



February 23, 2007

David Whyte, MSc., Project Manager
Environmental Impact Assessment Registration
P.O. Box 6000
Fredericton, NB
E3B 5H1

**RE: EIA Registration, Proposed Wastewater Treatment Facility,
Beulah Camp and Conference Centre, Brown's Flat, New Brunswick**

Dear Mr. Whyte:

In response to your review comments of January 26, we are pleased to provide you with the following answers:

Public Involvement Activities

1. *The following additional information is required regarding public consultation:*

a) What was the date of the newspaper notice placed in River Valley News?

The notice was placed on August 24, 2006. Timing of the public meeting was scheduled for the summer to allow all seasonal residents to attend the public information meeting and to participate in the discussions. A contact list was compiled and seasonal residents have been kept informed about our progress since the meeting.

b) Approximately how many households received the meeting notice via the Brown's Flat Post Office?

105 copies were delivered to the Post Office (the total number of mail boxes in Browns Flat.)

c) What was the total number of households that received the direct notice?

105 households received the invitations to the meeting. Furthermore, neighbours were invited and encouraged individually by Beulah's staff to attend the meeting.

d) Will the current (December 2006) version of the registration document be made available for public review ?

The documents have been posted on our website. Also, copies of the documentation were placed in the Browns Flat Post Office and the Irving Convenience store.

Crown Lands Lease

2. The registration document states that an extension of the Crown Lands lease is currently being applied for. Subsequent correspondence from DNR indicates that they have no record on an existing lease. What is the current status of the lease application?

The application has been filed. Mr. Alan Dockerty of DNR is the file manager. Upon request, additional information was submitted by our office to the satisfaction of DNR. DNR will proceed with our application, once the EIA determination has been made.

Navigable Waters Protection Program

3. Please confirm that the required application under the Navigable Waters Protection Program has been submitted.

The application was submitted on January 10, 2007. Additional information was submitted and received by Transport Canada on January 30, 2007. The receipt states that the application is currently under review and that we should allow a minimum of 90 days to process the application. Transport Canada requested additional information on the river boat wharf which is located on the property, but which has no bearing on the proposed wastewater treatment project.

Wetland Issues

4. *The registration document indicates specific siting requirements for a wastewater treatment facility (Page 12, section (v)). These include "Soil conditions: tight clay as a substrate, no bedrock within 3 m depth and a low water table are preferred conditions to protect the surrounding aquifer...". Given that it is proposed to place the lagoon pond partially in a wetland, which, by definition, has an elevated water table, it would seem that the selected location does not meet the above mentioned criteria. Please comment.*

Water is ponding on top of the clay layer or travelling in the surficial layer of top soil on top of the clay. In essence we are dealing with a perched water table. Groundwater was not encountered in any of the test pits dug in the proposed lagoon location. Topsoil would be removed in the lagoon area and any shallow ground water would be diverted around the lagoon into the wetland. There would be very little net-change in hydraulics of the wetland.

Further geotechnical investigations will be carried out to locate any deeper groundwater levels and the location of bed rock. Tree removal will be required to provide access for a track mounted drill rig.

5. *Page 14 of the Registration Document indicates that there are wetlands on sites S2 and S3 and that construction at these locations would result in significant disruption of wetlands that serve relatively important ecological functions. While the watercourse at location S3 is an obvious significant constraint, why has lagoon construction at location S2 been deemed to have greater potential for wetland disruption than the wetland in the proposed area? Both areas appear to be similar in slope according to the supplied topographic layer and both appear to be forested wetlands based on the supplied aerial photography.*

Both, wetlands (S2 and S3) are closer to Lake Galilee than the proposed lagoon location and therefore have a greater potential to impact the lake. Flows are larger, and there is a potential for fish being in the streams. Also, a visual inspection

showed that the terrain has several water bearing gulleys that do not show up on SNB mapping. Building the lagoon would involve significant work in wet soil conditions, which can be avoided in the proposed location. While the location of S2 is closer to the wastewater source, resulting in shorter pipelines and reduced costs, S2 has obvious increased environmental risks which we tried to avoid by moving the lagoon into the headwater of the watershed.

6. *While it appears that the necessary information for a functional assessment of the affected wetland was collected, and some information was presented on pages 14-15, a functional assessment was not undertaken. Please submit a brief functional assessment.* **The following table shows the ratings for the typical wetland functions for the wetland in the proposed lagoon location:**

Function	Rating
Groundwater recharge	minimal since the surficial soil consists primarily of clay, compared to gravel deposits on the upgradient slopes.
Groundwater discharge	moderate, surrounding areas have similar if not higher potential to discharge. Discharge potential will not be altered by the proposed development because it only affects a fraction of the wetland.
Flood & Stormwater attenuation	Low since the site is located in the headwater of the watershed.
Shoreline protection	not applicable
Water quality protection	moderate, there is very little water leaving the wetland site.
Floral diversity	moderate overall, very limited in the area that may be impacted by the proposed development

Function	Rating
Wildlife habitat	moderate, there is no habitat that is significantly different from habitats found on the remainder of the property (S1, S2, S3)
Fisheries Habitat	low, there is no fish habitat in the wetland and there is no fish passage to the wetland
Aesthetic/Recreational/ Educational	low, educational and recreational trails have been developed in area S2 and S3, the proposed area has been used for tree removal in the past and is otherwise relatively inaccessible, it does not lend itself to recreation or education

rating: low, moderate, high, exceptional

7. *An impact analysis was not undertaken for the affected wetland. Significance criteria for the impact assessment must be presented and potential impacts on the wetland must be analysed, followed by a statement of whether or not any residual impact is significant.*

Given the low functional importance of the wetland, and the fact that only one third of the wetland will be impacted, the residual impact is limited. The wetland will continue to function in its present form. The hydrology of the wetland will not change measurably as a loss in surface drainage. Shallow groundwater flow is still going to be directed to the wetland.

8. *What is the total wetland area (including access roads, berms, work areas, fill, etc) that would be affected by the development? Based on the foregoing please provide compensation options in a wetland compensation plan. The plan must be submitted to the Department of the Environment for review and approval.*

The total wetland area is 1.05 ha, the area impacted is 0.3 ha.

Compensation Plan: Compensation can be carried out on the Beulah property, as well as in the general area on other properties. Two onsite sewage disposal fields and one trickling filter will be removed as part of this project. We propose to restore these areas to become constructed wetlands for stormwater retention and treatment. Vegetated swales will be built to route surface runoff to these areas to allow wetland vegetation to establish. Overflow berms (with appropriate overflow structures) will be built to retain the surface water. These new wetlands will provide habitat, as well as treatment and attenuation of surface runoff. Approximately 0.5 ha of new wetland area will be established on the property.

New offsite wetlands will be built nearby where gravel removal has resulted in the destruction of habitat. We are working with a local contractor to identify these areas and develop a plan to build constructed wetlands for habitat restoration. Approximately, one ha of potential wetland area has been identified so far as having potential for development. A field investigation will be conducted as soon as the snow melts.

Should those measures be insufficient for your Department, we are open to cooperating with the Saint John River Society, with the Nature Trust of NB, Ducks Unlimited, the Eastern Habitat Joint Venture, the Hammond River Angling Association, the Nature Conservancy or similar organizations. The Saint John River Society indicated that they would like to team up with the developer to provide educational tools on wetlands protection in their new River Trailhead building in Grand Bay-Westfield. The Nature Trust indicated that they could use funding support to purchase properties with wetlands and place them under a conservation easement.

9. *Can the depth of the lagoon be adjusted to further limit the amount of affected wetland?*

The lagoon depth has already been maximized. Further depths will reduce the treatment plant performance, may affect groundwater flows and possibly exceed the depth of the clay layer. However, we may be able to make the lagoon banks steeper. Further geotechnical investigations will determine how steep the berms can be made without compromising stability.

Impact on Surface Water

10. Based on Figure 2-2, drainage to Lake Galilee has its origins in the northwest part of the site, in the vicinity of the proposed lagoon. Would lagoon construction and the associated dewatering (including the "permanent gravity drainage" designed to lower the local water table - page 6 of the Atlantic Geotechnology report) have a long term impact on the quantity of water entering the lake?

Temporarily and only during construction, there will be an influx of diversion water. In the long term, this source of extra water will be minimal. All test pits in the area were found to recharge extremely slowly, due to the impervious nature of the clay.

The lake's drainage area is approximately 24 ha, and the lagoon's footprint is 0.6 ha. Precipitation falling in the lagoon area will not feed Lake Galilee and be diverted to the Saint John River. The inflow to the Lake can therefore be expected to decrease by 2.5%. Considering that a higher percentage of precipitation would evaporate from the wetland than from surrounding, steeper terrain, the actual reduction in flow would likely be less than 2.5 %.

11. Please clarify the location of the proposed effluent pipeline from the lagoon to the outfall pipe with respect to watercourses. Will construction of this outfall pipe require any watercourse crossings? If so what are the proposed crossing techniques? See also item "a" under Additional Comments (elsewhere in this letter).

There will be one water course crossing in the head water. Most likely the watercourse will be dry at the time of construction, since it only carries water in the spring and fall. If the course is dry, a small rubber tired backhoe will be used to dig a trench. Original stream bed material will be used for backfilling and for restoration.

If the watercourse is wet, directional drilling will be employed. Directional drilling will be on site during construction and used for road crossings as well.

There may be minor drainage channels that have to be crossed near the area of S2. Those channels will be restored to original conditions as part of the construction work.

Impacts on Wildlife

12. It appears that information obtained from the Atlantic Canada Conservation Data Centre (AC CDC), was limited to plant occurrence data, which assisted in focusing the rare vascular plant assessment. Reports on other groups of wildlife at risk (e.g. birds, herpetiles, arthropods) potentially occurring in the area, including riparian areas and downstream habitats potentially affected by the project, must be obtained from the AC CDC and provincial wildlife biologists, as well as local naturalists. If habitats having the potential of harbouring wildlife at risk exist on site, then the preceding information must be supplemented by field surveys by professional biologists (with expertise at conducting the types of surveys required) at the appropriate time of year.

The inspection by our botanist did not identify habitat of species at risk. We are certainly interested in showing any DNR biologist where the site is and any other information they may be interested in. During the public meeting and subsequent discussions with local residents and people knowledgeable of the area, no wildlife related concerns with the site have been identified.

We hired Mr. Dale Hood, a local wildlife biologist of D.J. Hood Associates Ltd. to assist us with determining whether there is a potential for the presence of rare or endangered species on the property near the construction site. Mr. Hood has worked in the area and does not know of any sites that have been identified as harbouring endangered species, rare birds, herpetiles, arthropods etc. Mr. Hood contacted the following individuals with a request for their opinion on the proposed site location: Colette Lemieux with the Department of Environment (using the Nature Trust data base of NB), Mr. Steward Lusk, biologist with species at risk program with DNR, and Stephan Gerriets data manager with Atlantic Canada Conservation Data Centre. Also Mr. Hood reviewed the important bird area on Canada , web site.

To date Ms. Lemieux replied with the attached summary of four ESA sites in the area, none of which has any bearing on the proposed location.

According to the DNR Species at Risk database, the closest record of an NB listed species is a bald eagle nest site on Rocky Island, approximately 3km from the campground. Also of note are several species listed federally that may occur in proximity to the site. While Butternut (SARA Endangered) is ranked as At Risk in the NB General Status (though not listed under the NB Endangered Species Act), Debby Peck confirmed that there is no Butternut tree in the vicinity of the construction site. The Yellow Lampmussel and Shortnose Sturgeon are two species that are ranked Special Concern nationally and that occur in the Saint John River. The sturgeon (currently under consideration for addition to Schedule 1 under SARA), is known to occur in the vicinity of the project site, whereas known locations of the yellow lampmussel (Schedule 1) do not extend downstream of the Gagetown area. [Note, we assume that removal of a wastewater discharge from the Sturgeon habitat will be beneficial to that species)].

While the area north of Browns Flat is identified as an important bird habitat, no important bird features are identified near the proposed lagoon site. As more information becomes available regarding the presence of birds, we will forward it to

you.

It is our understanding that rare or endangered species can be found where the environment provides some unusual features. Based on our knowledge of the site, there are no features that are unique and that are not present on other similar areas on the property.

Water Wells and Groundwater

13. According to Figure 2-2, there is a private water well on PID 00140616 and there are also wells located within Beulah Camp that are down-gradient or cross-gradient from the proposed lagoon. There may also be other wells in the area. Please identify (list) all private water wells located within 500 m of the lagoon including the water wells associated with the camp and conference centre.

The active production wells that belong to Beulah Campground (W1, W2, and W4 to W8) and the drainage directions are shown on the attached figure. The following PIDs are located down gradient of the lagoon within 500m from the site, as indicated on Figure 1-1: 00139832, 00140574 ,00140590, 00140616, 00140814, 30102305, 30189211, 30195895, 30201545, 30201552, 30206536, 30228688

The highlighted PIDs belong to Beulah's Campground.

Up gradient wells may be located on the following PIDs with in a 500m radius from the lagoon:

00058610, 00092536, 00099358, 00116350, 00116707, 00116715, 00136937, 00136994, 00138834, 00138859, 00138933, 00138958, 00139337, 00139352, 00139394, 00139410, 00139436, 00140186, 00140202, 00140632, 00140640, 00140657, 00140699, 00140707, 00140715, 00140731, 00140749, 00140764, 00140772, 00140780, 00140798, 00140806, 00140830, 00140855, 00140871, 00140897, 00140913, 00141051, 00141077, 00141119, 00141440, 00141499, 00141507, 00142208, 00142471, 00158170, 00158394, 00482463, 00482687, 00482695, 00482703, 00486522, 00486530, 30017875, 30030373, 30030449,

30033740, 30037329, 30064869, 30064877, 30089528, 30089536, 30089544, 30089551, 30104277, 30104285, 30104293, 30104301, 30104319, 30104327, 30104335, 30104343, 30104350, 30104368, 30104376, 30104384, 30105274, 30105282, 30167902, 30194286, 30198105, 30200513, 30200521, 30200554, 30200562, 30201255, 30207989, 30211874, 30227995, 30228696, 00093708, 00093716, 00093724, 00136630, 00136952, 00138875, 00138891, 00138917, 00138933, 00138958, 00138990, 00139014, 00139279, 00139295, 00139311, 00140640

14. *Page 14 of the registration document indicates that there will be "extra water quality monitoring in the closest production wells" What will this extra water quality monitoring entail? Will there be regular monitoring of any water wells (private or campground) that are considered down-gradient or cross-gradient of the lagoon?*

Wells W4 and W5 are the closest to the lagoon, at a distance of 110 m. The closest well down gradient is W2, 240m away. A drinking water monitoring program will be developed in cooperation with the Department of Environment. To date, water quality monitoring has been limited. Future monitoring will be in line with applicable standards for municipalities of comparable size in New Brunswick. Extra monitoring will include bacteria, and Total Organic Carbon (TOC).

15. *Please describe the potential impacts that construction activities (sewage lagoon and sewer lines) may have on groundwater quality and quantity.*

Based on test pit explorations, all construction is expected to be in clay soils with very limited hydraulic conductivity. Therefore only very localized changes in groundwater flow are anticipated. There should be no change in groundwater quality near the lagoon. There may be slight changes in groundwater quality along the in-ground structures (pipelines), due to the percolation of surface water into the disturbed soil.

Lagoon Design and Lifespan

16. *Please confirm that the location of existing residences, the potential future conversion of cottages into year round residences, and the future construction of new cottages and residences have all been taken into account in the sizing and location of the proposed lagoon.*

The lagoon was placed as far away as possible from the densest area of the camp. Extra land was purchased for that purpose. The closest cottages are 150m away from the proposed lagoon. There are some seasonal RV sites along the access road to the future lagoon, and the closest one is 50m away from the lagoon site. The lagoon design capacity is 300 m³/day, which is more than the current average summer flow and will enable future growth.

17. *Will the preferred lagoon location allow for future upsizing of the lagoon?*

The lagoon can be divided into three cells in the future by installing an additional floating baffle, if an increase in treatment performance is required. A fourth cell could be installed closer to the existing access road, as well. Any existing seasonal RV sites in that area would be re-located elsewhere.

18. *What is the estimated lifespan of the proposed lagoon?*

The life span of the lagoon and the ground piping is 50 years at a minimum. The lift station, pumps and aerators may require replacement after 20 to 30 years.

19. *Will the clay liner offer sufficient protection from infiltration of wastewater down slope? Alternatively has a synthetic liner been considered?*

The clay appears to be ideal for lining the lagoon. As part of the liner construction, we propose to excavate clay material and screen and homogenize it, prior to backfilling and compacting. The clay permeability and stability will be tested. If the geo-technical testing proves that the clay is not suitable, or if weather conditions do not allow working with the clay, we will use a polyethylene liner.

20. *Although there will be aeration, we anticipate that some sludge will be generated. Will there be an external sedimentation facility to collect sludge or will the sludge accumulate in the lagoon? Please explain how the sludge will be removed and where it will be disposed of. In addition, how will effluent be dealt with during periods of lagoon maintenance?*

In our experience, sludge accumulation occurs mainly around the inlet pipe. Most of the sludge consists of sand and grit from sanding roads. Beulah's camp has very limited usage during the winter and there is no sanding. Also, entrainment into man holes is limited. Sludge generated during high summer usage will degrade during the winter months when lagoon usage is low. It is anticipated that the sludge will have to be removed much less frequently than at municipal year round facilities.

If sludge removal is required, a licensed dredging company will be hired for removal and de-watering of sludge.

21. *Please confirm that the "measures to minimize the impact on the wetland" (page 15) will be incorporated in the lagoon design.*

Yes, the owner intends to protect the remainder of the wetland as much as possible. All tributaries to Lake Galilee have been protected in the past and the owner intends to continue this practise in the future.

Lift Stations

22. *Page 4 of the registration document states that three new main sewage lift stations will be installed, while page 21 states that "the system has three lift stations, two of which will be replaced with new ones". Please clarify.*

Currently, three lift stations are located on the property. The one near the wharf has been recently upgraded, one near Lake Galilee will have to be replaced in the near future. A third lift station next to the Trickling Filter will be decommissioned. In its

place, possibly at a different location, the main sewage lift station that pumps wastewater the lagoon will be installed.

23. The submission indicates that back up power will not be added to the lift stations. Given that only limited amounts of waste water would reach the collection system during a power outage, how much storage capacity must be provided within the lift stations to prevent an overflow?

The storage volume within each lift station will accommodate for one hour of average summer flow. For example for the main lift station, 5m³ will be required. As mentioned in the registration document, the inflow would consist mostly of clean groundwater infiltration into the collection system.

Sewage Collection System

24. The registration document suggests that only those portions of the sewage collection system that are deteriorating will be replaced. How will it be determined which sections of the collection system are deteriorating?

Video inspections will be carried out during the summer of 2007.

25. Will any special attention be given to the replacement of manholes showing disrepair?

Yes, however to our knowledge there is not a single sanitary man hole on site. Clean outs will be repaired and replaced with sanitary man holes, where necessary.

26. Given that 1000 metres of sewer pipe is to be replaced, what percentage of the total sewage collection infrastructure does this represent?

This represents 30% of the collection system. The entire collection system

measures approximately 2,800 m.

27. *Following completion of this project, is the proponent proposing to institute a maintenance program for the sewer lines to check for leakage/infiltration over time?*

Yes. The operator will receive training and a maintenance budget will be established. Water and wastewater fees will be introduced to pay for the system and to pay for ongoing maintenance expenses.

28. *Are there any combined storm and sanitary sewers within Beulah Camp and Conference Centre? Are any such sewers being proposed? Note that the use of combined sewers is discouraged.*

No, at the moment there are no plans to install a storm water collection system. There is only one catch basin on the site. It discharges toward Lake Galilee. There are no plans to connect storm run-off and to divert it to the sanitary collection system.

29. *Page 4 of the Registration document indicates that there is no trailer dumping station on the subject property. Does this mean that there will be no trailer dumping station or RV pump out facility proposed as part of the new sewage treatment system? Please clarify.*

Currently, there is no plan to build a trailer dump or a pump out station on the property. However, after some operational experience has been gained with the lagoon, we would recommend that a dump station will be installed and connected.

Effluent Quality and Design Criteria

30. *With respect to the projected effluent quality on page 21 of the registration, please*

clarify what the <16 mg/L refers to. Is it Total Ammonia? Is it expressed as N or NH₃?

The value is <16mg/L of Total Ammonia expressed as N.

31. How was the design flow and organic loading determined? The registration document does not provide the total number of rooms in the two hotels, the number of camping sites for RV's and tents, showers and laundromat facilities, the size of the cafeteria, institutions, etc. The analysis of the flow and loading for each different type of unit must be known to properly determine the design flow and BOD load to the treatment facility, since each type produces different BOD and flow volumes.

A number of studies have been carried out on actual water consumption and wastewater generation, both during high demand times and during the off season. Past measurements indicated an average flow of 258 m³/day during the busiest week of the summer, and an average flow of 113 m³/day otherwise (see also the figures showing flow measurements appended to registration document). The lagoon was designed to be able to handle a continuous flow of 300m³/day (to allow for future growth), with a BOD concentration of 250 mg/L and TSS concentration of 200 mg/L.

32. Are food scraps from the kitchen disposed of in the wet/dry garbage or is there a garborator in the kitchen?

Food scraps from the kitchen are disposed of in wet/dry garbage. There is no garborator in the kitchen.

Winter Operation

33. Winter management of wastewater collection may pose a problem as only 20 homes are occupied during winter months. These homes may release flows as low as 10 cubic metres / day and the 750 metre long force main discharging to the lagoon will have a sewage residence time of over 14 hours for a 100 mm diameter force main and over 31

hours for a 150 mm diameter force main. Considering this, how will operational problems such as septicity, gas production (with possible air lock), and potential for freezing of the force main be addressed?

It is planned to install a 100 mm diameter force main (volume = 6.1 m³), buried below the frost line. Both, the force main and the gravity sewer will be on a gradual incline, thereby preventing the potential for air locked conditions. A continuous incline is required for the gravity sewer to avoid ponding of the effluent.

The main lift station will be equipped with two sewage lift pumps. Typically, the pumps will alternate and only run simultaneously when larger volumes have to be pumped. The float switches will be adjusted seasonally. In the winter, the floats will be set lower to pump small volumes, more frequently. Thereby septic conditions in the lift station can be avoided.

Decommissioning of the Existing Facility

34. The existing trickling filter must be decommissioned. Please briefly outline the proposed decommissioning procedure.

As part of construction, all systems will be tested. When the new treatment lagoon, the new lift station and outfall system are built and are ready to start operating, the existing gravity sewers will be connected to the new lift station. The existing septic tank will be pumped empty and filled with sand. The cover of the tank will be broken. Sewage sludge will be disposed of by the septage hauler.

The roof of the trickling filter will be dismantled and sold as scrap metal. The gravel inside will be removed and disposed of at an approved facility. The concrete base will be crushed and excavated. All materials will be recycled or disposed of at appropriate facilities. The site will be restored and converted into a constructed wetland, with the purpose of filtering any site runoff prior to discharge into the St. John River.

Construction Methods

35. *Will any blasting of bedrock be required to build the lagoon or sewer pipes?*

As far as we know to date, there will be no blasting required. Further soils testing will be carried out as part of the detailed design.

36. *What is the proposed depth of the new sewer line from the lagoon to the outfall?*

The proposed depth of the new sewer line from the lagoon to the outfall is 1.5 to 1.8 m to avoid frost problems.

Future Land Use

37. *What is the intended future use of the lands identified as S1, S2, and S3 on Figure 2-2?*

Those areas will be left undisturbed. There may be limited development of area S1 at some time in the future, however no development is planned for the next years.

38. *What is the anticipated long term growth of the camp in terms of full size homes and new institutions (hotels, restaurants, meeting facilities, etc.)?*

No new restaurants or major meeting facilities are planned. There could be some replacements of older facilities however. The number of new homes will be very limited as we are near maximum capacity on our land. There will be a slowly increasing number of retired ministers residing there year round. The current number of approximately 20 year round families could expand to 35 or 40 over a decade or so.

Impact of Extreme Events

39. *Have extreme precipitation events been taken into account in the design of the*

proposed lagoon? Extreme precipitation events have the potential to result in exceedances of the lagoon's capacity. Historical data and local area knowledge should be consulted in evaluating the adequacy of lagoon design. It may be worthwhile to obtain an estimate of Probable Maximum Precipitation (PMP) to ensure that extreme events can be accommodated, especially considering that over the coming decades, more intense precipitation events are very likely to occur as a result of climate change. In all likelihood, it will be more cost-effective to adjust design criteria now than to retrofit the facility in the future. Note that Climatological data is available from: Atlantic Climate Centre, Environment Canada, 77 Westmorland Street, Suite 260, Fredericton, New Brunswick E3B6Z3 Phone: (506) 451-6006, Fax: (506) 451-6010, E-Mail: climate.atlantic@ec.gc.ca

According to data from the Atlantic Climate Centre, the PMP for the area is 163 mm for a 24hour - 100 year return, extreme precipitation event. In this case, 1,100 m³ of clean water would be added to the design water volume of 7,200 m³ in the lagoon, raising the water level by close to 20cm over a 24 hour period. This increased flow will be taken into consideration in the design of discharge piping. We do not expect to see a significant change in treatment quality due to such a rainfall event. The main sewage lift pump will be designed to handle increased discharges resulting from high infiltration or high groundwater tables.

We trust that this information meets your requirements. Please do not hesitate to call, should you have any questions.

Yours sincerely,

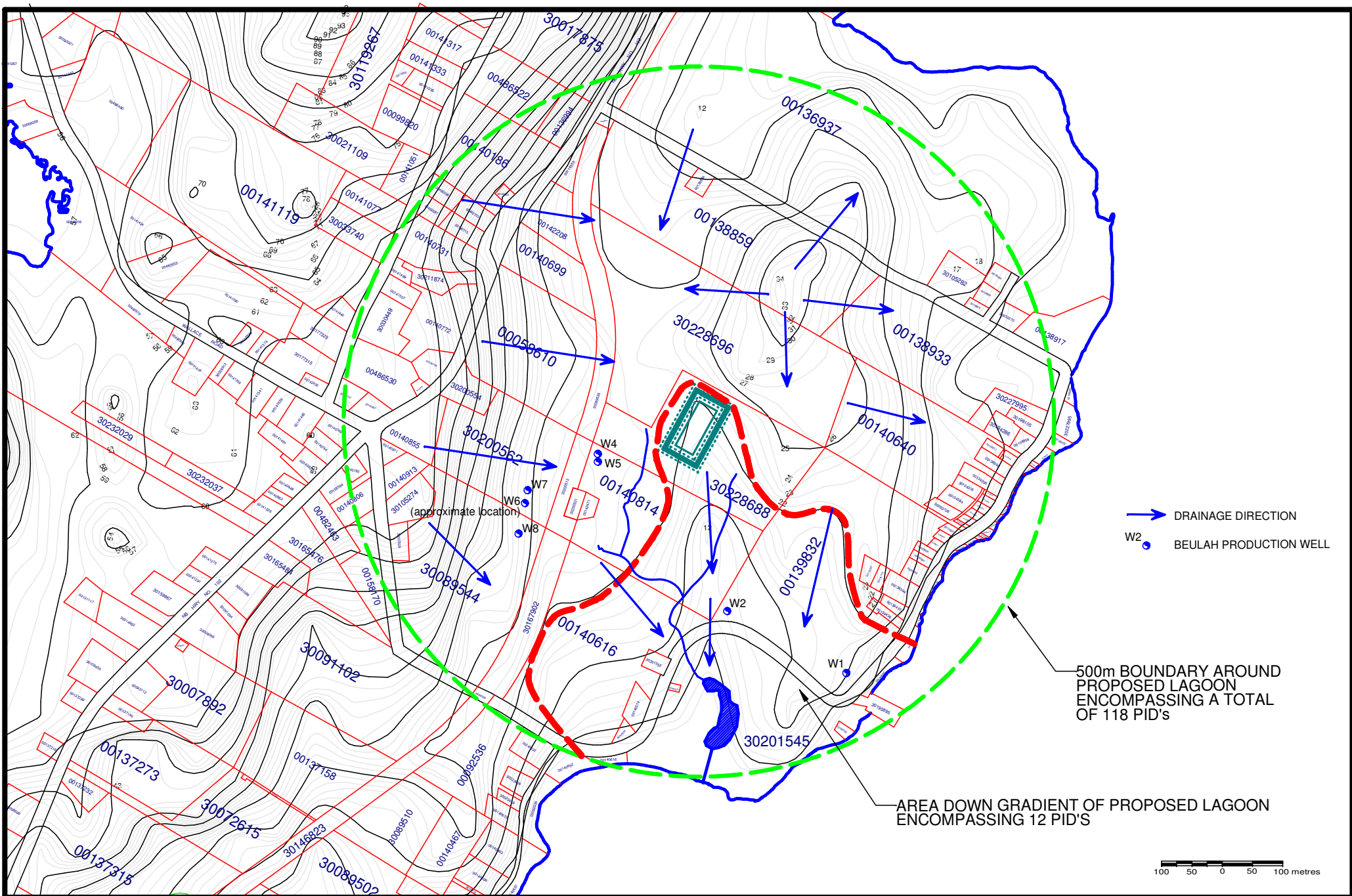




Jochen Schroer, M.Eng., P.Eng.

President, NATECH Environmental Services, Inc.

JS/vb

ref.:...let 07 Beulah EIA comments response



 DRAINAGE DIRECTION
 BEULAH PRODUCTION WELL

500m BOUNDARY AROUND PROPOSED LAGOON ENCOMPASSING A TOTAL OF 118 PID'S

AREA DOWN GRADIENT OF PROPOSED LAGOON ENCOMPASSING 12 PID'S

100 50 0 50 100 metres

BEULAH'S CAMPGROUND DRAINAGE PATTERN



Environmental Services Inc.

109 Patterson Cross Rd., Harvey Station, N.B.
 Ph: (506) 366-1080 Fax: (506) 366-1090

Date: 02/14/07

File: BCG-06-01

Scale: N.T.S.

DWG #: Figure 1-1

Appendix 1, ESA - Summary Reports

BROWNS FLATS ROADCUTS SITE ID 777 :

PARISH : GREENWICH CRITERION1 : 6 CATEGORY1

GEOLOGY IBP

COUNTY : I CRITERION2 : CATEGORY2 CNA :

REGION : SJ CRITERION3 : CATEGORY3 DOE :

NTS : 21-G/8 NBMAPS : 86 UTME : 724000 LAT : 4528

ORTHO : 10 454500 66100 FDS : 5060 UTMN :5039000 LONG 6608

LOCATION : Immediately northeast of Browns Flats.

DESCRIPTION : Roadcuts on Highway 102 are mainly Early Cambrian felsic volcanic rocks.

NAT_REG : 8 FOREST ADMIN : 4-5 OWNTYPE : M

ECOTYPE1 : WATERSHED : 1-03

ECOTYPE2 : ELEVATION : 45

SOURCES : GEOLOGICAL HIGHWAY MAP OF NB (1985)

CONTACTS :

LEGAL :

AGENCY :

COMPILER : CHIASSON/CRIGHTON DATE : 14-Jan-1994

Report Date : 21-Feb-2007

CARTERS POINT/BEDFORD SITE ID 778:

PARISH : KINGSTON CRITERION1 : 2 CATEGORY1 PLANT IBP

COUNTY : I CRITERION2 : CATEGORY2 CNA :

REGION : SJ CRITERION3 : CATEGORY3 DOE :

NTS : 21-G/8 NBMAPS : 86 UTME : 721500 LAT : 4524

ORTHO : 10 454000 66100 FDS : 5061 UTMN : 5032000 LONG 6610

LOCATION : On south shore of Long Reach, approximately 7 km. above the river's right angle turn at Westfield.

DESCRIPTION : Whorled Loosestrife *Lysimachia quadrifolia* L. is found here in several large colonies in sand on the shaded upper beach.

NAT_REG : 8 FOREST ADMIN : 3-6 OWNTYPE : M

ECOTYPE1 : RIPBANK WATERSHED : 1-03

ECOTYPE2 : ELEVATION : 0

SOURCES : HINDS (1983); (1986)

UNB HERBARIUM SEARCH (1993)

CONTACTS :

LEGAL :

AGENCY :

COMPILER : CHIASSON/CRIGHTON DATE : 14-Jan-1994

Report Date : 21-Feb-2007

CATONS ISLAND SITE ID 779 :

PARISH : GREENWICH CRITERION1 : 4 CATEGORY1

FOSSIL IBP

COUNTY : I CRITERION2 : CATEGORY2 CNA :

REGION : SJ CRITERION3 : CATEGORY3 DOE :

NTS : 21-G/8 NBMAPS : 86 UTME : 726000 LAT : 4529

ORTHO : 21 G/08-Z3 FDS : 5060 UTMN : 5040000 LONG 6607

LOCATION : Opposite Browns Flat, south of Isle of Pines in Long Reach, Saint John River.

DESCRIPTION : This is the type locality for two Brachiopoda (Invertebrate) fossils: *Acrothele matthewi* var. *costata* Matthew and

Botsfordia pulchra (Matthew) - in collection of New Brunswick Museum.

NAT_REG : 8 FOREST ADMIN : 4-5 OWNTYPE : P

ECOTYPE1 : WATERSHED : 1-01

ECOTYPE2 : ELEVATION : 0

SOURCES : MILLER (1988)

CONTACTS :

LEGAL :

AGENCY :

COMPILER : CHIASSON/CRIGHTON DATE : 14-Jan-1994

Report Date : 21-Feb-2007

ISLE OF PINES SITE ID 787 :

PARISH : GREENWICH CRITERION1 : 11 CATEGORY1 BIRD IBP

COUNTY : I CRITERION2 : 3 CATEGORY2 MAMMAL CNA :

REGION : SJ CRITERION3 : 12 CATEGORY3 DOE : 27

NTS : 21-G/8 NBMAPS : 86 UTME : 727500 LAT : 4530

ORTHO : 10 454500 66000 FDS : 5160 UTMN : 5041800 LONG 6605

LOCATION : In the Saint John River south of Grassy Island.

DESCRIPTION : This 20 ha. island, surrounded by marsh, serves as an important area for nesting, feeding and loafing waterfowl. It also supports a nesting pair of Bald Eagle.

NAT_REG : 8 FOREST ADMIN : 3-6 OWNTYPE : P

ECOTYPE1 : MARSH WATERSHED : 1-01

ECOTYPE2 : ELEVATION : 0

SOURCES : STOCEK, R.F. "ESA'S IN SAINT JOHN PLANNING REGION"

D.O.E. 1982.

CHOATE (1973); (1978)

CWS. CRITICAL MIGRATORY BIRD HABITAT (NEWBRUN.DBF)

CONTACTS : DOE. ESA'S(1982):CARTWRIGHT; CHRISTIE; GORHAM

RUDY STOCEK, MARITIME FOREST RANGER SCHOOL, FREDERICTON

LEGAL :

AGENCY :

COMPILER : CHIASSON/CRIGHTON DATE : 12-May-1995

Report Date : 21-Feb-2007