

**ENVIRONMENTAL ASSESSMENT REGISTRATION  
KINGS MINES WOOD WASTE DISPOSAL FACILITY**

**GRAND LAKE TIMBER  
DIVISION OF JD IRVING, LIMITED**

**Our File No.: 316-16-C**

**March 2017**

Prepared for:



**J.D. IRVING, LIMITED  
SAWMILL DIVISION**

Prepared by:



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## ACRONYMS

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ACCDC – Atlantic Canada Conservation Data Centre  
ASU – Archeological Services Unit  
CCME – Canadian Council of Ministers of the Environment  
CEAA – Canadian Environmental Assessment Agency  
CEAA 2012 – Canadian Environmental Assessment Act (2012)  
COPC – Chemicals of Potential Concern  
CoA – Certificate of Approval  
CoD – Certificate of Determination  
COSEWIC – Committee on the Status of Endangered Wildlife in Canada  
CRHP – Canadian Register of Historic Places  
CSA – Canadian Standards Association  
DELG – NB Department of Environment and Local Government  
DPS – NB Department of Public Safety  
DTI – NB Department of Transportation and Infrastructure  
DFO – Department of Fisheries and Oceans Canada  
EIA – Environmental Impact Assessment  
ESA – Environmentally Significant Area  
EMP – Environmental Management Plan  
GLT – Grand Lake Timber  
GPS – Global Positioning System  
HDPE – High Density Polyethylene  
IBA – Important Bird Areas  
JDI – JD Irving, Limited  
LAT – Latitude  
LONG – Longitude  
MBCA – Migratory Birds Convention Act  
NSE – Nova Scotia Environment  
OMoE – Ontario Ministry of the Environment  
OWLS – Online Well Log System  
PID – Real Property Parcel Identification Number  
PDA – Project Development Area  
ROW – Right-Of-Way  
SAR – Species at Risk  
SARA – Species at Risk Act  
SOCC – Species of Conservation Concern  
TC – Transport Canada  
TRC – Technical Review Committee  
VEC – Valued Environmental Component  
VOC – Volatile Organic Compounds

## **EXECUTIVE SUMMARY**

Grand Lake Timber Limited, a division of JD Irving, Limited, is proposing to construct and operate a wood waste disposal facility in Kings Mines, near Chipman, New Brunswick. The proposed site is located in an area formerly impacted by NB Coal in the late 1990's, which created a large valley suitable for a waste disposal site. Grand Lake Timber Limited mandated Roy Consultants, in collaboration with Craig HydroGeoLogic Ltd. to assess the in-situ soils, and it was determined that the site is appropriate for the disposal of wood waste and ash without requiring an engineered liner or leachate pond.

This registration document has been developed to meet the requirements of New Brunswick Regulation 87-83: the *Environmental Impact Assessment Regulation – Clean Environment Act*. Under Schedule A, item (m), of this regulation, “all waste disposal facilities or systems” and their significant modifications require registration.

The proposed project footprint is ideally located for a project of this nature, both for its topographic features but also its minimal potential for environmental impact. The proposed new location is also owned by the proponent, contains a large valley formed by the former NB Coal surface coal mine, and is located close to the mill site.

Based on the assessment of the proposed project, the existing site's environment, potential wood waste impacts and recommended mitigation, no significant adverse environmental effects are anticipated from the construction and operation of the project.

## **1. THE PROPONENT**

### **1.1 Name of Proponent**

The proponent is Grand Lake Timber, Division of JD Irving, Limited.

### **1.2 Address of Proponent**

#### **Grand Lake Timber Limited**

Mr. Charles Cyr, RPF  
*General Manager*  
290 Main Street  
Chipman, NB E4A 2M7

### **1.3 Chief Executive Officer**

Mr. Charles Cyr, RPF, Sawmill Manager.

### **1.4 Principal Contact Persons for the Purposes of the Environmental Impact Assessment**

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### **1.5 Property Ownership**

The project footprint will be located on property owned by JD Irving, Limited.



## **2. THE UNDERTAKING**

### **2.1 Name of the Undertaking**

The name of the Undertaking is the *Kings Mines Wood Waste Disposal Site*.

### **2.2 Background**

GLT is a softwood sawmill located in Chipman, Sunbury County, New Brunswick and produces approximately 200 million board feet of dimensional lumber per year. The sawmill consists of, among others, a hot pond, sawmill, seven (7) high-temperature kilns, a planer mill, a finger-jointer, and two wood-fired boilers. Currently, the sawmill operates for 18 hours per day, 5 days a week, with two 9-hour shifts. The dry kiln operations run 24-hour shift, 7-days per week. In total, the mill directly employs ~240 people, and provides indirect unemployment to an additional 500.

Spruce, pine and fir are harvested and brought to the sawmill in lengths ranging from 8 to 16 feet, stored at the site or the off-site wood yard, then submerged in the hot pond. Logs move from the hot pond to the three ring debarkers, before moving to the optimized primary breakdown line where they are scanned and rotated for optimum positioning.

Primary breakdown consists of chipping parallel faces on the logs and sawing off sideboards, which are sent to the optimized edger for further processing. The remaining log (“cant”) is passed through the optimized trimmer and then automatically sorted into a multi-bin drop-sorter and transported to the kilns.

Lumber is then dried in one of seven (7) high-temperature dry kilns, for various durations depending on tree species. Once kiln-dried, the boards are planed in a 100,000 square foot building that houses a planer mill and finger-jointing operation. Shorter pieces of lumber, which would otherwise become waste, can be finger-jointed and used to produce saleable products.

Wood by-products are generated during the debarking, sawing and planing of the logs. Wood waste, consisting of yard scrapings and hot pond solids go to the existing wood waste disposal site. Sawdust produced on site during the winter is burned in the biomass boilers for space heating. Bark from the debarker is either burned in the biomass boiler or sold.

### **2.3 Project Overview**

Grand Lake Timber (GLT) is proposing to construct and operate a wood waste disposal facility in Kings Mines, near Chipman, New Brunswick. The proposed project would consist of the development of a large disposal site which will accept wood waste (primarily yard-scraped bark and soil), hot pond solids, and ash from the nearby Grand Lake Timber sawmill.

The waste destined for the proposed Kings Mine disposal site will be deposited in the waste cell. A Cell Development Plan will be developed specifically for this site, and submitted for review and approval by the New Brunswick Department of Environment and Local Government through their Approvals process.

The current wood waste disposal site is nearing its end-of-life; therefore GLT is assessing the potential for a proposed new site.

## **2.4 Purpose/Rationale/Need for the Undertaking**

The GLT sawmill is a major economic driver for the region, in addition to the ~240 people directly employed at the mill site. In order to continue operating, GLT must have a viable wood waste disposal site. The current site is nearing its capacity and will be closed in the next 24 months at the mill's current rate of output. As such, a new wood waste disposal site is required.

Several options and sites were assessed by GLT in the early project planning stages. The "do nothing" ('null') alternative was evaluated but is not considered feasible. Despite significant improvements to the efficiency/modernization of the mill, wood waste cannot be completely eliminated; therefore disposal of wood waste is essential to the continued operation of the mill.

Expanding the existing site was deemed not feasible due to property ownership restrictions and the topography of the site.

The site proposed herein is ideally suited for the purpose: The site is located on property owned by the proponent and the topography allows the disposal of wood waste without significant earthworks/excavation or the requirement of a liner. The site, as part of the former NB Coal mine, has already undergone significant environmental degradation/changes. The site is already gated for security purposes, and is located a short distance (within 4km) of the mill site. No groundwater receptors (namely domestic water wells) are located within a kilometre of the site, and the nearby receiving watercourse, Wilson Brook, is already impacted by the former mine and will not be adversely impacted by the operation of the site.

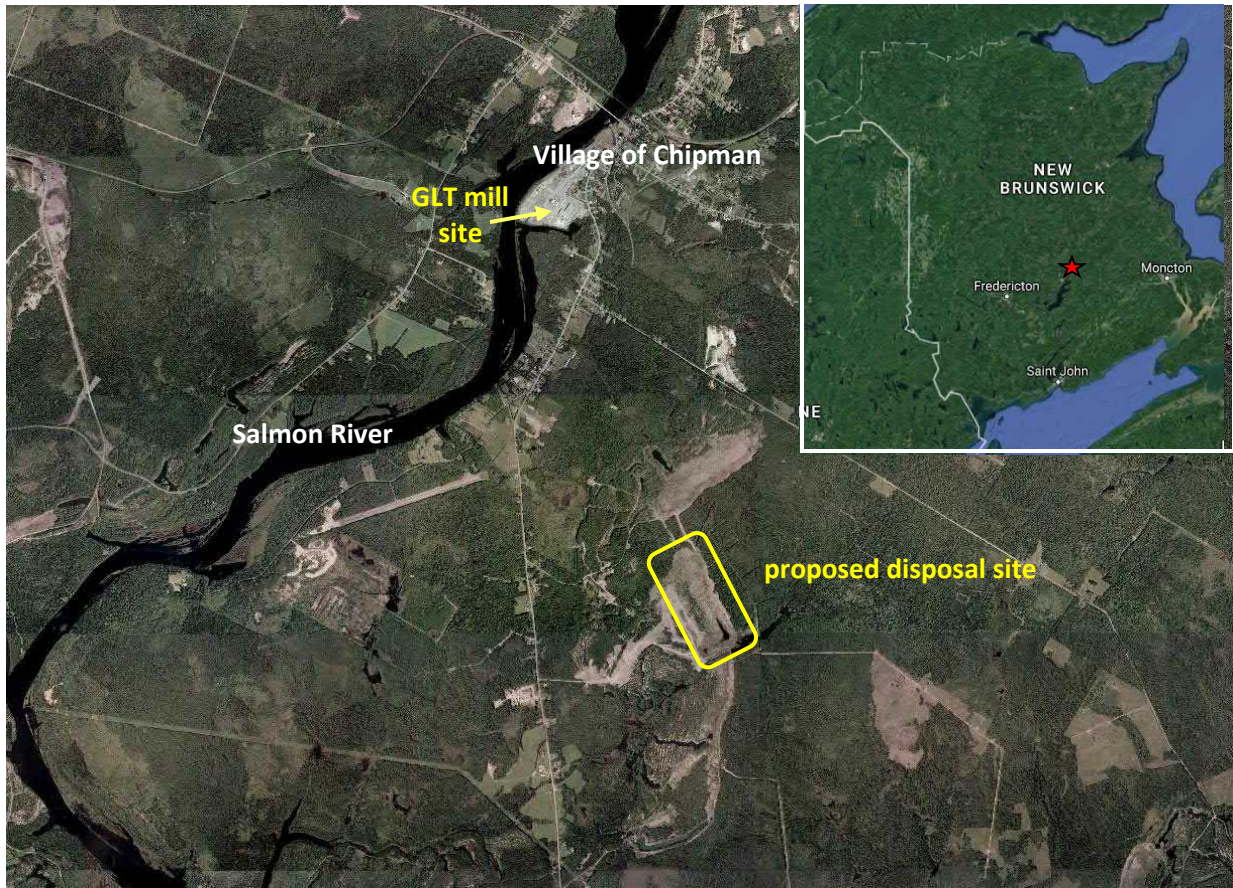
Refer to Section 2.9 for a more detailed discussion of the regulatory requirements for a wood waste disposal site.

## **2.5 Project Location**

The proposed project will be located off of Route 10 in Kings Mines, Queen's County, Parish of Chipman, property ID number 45073913 (Figure 1.0). The site is located ~4 kilometres south of the GLT mill site in Chipman.

The parcel is located in an unincorporated area and therefore has no zoning restrictions. Although the subject property was formerly surface-dredged by NB Coal, the east edge of the "cut" was the limit of the mined area. Refer to section 3.1.2 for more information on the geology of the area and past uses of the site.

The center of the proposed disposal site is geo-referenced at LAT 46<sup>o</sup>, 08', 26.96" N, LONG 65<sup>o</sup>, 52', 18.74" W.



**Figure 1: Proposed Project Location.**

## 2.6 Siting Considerations

The project site was chosen for a variety of favourable elements:

- a. The parcel is owned by the proponent;
- b. The site is located a short distance (~4km) from the GLT sawmill, thereby minimizing the amount of trucking required and potential greenhouse gas emissions;
- c. The proposed site's topography is physically suited for a waste disposal site – consisting of a deep valley (a mine “cut”) approximately 700m in length by 150m wide, and ~8m in depth at the centre of the cut. This would provide enough volume for GLT to dispose of wood waste and ash for at least 25 years;
- d. The cut already contains a number of lateral structures, left over from the remediation of the former mine, suitable for runoff control (berms);
- e. There is a minimal potential for environmental constraints – the subject property is a former surface coal mine cut and tailings area, contains no mature vegetation (does not require clearing), and contains a former beaver impoundment, to act as a final barrier to Wilson Brook, which is already impacted and suitable for receiving site runoff;
- f. Due to the mine tailings/soil on site, an engineered liner is not required;
- g. There are no downgradient domestic wells within 1 km of the site;
- h. There are no wetlands within the proposed project footprint;

- i. The proposed site is not located within or near a designated water supply (surface or groundwater);
- j. No Environmentally Significant Areas (ESAs) are located in proximity to the proposed project footprint;
- k. Lack of potential cultural/archaeological resources – due to the previous site work by NB Coal and the nature of the site (tailings and cut from the large scale, surface mining operation), there is an extremely low potential for archaeological or heritage resources;
- l. Lack of land-use conflicts – neighbouring properties are forested and/or former surface coal mine land;
- m. Accessibility – site access is already established and gated for security purposes, and
- n. Status quo – the project location is in close proximity to the current waste disposal site; the development of the proposed site would essentially maintain the status quo for residences located along the haul route (Route 10).



**Figure 2: Proposed Disposal Site and Access Road.**

## **2.7 Physical Components and Dimensions of the Undertaking**

Refer to Figure 3 for an overview of the proposed project components. The location of the project has been chosen based on the suitability of the site, requiring minimal site preparation.

The Project Development Area (PDA) is located on parcel identification number (PID) 45073913, and is owned by JD Irving, Limited. This parcel is approximately 39 hectares (acres) in size, and lies immediately south of the Village of Chipman municipal boundary. The subject property is located east of Route 10, approximately 4km south of the Chipman centre.

The project footprint will be approximately 10 hectares in total area.

The project will consist of the following physical components:

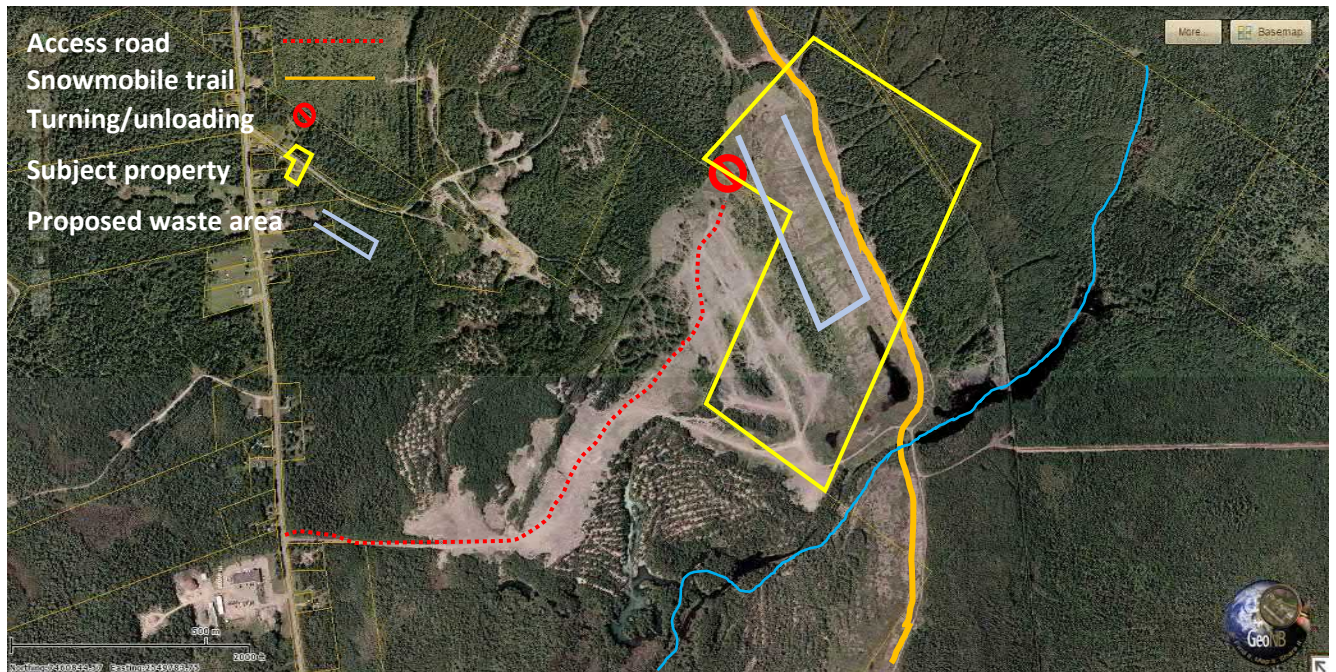
- Existing access road;
- Unloading area;
- Waste cell, and
- Monitoring wells.

The project construction can be divided into the following activities:

- Site preparation (primarily survey of the site and installation of monitoring wells), and
- Levelling of the unloading area.

Operation of the project will consist of the following activities:

- Transport of wood waste and ash from the mill site (primarily via standard dump truck, but may also include larger trucks);
- Unloading of the waste at the disposal facility;
- Levelling of the waste by bulldozer;
- Ground- and surface water monitoring (as per DELG Approval to Operate).



**Figure 3. Site overview.**

## **2.8 Construction, Operation and Maintenance Details**

### **2.8.1 Construction**

The proposed site is a former surface coal mine ‘cut’ (a valley formed by the dredge) and ‘dump’ (hill formed of tailings, re-shaped by NB Coal). Due to the suitability of the site, minimal site preparation will be required.

#### **2.8.1.1 Earthworks and Excavation**

The shape of the cut is ideally suited for a waste disposal site, therefore no excavation or earthworks will be required.

The site contains an existing access road suitable for transporting the waste to the disposal site; therefore no road construction is required.

An unloading area at the north end of the cut, where the trucks will turn and dump the waste and ash, will require levelling by a bulldozer. The size of this area will be restricted to the minimum area necessary for the safe turning radius of the trucks hauling waste.

#### **2.8.1.2 Vegetation Removal**

The site will not require removal of mature vegetation – the cut consists of immature, early successional tree and shrub species. Each year’s waste footprint area will be cleared of vegetation outside of the bird breeding season.

### **2.8.1.3 Site Survey**

Prior to initiating construction, the site components and property lines will be surveyed and staked.

### **2.8.1.4 Installation of Monitoring Wells**

Monitoring wells will be drilled and surveyed prior to initiating operation of the site, in consultation with DELG, to monitor groundwater quality impacts throughout the life of the project. Monitoring wells already in place will be maintained as part of the monitoring program, or decommissioned if no longer required. If necessary, new monitoring wells will be installed by a qualified drilling contractor prior to initiating operation of the site.

## **2.8.2 Operation and Maintenance**

The wood waste site will operate Monday to Friday, 7am – 5pm. Operation activities at the waste disposal site will consist of the following:

- Waste will be hauled from the GLT mill site to the waste disposal site via Route 10;
- The truck(s) will turn and dump the wood waste and/or ash into the waste cell;
- Waste will be spread and levelled by bulldozer (weekly or as needed);
- The empty truck(s) will return to the GLT mill site to await the next load of waste, as needed.

### **2.8.2.1 Transportation**

Depending on mill operations, between 1 and 6 truckloads of wood waste and ash will be transported and dumped at the site, per day. In 2016, 18,952 tonnes of wood waste were deposited in the current site, requiring approximately 1,400 round trips (on average 28 trips per week, or 4 trips/day).

Trucks will be filled at the GLT mill site in Chipman, and will then travel approximately 4km to the wood waste site via Route 10, adhering to all speed limits. Ash loads will be covered to prevent fugitive dust emissions escaping during this short trip.

### **2.8.2.2 Waste Management**

Management of the waste deposited at the site will be governed by the DELG-approved Cell Development Plan, as required by the Approval to Operate. In general, however, wood waste will be dumped at the unloading area, located at the north of the cut (and extending southward as the cut fills up over time). Trucks will dump the waste into the waste cell, as required. Once it has accumulated over a number of days, a bulldozer and operator will spread and level the waste (this will likely be done weekly, but will depend on the amount of waste deposited). This is done to prevent surface water from gathering and creating “soft spots” in the waste. As necessary, the bulldozer will cover deposited ash with wood waste to prevent fugitive dust emissions.

Operation of the waste disposal site will consist of the following:

- Trucks will access the site, turn and unload their wood waste and ash on top of the wood waste cell;
- A bulldozer will level the wood waste cell periodically, as needed. This is anticipated to be done on a weekly basis;

- Ash will be mixed with wood waste to prevent fugitive particulate emissions;
- Each year, after the conclusion of the bird breeding season, the vegetation will be cleared from the following year's anticipated waste cell footprint;
- Ground- and surface water will be sampled and analysed regularly, as per the requirements of the DELG Approval to Operate, and
- The access road will be maintained (i.e. graded, levelled or infilled) as needed.

### 2.8.3 Site Closure

Closure of the proposed site is not planned at this time, as the lifespan of this facility is anticipated to exceed 25 years, based on the volume of wood waste and ash produced annually from GLT and the capacity of the proposed site.

The current wood waste disposal site will be decommissioned under a separate EIA as per the requirements of the NB DELG.

## 2.9 Regulatory Considerations

The Province of New Brunswick's Department of Environment and Local Government (DELG) regulates the siting, construction, operation, maintenance and decommissioning of wood waste disposal facilities in New Brunswick under the Clean Environment Act and the Clean Water Act.

Wood waste management is regulated by the Department of Environment and Local Government through the facility's certificate of Approval to Operate, issued under the NB Clean Environment Act. In support of the Approval, DELG has developed draft *Guidelines for the Siting and Operation of a Wood Waste Disposal Site Dedicated to a Sawmill* (June 25, 2008) ("the guidelines"). The proposed site will require an Approval to Construct and Operate a class 3 site: "A wood waste disposal site in excess of 3 hectares of disposal area".

The Guidelines impose requirements for the siting and operation of a wood waste facility, including liner requirements, limit of the total depth of the waste to 10m, leachate controls and monitoring requirements.

In order to determine the suitability of the site, the proponent met with DELG staff early in the planning process to discuss the possibility of depositing waste in the cut without requiring the installation of an engineered liner. This was proposed given the nature of the waste, the negligible environmental impacts assessed at other wood waste sites, and the type of soils and previous impacts to the site from the former NB Coal surface mine. Based on these early discussions, Craig HydroGeoLogic was mandated to assess the hydrogeological conditions of the site and determine if a liner would be required as part of the project design.

Roy Consultants undertook a borehole and monitoring well installation program in December of 2016. Ten (10) boreholes were drilled using a track-mounted rotary drill rig, and four (4) of these were converted to monitoring wells: Two (2) wells in bedrock on the eastern limit of the cut, and two (2) into the tailings in the middle of the cut (see figure 4). Soil and groundwater samples were collected and sent to the Roy Consultants lab in Bathurst, and RPC Science and Engineering in Fredericton, respectively, for analysis.

Craig HydroGeoLogic reviewed the lab results, characteristics of in situ soils, the depth to bedrock, type of bedrock, and distances to surface and groundwater receptors. The assessment concluded that, using the available data and risk assessment method, as well as a historical review of similar sites (including the



nearby existing GLT wood waste disposal site), a liner system and leachate pond was deemed not necessary at this site, and any potential environmental impacts from the disposal of wood waste and ash would be inconsequential compared to previous impacts from the surface coal mine. Refer to Appendix E for the complete Craig HydroGeoLogic report.



**Figure 4. Site monitoring wells and groundwater flow.**

### 3 DESCRIPTION OF THE EXISTING ENVIRONMENT

#### 3.1 PHYSICAL AND NATURAL FEATURES

##### 3.1.1. General

The project property is an unoccupied parcel of land previously heavily impacted by surface coal mining activity. The site consists of an access road and a large ‘cut’ (valley) and ‘dump’ (hill), created by the former NB Coal surface coal mine. Based on aerial photo interpretation, the site was mined in the 1990’s and remediated/shaped in the 2000’s (refer to Appendix B for complete aerial photo sequence).



**Photo no. 1. NB Coal cable dredge operating (NB Museum, 2012).**

The site is bordered to the north by a forested parcel and another surface mine cut, extending north approximately 1.6 km to Dufferin Road.

The site is bordered to the east by multiple forested parcels, extending approximately 3 km to Dufferin Road.

The site is bordered immediately to the south by Wilson Brook, then additional former surface coal mine cuts, and forested parcels extending 4km to Coal Creek.

The site is bordered immediately to the west by a former surface mine area, currently in use by GLT as a wood storage site. Beyond the wood storage area, forested parcels extend approximately 1.5 km west to Route 10 and the nearest residential receptors.

A review of Department of Energy and Resource Development (ERD) aerial photography dating from the most recent (2008) back to 1928 shows the site was forested and undeveloped until after 1982 (Appendix B).

The site is located approximately 3.2 kms northeast of the current wood waste disposal site.

### **3.1.2. Geology**

Based on the Geological Survey of Canada's Surficial Geology Map of New Brunswick (Rampton, 1984), the surficial geology of the subject area consists of loamy lodgment till, minor ablation till, silt, sand, gravel and rubble with a discontinuous veneer over bedrock, less than 0.5 m thick.

Based on the Department of Natural Resources Geological Map of New Brunswick (2000), the regional bedrock geology of the subject area is identified as Pennsylvanian-aged sedimentary rocks consisting of red to grey sandstone, conglomerate and siltstone.

Based on aerial photo-interpretation and the results of a borehole/MW program on site, the eastern edge of the cut is the limit of the surface mining activity at this site.



**Photo no. 2. NB Coal cable dredge (undated Google image).**

### 3.1.3. Soils

The soil on site consists of the tailings left behind from the surface coal mine. As the cable-dredge removed the coal layer, overburden and unwanted material was disposed of in-situ as tailings, and re-shaped later into the “cut and dump” topography seen today. The depth of these tailings exceeds 10m at the low point of the cut. Based on the sieve analyses conducted on samples obtained from the borehole program, soils consist primarily of poorly-sorted gravelly sand, low in fines; or sandy gravel, low in fines. Refer to the Craig HydroGeoLogic Report in Appendix E for a more detailed discussion on the soils and their characteristics.



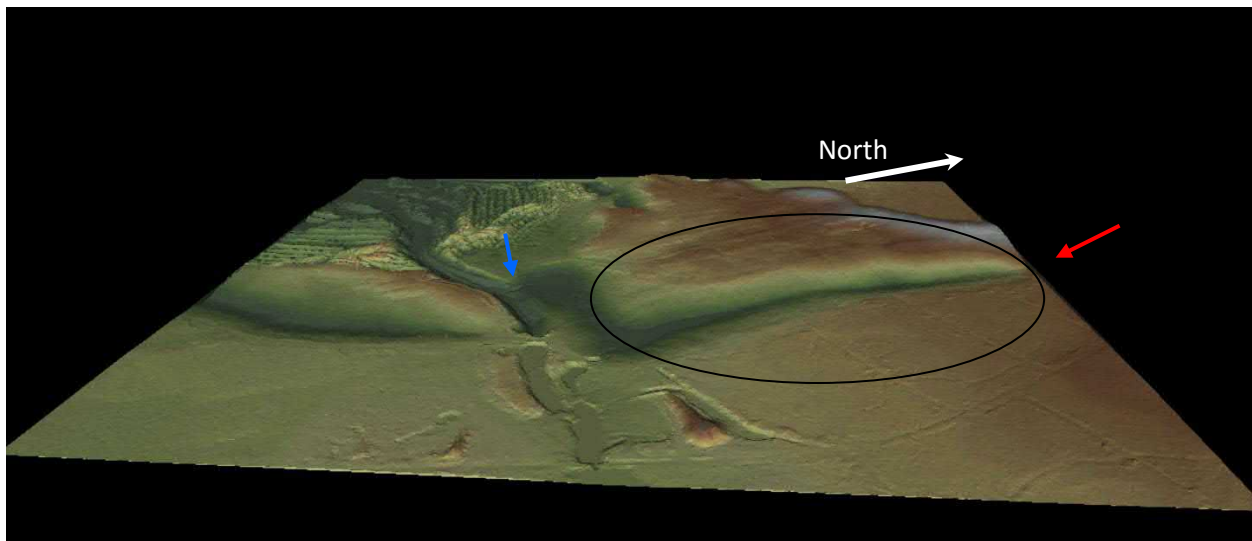
**Photo no. 3. Soil sample from borehole program.**

### 3.1.4. Topography

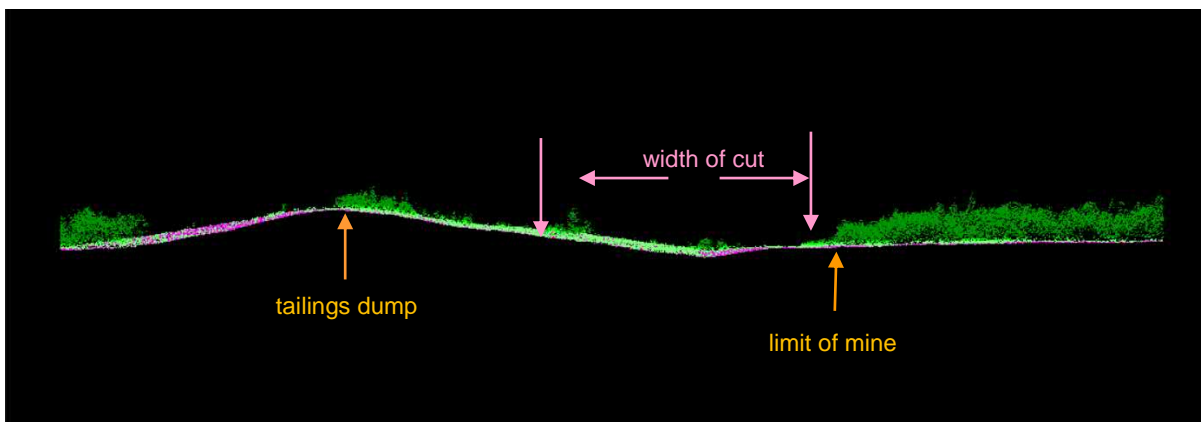
The site topography slopes south towards Wilson Brook. Area topography generally slopes to the west, towards Grand Lake. Wilson Brook is located immediately south of the site, and its confluence with Salmon River is located approximately 4 km west, downstream of the site. Most of the surface water runoff currently flows south and enters Wilson Brook via a beaver impoundment, or infiltrates through the overburden material towards Wilson Brook.

The western edge of the property is an elongated hill (the 'dump'), composed of mine tailings and positioned in a north/south direction. The centre of the parcel is composed of a valley (the 'cut'), also running north-south. The eastern edge of the property is a forested edge containing the NB Snowmobile Federation groomed snowmobile trail.

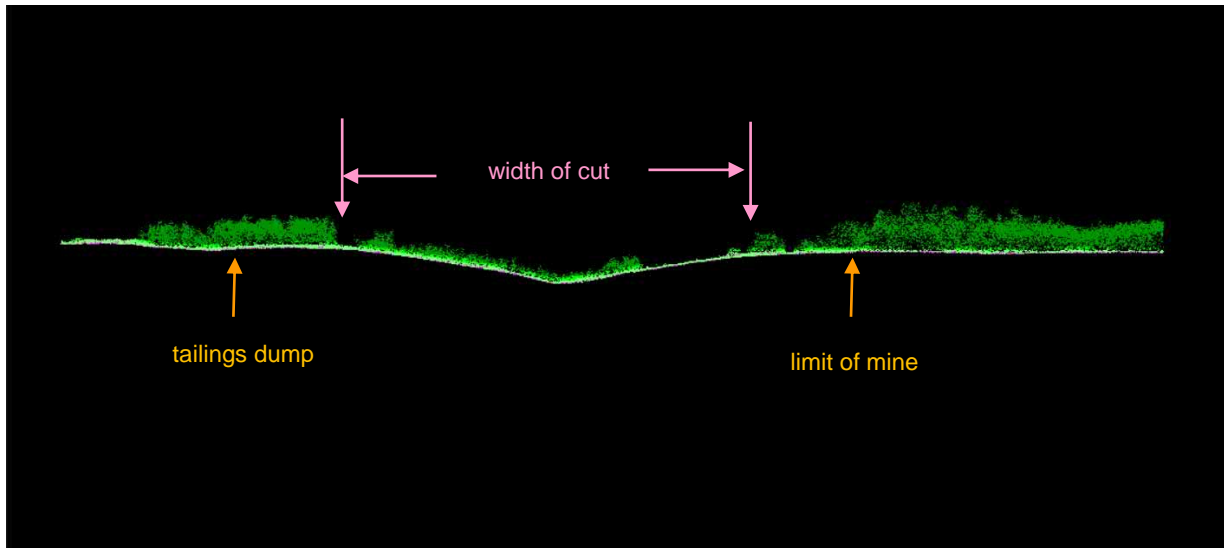
Refer to Figure 5 for site topography.



**Figure 5: Graphical Representation of LIDAR topography of subject site (note unloading will take place at red arrow, outlet to Wilson Brook at blue arrow) – FUGRO®.**



**Figure 6. Graphical Representation of LIDAR cross-section view of north end of cut (near unloading area) – FUGRO®.**



**Figure 7. Graphical representation of LIDAR cross-section view of mid-point of cut – FUGRO®.**

### **3.1.1. Surface Water**

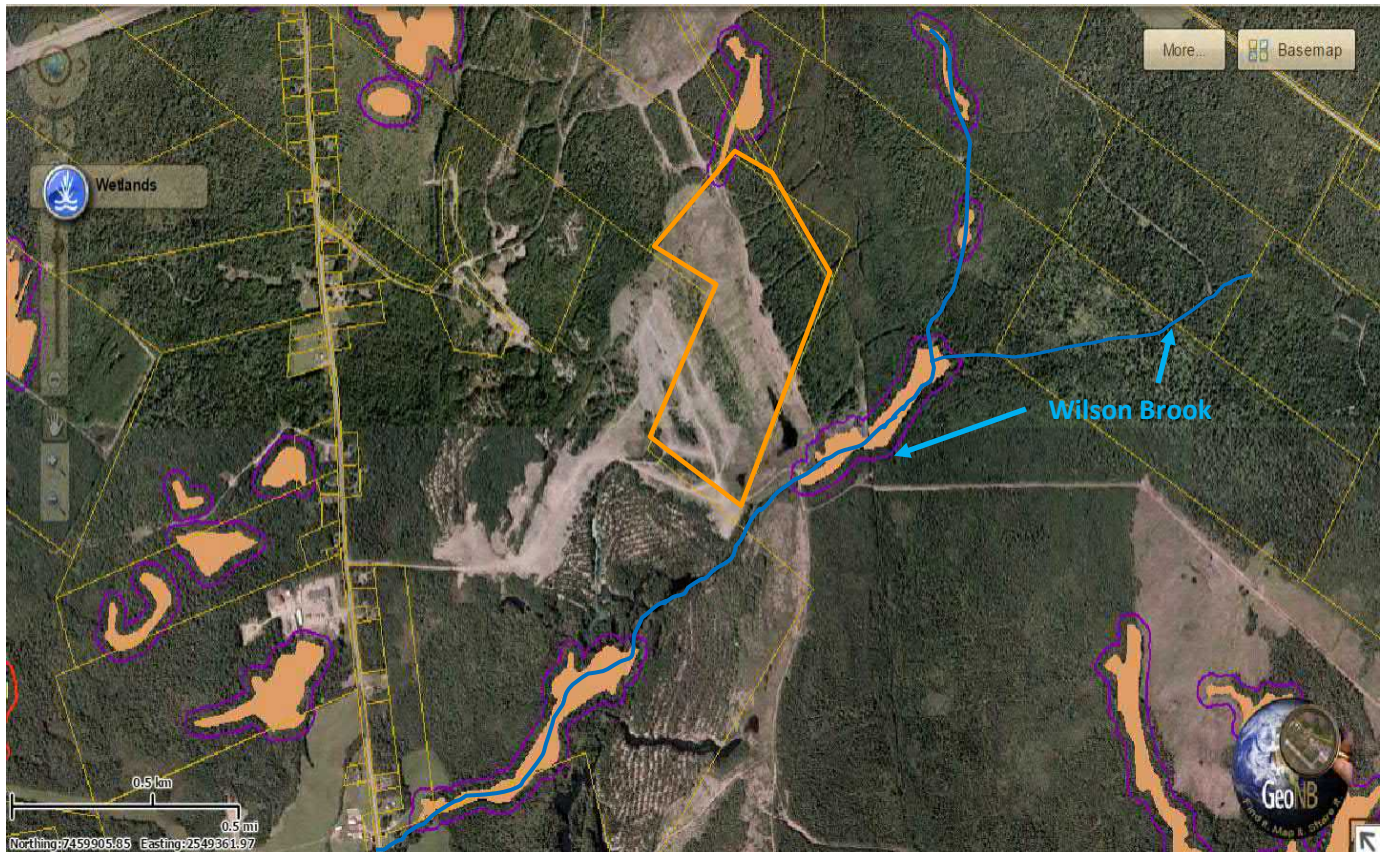
According to GeoNB Map Viewer and confirmed by site visits, there are no wetlands within the proposed project footprint. The nearest watercourse is Wilson Brook, immediately south and adjacent to the proposed disposal facility. Wilson Brook is the receiving water for surface and groundwater runoff from the cut, via a beaver impoundment. Wilson Brook connects to Grand Lake (and the Saint John River) via Long Creek, Salmon River, and Salmon Bay. The confluence of Wilson Brook and Long Creek is located approximately 4.2 km downstream of the site. Refer to Figure 8 for surface water features of the area. Wilson Brook also receives runoff from other previously-mined areas as seen on the aerial photos in Appendix B (note the bright green/aqua-coloured water denoting potential water quality impacts).

A regulated wetland is located immediately upstream and east of the site on Wilson Brook. A regulated wetland is also approximately 580 m downstream (west) of the site. A Provincially Significant Wetland (PSW) is located downstream approximately 2.7 km from the proposed site.

A grab water sample was obtained from Wilson Brook, downstream of the proposed site. The sample was analyzed at RPC Science and Engineering, Fredericton for Mercury, trace metals and general chemistry. Results show exceedances\* of ammonia, aluminum and cadmium, and elevated levels of iron, manganese and sulfate, and conductivity which is consistent with the groundwater sampled from the mine tailings.

No fish habitat survey was conducted for Wilson Brook. Refer to Appendix F for the complete grab water sample quality results.

\*results were compared to CCME and NSE surface water quality guidelines.



**Figure 8: Regulated wetlands and watercourses (GeoNB Map Viewer).**

### **3.1.2. Groundwater**

A search of the Department of Environment and Local Government’s Online Well Log System (OWLS) was completed to provide a general overview of the groundwater quality in the area. A search radius of 1.5 km was selected and eight (8) well records were returned for water wells drilled between 1996 and 2007. All wells are supplied with groundwater from a bedrock aquifer. Water-bearing fractures for most wells are located at depth. Refer to Table 1 for well log summary and Appendix D to view the well logs.

Water quality data for the above wells was reviewed and compared with the Canadian Drinking Water Quality Guidelines. Exceedances for total coliform, aluminium, arsenic, chloride, iron, manganese, turbidity and pH were recorded.

In addition to the groundwater data available in the OWLS database, GLT also implemented a monitoring well/borehole drilling program of the proposed site, to determine the depth to bedrock, depth to the water table, and water quality samples were collected and analyzed. Five (5) groundwater samples were collected from 4 monitoring wells and analysed for general chemistry, trace metals and mercury, and compared to the Ontario Ministry of the Environment’s groundwater standards for a non-potable site within 30m of a watercourse (Table 9)\*. Exceedances were noted for mercury in monitoring well MW3 and MW5, located in the centre of the cut, in the tailings.

\*in the absence of NB, NS or federal guidelines, the Ontario guidelines were used.

**Table 1: Results of Well Log Search (1.5 km Radius from Center of Subject Property).**

WELL #	DEPTH (ft)	Driller's ESTIMATED SAFE YIELD (lgpm)	Depth to Water Bearing Fractures (ft) and Rate (lgpm)	YEAR DRILLED	USE
1	53	20	45 (20 lgpm)	2003	Domestic
2	63	4	55 (4 lgpm)	2003	Domestic
3	285	10	100 (10 lgpm) & 180 (10)	2004	Domestic
4	145	3	30 (0.5 lgpm); 100 (2 lgpm); 145 (3 lgpm)	2004	Domestic
5	65	20	45 (2 lgpm); 55 (5 lgpm); 60 (13 lgpm)	2007	Domestic
6	40	7	30 (7 lgpm)	1996	Domestic
7	60	7	40 (2 lgpm); 50 (5 lgpm)	1996	Domestic
8	70	7	26 (3 lgpm); 60 (4 lgpm)	2001	Domestic

### 3.1.3. Vegetation

Based on aerial photointerpretation, the subject property was mined as late as 1998. Site reconnaissance confirms the PDA contains primarily immature, early-successional vegetation, primarily the following tree species:

- White birch (*Betula papyrifera*);
- Trembling aspen (*Populus tremuloides*);
- Balsam poplar (*Populus balsamifera*)
- Pin cherry (*Prunus pensylvanica*);
- Red maple (*Acer rubrum*);
- Willow (*Salix*) species;
- Balsam fir (*Abies balsamea*), and
- White pine (*Pinus strobus*).

The shrub and groundcover consists primarily of the above-noted tree species' seedlings, Speckled Alder (*Alnus rugosa*), raspberry and other common wildflower and grass species.





**Photo no. 4: On-site vegetation (June 2016).**



**Photo no. 5: On-site vegetation, similar view as photo 3 (December, 2016)**



**Photo no. 6: Subject site looking south (note snowmobile trail / road on left).**



**Photo no. 7: North end of cut (snowmobile trail/road on right).**

Information was requested from the Atlantic Canada Data Conservation Centre (ACCDC) for observations of rare and/or endangered species within a 5km radius of the subject site. No legally

protected species of flora were identified; however four (4) plant species of conservation concern (SOCC) were identified (table 4). Refer to table 3 for S-Rank Definitions.

**Table 2: ACCDC S-rank and rarity definitions.**

<b>Atlantic Canada Conservation Data Centre (ACCDC) S-Rank</b> <a href="http://www.accdc.com/en/rank-definitions.html">www.accdc.com/en/rank-definitions.html</a>	
<b>S-RANK DEFINITIONS</b>	
<b>SX</b>	<b>Presumed Extirpated:</b> Species or community is believed to be extirpated from the province. Not located despite intensive searches of historical sites and other appropriate habitat, and virtually no likelihood that it will be rediscovered.
<b>S1</b>	<b>Critically Imperiled</b> - Critically imperiled in the province because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the state/province.
<b>S2</b>	<b>Imperiled</b> - Imperiled in the province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the nation or state/province.
<b>S3</b>	<b>Vulnerable</b> - Vulnerable in the province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.
<b>S4</b>	<b>Apparently Secure</b> - Uncommon but not rare; some cause for long-term concern due to declines or other factors.
<b>S5</b>	<b>Secure</b> - Common, widespread, and abundant in the province.
<b>SNR</b>	<b>Unranked</b> - Nation or state/province conservation status not yet assessed.
<b>SU</b>	<b>Unrankable</b> - Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.
<b>SNA</b>	<b>Not Applicable</b> - A conservation status rank is not applicable because the species is not a suitable target for conservation activities.
<b>S#S#</b>	<b>Range Rank</b> - A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species or community. Ranges cannot skip more than one rank (e.g., SU is used rather than S1S4).
<b>Not Provided</b>	Species is not known to occur in the province.
<b>BREEDING STATUS QUALIFIERS</b>	
<b>N</b>	<b>Nonbreeding</b> - Conservation status refers to the non-breeding population of the species in the province.
<b>B</b>	<b>Breeding</b> - Conservation status refers to the breeding population of the species in the province.
<b>M</b>	<b>Migrant</b> - Migrant species occurring regularly on migration at particular staging areas or concentration spots where the species might warrant conservation attention. Conservation status refers to the aggregating transient population of the species in the province.

?	<b>Inexact or uncertain:</b> Denotes inexact or uncertain numeric rank.
<b>Species at Risk Act (SARA) (Canada and New Brunswick)</b>	
<b>Extirpated</b>	A wildlife species that no longer exists in the wild in Canada, but exists elsewhere in the wild.
<b>Endangered (E)</b>	A wildlife species facing imminent extirpation or extinction.
<b>Threatened (T)</b>	A wildlife species that is likely to become endangered if nothing is done to reverse the factors leading to its extirpation or extinction.
<b>Special Concern (SC)</b>	A wildlife species that may become threatened or endangered because of a combination of biological characteristics and identified threats.
<b>NBDNR General Status of Wildlife</b>	
<i>At risk</i>	Species for which a formal assessment has been completed, and determined to be at risk of extirpation or extinction. To be described by this category, a species must be either listed as endangered or threatened by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), or the New Brunswick equivalent.
<i>May be at risk</i>	Species or populations that may be at risk of extirpation or extinction, and are therefore candidates for a detailed risk assessment by COSEWIC or the New Brunswick equivalent.
<i>Sensitive</i>	Species which are not believed to be at risk of extirpation or extinction, but which may require special attention or protection to prevent them from becoming at risk.
<i>Secure</i>	Species that are not believed to be at risk, may be at risk, or sensitive. These are generally species that are widespread and/or abundant. Although some secure species may be declining, their level of decline is not felt to be a threat to their status in the province.
<b>COSEWIC</b>	
<b>Extinct</b>	A wildlife species that no longer exists.
<b>Extirpated</b>	A wildlife species that no longer exists in the wild in Canada, but exists elsewhere.
<b>Endangered</b>	A wildlife species facing imminent extirpation or extinction.
<b>Threatened</b>	A wildlife species that is likely to become an endangered if nothing is done to reverse the factors leading to its extirpation or extinction.
<b>Special Concern</b>	A wildlife species that may become threatened or endangered because of a combination of biological characteristics and identified threats.
<b>Not At Risk (NAR)</b>	A wildlife species that has been evaluated and found to be not at risk of extinction given the current circumstances.
<b>Data Deficient (DD)</b>	A category that applies when the available information is insufficient (a) to resolve a wildlife species' eligibility for assessment or (b) to permit an assessment of the wildlife species' risk of extinction.

**Table 3: Flora Species of Conservation Concern observed within a 5km Radius of subject site.**

Scientific Name	Common Name	COSEWIC status	SARA Status	Provincial Legal Prot.	Provincial Rarity Rank	Provincial GS Rank	# recs.	Distance from site
<i>Potentilla Canadensis</i>	Canada Cinquefoil	-	-	-	S1	5 undetermined	1	3.3 +/- 0.0
<i>Carex haydenii</i>	Hayden's Sedge	-	-	-	S3	4 Secure	1	4.5 +/- 0.0
<i>Carex tuckermanii</i>	Tuckerman's Sedge	-	-	-	S3	4 Secure	1	4.5 +/- 0.0
<i>Eriophorum russeolum</i>	Russet Cottongrass	-	-	-	S3S4	4 Secure	1	3.6 +/- 5.0

Canada Cinquefoil (*Potentilla Canadensis*) is a member of the rose family, typically found on dry, acidic soil (often anthropogenic-altered), as well as slopes in lawns, pastures, roadsides, and dry meadows.

Hayden's Sedge (*Carex haydenii*) is a native sedge typically found in open habitats with seasonally saturated soils such as marshes, meadows and fields, as well as shores of rivers or lakes.

Tuckerman's Sedge (*Carex tuckermanii*) is a native sedge species typically found in floodplain (river or stream floodplains), shores of rivers or lakes and wetlands (occurs only in wetlands).

Russet Cottongrass (*Eriophorum russeolum*), actually a sedge, is typically found in wet areas, preferring the acidic, nutrient-poor conditions of peat bogs.

No legally protected flora species were identified as occurring within the 5km search radius.

### **3.1.4. Wildlife and Wildlife Habitat**

Site reconnaissance of the subject property was conducted during the pre-planning stage in June, 2016 and the borehole program in December, 2016, consisting of traversing the site and observing and recording any sign of wildlife (tracks, scat, nests, dens, etc.).

Sign of common New Brunswick wildlife species were observed, including coyote (*Canis latrans*) tracks and scat, a moose (*Alces alces*) track, red fox (*Vulpes vulpes*) tracks and beaver (*Castor canadensis*) cuttings. No canine dens or moose beds were observed on site. Beaver had previously created a dam at the base of the cut and had blocked the access road culvert; however JD Irving had them removed to prevent blocking the culverts and washing out the access road.

One (1) moose track and one (1) coyote track was observed crossing the cut during the December site visit, and coyote scat was observed on the snowmobile trail/road at various places during the June visit. No moose 'hooking' of immature trees or shrubs was observed on site. In general, due to the limited cover and food available on site, wildlife sign observed was transient in nature, and the site is considered poor wildlife habitat.

The southern portion of the cut contains a beaver impoundment, which empties into Wilson Brook. This area is likely suitable habitat for common New Brunswick amphibian species.

### 3.1.5. Migratory Birds

Grand Lake Timber Ltd. recognizes the following with respect to migratory birds:

“Environment Canada is responsible for implementing the Migratory Birds Convention Act (MBCA), which protects migratory birds, their eggs, nests, and their young through the *Migratory Birds Regulations* (MBR):

“Under Section 6 of the *Migratory Birds Regulations* (MBR), no person shall disturb, destroy or take a nest or egg of a migratory bird; or to be in possession of a live migratory bird, or its carcass, skin, nest or egg, except under authority of a permit. It is important to note that under the current MBR, no permits can be issued for the incidental take of migratory birds caused by development projects or other economic activities. Furthermore, Section 5.1 of the MBCA describes prohibitions related to deposit of substances harmful to migratory birds:

Migratory birds protected by the MBCA include all seabirds except cormorants and pelicans, all waterfowl, all shorebirds, and most landbirds (birds with principally terrestrial life cycles). Most of these birds are specifically named in the Environment Canada publication, *Birds Protected in Canada under the Migratory Birds Convention Act*, Canadian Wildlife Service Occasional Paper No. 1.

“5.1 (1) No person or vessel shall deposit a substance that is harmful to migratory birds, or permit such a substance to be deposited, in waters or an area frequented by migratory birds or in a place from which the substance may enter such waters or such an area.

(2) No person or vessel shall deposit a substance or permit a substance to be deposited in any place if the substance, in combination with one or more substances, results in a substance — in waters or an area frequented by migratory birds or in a place from which it may enter such waters or such an area — that is harmful to migratory birds.”

It is the responsibility of the proponent to ensure that activities comply with the MBCA and regulations.”

### 3.1.6. Species at Risk

Canada’s Species at Risk Act (SARA) is one of three major components in the Government of Canada Strategy for the Protection of Species at Risk. It is designed as a key tool for the conservation and protection of Canada’s biological diversity and fulfils an important commitment under the United Nations Convention on Biological Diversity. New Brunswick also has a Species at Risk Act which complements the federal Act.

The purpose of **SARA** is to:

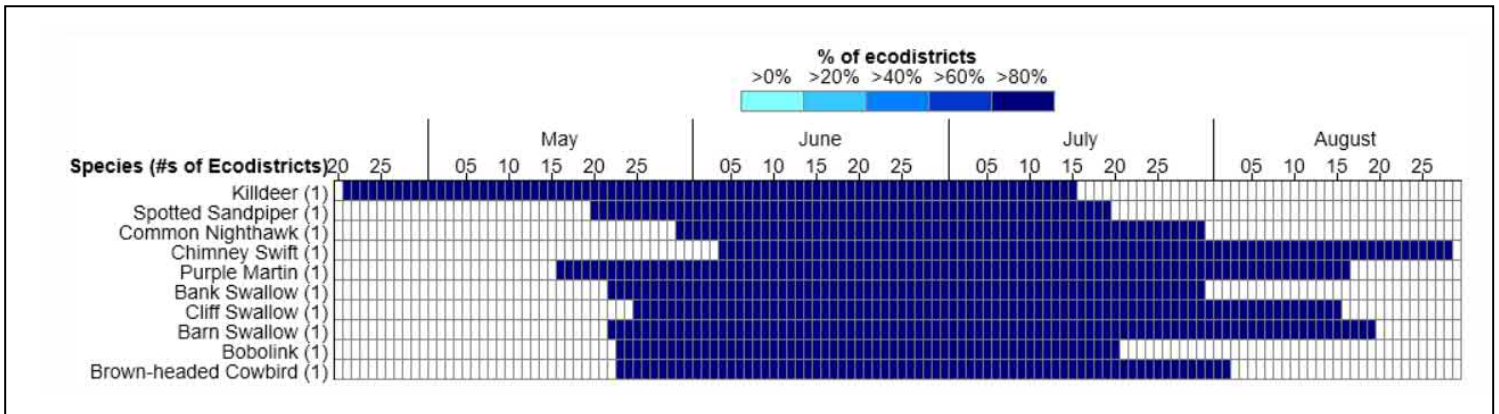
- A. Prevent wildlife species from becoming extinct or extirpated (lost from the wild in Canada);
- B. Help in the recovery of extirpated, endangered or threatened species; and
- C. Ensure that species of special concern do not become endangered or threatened.

Information was requested from the Atlantic Canada Data Conservation Centre (ACDC) for observations of rare and/or endangered wildlife species within a 5km radius of the subject site. The Maritime Breeding Bird Atlas was also consulted to identify confirmed or probable SAR breeding species within the Chipman atlas square. Twelve (12) bird species of conservation concern were identified, 5 of which are listed as “Threatened” (refer to table 5).

A review of each species' habitat requirements was completed, and compared with observations obtained during the site visits. A summary of this analysis is presented in section 4.

**Table 4. Rare or endangered vertebrate wildlife species within 5km radius of site (ACCDC).**

Scientific Name	Common Name	COSEWIC	SARA	Provincial Legal Prot.	Provincial Rarity Rank	Provincial GS Rank	# of recs.	Distance (km)
<i>Chaetura pelagica</i>	Chimney Swift	Threatened	Threatened	Threatened	S2S3B, S2M	1	4	3.4+/-7.0
<i>Riparia riparia</i>	Bank Swallow	Threatened	-	-	S2S3B, S2S3M	3	1	3.4+/-7.0
<i>Hirundo rustica</i>	Barn Swallow	Threatened	-	Threatened	S3B, S3M	3	3	3.4+/-7.0
<i>Dolichonyx oryzivorus</i>	Bobolink	Threatened	-	Threatened	S3B, S3M	3	1	4.6+/-0.0
<i>Chordeiles minor</i>	Common Nighthawk	Threatened	Threatened	Threatened	S3B, S4M	1	3	3.4+/-7.0
<i>Progne subis</i>	Purple Martin	-	-	-	S1B, S1M	2	3	3.4+/-7.0
<i>Petrochelidon Pyrrhonota</i>	Cliff Swallow	-	-	-	S2S3B, S2S3M	3	3	3.4+/-7.0
<i>Charadrius vociferous</i>	Killdeer	-	-	-	S3B, S3M	3	2	3.4+/-7.0
<i>Molothrus ater</i>	Brown-headed Cowbird	-	-	-	S3B, S3M	2	1	3.4+/-7.0
<i>Tyrannus tyrannus</i>	Eastern Kingbird	-	-	-	S3S4B, S3S4M	3	1	3.4+/-7.0
<i>Actitis macularius</i>	Spotted Sandpiper	-	-	-	S3S4B, S5M	4	1	3.4+/-7.0
<i>Larus delawarensis</i>	Ring-billed Gull	-	-	-	S3S4B, S5M	4	2	3.4+/-7.0



**Figure 9. Results of Bird Studies Canada nesting calendar query tool for the proposed site location.**

**3.1.7. Atmospheric**

No ambient air quality monitoring stations are located in the Chipman region, nor specifically near Kings Mines. The nearest industrial emissions source are GLT’s biomass boilers. Based on the general lack of industrial emitters and the rural nature of the site, ambient air quality can be assumed to be very good to excellent, particularly since the end of NB Coal mining activity and the closure of the Grand Lake coal-fired generating station.

**3.1.8. Environmentally Significant Areas**

A review of the Nature Trust NB Environmentally Significant Area (ESA) database found no ESAs within a 5.0 km radius of the subject site.

IBACanada.ca was consulted to determine which, if any, Important Bird Areas (IBA) were located near the proposed project. The nearest IBA is NB 010, Lower Jemseg, approximately 40km southwest of the site, and therefore is not anticipated to be impacted by the project.

**3.1.9. Archaeological Resources**

The proposed site was actively surface-dredged in the 1990’s, which resulted in large-scale, intrusive disturbance of the overburden material and upper layers of bedrock in the area. During this activity, any archaeological or heritage resources within the proposed PDA would have been destroyed. Given this fact, and the lack of potential direct, off-site impacts, no archaeological or heritage inventory was completed for this assessment.

**3.1.10. Land Use**

The project is proposed on private land located in an unincorporated area, in a rural area dominated by forested parcels and land formerly surface mined by NB Coal. No zoning or Rural Development Plan is in place for the subject parcel. The parcel adjacent (west) of the subject property is used by GLT as a wood storage area, where logs are stored throughout the winter before being sent to the Chipman mill for processing.



No Land Gazette environmental property flags exist for the subject property.

No residences are located closer than ~1.5 kilometres of the subject site, with the nearest residence located to the west on Route 10. Residential use in the area is primarily ribbon development along Route 10 (west of the site) and Dufferin Road (east and upgradient of the site).

### **3.2. SOCIOECONOMIC CONDITIONS**

#### **3.2.1. Population and Economy**

The Village of Chipman is the nearest population centre to the subject site, located approximately 4km to the north. Located within Queens County, Chipman had a population of 1,291 out of 11,708 in the county in 2006.

Chipman was founded in 1835 and incorporated in 1966. Although once a thriving industrial area with lumber mills, company stores, shipyards and the coal mining industry, the primary economic driver of the region today is the GLT sawmill, in addition to general goods and services employment.

#### **3.2.2. Heritage Sites**

A review of the New Brunswick Registry of Historic Places identified two (2) historic sites within five (5) kms of the subject property. Both are located in the Village of Chipman:

- Chipman Community Heritage Centre was constructed in 1939, and is designated a Local Historic Place for its architectural features and its association with mid-20<sup>th</sup> century community life in Chipman.
- Darrah's Insurace Ltd. Building was constructed in 1949, and is designated a Local Historic Place for its architectural features and its association with mid-20<sup>th</sup> century life in Chipman.

#### **3.2.3. Transportation**

The proposed project is located 4 km south of Chipman via New Brunswick Route 10. At present, this section of road is used by GLT for transporting its wood waste to the existing waste disposal facility, located approximately 1km south of the proposed site.

Route 10 is a 2-lane rural highway originating in Fredericton, and terminating in Sussex via York, Sunbury, Queens and Kings Counties. The section of Route 10 comprising the waste haul route contains posted speed limits of 50, 70 and 90 km/h. The access road to the proposed site is a paved access road with a gate that is locked outside of operating hours.



**Photo no. 8: Route 10 at entrance to site access road (Google Earth).**



**Photo no. 9: Site access road looking east from Route 10 (Google Earth).**

#### **3.2.4. Tourism**

The Chipman area is located on the banks of the Salmon River, which connects to Grand Lake, the largest freshwater lake in the Maritimes. The area is known for outdoor recreation such as camping, boating and fishing in the summer, hunting in the fall and snowmobiling during the winter months.

## 4 ENVIRONMENTAL ASSESSMENT AND POTENTIAL IMPACTS

Based on the project description and the existing environment the following Valued Environmental Components were identified for the EIA:

- a) Migratory birds and habitat;
- b) Surface water quality;
- c) Groundwater quality;
- d) Transportation;
- e) Atmospheric;
- f) Labour and economy;
- g) Accidents and Malfunctions, and
- h) Cumulative Environmental Impacts.

The following sections outline the potential impacts from the construction, operation and maintenance activities of the proposed project, and recommended mitigation measures.

### 4.1 Project Construction – Potential Environmental Effects

The subject site was chosen as a potential waste disposal site due to the minimal amount of site preparation required and the minimal impacts from a wood waste site in relation to the existing environment. Given this fact, the project construction activities described in the following sections will be required.

#### 4.1.1 Site Preparation – Site Survey

Description of Activity:

No mature tree clearing will be required for the preparation of the waste disposal cell, and the access road is already established. The survey will correctly establish and geo-reference the location of the project components.

Description of Potential Impact: N/A

Surveying of the site is a non-intrusive activity and is not anticipated to create adverse environmental impacts.

Recommended Mitigation:

No mitigation is recommended for the site survey.

#### 4.1.2 Construction of the Unloading Area

Description of Activity:

The unloading area will consist of a level area located at the north end of the cut. Construction of this area will require levelling of an area large enough for trucks to turn and dump the wood waste loads, by bulldozer. Vegetation in this area consists of sparse, immature tree species, shrubs and grasses which will be bulldozed into the cut during the levelling of the unloading area.

#### Description of Potential Impact 1: Migratory Birds

The excavation/levelling of the Unloading Area will remove vegetation as noted above. Some migratory bird species may use this area for nesting or foraging; therefore the activity may result in a decrease of nesting habitat. Bird SAR are not anticipated to be impacted by this activity.

#### Recommended Mitigation 1:

Clearing of the Unloading Area will be completed as soon as possible, prior to the nesting season for migratory birds and the area in question will be minimized to the smallest extent possible, suitable for the safe turning radius of a standard dump truck.

#### Description of Potential Impact 2: Surface Water Quality

The excavation and levelling of the Unloading Area will remove the surface vegetation and expose the soil in an area large enough for the turning radius of a standard dump truck. This area may be susceptible to erosion and sediment migration during heavy precipitation events. Sediment-laden runoff may create adverse impacts on surface water quality if it reaches a watercourse.

#### Recommended Mitigation 2:

The unloading area has been located at the northern end of the cut, as far as possible from any surface water bodies (over 500m). This area will be immediately upgradient of the waste cell, which already contains berm structures which will capture any surface runoff, slow it, allowing it to percolate into the soil before reaching Wilson Brook.

As an additional barrier, the existing beaver impoundment, located at the southern-most point of the cut, will also act as a sediment pond, to slow down any runoff that does not percolate into the ground.

#### Significance of Potential Impacts:

**Given the nature of the site, the distance from Wilson Brook, the presence of existing berm structures within the cut, and the presence of a beaver impoundment, adverse environmental impacts from the construction of the Unloading Area are considered not significant.**

**Table 5: Construction / Environment Interaction and Significance**

Description of Potential Project Interaction with VEC/VSC	Valued Ecosystem/Social Component (VEC/VSC)	Required Mitigation	Residual Effects		Further Study or Follow-up
			Likelihood	Significance	
Clearing Unloading Area	Migratory Birds and bird Species at Risk	Area to be cleared as soon as possible, prior to bird breeding season. The footprint of the unloading area will be kept to the minimum size required for the safe turning radius of the waste trucks.	1	1	0
	Surface Water Quality	The unloading area has been located at the northern end of the cut, as far as possible from any surface water bodies (over 500m). This area will be immediately upgradient of the waste cell, which already contains berm structures which will capture any surface runoff, slow it, allowing it to percolate into the soil before reaching Wilson Brook.  As an additional barrier, the existing beaver impoundment, located at the southern-most point of the cut, will also act as a sediment pond, to slow down any runoff that does not percolate into the ground.	1	1	0

Significance of residual impacts rated as follows:

0=None, 1=Not Likely/ Not Significant, 2=Likely/Significant, 3=Unknown, + =Positive, - =Negative

## 4.2 Project Operation – Environmental Effects

The operation of the wood waste facility will include the following components:

- Transportation of wood waste and ash to the disposal site;
- Unloading and levelling of the wood waste and ash at the Unloading Area, and
- Annual covering of the waste.

### 4.2.1 Transport, dumping and levelling of the Wood Waste at the Disposal Site

Wood waste and ash will be loaded into trucks at the GLT mill site, which will then haul the waste ~4km to the wood waste site, via Route 10. The exact number of trucks per day will vary depending on conditions at the GLT mill; however, for the purposes of this report, an average of nine (9) truck loads per day has been used.

According to the NB Department of Transportation and Infrastructure Annual Average Daily Traffic (AADT) 2012 figures, the AADT for this section of Route 10 is 1600. Because the proposed site is a

replacement for the existing wood waste site, operation of the proposed wood waste disposal facility will not increase the number of trucks operating on Route 10 from its present volume (the volume of wood waste is not anticipated to increase as a result of the proposed project).

The proposed wood waste disposal facility is located 2 km closer to the mill than the existing disposal site; thereby reducing greenhouse gas emissions from the transport of the wood waste, and reducing the number of residences potentially impacted by the truck traffic by fourteen (14).

No DTI permits or authorizations are required for this project.

All truck and heavy equipment travelling to and from the site during construction shall adhere to all applicable provincial transportation legislation (maximum speed limits, weight restrictions, etc.).

Once on site, the trucks will dump the waste into the cell, where it will be levelled/spread by bulldozer.

#### Description of Potential Impact 1: Transportation: Impacts to Route 10

The transportation of the wood waste will result in approximately 2400 truck round trips. Although this is a small fraction of the NBDTI's estimated AADT (9 trips out of an estimated 1600, or 0.56%), this can contribute to the degradation (i.e. wear and tear) of this 4km section of Route 10.

#### Description of Recommended Mitigation 1:

Trucks will adhere to posted speed limits, weight restrictions and all other DTI regulatory restrictions on the use of its provincial highways.

#### Description of Potential Impact 2: Atmospheric – Noise

The transportation of the wood waste will contribute to an increase in vehicle noise along the highway corridor, potentially impacting residences located along the 4km haul route.

#### Description of Recommended Mitigation 2:

Trucks will operate only during regular working hours of operation, namely between 7am and 5pm, weekdays only. Trucks will be maintained in good working order and properly muffled. Engine-assisted, or "Jake" brakes will not be used, and all posted speed limits (50, 70 and 90km per hour) will be adhered to.

#### Description of Potential Impact 3: Atmospheric – Greenhouse Gas Emissions from Trucks

The transportation of the wood waste will result in the discharge of greenhouse gas emissions from diesel exhaust, as well as dust from the road and ash, which may impact air quality in the vicinity of the 4km haul route.

Based on US EPA-derived calculations of combustible emissions for a diesel dump truck, the following method was used to determine potential greenhouse gas emissions from the transportation of waste:

Assumption 1: 1 truck used, on average 9 x day, for a total of 6 hours engine run-time x 5 days/week

Assumption 2: Horsepower rating of 300 hp, and

Assumption 3: Total days of hauling=260 days/year.

**Total horsepower-hours per year = 468,000**

The following US EPA Emission Factors (EF) were used:

**Table 6: US EPA Emission Factors for a diesel dump truck.**

EMISSION FACTORS (g/hp-hour)						
EQUIPMENT	VOC	CO	NO <sub>x</sub>	PM-2.5	SO <sub>2</sub>	CO <sub>2</sub>
Diesel Dump Truck	0.440	2.070	5.490	0.400	0.740	536.000

To determine the projected total emissions for each parameter for the proposed Kings Mines wood waste disposal site, the total horsepower-hours per year is multiplied by each emission factor and converted to tons using a conversion factor of **1.102x10<sup>-6</sup>**.

Based on these calculations, the following results are obtained:

**Table 7: Total greenhouse gas emissions calculated for the proposed project.**

TOTAL EMISSIONS (tonnes/year)						
	VOC	CO	NO <sub>x</sub>	PM-2.5	SO <sub>2</sub>	CO <sub>2</sub>
<b>Total</b>	0.208	0.98	2.60	0.189	0.350	253.9

Description of Recommended Mitigation 3:

The site in question is closer to the GLT mill site by approximately 2km, thereby decreasing the overall annual travel time/distance required to haul wood waste for disposal.

Trucks will be maintained in good working order to minimize diesel emissions. Ash loads will be covered to minimize fugitive dust emissions.

**Significance of Potential Impacts:**

**Given the AADT of 1600 compared to 9 trucks/day required for the project, the fact that the proposed site is closer than the current wood waste site, the amount of greenhouse gases estimated, and the proposed mitigation measures, adverse impacts to air quality are considered minimal and therefore not significant.**

**4.2.2 Storage of Wood Waste and Ash in a Former Surface Coal Mine Cut**

Based on previous year's production values at GLT, it is anticipated that approximately 18,900 tonnes of wood waste, consisting of yard scraping (mud and bark), and hot pond waste (bark, sand, grit) will be deposited in the waste facility annually. Approximately 6,300 tonnes of wood ash from the GLT mill's boilers will be deposited at the site. In total, approximately 25,000 tonnes of total waste will be deposited annually at the proposed site.

At present, JD Irving, Limited operates four (4) similar wood waste disposal facilities in the Province under the regulatory criteria set forth in their Approvals to Operate, including the existing GLT site. The



wood waste is deposited, and up- and down-gradient monitoring wells are monitored for a variety of parameters. Where applicable, surface water samples are also collected and analysed.

#### Description of Potential Environmental Impact 1: Ground- and Surface Water Impacts

The deposition of wood waste and ash may result in contaminants leaching into the ground and contaminating ground and surface water down-gradient of the site. Precipitation runoff from the waste site may contain contaminants which may adversely impact the water quality in nearby Wilson Brook.

#### Description of Recommended Mitigation 1:

Siting the wood waste disposal facility within an already-impacted former surface coal mine, with more than 30 feet of tailings underlying the proposed site, with sufficient setbacks from human and environmental receptors.

The cut contains berm structures already, which will act as surface runoff controls.

The site contains an existing beaver impoundment, which will contribute to the attenuation of any surface water runoff.

GLT commissioned a soil and groundwater risk assessment of the site as part of the planning process, to identify downstream human and environmental receptors and to determine the potential impacts from the deposition of wood waste and ash at this site. This assessment included a review of the groundwater data available from other, similar wood waste disposal sites operated by the proponent. This study concluded that, given the site soil and groundwater conditions and lack of environmental and health receptors, any potential impacts from the proposed wood waste site would be inconsequential.

This study also concluded that the site conditions would provide sufficient attenuation to mitigate any potential impacts to Wilson Brook, including travel time through the soil, the existing, degraded site conditions, and the presence of the beaver pond as an additional barrier between Wilson Brook and the waste cell. Refer to Appendix E for the complete report.

GLT will implement a Groundwater and Surface Water Monitoring Program as per the requirements of the DELG Approval to Operate.

#### Description of Potential Environmental Impact 2: Migratory Bird Habitat

The infilling of the cell with wood waste will eliminate potential bird habitat from within the cut, by covering the ground vegetation, shrubs and immature tree species. This will result in the permanent loss of approximately 10 hectares over the 25 + year lifecycle of the facility. In 2017, this will result in a footprint of approximately 5000m<sup>2</sup>.

#### Description of Recommended Mitigation 2:

Vegetation within the footprint of each proceeding year will be cleared outside of the breeding bird season.

During the first year of operation, the waste cell is anticipated to impact an area approximately 5000m<sup>2</sup> in size.

Overall, the project will result in the total loss of 10 ha, and is not considered significant given the site conditions.

Description of Potential Environmental Impact 3: Spotted Sandpiper.

A review of the ACCDC data identified twelve (12) SOCC which may be found in the region. An analysis of their nesting and foraging habitats identified that the southern edge of the cut, which contains the beaver impoundment, may be suitable foraging habitat for the Spotted Sandpiper (the site is not considered suitable for other bird SAR).

The deposition of wood waste may create sensory disturbance or may directly impact Spotted Sandpiper foraging habitat (rocky shorelines along ponds).

Description of Recommended Mitigation 3:

A 10-meter buffer will be maintained between the southern-most edge of the wood waste cell and the edge of the beaver pond. Given the rate of waste deposition, the waste cell is not likely to reach this point for many years (20+). Once the waste cell begins closing in on this area, the site will be cleared of vegetation prior to the Spotted Sandpiper's breeding season. Furthermore, the 10m buffer noted above will be maintained.

**Significance of Potential Impacts:**

**Based on the results of the site-specific Risk Assessment, the minimal environmental impacts observed at their other wood waste disposal sites, and the implementation of a groundwater and surface water monitoring program, no significant adverse environmental impacts are anticipated.**

**4.2.3 Labour and Economy**

The proposed wood waste is required for the continued operation of the GLT sawmill, a major direct (and indirect) employer in the Chipman region. The proposed wood waste disposal facility is not anticipated to create net employment, but will continue to maintain the current employment in the region by supporting the GLT mill site operations. No mitigation is required.

**4.2.4 Accidents and Malfunctions**

GLT has standard operating procedures in place for employees to follow in the event of an unplanned event or accident on site. Such accidents could impact the health of employees or the environment.

No temporary fuel storage will be required at the proposed wood waste site – the bulldozer will be refueled from a mobile tank (1/2-ton truck). Nevertheless, fuel and/or hydraulic leaks may occur on site or on Route 10 during the transportation of the waste. The environmental and human health effects of such accidents, malfunctions and unplanned situations were considered as part of this assessment.

Description of Potential Effect 1: Soil and Groundwater – Petroleum Leaks

Petroleum products spills and/or leaks mostly associated with machinery and vehicles operating during construction or operation of the project could impact soil and water quality.

Description of Recommended Mitigation 1:

Petroleum products or any other deleterious substances will not be dumped on the ground or in the water, or handled or stored in a careless manner.

All necessary precautions will be taken to avoid spills and contamination to the soil and water when handling petroleum products on site and during fuelling and servicing of vehicles and equipment. Vehicles and equipment will be maintained in good working order to prevent leaks on site.

Appropriate emergency spill response equipment will be maintained on site.

All spills or leaks will be promptly contained, cleaned-up and reported to regulatory authorities. Employees will be briefed in the use of spill kits and appropriate emergency reporting procedures. The GMIA's Standard Operating Procedure (SOP) for Environmental Incident Management will be followed. Should contaminated soils be encountered during construction or demolition activities, they will be managed in accordance with applicable federal and/or provincial requirements (i.e. New Brunswick *Guideline for the Management of Contaminated Sites* (July 2012)).

Vehicles and equipment will be maintained in good working order to prevent leaks on site.

All spills or leaks will be promptly contained, cleaned-up and reported to regulatory authorities. The GLT Standard Operating Procedure (SOP) for Environmental Incident Management will be followed.

#### Description of Potential Effects 2: Worker Safety

An employee may be injured on site during operations.

#### Description of Recommended Mitigation 2:

GLT has developed workplace safety protocols and standard operating procedures for its staff. Employees are required to maintain and wear personal protective equipment (PPE) at all times on site.

All required health and safety equipment will be kept on site and in good working order, including a First Aid kit and any other necessary health and safety equipment.

Only employees properly skilled and trained shall be employed in the construction, operation and maintenance of the project. All appropriate employee certification shall be maintained in good standing.

All workers on site shall be properly trained and insured as per the requirements of WorkSafe NB and the Occupational Health and Safety Act (OHSA).

All accidents shall be reported to WorkSafe NB and where necessary, protocols developed to avoid future, similar occurrences.

#### **Significance of Potential Impacts:**

**Given the above-recommended mitigation measures, no significant adverse environmental impacts are anticipated.**

### **4.3 Cumulative Effects Assessment**

Cumulative effects are “changes to the environment that are caused by an action in combination with other past, present and future human actions” (Environment Canada). Cumulative effects can appear to be minor effects when assessed individually, but when examined within a larger spatial context, “can pose a serious threat to the environment and result in the degradation of important resources”. (*USEPA 315-R-99-002*).

#### Cumulative Effects Analysis – Process:

1. Identify the effects which may be (or become) regional issues of concern;
2. Determine an appropriate spatial and temporal assessment scale;
3. Identify other actions that may create effects which overlap the regional issue of concern, and
4. Evaluate the significance of the cumulative effects at the spatial and temporal scale chosen.

When assessing the effects of this project in addition to the existing developments in the project area, the existing developments create an environmental background level that reflects the nature of this area. As part of the environmental effects assessment, consideration of cumulative effects that are likely to result from this project in combination with other projects or activities that have been or will be carried out were anticipated.

Given the environmental context, namely an area that was heavily impacted by surface dredge mining, groundwater and surface water quality (Wilson Brook) were identified as potential cumulative environmental effects from this project:

- Groundwater: potential impacts of wood waste leachate on groundwater, on nearest residential wells, and
- Surface Water: potential impacts of wood waste leachate on surface water quality in Wilson Brook.

#### **4.3.1 Groundwater**

##### **4.3.1.1 Effects (Impacts) of Concern**

Groundwater impacts from wood waste leachate may occur, and depending on existing conditions, potential receptors such as domestic wells, and the hydrogeological conditions on site, may contribute to a cumulative effect on a larger spatial scale.

Parameters commonly associated with wood waste disposal facilities can include ammonia, BOD<sub>5</sub>, total phosphorus, total resin acids (TRA), total organic carbon, sulfate and various trace metals and total fatty acids, which can occur in shallow, intermediate or deep wells (Roy Consultants, 2015).

##### **4.3.1.2 Spatial Boundary**

In drawing a spatial boundary for a cumulative effect assessment, the practitioner must ensure that the appropriate scale is chosen. It must be large enough “to provide the context necessary for understanding the health of the resource, and compact enough to present proper perspective” (Caltrans, 2005). Ideally, the spatial boundary must be large enough to demonstrate the cumulative effect at a meaningful scale. In the case of this project, the impact is the potential adverse impact to groundwater quality, so the assessment must determine the scale at which this impact may be significant at the landscape level.

An appropriate spatial boundary for groundwater impacts should consider the down-gradient receptors, i.e. domestic wells. At the proposed wood waste site, there are no immediate downstream receptors. The nearest domestic wells are located approximately 1.5km west of the site. Therefore, the spatial boundary is defined as the distance to the nearest receptors, or 1.5 kilometres.

#### **4.3.1.3 Past and Existing Impacts**

The area in question, between the proposed site and the nearest residential receptors, is a heavily-impacted, former surface coal mine. The resulting landscape has produced groundwater conditions typical for the area – in Craig HydroGeoLogic, 2017, existing groundwater conditions are described: “In summary, the groundwater chemistries found in the NBDELG database are not unusual for this area and reflect natural aquifer conditions in this specific area. Specific groundwater chemistry problems are evident in the area. Exceedances for arsenic, chloride, iron, manganese, pH, turbidity and TDS are observed.”

#### **4.3.1.4 Future Foreseeable Impacts**

As noted in previous sections, the downgradient area considered is a forested area previously mined by NB Coal, and owned by the proponent (GLT). GLT uses the area for wood storage, which is necessary for the continued efficient operation of the sawmill, and no future industrial developments are planned for this area.

#### **4.3.1.5 Conclusion - Groundwater**

Roy Consultants mandated Craig HydroGeoLogic to complete a groundwater, bedrock and soil analysis of the site, and in consideration of the existing conditions and distance to the nearest receptors, there are no active exposure pathways by which groundwater is being ingested for potable use, and therefore no unacceptable risks to human or ecological receptors. There are no future foreseeable developments for the area in question, and the existing conditions are such that groundwater impacts from wood waste leachate are essentially inconsequential by comparison to the existing conditions. Finally, mitigation for groundwater impacts, including the aforesaid Craig HydroGeoLogic study, the monitoring program requirement, and a DELG-approved cell development plan, will be implemented.

Based on these facts, the potential cumulative effects to groundwater in the area from the proposed project are considered not significant.

### **4.3.2 Surface Water – Wilson Brook**

#### **4.3.2.1 Effects (Impacts) of Concern**

Wilson Brook is located immediately adjacent to, and downgradient of the proposed wood waste disposal site. Leachate from the sub-surface decomposition of wood waste can reach Wilson Brook through surface-groundwater interaction, as well as from precipitation runoff from the wood waste. Surface water impacts from wood waste leachate could contribute to a cumulative effect on a larger spatial scale, given the fact that the existing site is also located adjacent to Wilson Brook, approximately 3km downstream.

As with potential groundwater impacts, parameters which could impact surface water include lowered pH, turbidity, suspended solids, ammonia, BOD<sub>5</sub>, total phosphorus, total resin acids (TRA), total organic carbon, sulfate and various metals.

#### **4.3.1.2 Spatial Boundary**

As noted above, an appropriate spatial boundary for surface water impacts should consider the downstream conditions and additional inputs. In this case, the existing downstream wood waste site may also be impacting surface water, which can contribute additional inputs to Wilson Brook. Therefore, the

spatial boundary is defined as the Wilson Brook watershed. Wilson Brook originates approximately 1,500 m upstream of the proposed site, and flows approximately 3.5km southwest to its confluence with Long Creek.

#### **4.3.1.3 Past and Existing Impacts**

Water quality of Wilson Brook is likely impacted from the former NB Coal surface coal mine, primarily through elevation of conductivity, sulfate, iron, manganese, and some water-soluble metals including cadmium.

The current GLT wood waste disposal site contains surface water runoff controls, which directs precipitation runoff around the waste cells. From there, surface water travels via two large mine cuts before reaching Wilson Brook. Additionally, groundwater at this site flows away from Wilson Brook, thereby further reducing the likelihood of the existing wood waste site from impacting Wilson Brook water quality.

Surface water quality sampling was previously discontinued at this site.

#### **4.3.1.4 Future Foreseeable Impacts**

As noted in previous sections, the downgradient area considered in this CEA is a forested area previously mined by NB Coal, and owned by the proponent (GLT). GLT uses the area for wood storage, which is necessary for the continued efficient operation of the sawmill, and no future developments requiring effluent discharge to Wilson Brook are planned.

#### **4.3.1.5 Conclusion – Surface Water**

Roy Consultants and Craig HydroGeoLogic have undertaken a groundwater, bedrock and soil analysis of the site, which has demonstrated minimal risk to surface water quality from natural attenuation of leachate through the soil, and the additional barrier of a beaver pond providing further attenuation, prior to discharging surface water to Wilson Brook.

In addition to mitigation at the proposed new site, mitigation at the current site has been implemented throughout its life cycle, including directing surface runoff off of/away from the wood waste cells. Additionally, groundwater monitoring shows the flow of groundwater *away* from Wilson Brook at this location.

**Taking into consideration the current water quality of Wilson Brook, the mitigation for the proposed wood waste site, and the mitigation and lack of impacts from the existing wood waste site, cumulative surface water impacts are considered unlikely and therefore not significant.**

**Table 8: Operational Environmental Effects and Recommended Mitigation Measures Summary**

Significance of residual impacts rated as follows:

0=None, 1=Not Likely/ Not Significant, 2=Likely/Significant, 3=Unknown, + =Positive, - =Negative

Valued Ecosystem/ Social Component (VEC/VSC)	Description of Potential Project Interaction with VEC/VSC	Required Mitigation	Residual Effects		Further Study or Follow-up
			Likelihood	Significance	
Transportation of Waste to Site	Transportation – impacts to Route 10	GLT trucks will adhere to posted speed limits, weight restrictions and all other DTI regulatory restrictions on the use of its provincial highways.	1	1	0
	Atmospheric quality - increased noise along Route 10	<ul style="list-style-type: none"> <li>Trucks will operate only during regular working hours of operation, namely between 7am and 5pm, weekdays.</li> <li>Trucks will be maintained in good working order and properly muffled.</li> <li>Engine-assisted, or “Jake” brakes will not be used, and all posted speed limits (50, 70 and 90kph along the haul route) will be adhered to.</li> </ul>	1	1	0
	Atmospheric quality – Diesel engine and dust air emissions	<ul style="list-style-type: none"> <li>Trucks will be maintained in good working order.</li> <li>Ash loads will be covered to minimize fugitive dust emissions.</li> </ul>	1	1	0
Ground- and Surface Water Quality	Wood waste leachate may impact groundwater quality	<ul style="list-style-type: none"> <li>Site Choice: the wood waste disposal facility will be in an already-impacted former surface coal mine, with more than 30 feet of tailings underlying the proposed site;</li> <li>GLT commissioned a soil and groundwater risk assessment of the site as part of the planning process, to identify downstream human and environmental receptors and to determine the potential impacts from the deposition of wood waste and ash;</li> <li>There are existing berms within the cut which will act as barriers to surface runoff;</li> <li>There is an existing beaver impoundment which will contribute to the attenuation of any site surface runoff;</li> <li>GLT will implement a Groundwater and Surface Water Monitoring Program as per the requirements of the DELG Approval to Operate.</li> </ul>	1	1	1

Migratory Bird Habitat	Potential impacts to bird and bird habitat within the 10 ha total project footprint.	<ul style="list-style-type: none"> <li>Vegetation clearing for each following year will be completed outside of the breeding bird season;</li> <li>Overall, the project will result in the total loss of 10 ha, which is not considered significant given the site characteristics and the adjacent, more beneficial habitats.</li> </ul>	1	1	0
	Impact to Spotted Sandpiper	<ul style="list-style-type: none"> <li>A 10m buffer will be maintained between the cell and the pond;</li> <li>Vegetation near the southern-most edge of the cell will be cleared outside of the Spotted Sandpiper nesting season, if/when necessary.</li> </ul>	1	1	0
Labour and Economy	No net change in employment in region	<ul style="list-style-type: none"> <li>No mitigation necessary.</li> </ul>	1	1	0
Accidents and Unplanned Events	Petroleum spills may occur on site	<ul style="list-style-type: none"> <li>Petroleum products or any other deleterious substances will not be dumped on the ground or in the water, or handled or stored in a careless manner;</li> <li>All necessary precautions will be taken to avoid spills and contamination to the soil and water when handling petroleum products on site and during fuelling and servicing of vehicles and equipment. Vehicles and equipment will be maintained in good working order to prevent leaks on site;</li> <li>Appropriate emergency spill response equipment will be maintained on site;</li> <li>All spills or leaks will be promptly contained, cleaned-up and reported to regulatory authorities. Employees will be briefed in the use of spill kits and appropriate emergency reporting procedures. The GMIA's Standard Operating Procedure (SOP) for Environmental Incident Management will be followed;</li> <li>Should contaminated soils be encountered during construction or demolition activities, they will be managed in accordance with applicable federal and/or provincial requirements (i.e. New Brunswick Guideline for the Management of Contaminated Sites (July 2012));</li> <li>Vehicles and equipment will be maintained in good working order to prevent leaks on site;</li> <li>All spills or leaks will be promptly contained, cleaned-up and reported to regulatory authorities. The GLT Standard Operating Procedure (SOP) for Environmental Incident Management will be followed.</li> </ul>	1	1	0



	An employee may be injured on site during operations.	<ul style="list-style-type: none"> <li>GLT has developed workplace safety protocols and standard operating procedures for its staff. Employees are required to maintain and wear personal protective equipment (PPE) at all times on site.</li> <li>All required health and safety equipment will be kept on site and in good working order, including a First Aid kit and any other necessary health and safety equipment.</li> <li>Only employees properly skilled and trained shall be employed in the construction, operation and maintenance of the project. All appropriate employee certification shall be maintained in good standing.</li> <li>All workers on site shall be properly trained and insured as per the requirements of WorkSafe NB and the <u>Occupational Health and Safety Act (OHSA)</u>.</li> <li>All accidents shall be reported to WorkSafe NB and where necessary, protocols developed to avoid future, similar occurrences.</li> </ul>	1	1	0
Cumulative Effects	Groundwater Quality	<ul style="list-style-type: none"> <li>Site selection;</li> <li>Attenuation from in situ soils;</li> <li>Soil and Bedrock Risk Assessment Study;</li> <li>Groundwater Monitoring Program;</li> </ul>	1	1	1
	Surface Water Quality – Wilson Brook	<ul style="list-style-type: none"> <li>Site selection;</li> <li>Attenuation from in situ soils;</li> <li>Beaver impoundment on site;</li> <li>Soil and Bedrock Risk Assessment Study;</li> <li>Mitigation / site conditions at current wood waste site;</li> <li>Surface Water Monitoring Program</li> </ul>	1	1	1

## **5 PUBLIC INVOLVEMENT**

The public involvement activities proposed for this project registration are being conducted as per the requirements of Appendix C of the Guide to Environmental Impact Assessment in New Brunswick (2012). The public involvement strategy will be submitted separately to the DELG Project Manager for approval, and a summary report outlining the strategy and its results will be submitted for review within 60 days of the date of registration.

## **6 FIRST NATIONS**

The proposed project is located on privately-owned land and will be funded by the proponent. The nearest First Nation, St. Mary's First Nation, is located approximately 80km west of the subject site.

Based on the history of the site (a surface-dredged coal mine) and the current land use, it is not anticipated that the proposed project will infringe on Aboriginal Rights or traditional land use by a First Nation.

## **7 APPROVAL OF THE UNDERTAKING**

The following permits, approvals and authorizations are anticipated for the project to include but not be limited to:

### **7.2 Provincial**

- a) Certificate of Determination – DELG
- b) Approval to Construct and Operate – DELG

### **7.3 Federal**

No federal approval or authorization is anticipated for this project.

## **8 FUNDING**

The proposed GLT Kings Mines Wood Waste Disposal Facility is a privately funded project.

## **9 CLOSING STATEMENT**

Grand Lake Timber, Limited is proposing to develop a wood waste disposal facility in Kings Mines, near Chipman, NB. The site in question is ideally suited for the purpose, as it is located within an already heavily-impacted former mine site. The project represents an improvement to the current site, as it is ~2km closer to the GLT sawmill, thereby reducing the impacts associated with the hauling of the waste (GHG emissions, transportation noise, impacts to Route 10).

Craig HydroGeoLogic undertook an analysis of the site soil, bedrock and groundwater characteristics, as well as potential downstream receptors, and concluded that a liner system and leachate pond for the wood waste cell is not a requirement for this site.

Based on this assessment and the mitigation proposed in this report, no significant adverse environmental effects are anticipated.

This report was prepared by Roy Consultants for the exclusive use of Grand Lake Timber, Limited. The information contained herein may not be re-published or relied upon for any other purpose or by any other third party without the express written notice of the author.

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