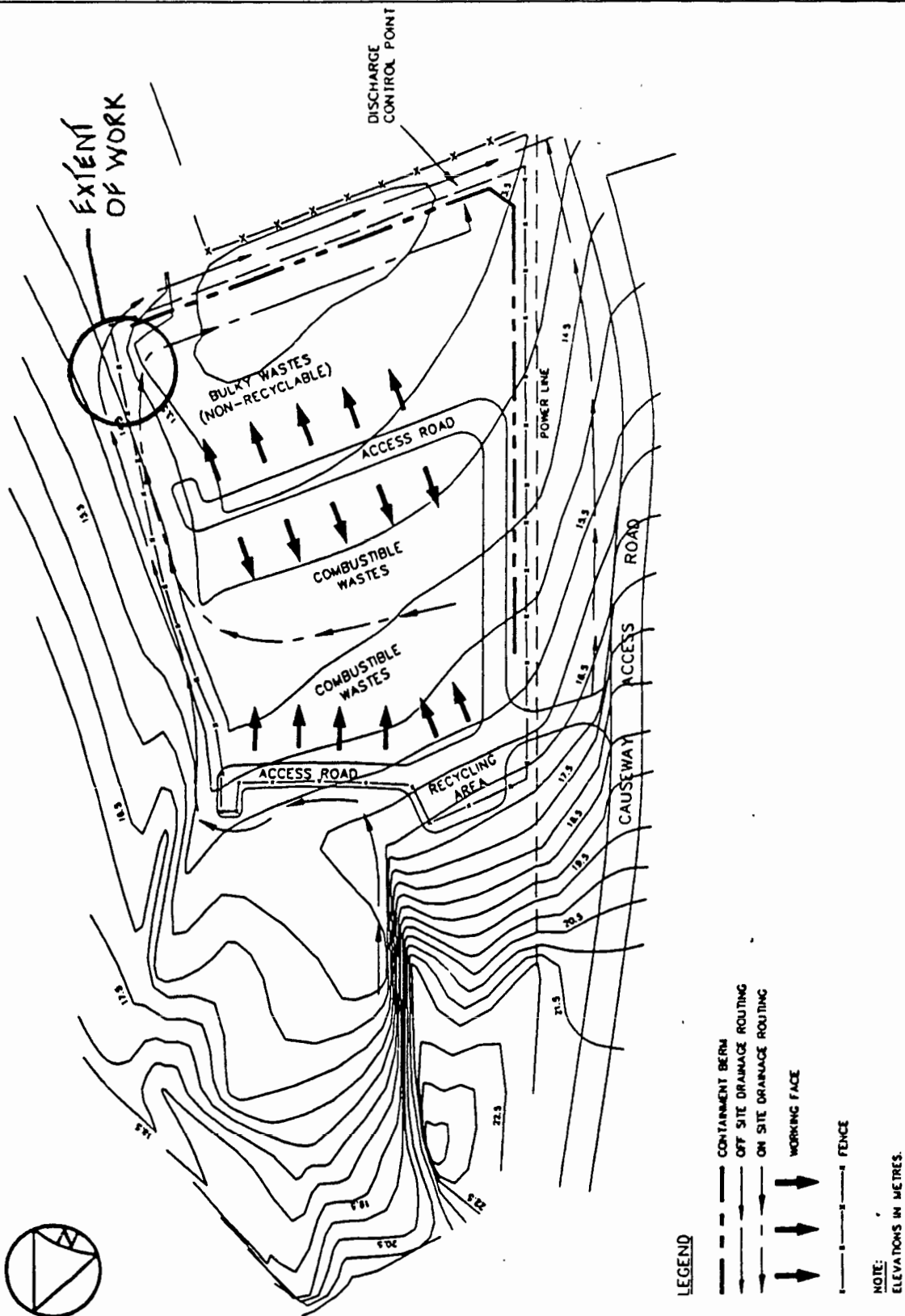
Fax/ᐃᓄᓪᓴᓐ (403) 873-6924

ᓄᓄᓐᓴᓐ ᐃᓄᓪᓴᓐ ᐃᓄᓪᓴᓐ (ᐃᓄᓪᓴᓐ, ᓄᓪᓴᓐ, ᐃᓄᓪᓴᓐ)
ᐃᓄᓪᓴᓐ ᐃᓄᓪᓴᓐ ᐃᓄᓪᓴᓐ

A Report date and time ᐃᓄᓪᓴᓐ ᐃᓄᓪᓴᓐ ᐃᓄᓪᓴᓐ 3PM 29/10/98		B Date and time of spill (if known) ᐃᓄᓪᓴᓐ ᐃᓄᓪᓴᓐ ᐃᓄᓪᓴᓐ 2.30 PM 29/10/98		C Original report ᐃᓄᓪᓴᓐ ᐃᓄᓪᓴᓐ Update no. _____ ᐃᓄᓪᓴᓐ ᐃᓄᓪᓴᓐ		Spill number ᐃᓄᓪᓴᓐ	
D Location and map coordinates (if known) and direction (if moving) ᓄᓄ ᐃᓄᓪᓴᓐ ᐃᓄᓪᓴᓐ ᐃᓄᓪᓴᓐ ᐃᓄᓪᓴᓐ ᐃᓄᓪᓴᓐ NAKASUK SCHOOL SEWER LINE							
E Party responsible for spill ᐃᓄᓪᓴᓐ MUNICIPALITY OF IQUAMIT / GOVT OF N.W.T.							
F Product(s) spilled and estimated quantities (provide metric volumes/weights if possible) ᐃᓄᓪᓴᓐ ᐃᓄᓪᓴᓐ ᐃᓄᓪᓴᓐ ᐃᓄᓪᓴᓐ SEWAGE							
G Cause of spill ᐃᓄᓪᓴᓐ BLOCKAGE / FROZEN LINE							
H Is spill terminated? ᐃᓄᓪᓴᓐ ᐃᓄᓪᓴᓐ ☒ yes / ☐ no		I If spill is continuing, give estimated rate ᐃᓄᓪᓴᓐ ᐃᓄᓪᓴᓐ ᐃᓄᓪᓴᓐ P/A		J Is further spillage possible? ᐃᓄᓪᓴᓐ ᐃᓄᓪᓴᓐ ᐃᓄᓪᓴᓐ ☐ yes / ☒ no		K Extent of contaminated area (in square metres if possible) ᐃᓄᓪᓴᓐ ᐃᓄᓪᓴᓐ ᐃᓄᓪᓴᓐ 20 METRES SQ	
L Factors affecting spill or recovery (weather conditions, terrain, snow cover, etc.) ᐃᓄᓪᓴᓐ ᐃᓄᓪᓴᓐ ᐃᓄᓪᓴᓐ ᐃᓄᓪᓴᓐ FROZEN				M Containment (natural depression, dykes, etc.) ᐃᓄᓪᓴᓐ ᐃᓄᓪᓴᓐ ᐃᓄᓪᓴᓐ NATURAL DEPRESSION			
N Action, if any, taken or proposed to contain, recover, clean up or dispose of product(s) and contaminated materials ᐃᓄᓪᓴᓐ ᐃᓄᓪᓴᓐ ᐃᓄᓪᓴᓐ ᐃᓄᓪᓴᓐ ᐃᓄᓪᓴᓐ SEWAGE WAS MIXED WITH SURROUNDING SNOW AND REMOVED BY DUMP TRUCKS TO SEWAGE LAGOON DUMP SITE.							
O Do you require assistance? ᐃᓄᓪᓴᓐ ᐃᓄᓪᓴᓐ ☒ no / ☐ yes, describe: ᐃᓄᓪᓴᓐ				P Possible hazards to persons, property, or environment; eg: fire, drinking water, fish or wildlife ᐃᓄᓪᓴᓐ ᐃᓄᓪᓴᓐ ᐃᓄᓪᓴᓐ 405 MILES			
Q Comments and/or recommendations ᐃᓄᓪᓴᓐ ᐃᓄᓪᓴᓐ ᐃᓄᓪᓴᓐ THIS LINE WAS IDENTIFIED AS A PROBLEM LAST YEAR AND IS TO BE REMOVED AND REPLACED WITH NEW HDPE PIPE. THIS REMOVAL IS TO BEGIN WITHIN THE NEXT WEEK. THE MUNICIPALITY OF IQUAMIT WILL MONITOR ON DAILY BASIS UNTIL THIS OCCURS.						FOR SPILL LINE USE ONLY ᐃᓄᓪᓴᓐ ᐃᓄᓪᓴᓐ Lead Agency ᐃᓄᓪᓴᓐ ᐃᓄᓪᓴᓐ Spill significance ᐃᓄᓪᓴᓐ Lead Agency contact and time ᐃᓄᓪᓴᓐ ᐃᓄᓪᓴᓐ ᐃᓄᓪᓴᓐ ᐃᓄᓪᓴᓐ Is this file now closed? ᐃᓄᓪᓴᓐ ᐃᓄᓪᓴᓐ	
Reported by ᐃᓄᓪᓴᓐ CHRIS FRODA		Position, Employer, Location ᐃᓄᓪᓴᓐ ᐃᓄᓪᓴᓐ ᐃᓄᓪᓴᓐ MUNICIPALITY OF IQUAMIT UTILITIES DEPARTMENT				Telephone ᐃᓄᓪᓴᓐ 979-5648	
Reported to ᐃᓄᓪᓴᓐ _____		Position, Employer, Location ᐃᓄᓪᓴᓐ ᐃᓄᓪᓴᓐ ᐃᓄᓪᓴᓐ _____				Telephone ᐃᓄᓪᓴᓐ _____	

APPENDIX "H"

Asbuilt Sketches 1998 Landfill Site Berm Repair

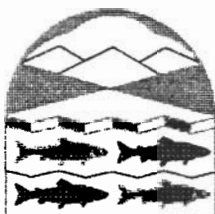
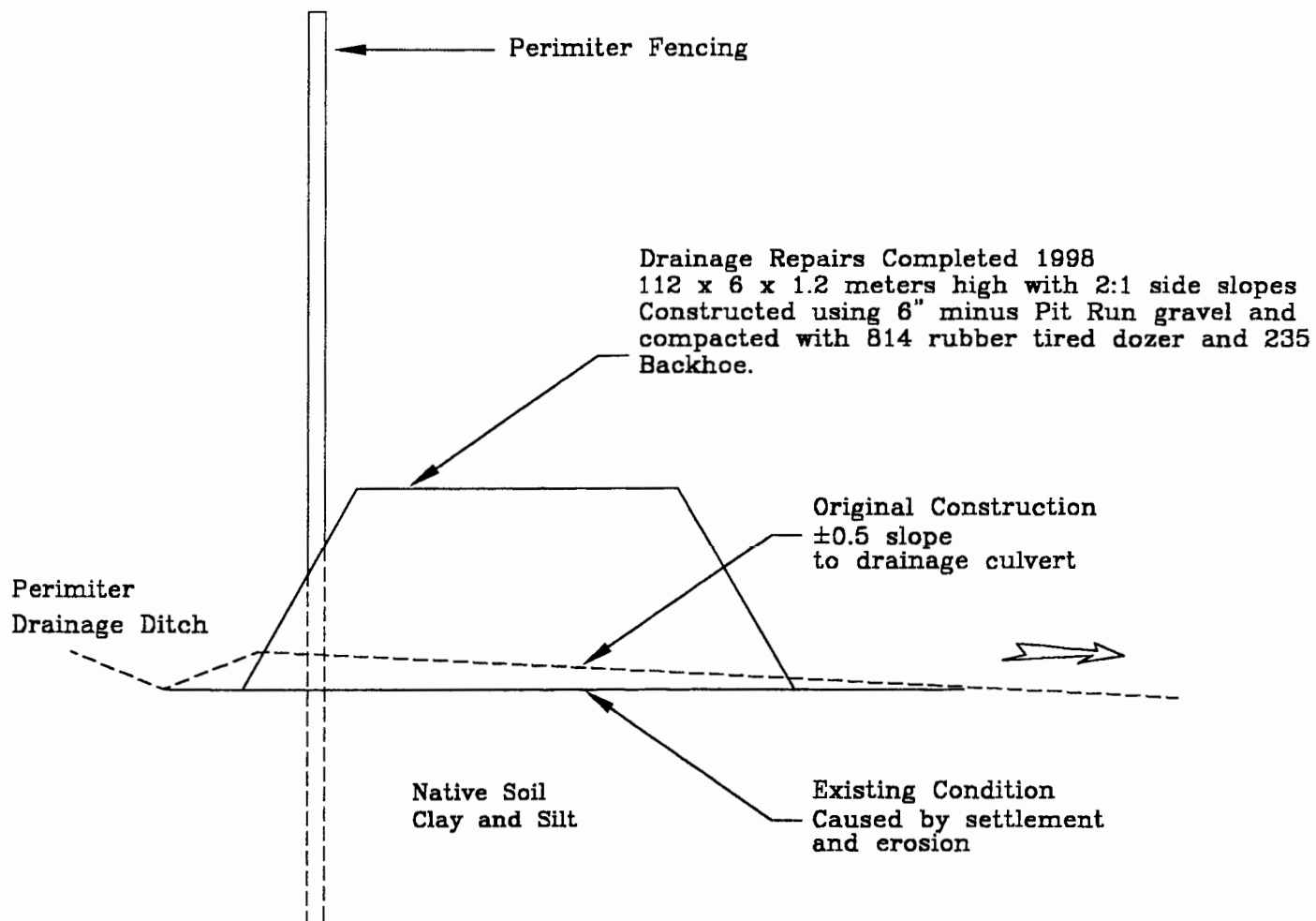


Municipality of Iqaluit West 40 Landfill - Berm Repairs

Scale: N.T.S.

Rev: Sept 1998

DWG: A-1



Municipality of Iqaluit West 40 Landfill - Berm Repairs

Scale: N.T.S.

Rev: Sept 1998

DWG: A-2