

**ENVIRONMENTAL ASSESSMENT
REGISTRATION DOCUMENT**

**Deer Lake Regional Airport Authority Inc.
1 Airport Road, Suite 1
Deer Lake, NL A8A 1A3**

PREPARED BY:

ANDERSON ENGINEERING CONSULTANTS LTD.

JANUARY, 2011



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1.0 NAME OF UNDERTAKING

Deer Lake Regional Airport Sewage System Upgrading

2.0 PROPONENT

2.1 Name of Corporate Body

Deer Lake Regional Airport Authority Inc.

2.2 Address

1 Airport Road, Suite 1
Deer Lake, NL A8A 1A3

2.3 Chief Executive Officer

Name: Mr. Jamie Schwartz
Official Title: President & CEO
Telephone: (709) 635-3601, ext. 222

2.4 Principal Contact Person for Purposes of Environmental Assessment

Name: Mr. Walter Anderson, P.Eng.
Official Title: President, Anderson Engineering Consultants Ltd.
Telephone: (709) 634-9944

3.0 THE UNDERTAKING

3.1 Nature of the Undertaking

The focus of this undertaking is to upgrade the airport's existing sewage treatment system to a larger more environmentally friendly system which will accommodate projected future waste water flows.

3.2 Purpose/Rationale/Need for the Undertaking

The existing sewage treatment system has been in use for more than thirty years and is approaching the end of its useful design life. The historical passenger levels for this airport show increasing traffic trends and the need for a larger system is apparent. At the same time of increasing the sewage treatment system capacity, the airport would also like to convert to a more environmentally friendly system which has a lower annual operating and maintenance cost.

4.0 DESCRIPTION OF THE UNDERTAKING

4.1 Geographical Location

Deer Lake Regional Airport is located on the western coast of Newfoundland, just east of Route 430 and north of the community of Deer Lake. Its coordinates are 49°13' N and 57°24' W.

The existing sewage treatment system consisting of a traditional septic system (ie. septic tank , dosing device and tile field) is located to the north-west of the airport parking lot is proposed to be replaced with a new Abydoz sewage treatment system. That system will be constructed to the north-west of the existing system adjacent to the Upper Humber River.

A copy of the Site Location Plan can be found in "Appendix A" and the Site Plan can be found in "Appendix B".

4.2 Physical Features

Major Physical Features of the Undertaking

This undertaking will consist of replacing the existing traditional septic system with a new larger capacity Abydoz sewage treatment system. The major physical features required to complete this undertaking are identified below. Please note that the dimensions of the major physical features listed are approximations only which are based on preliminary design calculations.

- a) Abydoz Sewage Treatment System
 - 520 meters of 150 mm diameter PVC sanitary sewer line
 - 14 meters of 200 mm diameter PVC sanitary sewer line
 - 7 manholes
 - 40 cubic meter concrete septic tank
 - 620 square meter Abydoz engineered wetland
 - Minor upgrading of existing 520 meter long access road

Areas to be Affected by the Undertaking

The area being considered for the engineered wetland portion of the proposed sewage treatment system is currently unused. The land required for the undertaking is owned by the Deer Lake Airport Authority and that area is located adjacent to an existing drainage ditch which also accommodates flows from the existing sewage treatment system. The size of the proposed wetland sewage treatment system has been designed so that ammonia and BOD

(biological oxygen demand) levels are within the required limits to allow discharge into the Upper Humber River via way of the existing drainage ditch.

Minor upgrading of the access road and construction of the wetland system will require some minor clearing and grubbing. During construction, every effort will be made to conserve the natural environment and promote vegetative growth along any disturbed areas of the existing access road.

The existing septic system will remain in operation until the new sewage treatment system has been commissioned and is fully operational. Please refer to the site plan in "Appendix B".

Positive impacts from this undertaking will include generating employment opportunities during construction and a low operating and maintenance cost for the system (ie. the existing system requires electricity to operate lift pumps while the new system will treat waste naturally with vegetative growth and root action).

Description of Physical and Biological Environments

The area of the sewage treatment system upgrade is gently sloping from south to north toward the Humber River with mostly alders, brush and low growth forest. Silt is the predominant underling soil with gravel outcrops in several areas. Clay layers were also identified at much deeper depths and also adjacent to the Humber River. The area of the proposed undertaking is situated within the North American lapetus Margin, more commonly known as the "Humber Zone". This zone consists primarily of transported slope/rise rocks.

Harsh winters and cool summers characterize the climate of Deer Lake. The mean daily temperature for January is -8.9 degrees Celsius and the mean daily temperature during July is 16.1 degrees Celsius. The average annual precipitation for this area is 1078.8 mm.

4.3 Construction

Construction Period

Construction of the undertaking is tentatively scheduled for the spring of 2011.

Potential Sources of Pollutants and Mitigation Measures

The potential sources of pollutants during the construction phases of the undertaking are:

- a) Silt and sediment

Since excavation must occur near the Upper Humber River, silt fences will be utilized during construction to ensure that silt does not enter into the river.

b) Construction debris

Solid waste and garbage from construction activities will be minimal. Materials will be collected on a regular basis and disposed of at an approved disposal site. Construction debris will not be permitted to be disposed of on site. However, it may be contained on site for short periods of time prior to disposal.

c) Sewage

Construction workers will use washroom facilities at the airport or portable construction port-o-potties. Since the existing sewage treatment system will remain in operation until the new system is commissioned and fully operational, workers can use the facilities in the airport. If the airport executive feels this provides an inconvenience to their operation, the contractor can supply portable construction port-o-potties which will be cleaned on a regular basis and have waste transported to an approved disposal facility.

d) Airborne emissions

Airborne emissions as a result of heavy machinery, portable air compressors, and possibly a small portable electric generator may be anticipated. However, such emissions will be minimal.

e) Noise pollution

All efforts will be made to minimize the risk of construction activity disturbing wildlife. Disturbance or displacement of wildlife by construction activities will generally be limited to incidental encounters since not many animals have been identified as living around or close to the airport.

Resource Conflicts

In an effort to maintain the integrity of the site as a natural setting, only areas that are required for placement of infrastructure will be disturbed. The tile field of the existing septic system will be left to re-vegetate once the new system is operational.

As current airport activities keep most wildlife at a distance, the possibility of disturbance to animals is considered very minimal during the construction of the

project. No long-term effect is anticipated on the disruption or movement of big game animals or furbearers.

The undertaking should not adversely affect waterfowl or raptor populations. If a nesting raptor or waterfowl is encountered, construction work will avoid the area until the chicks have left the nest. The Wildlife Division will be consulted to ensure the protection of the waterfowl and/or raptors.

Due to the nature of the construction, there will be a minimal increase on use of the local transportation network. Trained flagpersons will be employed during construction to ensure safe operation and minimal disturbance to patrons of the airport.

4.4 Operation

Description of Operation

The operation of the undertaking will include regular monitoring of the effluent to ensure it is reaching design levels as well as being in compliance with treatment levels for discharge into a freshwater body. Regular maintenance of the system will include pumping of the septic tank every several years or as needed for sludge removal and its disposal into an approved landfill operation.

Period of Operation

The undertaking will be a 24 hour, year-round operation.

Potential Sources of Pollutants

Potential sources of pollutants during the year-round operation of the undertaking are:

a) Concentrated sludge

Removal of sludge from the concrete septic tank will be conducted by trained and experienced workers on a regular basis which is anticipated to be about every three to five years.. The sludge will then be transported to an approved landfill site. Once at that site, the concentrated sludge will pose very little potential for pollution.

Resource Conflicts

There will be no resource conflicts in this area once the undertaking has been completed. Once completed, the habitat of all species will be returned to its original state without compromise.

4.5 Occupations

Construction

During construction of the proposed undertaking, it is expected that 12 people will be employed as a direct result of the project. The number of positions anticipated during the construction phase of the project, using the National Occupational Classification System are listed below.

National Occupational Classifications Applicable Classifications for the Proposed Undertaking Based on NOC 2001		
NOC Occupational Title Code	Title	Number of Anticipated Positions
0015	Senior Managers	1
0711	Construction Manager	1
2131	Civil Engineers	1
2231	Civil Engineering Technologists and Technicians	1
2253	Drafting Technologists and Technicians	1
7215	Contractors and Supervisors, Carpentry Trades	2
7421	Heavy Equipment Operators	3
7612	Other Trades Helpers	2
	Total	12

Operation

The operation of the undertaking is not expected to create or delete employment.

4.6 Project Related Documents

"Appendix C" contains copies of various correspondence regarding the design of the Abydoz system as follows:

- Wetland Design Review – Dated Aug. 16, 2010
- Letter to Mr. Keith Abbott, Government of Newfoundland Labrador, Department of Environment & Conservation, Water Resources Management, Corner Brook office from Abydoz regarding design – Dated Aug. 20, 2010
- Further Correspondence from Abydoz to Mr. Keith Abbott – Dated Aug. 31, 2010

5.0 APPROVALS REQUIRED FOR THE UNDERTAKING

The following permits, approvals and authorizations may be required.

APPROVAL REQUIRED	APPROVAL AUTHORITY
Approval of the Undertaking	Minister, Environment and Conservation
Authorization for work or undertaking affecting fish habitat	Department of Fisheries and Oceans Canada
Facility Inspection	Government Service Center

6.0 SCHEDULE

Deer Lake Regional Airport Authority plans to start the project in the spring of 2011. Due to the aging of the current septic system and anticipated increased traffic volumes in the very near future, it is important that this project receive a release from the Environment Assessment Process prior to that time.

7.0 FUNDING

Funding for this undertaking will come from Deer Lake Regional Airport Authority's capital improvement budget.

Date:

Signature of Chief Executive Officer:

Appendix A
- Site Location Plan

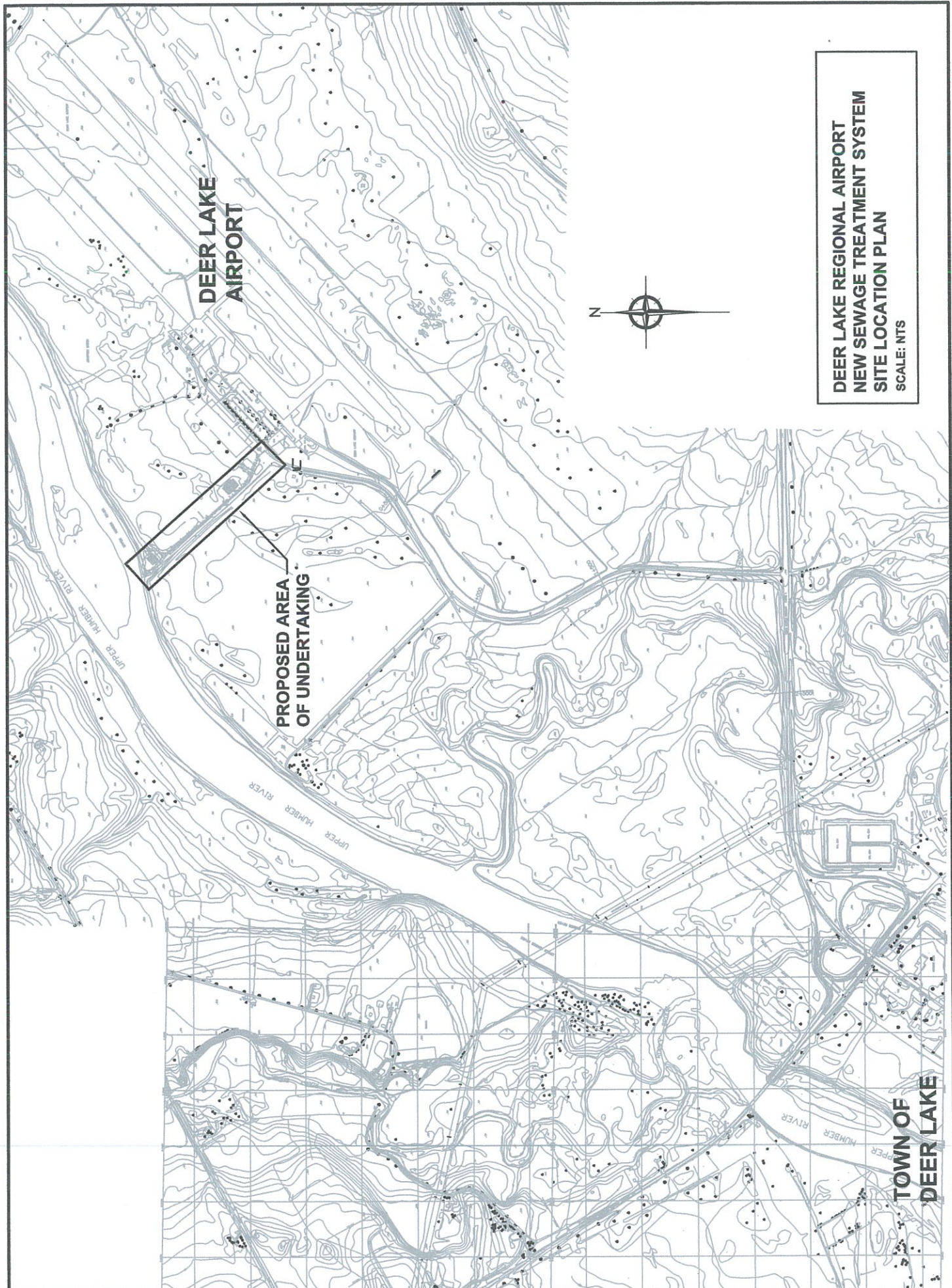
**DEER LAKE REGIONAL AIRPORT
NEW SEWAGE TREATMENT SYSTEM
SITE LOCATION PLAN**
SCALE: NTS



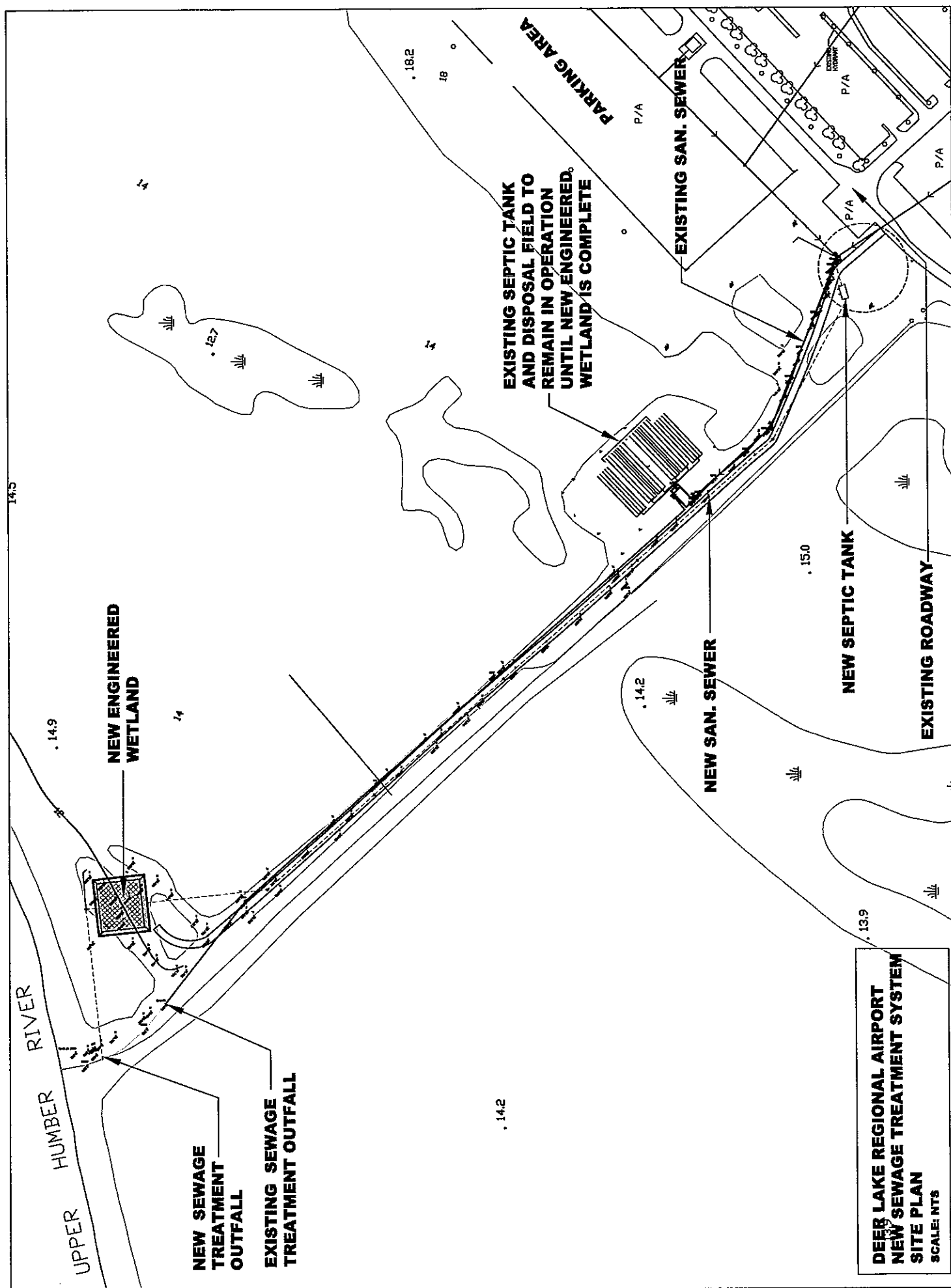
**DEER LAKE
AIRPORT**

**PROPOSED AREA
OF UNDERTAKING**

**TOWN OF
DEER LAKE**



Appendix B
- Site Plan



Appendix C
- Project Related Documents



Anderson Engineering Consultants Ltd.
Suite 312, Millbrook Mall
2 Herald Avenue
Corner Brook, NL, A2H 4B5

Aug 16, 2010

Re: Wetland Design review based on sampling data

Hi Walter;

We have reviewed the BOD and Nitrogen levels and need to increase the design size to deal with the increased levels found in the testing.

BOD

The BOD showed levels varying significantly which is typical of smaller systems, from a low of 33mg/l to 170mg/l and 430mg/l in the septic tank.

The original design was for 100 mg/l. Consider the loading of 170mg/l and due to the very high levels found in the septic tank we feel a design value of between 160-200 mg/l would be a more reasonable figure.

The limit for discharge is 20 mg/l

Ammonia

The nitrogen ranged from 14mg/l to 24 mg/l and with 53 mg/l in the septic tank.

The original design used 10 mg/l, this should be increased to 20 mg/l, as the average over the four hrs was 19mg/l, not considering the septic tank.

The limit for discharge is 2 mg/l

The ammonia is harder to reduce than the BOD and thus it drives the design sizing, the new wetland system need to be 620 m² to provide for the treatment levels required for discharge into a fresh body of water- the Deer Lake River.



This also takes into account the increase in flow that was determined as a result of the review previously performed.

Average daily flow increased from 22 m^3 to 34 m^3 , with peak flows occurring over 6-8hr of the day resulting in a daily surge which is equivalent to a flow of 72 m^3 per day. The peak flow can be mitigated by a larger septic tank and with a dosing unit, however the system still has to be increased to accommodate the larger flow of 34 m^3 / day.

New wetland size of 620 m^2 increase from original size of 300 m^2

New cost of wetland system $\$170,000 + \text{HST}$

The septic tank also has to be increased in size which I believe you are currently designing and pricing.

Although this a significant increase on the original budget, any type of treatment system would be under the same pressure due to the combined effects of 150 % increase in flow and a 200% increase in Ammonia levels.

Although the client can reduce the system and cost by not building for the future, I would not recommend this course of action.

I hope this increase can be reviewed with the client to receive approval to proceed as drawings need to be submitted as soon as possible to the Department of Environment to get approval to construct the system.

I trust this is satisfactory, and I look forward to hearing from you.

Yours truly

A handwritten signature in black ink, appearing to read 'G. Sharp', written over a horizontal line.

Glenn Sharp P. Eng
ABYDOZ Environmental Inc.



Government of Newfoundland and Labrador
Department of Environment and Conservation
Water Resources Management
Corner Brook,
Newfoundland

August 20, 2010

Attn: **Mr. Keith Abbott**

Ref: **Deer lake Airport – Wetland Design of Sewage Treatment System**

Dear Keith:

Attached please find a copy of the proposed design drawings for the engineered wetland treatment system for the Airport sewage in Deer Lake, Newfoundland.

The wetland has been designed for the average daily flow of 34,000 l/day based on the design requirements, of 15L/day per passenger and looking for future expansion to 2029, with a projected passenger volume in that year of 546,641 per year. A new Septic tank of 41 m3 will also be installed to replace the existing tank as part of the overall system.

The sewage will be treated to freshwater discharge standard (20 mg/l BOD and TSS) by the wetland system and be discharged into the Deer Lake River as per the drawings.

We request review and approval of this system so we can install this system for the client to correct their sewage issues.

If you have any questions or require any further clarification please call, 709-727-7878.

Yours truly,

A handwritten signature in black ink, appearing to read "Glenn Sharp", written over a horizontal line.

Glenn Sharp, P.Eng.

Encl:
2- Sets of Drawings



Government of Newfoundland and Labrador
Department of Environment and Conservation
Water Resources Management
Corner Brook,
Newfoundland

August 31, 2010

Attn: **Mr. Keith Abbott**

Ref: **Deer Lake Airport – Wetland Design of Sewage Treatment System**

Dear Keith:

As previously discussed, the original design requirements of the sewage treatment system at the Deer Lake airport need to be adjusted to consider peak months of passenger activity.

The original wetland design calculations for the system used an average daily flow of 22 m³/d. Upon closer inspection it was found that the peak flow values experienced in July and August had not been considered. During these months passenger volumes increase by approximately 50% therefore instead of 1,500 passengers/day, the actual design population should be projected to 2,267 passengers/day in 2029 in order to accommodate these peak flows.

The following calculation was used to reach a new average flow of 34 m³/day (assuming a buffering tank would be used to equalize flow over 24 hours);

Flow per Passenger	15 L/d (Guideline)
Number of Passengers in Jul/Aug	68,000 per month (Projected to 2029)
	2,267 per day
Average Flow = 2,267 Passengers x 15 L per Passenger	
Average Flow 2029	34,000 L/d during peak months

In order to accommodate these increased flows, the septic tank was also resized. For a one day retention time plus 20% sludge storage volume the new tank volume was calculated to be 41 m³.

For more information, a review of the initial calculations and assumptions of the original design is attached. If you have any questions or require any further clarification please call, 709-895-7979.

Best Regards,

Laura Parsons, BASc

CC: Glenn Sharp, P.Eng.
Walter Anderson, P. Eng

Appendix D
- Estimated Project Budget

Deer Lake Regional Airport

Sewage Treatment System Upgrade

Estimated Project Budget

Construction Estimate (excluding Abydoz System) (see attached)		\$182,296.50
Engineering		\$33,575.00
Abydoz System (Engineering and Construction)		<u>\$157,008.00</u>
	Subtotal	\$372,879.50
	HST	<u>\$48,474.34</u>
		<u>\$421,353.84</u>

Deer Lake Regional Airport

Page 1 of 2

Sewage Treatment System Upgrade - Preliminary Estimate

Deer Lake, NL.

08-Oct-10

090631**SCHEDULE OF QUANTITIES**

The quantities set out in this schedule are estimated quantities only and are not to be taken as final quantities by the Contractor. The unit prices bid shall include all labour, plant, materials, overhead, duties, and profit and all other obligations and liabilities under the contract. HST, if applicable, is to be applied in accordance with SGC 1.0. Totals shall be determined by multiplying the quantity by the tendered unit price.

SECTION	DESCRIPTION	UNIT	QTY	PRICE	TOTAL
DIVISION #1					
01010	Mobilization & Demobilization				
	(not greater than 5%)	LS	1	\$ 1,200.00	\$ 1,200.00
01560	Environmental Requirements				
	Silt Fence	LM	10	\$ 10.00	\$ 100.00
01570	Traffic Regulations				
	Flagpersons Wages	Hour	80	\$ 17.50	\$ 1,400.00
02111	Clearing & Grubbing				
	a. Clearing	m ²	2000	\$ 1.25	\$ 2,500.00
	b. Grubbing	m ²	3000	\$ 1.25	\$ 3,750.00
DIVISION # 2					
02223	Excavation, Trenching and Backfilling				
	Main Trench Excavation				
	1. Common	m ³	2208	\$ 12.00	\$ 26,496.00
	Imported Common Backfill	m ³	553	\$ 24.50	\$ 13,548.50
	Granular Pipe Bedding				
	1. Type 3	m ³	561	\$ 5.00	\$ 2,805.00
	Supply & Placement of Marking Tape				
	a. Sanitary Sewer	Lm	614	\$ 1.00	\$ 614.00
02224	Roadway Excavation, Embankment & Compaction				
	Mass Excavation				
	1. Common	m ³	1114	\$ 10.00	\$ 11,140.00
02231	Scarifying & Reshaping				
	Scarifying & Reshaping incl. Compaction	m ²	2272	\$ 1.50	\$ 3,408.00
02233	Selected Granular Base & Sub Base Material				
	1. Class "A" Granular Base	tonne	525	\$ 24.00	\$ 12,600.00
	2. 100mm Minus Rock Fill	tonne	79	\$ 20.00	\$ 1,580.00

090631

SCHEDULE OF QUANTITIES

The quantities set out in this schedule are estimated quantities only and are not to be taken as final quantities by the Contractor. The unit prices bid shall include all labour, plant, materials, overhead, duties, and profit and all other obligations and liabilities under the contract. HST, if applicable, is to be applied in accordance with SGC 1.0. Totals shall be determined by multiplying the quantity by the tendered unit price.

SECTION	DESCRIPTION	UNIT	QTY	PRICE	TOTAL
02601	Manholes, Catch basins, Ditch Inlets & Valve Chambers				
	Supply & Placement of 1200 diameter Pre-Cast Manholes				
	1. 1.5 m to 2.0m - Sanitary	each	1	\$ 2,500.00	\$ 2,500.00
	2. 2.0 m to 2.5 m - Sanitary	each	1	\$ 3,000.00	\$ 3,000.00
	3. 2.5 m to 3.0 m - Sanitary		2	\$ 3,500.00	\$ 7,000.00
	3. 2.0 m to 2.5 m - Sanitary (Cast-in-Place Bottom)	each	1	\$ 5,100.00	\$ 5,100.00
	4. 3.0 m to 3.5 m - Sanitary	each	1	\$ 4,500.00	\$ 4,500.00
	5. 3.5 m to 4.0 m - Sanitary	each	1	\$ 5,250.00	\$ 5,250.00
	Inflow Protectors	each	7	\$ 125.00	\$ 875.00
02702	Pipe Sewer Construction				
	Supply & Placement of Sanitary Sewer				
	1. Main Line				
	a. 150 mm dia SDR 35	Lm	600	\$ 45.00	\$ 27,000.00
	b. 200 mm dia SDR 35	Lm	14	\$ 60.00	\$ 840.00
	c. 150mm dia SDR 35 45° Long Radius Bend	each	1	\$ 120.00	\$ 120.00
	T.V. Camera Inspection Services (Sanitary Sewer)	Lm	614	\$ 2.00	\$ 1,228.00
	Concrete Septic Tank including Excavation, Backfilling Around Tank, and Bollards	LS	1	\$ 30,750.00	\$ 30,750.00
	Additional Items				\$ -
	b. Wetland Bed Liner	m ²	928	\$ 14.00	\$ 12,992.00
	a. Sub-total				
	b. HST 13% of a.				
	c. Grand Total (carry forward to page 1 of Tender Form)				
Anderson Engineering Consultants Limited					
Department of Municipal Affairs					
Spec. Set No. _____					