Water License Annual Report - Executive Summary

The City of Iqaluit provides its residents with drinking water, wastewater management and solid waste management. These services are governed by the City of Iqaluit's Water License 3AM-IQA0611, which was issued by the Nunavut Water Board in 2006. In accordance with Schedule B of the Water License, this Annual Water License Report summarizes the activities conducted by the City in 2010.

The Water Treatment Plant (WTP) receives raw water from Lake Geraldine and provides the residents of Iqaluit with potable water. In 2010, the City used 877,090 m^3 of water from the Lake Geraldine, this is approximately 200,000 m^3 less than the allowed usage of 1,100,000 m^3. In 2010, there were no major problems with the WTP or the water distribution system. In August, an underwater survey of the dam was completed to aid in the development of a grouting program to repair leaks in the dam. In November, there was a Dam Safety Inspection (DSI) Report prepared on the Lake Geraldine Dam, which recommended that the City: 1) implement a grouting program to fix the leaks in the dam, 2) investigate and develop a repair program for the leaks that were notice in the north berm and 3) prepare an Emergency Preparedness Plan. The City plans to complete this program in the summer of 2011.

The Wastewater Treatment Plant (WWTP) provides the City with primary sewage treatment. In 2010, there was some minor maintenance work done on the WWTP, including cleaning and the replacement of the filter in the Salsnes Filter. A maintenance issue with the water tank also caused issues with the computer that controls and takes the readings for the WWTP. Also, in 2010, a major renovation happened on the Sewage Lift Station #2 to update the aging building and equipment.

The City provides the residents of Iqaluit with solid waste management services at the West 40 landfill. In September of 2009, it was noticed that landfill run-off was leaching through the perimeter berm into the outside drainage ditch. Immediate measures were taken to prevent the run-off from draining to the ocean and a report was prepared to identify the water management improvements required to address this problem. In 2010, a detailed engineering design and tender documents were completed for this work. The water management improvements are planned to be carried out in the summer of 2012. Furthermore, in 2010 the City of Iqaluit issued a request for proposal for the Development of a Preliminary Design for New Waste Management Facilities in the City of Iqaluit. This contract was awarded to Trow Associates Inc. on December 20, 2010; the work is expected to be completed in the fall of 2011. In July of 2010, the Public Works Department started to provided treatment for landfill run-off through a dewatering bag.

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ᐃᒥᖅᒥᐅ ᐊᑐᖅᑕᐅᔨᑦᓴᒥᐅ ,ᐃᒥᕈᔨᓐᓂᑦ ᐊᑐᖅᑕᐅᓄᔨᒥᓂᖅᓄᑦ ᐃᒋᑦ ᑎᔭᐅᑦᓗᑎᐅ ᐊᓪᓚᓗ
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ᐊᐅᓕᑕᐅᔪᑦᓴᑎᖅᑲᑦᑐᑦ ᓄᓇᓕᐸᐅᓴᐃᑦ ᐃᖅᑲᐃᑦ ᐃᒪᓕᕆᔨᓐᓇᐅᑎᓕᓯᖅᓱᑦ
ᓇᓗᓇᐃᐅᔪ ᔨᑕᓕᒪᓪᓚᑦ ᐅᐃᖏᓐ3AM-IQA0611, 2006-ᖃᑎᑦ ᓗᔪ ᐃᒪᓕᕆᔨᓐᓇᐅᑎᓕᓯᖅᓱᑦᑐᑦ
ᐅᑎᒪᔭᓄᑦ ᓯᑎᐅ ᔨᓐᓇᐅᑦ ᑲᖅᑕᐅᔭᕈᐅᔭᕆᔨᒪᑦ ᓗᔪ. ᒪᓕᑦ ᑐᒋᑦ ᐅᐃᔪᖏᓚ ᐱ ᐃᒪᓕᕆᔨᓐᓇᐅᑎᓕᐅᔪᑦ
ᑎᑎᕆᑦ ᓯᒪᓂᖅ ,ᐊᑦᓴᔪᑐᒍᓯᓗᑦᑐᑦ ᐅᓂᐅ ᐃᒪᓕᕆᔨᓐᓇᐅᑎᓕᓯᖅᓱᑦᑐᑦ ᐅᓂᐅ ᑲᓕᐊᖏᓯᓯᒪᔨᖅ
ᓇᓗᓇᐃᖅᓴᐃᔪᑐᒍᓯᓗᒪᔨᖅ ᐱᓕᕆᐊᖏᓕᐅᑕᖅᑐᓂᑦ ᓯᑎᐅ ᑲᓂᐅᑦᓗᑎᐅ 2010-ᖃᑎᑦ ᓗᔪ .

ᐃᒪᓕᕆᓵᓴᐅ ᐃᒥᖅᑭᒃᑦᑐᖅ ᑐᖅᓴᓪᓗᒪᓕᖅᑐᑦ ᑐᒥᑦ ᐃᒥᖅᑕᓴᒪᓪᓚᐅ ᑐᓴᐅ
ᐃᖅᑲᓪᓚᒥᐅᑕᓄᑦ ᐃᒪᓕᖅᑕᐅᔭᕐᑦ ᑐᓂᐊᑐᑦᓯᓪᓚᐅ . 2010-ᖃᑎᑦ ᓗᔪ ,ᓯᑎᐅ ᑲᓂᐅᑦ ᐊᑐᐃᖅᑲᖅᑐᑦ
ᐃᒥᖅᒥᐅ 877,090 ᑭᑕᐃᑦ ᐱᖓᓱᐊᖅᑎᖓᔪᖅᓯᑦ ᓗᑎᑦ ᐃᒥᖅᑕᓴᒪᓪᓚᐅ ,ᑕᕐᔭᓐᓇᓗ 200,000 ᑭᑕᓂᑦ
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ᐃᒪᓕᕆᓵᓴᒪᓪᓚᐅ ᐅᕐᔭᓐᓇᓕᓐᓂᑦ .ᐊᑲᓗᔾᔨᐅᑎᓕᓯᖅᓱᑦᑐᑦ ,ᐃᒥᖅᑕᓴᒪᓪᓚᐅ ᐃᖅᑲᐃᓚᖓᓕᖓ
ᓴᓐᓗᑕᐅᔭᕐᑦ ᖃᐅᔨᓴᓕᖅᑕᐅᔭᕆᔨᖅᑐᖅᑕᕆᔨᖅᓐᓇᐅᓂᖅᑐᑦ ᖃᐅᔨᓴᔾᔨᐅᔭᓕᐊᓂᖅᑐᓂᐅᑦᓗᑎᐅ
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ᐃᖅᑲᓪᓚᒥᐅᑕᓄᑦ ᓯᑎᐅ ᑯᑦᓂ ; 1) ᐱᒋᐊᖅᑎᑦᓯᔪᖁᔭᓂᑕᓄᐅ ᐊᓪᓚᒍᓐᓇᐅᑎᓕᓯᖅᓱᑦᑐᑦ
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Water License No. 3AM-IQA0611
2010 Annual Report
City of Iqaluit

In July of 2006, the City of Iqaluit was issued Water License number 3AM-IQA0611 by the Nunavut Water Board. This license was issued for a five year period commencing on May 15, 2006. A requirement of the license is an annual report due March 31 of each year summarizing activities governed by the license for the previous calendar year. In accordance with Schedule B of the Water License, this Annual Water License Report summarizes the activities conducted by the City of Iqaluit in 2010.

A. The monthly and annual quantities in cubic meters of water obtained from Lake Geraldine

Table 1 summarizes the monthly and annual quantities of water drawn from Lake Geraldine, the City of Iqaluit's raw water source. The total water usage for 2010 was 877,090 m^3, which is well within the allowed usage of 1,100,000 m^3.

Table 1. Raw Water Drawn from Lake Geraldine Reservoir (2010)

Month	Volume (m^3)
January	78,510
February	71,710
March	81,430
April	82,610
May	79,000
June	73,560
July	74820
August	69,910
September	71,350
October	70,340
November	62,140
December	61,710
Total	**877,090**

B. The monthly and annual quantities in cubic meters of discharge from the Wastewater Treatment Facility

Table 2 summarizes the monthly and annual quantities of discharge from the City of Iqaluit's Wastewater Treatment Plant (WWTP) during 2010.

Table 2. Discharge from the Wastewater Treatment Plant (2010)

Month	Volume (m^3)
January	67,481
February	63,697
March	73,913
April	72,624
May	71,330
June	69,613
July	76,287
August	74,335
September	69,439
October	67,826
November	63,027
December	61,739
Total	**831,312**

During shutdowns of the WWTP, raw sewage was diverted to the backup sewage lagoon. The knife gate valve that diverts the sewage to the sewage lagoon is not equipped with a monitoring device; therefore, there was no measurements taken to determine the amount of discharge for the days that the WWTP is not operational. As a result, the amount of discharge for the duration of each shutdown was calculated using average daily discharge rates. The average daily total was determined by dividing the total volume of discharge from the WWTP recorded for the month that the shutdown occurred by the number of days the WWTP was operational that month. The dates of each shutdown can be found in Section F.

C. The monthly and annual quantities in cubic meters of sludge removed from the Wastewater Treatment Facility

Table 3 summarizes an estimate of the monthly and annual quantities of sewage sludge removed from the City of Iqaluit's WWTP and deposited at a designated area in the West 40 Landfill.

Table 3. Sewage Sludge Removed from the Wastewater Treatment Facility and Deposited at the West 40 Landfill (2010)

Month	Volume (m^3)
January	27.2
February	23.8
March	25.5
April	25.5
May	27.2
June	22.1
July	25.5
August	25.5
September	25.5
October	22.1
November	25.5
December	27.2
Total	**302.6**

The sludge that is removed by the Salsnes Filter in the WWTP falls into a trailer in a room below the primary treatment room. The trailer that is used to catch the sludge from the Salsnes Filter has 3.4 cubic meters of storage and is approximately 50% full each time it is unloaded. The trailer is unloaded at the West 40 Landfill every second day including weekends and holidays. The difference in volume from month to month is due to two different factors: 1) every month doesn't have the same number of days, and 2) during the shutdowns there is no sludge produced because the raw sewage was diverted to the lagoon.

D. A summary report which includes all data and information generated under the Monitoring Program, including the QA/QC program, in an electronic and printed format acceptable to the Board

The Monitoring Program was not applied in 2010.

E. A summary of construction activities conducted

Uivvaq Loop Utilidor Extension

The extension of the utilidor system that started in the fall of 2009 was completed and commissioned in August 2010. The extension included a watermain, sewer pipe and recirculation pipe as well as four access vaults (two with fire hydrants). This project now connects the utilidor on Queen Elizabeth Way and Palaugaa Drive through Pitsi Lane and Mattaaq Cr. Please see Appendix A for copies of the as-built drawings.

Lift Station #2

Upgrades to Lift Station #2 started in June of 2010.This work included:

- Removal and salvage or disposal of existing piping, electrical, mechanical and process components and existing equipment
- Demolition and replacement of existing structure
- Supply and installation of pumps, grinders, grinder channels and hoist
- Supply and installation of a power generator
- Supply and installation of boilers, HVAC, piping, mechanical and electrical components
- Realignment of existing water main, installation of new sewer bypass, sewer forcemain and modification to an existing access vault
- Supply and installation of a new access vault and connecting to existing sewers
- All associated architectural, structural, civil and site work

On February 26, 2011, the upgrades to Lift Station #2 were substantially completed, some site work is still remaining and is planned to be during the summer of 2011. Please see Appendix B for copies of the tender drawings.

F. A summary of any modification and/or major maintenance work and/or demolition work carried out and any associated structures

Wastewater Treatment Plant

The following maintenance work was carried out at the WWTP in 2010:

June 7 – 9, 2010: The filter in the Salsnes Filter at WWTP was replaced.

July 22 - 23, 2010:	The trash auger that removes larger solids before they reach the Salsnes Filter was cleaned.
October 7 - 8, 2010:	The trash auger that removes larger solids before they reach the Salsnes Filter was cleaned.
October 20 - 23, 2010:	The main pit where the effluent enters the WWTP was cleaned.
October 28, 2010:	The lift pump that pumps the effluent entering the WWTP to the trash auger had a blockage that needed to be removed.

During the above listed maintenance work, the WWTP was shut down and the sewage was diverted to the sewage lagoon

Sept. 1, 8 & 20 - 21, 2010:	The plant was not shutdown but the computer that takes the daily readings was damaged when the hot water tank leaked. The computer was not working on the days listed.
Nov. 24-25 & 27, 2010:	The plant was not shutdown but the computer that takes the daily readings was damaged when the hot water tank leaked. The computer was not working on the days listed. The office was moved after this to avoid reoccurrence.

On the days above discharge readings could not be taken due to computer damage.

G. A summary of all work carried out under the Managements Plans in accordance with this License

Dam Safety Inspections

In November 2010, a Dam Safety Inspection (DSI) was performed on Lake Geraldine Dam by Concentric Associates International Inc. A report was prepared for the DSI and can be found in Appendix C.

Preliminary Design of New Solid Waste Management Facilities

On December 20, 2010, the City of Iqaluit has awarded the Development of a Preliminary Design for New Municipal Solid Waste Management Facilities in the City of Iqaluit to Trow Associates Inc. The completion of the project is scheduled to finish in fall of 2011. This project includes the development of a decommissioning plan for the existing West 40 landfill. A copy of the Terms of Reference for the Request for Proposal is provided in both English and Inuktitut in Appendix D.

H. A progress report and revisions to any studies requested by the Board that relate to waste management, water use or reclamation and a brief description of any future studies planned by the Licensee including, an executive summary in terms understandable to the general public, translated into Inuktitut

See comments in Section G.

I. Any addendums to the approved Contingency Plans and the approved Operation and Maintenance Manuals

In 2010, no addendums were made to the approved Contingency Plans and Operation and Maintenance Manuals

J. A list and description of all spills and un-authorized discharges, including volumes, Spill Report Line Identification Number and summaries of follow-up action taken

Table 4 below provides a summary of all spills and un-authorized discharges that occurred in 2010, including volumes, Spill Report Line Identification Number and summaries of the follow-up actions taken. Copies of the spill reports can be found in Appendix E.

Table 4. Summary of all spills and un-authorized discharges that occurred in 2010

Spill Report ID Number	Date	Location	Description	Volume (m^3)	Cause	Follow up Actions
2010-008	01/20/2010	Water Treament Plant	Chlorine Gas	Unknown	Loose Packing Nut	The bottle of chlorine was removed and taken to a shack 100 yards from the Water Treatment Plant. An emergency safety cap was installed and caution tape was put around the shack for security reasons.
2010-024	02/01/2010	Lift Station #1	Fuel Oil	0.5	Valve Bonet Removed on tank	Nunatta Environmental performed the cleanup with the assistance from Franz Environmental (Engineering Firm) who provided expertise in determining the extent of the cleanup.
2010-037	02/15/2010	Lift Station #1	Sewage	1	Blown fuse on the main panel	The spill was contained on snow and ice around the overflow and was cleaned up by our Public Works staff.
2010-052	03/02/2010	Lift Station #1	Sewage	0.5	Censor in the well didn't work	KRT Electric replaced the censor and our Public Works staff cleaned the spill that was contained on snow and ice.
2010-056	03/05/2010	Lift Station #1	Sewage	1	High tide in the Koojesse Inlet flowed into the overflow pipe.	The spill was contained on snow and ice and the Public Works staff cleaned the spill and deposited the contaminated snow and ice in the sewage lagoon.
2010-074	03/16/2010	Manhole 63B,32B,32A & Lift Station #2	Sewage diluted with potable water	5	Water main break	The Public Works staff cleaned up the sewage that was contained on snow and ice and deposited it at the sewage lagoon.
2010-083	03/25/2010	Government of Nunavut Airport Land	Sewage	Unknown	Clogged sewer pipe	The pipe where the spill occurred was capped and Nunavut Excavating was contracted to clean up the contaminated area and deposit it at the sewage lagoon.
2010-084	03/25/2010	Manhole 1 beside Lift Stion #1	Sewage	0.6	Blocked sewer pipe	A sewage vacuum truck cleaned out the manhole and the Utilidor staff was able to remove the blockage. The Public Works staff removed the contaminated snow and ice to the sewage lagoon.

Spill Report ID Number	Date	Location	Description	Volume (m^3)	Cause	Follow up Actions
2010-212	05/01/2010	Arctic Winter Games Facility	Heating Fuel	0.02	Heat expansion of heating fuel	City employees used shovels to clean up the contaminated soil. The soil was taken to a contained disposal site.
2010-289	07/12/2010	House 1692	Sewage	0.15	Backed up sewage pipe at AV 232	A sewage vacuum truck was called in to prevent anymore overflow. The Utilidor staff determine that the sewer pipe was blocked due to grease build up, so the pipe was blasted with water. The Public Works staff cleaned up the spill.
2010-339	08/12/2010	House 2523	Heating Fuel	0.5	Sewage Vacuum truck backed into a heating fuel tank	The heating tank was removed from the site. Public Works staff cleaned up the contaminated soil and diposed of it at Nunatta Environmental's containment site.
2010-467	12/22/2010	AV 415	Sewage	0.2	Blocked sewer pipe	Sewage vacuum trucks were called to pump down the level of the sewage in AV 415. A hot water blaster was used to blast the sewer pipe to free the blockage. The Public Works staff cleaned up the contaminated snow and deposited at the sewage lagoon.
2010-471	12/27/2010	Apex Garage	Fuel	0.1	Equipment Malfunction	The Public Works Staff excavated 83 m3 of material and delivered it to Nunatta Environmental's land farm. Nunatt collected soil samples and sent them for testing, the test results were delivered to the Department of Environment and were considered satisfactory to backfill the excavated area.

K. Any revisions to approved Closure and Reclamation Plans

In 2010, no revisions were made to approved Closure and Reclamation Plans.

L. A summary of any closure and reclamation work undertaken and an outline of any work anticipated for the next year, including and changes to implementation and scheduling.

No closure and reclamation work was undertaken in 2010.

M. A summary of actions taken to address concerns or deficiencies listed in the inspection reports and/or compliance reports filed by an Inspector

Lake Geraldine Dam

As requested in our October 13, 2009 inspection report, the City of Iqaluit had a Dam Saftey Inspection (DSI) completed. The DSI report recommended that the City: 1) implement a grouting program to fix a leak in the dam, 2) prepare an Emergency Preparedness Plan, 3) conduct an underwater survey, and 4) update the Operation & Safety Manual Logbook, and Permanent File. In 2010, the City completed the underwater survey and developed the grouting program design and tender documents. The grouting program is to be completed in the summer of 2011. The underwater survey was completed during the summer of 2010 and the report can be found in Appendix F. The permanent file update and the Emergency Preparedness Plan are scheduled to be completed in 2011.

West 40 Landfill

In fall of 2009, on a routine inspection with the INAC Water Inspector, it was noticed that there was run-off from the landfill leaching through the perimeter berms. The Inspector asked the City to identify the actions necessary to prevent uncontrolled discharges of landfill runoff from occurring in the future. The City retained the services of AECOM to prepare the necessary report, which identifies the required on-site runoff storage and conveyance system upgrades. This report was submitted to the NWB on November 6, 2010. In 2010, the detailed design and tender documents were completed. These water management upgrades are expected to be completed in 2012.

In the July 1, 2010 Water Use Inspection Report, the City was asked to look into options and alternatives for dealing with its solid waste. The City of Iqaluit is currently working on a Preliminary Design for New Municipal Solid Waste Management Facilities. This project involves the development of a new Solid Waste Management Program and the design of the new facilities (including site selection). It also includes the development of a decommissioning plan for the West 40 landfill and the update of the Operations and Maintenance manual to identify the interim measures that will be implemented at the West 40 landfill

while the new facilities are being built. This project is expected to be complete in the fall of 2011.

The July2010 report also directed the City to take measures to address hazardous materials storage at the landfill and look for opportunities to ship hazardous materials to a licensed treatment facility. During the summer of 2010, the City shipped all vehicle batteries from the landfill south for disposal. Furthermore, the Solid Waste Management Program currently under development (see description above) will include a plan to manage household hazardous waste.

Finally, the July 2010 report directed the City to address waste water management and investigate options for treatment of landfill run-off discharged from the off-site retention pond. In response to this, the Public Works Department purchased dewatering bags (Geotubes) to filter the discharged run-off. Table 5 gives an overview of some of the results achieved with the filter by comparing water chemistry measured in June (no treatment) compared to July when the run-off was filtered through the dewatering bag. In 2011, the Public Works Department plans to work with the manufacturer to develop system that can achieve further reductions.

Table 5: Overview of results for landfill run-off.

Parameter	June 1, 2010 (no treatment)	July 1, 2010 (filtration through Geotube)	Percent Reduction
Ammonia	4.0 mg/l	3.33 mg/l	16.80%
Aluminum	0.08 mg/l	0.02 mg/l	75.00%
Iron	4.08 mg/l	0.52 mg/l	87.30%
Zinc	1.7 mg/l	0.05 mg/l	97.10%
TSS	14 mg/l	12mg/l	14.30%
Turbidity	28.8 NTU	6.4 NTU	77.80%

N. Update on implementation of recommendations from any Dam Safety Inspection and/or Review

See Section M.

O. A brief update on the implementation plan of all facilities within the scope of this License including projected implementation and status of Phase II of the Wastewater Treatment Plant

Solid Waste Management Facilities

See Section G and Appendix D.

Wastewater Treatment Facility

In 2011, the City of Iqaluit will be preparing a detailed Capital Plan. This will address the upgrades required at the WWTP and will provide the Department of Engineering with a timeline and implementation plan for proceeding with Phase II of the WWTP.

P. Any details on water use or waste disposal requested by the Board by November 1st of the year being reported

Water License Renewal Application and Amendments

The City is planning to combine its past amendment application with its upcoming renewal application. City staff have been working hard on completing the detailed renewal application and expect to submit it no later than November 15, 2011.

Appendix A

As-built Drawings of Uivvaq Loop Utilidor Extension

See attached folder.

Appendix B

Tender Drawings of Sewage Lift Station #2

See attached folder.

Appendix C

Lake Geraldine DSI

CONCENTRIC
Concentric Associates International Incorporated

Lake Geraldine Dam
Iqaluit, Nunavut
Dam Safety Inspection

November 23, 2010
REPORT

Produced For:
THE CITY OF IQALUIT
Produced By:
CONCENTRIC ASSOCIATES INTERNATIONAL INCORPORATED
Concentric Project Reference Number:
10-3496

Lake Geraldine Dam
Iqaluit, Nunavut
Dam Safety Inspection

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APPENDIX A - Photographs

1. EXECUTIVE SUMMARY

Concentric Associates International Inc., (Concentric) was retained by the City of Iqaluit, to undertake a Dam Safety Inspection (DSI) of the Lake Geraldine Dam. The scope of work for the assignment has been undertaken in accordance with Concentric's proposal 10-3496 dated October 27, 2010.

The site inspection was conducted on November 1, 2010, by Allan Murray, P.Eng., and Chileab Yue, of Concentric.

It is recommended that the next DSI be conducted prior to November 2010.

OBSERVATIONS:

With the exception of the following items, no significant changes in condition of the concrete dam structure and retention berms were observed since the previous DSI, which was conducted in 2009.

- A significant leak has developed in the north berm in the vicinity of the vehicular access ramp.
- Localized wash outs along the north berm have developed due to wind events in October 2010.

Representative existing conditions have been documented by photographs in Appendix A.

The required documentation (discussed further below) under the Canadian Dam Safety Guidelines is not up to date, and remains incomplete.

RECOMMENDATIONS:

1. A grouting program should be implemented in 2011 to address observed leakage. This program was originally recommended for 2010 but the construction phase was deferred to 2011 at the request of the City and after dialogue with Concentric.
2. Repairs to the north berm are required in the short term, and in 2011 to address localized wash outs.
3. Leakage through the north berm requires assessment and repair in 2011.
4. Preparation of the required Operation & Safety Manual, Logbook, and Permanent File was completed in 2007; however, the documents require updating.
5. The Emergency Preparedness Plan has not been completed. This is considered a high priority.
6. Complete the next DSI prior to November 2011.

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2. INTRODUCTION

Concentric Associates International Inc., (Concentric) was retained by the City of Iqaluit, to undertake a Dam Safety Inspection (DSI) of the Lake Geraldine Dam located in Iqaluit, Nunavut.

This assignment and the scope of work described herein have been undertaken in accordance with Concentric's proposal 10-3496 dated October 27, 2010.

The site visit was conducted on November 1, 2010.

This report summarizes our terms of reference for the assignment, observations, conclusions and recommended action.

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3. BACKGROUND

The Canadian Dam Safety Guidelines (DSG) requires that all structures exceeding prescribed height and volume minimums be subject to Dam Safety Reviews (DSR's) and Dam Safety Inspections (DSI's) at regular intervals.

A DSR is a comprehensive, formal review process that involves completion of checklist items in accordance with the Dam Safety Guidelines. The DSR forms a baseline of dam history, condition, repair requirements, and extensive documentation of monitoring, operating, safety and emergency procedures.

The Lake Geraldine Dam requires a DSR every seven (7) years. The last DSR was conducted in 2006 by Concentric; another DSR should not be required until 2013 unless the structures are significantly altered.

It is required in the DSG document that in the interval between DSR's, a Dam Safety Inspection be performed on an annual basis. The DSI is a much less comprehensive review, comprising a visual inspection only to identify any changes in condition, or any observed concerns.

A detailed historical perspective may be referenced in the DSR on file with the City of Iqaluit.

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4. SCOPE OF SERVICES

Our directive has been to undertake a Dam Safety Inspection (DSI) in accordance with the DSG, for the Lake Geraldine Dam. The inspection consisted of an on-site visual assessment, notation of any significant changes in condition since the last available DSI, preparation of a written report in a format compatible with the DSR, and a photographic record.

The following is a summary of the scope of work for this assignment. The DSI report is the primary deliverable, and has been prepared in accordance with the DSG document.

- Review available record documentation.
- Conduct a visual on-site assessment of the sewage lagoon
- Prepare a photographic record documenting general and representative conditions
- Identify, characterize, and risk-assess any actual or potential concerns
- Prepare a written report summarizing our observations, items of concern, and recommendations
- Indicate any recommended repairs
- Prioritize action items
- Submit final documents in electronic format and hard copy

Limitations

The DSI is based on visual assessment; no invasive inspection/assessment was done.

This report has been prepared for the sole use of The City of Iqaluit.

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5. SUMMARY OF PREVIOUS DSI

The original DSR was conducted in 2001. In 2005, a major alteration to the dam was designed, and implemented over a two (2) year period. The major alteration triggered the requirement for a revised DSR. The DSR was prepared by Concentric in late 2006.

The previous DSI's were conducted by Concentric in 2006 and 2009.

This DSI should be read in conjunction with the current DSR, which contains the historical record, the bulk of which is not repeated here.

A summary of observed conditions and recommendations from the 2009 DSI (in italics; with updated information added in non-italics as appropriate) is as follows:

- *A grouting program should be designed for implementation in 2010 to address the observed leakage. The grouting program should include injection of the vertical and transverse joints in the vicinity of the above grade leak in the concrete section south of the spillway.*

  This program was originally recommended for 2010 and the design documents were completed in 2010 by Concentric. The construction phase was deferred to 2011 at the request of the City and after dialogue with Concentric.

- *A grouting program should also target the upwelling source. It is possible that the underwater survey (recommended below) will assist in assessing the source and developing a repair strategy.*

  This area will be included in the 2011 grouting program as appropriate.

- *Preparation of the required Operation & Safety Manual, Logbook, and Permanent File was completed in 2007; however, the documents require updating.*

  To our knowledge no updating has been done since 2007.

- *The Emergency Preparedness Plan (EPP) has not been completed. Given the vertical extension of the dam in 2006, we view this requirement as high priority. The Emergency Preparedness Plan should be completed in 2010.*

  To our knowledge the EPP has not been completed.

- *In concert with the EPP above, and the DSG's, remote, and possibly site based monitoring equipment should be installed at the dam. This will require some research, and a design/specification process.*

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The requirement for monitoring equipment will be determined by the EPP.

- *An underwater survey should be conducted prior to August 2010.*

  The underwater survey was completed in the summer of 2010.

- *Complete the next DSI prior to October 2010.*

  The DSI was completed in 2010.

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6. COMMENTARY ON DAM SAFETY GUIDELINES

The Canadian Dam Association publication, Dam Safety Guidelines (DSG), governs the nature and frequency of inspection and review activities for structures which fall under its umbrella criteria.

The DSG applies to those structures that are at least 2.5 meters in height, and which have at least 30,000 cubic meters of storage capacity.

The DSG document is far reaching in terms of applicability and requirements for conformance. This is understandable as the type and complexity of structures that fall under the jurisdiction of the document varies considerably, from relatively small and simple embankments or dikes to massive and complex dams associated with hydroelectric generating facilities, irrigation, flood control, etc.

The DSG requires that all structures exceeding the height and volume minimums described above be classified according to their "consequence category", that is, the consequence of dam failure in terms of life safety, and socio-economic impact. The category assigned may range from very low to very high. The consequence category dictates the requirement and frequency of Dam Safety Reviews.

A Dam Safety Review (DSR) is a comprehensive, formal review process, conducted at regular intervals, that involves completion of checklist items in accordance with the Dam Safety Guidelines.

The DSR forms a baseline of dam history, condition, repair requirements, and extensive documentation of monitoring, operating, safety and emergency procedures.

The frequency of DSR's varies depending on consequence category. For structures where significant life safety and/or socio-economic consequence exist, the DSR is usually conducted every five (5) to ten (10) years. The Lake Geraldine Dam requires a DSR every seven (7) years. The current DSR for the Lake Geraldine Dam was conducted in 2006; therefore, the Lake Geraldine Dam is due for an updated DSR in 2013. If significant alterations (not including repairs that do not change the height or volume of the structure) to the structure take place before this date, an updated DSR would be required.

It is required in the DSG document that in the interval between DSR's, a Dam Safety Inspection (DSI) would be performed on an annual basis. The DSI is a much less comprehensive review, comprising a visual inspection to identify any changes in condition, or any observed concerns. The results of the DSI are incorporated into the DSR documentation. A DSI may trigger repairs, or changes in standard operating procedures.

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7. OBSERVATIONS

The Lake Geraldine Dam was accessed on foot. Based on our visual assessment we have the following comments:

- The visible concrete portions of the dam structure are in general unchanged from that observed for the 2009 DSI.
- The level of the Lake Geraldine reservoir has increased at least 0.6 metres since October 2009. The water level was within approximately 0.2m of the spillway crest at the time of our recent inspection; i.e. close to capacity.
- The berm structures exhibit the following issues:
  - Through leakage has developed in the north berm in the vicinity (both north and south sides) of the vehicular access ramp. The location is coincident with a change in direction of the berm.
  - Localized wash-outs have occurred on the upstream face of the north berm. It was reported that these wash outs developed as a result of wind events during the week of October 18, 2010. The larger armour stone remains however sections of the roadbed have been washed out.
- The leak in the concrete dam structure south of the spillway section that was identified in the 2009 DSI has not changed significantly.
- Upwelling along the south concrete wing wall appears has not changed significantly since the 2009 DSI.

To our knowledge, the required documentation (discussed previously) under the Canadian Dam Safety Guidelines is not up to date, and remains incomplete.

Specifically, the Permanent Record File, Logbook, and Operation & Safety Manual have not been updated.

To our knowledge, the Emergency Preparedness Plan (EPP) has not been completed.

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8. DISCUSSION

The following issues are discussed in more detail:

Localized Wash Out

It was reported that, at times during the wind events, waves were overtopping the berm. High winds from the east were reported over several days.

Wave action as a result of high winds caused the erosion of granular material and the exposure of the concrete cutoff wall within the north berm.

A review of design drawings for the north berm wall, (Trow Associates Inc. Drawing BD2, Lake Geraldine Earth & Concrete Work 2006, June 2006) noted that the proposed construction of the north berm of the Lake Geraldine reservoir comprises a 200 mm thick concrete cutoff wall with rock fill on the upstream face (at a slope of 2:1 from the top) and 250 mm minus granular covered with 600 mm rip rap on the downstream face (at a slope of 2:1 from the top). The top of the berm is approximately 2.4 metres wide with a 2% slope towards the downstream face of the berm.

A cursory visual inspection of the north berm wall noted that, in general, the berm is constructed in accordance with the Drawing BD2.

In general, the rock fill is an effective barrier against erosion along the north berm wall. Only in extreme cases will wave action erode the granular material in this area.

As a short term solution, all areas of erosion should be filled with rock of similar size to the existing rock fill.

As per the design, the vehicular roadbed extends over the cut-off wall on the upstream side of the berm a distance of perhaps 1.2 metres. The roadbed material is a much finer granular than the rip rap, with the visual appearance of pit run gravel. This material was what washed out during the wind events.

The vehicular roadbed on the downstream side of the cut-off wall has adequate width for vehicular traffic.

In the longer term, we recommend filling the upstream berm with rock up to and slightly above the top of the cutoff wall and thus eliminate a 1.2 metre width of the vehicular roadbed.

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Lake Geraldine Dam Safety Inspection

Leakage at Vehicular Access Ramp

Through leakage in the north berm was observed on both the north and south sides of the vehicular access ramp.

This leakage was not observed at the time of the 2009 DSI, however, at that time there was more snow and ice cover.

There are several potential sources for the water flow at the base of the downstream face of the berm.

Given the wave overtopping during the wind events there would have been a significant amount of water that crossed over the concrete cut-off wall and then made its way through and out the base of the berm on the downstream side. One would expect that outflow to have ceased shortly after the waves subsided, and certainly within a few days.

The dam vertical extension in 2006 included a corresponding vertical extension to the concrete cut-off wall; details on the record drawings show a proprietary (Sika) product placed as a waterstop between the older and newer sections. This detail could be a source of leakage.

There could be leakage (upwelling) at the interface between the cut-off wall and the bedrock that it is reportedly founded in. The reservoir is at its highest levels ever and thus hydrostatic pressures are as well.

A workmanship or durability detail may exist in the cut-off wall in the vicinity; perhaps at the change in direction of the berm, which is coincident with the vehicular access ramp.

The actual cause of the leakage cannot be determined without considerably more investigation, and invasive assessment.

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9. RECOMMENDATIONS

The following actions are recommended:

1. The grouting program originally designated for implementation in 2010 was designed in 2010; however, the implementation phase was deferred to 2011 by the City, and after dialogue with Concentric.
2. The localized wash outs from the wind events of 2010 require repair. As a short term interim measure all areas of erosion should be filled with rock of similar size to the existing rock fill. In the longer term, the upstream berm should be filled with rock up to and slightly above the top of the cutoff wall, and thus eliminate a 1.2 metre width of the vehicular roadbed.
3. The through leakage in the north berm at the vehicular access ramp requires investigation and repair in 2011. An investigative program will be prepared if requested by the City.
4. Preparation of the required Operation & Safety Manual, Logbook, and Permanent File was completed in 2007; however, the documents require updating. To our knowledge this has not been done.
5. The Emergency Preparedness Plan (EPP) was recommended for completion in 2010. To our knowledge the EPP has not been completed. The Emergency Preparedness Plan should be completed in 2011.
6. Complete the next DSI prior to November 2011.

We would be pleased to discuss this report with you. Should there be any questions, please contact the undersigned.

Yours truly,

Concentric Associates International Incorporated

Chileab Yue
Iqaluit Branch Manager

Allan Murray, P.Eng.
Partner

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APPENDIX A
Photographs

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Photograph 1
Overview of Dam Structure; from the Northwest.

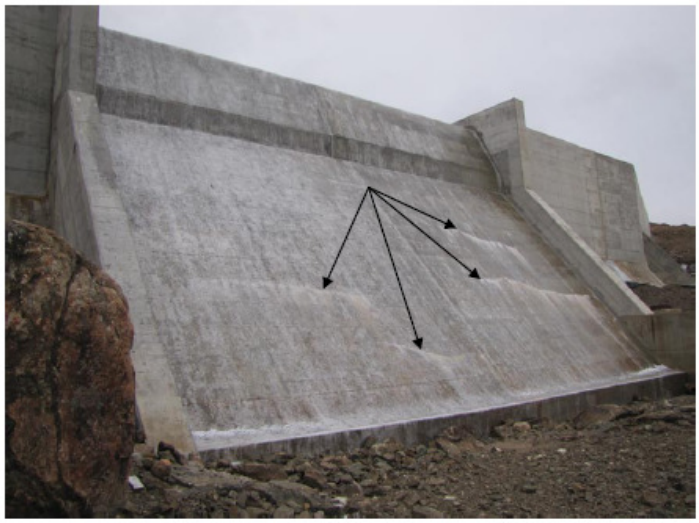
Photograph 2
Overview of North Berm, Downstream Face. Note leakage just north of ramp access.

Photograph 3
North Berm at South side of ramp access; note leakage.

Photograph 4
Southern portion of North Berm, upstream face; note localized washouts due to wave action.

Photograph 5
Overview of spillway; note water level near capacity; approx. 0.6m higher than October 2009.

Photograph 6
Leakage at North end of Spillway; similar to 2009 DSI.



Photograph 7
Leaching cracks in Spillway face; Similar to 2009 DSI.

Photograph 8
Leakage at South Gravity section; Similar to 2009 DSI.

Appendix D

Terms of Reference of the Development of a Preliminary Design of New Solid Waste Facilities in the City of Iqaluit.

5.0 ᓇᓗᓇᐃᔨᑎᖏᑦ ᐱᒃᖁᐃᓕᑦ

5.1 ᖃᓄᐃᓐᓇᓕᒫᖅ

ᐊᑦᑕᕐᕕᐅᔪᖅ ᒪᑉᓐᓇ ᓴᓇᒃᐅᓂᓂᕆᒪᑦ 1995ᒥ ᐊᑦᑕᕐᕕᐅᕼᐃᓐᓇᕐᓂᕆᔨᐊᕐᓂᑦᑎᓪᓗᒍ ᐊᑦᑕᕐᕕᖏᓪᓕᕆᑦᑕᕐᓂ ᓴᓇᒃᐅᓂᖅᓂᒃᑯᓂᖅ. ᐃᓂᐅᔪᖅ ᑖᓐᓇ ᐱᕕᖃᓄᐊᕐᑕᐅᓂᕐᓂᒪᒪᑦ 2001ᖃᐅᔨᓴᒍ ᑐᖅᑯᐃᕕᐅᕼᖃᓐᓂᕐᓂᓂᕐᓂᑦ ᓄᑖᒃ ᓴᓇᓕᐅᖏᓪᓂᖏᓪᓂ ᐃᓕᓴᕆᒪᒥᓂᖅᒥᒃ. 2001ᖃᐅᔨᓴᒍ, ᐊᑐᕼᖃᓐᓂᓇᑎᓂᓂᒃ ᐊᑐᓕᕆᔨᕿᓇᐊᓇᓕᐅᕼᐅᒪᓪᓚᑦ ᑭᓯᐊᓂ ᖃᐅᔨᓴᒍᓂᐅᓇᖅ ᐅᑭᐅᑦ ᒪᓕᒃᖁᓂᓂᐅᓇᖅ ᐊᓂᐊᓕᖅᑎᓂᒃ ᐊᑐᓕᕆᔨᕿᓇᐊᓇᓕᐅᕼᐅᒪᓪᓚᑦ ᑭᓯᐊᓂ ᐱᒋᐊᕈᑎᒃᓴᖅᑎᓂᒃ ᐊᑐᓕᕆᔨᕿᓇᐊᓇᓕᐅᕼᐅᒪᓪᓚᑦ ᐊᑭᓯᐊᓂᖅᓱᐊᕐᓂᒃ ᐊᑐᓕᕆᔨᕿᓇᐊᓇᓕᐅᕼᐅᒪᓪᓚᑦ ᑭᓯᐊᓂ ᐱᒋᐊᕈᑎᒃᓴᖅᑎ

ᖃᓄᐃᑦᑐᒃᑯᑦ ᓄᓇᓕᐃᓐᓂᒃ ᖃᐅᔨᓴᕐᓯᒪᔪᓐᓇᖅ ᐊᒥᓱᑲᓪᓚᕆᔨᖅ ᐊᑐᖅᑕᐅᔭᕐᓇᓐᓄᖅ ᑕᕿᓂᓪ ᐋᑦᑎᐊᐃᐅ ᒥᐊᓂᓴᕆᔨᖅᓄᑦ ᐃᖅᑲᓇᓱᓴᕆᔨᖅᓄᑦ, 3) ᑯᓪᓕᓇᐋᓪᒪᓗᖅ ᐅᓪᓗᒥᒃ ᖃᓄᐃᑦᑐᒃᑯᑦ ᑕᕿᓂᓪ ᐋᑦᑎᐊᐃᐅ ᒥᐊᓂᓴᕆᔨᖅᓄᑦ ᐊᐅᓪᓚᕆᔨᐅᓂᖅᑕᓗ ᐊᑐᐊᖏᑦᑐᑦ ᐊᑐᓪᑯᓱᕐᓂᖅᓱᓐᓂᑦ ᐊᑐᕐᕉᕆᔨᐅᓂᖅᓱᓐᓂᑦ ᒥᐊᓂᓴᕆᔨᖅᓄᑦ ᐃᓕᓴᕐᕕᖅ ᓄᑯᓂᖅ ᓴᓇᔨᕆᔨᖅᓄᑦᓯᓗᒃᑐᓂᒃ, ᐋᒪᓚᓗ
4) ᓴᖅᑭᑎᕐᓂᓯᒋᐊᖅ ᐊᑐᐅᓂᖅᑎᑕᐅᓪᓕᐊᑎᓪᓗᒍ ᑮᓇᐅᑎᖅᑎᓂᖅ ᑯᓪᓕᓇᐋᑦ ᐋᑦᑎᐊᐃᐅ.

ᑕᒪᓐᓇ ᐱᓕᕆᓕᐊᑎᓪᓗᒍ, ᐅᑯᐊ ᐊᐱᖅᑯᓂᑦ ᑭᐅᔾᔨᕕᖅᓯᓂᐊᖅᓯᒪᓕᑦ:

Δ. ᓯᓇᐅᓕᑦ ᐱᔾᓚᐊᖅᑲᒪᓚᑎᑦ ᐊᑐᖅᑕᐅᔭᓓᓇᓂᐊᑎᓪᓗᓂᒃ ᓄᓇᕆᓐᓄ ᑕᕿᓂᓪ ᐋᑦᑎᐊᑯᓕᓄᑦ ᐊᐅᓪᓚᕆᔨᐅᓂᖅᓱᓐᓂᑦᑕ?
ᐱ. ᖃᓄᐃᓕᓴᕐᓂᓯᐊᖅᑦ ᑐᖓᔪᓚᐅᐅᔭᑦ ᑎᑭᐅᑎᐅᐅᓇᓯᓂᐊᖅᑎᓪᓗᒍ ᖃᓄᐃᑦᑐᓴᑦ ᐱᔭᒪᔾᔪᑎᒃᓴᓂᖅᑕ?
Ո. ᖃᓄᐃᑦᑐᓴᓴᑦ ᑕᕿᓂᓪ ᐋᑦᑎᐊᐃᐅ ᒥᐊᓂᓴᕆᔨᐅᓂᖅᓱᓐᓂᓪ ᓇᓕᓵᖅᑎᓂᕐᓇᖅᑐᓂᑦ ᐊᑲᐅᓂᖅᓴᓐᓇᔭᓂᑦ ᐅᖓᓱᓯᑐᑐᒃᓚᓪᓕᑐᑦ ᐅᑭᐅᖅᑕᖅᑐᒥ
ᐅᓄᐅᖅᑕᖅ
ᓄᓇᓕᕆᓂᓂᖅ?
Ρ. ᓯᓇᓕ ᐱᐅᓂᖅᓴᐅᓴᑦ ᑕᕿᓂᓪ ᐋᑦᑎᐊᐃᐅ ᒥᐊᓂᖅᓯᓂᔪᓐᓇᖅ ᐋᑦᑎᐊᓯᖅᑕᐅᔭᕐᓇᓐᓄᖅ ᓄᓇᕆᓐᓄᓐᓂᐊᑎᓪᓗᒃᑐᓂᑦ?
Ր. ᖃᓄᐃᓂᓪ ᑲᒪᒋᐅᐅᓴᓂᐊᖅᑎᓪᓗᒍ ᐱᑐᕐᓇᐅᑎᖅᑐᓄᓪᓕᐊᓂᑦ, ᑕᕿᓂᓪ ᓴᓂᑦ ᐋᑦᑎᓗ
ᐅᓗᓚᐊᓇᖅᑐᑦ
ᖃᓄᐃᑦᑐᓴᓴᑦ ᓴᓗᒋᓇᖅᓴᐅᑕᐅᓴᑦᑐᑦ ᓴᓇᔨᕆᑕᐅᓴᑦᑐᑦ ᐃᒋᑦᑕᓚᐊᓂᑦ?
Ր. ᖃᓄᐃᑦᑐᔨᓂᓪᓂ ᑕᕿᓂᓪ ᓴᓂᑦ ᒥᐊᓂᓴᕆᔨᐅᓂᖅᓱᓐᓂᖅᓄᓪᓕᑦ ᐃᓪᓗᓂᖅᓱᓐᓂᐅᔨᓂᖅᓱᓐᓂᑦᑕ ᓴᓇᔨᕆᐅᓂᖅᑎᓪᓗᒍ ᓇᒻᒥᖅᑐᓂᖅᓱᓐᓂᑦᑕ ᐋᑦᑎᓗ
ᐅᓄᐅᖅᑕᖅᑐᑦ
ᖃᓄᐃᑦᑐᓴᓴᑦ ᐊᐅᓪᓚᕆᔨᐅᓂᖅᓱᓐᓂᑦᑕ ᐊᐅᓪᓚᕆᔨᐅᓂᖅᓱᓐᓂᑦᑕ ᐃᒋᑦᑕᓚᐊᓂᑦ?
ᓭ. ᖃᓄᐃᓂᓪ ᒥᐊᓂᓴᕆᔨᐅᓂᖅᓱᓐᓂᑦ ᐋᑦᑎᐊᐃᐅᓴᑦ ᓴᓇᔨᕆᐅᓂᖅᓱᓐᓂᑦ ᓄᓇᕆᓐᓄᓐᓂᐊᑎᓪᓗᒃᑐᓂᑦ
ᐃᓪᓗᓂᐅᔨᓴᕐᓂᓪᓂᓪ?

5.3 ᐋᑦᑭᓭᑦᓯᒪᓂᖅᑎᑦ ᐱᔨᑦᓯᐅᑎᖅᑎᓐᓂᒃᓂᖅ

ᓂᕆᐊᓚᕆᔨᐅᔪᖅ ᐱᓇᓭᑐᓂᒃ ᓴᓇᒪᓂᑦᓴᖓᓄᓪ ᐋᑦᑭᑦᓭᐃᓂᐅᓂᖅᑐᖅ ᓄᓇᕆᑦ ᑕᖓᔾᔨᓂᒃ ᒥᐊᓂᓴᕆᔨᐅᓂᖅᓱᓐᓂᖅᑎᑎᒍᑦ ᐋᑦᑭᑦᓭᐃᓂᓪᓂᑦ ᐃᓪᓗᓂᖅᓱᓐᓂᐅᓂᖅᓱᓐᓂᑦᑕᓂᒃ ᐱᔨᑲᓚᐊᖅᑐᓂᖅᓱᓐᓂᑦᑕᓂᒃ ᓴᓇᔨᕆᐅᓂᖅᓱᓐᓂᐅᔨᓂᖅᓱᓐᓂᑦᑕᓂᒃ ᓴᓇᔨᕆᐅᓂᖅᓱᓐᓂᑦᑕᓂᒃ ᐃᓕᓴᕐᕕᖅᓱᓐᓂᑦᑕᓂᒃ ᐊᑦᑕᓂ. ᐊᑐᓂ ᐱᔨᑲᓚᐊᖅᑐᓂᖅᓱᓐᓂᑦᑕᓂᒃ, ᑲᒪᔨᑎᑦᓴᖓᓂᑦ ᐅᓂᖅᑲᓂᐊᖅᑐᓂᖅᓱᓐᓂᑦᑕᓂᒃ ᐱᓕᕆᓕᐊᓂᖅᓱᓐᓂᑦᑕᓂᒃ ᐃᓪᓗᓂᖅᓱᓐᓂᐅᓂᖅᓱᓐᓂᑦᑕᓂᒃ ᐱᓕᕆᓕᐊᓂᖅᓱᓐᓂᑦᑕᓂᒃ ᐃᓪᓗᓂᖅᓱᓐᓂᐅ

ii. ᓄᓇᕗᒻ ᑲᓪᓚᑲᓂᕐᑕ ᐊᖏᑭᓯᓪᓚᒪᕐᓂᕐᑕ (ᐅᑦᑐᑎᑎᓗᑦᑕ, ᐊᑐᖏᑕᐅᖅᑲᓂᕐᓂᒍᓐᓇᖅ ᑲᑎᖏᑭᐃᓕᓴᕐᓗᓂ ᐊᖏᑭᓯᑕᐅᓪᓚᒪᓴᒃᑯᑦ);
iii. ᐱᕕᓇᐊᓯᓂᐊᐅᕐᓂᕐᑐᑦ ᐱᓇᓪᓴᐃᑦ (ᐅᑦᑐᑎᑎᓗᑦ, ᐃᐅᓪ ᒪᑭᓐᓇ ᓂᓵᔪᑎᓂᓯᒧᑦ ᑲᑐᕐᖏᑕᑎᑦᑕ); ᐊᒪᓚᓗ,
iv. ᓂᐅᐃᓴᐃᑦ, ᓴᓇᔪᓕᓵᕆᐊᑦᓚᐃᓕᐃᓪᓗ ᑲᓇᖏᑕ ᑲᒪᑭᐅᐅᓇᖏᑕ.

ᑎ. ᖃᐅᔨᓴᑦᑕᐅᓗᑎᒃ ᓚᖓᓂᒃᓴᑎᓂᐅ
i. ᐅᖃᓪᓚᕐᑕᐅᓗᑎᒃ ᐃᓇᑭᐊᑎᑭᓂᓯᓂᖏᓐᓂᑕ ᐱᕆᓵᐊᖃᓕᑦᑐᓄᒃ (ᑕᔪᓗᒍ ᑕᒪᐃᓐᓇᓕᑦ ᐸᑦᓇᐅᑎᑭᐅᑭᒪᔪᑦ)
ᐊᑐᖏᑕᐅᓴᐸᑕᐅᔪᓐᓇᑦᓗᓐᓂ ᑕᖏᓂᓐᓂ ᓴᓐᓂ ᒥᐊᓂᓵᐅᓂᖏᓐᓇᓐᓂ (ᖃᓄᑎᑎ ᑕᖏᓂᓐᓂ ᓴᓐᓂ ᓄᐊᔨᔪᓐᓇᐊᓂᐊᒪᖓᑕ
ᓄᓇᓕᐅᔪᖅ ᐱᕐᖏᔪᓐᓇᐊᑎᓐᓗᒍ?)
ii. ᓇᓗᓇᐃᓴᓗᑦ ᐅᖃᓪᓚᕐᑕᐅᓗᑎᓐᓗᓐᓗ ᐱᓴᔨᐃᑦ ᐊᑐᖏᑕᐅᓴᐸᑕᐅᔪᓐᓇᑦᓂ ᓴᓐᓂ ᓄᐊᔨᔪᓐᓇᓕᑦᑐᓂᓗᑦᑕ (ᑐᐸᓕᐅᑎᓗᒍ.
ᓇᒧᓐᖓᓕᐊᖏᓴᖓᓂᑕ ᓴᖓᔪᑎᑕᐅᓂᖏᓂᑕ, ᐋᖏᑭᑭᐊᑦᑕᐅᓂᖏᓂᑕ ᐃᒥᖓᑕ ᑭᓇᓗᐃᑦ ᖃᓪᓚᑲᓂᕐᑐᑎᓂᓗᒍ, ᐊᓯᖏᓐᓇᓗ)

ᑭ. ᓇᓗᓇᐃᕐᓴᓗᑦ ᓂᓕᐅᑎᕐᑐᐊᔪᑦ ᒥᑦᓯᑎᓗᑦ ᐊᓯᖏᓪᓯᓯᒥᓕᓂᖏᓐᓄᓕᓂ ᐊᖏᑭᑕᐅᓴᐸᑕᐅᔪᓐᓇᑦᓂ ᓄᓪᑕᓂ ᑕᖏᓂᓐ
ᒥᐊᓂᓕᐅᕐᓴᐅᑎᖏᓐᓂᓐᓂ ᐃᓐᓗᐃᑎᖏᓐᓂᓐᓂ ᐊᑐᖏᑕᐅᓵᖏᓐᓄᓕᓂ ᐊᑯᓂᐅᔪᓚᑦ. ᖃᒥᑦᑭᓗᓂᓐ ᐊᑦᑐᖏᑕᐅᓴᐸᑕᐅᓚᕐᑦᑐᓂ
ᐊᑕᔪᑦ ᓴᓇᒪᓂᖏᓐᓄᓕᓂ (ᑐᐳᖏᓐ. ᓯᑦᒥᓂᐅᑎᓯᒪᓚᔪᑦ ᐊᐅᑦᔪᓐᓇᓂᐊᓂᖏᓐᓄᓕᓂ)
ᑭ. ᓇᓗᓇᐃᕐᓴᓗᑦ ᐊᐅᓪᓚᕐᓂᑕ ᐋᖏᑭᓯᓯᒪᓂᖏᓂ ᑭᑐᖏᑕᐅᓴᐸᑕᐅᓚᕐᓵᕐᔪᐊᑦᑐᓄᒃ ᐱᓪᓗᐊᖏᔪᓯᑐᒧᑦ
ᐊᖏᑭᑭᑕᐅᓯᒪᓚᓄᓕᑦ
ᐊᓚᒪᓗ ᐃᓪᓗᓴᐃᑦᑕ ᐊᐅᓪᓚᑕᐅᓴᐸᑕᐅᓂᖏᓂᓄᒃ
i. ᓯᓄᐅᓕᑦ ᐊᐅᓪᓚᑕᐅᓴᐸᑕᐅᓵᖏᓐᓄᓕᓂ/ᐊᐅᓪᓚᓯᓯᑕᐅᓴᐸᑕᐅᓵᖏᓐᓄᓕᓂ ᐱᐅᓪᓚᑕᐅᓵᖏᓐᓄᓕᓂ ᐊᑐᖏᑕᐅᓴᐸᑕᐅᓵᖏᓐᓄᓕᓂ?
ii. ᐱᐅᑦᑎᓐᓄᑦ ᑲᑎᑐᐊᓚᑦ ᐊᓯᔨᑦᑕᐅᓂᖏᓂᑕ ᐅᓪᓗᒥᓂᓕᐅᕐᓴᐅᑎᖏᓐᓄᓕᓂ ᐊᑐᖏᑕᐅᓴᐸᑕᐅᓵᖏᓐᓄᓕᓂ ᐊᑐᖏᑕᐅᓴᐸᑕᐅᓵᖏᓐᓄᓕᓂ
ᐊᑐᖏᑕᐅᓴᐸᑕᐅᓵᖏᓐᓄᓕᓂ ᐊᑐᖏᑕᐅᓴᐸᑕᐅᓵᖏᓐᓄᓕᓂ ᐊᑐᖏᑕᐅᓴᐸᑕᐅᓵ

. ᖃᓄᐃᑎᐅᑦᓯᒃᑯᑦ ᐃᖃᓗᐃᑦ ᓂᓪᓚᑕ ᐊᓂᔨᐅᒃᓭᓪᓗᓂᒃᓴᓂᓄᑦ ᐊᑐᖅᑕᐅᔨᕐᓯᐅᑦᓯᒃᑯᑦ ᐱᓕᕆᓂᐊᖅᑎᓄᑦ?

o ᐊᑐᖅᑕᐅᓪᓚᖅᑐᓄᑦ ᐱᓯᒪᓇᐅᑎᐅᓚᕐᔪᓄᑦ ᓴᓇᔨᐅᓪᓚᓕᕆᓂᖅ/ᓇᓗᓯᕿᑎᓯᓴᓂᖅ ᐊᑐᖅᑕᐅᓂᒋᓪᓕᑦ ᐅᑭᐅᓯᖅᑐᒃᑎᒥ ᐅᓪᓗᓕᒃ

ᐃᓄᓯᓇᖅᑐᒥᓯᓄᑦ?

. ᐱᐅᔨᒪᓂᖅᓯᑦ ᐊᖅᑭᐅᓂᒪᓂᕐᓂᑦ?

. ᐊᖅᓂᓯᓇᐅᑎᕃᓂᕐᓂᖅ ᐃᓕᓴᓂᐊᕐᓇᖅᑐᓇᖅᐱᑦ?

ii. ᐱᒋᐊᓯᓂᖓᔪᑦ ᐅᖅᓚᒃᐅᑎᓯᓴᐃᑦ ᐅᓂᐊᑦ:

o ᐊᑭᑐᔨᑎᑦ ᐊᓘᓚᓗ ᐊᐅᓪᓛᓂᓯᓂᔭᑦ ᒥᐊᓂᖅᓂᓯᓂᔭᓕᒫᓗ ᐊᑭᖏᕐᓂ ᐃᓂᒪᒋᐅᒃᐅᓴᓇᐊᕐᓂᖅ,

o ᐊᐢᑎᒧᑦ ᐊᑕᐃᖅᑕᐅᔨᔨᐅᓇᖅᑐᑦ ᐊᓘᓚᓗ ᐊᑐᐊᖅᓄᒧᑦ ᑐᓗᑭᑕᐅᔨᐅᓇᖅᑐᑦ,

o ᓄᓇᓕᓇᓂᔨᓕᑦ ᓴᖅᑭᑦᓯᓇᐊᓪᓕᑦ (ᒪᐃᕐᓄᑦ ᑮᔨᓇᐅᑎᒃᓄᑦ), ᐊᓘᓚᓗ

o ᐊᑭᖏᕐᓄᑦ ᑭᓇᐅᓴᑎᒧᑦ ᐅᑎᖅᐱᐅᐢᓕᕆᓂᐊᕐᔪᐅᑎᓇᖅᑐᑦ.

ᐱ. ᒥᐊᓂᖅᓯᓂᖅ ᐱᑐᐃᕐᓇᖏᑦᑐᑎᒧᑦ ᐱᕐᔪᑦᐅᐢᕐᑐᓂᖅ

i. ᐅᖅᓚᕐᓂᒃᓄᑦ ᐊᑐᑎᔪᕐᓇᖅᑐᓂᖅ ᐱᐅᓂᖅᑕᐅᔭᒃᓄᑦ ᐊᑐᖅᑕᐅᐢᕐᑐᓂᖅ ᐊᓘᓚᓗ ᐊᑐᐊᒐᓂᐅᓇᐊᓪᓕᑦ,
ᑭᓪᓕᓯᓂᐊᖅᑕᐅᓗᑎᒃ
ᓄᓇᓕᑦᑕᐅᔨᐃᑦ ᓇᓪᓴᖏᑎᓂᐊᕐᓇᖅᓯᖏᑦ ᖃᒪᑭᔨᖅᓴᕐᓂᐊᖅᓴᓐᓚᓗᑦ ᐅᑯᓂᖅᓗ:
. ᐱᑐᖅᑭᓂᖅᓚᑦ ᐊᔪᓕᖅᑕᑦ ᓄᓇᓯᐅᑏᑦ,
. ᐃᓪᓚᓯᐅᑎᓗᒍᓪᓕᐃᑦ ᐅᓗᓇᐊᓇᖅᑐᑦ ᐅᓪᓇᖅᑐᑦ ᒪᖅᓗᑯᖏᑦ, ᐊᓘᓚᓗ
. ᑕᖏᓪᓕᑦ ᓴᓂᑦ (ᐱᑎᐊᑭᑎᑎᓗᑦ 2006ᒥ ᒪᖅᓗᑯᓕᓇᓴᔪᓕᒥᓂᑦ ᐊᐅᓪᓛᓂᓯᓂᖅᑯᑦ ᐊᓘᓚᓗ ᒥᐊᓂᖅᓯᓴᔪᑎᑎᒥᓂᑦ ᐅᓂᖅᐳᓕᐊᓂᖅᓂᖅ).

ii. ᖃᐅᔨᑦᓯᐊᖅᓗᑦ ᓄᓇᓕᔪᕐᓇᖅᑐᓂ ᐊᐳᐅᓂᖅᔪᕐᓇᐅᑦ ᓇᓪᓴᖏᑎᓂᐊᕐᓇᖅᑐᓂᖅᓯᖏᑦ (ᖏᑦᑐᑦ) ᖃᒪᑭᔨᐅᓂᖅᑎᑦ ᐱᑐᐃᓐᓇᖅᑐᓕᒫᓗᒍᑦ ᐱᔨᔪᑕᐅᔪᓂᖅᓂᖅ.

5.3.4 ᐊᓪᓚᔨᓂᖅ 4- ᐊᑐᖅᑕᐅᐳᐃᓐᓇᓂᐅᓇᖅᑐᑦ ᐊᓘᓚᓗ ᐊᑐᓂᓪᓂᖅᑕᐅᔭᓕᓇᓂᐅᓇᖅᓯᓂᑦ ᑮᓇᐅᑎᖏᑦ ᑯᓕᐊᓇᐊᑦ ᐊᑎᒋᕕᖓᓂᑦ

ᐃ. ᐊᖓᔪᒪᓂᒃᓯᑦ ᓄᓇᓕᔪᕐᓇᖅᑐᓂ ᐃᖃᓗᐃᑦ ᑕᖏᓪᓕᑦ ᓴᓂᑦ ᒥᐊᓂᓴᐅᐳᔨᔪᑎᖏᑎᑦ ᐊᐅᓪᓚᓯᓂᐊᕐᓇᖅᑐᑦ ᓓᓚᒃ ᒥᐊᓂᔨᓂᐊᕐᓇᖅᑐᓂᖅᓯᖏᑦ ᐊᔪᓇᖃᓐᓂᐅᔨᔪᑎᖏᑎᑦ ᐱᓕᓇᓐᓂᖅᑐᑦ ᐃᓕᓴᕐᓂᐊᖅᓯᓂᖅᑐᑦ ᐱᓕᕆᓂᐊᖅᑐᑦ ᐃᓕᓴᕐᓂᐊᕐᓇᖅᑐᓂᖅ:

i. ᐱᖁᔭᓂᖅᑕᐅᔨᓇᖅᑐᒥᓄᑦ ᐃᓂᒪᓕᒥᓄᑦ (ᐊᓪᓚᐊᓇᐅᒡᓕᖅ ᓄᓇᓕᓐᓂᑦ ᑲᓱᒪᓕᔨᓴᓇᐊᖅᖏᓕᒡᓕᓂ
ᓴᓇᔨᐅᓪᓚᐅᑎᖏᓐᓂᖏᓐᓂᓂ
ᓄᓪᓕᑦ ᑕᖏᓪᓕᑦ ᓴᓂᑦ ᒥᐊᓂᓴᐅᐳᔨᔪᑎᖏᑎᑦ ᐃᓕᓴᕐᓂᐊᖅᓯᓂᖅᑐᑦ),
ii. ᓇᐅᔨᔨᐅᒪᑎᓕᔨᓴᓂᒃᓄᑦ ᐃᐊᐊᕐᓚᐅᑕᐅᔭᓕᓇᖅᑐᓂᑦ, ᐊᓘᓚᓗ
iii. ᒥᐊᓂᖅᔨᐅᑎᓕᔨᐊᓇᓪᓚᓂᑦ ᐊᑎᑕᓇᖏᑎᖅᑐᓂᖅ ᑕᒪᐃᑎᒋᑦ ᓄᓇᓕᔪᕐᓇᐅᑦ ᐃᖅᑲᓇᐃᓕᖅᑎᑎᖏᓐᓂᓄᑦ ᐊᑎᔨᔨᒥ.

ᐱ. ᑐᓐᖓᕕᖅᓯᓂᖅᑐᑦ ᐊᖅᐳᓂᖅᔪᕐᓇᐅᑦ ᖃᒪᓕᕆᓂᐊᕐᓇᖅᑐᓂᖅᓯᖏᑦ ᐊᐅᓪᓚᓯᓂᐊᕐᓇᖅᑐᓂᖅᓯᖏᑦ ᐱᓕᓇᓐᓂᖅᑐᑦ,
ᐊᑐᐃᓐᓇᐅᓗᓂᑦ
ᐊᑐᖅᑕᐅᔪᓂᒃᖅᓯᓪᓚᕐᓇᓂᐅᓇᖅᓯᓂᑦ ᓴᓇᒪᓂᖅᑎᒍᑎᖓᓂᑦ ᐊᓘᓚᓗ ᓇᓗᓇᐃᕐᑎᓂᓕᒃ ᑎᑎᒃ ᒥᑦᓴᐅᓴᐅᓪᓚᓕᔪᓄᑦ
ᒪᑐᓂᓗᑦᑕᖏᓐᓂᓄᑦ
ᐊᓘᓚᓗ ᑭᒧᐅᓂᓴᒃ ᒥᐊᓂᖅᔨᐅᓂᐊᕐᓇᖅᑐᓂᖅᓯᖏᑦ ᐃᓂᒪᓕᒥᓄᑦ ᓴᓇᔨᐅᓪᓚᓕᔪᓄᑦ ᐱᓕᕆᓂᐊᖅᑐᑦ ᐃᓕᓴᕐᓂᐊᕐᓇᖅᑐᓂᖅᓯᖏᑦ ᐃᖅᑲᓇᐃᓕᖅᑎᑎᖏᓐᓂᓄᑦ
ᐃᓄᐃᑦᓴᕐᓂᐊᖅᑐᓂᖅᓯᖏᑦ ᐊᓘᓚᓗ ᐊᑐᐃᓐᓇᖅᑐᓂᖅᓯᖏᑦ ᓇᓗᓇᐃᕐᑎᓂᓕᒃ ᓄᓇᓕᔪᕐᓇᐅᑦ ᐃᓕᓴᕐᓂᐊᕐᓇᖅᑐᓂᖅᓯᖏᑦ.

5.3.5 ᐊᓪᓚᔨᓂᖅ 5- ᐃᓂᓴᐳᐊᓕᒫᓂᑦ ᓇᓗᓯᕿᑎᓯᓴᓂᑦ

ᐃ. ᓇᓗᓇᐃᔭᓐᓄᓗᓂᑦ ᐃᓂᐅᔨᓕᒫᑦ ᓇᓗᓯᕿᑎᖏᑎᒍᑦ ᓄᓪᓕᑦ ᑕᖏᓪᓕᑦ ᒥᐊᓂᖅᓯᓴᔪᑎᖏᑎᑦ ᐃᓕᓴᕐᓂᐊᖅᓯᓂᖅᑐᓄᑦ ᐃᖅᑲᓇᐃᓕᖅᑎᑎᖏᓐᓂᓄᑦ:
i. ᓄᓇᓕᔪᓂᑦ ᐊᑐᖅᑕᐅᓂᖅᓯᓂᑦ ᐱᓕᕆᓂᐊᖅᑐᑦ ᐃᓂᒪᓕᒥᓄᑦ ᓴᓇᔨᐅᓪᓚᓕᔪᓄᑦ ᐱᓕᕆᓂᐊᖅᑐᑦ ᐃᓕᓴᕐᓂᐊᕐᓇᖅᑐᓂᖅᓯᖏᑦ ᐃᖅᑲᓇᐃᓕᖅᑎᑎᖏᓐᓂᓄᑦ
ᐃᓄᐃᑦᓴᕐᓂᐊᖅᑐᓂᖅᓯᖏᑦ ᐊᓘᓚᓗ ᐊᑐᐃᓐᓇᖅᑐᓂᖅᓯᖏᑦ ᓇᓗᓇᐃᕐᑎᓂᓕᒃ ᓄᓇᓕᔪᕐᓇᐅᑦ ᐃᓕᓴᕐᓂᐊᕐᓇᖅᑐᓂᖅᓯᖏᑦ.

iii. ᐊᑐᐃᓐᓇᕆᐊᓕᓂᖏᓐᓄᑦ ᐱᒃᓯᑎᑐᖅᑦ,
iv. ᐱᓕᕆᓂᖏᓂᐅᒃᑲ ᐱᒃᓯᑎᑐᖅᑦ,
v. ᓇᒥᓐᓂᖅᓱᓂ ᓄᓇᓐᖓᐊᑎᒍᓄ ᐊᖓᔪᓇᓂᕐᕕᐊᓚᐊᖅᑐᑦᑕᓗ ᐱᒃᓯᑎᑐᖅᑦ,
vi. ᐱᒃᓯᑎᑐᖅᑦ ᓂᓪᑕᐅᑲ ᐊᓂᒃᓴᓂᖅᓯᕐᓂᐊᓂᖅᖓᓪᓕ ᓇᒪᑎᑦᓂᓇᐃᓐᓇᐅᑎᑐᖅᑦ (ᐃᓐᓕᓄᐊᑎᓄᓂ ᐅᖅᖃᒪᓕᐅᕐᓴᑦ ᑕᔪᓕᑦᓂ ᐊᓐᓕᓄᓂᖅ 5.3.1. "ᑭ"-ᒥᑦᑐᑦ),
vii.ᓂᕆᓂᐊᒍᑦ ᐊᑎᑐᕈᐅᒃᓯᑎᑎᓕᒥᓂᑦ ᐃᓂᐅᐅᓯᑦ (ᑐᑭᓕᐅᑎᓕᑐᒍ, ᔪᓕᐊᓚᐊᒥ ᐊᑦᓂᔭᕐᖓ), ᐊᖏᓕᓗ
viii. ᓄᓇᓕᒥᐅᓂᑦ ᐃᓂᒋᓕᒥᕆᐅᐅᓯᑦ/ᐃᑲᔪᖅᓂᕈᐅᓯᑦ.

5.3.6 ᐊᓐᓕᓄᓂᖅ 6- ᖃᐅᔨᓴᐅᑎᖓᑦ ᑕᖓᓄᑦ ᓴᓂᑦ ᒥᐊᓂᓴᐅᐅᓯᓚᓂᖓᓐᓂᑲ ᐋᖅᑭᓂᓂᒪᓯᑦ ᐊᖏᓕᓗ ᓇᓐᓕᖅᓂᑲ ᐃᓐᓕᖃᓄᓂᖅ

ᐃ. ᐊᑐᓵᓕᑦ ᑐᑭᓂᓇᐅᑎᓕᐊᖓᔪᑦᐃᐃᑦ ᓄᐊᑕᐅᓂᒪᓯᑦ ᐊᓐᓕᓄᓂᖅ 1ᒥᑦ-5ᑎᑦᑐᑦ, ᓇᓕᓇᐃᖅᑐᑐᑎᓕᑦ ᐱᖓᓂᓐᓕᐊᑕᐅᓯᑦ ᓇᓪᓕᖅᑐᐊᓂᖅᓯᒪᓯᑦᑎᑦᓂᖓᓄᑦ ᑕᖓᓄᑦ ᒥᐊᓂᓴᐅᐅᓄᓐᓂᒃ ᐋᖅᑭᓂᓂᒪᓯᑦᑎᒍᑦ ᓇᓪᓖᖏᓚᕿᐅᔪᓄᑦ, ᐊᑐᓂᑦ
ᐱᖃᓂᐅᕐᓴᐅᓂᖏᓐᓄᑦ:

i. ᐋᖅᑭᓂᓂᒪᓯᑎᒍᑦ ᒥᐊᓂᖅᓂᓂᒥᒃ ᑕᒪᐃᓐᓄᑦ ᓄᓇᓕᓐᓂ ᑕᖓᓄᑦ ᐊᑐᖅᑕᐅᓯᕐᓗᓄᑦ, ᐱᖃᓂᐅᑎᓄᑦᑦ ᐃᓐᓕᒥᐅᑕᐃᑦ ᐅᓄᕆᐊᓇᖅᑐᑦ ᐅᓐᓇᖅᑐᑦ, ᓄᖏᓪᓂᔪᓐᓇᖅᑐᑦᓄᓐᓂᒃ ᐃᓐᓕᒥᐅᑕᐃᑦ ᐅᓄᕆᐊᓇᖅᑐᑦ ᐃᓐᓕᓄᑦ ᐊᑐᖅᑕᐅᓯᕐᓗᓄᑦ;
ii. ᐃᓂᓪᓚᐅᓴᖅ ᐱᒋᐊᖏᓚᐅᑎᓂᐅᐊᖏᓪᓂᕐᓂᓄ ᓴᓇᒪᓂᖓᓂᑦ ᓄᓪᒋᒪᑦ ᑕᖓᓄᑦ ᓴᓂᑦ ᒥᐊᓂᓴᐅᐅᓂᖓᓂᑕ ᐃᓐᓕᓄᑎᑦᓂᑦ;
iii. ᐅᖃᓕᓚᐅᑕᐅᓗᓂᓂ ᐊᐅᑐᑕᐅᓚᐅᑕᐅᓴᓐᓄᑦ ᔪᓕᐊᓚᐊᒥ ᐊᓪᓚᐊᖓᓂ ᐊᑐᖅᓂᓂᖅᓴᓪᓕᓂᓪᓕᒪᓂ ᐸᖏᓐᓄᑦ ᐋᖅᑭᓂᓂᒪᓯᑕᐅᓗᓂᑎ
ᐊᓐᓕᓄᓂᖅ 4ᖓᓂ; ᐊᖏᓗᓗ,
iv. ᐋᖅᑭᓂᓂᒪᓯᑕᐅᓕᐊᖓᔪᖅᑎᑎᒥᓂᖓᓄᑦ ᓴᓇᓚᐅᓴᓐᓂᐊᓂᓴᑎᓐᓗᓂᑦ ᓇᓵᖁᓕᑎᓂᓴᖓᓂᑕ.

ᐱ. ᑭᒃᔪᓇᖅᖓ ᐊᑐᓂ ᓇᓵᖁᓕᑎᓂᓴᓇᓂᖏᓐ:

i. ᐅᖃᓕᓚᐅᑕᐅᓚᐅᐊᓵᓵᓄᑦ:
ᐃᓐᓗᓂᓂᐊᖓᔪᓂᐊᖓᓄᑦ ᐱᐃᑐᑎᑎᓂᓚᐊᖃᖅᓴᓂᖓᓂᑕ ᐱᓚᐅᐊᓵᓵᓄᑦ ᐊᖏᓗᓗ ᐃᓂᔪᒋᓚᐅᓚᐅᐊᓵᓵᓄᑦ ᔪᑲᓂᓂᓴᒥ ᐱᑲᖃᓂᓂᐊᓂᓴᓐᓄᓪᓕᑦ;
. ᐊᐅᓂᔪᓂᓴᓪᓕᑦ ᐱᓚᐅᐊᓵᓵᓄᑦ (ᑐᑭᓂᐅᑎᓗᔪᒍ, ᐱᐃᑐᑎᑎᓂᓴᖓᓐᓇᖅ, ᐃᖃᓗᐅᓚᐅᖅᑎᑦᓂ, ᐃᓂᓪᓂᓴᐊᓚᐊᓵᓵᓄᑦ, ᔪᓇᑦᔨᑦᖓᓂᑦ);
. ᓇᐅᓂᔪᐅᒪᓴᐊᑎᓂᓂᖏᓂᑦ ᒪᓇᑎᔭᓇᖅ ᒪᓪᓕᓂᔪᓵᓄᑦ, ᐱᓴᖅᓇᐅᑎᑦ ᓪᒪᐃᓂᓂᓂᖏᓪᓕᒍ ᐱᓚᐅᐊᓪᓂᓇᓂᑦ
ᐊᑐᓪᖃᑎᓂᔪᓂᓴᒥᒃ
ᓇᓵᖁᓕᑎᓂᓂᓂᖏᓐᓄᑦ;
. ᐱᐃᓂᓂᓴᐅᓂᓂᓂᖏᓐᓄᑦ ᐃᑲᔪᖃᑎᑎᓂᓴᓐᓄᑦ ᐊᔪᖏᖅᓂᓂ ᐳᖅᑐᓪᓚᐅᓂᑦ ᑎᒋᒪᐅᓂᓴᓪᓕᑦ/ᐊᔪᖏᖅᑎᑎᒍᓪᓗ
ᐱᓇᔪᐃᓂᑎᒍᑦ
ᖃᑎᖅᔪᓂᐅᓗᑎᒃ (ᑐᑭᓂᐅᑎᓗᔪᒍ, ᐊᐅᓪᓂᔪᓂᓴᓪᓕᑦ ᐱᔭᒥᓇᖅᓴᐃᓂᓴᓪᓕᓪᓗ ᐊᑐᖅᓂᓂᖅᓴᓐᓇᓂᑦ ᓪᓚᐅᓇᖅᑐᑦ,
ᒥᐊᓂᓴᐅᐅᓗᑎᒃ
ᓄᓇᓕᓐᓂ ᑕᖓᓄᑦ ᖃᒪᑎᓴᐅᓂᖓᓐᓇᓄᑦ); ᐊᐅᓪᓂᔪᓂᓴᓪᓕᑦ ᐱᔭᒥᓇᖅᓴᐃᓂᓴᓪᓕᓪᓗ ᐱᓇᓱᐊᓂᓴᓐᓄᑦ(ᑐᑭᓂᐅᑎᓗᔪᒍ,
ᖃᐅᔨᓴᕐᕕᐅᓂᓂᖅᓴᓂᑦ, ᖃᐃᓚᑎᑕᓂᓂᓴᓪᓕᑦ ᐱᒋᐊᖓᓂᑦ, ᐊᓂᓂᓪᓗ);
. ᐊᑐᖅᓂᓴᑎᑕᐅᓂᓪᓕᐊᓂᓂᓄᓐᓇᓂᓪᓗ ᒪᑐᐅᐃᓚᓂᓴᓐᓇᓂᓂᓪᓗ ᐱᓚᐅᐊᓵᓵᓄᑦ ᐃᓐᓕᓄᑎᑦᓂᒋᔭᒪᓚᔪᓄᑦ; ᐊᖏᓗᓗ,
. ᐊᐃᑎᓂᓚᓂᓴᓪᓕᑦ ᒥᐊᓂᓴᐅᐅᓂᖓᓂᓄᑦ ᐱᒋᐊᖓᓂᑦ (ᑐᑭᓂᐅᑎᓗᔪᒍ, ᔪᖃᓪᒥᑎᔪᑦ ᓄᐊᑦᔨᓪᓂᐊᓂᓴᐃᓂᓂᓂᑦ
ᖃᒪᑎᑦᓂᓴᐅᓂᖓᓐᓗᓄᑦ).

ii. ᓄᒪᓪᓂᔪᐊᓂᓴᓪᓕᑦ ᓇᓕᓇᐃᓐᓇᑐᖅᓯᒪᐅᓴᓂᖓᓂᑕ ᐊᐅᓪᓂᔪᓂᓴᒋᐊᓂᓚᓐᓂᖓᓂᑎᑦᓂᔪᑦ ᑭᓇᐅᑦᑎᑎᔪᑦ ᐃᓕᓂᖓᓐᓂᒃ, ᐱᖃᓂᐅᑎᓗᔪᒍ:
. ᓇᓕᓇᐃᖅᑎᓂᓚᒥᒃ ᖁᑭᒃ ᒥᓴᐅᑦᓂᓴᓂᓚᓂᑦ ᐊᖏᑐᔨᓄᑦ, ᐊᐅᓪᓂᔪᓂᓴᓪᓕᑦ (ᐱᖃᓂᐅᑎᓗᔪᒍ,
ᐃᓐᓕᓄᑎᑦᓂᑦ
ᐃᓪᓚᐅᓴᐅᑎᓂᖓᓂᑦ) ᐊᖏᓗᓗ ᐊᑐᖅᓂᓂᖅᓴᓐᓇᐅᑎᓂᖓᓂᑕ ᐊᖏᖓᓂᒃ ᑕᒪᐃᓐᓄᑦ ᐃᓂᖓᓂᒃ, ᐃᓐᓕᓄᑎᓄᓂ
ᐋᖅᑭᓂᓂᒪᓯᑦᑎᒍᓐᓗᓗ; ᐊᖏᓗᓗ,
. ᓇᓕᓇᐃᓐᓇᖅᓂᓂᓕᐅᓐᓇᓂ ᐅᖃᓕᓚᐅᑕᐅᓂᓚᒥᒃ ᐊᖏᖓᑕ ᐅᑎᖃᑎᓂᓴᓪᓕᑦ ᓇᓵᖁᓕᑎᓂᓴᖓᓂᓂᒃ, ᐊᖏᖓᑕ
ᐋᖅᑭᖅᓚᓂᓴᓂᐊᓂᓴᓇᖅᓂᓂᒃ ᐊᖏᓗᓗ ᑭᓇᐅᑦᑎᑎᔪᑦ ᐱᓚᐅᐊᓵᓵᓄᑦ ᐃᓂᓴᓂᓂᐊᓂᓴᐃᓐᓇᐅᑎᑦᓂᑦ ᐃᓐᓕᓄᑦ
ᐃᓐᓕᓄᑎᑦᓂᓂᓂᑦ ᐊᖏᓗᓗ
ᐃᓂᓪᓂᔪᓂᓴᓂᖓᓂᑕ ᐋᖅᑭᓂᓂᒪᓯᑦᑎᓂᖓᓂᓂᑦ.

5.3.7 ᐊᓐᓇᖅ 7- ᓂᕆᐊᖏᓂᖅ ᐱᓕᒪᔨᐅᓂᖅᑕᒻᒥᑦ ᑕᖏᓐᓂᑦ ᓴᓐᑦ ᒥᐊᓂᓚᔨᐅᑎᖏᓐᓂᒃᓂ ᐃᖅᑭᓯᖏᓪᓕᔪᑎᒍᑦ ᐃᓐᓇᐸᑎᖏᓐᓂᒃ

ᐃ. ᖃᒥᖅᑎᖏᓯᐊᖅᓇᑦ ᐊᔨᖅᓴᒪᖓᒋᓇ ᐃᖅᑭᑭᓯᓪᓕᓕᒫᖅᓯᖅᑐᓂᒃ ᐃᓇᓴᓂᑎᑐᓐᓇᓂᖅᓗᑦ, ᐊᐸᑎᓕᓚᓂᖅᓗᑦ ᐊᒻᒪᓗ ᐱᐅᖅᑕᖅᓕᐊᓂᖅᓗᑦ
ᐊᖏᑐᖅᑕᐅᔨᔪᑎᑎᒃᓴᖅᑎᑦᑕ ᓇᓱᖏᑎᐅᓂᒃᓴᓂᐅᔨᐅᓕ

ᐱ. ᐃᓕᓴᕆᐅᒪᓇᑦ ᓂᕆᐊᓚᐅᔨᓯᒪᔪᓕ ᑕᖏᓐᓂᑦ ᓴᓐᑦ ᒥᐊᓂᓚᐅᔨᓂᖏᓐᓄᓇᑦ ᐃᖅᑭᑭᓯᓯᒪᔪᓕ ᐊᒻᒪᓗ ᐃᓪᓗᔨᔪᑎᖏᓐᓄᓇᑦ
ᓇᓗᓇᐃᔾᔨᓇᓐᓂᓗ ᑐᑭᑭᖏᑕᐅᔨᔪᐃᓐᓂᑦ ᓂᕆᐊᖓᓯᒪᔪᓕ ᐱᓪᓗᑎᓯᓯᒪᔪᓕ ᐊᒻᒪᓗ ᐃᓪᓗᔨᔪᑎᖏᓐᓄᓇᑦ

ᑎ. ᐱᔪᒥᑎᐅᖏᓯᒪᔪᖅ ᑲᑎᒪᓕᐅᑲᓇᒪᓗᒍ ᐊᖏᖓᕆᑕᐅᓇᕐᓗᒍ

5.3.8 ᐊᓪᓚᔨᓂᖅ 8- ᐱᐅᓯᑎᑕᐅᓯᐊᖅᓂᔨᓯᒪᓇᓗᑎᑦ ᐱᓯᐊᖏᐅᑎᑕᓯᖏᓐᓄᑦ ᑲᓇᒪᓂᖓᓂ ᐊᒻᒪᓗ ᐊᑭᖓᓂ ᒥᖏᐅᓴᖏᓯᒪᓂᖓᓂ ᐊᖓᔪᖅᑕᐅᓯᒪᔪᓕ ᔪᓂᓂᒃᑐᓂ ᑕᖏᓐᓂᑦ ᓴᓐᑦ ᒥᐊᓂᓚᐅᔨᔪᑎᖏᓐᓂᒃ ᐃᓪᓗᔨᔪᑎᖏᓐᓄᓇᑦ

ᓴᓇᒪᓂᖏᓴᖅᓄᓇᓂᓕ ᐃᖅᑭᑭᓯᓯᐊᖏᓯᒪᓇᓗᑎᓂᒃ ᑕᖏᓐᓂᑦ ᓴᓐᑦ ᒥᐊᓂᓚᐅᔨᔪᑎᖏᓐᓂᒃ ᐃᓪᓗᔨᔪᑎᖏᓐᓄᓇᑦ ᐊᒻᒪᓗ ᐱᔨᑲᓯᓯᐊᖏᓯᒪᓇᓗᑎᓂᒃ
ᓇᓗᓇᐃᔨᖅᑎᓂᓪᓗ 'ᑎᑎᒃ ᑲᑎᓯᒪᑎᓪᓗᑎᓂᒃ ᐊᐅᑐᔭᑎᓇᓂ ᐊᐅᓪᓚᔨᓯᓂᓪᓗ ᐊᐅᑭᖓᓄᑦ. ᐱᐅᓯᑎᐊᖏᓯᒪᔪᓕ ᓴᓇᒪᓂᖏᓐᓂᑦ
>ᐃᔪᐃᔨᓇᐊᖅᖓᑎᑐᓂ ᐃᑯᐊᓪᓚᑕᓪᓚᒪᐅᑎᑕᓯᖏᓐᓄᓇᒃ ᓴᓐᓂᓂᐊᖅᑎᐅᑎᑕᐅᔪᓂᓪᓗ ᖃᓇᖓᓐᓂᖅᓴᖏᓐᓄᓇᒃ ᐊᒻᒪᓗ ᐊᑎᓪᓗᑎᓂᒃ
ᐃᓪᓗᔨᔪᑎᖏᓐᓄᓇᑦ (ᑐᐸᓚᐅᑎᓗᔪ, ᐃᓇᑐᐃᓐᓇᔨᔪᐅᑎᑦᓇᓚᒥᓂᓪᓚᐅᔨᐸᐸᑕᓄᑯ ᑕᐱᓐᓚᓂᔨᓯᒪᔪᓕᖓ). ᐅᑯᐊ ᐊᑕᓐᓚᑎᑦ ᐊᐱᖅᑯᑎᑦ
ᐃᓯᒪᑎᐸᐅᔾᔨᓇᓚᓐᓚᑦ:

ᐃ. ᓇᓚᐊᖓᔪᓂ ᑭᓇᐅᔾᐃᑦ/ᒥᐊᓂᖅᓯᐅᑎᑦ ᓇᓐᓴᕆᑕᐅᔪᓐᓇᓂᑦ ᐊᑐᐃᓐᓇᐅᔾᔨᓗᑎᒃ ᓄᓇᓚᐸᐅᔾᔨᒪᓐᓂᖅ?
ᐱ. ᓯᓇᐅᔪᓚᓂ ᖃᓄᐃᓚᖓᔾᔨᒃ ᐊᓂᔪᐃᑦᓯᐊᕆᑕᐅᔪᓐᓇᓂᑦ?
ᑎ. ᑭᓱᐊᓂᒃ ᑐᓂᕆᑎᖅᓐᓂᖅᑐᑦ (ᐊᖏᐅᔪᐊᑦ ᐊᖏᐅᖓᓂᑦᑐᓂ)?
ᑭ. ᑕᑯᐊ ᓇᓐᓴᕆᑎᖅᓐᓂᑦ ᐊᑐᑎᖃᓂᐅᓕᕆᑦ ᑕᒪᐃᓐᓇᑦ ᐅᓪᓴᓐᓇᑦ ᐃᓕᐃᓐᓇᖅᑐᓂᒃ ᓄᓇᓕᐸᐅᔾᔨᒪᓐᓂᖅ ᑕᖏᓐᓂᑦ ᓴᓐᑦ ᒥᐊᓂᔨᓯᓂᓪᓗᑐᖓᓚᐅᑎᔪᑦ
ᐃᖃᖅᑭᓯᓯᒪᔪᓕᐊᓂᖅ?

5.3.10 ᐊᓪᓚᔨᓂᖅ 10- ᐊᑐᖃᑎᓯᓂᔨᓯᒪᑦ ᐸᕐᓇᐅᑕᐅᓯᒪᔪᓕᐊᓂ

ᓴᖅᑭᑎᑦᓯᓂᖅ ᓇᓚᓄᐃᔅᑐᖅᓯᒪᔪᓕᐊᓂᒃ ᐊᑐᓕᕐᑎᑎᓂᐅᔨᑦᑕᖏᓐᓂᒃ ᐸᕐᓇᐅᑕᐅᓯᒪᔪᓕᐊᓂᒃ ᓇᓚᓄᖏᑦᓯᓚᔨᑦᑕᓂ
ᐊᑐᖅᑕᐅᔨᓪᓕᓚᐅᔨᑦᑐᓂ ᐊᑐᓕᖅᐸᑦ ᓂᕆᐊᖓᓯᒪᔪᓕᐊᓂᒃ ᑕᖏᓐᓂᑦ ᓴᓐᑦ ᒥᐊᓂᓚᐅᔨᑎᓂᓕᓂᒃ ᐃᖅᑭᑭᓯᓯᒪᔪᓕᔭᐅᑦ ᐊᒻᒪᓗ
ᓴᓇᒪᓂᖅᑎᓂᒃ ᐱᓕᓚᐃᓕᓂᒃ ᑕᖏᓐᓂᑦ ᓴᓐᑦ ᒥᐊᓂᖅᓯᐅᓂᓪᓗᑦ ᐃᓪᓗᔨᔪᑎᖏᓐᓄᓇᑦ.

5.4 ᑐᓂᓕᐅᔪᓐᓇᖅᑐᓂᒡᓗᑦ

ᑐᓂᓕᐅᔪᓐᓇᖅᑐᓂᒡᓗᑦ ᐊᑐᐃᓐᓇᓕᖅᑕᓕᐅᔨᓂᔪᓂᑦ ᖃᕆᔨᓕᓕᔭᐅᑦ ᐃᖅᑭᑭᓯᓯᒪᓕᓂᒃ ᐱᖃᓕᓕᔨᐅᔪᓂᒃ ᐱᓕᕐᓚᐃᓂᑦ
ᖃᓄᖅᑐᖅᑐᒡᓗᒍᐊᖏᓯᒪᓕᓂᒃ ᖃᕆᑎᐅᓕᒪᓐᓇᖅᑎᑦᑕ ᑎᑎᖅᑐᖅᓴᖅᑭᓯᓯᒪᓕᓂᒃ ᐊᑕᓂ. ᐃᖃᓗᐅᓕᓕᕐᓚᐃᓂᑦ, ᐱᓕᕐᓚᐃᖃᖅᑐᒡᓗᒍ
ᐊᑐᐃᓐᓇᕆᔨᑦᑕᐅᔪᓐᓇᖅᑐᓂᒃ ᐊᑐᐃᓐᓇᐅᔾᔨᓗᑎᒃ ᐃᓕᓴᕐᓂᖅᓯᒪᔪᓕᐊᓂᒃ ᐃᓕᓴᕐᓂᖅᓯᒪᔪᓕᐊᓂᒃ ᐊᑐᐃᓐᓇᐅᔾᔨᓗᑎᒃ
ᐃᓕᓴᕐᓂᖅᓯᒪᔪᓕᐊᓂᒃ ᐊᑐᐃᓐᓇᐅᔾᔨᓗᑎᒃ ᐃᓕᓴᕐᓂᖅᓯᒪᔪᓕᐊᓂᒃ ᐊᑐᐃᓐᓇᐅᔾᔨᓗᑎᒃ ᐃᓕᓴᕐᓂᖅᓯᒪᔪᓕᐊᓂᒃ
ᐊᑐᐃᓐᓇᐅᔾᔨᓗᑎᒃ

ᒥᐊᓂᓗᐅᓂᖏᑦ ᐋᖅᑭᓯᒪᔨᒃᑯᑦ ᓇᓕᕆᑎᖏᓐᓂᒃ ᐊᒻᒪᓗ ᓇᓗᓇᐃᔪᖅᑭᓯᒪᓕᕆᔨᓗᑦ ᓯᕗᓕᖅᑏᑦ ᐅᓂᒃᑲᖏᓐᓂᒃ ᖃᓕᓗᓇᑎᑐᖓᓕᒃ. ᐃᖅᑲᐅᒪᔾᓂᐊᓕᒃ ᐊᐅᓪᓕᓯᓂᔭᖓᑦ ᐊᒻᒪᓗ ᒥᐊᓂᖅᓯᓂᔭᖓᑦ ᐊᑐᐊᒃᑯᑦ ᐃᓕᓴᒃᑯᑦ ᑐᓂᔾᔨᒃᓴᓕᖅᑎᓪᓕᖅᑐᑦ ᑭᒪᔨᖓᓪᓕᐊᑦ. ᐱᖓᓱᐊᕐᓂᖅᑐᑦ ᐊᐅᓚᑦᑎᓯᓂᖅᑐᑦ ᐱᒪᓐᓇᐅᑉᐸᑎᓕᒃ ᐅᓂᒃᑳᖅᑐᑦ ᐊᑐᖅᑕᐅᓕᓯᐊᖅᑎᓗᑦ ᐱᖓᓱᐅᑎᐅᐅᔾᔪᓕᐊᓕᒃ ᐅᑯᓂᖅᓴᓂᒃ ᐊᑐᖅᑕᐅᓕᓯᐊᖅᑎᓗᑦ ᐱᖓᓱᐅᑎᐅᐅᔾᔪᓕᐊᓕᒃ ᐅᑯᓂᖅᓴᓂᒃ ᐊᑐᖅᑕᐅᓕᓯᐊᖅᑎᓗᑦ.
5. ᖃᕆᔨᐅᔾᔨᑲᖅᓯᒪᓗᓂᑦ ᐊᐳᖅᑐᑦ ᑐᑭᓯᓯᐊᕐᓂᖏᑦ ᐅᓂᒃᑳᓕᖅᑐᓯᒪᓕᕆᑦ ᓴᖅᑭᓯᒪᔨᑦ ᐊᑐᓂ ᑕᖏᓐᓄᑦ ᓴᓂᒃ ᒥᐊᓂᓕᒃᐅᔾᔨᐸᓂᖏᑦ ᐋᖅᑭᓯᒪᓕᕆᓂᖅ ᐃᖅᑲᓇᖅᑐᑦ.
6. ᖃᕆᔨᐅᔾᔨᑲᖅᓯᒪᓗᓂᑦ ᐊᐳᖅᑐᑦ ᐱᒋᐊᖅᑎᓂᖏᑦ ᑭᖑᓪᓕᖅᓵᒥᒃ ᐅᓂᒃᑳᓕᐊᕐᓂᒥᒃ, ᖁᒥᖅᑐᐅᔾᔨᑲᓪᓕᖅᑐᑦ ᐅᓂᒃᑳᓕᐊᕐᓂᒥᒃ ᐅᑭᐅᓂᒃᑯᑦ ᐱᓕᕆᔨᒃᑯᐊᓂᒃ ᐃᓚᖓᔾᔨᓂᒃᑯᑦ ᐱᓕᕆᔨᒃᑯᐊᓂᒃ ᐅᑭᐅ

5.0 TERMS OF REFERENCE

5.1 Background

The existing landfill was built in 1995 as an interim disposal site until a permanent site could be identified. It is located on the west side of Iqaluit in the area known as the West 40. The site was expanded in 2001 to provide more storage while a new waste management facility was to be designed and built. In 2001, a recycling program was implemented but cancelled two years later due to the high cost of the program. For numerous years open burning was a common practice at the West 40 Landfill but in the early 2002 open burning was discontinued due to possible health implications and complaints made by the residents.
The waste stream that enters the landfill is separated into many different categories: municipal waste, construction debris (wood), scrap metal and tires, hazardous waste and bio-solids. Municipal waste and construction debris are piled in separate piles in the middle of the landfill and compacted by a large landfill compactor. Scrap metal and tires are stored at the south end of the landfill and a company is currently baling approximately 20% of the scrap metal and shipping it south. Hazardous waste is stored in the north section of the landfill in sealift containers and certain items (i.e. batteries and propane cylinders) are shipped south periodically. In 2008 and 2009, the City performed a pilot project to treat sewage sludge (bio-solids) from the Wastewater Treatment Plant. This project was a success and sludge is still composted at the north end of the landfill; however, the amount of sludge that can be composted is restricted due to current space limitations.
The current landfill is nearing capacity and a new waste management facility is needed as soon as possible.
The documents listed below are available on the City of Iqaluit Webpage www.city.iqaluit.nu.ca “Tenders and Proposals”.

- City of Iqaluit General Plan (2010)
- Solid Waste Management and Planning Study (September 2000)
- Solid Waste Facility Site Selection (September 2001)
- Landfill Facility Expansion Preliminary Design Report (August 2001)
- Iqaluit Landfill Water Management Improvements Report (November 2009)
- Iqaluit Sewage Sludge Management Composting Pilot Project Report (March 2009)
- City of Iqaluit Sludge Management Operation and Maintenance Report (May 2006)

The City of Iqaluit's Water License can be downloaded from the Nunavut Water Board FTP Site (http://www.nunavutwaterboard.org/en/public_registry). A copy of the 2005 City of Iqaluit Solid Waste Facility Operation and Maintenance Manual will be provided to the successful Proponent.

5.2 Objectives

The primary objectives of this work are to: 1) develop a new municipal solid waste management program, and 2) complete the preliminary design of the required solid waste management facilities. This work will provide the information necessary to proceed with the

detailed engineering design and subsequent construction of the new solid waste management facilities.
This process will involve thorough research and analysis of the issues, needs and options, as well as extensive stakeholder engagement and public consultation. It will include: 1) an analysis of the feasibility of different solid waste management approaches in Iqaluit's unique arctic context, 2) the identification and analysis of several viable solid waste management program options, 3) the update of the West 40 Landfill Solid Waste Facility Operation and Maintenance Manual with recommendations for the interim management of this site while new facilities are being built, and 4) the development of a Decommissioning Plan for the West 40 landfill.
During this process, the following questions need to be answered:
a. What principles will guide how municipal solid waste is handled in our community?

b. What goals and targets do we want to achieve?

c. What solid waste management options are viable for our remote arctic community?

d. What is the best solid waste management program for our community?

e. How will we deal with special issues such as end-of-life vehicles, bio-solids and household hazardous waste?

f. What type of solid waste management facilities do we need to build? Where will they be located and how big do they need to be?

g. How much will the new solid waste management program and facilities cost to build and operate? How will we pay for them?

h. What will happen to our existing landfill?

i. How will we manage our existing landfill while the new solid waste management facilities are being designed and built?

5.3 Scope of Services

The successful proponent will engineer the new solid waste management program and facilities by completing the work outlined in the ten steps described below. As each step is completed, the consultant will submit detailed written documentation of the work in the form of Progress Reports and will make the necessary changes to address the City's comments as well as those of key stakeholders. This documentation will form the basis of the preliminary and final reports.
Council, key stakeholders and the community at large must be involved throughout this design process. The successful proponent will create a stakeholder engagement plan and will submit it to the City for review and approval before it is implemented. The successful proponent will then implement the approved stakeholder engagement plan, including the facilitation of meetings and development of communications materials. ***Note that proposal***

submissions should provide clear details of the key elements of the stakeholder engagement plan.

5.3.1 Step 1- Current Situation and Needs Analysis

a. Determine the quantity, type and composition (i.e. waste audit) of waste currently produced in Iqaluit. All waste streams should be considered, including end-of-life vehicles, bio-solids and household hazardous waste.

b. Discuss current and, where relevant, past solid waste management practices in the community, including but not limited to:
i. Municipal operations (e.g. existing facilities and operations, runoff management, collection services, tipping fees and revenues, operating expenses);
ii. Government of Nunavut programs (e.g. recycling pilot program);
iii. Non-profit organizations (e.g. Bill Mackenzie Humanitarian Society); and,
iv. Commercial, industrial and institutional waste.

c. Analyze future needs
i. Discuss population projections (see General Plan) and their implications for solid waste management (how much solid waste will be generated as our community continues to grow?)
ii. Identify and discuss the other factors that could impact waste generation (e.g. diversion rates, upgrades to the Waste Water Treatment Plant, etc.)

d. Summarize expected regional climate change impacts over the lifespan of the new solid waste management facilities. Focus on impacts relevant to infrastructure (e.g. permafrost degradation).

e. Summarize the regulatory framework that will impact project approval and facility operations
i. What regulations/regulatory bodies apply?
ii. Are there any relevant regulations that will change or come into effect in the near future?

5.3.2 Step 2- Decision-making Framework

Develop a decision-making framework to guide the design of the new solid waste management program and associated facilities:
a. Identify guiding principles,
b. Set goals and targets for the project, and
c. Identify what analysis and decision-making tools will be used.

5.3.3 Step 3- Solid Waste Management Approaches

This step will include the following two components:
a. Solid Waste Management Options

Identify and analyze solid waste management options, including but not limited to:

- Reduction and Reuse

- Recycling
- Composting
- Incineration
- Gasification
- Landfill

For each option identified above, analysis should include
i. A detailed discussion of the implementation of these options in a northern/remote context, which considers the following questions:
- What are the challenges/opportunities?
- Is the technology/option appropriate from an operation and maintenance standpoint?
  - Is there sufficient local expertise?
  - Will there be a need for staff training or outside expertise?
  - How will Iqaluit's harsh climatic conditions impact this option?

- Has the technology/option has been used in other northern or remote communities?
  - Was it successful?
  - Were there challenges we can learn from?

ii. Preliminary discussion of:
- Capital and O & M cost considerations,
- Environmental impacts and regulatory implications,
- Zoning requirements (General Plan), and
- Cost recovery opportunities.

b. Management of Special Issues
i. Through a discussion of relevant best practices and regulatory requirements, investigate the City's options for dealing with:
- End-of-life vehicles,
- Household hazardous waste, and
- Bio-solids (build on the 2006 Sludge Management Operation and Maintenance Report).

ii. Identify the City's best option(s) for dealing with each of these special issues.

5.3.4 Step 4- Interim Measures and Decommissioning Plan for Existing West 40 Landfill
a. Update the City of Iqaluit Solid Waste Facility Operation and Maintenance Manual with a focus on interim measures that should be undertaken to:

i. Optimize space (the West 40 landfill will have to meet the needs of the community until the new solid waste management facilities are built),
ii. Mitigate risk of fire, and
iii. Maintain safe working conditions for City staff working in the landfill.

b. Based on best practices and regulatory requirements, provide a Decommissioning Plan, which will include a preliminary design and Class D estimate for the closure and subsequent monitoring of the existing West 40 Landfill. Plan will consider fire risks and associated mitigation measures.

5.3.5 Step 5- Site Options

a. Identify site options for the new solid waste management facility taking into consideration:

i. Land use issues, such as required setbacks, zoning requirements and future growth of the community,

ii. Environmental issues (e.g. wind, runoff, vegetation),

iii. Accessibility issues,

iv. Servicing issues,

v. Geological and terrain issues,

vi. Issues of climate change resilience (building on discussion in 5.3.1. d),

vii. Previously impacted sites (e.g. West 40 Landfill), and

viii. Community concerns/support.

5.3.6 Step 6- Analysis of Solid Waste Management Program and Facility Options

a. Using the information gathered in Steps 1-5, identify at least three feasible alternate solid waste management program options, each of which will include:

i. A program for the management of all municipal solid waste streams, including household hazardous waste, bio-solids and end-of-life vehicles;
ii. The site and preliminary design for the new solid waste management facilities;
iii. A discussion of the impact on the West 40 Landfill Decommissioning Plan developed in Step 4; and,
iv. The rational that went into the development of the option.

b. For each option:

i. Discuss:

- Facility sizing requirements and considerations for future expansion;
- Operating requirements (e.g. space, staff, training, equipment);
- Measures such as bylaws, permits and licenses which will be necessary to implement the option;

- Opportunities for cooperation with other levels over government/ other organizations in the collection (e.g. processing and marketing of recyclable material, management of municipal solid waste);
- Any issues that may stall the process (e.g. need for additional studies, regulatory issues, etc.);
- Decommissioning and closure requirements for the proposed facilities; and,
- Environmental management issues (e.g. runoff collection and treatment).
- Complete a detailed life-cycle financial analysis, including:
- Class D estimate for the total capital, operating (including staff training) and decommissioning cost for all sites, facilities and programs; and,
- Detailed discussion of cost recovery options, financing mechanisms and funding opportunities for all sites, facilities and educational programs.

5.3.7 Step 7- Selection of a Preferred Solid Waste Management Program and Facilities

a. Analyze and compare the social, environmental and economic impacts of the alternate options

b. Identify preferred solid waste management program and facilities and summarize the rationale behind its selection

c. Take preferred option to Council for approval

5.3.8 Step 8- Refinement of Preliminary Design and Cost Estimate for the Approved Solid Waste Management Facilities

Refine the design of the Solid Waste Management Facilities and complete a Class C cost estimate for the total capital and operating costs. Refined design must consider fire risk mitigation and protection strategies.

5.3.9 Step 9- Investigation of Alternate Funding/Management Options

Using case studies, thoroughly discuss the benefits and risks of different funding/ management options for the preferred program and associated facilities (e.g. public-private partnerships). The following questions should be considered:

a. What alternate funding/management options may be available to the City?

b. What conditions are required for success?

c. What are the implications (pros and cons)?

d. Are these options worth considering for either all or a portion of the solid waste management program?

5.3.10 Step 10- Implementation Plan

Develop a detailed implementation plan that clearly outlines the steps required to implement the preferred solid waste management program and build the required solid waste management facilities.

5.4 Deliverables

All deliverables are to be supplied in digital format as well as the required hard copy amounts listed below. Note that, where required, the City will provide Inuktitut translation services. The following deliverables will be required as part of this Project:

1. Three (3) copies of a public consultation plan, five pages or less, for review and approval by City staff.

2. An electronic copy of Progress Reports, which will document steps as they are complete and will provide opportunity for review and comment by City staff and key stakeholders.

3. Three (3) copies of the updated City of Iqaluit Solid Waste Facility Operation and Maintenance Manual with a one page summary highlighting the suggested interim measures.

4. Ten (10) copies of the Preliminary Report, which will include the work completed for Steps #1-6, adjusted to reflect Progress Report feedback. This report will be available for the

public consultation on the Solid Waste Management Program Options and will have a detailed Executive Summary in both English and Inuktitut. Note that the Operation and Maintenance Manual is a separate deliverable and can be left out of this report; however the summary highlighting interim measures should be included in the report.

5. An electronic copy of the information sheets developed for each of the different solid waste management program options.

6. An electronic copy of the Draft Final Report, for review and approval by City staff. This report will include:

- All the material contained in the Preliminary Report amended, where necessary, to reflect the comments received during the public consultation process;

- An Executive Summary

- Documentation for steps #7-10, adjusted to reflect Progress Report feedback

- Appendices with all presentations and handouts developed for this process

7. Ten (10) copies of the Final Report (written in English), including a detailed Executive Summary translated into Inuktitut.

5.5 Schedule

- Proposal Closing Date: December 3, 2010
- Proposal Award: December 16, 2010
- Project Completion: July 2011

5.6 City of Iqaluit Contacts and Resources

The lead contact for the City will be the Director of Engineering and Sustainability, Ms. Meagan Leach, with technical support from the City's Public Works, Emergency Services and Lands and Planning Departments. The consultant will be expected to meet with City staff at the outset of the Project to discuss in more detail the overall objectives. Contacts will be provided to the successful Proponent.

Appendix E

2010 Spill Reports

Spill #1 - January 20, 2010

Canada

NT-NU SPILL REPORT

OIL, GASOLINE, CHEMICALS AND OTHER HAZARDOUS MATERIALS

NT-NU 24-HOUR SPILL REPORT LINE
TEL: (867) 920-8130
FAX: (867) 873-6924
EMAIL: spills@gov.nt.ca

REPORT LINE USE ONLY

A	REPORT DATE: MONTH – DAY – YEAR January 20 2010	REPORT TIME 9:00am	☒ ORIGINAL SPILL REPORT, OR	REPORT NUMBER -
B	OCCURRENCE DATE: MONTH – DAY – YEAR January19 2010	OCCURRENCE TIME 9:00	☐ UPDATE # TO THE ORIGINAL SPILL REPORT	
C	LAND USE PERMIT NUMBER (IF APPLICABLE) na	WATER LICENCE NUMBER (IF APPLICABLE) 3am-iqa0611		
D	GEOGRAPHIC PLACE NAME OR DISTANCE AND DIRECTION FROM THE NAMED LOCATION Water Treatment Plant –Iqaluit	REGION ☐ NWT ☒ NUNAVUT ☐ ADJACENT JURISDICTION OR		
E	LATITUDE DEGREES na MINUTES na SECONDS na	LONGITUDE DEGREES na MINUTES na SECONDS na		
F	RESPONSIBLE PARTY OR VESSEL NAME Water Treatment Plant —City of Iqaluit	RESPONSIBLE PARTY ADDRESS OR OFFICE LOCATION box 460 Iqaluit nu. x0a 0h0		
G	ANY CONTRACTOR INVOLVED na	CONTRACTOR ADDRESS OR OFFICE LOCATION na		
H	PRODUCT SPILLED Chlorine gas	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES unknown	U.N. NUMBER un 1017	
	SECOND PRODUCT SPILLED (IF APPLICABLE) na	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES na	U.N. NUMBER na	
I	SPILL SOURCE 150 lb cylinder	SPILL CAUSE packing nut	AREA OF CONTAMINATION IN SQUARE METRES na	
J	FACTORS AFFECTING SPILL OR RECOVERY see box K	DESCRIBE ANY ASSISTANCE REQUIRED Fire Department	HAZARDS TO PERSONS, PROPERTY OR EQUIPMENT compressed gas	

K — ADDITIONAL INFORMATION, COMMENTS, ACTIONS PROPOSED OR TAKEN TO CONTAIN, RECOVER OR DISPOSE OF SPILLED PRODUCT AND CONTAMINATED MATERIALS

On January 19 2010 @9:00am a 150 lb bottle of chlorine was being changed in the chlorine room at the Wtp. A bottle was noticed to have a very small leak. It was removed from the building to a wooden shack about 100 yards from the building . The fire dept. was notifed along with Robert Eno from enviroment NU . An Emergency saftey cap was insalled . The cylinder is in a safe and secure location with safety tape around area. We are presently working on a solution with Robert Eno and the fire dept.

L	REPORTED TO SPILL LINE BY Robert Hogan	POSITION Utilidor Forman	EMPLOYER City of Iqaluit	LOCATION CALLING FROM WTP	TELEPHONE 867-222-2941
M	ANY ALTERNATE CONTACT Robert Brouillet	POSITION WTP Operator	EMPLOYER Citvof Iqaluit	ALTERNATE CONTACT LOCATION WTP	ALTERNATE TELEPHONE 867-979-5643

REPORT LINE USE ONLY

N	RECEIVED AT SPILL LINE BY	POSITION Station operator	EMPLOYER	LOCATION CALLED Yellowknife, NT	REPORT LINE NUMBER (867) 920-8130

LEAD AGENCY ☐ EC ☐ CCG ☐ GNWT ☐ GN ☐ ILA ☐ INAC ☐ NEB ☐ TC | SIGNIFICANCE ☐ MINOR ☐ MAJOR ☐ UNKNOWN | FILE STATUS ☐ OPEN ☐ CLOSED

AGENCY	CONTACT NAME	CONTACT TIME	REMARKS
LEAD AGENCY			
FIRST SUPPORT AGENCY			
SECOND SUPPORT AGENCY			
THIRD SUPPORT AGENCY			

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Spill #2 - February 1, 2010

Canada

NT-NU SPILL REPORT

OIL, GASOLINE, CHEMICALS AND OTHER HAZARDOUS MATERIALS

NT-NU 24-HOUR SPILL REPORT LINE
TEL: (867) 920-8130
FAX: (867) 873-6924
EMAIL: spills@gov.nt.ca

REPORT LINE USE ONLY

A	REPORT DATE: MONTH – DAY – YEAR Febuary 1/2010	REPORT TIME 9:00 am	☒ ORIGINAL SPILL REPORT, OR	REPORT NUMBER 10 · 024
B	OCCURRENCE DATE: MONTH – DAY – YEAR January 29/2010	OCCURRENCE TIME 7:04 pm	☐ UPDATE # TO THE ORIGINAL SPILL REPORT	
C	LAND USE PERMIT NUMBER (IF APPLICABLE) na	WATER LICENCE NUMBER (IF APPLICABLE) na		
D	GEOGRAPHIC PLACE NAME OR DISTANCE AND DIRECTION FROM THE NAMED LOCATION Lift Station #1 City of Iqaluit	REGION ☐ NWT ☒ NUNAVUT ☐ ADJACENT JURISDICTION OR		
E	LATITUDE DEGREES na MINUTES na SECONDS na	LONGITUDE DEGREES na MINUTES na SECONDS na		
F	RESPONSIBLE PARTY OR VESSEL NAME City of Iqaluit	RESPONSIBLE PARTY ADDRESS OR OFFICE LOCATION P O Box 460 Iqaluit N U X0A 0H0		
G	ANY CONTRACTOR INVOLVED Nunatta Environmental	CONTRACTOR ADDRESS OR OFFICE LOCATION P O Box 267 Iqaluit N U X0A 0H0		
H	PRODUCT SPILLED fuel oil	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES 500 liters est.	U.N. NUMBER un-1202	
	SECOND PRODUCT SPILLED (IF APPLICABLE) na	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES na	U.N. NUMBER na	
I	SPILL SOURCE Fuel Tank	SPILL CAUSE Valve Bonet	AREA OF CONTAMINATION IN SQUARE METRES 6 meters by 6 meters	
J	FACTORS AFFECTING SPILL OR RECOVERY see k	DESCRIBE ANY ASSISTANCE REQUIRED see k	HAZARDS TO PERSONS, PROPERTY OR EQUIPMENT see k	

K — ADDITIONAL INFORMATION, COMMENTS, ACTIONS PROPOSED OR TAKEN TO CONTAIN, RECOVER OR DISPOSE OF SPILLED PRODUCT AND CONTAMINATED MATERIALS

On January 29/2010 at 7:04 pm I received an alarm at Lift Station #1. The alarm was for low fuel. I arrived on site at 7:18 pm. I looked at the fuel tank located in the rear of the building and noticed the bonet of the valve wasn't there. The tank at that time was empty. I notifyed Frank Ford Ops Sup. Eepa Nauyuk gave me a hand and we fixed it immediately by replacing the vavle .We then notifyed Nuna Env. to clean the spill and they were there cleaning within the hour. Uqsuk was called out around 7:30 pm and they filled the tank half full so we could heat our building. Bylaw was also called in at that time. Any further questions please don't hesitate to call

L	REPORTED TO SPILL LINE BY Robert Hogan	POSITION Utilidor Forman	EMPLOYER City of Iqaluit	LOCATION CALLING FROM 1554d	TELEPHONE 867-222-2941
M	ANY ALTERNATE CONTACT Frank Ford	POSITION Ops Sup.	EMPLOYER City of Iqaluit	ALTERNATE CONTACT LOCATION Fed Garage	ALTERNATE TELEPHONE 867-222-2965

REPORT LINE USE ONLY

N	RECEIVED AT SPILL LINE BY	POSITION Station operator	EMPLOYER	LOCATION CALLED Yellowknife, NT	REPORT LINE NUMBER (867) 920-8130

LEAD AGENCY ☐ EC ☐ CCG ☐ GNWT ☒ GN ☐ ILA ☐ INAC ☐ NEB ☐ TC | SIGNIFICANCE ☐ MINOR ☐ MAJOR ☐ UNKNOWN | FILE STATUS ☐ OPEN ☐ CLOSED

AGENCY	CONTACT NAME	CONTACT TIME	REMARKS
LEAD AGENCY	Robert Eno	02/01/10 11:46	
FIRST SUPPORT AGENCY			
SECOND SUPPORT AGENCY			
THIRD SUPPORT AGENCY			

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Spill #3 - February 15, 2010

Northwest Territories Nunavut Canada

NT-NU SPILL REPORT

OIL, GASOLINE, CHEMICALS AND OTHER HAZARDOUS MATERIALS

NT-NU 24-HOUR SPILL REPORT LINE
TEL: (867) 920-8130
FAX: (867) 873-6924
EMAIL: spills@gov.nt.ca

REPORT LINE USE ONLY

A	REPORT DATE: MONTH – DAY – YEAR **February 15, 2010**	REPORT TIME **3:00 pm**	☐ ORIGINAL SPILL REPORT, OR ☐ UPDATE # _____ TO THE ORIGINAL SPILL REPORT	REPORT NUMBER
B	OCCURRENCE DATE: MONTH – DAY – YEAR **February 13, 2010**	OCCURRENCE TIME **10:00pm**		
C	LAND USE PERMIT NUMBER (IF APPLICABLE) **na**	WATER LICENCE NUMBER (IF APPLICABLE) **na**		
D	GEOGRAPHIC PLACE NAME OR DISTANCE AND DIRECTION FROM NAMED LOCATION **Lift Station #1 Iqaluit NU.**	REGION ☐ NWT ☐ NUNAVUT ☐ ADJACENT JURISDICTION OR OCEAN		
E	LATITUDE DEGREES MINUTES SECONDS	LONGITUDE DEGREES MINUTES SECONDS		
F	RESPONSIBLE PARTY OR VESSEL NAME **City of Iqaluit**	RESPONSIBLE PARTY ADDRESS OR OFFICE LOCATION **PO Box 460 Iqaluit NU. X0A 0H0**		
G	ANY CONTRACTOR INVOLVED **none**	CONTRACTOR ADDRESS OR OFFICE LOCATION **none**		
H	PRODUCT SPILLED **Sewage**	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES **est. 1000 liters**	U.N. NUMBER	
	SECOND PRODUCT SPILLED (IF APPLICABLE) **na**	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES **na**	U.N. NUMBER	
I	SPILL SOURCE **Pump Failure**	SPILL CAUSE **Blown fuse on main panel**	AREA OF CONTAMINATION IN SQUARE METRES **40 square meters**	
J	FACTORS AFFECTING SPILL OR RECOVERY **On shore**	DESCRIBE ANY ASSISTANCE REQUIRED **Backhoe - Dump Truck**	HAZARDS TO PERSONS, PROPERTY OR ENVIRONMENT **none**	

K — ADDITIONAL INFORMATION, COMMENTS, ACTIONS PROPOSED OR TAKEN TO CONTAIN, RECOVER OR DISPOSE OF SPILLED PRODUCT AND CONTAMINATED MATERIALS

At approx. 10:00 pm I received a page from dispatch on a high level alarm for Lift Station #1. I arrived on site and noticed that sewge had discharged through the overflow. I then replaced the blown fuse on the pump 101 & reset the pump bringing down the level. The spill is contained to the outside of the building around the overflow. Clean up will be done with a backhoe and a dump truck. It will be disposed at the lagoon. I will be in close contact as the cleanup continues & will inform when done for inspection. Any questions please call.

L	REPORTED TO SPILL LINE BY **Robert Hogan**	POSITION **Utilidor Foreman**	EMPLOYER **City of Iqaluit**	LOCATION CALLING FROM **Iqaluit**	TELEPHONE **867-222-2941**
M	ANY ALTERNATE CONTACT **Frank Ford**	POSITION **Operations Super.**	EMPLOYER **City of Iqaluit**	ALTERNATE CONTACT LOCATION **Iqaluit**	ALTERNATE TELEPHONE **867-979-5653**

REPORT LINE USE ONLY

N	RECEIVED AT SPILL LINE BY	POSITION STATION OPERATOR	EMPLOYER	LOCATION CALLED YELLOWKNIFE, NT	REPORT LINE NUMBER (867) 920-8130

LEAD AGENCY ☐ EC ☐ CCG ☐ GNWT ☐ GN ☐ ILA ☐ INAC ☐ NEB ☐ TC | SIGNIFICANCE ☐ MINOR ☐ MAJOR ☐ UNKNOWN | FILE STATUS ☐ OPEN ☐ CLOSED

AGENCY	CONTACT NAME	CONTACT TIME	REMARKS
LEAD AGENCY			
FIRST SUPPORT AGENCY			
SECOND SUPPORT AGENCY			
THIRD SUPPORT AGENCY			

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Spill #4 - March 8, 2010

Northwest Territories Nunavut Canada

NT-NU SPILL REPORT

OIL, GASOLINE, CHEMICALS AND OTHER HAZARDOUS MATERIALS

NT-NU 24-HOUR SPILL REPORT LINE
TEL: (867) 920-8130
FAX: (867) 873-6924
EMAIL: spills@gov.nt.ca

REPORT LINE USE ONLY

A	REPORT DATE: MONTH – DAY – YEAR March 9, 2010	REPORT TIME 11:00AM	☐ ORIGINAL SPILL REPORT, OR ☐ UPDATE # _____ TO THE ORIGINAL SPILL REPORT	REPORT NUMBER ____-_____
B	OCCURRENCE DATE: MONTH – DAY – YEAR March 8, 2010	OCCURRENCE TIME 9:00AM		
C	LAND USE PERMIT NUMBER (IF APPLICABLE)	WATER LICENCE NUMBER (IF APPLICABLE)		
D	GEOGRAPHIC PLACE NAME OR DISTANCE AND DIRECTION FROM NAMED LOCATION Sewage Lift Station #1	REGION ☐ NWT ☒ NUNAVUT ☐ ADJACENT JURISDICTION OR OCEAN		
E	LATITUDE DEGREES MINUTES SECONDS	LONGITUDE DEGREES MINUTES SECONDS		
F	RESPONSIBLE PARTY OR VESSEL NAME City of Iqaluit	RESPONSIBLE PARTY ADDRESS OR OFFICE LOCATION P.O. Box 460 Iqaluit, Nunavut X0A 0H0		
G	ANY CONTRACTOR INVOLVED	CONTRACTOR ADDRESS OR OFFICE LOCATION		
H	PRODUCT SPILLED Sewage	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES 500 liters approximately	U.N. NUMBER	
	SECOND PRODUCT SPILLED (IF APPLICABLE)	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES	U.N. NUMBER	
I	SPILL SOURCE Overflow pipe	SPILL CAUSE Censor in well did not work	AREA OF CONTAMINATION IN SQUARE METRES 20 square meters	
J	FACTORS AFFECTING SPILL OR RECOVERY	DESCRIBE ANY ASSISTANCE REQUIRED	HAZARDS TO PERSONS, PROPERTY OR ENVIRONMENT	

K — ADDITIONAL INFORMATION, COMMENTS, ACTIONS PROPOSED OR TAKEN TO CONTAIN, RECOVER OR DISPOSE OF SPILLED PRODUCT AND CONTAMINATED MATERIALS

The ping censor wasn't working correctly. KRT Electric replaced the censor March 8, 2010. The spill was contained on snow and ice in a small area and was cleaned up immediately by City of Iqaluit's Public Works Department. There were four tandem truck loads (7.65 cubic meter box) of sewage contaminated snow removed and deposited at the sewage lagoon. The utilidor staff is performing hourly checks on sewage lift station #1 to ensure the problem is fixed.

L	REPORTED TO SPILL LINE BY Robert Hogan	POSITION Utilidor Foreman	EMPLOYER City of Iqaluit	LOCATION CALLING FROM Iqaluit	TELEPHONE (867) 222-2941
M	ANY ALTERNATE CONTACT Pat Wolfe	POSITION WWTP Operator	EMPLOYER City of Iqaluit	ALTERNATE CONTACT LOCATION Iqaluit	ALTERNATE TELEPHONE (867)979-5648

REPORT LINE USE ONLY

N	RECEIVED AT SPILL LINE BY	POSITION STATION OPERATOR	EMPLOYER	LOCATION CALLED YELLOWKNIFE, NT	REPORT LINE NUMBER (867) 920-8130

LEAD AGENCY ☐ EC ☐ CCG ☐ GNWT ☐ GN ☐ ILA ☐ INAC ☐ NEB ☐ TC | SIGNIFICANCE ☐ MINOR ☐ MAJOR ☐ UNKNOWN | FILE STATUS ☐ OPEN ☐ CLOSED

AGENCY	CONTACT NAME	CONTACT TIME	REMARKS
LEAD AGENCY			
FIRST SUPPORT AGENCY			
SECOND SUPPORT AGENCY			
THIRD SUPPORT AGENCY			

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Spill #5 - March 5, 2010

Northwest Territories Nunavut Canada

NT-NU SPILL REPORT

OIL, GASOLINE, CHEMICALS AND OTHER HAZARDOUS MATERIALS

NT-NU 24-HOUR SPILL REPORT LINE
TEL: (867) 920-8130
FAX: (867) 873-6924
EMAIL: spills@gov.nt.ca

REPORT LINE USE ONLY

A	REPORT DATE: MONTH – DAY – YEAR: March 5, 2010	REPORT TIME: 2:00PM	☐ ORIGINAL SPILL REPORT, OR ☐ UPDATE # _____ TO THE ORIGINAL SPILL REPORT	REPORT NUMBER ____-____
B	OCCURRENCE DATE: MONTH – DAY – YEAR: March 5, 2010	OCCURRENCE TIME: 9:00AM		
C	LAND USE PERMIT NUMBER (IF APPLICABLE)	WATER LICENCE NUMBER (IF APPLICABLE)		
D	GEOGRAPHIC PLACE NAME OR DISTANCE AND DIRECTION FROM NAMED LOCATION: Sewage Lift Station #1	REGION ☐ NWT ☐ NUNAVUT ☐ ADJACENT JURISDICTION OR OCEAN		
E	LATITUDE DEGREES MINUTES SECONDS	LONGITUDE DEGREES MINUTES SECONDS		
F	RESPONSIBLE PARTY OR VESSEL NAME: City of Iqaluit	RESPONSIBLE PARTY ADDRESS OR OFFICE LOCATION: P.O. Box 460 Iqaluit, Nunavut X0A 0H0		
G	ANY CONTRACTOR INVOLVED	CONTRACTOR ADDRESS OR OFFICE LOCATION		
H	PRODUCT SPILLED: Sewage	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES: 1000 Liters	U.N. NUMBER	
	SECOND PRODUCT SPILLED (IF APPLICABLE)	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES	U.N. NUMBER	
I	SPILL SOURCE: Overflow pipe	SPILL CAUSE: High tide in the Koojesse Inlet	AREA OF CONTAMINATION IN SQUARE METRES: 40 square meters	
J	FACTORS AFFECTING SPILL OR RECOVERY	DESCRIBE ANY ASSISTANCE REQUIRED	HAZARDS TO PERSONS, PROPERTY OR ENVIRONMENT	

K — ADDITIONAL INFORMATION, COMMENTS, ACTIONS PROPOSED OR TAKEN TO CONTAIN, RECOVER OR DISPOSE OF SPILLED PRODUCT AND CONTAMINATED MATERIALS:

The spill was contained in the Koojesse Inlet on snow and ice. An excavator and tandem truck were used to remove the contaminated snow. The contaminated snow was deposited at the sewage lagoon.

L	REPORTED TO SPILL LINE BY: Paul Clow	POSITION: Project Officer	EMPLOYER: City of Iqaluit	LOCATION CALLING FROM: Iqaluit	TELEPHONE: 867-979-6363
M	ANY ALTERNATE CONTACT: Pat Wolfe	POSITION: WWTP Operator	EMPLOYER: City of Iqaluit	ALTERNATE CONTACT LOCATION: Iqaluit	ALTERNATE TELEPHONE: 867-222-2941

REPORT LINE USE ONLY

N	RECEIVED AT SPILL LINE BY	POSITION: STATION OPERATOR	EMPLOYER	LOCATION CALLED: YELLOWKNIFE, NT	REPORT LINE NUMBER: (867) 920-8130

LEAD AGENCY ☐ EC ☐ CCG ☐ GNWT ☐ GN ☐ ILA ☐ INAC ☐ NEB ☐ TC | SIGNIFICANCE ☐ MINOR ☐ MAJOR ☐ UNKNOWN | FILE STATUS ☐ OPEN ☐ CLOSED

AGENCY	CONTACT NAME	CONTACT TIME	REMARKS
LEAD AGENCY			
FIRST SUPPORT AGENCY			
SECOND SUPPORT AGENCY			
THIRD SUPPORT AGENCY			

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Spill #6 - March 16, 2010

Northwest Territories Nunavut Canada

NT-NU SPILL REPORT

OIL, GASOLINE, CHEMICALS AND OTHER HAZARDOUS MATERIALS

NT-NU 24-HOUR SPILL REPORT LINE
TEL: (867) 920-8130
FAX: (867) 873-6924
EMAIL: spills@gov.nt.ca

REPORT LINE USE ONLY

A	REPORT DATE: MONTH – DAY – YEAR March 16, 2010	REPORT TIME 4:45PM	☒ ORIGINAL SPILL REPORT, OR ☐ UPDATE # _____ TO THE ORIGINAL SPILL REPORT	REPORT NUMBER ____-____
B	OCCURRENCE DATE: MONTH – DAY – YEAR March 15, 2010	OCCURRENCE TIME 4:00PM		
C	LAND USE PERMIT NUMBER (IF APPLICABLE)	WATER LICENCE NUMBER (IF APPLICABLE)		
D	GEOGRAPHIC PLACE NAME OR DISTANCE AND DIRECTION FROM NAMED LOCATION Manhole - 63B, 32B, 32A and Lift Station #2	REGION ☐ NWT ☒ NUNAVUT ☐ ADJACENT JURISDICTION OR OCEAN		
E	LATITUDE DEGREES MINUTES SECONDS	LONGITUDE DEGREES MINUTES SECONDS		
F	RESPONSIBLE PARTY OR VESSEL NAME City of Iqaluit	RESPONSIBLE PARTY ADDRESS OR OFFICE LOCATION PO Box 460 Iqaluit, Nunavut X0A 0H0		
G	ANY CONTRACTOR INVOLVED	CONTRACTOR ADDRESS OR OFFICE LOCATION		
H	PRODUCT SPILLED Sewage diluted with potable water	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES 5000 liters estimated	U.N. NUMBER	
	SECOND PRODUCT SPILLED (IF APPLICABLE)	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES	U.N. NUMBER	
I	SPILL SOURCE Lift Station #2	SPILL CAUSE Water Main Break	AREA OF CONTAMINATION IN SQUARE METRES 90	
J	FACTORS AFFECTING SPILL OR RECOVERY	DESCRIBE ANY ASSISTANCE REQUIRED	HAZARDS TO PERSONS, PROPERTY OR ENVIRONMENT	

K — ADDITIONAL INFORMATION, COMMENTS, ACTIONS PROPOSED OR TAKEN TO CONTAIN, RECOVER OR DISPOSE OF SPILLED PRODUCT AND CONTAMINATED MATERIALS

On March 15, 2010, our utilidor foreman received a call from dispatch for a mechanical alarm at Sewage Lift Station #2. The foreman checked the adjacent AV and noticed it was full and overflowing. Sewage trucks and a cleanup crew started immediately, while that was taking place the utilidor foreman noticed that there was a water main break inside manhole 63A, causing an extreme amount of water flowing through the sewer lines to Lift Station #2. The spill is contained to snow and ice around the overflow from Lift Station #2. The cleanup is ongoing and the contaminated snow and ice is being deposited at the sewage lagoon.
Once the water was shutdown the utilidor staff was able to identify the actual cause of the water main break and worked through the night to replace the faulty valve which caused the spill.

L	REPORTED TO SPILL LINE BY Rob Hogan	POSITION Utilidor Foreman	EMPLOYER City of Iqaluit	LOCATION CALLING FROM Iqaluit	TELEPHONE 867-222-2941
M	ANY ALTERNATE CONTACT Paul Clow	POSITION Project Officer	EMPLOYER City of Iqaluit	ALTERNATE CONTACT LOCATION Iqaluit	ALTERNATE TELEPHONE 867-979-6363

REPORT LINE USE ONLY

N	RECEIVED AT SPILL LINE BY	POSITION STATION OPERATOR	EMPLOYER	LOCATION CALLED YELLOWKNIFE, NT	REPORT LINE NUMBER (867) 920-8130

LEAD AGENCY ☐ EC ☐ CCG ☐ GNWT ☐ GN ☐ ILA ☐ INAC ☐ NEB ☐ TC | SIGNIFICANCE ☐ MINOR ☐ MAJOR ☐ UNKNOWN | FILE STATUS ☐ OPEN ☐ CLOSED

AGENCY	CONTACT NAME	CONTACT TIME	REMARKS
LEAD AGENCY			
FIRST SUPPORT AGENCY			
SECOND SUPPORT AGENCY			
THIRD SUPPORT AGENCY			

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Spill #7 - March 7, 2010

Northwest Territories Nunavut Canada

NT-NU SPILL REPORT

OIL, GASOLINE, CHEMICALS AND OTHER HAZARDOUS MATERIALS

NT-NU 24-HOUR SPILL REPORT LINE
TEL: (867) 920-8130
FAX: (867) 873-6924
EMAIL: spills@gov.nt.ca

REPORT LINE USE ONLY

A	REPORT DATE: MONTH – DAY – YEAR March 25, 2010	REPORT TIME 5:00PM	☐ ORIGINAL SPILL REPORT, OR ☐ UPDATE # _____ TO THE ORIGINAL SPILL REPORT	REPORT NUMBER ____-_____
B	OCCURRENCE DATE: MONTH – DAY – YEAR March 18, 2010	OCCURRENCE TIME 2:30PM		
C	LAND USE PERMIT NUMBER (IF APPLICABLE)	WATER LICENCE NUMBER (IF APPLICABLE)		
D	GEOGRAPHIC PLACE NAME OR DISTANCE AND DIRECTION FROM NAMED LOCATION Government of Nunavut Airport land	REGION ☐ NWT ☒ NUNAVUT ☐ ADJACENT JURISDICTION OR OCEAN		
E	LATITUDE DEGREES MINUTES SECONDS	LONGITUDE DEGREES MINUTES SECONDS		
F	RESPONSIBLE PARTY OR VESSEL NAME City of Iqaluit	RESPONSIBLE PARTY ADDRESS OR OFFICE LOCATION PO Boc 460 Iqaliut Nunavut X0A 0H0		
G	ANY CONTRACTOR INVOLVED Nunavut Excavating	CONTRACTOR ADDRESS OR OFFICE LOCATION PO Box 1984 Iqaluit Nunavut X0A 0H0		
H	PRODUCT SPILLED Sewage	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES Unknown	U.N. NUMBER	
	SECOND PRODUCT SPILLED (IF APPLICABLE)	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES	U.N. NUMBER	
I	SPILL SOURCE Sewer Main	SPILL CAUSE Clogged Sewer Main	AREA OF CONTAMINATION IN SQUARE METRES 600 square meters	
J	FACTORS AFFECTING SPILL OR RECOVERY	DESCRIBE ANY ASSISTANCE REQUIRED	HAZARDS TO PERSONS, PROPERTY OR ENVIRONMENT	

K — ADDITIONAL INFORMATION, COMMENTS, ACTIONS PROPOSED OR TAKEN TO CONTAIN, RECOVER OR DISPOSE OF SPILLED PRODUCT AND CONTAMINATED MATERIALS

The Public Works Department blasted the sewer main to free up the pipe. The utilidor staff capped the pipe where the spill occurred. The spill was contained to the immediate area and Nunavut Excavating was then called to perform the cleanup of the contaminated area. The contaminated material was unloaded at the sewage lagoon.

L	REPORTED TO SPILL LINE BY Rob Hogan	POSITION Utilidor Foreman	EMPLOYER City of Iqaluit	LOCATION CALLING FROM Iqaluit	TELEPHONE 222-2941
M	ANY ALTERNATE CONTACT Pat Wolfe	POSITION WWTP Operator	EMPLOYER City of Iqaluit	ALTERNATE CONTACT LOCATION Iqaluit	ALTERNATE TELEPHONE 979-5648

REPORT LINE USE ONLY

N	RECEIVED AT SPILL LINE BY	POSITION STATION OPERATOR	EMPLOYER	LOCATION CALLED YELLOWKNIFE, NT	REPORT LINE NUMBER (867) 920-8130

LEAD AGENCY ☐ EC ☐ CCG ☐ GNWT ☐ GN ☐ ILA ☐ INAC ☐ NEB ☐ TC | SIGNIFICANCE ☐ MINOR ☐ MAJOR ☐ UNKNOWN | FILE STATUS ☐ OPEN ☐ CLOSED

AGENCY	CONTACT NAME	CONTACT TIME	REMARKS
LEAD AGENCY			
FIRST SUPPORT AGENCY			
SECOND SUPPORT AGENCY			
THIRD SUPPORT AGENCY			

PAGE 1 OF _____

Spill #8 - March 25, 2010

Northwest Territories Nunavut Canada

NT-NU SPILL REPORT

OIL, GASOLINE, CHEMICALS AND OTHER HAZARDOUS MATERIALS

NT-NU 24-HOUR SPILL REPORT LINE
TEL: (867) 920-8130
FAX: (867) 873-6924
EMAIL: spills@gov.nt.ca

REPORT LINE USE ONLY

A	REPORT DATE: MONTH – DAY – YEAR: March 25, 2010	REPORT TIME: 5:00PM	☐ ORIGINAL SPILL REPORT, OR ☐ UPDATE # _____ TO THE ORIGINAL SPILL REPORT	REPORT NUMBER ____-____
B	OCCURRENCE DATE: MONTH – DAY – YEAR: March 23, 2010	OCCURRENCE TIME: 3:00PM		
C	LAND USE PERMIT NUMBER (IF APPLICABLE)	WATER LICENCE NUMBER (IF APPLICABLE)		
D	GEOGRAPHIC PLACE NAME OR DISTANCE AND DIRECTION FROM NAMED LOCATION: Manhole #1 - beside Lift Station #1	REGION ☐ NWT ☐ NUNAVUT ☐ ADJACENT JURISDICTION OR OCEAN		
E	LATITUDE DEGREES MINUTES SECONDS	LONGITUDE DEGREES MINUTES SECONDS		
F	RESPONSIBLE PARTY OR VESSEL NAME: City of Iqaluit	RESPONSIBLE PARTY ADDRESS OR OFFICE LOCATION: PO Box 460 Iqaluit Nunavut X0A 0H0		
G	ANY CONTRACTOR INVOLVED	CONTRACTOR ADDRESS OR OFFICE LOCATION		
H	PRODUCT SPILLED: Sewage	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES: 600 liters estimate	U.N. NUMBER	
	SECOND PRODUCT SPILLED (IF APPLICABLE)	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES	U.N. NUMBER	
I	SPILL SOURCE: Sewer Main	SPILL CAUSE: Sewer Main Blockage	AREA OF CONTAMINATION IN SQUARE METRES: 400 square meters approximate	
J	FACTORS AFFECTING SPILL OR RECOVERY	DESCRIBE ANY ASSISTANCE REQUIRED	HAZARDS TO PERSONS, PROPERTY OR ENVIRONMENT	

K — ADDITIONAL INFORMATION, COMMENTS, ACTIONS PROPOSED OR TAKEN TO CONTAIN, RECOVER OR DISPOSE OF SPILLED PRODUCT AND CONTAMINATED MATERIALS:

The Utilidor foreman received a call notifying him that there was a overflow at Manhole #1. He went to the site and called two sewage vacuum trucks to pump out Manhole #1. The spill was contained to the area around Manhole #1 on snow and ice. The sewer main was blocked with rags and the Utilidor crew cleaned the sewer main. The cleanup crew cleared and removed all contaminated snow and ice to the sewage lagoon.

L	REPORTED TO SPILL LINE BY: Rob Hogan	POSITION: Utilidor Foreman	EMPLOYER: City of Iqaluit	LOCATION CALLING FROM: Iqaluit	TELEPHONE: 222-2941
M	ANY ALTERNATE CONTACT: Paul Clow	POSITION: Project Officer	EMPLOYER: City of Iqaluit	ALTERNATE CONTACT LOCATION: Iqaluit	ALTERNATE TELEPHONE: 979-6363

REPORT LINE USE ONLY

N	RECEIVED AT SPILL LINE BY	POSITION: STATION OPERATOR	EMPLOYER	LOCATION CALLED: YELLOWKNIFE, NT	REPORT LINE NUMBER: (867) 920-8130

LEAD AGENCY ☐ EC ☐ CCG ☐ GNWT ☐ GN ☐ ILA ☐ INAC ☐ NEB ☐ TC | SIGNIFICANCE ☐ MINOR ☐ MAJOR ☐ UNKNOWN | FILE STATUS ☐ OPEN ☐ CLOSED

AGENCY	CONTACT NAME	CONTACT TIME	REMARKS
LEAD AGENCY			
FIRST SUPPORT AGENCY			
SECOND SUPPORT AGENCY			
THIRD SUPPORT AGENCY			

PAGE 1 OF _____

Spill #9 - May 1, 2010

Northwest Territories Nunavut Canada

NT-NU SPILL REPORT

OIL, GASOLINE, CHEMICALS AND OTHER HAZARDOUS MATERIALS

NT-NU 24-HOUR SPILL REPORT LINE
TEL: (867) 920-8130
FAX: (867) 873-6924
EMAIL: spills@gov.nt.ca

REPORT LINE USE ONLY

A	REPORT DATE: MONTH – DAY – YEAR 06-03-2010	REPORT TIME 11:00	☒ ORIGINAL SPILL REPORT, OR ☐ UPDATE # TO THE ORIGINAL SPILL REPORT	REPORT NUMBER -
B	OCCURRENCE DATE: MONTH – DAY – YEAR Sometime in May 2010	OCCURRENCE TIME ----		
C	LAND USE PERMIT NUMBER (IF APPLICABLE)	WATER LICENCE NUMBER (IF APPLICABLE)		
D	GEOGRAPHIC PLACE NAME OR DISTANCE AND DIRECTION FROM THE NAMED LOCATION Arctic Winter Games Facility Iqaluit, NU.	REGION ☐ NWT ☒ NUNAVUT ☐ ADJACENT JURISDICTION OR		
E	LATITUDE DEGREES MINUTES SECONDS	LONGITUDE DEGREES MINUTES SECONDS		
F	RESPONSIBLE PARTY OR VESSEL NAME City of Iqaluit	RESPONSIBLE PARTY ADDRESS OR OFFICE LOCATION PO. Box 460 Iqaluit. NU. X0A 0H0		
G	ANY CONTRACTOR INVOLVED none	CONTRACTOR ADDRESS OR OFFICE LOCATION n/a		
H	PRODUCT SPILLED Heating Fuel	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES approx. 20 litres	U.N. NUMBER	
	SECOND PRODUCT SPILLED (IF APPLICABLE) none	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES none	U.N. NUMBER	
I	SPILL SOURCE Heating fuel tank	SPILL CAUSE Heat expansion caused overflow	AREA OF CONTAMINATION IN SQUARE METRES 24 ft2	
J	FACTORS AFFECTING SPILL OR RECOVERY frozen ground	DESCRIBE ANY ASSISTANCE REQUIRED none	HAZARDS TO PERSONS, PROPERTY OR EQUIPMENT none	
K	ADDITIONAL INFORMATION, COMMENTS, ACTIONS PROPOSED OR TAKEN TO CONTAIN, RECOVER OR DISPOSE OF SPILLED PRODUCT AND CONTAMINATED MATERIALS On May 17, 2010 it was brought to my attention that the heating fuel tank behind Arctic Winter Games Facility was leaking. Upon observing, we found that when the fuel tank was last filled there was not enough room left for expansion should the weather warm up. The fuel in the tank expanded in the warm weather, and approximately 20 litres leaked out of the fuel gauge on the top of the fuel tank on to the ground immediately under the tank. City employees used shovels to clean up contaminated soil under the tank, and got as much as they could until the ground thawed more. On June 03, 2010 another attempt to clean up the remaining contaminated soil was done. The remaining contaminated soil was removed and taken to a contained disposal site. We are now waiting for permission to backfill the site upon approval from Envirment and Oceans and Fisheries. Approximately 1.5 cubic meters of soil were removed. Upon approval, site will be backfilled with gravel, or excavate more material if required.				
L	REPORTED TO SPILL LINE BY Frank Ford	POSITION Superintendent PW	EMPLOYER City of Iqaluit	LOCATION CALLING FROM Iqaluit, NU.	TELEPHONE 867-979-5653
M	ANY ALTERNATE CONTACT Rob Hogan	POSITION Utilidor Forman	EMPLOYER City of Iqaluit	ALTERNATE CONTACT LOCATION Iqaluit. NU	ALTERNATE TELEPHONE 867-222-2941

REPORT LINE USE ONLY

N	RECEIVED AT SPILL LINE BY	POSITION Station operator	EMPLOYER	LOCATION CALLED Yellowknife, NT	REPORT LINE NUMBER (867) 920-8130

LEAD AGENCY ☐ EC ☐ COG ☐ GNWT ☐ GN ☐ ILA ☐ INAC ☐ NEB ☐ TC	SIGNIFICANCE ☐ MINOR ☐ MAJOR ☐ UNKNOWN	FILE STATUS ☐ OPEN ☐ CLOSED

AGENCY	CONTACT NAME	CONTACT TIME	REMARKS
LEAD AGENCY			
FIRST SUPPORT AGENCY			
SECOND SUPPORT AGENCY			
THIRD SUPPORT AGENCY			

Spill #10 - July 12, 2010

Northwest Territories Nunavut Canada

NT-NU SPILL REPORT

OIL, GASOLINE, CHEMICALS AND OTHER HAZARDOUS MATERIALS

NT-NU 24-HOUR SPILL REPORT LINE
TEL: (867) 920-8130
FAX: (867) 873-6924
EMAIL: spills@gov.nt.ca

REPORT LINE USE ONLY

A	REPORT DATE: MONTH – DAY – YEAR July 12/2010	REPORT TIME 13;00	☒ ORIGINAL SPILL REPORT, OR	REPORT NUMBER -
B	OCCURRENCE DATE: MONTH – DAY – YEAR July 11/2010	OCCURRENCE TIME 21:00—-	☐ UPDATE # TO THE ORIGINAL SPILL REPORT	
C	LAND USE PERMIT NUMBER (IF APPLICABLE)	WATER LICENCE NUMBER (IF APPLICABLE)		
D	GEOGRAPHIC PLACE NAME OR DISTANCE AND DIRECTION FROM THE NAMED LOCATION House #1692	REGION ☐ NWT ☒ NUNAVUT ☐ ADJACENT JURISDICTION OR		
E	LATITUDE DEGREES MINUTES SECONDS	LONGITUDE DEGREES MINUTES SECONDS		
F	RESPONSIBLE PARTY OR VESSEL NAME City of Iqaluit	RESPONSIBLE PARTY ADDRESS OR OFFICE LOCATION PO. Box 460 Iqaluit. NU. X0A 0H0		
G	ANY CONTRACTOR INVOLVED none	CONTRACTOR ADDRESS OR OFFICE LOCATION		
H	PRODUCT SPILLED Sewage	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES 150 approx	U.N. NUMBER	
	SECOND PRODUCT SPILLED (IF APPLICABLE)	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES	U.N. NUMBER	
I	SPILL SOURCE Backed up Sewage pipe at AV 232	SPILL CAUSE Grease buildup in pipe	AREA OF CONTAMINATION IN SQUARE METRES approx 480 square ft.	
J	FACTORS AFFECTING SPILL OR RECOVERY Rocky, rough terrain	DESCRIBE ANY ASSISTANCE REQUIRED none	HAZARDS TO PERSONS, PROPERTY OR EQUIPMENT none	
K	ADDITIONAL INFORMATION, COMMENTS, ACTIONS PROPOSED OR TAKEN TO CONTAIN, RECOVER OR DISPOSE OF SPILLED PRODUCT AND CONTAMINATED MATERIALS **At approx. 21:00 Rob Hogan received a page from dispatch, regarding sewage backing up next to house #1692. Upon investigation there was noticed a severe grease build up in the sewage lines at AV 232. A Vac truck was called in immediately to contain the spill and avoid any further overflow. The sewage lines were then blasted and cleared of any debris. The homeowner and public health were notified immediately and cleanup is ongoing.**				
L	REPORTED TO SPILL LINE BY Rob Hogan	POSITION Utilidor Foreman	EMPLOYER City of Iqualuit	LOCATION CALLING FROM 1554D	TELEPHONE 83-67-222-2941
M	ANY ALTERNATE CONTACT Frank Ford	POSITION PW Superintendent	EMPLOYER City of Iqaluit	ALTERNATE CONTACT LOCATION Municipal Garage	ALTERNATE TELEPHONE 867-222-2965

REPORT LINE USE ONLY

N	RECEIVED AT SPILL LINE BY	POSITION Station operator	EMPLOYER	LOCATION CALLED Yellowknife, NT	REPORT LINE NUMBER (867) 920-8130

LEAD AGENCY ☐ EC ☐ COG ☐ GNWT ☐ GN ☐ ILA ☐ INAC ☐ NEB ☐ TC	SIGNIFICANCE ☐ MINOR ☐ MAJOR ☐ UNKNOWN	FILE STATUS ☐ OPEN ☐ CLOSED

AGENCY	CONTACT NAME	CONTACT TIME	REMARKS
LEAD AGENCY			
FIRST SUPPORT AGENCY			
SECOND SUPPORT AGENCY			
THIRD SUPPORT AGENCY			

Spill #11 - August 12, 2010

Northwest Territories Nunavut Canada

NT-NU SPILL REPORT

OIL, GASOLINE, CHEMICALS AND OTHER HAZARDOUS MATERIALS

NT-NU 24-HOUR SPILL REPORT LINE
TEL: (867) 920-8130
FAX: (867) 873-6924
EMAIL: spills@gov.nt.ca

REPORT LINE USE ONLY

A	REPORT DATE: MONTH – DAY – YEAR 08-12-2010	REPORT TIME 10:00	☒ ORIGINAL SPILL REPORT, OR	REPORT NUMBER -
B	OCCURRENCE DATE: MONTH – DAY – YEAR 08-12-2010	OCCURRENCE TIME -15:30——	☐ UPDATE # TO THE ORIGINAL SPILL REPORT	
C	LAND USE PERMIT NUMBER (IF APPLICABLE)	WATER LICENCE NUMBER (IF APPLICABLE)		
D	GEOGRAPHIC PLACE NAME OR DISTANCE AND DIRECTION FROM THE NAMED LOCATION House # 2523	REGION ☐ NWT ☒ NUNAVUT ☐ ADJACENT JURISDICTION OR		
E	LATITUDE DEGREES MINUTES SECONDS	LONGITUDE DEGREES MINUTES SECONDS		
F	RESPONSIBLE PARTY OR VESSEL NAME City of Iqaluit	RESPONSIBLE PARTY ADDRESS OR OFFICE LOCATION PO. Box 460 Iqaluit. NU. X0A 0H0		
G	ANY CONTRACTOR INVOLVED Lawlor Mechanical	CONTRACTOR ADDRESS OR OFFICE LOCATION Box 11160 Iqaluit, NU. X0A 0H0		
H	PRODUCT SPILLED Heating Fuel	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES 400 - 500 litres approx	U.N. NUMBER	
	SECOND PRODUCT SPILLED (IF APPLICABLE)	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES	U.N. NUMBER	
I	SPILL SOURCE Heating Fuel Tank	SPILL CAUSE Sewage Truck backed into tank	AREA OF CONTAMINATION IN SQUARE METRES 8 sq. m.	
J	FACTORS AFFECTING SPILL OR RECOVERY sepage under home	DESCRIBE ANY ASSISTANCE REQUIRED	HAZARDS TO PERSONS, PROPERTY OR EQUIPMENT	
K	ADDITIONAL INFORMATION, COMMENTS, ACTIONS PROPOSED OR TAKEN TO CONTAIN, RECOVER OR DISPOSE OF SPILLED PRODUCT AND CONTAMINATED MATERIALS At approximately 15:30 on Aug. 12 it was reported that sewage truck accidentally backed into a home heating fuel tank at House # 2523 in the City of Iqaluit. Bylaw and Nunatta Environmental were immediately called to the scene, where it was noted that approx. 400 - 500 litres of diesel fuel had leaked out of the tank. City equipment was called in to remove the fuel tank and stand from site and cleanup was started with City of Iqaluit equipment including a backhoe, loader, dump truck and several employees with shovels. The cleanup is ongoing, with all contaminated soil being hauled to Nunatta Environmental disposal yard. Upon satisfactory completion, Nunatta Environmental wil take soil samples of area and re-assessment can be done. At present, there has been approximately 30 m.3 of soill removed from site and disposed of at Nunatta and manual cleanup is ongoing. Lawlor Mechanical was used to hook up a temporary home heating fuel supply tank until cleanup is complete.				
L	REPORTED TO SPILL LINE BY Frank Ford	POSITION PW. Superintendent	EMPLOYER City of Iqaluit	LOCATION CALLING FROM Iqaluit	TELEPHONE 867-979-5653
M	ANY ALTERNATE CONTACT Rob Hogan	POSITION Utilidor Forman	EMPLOYER City of Iqaluit	ALTERNATE CONTACT LOCATION Iqaluit	ALTERNATE TELEPHONE 867-222-2941

REPORT LINE USE ONLY

N	RECEIVED AT SPILL LINE BY	POSITION Station operator	EMPLOYER	LOCATION CALLED Yellowknife, NT	REPORT LINE NUMBER (867) 920-8130

LEAD AGENCY ☐ EC ☐ COG ☐ GNWT ☐ GN ☐ ILA ☐ INAC ☐ NEB ☐ TC	SIGNIFICANCE ☐ MINOR ☐ MAJOR ☐ UNKNOWN	FILE STATUS ☐ OPEN ☐ CLOSED

AGENCY	CONTACT NAME	CONTACT TIME	REMARKS
LEAD AGENCY			
FIRST SUPPORT AGENCY			
SECOND SUPPORT AGENCY			
THIRD SUPPORT AGENCY			

Spill #12 - December 22, 2010

Northwest Territories Nunavut Canada

NT-NU SPILL REPORT

OIL, GASOLINE, CHEMICALS AND OTHER HAZARDOUS MATERIALS

NT-NU 24-HOUR SPILL REPORT LINE
TEL: (867) 920-8130
FAX: (867) 873-6924
EMAIL: spills@gov.nt.ca

REPORT LINE USE ONLY

A	REPORT DATE: MONTH – DAY – YEAR **December 22, 2010**	REPORT TIME **12:00PM**	☐ ORIGINAL SPILL REPORT, OR	REPORT NUMBER -
B	OCCURRENCE DATE: MONTH – DAY – YEAR **December 22, 2010**	OCCURRENCE TIME **8:00AM**	☐ UPDATE # TO THE ORIGINAL SPILL REPORT	
C	LAND USE PERMIT NUMBER (IF APPLICABLE)	WATER LICENCE NUMBER (IF APPLICABLE) **3AM-IQA0611**		
D	GEOGRAPHIC PLACE NAME OR DISTANCE AND DIRECTION FROM THE NAMED LOCATION **Iqaluit**	REGION ☐ NWT ☒ NUNAVUT ☐ ADJACENT JURISDICTION OR		
E	LATITUDE DEGREES MINUTES SECONDS	LONGITUDE DEGREES MINUTES SECONDS		
F	RESPONSIBLE PARTY OR VESSEL NAME **City of Iqaluit**	RESPONSIBLE PARTY ADDRESS OR OFFICE LOCATION **PO Box 460 Iqaluit. NU X0A 0H0**		
G	ANY CONTRACTOR INVOLVED **NA**	CONTRACTOR ADDRESS OR OFFICE LOCATION		
H	PRODUCT SPILLED **Sewage**	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES **200 Liters**	U.N. NUMBER	
	SECOND PRODUCT SPILLED (IF APPLICABLE) **NA**	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES	U.N. NUMBER	
I	SPILL SOURCE **Access Vault 415**	SPILL CAUSE **Blockage in the line**	AREA OF CONTAMINATION IN SQUARE METRES **10 sq. meters**	
J	FACTORS AFFECTING SPILL OR RECOVERY **None**	DESCRIBE ANY ASSISTANCE REQUIRED	HAZARDS TO PERSONS, PROPERTY OR EQUIPMENT	
K	ADDITIONAL INFORMATION, COMMENTS, ACTIONS PROPOSED OR TAKEN TO CONTAIN, RECOVER OR DISPOSE OF SPILLED PRODUCT AND CONTAMINATED MATERIALS **At 8:00AM the Public Works Roads Foreman noticed the spill and contacted the Acting Utilidor Foreman. Sewage trucks were called to the site to pump down the level of sewage in Access Vault (AV) 415. The hot water blaster was then used to blast the line and free the blockage. A loader and a tandem truck were used to clean up the sewage that had saturated the surrounding snow and the affected snow was brought to the sewage lagoon.**			

L	REPORTED TO SPILL LINE BY **Arif Sayani**	POSITION **A/Manager PW**	EMPLOYER **City of Iqaluit**	LOCATION CALLING FROM **Iqaluit**	TELEPHONE **867-222-4436**
M	ANY ALTERNATE CONTACT **Paul Clow**	POSITION **Project Officer**	EMPLOYER **City of Iqaluit**	ALTERNATE CONTACT LOCATION **Iqaluit**	ALTERNATE TELEPHONE **867-979-6363 x233**

REPORT LINE USE ONLY

N	RECEIVED AT SPILL LINE BY	POSITION **Station operator**	EMPLOYER	LOCATION CALLED **Yellowknife, NT**	REPORT LINE NUMBER **(867) 920-8130**

LEAD AGENCY ☐ EC ☐ COG ☐ GNWT ☐ GN ☐ ILA ☐ INAC ☐ NEB ☐ TC	SIGNIFICANCE ☐ MINOR ☐ MAJOR ☐ UNKNOWN	FILE STATUS ☐ OPEN ☐ CLOSED

AGENCY	CONTACT NAME	CONTACT TIME	REMARKS
LEAD AGENCY			
FIRST SUPPORT AGENCY			
SECOND SUPPORT AGENCY			
THIRD SUPPORT AGENCY			

Spill #13 - December 27, 2010

Northwest Territories Nunavut Canada

NT-NU SPILL REPORT

OIL, GASOLINE, CHEMICALS AND OTHER HAZARDOUS MATERIALS

NT-NU 24-HOUR SPILL REPORT LINE
TEL: (867) 920-8130
FAX: (867) 873-6924
EMAIL: spills@gov.nt.ca

REPORT LINE USE ONLY

A	REPORT DATE: MONTH – DAY – YEAR **December 27, 2010**	REPORT TIME **1:00 PM**	☒ ORIGINAL SPILL REPORT, OR	REPORT NUMBER -
B	OCCURRENCE DATE: MONTH – DAY – YEAR **Discovered on December 27, 2010**	OCCURRENCE TIME **8:30 AM**	☐ UPDATE # TO THE ORIGINAL SPILL REPORT	
C	LAND USE PERMIT NUMBER (IF APPLICABLE)	WATER LICENCE NUMBER (IF APPLICABLE)		
D	GEOGRAPHIC PLACE NAME OR DISTANCE AND DIRECTION FROM THE NAMED LOCATION **Iqaluit**	REGION ☐ NWT ☒ NUNAVUT ☐ ADJACENT JURISDICTION OR		
E	LATITUDE DEGREES MINUTES SECONDS	LONGITUDE DEGREES MINUTES SECONDS		
F	RESPONSIBLE PARTY OR VESSEL NAME **City of Iqaluit**	RESPONSIBLE PARTY ADDRESS OR OFFICE LOCATION **P.O. Box 460 Iqaluit. NU X0A 0H0**		
G	ANY CONTRACTOR INVOLVED **NA**	CONTRACTOR ADDRESS OR OFFICE LOCATION **NA**		
H	PRODUCT SPILLED **Fuel**	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES **100 L**	U.N. NUMBER	
	SECOND PRODUCT SPILLED (IF APPLICABLE) **NA**	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES **NA**	U.N. NUMBER	
I	SPILL SOURCE **Fuel Tank at Apex Garage**	SPILL CAUSE **Equipment malfunction**	AREA OF CONTAMINATION IN SQUARE METRES **10 sq. meters**	
J	FACTORS AFFECTING SPILL OR RECOVERY **Direction required**	DESCRIBE ANY ASSISTANCE REQUIRED **Direction required**	HAZARDS TO PERSONS, PROPERTY OR EQUIPMENT	
K	ADDITIONAL INFORMATION, COMMENTS, ACTIONS PROPOSED OR TAKEN TO CONTAIN, RECOVER OR DISPOSE OF SPILLED PRODUCT AND CONTAMINATED MATERIALS **The heating system at the City's Apex Garage has been malfunctioning for the last 3-4 days. During this time, a temporary fuel supply has been installed indoors to allow the system to function. On December 27, 2010 at 8:30 am, the Acting Utilidor Foreman was at the garage to let in a contractor to fix the heating system. At this time, it was noticed that a fuel spill of approximately 100 L had occurred on the exterior fuel tank. It appears that a check valve on a secondary motor failed and that the fuel from the temporary supply was pumped in to the main exterior tank. Furthermore, it appears that the containment section on the main tank was compromised resulting in the spill. The extent of the spill is minimal and the fuel has collected under the tank and up to 2 meters from the tank in the surrounding area. The presence of snow and cold weather has helped in keeping the affected area to a minimum. Barricades have been placed around the fuel tank.** **The City requests that direction be given on the recovery process.**				
L	REPORTED TO SPILL LINE BY **Arif Sayani**	POSITION **A/Manager PW**	EMPLOYER **City of Iqaluit**	LOCATION CALLING FROM **Iqaluit**	TELEPHONE **867-222-4436**
M	ANY ALTERNATE CONTACT	POSITION	EMPLOYER	ALTERNATE CONTACT LOCATION	ALTERNATE TELEPHONE

REPORT LINE USE ONLY

N	RECEIVED AT SPILL LINE BY	POSITION **Station operator**	EMPLOYER	LOCATION CALLED **Yellowknife, NT**	REPORT LINE NUMBER **(867) 920-8130**

LEAD AGENCY ☐ EC ☐ COG ☐ GNWT ☐ GN ☐ ILA ☐ INAC ☐ NEB ☐ TC	SIGNIFICANCE ☐ MINOR ☐ MAJOR ☐ UNKNOWN	FILE STATUS ☐ OPEN ☐ CLOSED

AGENCY	CONTACT NAME	CONTACT TIME	REMARKS
LEAD AGENCY			
FIRST SUPPORT AGENCY			
SECOND SUPPORT AGENCY			
THIRD SUPPORT AGENCY			

Appendix F

Underwater Survey Report

Date: Aug. 12, 2010

Client: Concentric Associates International Incorporated

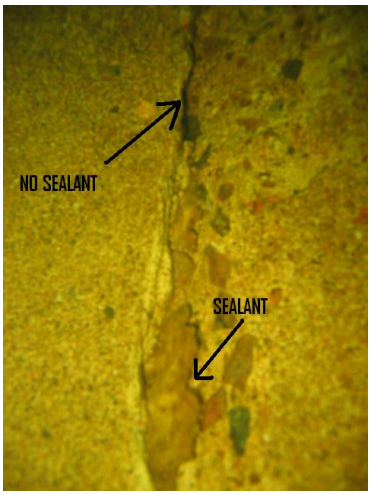
Location: Geraldine Dam, Iqaluit, NU

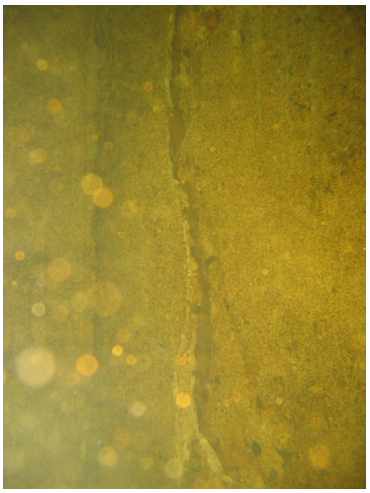
Job Scope:
• Perform an underwater visual inspection of the upstream concrete face of the dam.
• The diver shall note on the drawings provided areas of deterioration, including but not limited to; concrete deterioration, cracking, erosion, etc. Additional attention is required at locations where leaking is observed on the downstream side of the dam, along expansion joints, construction joints, and where the dam meets the lake bed.
• The diver shall visually inspect the entire length of the dam, at 1m depth intervals starting at the surface. The diver shall make all efforts to limit disturbances to the surrounding lake bed to provide adequate clarity during inspection.
• The diver shall take photographic images of areas of concern; concrete deterioration, cracking, etc. A full underwater video record of the inspection shall also be undertaken.
• The diver shall provide adequate lighting during the inspection at all times.

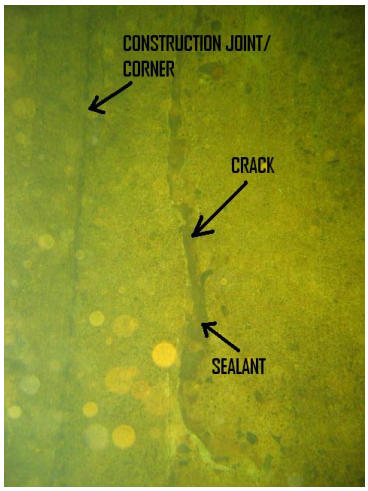
Crew: Jason Golka
Dave Podealuk
Dylan Lukenbill

Summary: Overall, the dam is in excellent condition. All of the concrete is intact and there are no signs of degradation. There are some spots on the downstream side that show a minimal amount of leakage. These were noted by the client previous to the inspection. The upstream side however, does not yield much evidence of these leaks. The diver found only one crack on the upstream side of the dam and it had already been filled with some sort of sealant. The crack was however in line with one of the leaks on the downstream side.
The other leaks are minimal and the water is likely moving though a cold joint or expansion joint, and would be difficult to find due to the lack of flow. The diver did note that the new addition to the dam had sealant in the expansion joints but only at the top. It appears as though the sealant was used when the expansion to the dam was done. There is no evidence of sealant lower on the dam. It is assumed that the workers placed the sealant down to the water at the time, and that was all that could be reached. Note: The

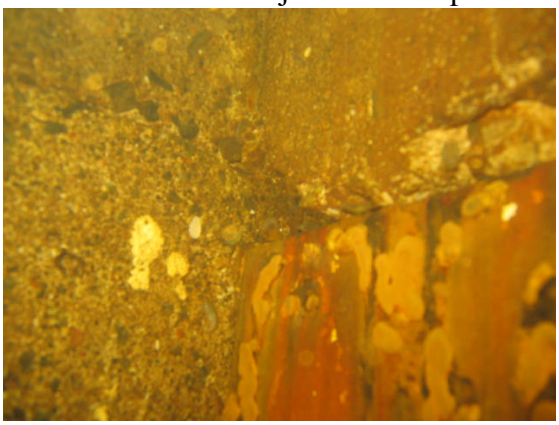
leaks found on the downstream side are well below the new addition to the dam where there is no sealant in the expansion joints.
These photos were taken of the crack found about +8050mm from line D, very close to line E, and between elevation 2 and 3 on the drawing.
The crack seems to have had some type of sealant injected into it, and is also in line with one of the leaks found on the downstream side.

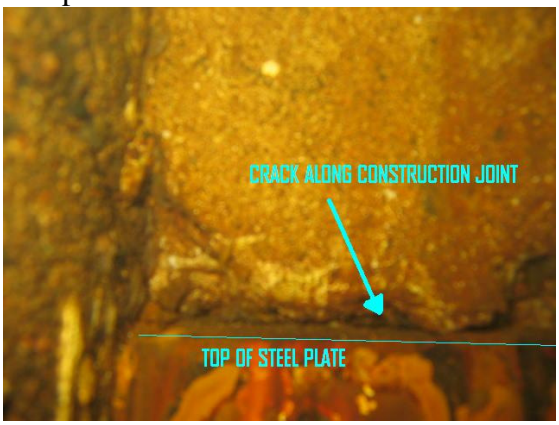






The top of the crack starts at the construction joint between the old concrete and the newer addition. It runs almost parallel with the construction joint in the corner down to the next construction joint at the top of the steel plate.





The photos below show the sealant in the expansion joints. This sealant does not go beyond the new concrete. The photos clearly show that there was no sealant in the joint previous to the placement of the sealant shown. All of the expansion joints look like this. More visual evidence can be seen in the video that was produced.