

Rhonda Miller

From: Patricia Hogg [Patricia_Hogg@gov.nt.ca]
Sent: Thursday, March 13, 2008 2:40 PM
To: permits@mvlwb.com
Cc: Rhonda Batchelor; Steve Loutitt
Subject: Annual Report 2007 - Yellowknife Airport
Attachments: Ltr2007AnnualreportMVLWB.pdf; 2007AnnualReportYZF.doc; GlycolMitigationOperPlanmarch08.doc; InstalltnReport2007.pdf

Ms. Mullaney,

Please find attached DOT's Annual Report (2007) and accompanying documents for the Yellowknife Airport. If you have any questions, please contact Rhonda Batchelor, Senior Environmental Affairs Analyst at 873-7063.

Regards,

Patty Hogg
Environmental Analyst



March 12, 2008

Ms. Tyree Mullaney
Regulatory Officer
Mackenzie Valley Land and Water Board
7th Floor - 4910 50th Avenue
PO BOX 2130
YELLOWKNIFE NT X1A 2P6

Dear Ms. Mullaney:

Yellowknife Airport Water Licence MV2001L3-0012 - 2008 Annual Report

In accordance with the Yellowknife Airport Water License (MV2001L3-0012), the Department of Transportation (DoT) is required to submit an Annual Report as of March 31 of the year following the calendar year reported. Please accept this report as fulfillment of these requirements.

Regards,

Patricia Hogg
Environmental Analyst

Attachment



**Yellowknife Airport Water License
MV2001L3-0012**

Annual Report 2007

Prepared By:

Department of Transportation
Government of the Northwest Territories

March 2008



In accordance with Yellowknife Airport's Water License MV2001L3-0012, the Department of Transportation (DoT) is required to submit an Annual Report as of March 31 of the year following the calendar year reported. This report fulfills those requirements. Where no Part or Item is listed below, no reporting is required.

Part B: General Conditions

1. a) Monthly and Annual Quantities of Water Obtained (All Sources)

In 2007, the Yellowknife Airport had 1,075 cubic metres of potable water delivered by truck to three (3) locations (Airport Terminal Building, Maintenance Garage and Fire Hall). This water is delivered and consumed on a regular monthly basis and does not change quantities much from month to month.

Non-Potable water used during this period was 5,324 cubic metres obtained from Long Lake.

Consumption was made on a quarterly basis as noted below:

Jan 1 – Mar 31	Apr 1 – Jun 30	July 1 – Sep 30	Oct 1 – Dec 31
1331	1581	1221	1191

b) Annual quantities of de-icing fluid (ie. Glycol) used 2006-2007:

Month	Glycol Usage (litres)
September 2006	474
October 2006	13,402
November 2006	30,859
December 2006	16,992
January 2007	20,009
February 2007	8,652
March 2007	10,101
April 2007	7,442
May 2007	544

c) Glycol Mitigation Plan

See attached file: *2008 Glycol Mitigation Operational Plan*

d) Sewage Solids Removed from Sewage Disposal Facilities

In 2007, the Yellowknife Airport had 5,615 cubic metres of sewage trucked off site by Kavanaugh Brothers.

e) Updates/Revisions to the Waste Disposal Facilities Operation and Maintenance Plans

No Updates/Revisions to report

f) Updates/Revisions to the Spill Contingency Plan

No updates or revisions to the Spill Contingency Plan.

g) Summary of Modifications and/or Major Maintenance Work Carried out on the Water Supply and Waste Disposal Facilities

No modifications to the facilities during this period.

h) Summary of any Abandonment and Restoration Work Completed During the Year and an Outline of any Work Anticipated for the Next Year

No work done during this year and none planned for the following year.

i) Summary of any Studies Requested by the Board that Relate to Waste Disposal, Water Use or Reclamation, and a Brief Description of any Future Studies Planned

No studies done and none planned. Water sampling completed annually.

j) List of Unauthorized Discharges

None.

k) Other Details on Water Use or Waste Disposal Requested by the Board by November 1st of the Year Being Reported

No other requests made.

l) Summary of Airport Expansion or Development Work Completed during the Year and an Outline of Work Anticipated for the Following Year

None

Part D: Conditions applying to waste disposal

7. As-built drawings of the new Gylcol Retention Facility.

See attached file: HDPE liner installation report (Aug 2007)

GNWT Dept. of Transportation

**Glycol contaminated snow
containment facility**

HDPE liner installation report

Aug. 17, 2007





Northwest Territories Transportation

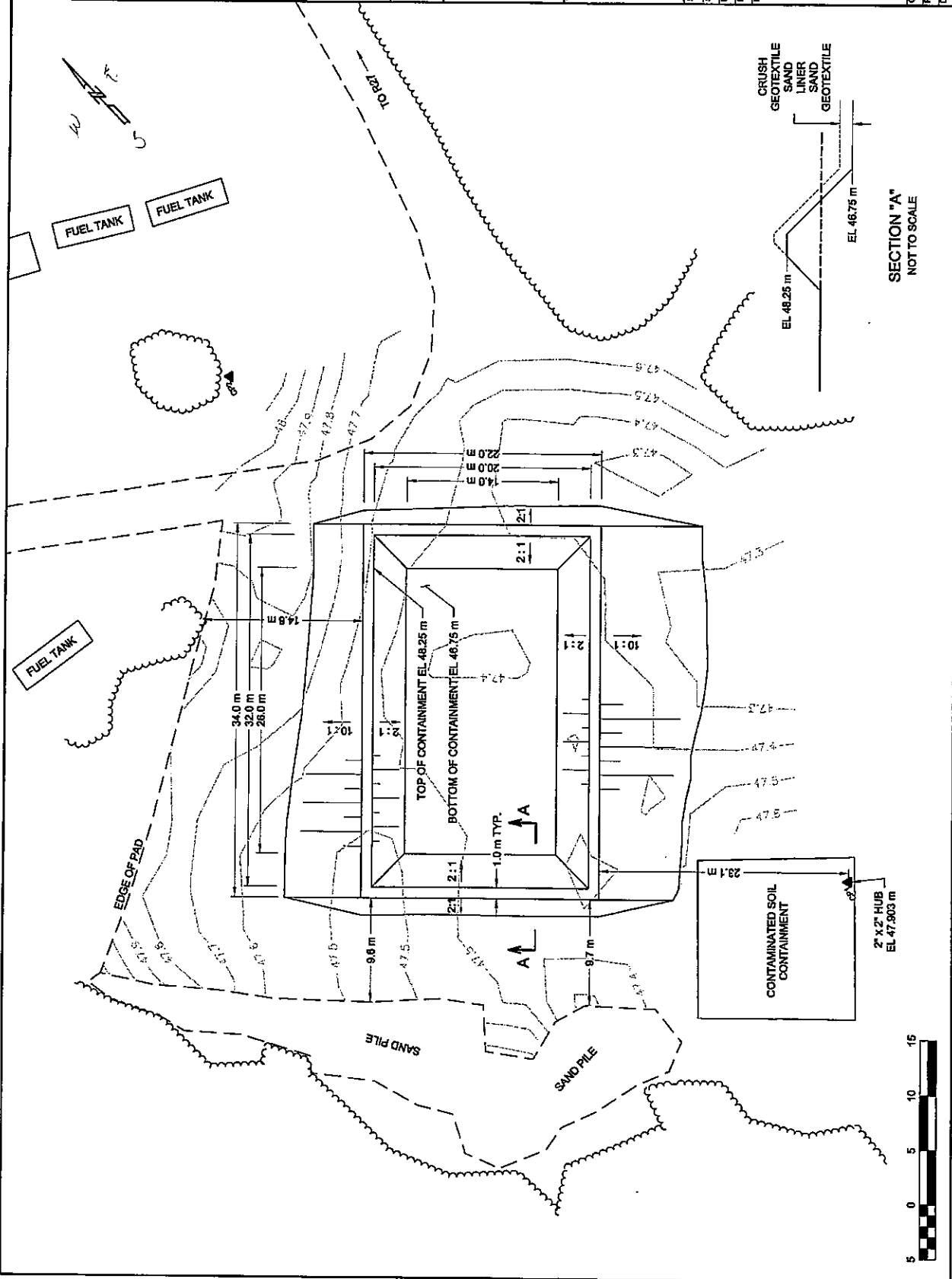
SUB GRADE VOLUMES
CUT VOLUME: 287 CU M
FILL VOLUME: 368 CU M

KJ Technical Services Ltd.
1000-10th Avenue, Yellowknife, N.W.T. X1A 2S5
Project

DEICING FLUID/SNOW
DISPOSAL CONTAINMENT
YELLOWKNIFE AIRPORT

PLAN

Scale	1:300
Drawn by	K. Jibey
Checked by	K. Jibey
Designed by	K. Jibey
Project No.	
Page	of
Drawing No.	



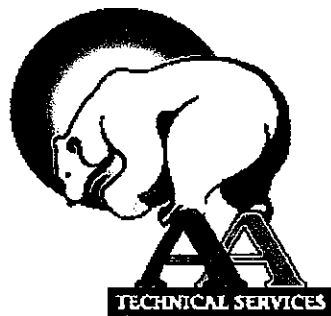
GNWT Dept. of Transportation

Glycol contaminated snow containment facility

60mil HDPE liner installation

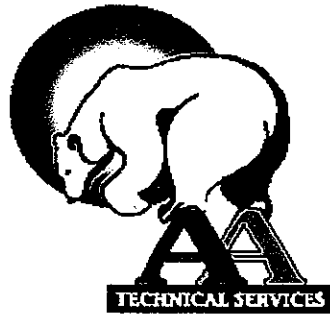
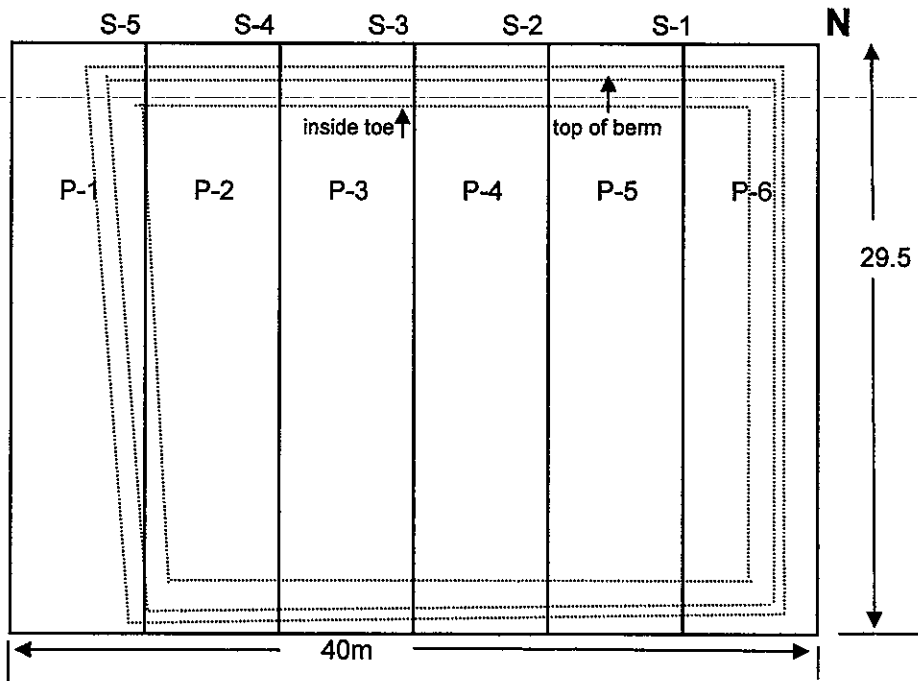
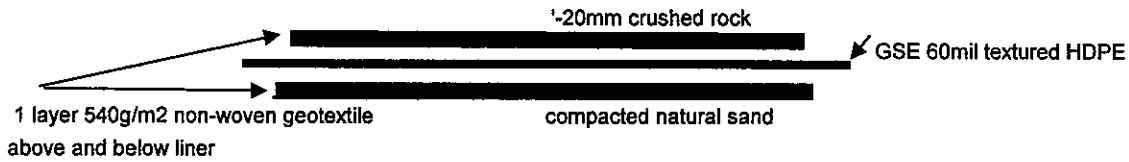
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page 3	Daily wedge welder qualification test data
page 4	Seam air pressure test data
page 5	GSE factory roll test data
page 6	Warranty



Glycol contaminated snow containment facility

60mil single textured HDPE panel layout drawing



(not to scale)

WEDGE WELDER QUALIFICATION DATA

A&A TECHNICAL SERVICES
327 OLD AIRPORT ROAD
YELLOWKNIFE, NT

PROJECT NAME:	Glycol contaminated snow contain.
LOCATION:	Yellowknife Airport
Client:	GNWT DOT (Environment)
DATE:	Aug. 17/07
Q/C TECHNICIAN	Al Harman

WEDGE WELDER No	1
TRAVEL SPEED (m/min)	1.8
SHEET TEMPERATURE (°C)	+25
WEDGE TEMPERATURE (°C)	356
MATERIAL HDPE	GSE 60mil S-tex

DESTRUCTIVE TEST RESULTS

PEEL TESTS

TEST No.	lbs/in.	% Separat	Comments:
1	146/151	0	
2	140/145	0	
3	148/152	0	All samples failed outside weld
4			
5			

SHEAR TESTS

TEST No.	lbs/in.	Comments:
1	174	
2	177	
3	175	All samples failed outside weld
4		
5		

Q/C TECHNICIAN

signature

AH,

NOTE: ASTM Minimum weld strength for 60 mil HDPE
 Peel 78 lbs/in
 Shear 120 lbs/in



Liming Technology, Inc

Roll Test Data Report

Bill of Lading: 67260

Sales Order No. 51645

Project Number 523207

Customer Name A & A Technical Services

Project Location Canada

Product Name HST060AW00



Report Date 5/31/2007

Modified

Roll No.	ASTM D 3994				ASTM D 638 Type II B483				ASTM D 1004				ASTM D 4833		ASTM D 1505		ASTM D 1603		ASTM D 5596		GRI G1.12
	Average Thickness (mil)	Minimum Thickness (mil)	TD Strength @ Yield (psi)	TD Strength @ Break (psi)	TD Elongation @ Yield (%)	TD Elongation @ Break (%)	TD Elongation @ Yield (%)	TD Elongation @ Break (%)	TD Tear Resistance (lb)	TD Tear Resistance (lb)	Puncture Resistance (lb)	Puncture Resistance (lb)	Density (g/cc)	Carbon Black Content (%)	Carbon Black Dispersion	Aggreg. Height (mil)	Aggreg. Height (mil)	Vis. in Carl. Cell	Vis. in Carl. Cell	Side A (mil)	
102127925	60	56	169	170	183	200	15	17	475	485	55	56	159	0.948	2.67	10	25				
102127926	60	56	174	166	151	-205	15	18	290	500	56	57	163	0.947	2.75	10	25				
102127974	61	56	171	166	174	198	16	18	452	509	54	56	155	0.946	2.79	10	27				
102127975	61	57	170	167	169	204	16	17	440	525	56	59	160	0.946	2.64	10	27				
102127976	61	56	170	167	189	204	16	17	440	525	56	59	160	0.946	2.64	10	27				
102127977	61	56	170	167	169	204	16	17	440	525	56	59	160	0.946	2.64	10	25				

2812906787

Approved By:

This test report shall not be reproduced, except in full, without written approval of the laboratory.

19103 Gundie Road - Houston, Texas 77073

GLYCOL MITIGATION OPERATIONAL PLAN

**Yellowknife Airport Water License
MV2001L3-0012**

Submitted to:

Mackenzie Valley Land and Water Board
Box 2130
Yellowknife, NT
X1A 2P6

Prepared By:

Department of Transportation
Government of the Northwest Territories



March 11, 2008

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1.0 Introduction

The Glycol Mitigation Operational Plan (GMOP) addresses the potential risks associated with the use of de-icing products (i.e. glycol) at the Yellowknife Airport. The purpose of this plan is to:

- Ensure that adequate measures are in place to account for product storage, handling, and usage, as well as runoff containment and waste storage; and,
- Limit airport liability while ensuring compliance with all applicable regulations, standards and guidelines.

The GMOP has been compiled in consultation with the Airport Manager's office and Environmental Affairs in the Department of Transportation (DoT) and is intended as a reference document for airport operators and staff. The GMOP fulfills the requirement of the MVLWB for the Yellowknife Airport Water License MV2001L3-0012.

2.0 De-icing Fluids

De-icing fluids are used by Air Carriers during cold months to remove ice from aircraft. De-icing fluids are composed of a combination of glycol, water, and additives. Although there are different types of glycol used in de-icing fluids, only Type I De-icing fluid, which consists of ethylene glycol, is used for regular de-icing procedures at the Yellowknife Airport. Ethylene glycol is the more toxic of the different types of glycol, however it is more efficient and smaller amounts are therefore required. Yellowknife Airport tenants currently use: UCAR™ Aircraft Deicing Fluid XL 54 SAE/ ISO Type I. Refer to Appendix C for Material Safety Data Sheet for Ethylene Glycol.

Tenants are required to report any changes to the type of de-icing fluid that is used on their properties to the Airport Manager.

2.1 De-icing Season

Due to the nature of de-icing requirements, the use of de-icing fluid normally extends from September 15 through May 15. Therefore the number of days in an average de-icing season is 244 days. However, because the de-icing season is highly dependent upon weather patterns, the season can be extended in length when needed.

2.2 Volumes

The use of de-icing product by air carriers is monitored, and this data is compiled and submitted to the Airport Manager's Office via the Airline Monthly Report. The total volume of de-icing products used for this past season (September 2006 - May 2007) was (104,475.0 L). See Appendix A for the Yellowknife Airport De-icing Volumes 2006-2007.

2.3 Storage and Handling

De-icing fluid is transported onto airport property using de-icing vehicles. It is applied from specialized equipment designed specifically for that purpose. The fluid comes in 45-gallon (205 L) drums, which are securely stored outdoors. First Air has a bulk storage facility on site and the de-icing fluid is delivered by tanker truck. Air carriers are responsible for reporting any changes in equipment or storage in the Airline Monthly Report (See Section 5.3).

3.0 De-icing Fluid Use

3.1 Environmental Concerns

The introduction of de-icing fluid into the natural environment is of special concern to DoT due to the close proximity of Long Lake to the airport. Long Lake is considered a sensitive environment because 1) it is an ecological zone that harbors animals and plants, 2) it is the source of non-potable water for the airport, and 3) it is a recreational park with a public beach.

The water table on the airport property is relatively close to the surface (1-2 meters) and the gradient flow is towards Long Lake¹. In the past surface water runoff was directed towards the north of the property, draining into Long Lake.

3.2 Mitigation

A number of measures have been implemented to reduce the loss of de-icing fluids into the environment, and Long Lake in particular. During the fall of 2004, construction began on the North Apron Expansion project. In order to direct surface runoff away from Long Lake, the existing apron was expanded to the north. Using a rock base to ensure stability and provide an adequate pavement load rating (PLR), the ramp was graded (slope 0.5%) towards the sandy infield, located on the south side of the airport adjacent to the abandoned septic field. The area was paved in order to improve holdover time efficiency and prevent fluid from seeping through the asphalt. The project was completed in 2005.

Most recently, a new Glycol Retention Facility (GRF) was constructed off-apron to provide a designated holding area for glycol-contaminated snow and water.

4.0 De-icing Fluid Management

Due to the improved configuration and sloping of the newly expanded North Apron, de-icing fluids no longer seep towards Long Lake. Rather, they seep south, draining into the Airport's sandy infield. De-icing fluids that remain on the apron's asphalt surface typically mix with surrounding snow. It is this mix of snow and de-icing fluids that is the main focus of de-icing fluid (glycol) management.

¹ Department of Transportation. 2002. Ground and Surface Water Monitoring at the Yellowknife Airport

4.1 Snow Removal

Removal of glycol-contaminated snow occurs based on a number of factors including snow fall, fluid use, etc. Once enough glycol-contaminated snow has accumulated on the apron, it is collected and removed using sweepers and plough trucks. It is then transported to the sandy infield where it is staged temporarily. Because Transport Canada sets restrictions on the amount of snow that is allowed in the infield, snow placed here is done so temporarily. Once snow has accumulated to regulate levels, it is removed and relocated to its final holding place - the Glycol Retention Facility (GRF). Removal of snow to the GRF can occur at any time during the de-icing season under the direction of the Airport Manager's Office.

4.2 The Glycol Retention Facility

In August of 2007, a new Glycol Retention Facility (GRF) was constructed adjacent to the existing glycol facility in the Training Area of the Yellowknife Airport (see attachment titled *HDPE liner installation report*). It was built to the specifications of, and under the direct supervision of, a geotechnical/geomembrane specialist: A & A Technical Services. The new bermed and lined containment facility measures approximately 22m x 34m in accordance with the attached drawing. The methodology for construction was as follows:

- Surveyed and staked area adjacent to old GRF
- Cleared and leveled area to be bermed down to sound granular materials
- Graded, watered and compacted area
- Constructed berms to required grades using available granular materials
- Bermed material was compacted as it was placed to prevent materials from settling subsequent to construction
- Removed all organics, lumps, large stones under areas to be lined
- Installed geotextile and liner
- Placed -20mm granular inside lined enclosure

The resulting facility possesses a retention capacity of 546,000L before overtopping. The facility will be monitored for adequacy and integrity.

Before disposing of any residual fluid in the GRF, samples will be taken and sent to a laboratory for analysis to ensure glycol concentration levels satisfy requirements for disposal. Once requirements have been met, the mixture will be disposed of in an appropriate manner.

Prior to spring thaw and after the last de-icing event of the season, glycol-contaminated snow will be collected from all asphalt surfaces and the infield staging area. These areas will be thoroughly scraped down to the substrate in order to ensure removal of as much spent de-icing fluid as possible. This mixture will then be relocated to the GRF where it will melt, and biodegrade as a result of exposure to sunlight. The glycol/water mixture will be monitored by airport maintenance staff to ensure that the maximum capacity of the facility has not been exceeded.

If an emergency situation should arise at the GRF, contents will be emptied and transported to the City of Yellowknife Septic Waste Disposal Facility (Fiddler's Lagoon). Pre-authorization has been granted by the City of Yellowknife to use this facility. The

Airport Manager's Office is responsible for coordinating the spill response, as per the Yellowknife Airport Glycol Retention Facility Spill Contingency Plan (June 2006).

Glycol has the potential to attract wildlife. Consequently any residual mixture left behind after thaw may attract wildlife, especially bird species, to the facility. In order to protect wildlife from gaining access to the facility, deterrent mechanisms will be installed. These mechanisms may include the use of meshes, guide wires, etc. The effectiveness of deterrents will be evaluated for success and may change as required by the Airport Manager's office.

5.0 Environmental Reporting

5.1 Surveillance Network Program

An annual sampling program has been implemented to monitor glycol discharge into Long Lake. The maximum acceptable concentration of glycol rejected into the environment at the point of entry into the culvert at Highway #3 is 100mg/l, which is a guideline set by Environment Canada.

Surface water samples are obtained when the following conditions exist:

- a) During the de-icing season (September thru May),
- b) When water is flowing through the culverts along Highway #3,
- c) When water flow volumes are judged to be adequate for sampling.

In addition to the surface water samples, Long Lake is also sampled. These samples are collected twice yearly; once in the spring and once in the fall when de-icing is occurring.

When the water table is sufficiently high, groundwater wells located around the airport will be sampled for glycol at as per the Surveillance Network Program (August 2005).

Prior to the discharge of the GRF mixture, grab samples will be taken and analyzed. Results from grab sampling will be reported to the DIAND inspector. The amount of water remediated will be recorded and submitted to the Mackenzie Valley Land and Water Board (MVLWB). Furthermore, information regarding emergency transport of materials/fluids for disposal (ex. volumes of fluids) will be recorded and submitted.

The results from these environmental monitoring programs will be submitted to the DIAND inspector, and to the MVLWB as required under DoT's water license within thirty days of sampling.

5.2 Airport Manager's Annual Report

At the end of the de-icing season, the Airport Manager will produce an annual report noting the sampling data obtained from the various sampling programs, the volumes of de-icing fluid used, amount of water remediated in the Glycol Retention Facility, amount of residual de-icing product/water mixture transported to another facility, and any changes to the de-icing program. This information will be incorporated in the agenda of the Yearly Winter Maintenance Meeting, which typically occurs before the de-icing season (prior to September 15th). Furthermore, this annual report will be provided to

both the Mackenzie Valley Land and Water Board (MVLWB) and INAC as part of DoT's water license requirements.

5.3 Air Carrier (non-DoT) Monthly reporting

The following information contributes in part to the Airport Manager's Annual report. Please note that the information originates from Air Carriers, and not DoT.

- Each month, the air carriers will produce and submit a monthly report, noting the volumes of de-icing fluid used, and any changes to application procedures, or changes in de-icing equipment or storage.
- New staff that operates de-icing equipment will be trained as soon as possible in de-icing fluid management.
- Any inadvertent spills of de-icing fluid will be noted on a spill report, reported to the NWT Spill Line, and submitted with the monthly report to the Airport Manager's Office. Refer to Appendix 'H' for a copy of the NWT Spill Report Form.

APPENDIX A

Table 1. Yellowknife Airport Glycol Usage 2006

Month	Glycol Usage (litres)
September 2006	474
October 2006	13,402
November 2006	30,859
December 2006	16,992

Table 1a. Yellowknife Airport Glycol Usage 2007

Month	Glycol Usage (litres)
January 2007	20,009
February 2007	8,652
March 2007	10,101
April 2007	7,442
May 2007	544

APPENDIX C

Material Safety Datasheet (MSDS) for DOWANOL* EB ETHYLENE GLYCOL BUTYL ETHER.



[ethyleneMSDS.asp](#)

APPENDIX D

HDPE liner installation report August 2007 (attached)