

**REVISED
EIA REGISTRATION
(Revised September 2007)**

**Deersdale Sawmill Biomass
Energy Plant Project**

**J.D. Irving, Limited
Deersdale, New Brunswick**

Project No. 1006181



PROJECT NO. 1006181

TO New Brunswick Department of Environment (NBENV)
Project Assessment and Approvals Branch
P.O. Box 6000, 20 McGloin Street
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ON Revised EIA Registration for Deersdale Sawmill
Biomass Energy Plant Project (Revised September 2007)

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Preface

This revised EIA Registration has been prepared on behalf of J.D. Irving, Limited (the Proponent) to provide new information relating to the Deersdale Sawmill Biomass Energy Plant Project (the Project), originally submitted for registration under the *Environmental Impact Assessment Regulation – Clean Environment Act* on September 5, 2006.

As detailed in the original EIA Registration, the Deersdale sawmill is a softwood lumber sawmill producing approximately 165,180-176,980 m³/year (70-75 million foot board measure per year, or FBM/year) of lumber from spruce, pine, and fir trees. The lumber produced by the sawmill is currently dried in three low temperature dry kilns prior to shipment to market. The steam required to provide the heat to the dry kilns is currently supplied by three boilers burning No. 6 fuel oil. In addition, a small thermal oil heater fuelled by No. 2 fuel oil is used for log conditioning and space heating for the sawmill.

The Project, as was originally registered in September 2006, was intended to replace the current combustion of fossil fuels in four boilers at the sawmill by the combustion of biomass in two biomass boilers to generate steam for lumber drying, for log conditioning, and for space heating of the buildings on-site. The Project, as originally conceived, consisted of the installation and operation of two new biomass boilers, and associated materials handling, process, and pollution control equipment. These would replace the existing three No. 6 fuel oil-fired boilers and a small No.2 fuel oil-fired thermal oil heater currently operating on-site.

Since the submission of the EIA Registration for the Project, J.D. Irving, Limited has further examined its steam supply options, including the viability of biomass as a heat source, the future of the sawmill industry, and the future of the Deersdale sawmill itself.

In consideration of potential future growth of the sawmill (to be achieved by operating longer hours) and in light of potential increased steam demand to dry the additional lumber produced, J.D. Irving, Limited is proposing to install two biomass-fired boilers as part of the Project, one of which is larger than that previously planned and originally registered under the EIA Regulation in September 2006. This is to ensure that the future demand for steam can be fulfilled by the steam generating assets currently being planned, rather than requiring the addition of another boiler at some time in the future. In addition, a fourth dry kiln is now planned for the facility to assist in drying lumber produced by the sawmill in the future.

Further details on these amendments, and other small changes to the previously planned Project (such as small changes to the materials handling equipment), are described in this revised EIA Registration document. This revised EIA Registration is intended to supersede the previous version of the EIA Registration document dated September 5, 2006.





Table of Contents

	Page No.
PREFACE	i
1.0 INTRODUCTION	1
1.1 Name of Undertaking and Project Proponent.....	1
1.2 Project Overview (Nature of the Undertaking).....	2
1.3 Purpose/Rationale/Need for the Undertaking.....	5
1.4 Regulatory Framework and Purpose of Document	6
1.5 Organization of this Revised EIA Registration	7
2.0 PROJECT DESCRIPTION AND MITIGATION – REVISED SEPTEMBER 2007	9
2.1 Geographic Location	9
2.2 Overview of the Deersdale Sawmill.....	9
2.2.1 Current Fuel Consumption and Steam Production	10
2.3 Description of the Project Components.....	13
2.3.1 Biomass Handling.....	13
2.3.2 Fresh Water	14
2.3.3 Steam and Condensate Piping.....	14
2.3.4 Biomass Boilers	14
2.3.4.1 Emissions Control Equipment	19
2.3.4.2 Exhaust Stacks.....	19
2.3.4.3 Ash Handling System	20
2.3.5 Addition of Fourth Dry Kiln.....	20
2.3.6 Other Ancillary Equipment and Systems	21
2.4 Construction	21
2.4.1 Site Preparation.....	22
2.4.2 Physical Construction and Equipment Installation.....	22
2.4.3 Commissioning	23
2.4.3.1 Construction and Commissioning Schedule.....	23
2.4.4 Project-Related Emissions and Wastes	23
2.4.4.1 Air Contaminant Emissions	23
2.4.4.2 Sound Emissions.....	24
2.4.4.3 Wastewater Generation.....	24
2.4.4.4 Waste Generation and Management.....	25
2.5 Operation.....	25
2.5.1 General Operation of the Biomass Energy Plant.....	25
2.5.2 Phase 1 Operation.....	26
2.5.3 Phase 2 Operation.....	26
2.5.4 Summary of Intended Future Operation	26
2.5.5 Ongoing Maintenance	27
2.5.6 Project-Related Emissions and Wastes	27
2.5.6.1 Air Contaminant Emissions	27

Table of Contents (continued)

	Page No.	
2.5.6.2	Sound Emissions.....29	29
2.5.6.3	Wastewater Generation.....29	29
2.5.6.4	Waste Generation and Management.....30	30
2.6	Decommissioning and Abandonment.....30	30
2.7	Accidents, Malfunctions, and Unplanned Events30	30
2.7.1	Process Upsets31	31
2.7.2	Fires.....31	31
2.7.3	Vehicle Accidents32	32
3.0	EXISTING CONDITIONS AND POTENTIAL ENVIRONMENTAL EFFECTS.....33	33
3.1	Physical Environment.....33	33
3.1.1	Existing Conditions33	33
3.1.1.1	Physical Setting.....33	33
3.1.2	Potential Environmental Effects.....33	33
3.2	Atmospheric Environment34	34
3.2.1	Existing Conditions34	34
3.2.1.1	Air Quality34	34
3.2.1.2	Sound Quality34	34
3.2.2	Potential Environmental Effects.....35	35
3.2.2.1	Air Quality35	35
3.2.2.2	Sound Quality40	40
3.3	Groundwater Environment41	41
3.3.1	Existing Conditions41	41
3.3.2	Potential Environmental Effects.....41	41
3.4	Freshwater Environment42	42
3.4.1	Existing Conditions42	42
3.4.2	Potential Environmental Effects.....42	42
3.5	Terrestrial and Wetland Environment.....43	43
3.5.1	Existing Conditions43	43
3.5.2	Potential Environmental Effects.....43	43
3.6	Land Use.....44	44
3.6.1	Existing Conditions44	44
3.6.2	Potential Environmental Effects.....44	44
3.7	Heritage and Archaeological Resources44	44
3.7.1	Existing Conditions44	44
3.7.2	Potential Environmental Effects.....44	44
3.8	Labour and Economy45	45
3.8.1	Potential Environmental Effects.....45	45
3.9	Road Transportation.....46	46
3.9.1	Existing Conditions46	46
3.9.2	Potential Environmental Effects.....46	46

Table of Contents (continued)

	Page No.
3.9.2.1 Construction	46
3.9.2.2 Operation.....	47
3.10 Current Use of Land and Resources for Traditional Purposes by Aboriginal Persons	47
3.10.1 Existing Conditions	47
3.10.2 Potential Environmental Effects.....	48
3.11 Public Health and Safety	48
3.11.1 Existing Conditions	48
3.11.2 Potential Environmental Effects.....	48
4.0 OTHER CONSIDERATIONS	51
4.1 Project-Related Documents	51
4.2 Approval of the Undertaking.....	51
4.3 Funding	51
4.4 Regulatory, Public, and Stakeholder Consultation	51
4.4.1 Regulatory Consultation	52
4.4.2 Public / Stakeholder Notification.....	52
4.5 Project Schedule	52
5.0 CLOSING REMARKS.....	53
6.0 REFERENCES.....	55

List of Figures

Figure 1.1 Project Location.....	3
Figure 2.1 Aerial Photograph Showing Project Location	11
Figure 2.2 Site Plan	15
Figure 2.3 Boiler and Fuel Storage Building Detail.....	17

List of Tables

Table 2.1 Typical Existing Fuel Consumption, Steam Production, and Emissions	10
Table 2.2 Summary of Intended Future Operation of the Deersdale Sawmill	26
Table 2.3 Estimated Fuel Consumption, Steam Production, and Emissions from the Proposed Future Operation of the Project (Phase 1 and Phase 2).....	27
Table 3.1 Estimated Emissions from the Operation of the Project – Current Operation versus Proposed Future Operation (Phase 1 and Phase 2) *	37
Table 3.2 Overall Summary of Estimated Emissions – Current Operation versus Proposed Future Operation (Phase 1 and Phase 2)	38

Table of Contents (continued)

Page No.

List of Appendices

Appendix A: Additional Information (“General Information Requirements” in NB EIA Guide)



Glossary

Term

Definition

annual capacity factor

Annual capacity factor is defined as the ratio of the average time-weighted power load developed by a boiler for a given year, to the total capacity rating of the boiler, had it been operational at full load during each hour throughout the year.

biomass

Biomass generally refers to a wide range of organic materials that are derived from natural sources. In the context of this EIA Registration, the term biomass shall be taken exclusively to mean sawmill residues (defined below).

Biomass Energy Plant

Referred throughout this document as the “Project”, the Deersdale Sawmill Biomass Energy Plant to be constructed by J.D. Irving, Limited will generate heat and steam from the combustion of biomass as a replacement of the existing oil fired boilers at the Deersdale sawmill in Deersdale, NB. The heat and steam will be used in various parts of the process at the existing sawmill. The Biomass Energy Plant is the sole subject of this EIA Registration.

boiler

A device which is used to combust fuel in an industrial process for the purposes of generating steam.

boiler blowdown

A wastewater stream from the operation of a boiler, which is bled from the boiler in small volumes on a continuous basis to prevent saturation of the water with contaminants.

Certificate of Approval

Also abbreviated “CoA”, a Certificate of Approval is a legal document issued by the New Brunswick Department of the Environment under the *Air Quality Regulation – Clean Air Act* and/or the *Water Quality Regulation – Clean Environment Act*. A Certificate of Approval identifies the terms and conditions that a source of contaminants to the environment must comply with in order to remain in compliance with provincial environmental legislation. Certificates of Approvals can be issued for construction or for operation of a facility. A CoA is also referred to as an “Approval”.

Term

Definition

Determination Review

A review of a project by the New Brunswick Department of Environment (NBENV) or other regulatory agencies under the provincial *Environmental Impact Assessment Regulation*, aimed at determining whether an environmental impact assessment of the project is required or whether the project can proceed subject to conditions. Also sometimes colloquially termed “screening review”.

EIA

Environmental Impact Assessment, also sometimes referred to as Environmental Assessment or EA. EIA is an established protocol for assessing the potential environmental effects of a particular project or development in accordance with the relevant provincial and/or federal acts and regulations. EIA is intended to be a conceptual review at the planning stages of a project or development, rather than a detailed review of engineering designs associated with the project or development.

environment

The components of the Earth and includes
(a) air, land and water, including all layers of the atmosphere,
(b) all organic and inorganic matter and living organisms, and
(c) the interacting natural systems that include components referred to in paragraphs (a) and (b).

environmental effect

In respect of a project, “environmental effect” means:
(a) any change that the project may cause in the environment, including any change it may cause to a listed wildlife species, its critical habitat or the residences of individuals of that species, as those terms are defined in subsection 2(1) of the *Species at Risk Act*,
(b) any effect of any change referred to in paragraph (a) on:
i) health and socio-economic conditions;
ii) physical and cultural heritage;
iii) the current use of lands and resources for traditional purposes by aboriginal persons; or
iv) any structure, site or thing that is of historical, archaeological, paleontological or architectural significance; or
(c) any change to the project that may be caused by the environment
whether any such change or effect occurs within or outside Canada.

green lumber

Lumber product from the sawmill, prior to being dried in the drying process at the sawmill.



<u>Term</u>	<u>Definition</u>
maximum continuous rating (MCR)	The design or specified rating of a boiler's generation output, typically in units of mass or steam or energy per unit time.
Minister	The Minister of the New Brunswick Department of Environment.
mitigation	In respect of a project, the elimination, reduction or control of the adverse environmental effects of the project, and includes restitution for any damage to the environment caused by such effects through replacement, restoration, compensation or other means.
multi-cyclone collector	A mechanical air pollution control system for removal of particulate matter from an exhaust gas stream, consisting of several cyclones operating in parallel which remove particulate matter by the inertia of the particles within the cyclones.
particulate matter	Also referred to as total suspended particulate matter (TSP), or colloquially called soot or dust, particulate matter is a general term to describe material, in solid or liquid form, contained within an exhaust gas stream or in ambient air.
process wastewater	Wastewater used in an industrial process which is no longer suitable for its original purpose and is therefore treated and released to the environment. In the context of this EIA Registration, process wastewater shall be taken to mean boiler blowdown exclusively.
Project	In relation to a physical work, any proposed construction, modification, decommissioning, abandonment or other undertaking in relation to the physical work. In the context of this EIA Registration, the Project is the "Deersdale Sawmill Biomass Energy Plant Project" described herein.
Proponent	In respect of a project, the person or body corporate that proposes the project. In the context of this EIA Registration, the Proponent is J.D. Irving, Limited.
sawmill residues	The by-products consisting of biomass that result from the production of lumber or other wood manufacturing products. In the context of this EIA Registration, sawmill residues shall be taken to mean primarily bark, supplemented as necessary by sawdust, shavings, and wood chips.

Term

Definition

secondary fuel

A fuel that is used for supplementing the primary fuel for the Project, such as a fuel used for co-firing, start-up, or back-up purposes. In the context of this EIA Registration, secondary fuel shall be taken to mean either No. 6 fuel oil or No. 2 fuel oil.

site run-off

Wastewater from precipitation coming into contact with the ground surface at the site, and potentially coming into contact with contaminants on the ground surface such as solids.

Undertaking

A project that requires registration under the provincial *Environmental Impact Assessment Regulation*. Synonymous with "Project".

wastewater

Water whose physical and/or chemical properties have been altered from its original state, which alteration makes it no longer suitable for its original purpose and is therefore ultimately destined for treatment and eventual disposal or release to the environment. In the context of this EIA Registration, wastewater includes process wastewater and site run-off, but excludes cooling water.



List of Acronyms and Units

<u>Acronym/ Unit</u>	<u>Definition</u>
bbl	barrel of oil (158.8 L)
BHP	boiler horsepower (9.81 kW)
BTU	British thermal unit
°C	degrees Celsius
CEM	continuous emission monitor
CO	carbon monoxide
CO ₂	carbon dioxide
CoA	Certificate of Approval
EIA	Environmental Impact Assessment
°F	degrees Fahrenheit
GHG	greenhouse gas
GMt	green metric tonnes
ha	hectares (10,000 square metres)
hr	hour (3,600 seconds)
igal	imperial gallon (4.545 L)
J	Joule
kg	kilograms (1,000 grams)
km	kilometre (1,000 metres)
kPa	kilopascals (1,000 pascals)
kVA	Kilovolt-ampere (1,000 volt-amperes)
kW	kilowatt (1,000 Watts)
L	litre
LSD	Local Service District
lb	pounds (0.455 kg)
lb/MMBTU	pounds of contaminant per million British Thermal Units of heat input
m	metre
m ²	square metre
m ³	cubic metre
MCR	maximum continuous rating
mg/Rm ³	milligrams of contaminant per cubic metre of air at reference conditions (25°C and 101.3 kPa)
min	minute (60 seconds)

<u>Acronym/ Unit</u>	<u>Definition</u>
MM	million
NBENV	New Brunswick Department of Environment
NBDNR	New Brunswick Department of Natural Resources
NBDOT	New Brunswick Department of Transportation
NO _x	nitrogen oxides (expressed as nitrogen dioxide)
PID	parcel identifier (as referenced by Service New Brunswick)
PM	particulate matter
psig	pounds per square inch (gauge)
s	second
SNB	Service New Brunswick
SO ₂	sulphur dioxide
t	tonnes (1,000 kilograms)
TRC	Technical Review Committee
TSP	total suspended particulate matter
USgal	U.S. gallon
V	volt
VEC	Valued Environmental Component
VOC	volatile organic compound
W	watt (1 J/s)
yr	year

1.0 INTRODUCTION

This document is a revised Environmental Impact Assessment Registration (“EIA Registration”) for the Deersdale Sawmill Biomass Energy Plant Project (“the Project”) being proposed by J.D. Irving, Limited (“the Proponent”) in Deersdale, New Brunswick. The Project was originally submitted for registration under the *Environmental Impact Assessment Regulation – Clean Environment Act* on September 5, 2006. This revised EIA Registration is intended to supersede the previous version of the EIA Registration document dated September 5, 2006.

The Project will be constructed and operated at the existing Deersdale sawmill in Deersdale, New Brunswick, to assist the sawmill in fulfilling its energy needs.

The registration of the Project is required pursuant to Section 5(1) of the *Environmental Impact Assessment Regulation 87-83* (hereinafter referred to as the “EIA Regulation”) filed under the *Clean Environment Act* of the Province of New Brunswick (Government of New Brunswick, 1987).

At this time, it is expected that the Project will be privately funded by the Proponent, on land owned by the Proponent. There are no known authorizations required under the *Law List Regulations* under the *Canadian Environmental Assessment Act (CEAA)* to enable the Project to be carried out. Therefore, the Project does not trigger *CEAA*, and thus an environmental assessment under *CEAA* is not required.

1.1 Name of Undertaking and Project Proponent

The Project may be referred to as the “Deersdale Sawmill Biomass Energy Plant Project”.

The Proponent of the Project described herein is J.D. Irving, Limited. The details of the Project proponent are as follows.

Name of Undertaking:	Deersdale Sawmill Biomass Energy Plant Project (Revised September 2007)
Name of Proponent:	J.D. Irving, Limited
Mailing Address of Proponent:	5120 Route 107 Deersdale, New Brunswick E7L 1W5
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1.2 Project Overview (Nature of the Undertaking)

The Project involves the construction and operation of the Deersdale Sawmill Biomass Energy Plant Project at the existing Deersdale sawmill in Deersdale, New Brunswick. The location of the Project is shown in Figure 1.1.

The Project will primarily consist of the installation and subsequent operation of two boilers, fuelled by biomass generated at the sawmill, to generate the steam necessary to fulfill the steam needs of the sawmill. In the event that biomass is unavailable, the existing boilers will remain in place for future use if required. The new biomass boilers will replace the steam generated by three existing boilers fuelled by No. 6 fuel oil to supply steam to the dry kilns, and one small thermal oil heater fuelled by No. 2 fuel oil used for log conditioning and for space heating at the sawmill.

The key component of the Project will involve the installation and operation of two new biomass boilers and associated process equipment to produce steam for use at the sawmill. The two new boilers will each have a rated capacity of 5,890 kW (600 BHP). The steam from the Biomass Energy Plant will be used in the lumber drying process, for log conditioning, and for space heating of the buildings on-site. A fourth new dry kiln will also be added to provide additional lumber drying capability and to complement the existing three dry kilns currently operating on site.

The new biomass boilers will each be capable of generating up to 9,090 kg/hr (20,000 lb/hr) of steam, for a total of up to 18,180 kg/hr (40,000 lb/hr) of steam for the sawmill. Following the completion of the Project (Phase 1), steam will be generated from the combustion of up to 20,000 green metric tonnes per year (GMT/yr) of sawmill residues from the sawmill operation. In the future (Phase 2), extended hours of operation may result in the requirement for additional steam to supply the dry kilns on site to dry the additional lumber produced, thereby requiring the combustion of up to 25,000 GMT/yr of sawmill residues. The actual hourly or daily biomass consumption may vary due to variable firing rates of the boilers and in response to the steam demand of the dry kilns (e.g., to meet peak steam demands), but on average would not exceed the amounts stated above within any given year.



Figure 1.1 Project Location





All of the biomass fuel required for the Project will originate from the Proponent's sawmill operations at the Deersdale site, with allowance for transportation of sawmill residues from other sawmill operations of the Proponent should the need arise. The sawmill currently generates an average of 47,900 GMt/yr of sawmill residues, of which 20,000-25,000 GMt/yr will be required for the steam plant. The remaining sawmill residues from the Deersdale sawmill operation will be directed to other J.D. Irving, Limited operations for use as a fuel or other appropriate end use.

Each of the two biomass boilers will be equipped with a multi-cyclone collector to control particulate matter emissions from the boilers. The new biomass boilers will have a common ash collection system. Emissions from the biomass boilers will be released via new individual stacks for each boiler. Alternatively, a common stack to serve the two new biomass boilers may be installed, subject to suitable economics and acceptable plume dispersion.

Emissions from the Project may include particulate matter and combustion gases from the biomass boilers, as well as potential fugitive particulate matter emissions from the storage and handling of biomass. Ash generated from the biomass boiler operation will be sent to approved composting operations in New Brunswick to be composted via existing approved practices. A solid waste disposal facility is not required as part of the Project.

Other aspects of the existing operation of the Deersdale sawmill are not affected by the Project. As such, the scope of the Project being considered is limited to the construction and subsequent operation of the new biomass boilers, the fourth new dry kiln, the new Boiler and Fuel Storage Building, and associated equipment and systems, as well as the mothballing of the existing three boilers and small thermal oil heater on site. The remainder of the sawmill operation and associated emissions and releases are not expected to change compared to their current operation as a result of the Project, and are thus not discussed further in this EIA Registration. The operation of these other aspects of the sawmill are, and will continue to be, conducted in accordance with the terms and conditions of the Certificate of Approval I-4089 for the Deersdale Sawmill.

1.3 Purpose/Rationale/Need for the Undertaking

Changes in energy policy in New Brunswick and Canada, volatile fuel prices, as well as environmental challenges and other global environmental phenomena such as climate change, are stimulating a need to improve energy efficiency and to develop and use alternative energy sources and new technologies to meet current and future energy needs.

The Project is intended to improve the steam supply for the Deersdale sawmill to a stable, secure, cost-effective and environmentally sustainable steam supply for the sawmill. The replacement of the four existing boilers fuelled by fossil fuels by clean, new, modern steam generation technology will improve energy efficiency and reduce emissions.

Since biomass combustion is considered to be part of the global carbon cycle (*i.e.*, the carbon dioxide it produces is returned to the forests) and is therefore considered CO₂-neutral, the Project will result in a net benefit with respect to greenhouse gas emissions associated with the sawmill operation. This is consistent with the principles embraced in the *Kyoto Protocol* (UNFCCC, 1997), the Province of New

Brunswick's *Climate Change Action Plan 2007-2012* (Government of New Brunswick, 2007), the Government of Canada's *Regulatory Framework for Air Emissions* (Government of Canada, 2007), and the New England Governors and Eastern Canadian Premiers' *Climate Change Action Plan* (NEGECIP, 2001).

The Project will reduce the requirement for energy generated from the combustion of fossil fuels to meet the steam requirements of the sawmill, and result in an estimated reduction of 2,700,000 litres (approximately 17,000 barrels) of No. 6 fuel oil and 325,000 litres (approximately 2,050 barrels) of No. 2 fuel oil burned each year and an associated reduction in emissions associated with the operation of the Deersdale sawmill as compared to the existing operation. In addition, since biomass contains little sulphur, the Project represents an opportunity to reduce emissions.

In addition to the above-mentioned benefits, it is expected that the Project will also achieve the following outcomes.

- The steam needs of the Deersdale sawmill will be addressed by the new Biomass Energy Plant and associated boilers.
- The steam produced will be generated from renewable energy sources (*i.e.*, biomass).
- Fossil fuel combustion and associated emissions of air contaminants to the atmosphere will be reduced – especially sulphur dioxide and carbon dioxide.
- Energy costs will be reduced.
- The Project will assist the Province of New Brunswick and the Government of Canada in meeting their environmental and/or energy policy commitments, including the provincial government's environmental commitments under the *Climate Change Action Plan 2007-2012*, the provincial target of reducing SO₂ emissions by 50% by 2010, the Government of Canada's *Regulatory Framework for Air Emissions*, the climate change initiatives under the *Kyoto Protocol*, and the New England Governors and Eastern Canadian Premiers' *Climate Change Action Plan*.
- Employment and related economic spin-offs will be created during construction.

The Project, producing steam from biomass for use in the dry kilns and space heating at the Deersdale sawmill, represents an attractive means of meeting the energy needs of the sawmill and reducing its reliance on fossil fuels for energy, thereby reducing overall energy costs in an environmentally responsible manner.

Combined, these aspects form the basis of the Proponent's motivation for the Project.

1.4 Regulatory Framework and Purpose of Document

The Project is an Undertaking under the *Environmental Impact Assessment Regulation 87-83* under the *Clean Environment Act* of the Province of New Brunswick ("*EIA Regulation*"), according to item (k) in Schedule "A" of the *EIA Regulation* ("all facilities for the commercial processing or treatment of timber resources other than fuel wood, except maple sugaries, shingle mills, and sawmills producing less than one hundred thousand foot board measure annually"). As such, the Project requires formal registration under Section 5(1) of the *EIA Regulation* and will undergo a Determination Review, to be coordinated by the New Brunswick Department of Environment (NBENV).

At this time, it is expected that the Project will be privately funded by the Proponent, and no direct funding or other forms of financial assistance are being sought from the federal or provincial governments to enable the Project to be carried out. The Project will be built on land owned by the Proponent. There are no known authorizations required under the *Law List Regulations* under the *Canadian Environmental Assessment Act (CEAA)* to enable the Project to be carried out. Therefore, the Project does not trigger *CEAA* and thus an environmental assessment under *CEAA* is not required.

The objective of this document is to provide information to the New Brunswick Department of Environment (NBENV) and other regulatory agencies in order to satisfy the regulatory requirements for registration of the Project under the *Environmental Impact Assessment Regulation 87-83*, to enable a determination as to whether or not a Comprehensive EIA Review of the Project is required under the *EIA Regulation*.

1.5 Organization of this Revised EIA Registration

This report is presented in six sections, as follows:

- A brief introduction and overview of the Project, as well as the objectives of this report, are presented in Section 1.0;
- A description of the Project, including a summary of the preliminary information currently available related to the Project, and planned mitigation is provided in Section 2.0;
- A discussion of the existing environment and the potential environmental effects of the Project are provided in Section 3.0;
- Information on other considerations including funding and public and stakeholder consultation activities that have been conducted or are planned as part of the Project is provided in Section 4.0;
- Closing remarks are provided in Section 5.0; and
- References consulted in the preparation of this revised EIA Registration are provided in Section 6.0.

Additional information, including a table of concordance to address the General Information Requirements for EIA Registration documents as outlined in the EIA Guide published by the NBENV (NBENV, 2005), is provided in Appendix A.



2.0 PROJECT DESCRIPTION AND MITIGATION – REVISED SEPTEMBER 2007

A description of the Project to be constructed and operated at the existing Deersdale sawmill, as currently conceived and updated from the original EIA Registration document dated September 5, 2006, is provided in this Section. For context, a brief description of the existing sawmill and its associated steam supply sources is also provided.

As previously noted, other aspects of the existing operation of the sawmill are not affected by the Project. Other than for the elements of the Project described below, the remainder of the sawmill operation and associated emissions and releases are not expected to change compared to their current operation as a result of the Project, and are thus not discussed further in this EIA Registration. The operation of these other aspects of the sawmill are, and will continue to be, conducted in accordance with the terms and conditions of the Certificate of Approval I-4089 for the Deersdale Sawmill.

2.1 Geographic Location

The geographic location of the Project is at the existing Deersdale sawmill operated by J.D. Irving, Limited, located at 5120 Route 107, in the Local Service District (LSD) of Deersdale, County of York, and Province of New Brunswick, as was shown in Figure 1.1.

The property upon which the Project will be completed is owned by J.D. Irving, Limited. The Deersdale property is identified by Service New Brunswick (SNB) as Parcel Identifier (PID) Number 75145623. The sawmill site is approximately located at 46°30'01" N and 67°02'28" W.

An aerial photograph showing the location of the existing Deersdale sawmill, its associated steam supply sources and the location of the Project is provided in Figure 2.1.

2.2 Overview of the Deersdale Sawmill

The Deersdale sawmill is a softwood lumber sawmill producing 165,200-176,980 m³/year (70-75 million board feet per year) of lumber from spruce, pine, and fir trees. The raw materials arrive at the sawmill in the form of 2.4 m (8 ft) logs, with the capability to process 3.05 m (10 ft) logs, obtained from private leaseholds or from Crown land licenses held by J.D. Irving, Limited. The facility produces various lengths of pine, fir, and spruce lumber.

With respect to steam supply, the current steam demand required by the dry kilns at the Deersdale sawmill is approximately 4,545 kg/hr (10,000 lb/hr), on average, with their maximum demand at 10,584 kg/hr (23,285 lb/hr). The actual steam requirement may vary from hour to the next based on the operating conditions on a daily basis, but would be approximately this amount, averaged over a typical operating year.

The steam requirements for the dry kilns at the sawmill are currently fulfilled by three sources:

- One existing 1,960 kW (200 BHP, or 6.7 MMBTU/hr) Volcano Boiler, fuelled by No. 6 fuel oil as a primary fuel;

- One existing 2,870 kW (293 BHP, or 9.8 MMBTU/hr) Iron Fireman Boiler, fuelled by No. 6 fuel oil as a primary fuel; and
- One existing York Shipley Boiler, fuelled by No. 6 fuel oil as a primary fuel.

All three boilers provide steam to the dry kilns and are fuelled by No. 6 fuel oil. Each boiler is operated independently to provide steam for the dry kilns.

Additionally, a small thermal oil heater fuelled by No. 2 fuel oil is used for log conditioning (*i.e.*, for heating the hot ponds) and for space heating of the sawmill.

Each of the three existing boilers and the small thermal oil heater are equipped with a dedicated stack. There are currently no emission control devices in place for these boilers and heater.

2.2.1 Current Fuel Consumption and Steam Production

Based on the above information, and from historical fuel consumption and steam production records, the typical fuel consumption and steam production from the existing steam supply sources associated with the Deersdale sawmill are presented in Table 2.1. Emissions from the typical operation of the existing boilers associated with the Deersdale sawmill are also provided. It is noted that steam demand, fuel consumption, and emissions vary from year to year and season to season based on a number of factors, and thus the information presented below is intended for illustrative purposes only.

Table 2.1 Typical Existing Fuel Consumption, Steam Production, and Emissions

Parameter	Data	
TYPICAL EXISTING OPERATION		
Typical Annual Average Lumber Throughput	165,200-176,980 m ³ /yr (70-75 million FBM/yr)	
Typical Steam Demand	Annual average: 4,545 kg/hr (10,000 lb/hr) Maximum Peak: 10,584 kg/hr (23,285 lb/hr)	
Typical Annual No. 6 Fuel Oil Consumption at Typical Steam Demand	2,700,000 L/yr (17,002.52 bbl/yr)	
Typical Annual No. 2 Fuel Oil Consumption at Typical Steam Demand	325,000 L/yr (2,046.60 bbl/yr)	
Typical Annual Biomass Consumption at Typical Steam Demand	N/A	
Estimated Annual Emissions from Boilers at Typical Existing Operation*		
Total Particulate Matter (PM)	0.38 kg/hr	3.32 t/yr
Sulphur Dioxide (SO ₂)	9.62 kg/hr	84.31 t/yr
Nitrogen Oxides (NO _x as NO ₂)	2.13 kg/hr	18.63 t/yr
Carbon Monoxide (CO)	0.21 kg/hr	1.82 t/yr
Carbon Dioxide (CO ₂)	1,025.8 kg/hr	8,986 t/yr

Legend: kg/hr kilograms per hour L/yr Litres per year
 lb/hr pounds per hour bbl/yr barrels of oil per year
 GMt/yr Green metric tonnes per year N/A Not applicable
 t/yr Tonnes of contaminant per year

* Based on US EPA AP-42 Emission Factors (US EPA, 1995) for No. 6 fuel oil and No. 2 fuel oil combustion in small boilers <100 MMBTU/hr, normal firing (Tables 1.3-1 and 1.3-12), and assuming operation of the units at the typical annual fuel consumption from historical operation. Numbers presented in table may vary slightly due to rounding.



Figure 2.1 Aerial Photograph Showing Project Location





2.3 Description of the Project Components

As previously discussed, the Project involves the replacement of the three oil fired boilers and one oil-fired thermal oil heater by two new biomass boilers at the Deersdale sawmill in Deersdale, New Brunswick.

A preliminary site layout plan showing the existing layout of the Deersdale sawmill and the Project configuration are provided in Figures 2.2 and 2.3.

The Biomass Energy Plant will consist of two new biomass boilers, and associated materials handling, process, and pollution control equipment. The boilers will be equipped with multi-cyclone collectors to control particulate matter emissions.

The Project is described in further detail in the following sub-sections.

2.3.1 Biomass Handling

A biomass handling system will be implemented to assist in the management of the fuel for the Project. The biomass handling system will consist of the following elements.

- Biomass will be generated on-site from the existing sawmill operation, or brought to the sawmill from other sawmills operated by the Proponent if needed. Bark generated by the sawmill operation will be screened for use by the Project. In addition, sawdust may be brought from other parts of the sawmill to the Boiler and Fuel Storage Building for use as a fuel, as appropriate and required.
- A covered conveyor will deliver the biomass fuel from the yard to the covered storage bins, or drop the biomass onto a paved uncovered pad. Each storage bin will have a capacity to maintain enough material for up to 60 hours of operation. A paved area will be used as an overflow.
- From the storage bin, biomass will be conveyed through a conveyor system to boiler feed bins located inside the new steam plant. Each boiler will have a feed bin ahead of the combustion chamber, designed to prevent back draft and to provide an even fuel distribution to the grate system.
- Biomass will then be fed from the boiler feed bins into the new boilers for combustion.

An existing developed area near the Boiler and Fuel Storage Building will be paved, to be used as overflow for uncovered storage of biomass. A front end loader will be used to build, manage, and reclaim the outside storage pile as required. Reclaimed material will be processed through an overhead door into the covered storage bins. A working inventory of approximately 600-725 GMt of biomass material stored outside at any given time. The biomass material may be expected to remain on-site for approximately 10 days on average.

Any run-off from the site, including that which may originate in the outdoor biomass storage area, will be collected and directed to existing storm water ditches along the perimeter of the site. Given that the biomass will remain on-site for a relatively short period, and since leachate tends to form during the decay of biomass over a longer period of time, it is not expected that a substantive quantity of leachate will be generated and require treatment as a result of the storage of biomass on-site. For the same reasons, the storage of biomass on-site is not expected to result in the generation of odours that could become a nuisance at off-site receptors.

2.3.2 Fresh Water

The fresh water needs of the existing Deersdale sawmill boilers are currently supplied from an existing well located near the existing boiler plant at the sawmill. Fire protection is accomplished by the presence of an existing Fire Pond at the sawmill. The existing boilers currently use an estimated 12.9 m³/day (1.97 igal/minute) of fresh water from the existing well.

There will be a nominal increase in the water consumption for the fresh water requirements of the new biomass boilers. In Phase 1, the anticipated water consumption for the new biomass boilers is estimated at 16.4 m³/day (2.51 igal/minute) of fresh water. In Phase 2, the water consumption of the new biomass boilers is estimated at 20.6 m³/day (3.15 igal/minute) of fresh water.

The boiler feed water for the Project will be supplied from a new well to be drilled on-site, near the new Boiler and Fuel Storage Building. The new well will be drilled by an approved well driller and according to the requirements of the New Brunswick *Clean Water Act* and regulations thereunder.

The boiler feed water for the Project will be directed to a new de-aerator and feedwater treatment systems. New feed water pumps will also be installed as part of the Project.

2.3.3 Steam and Condensate Piping

New steam and condensate piping will be installed for the new biomass boilers to tie into existing piping infrastructure. The existing steam and condensate piping currently serving the existing fuel oil fired boilers will remain in place for use.

2.3.4 Biomass Boilers

The new biomass boiler plant will be capable of producing, at maximum continuous rating (MCR), a total of 18,180 kg/hr (40,000 lb/hr) of steam.

The biomass boilers, each rated at 5,890 kW (600 BHP) at their maximum continuous rating, will replace the three existing oil fired boilers and the small thermal oil heater at the Deersdale sawmill, as described previously. The three existing boilers and thermal oil heater at the site, while no longer operational or in active service, will be maintained in an inactive state at the site for future use in the event that they are required (e.g., in the event of a long-term interruption of the biomass boiler operation).

Each of new boilers will be capable of generating up to 9,090 kg/hr (20,000 lb/hr) of steam, but their operation on a daily basis is expected to be considerably less than this amount. This will be the equivalent of 18,180 kg/hr (40,000 lb/hr) of steam, or 11,780 kW (1,200 BHP) of thermal energy, that could be potentially generated by the boilers from the combustion of biomass. The added capacity will allow for meeting potential future steam demand for the sawmill. The biomass boilers will not have the capability to burn a secondary fuel such as No. 6 fuel oil; however, in the event that biomass is not available, the existing fuel oil fired boilers will remain in place for future use if required.

Figure 2.2 Site Plan





Figure 2.3 Boiler and Fuel Storage Building Detail





Following the completion of the Project, the new biomass boilers will be fuelled by biomass consisting of sawmill residues from the Deersdale sawmill operation (or potentially other sources operated by the Proponent, should the need arise), to generate steam. Initially (Phase 1), up to 20,000 green metric tonnes per year (GMt/yr) of biomass will be burned in the biomass boilers to generate steam (known as Phase 1). In the future (Phase 2), extended hours of operation may result in the requirement for additional steam to supply the dry kilns on site to dry the additional lumber produced, thereby requiring the combustion of up to 25,000 GMt/yr of sawmill residues. The actual hourly or daily biomass consumption may vary due to variable firing rates of the boilers and in response to the steam demand of the dry kilns (e.g., to meet peak steam demands), but on average would not exceed the amounts stated above within any given year.

Assuming approximately 5 days per year for maintenance, the biomass flow rate to the Biomass Energy Plant will be approximately 2.3-2.9 GMt/hr of biomass, or approximately 56-69 GMt of biomass per day.

2.3.4.1 Emissions Control Equipment

A multi-cyclone type dust collector is currently planned for the exhaust of each of the new boilers, in order to collect particulate matter in the flue gases from the combustion of biomass. Multi-cyclone collectors are considered to be the industry standard for controlling particulate matter emissions from the combustion of biomass in small boilers (*i.e.*, less than 29,300 kW or 100 MMBTU/hr). Other particulate matter control technologies such as electrostatic precipitators and wet electrostatic precipitators are not in common use for boilers of the size contemplated by the Project, are energy intensive and expensive to operate, and in some cases may have low collection efficiencies due to low resistivity of the ash from biomass combustion. The Proponent operates a number of boilers equipped with multi-cyclone collectors, similar to those proposed as part of the Project, at some of its other facilities (e.g., Doaktown Sawmill) while meeting emission standards and avoiding unacceptable ground-level concentrations. As such, multi-cyclone collectors are proposed for this Project.

Specific details of the design and capacity of the multi-cyclones will be provided following the completion of detailed engineering design. However, based on the preliminary sizing of the multi-cyclone collectors and based on experience at similar facilities, the particulate matter emission is expected to be less than 200 mg/Rm³ (corrected to 11% oxygen). Given the above experience with similar facilities and the anticipated emission performance of the new equipment, there should be no need for the use of other types of emission control devices (e.g., electrostatic precipitators) to control particulate matter emissions from the Project.

From the boilers, flue gases will be drawn through the system by induced-draft and forced-draft fans, to the new multi-cyclone collectors for removal of particulate matter in the flue gas streams. The treated flue gases will then be directed from the exhaust of the multi-cyclone collectors to the stack(s).

2.3.4.2 Exhaust Stacks

Flue gases from the new biomass boilers will be released to the atmosphere via new individual exhaust stacks for each boiler. Alternatively, a common stack to serve the two new biomass boilers may be installed, subject to suitable economics and acceptable plume dispersion. For the purposes of this

revised EIA Registration, it is assumed that two new individual stacks (one for each boiler) will be constructed. The existing stacks, currently serving the existing oil fired boilers and small thermal oil heater, will remain in place for potential future use if required (e.g., in the event of biomass interruption, maintenance, or downtime).

Based on preliminary design considerations, each of the new stacks will have an approximate minimum overall height of 15.2 m (50 feet) above ground-level and an exit diameter of 0.66 m (2.2 feet). The specific heights and exit diameters of the new stacks will be confirmed during detailed engineering design, and their details will be made available during the permitting phase of the Project (following the EIA review).

The new stacks will be carbon steel, free-standing structures. The boilers will be equipped with oxygen monitors for combustion control purposes.

2.3.4.3 Ash Handling System

A new common ash handling system for the bottom ash from the new biomass boilers will be installed as part of the Project. The ash handling system will consist of a covered conveyor and a covered above-grade storage bin (*i.e.*, covered roll-off container) to store the ash pending disposal. The covered ash storage bin will be located outside, adjacent to the Boiler and Fuel Storage Building

Ash will be collected from a number of points within the boilers using screw conveyors and fly ash will be collected using a multi-cyclone collector. The fly ash from the multi-cyclone collector will be stored in a small ash hopper equipped with a rotary air lock for discharge into the main covered ash conveyor. All ash will be transported by the main conveyor to a single covered ash storage bin.

The covered storage bin containing the ash will periodically be loaded onto trucks for transportation to the intended receiving sites. Overall, approximately 200-275 tonnes per year of bottom ash and fly ash are expected to be generated from the Operation of the Project.

Ash will be periodically shipped by truck to approved composting operations in New Brunswick to be composted via existing approved practices. Ash will be blended by these operations into compost such that it meets acceptable compost quality. Approximately 6-8 trucks of ash per year are expected to transport ash to these facilities (*i.e.*, one truck every 45-60 days). A solid waste disposal facility is not required as part of the Project. In future, the Proponent may consider land application of ash, as feasible, following the approval of the Canadian Food Inspection Agency and subject to acceptance by the NBENV.

2.3.5 Addition of Fourth Dry Kiln

Drying wood in an insulated chamber and circulating air over it is called kiln drying. For most end uses of lumber, the free water and much of the bound water in lumber produced at a sawmill should be removed down to a moisture content of below 20%. To accomplish this, a dry kiln is often used to dry the wood. Almost all commercially produced lumber is dried in a kiln before it is finally put in use.

High-temperature dry kilns operate at temperatures of 93-115°C (200-240°F), compared to 71-90°C (160-195°F) for low temperature kilns, and air velocities usually exceed 4 m/s (800 ft/min). Moisture is vented at different stages along the drying schedule. This type of kiln was developed to dry softwood lumbers. Commercial high-temperature kilns can dry large quantities of lumber in one day.

As a result of potential increased lumber production in the future (Phase 2), a fourth dry kiln will be added to meet the additional drying demand. The new dry kiln will supplement the current lumber drying capability at the Deersdale sawmill, currently achieved by three existing low-temperature dry kilns. The fourth dry kiln would be a high temperature type and will operate at temperatures of up to 115°C (240°F).

2.3.6 Other Ancillary Equipment and Systems

A new Boiler and Fuel Storage Building will be constructed to house the new equipment. The new Boiler and Fuel Storage Building will be constructed on reinforced concrete spread footing foundations from a pre-engineered building 23 m x 29 m and 12 m in height (75 ft x 95 ft x 40 ft high). Building service systems such as fire fighting, fire detection, sprinklers, heating, ventilation, indoor and outdoor lighting, air conditioning, and plant air will be added to the new biomass boiler plant as required.

The existing electrical distribution system at the sawmill is not adequate to service the new electrical loads being introduced for the Project. The electrical system for the Project will require the addition of a new power transformer (approximately 1,000 kVA), to power the new boilers, the fuel handling system, and building services. Also, a new electrical room will be required for inside the boiler building to house new 600 V motor control centres (MCC), building services equipment and other electrical process controls required to power and control the new boilers.

The process control equipment required for the control and monitoring of the new boilers and the associated process equipment will be installed in the new electrical room in the biomass boiler building. The process will be controlled with electronic instrumentation and control devices connected to a modern programmable logic controller technology and supervisory control system.

2.4 Construction

The construction of the Project will be initiated following the receipt of the required approvals from the NBENV and any other applicable regulatory agencies. Since the Project will be built on existing industrial land at the Deersdale sawmill, with many of the existing facilities and structures used for the Project, the construction of the Project is expected to be relatively straightforward and proceed in three distinct phases. These are:

- Site preparation;
- Physical construction of the facility structures and installation of equipment; and
- Commissioning.

These phases of construction are described briefly below.

2.4.1 Site Preparation

The site preparation activities to accommodate the Project are expected to be relatively straightforward. Only one new building to house the new boilers will be constructed as part of the Project, in an area that is currently used for industrial service. Therefore, little additional ground disturbance of the site beyond what is currently developed is expected. The location of the new biomass boiler building was shown in Figure 2.2.

Therefore, the main activities associated with site preparation are summarized as follows:

- The site preparation activities for the construction of the Project;
- The preparation of the foundations for any outdoor equipment that will be required for the Project (e.g., conveyors, hoppers, and related equipment); and
- Structural preparations of the boiler house to accommodate the new boilers.

Following approval of the Project under the EIA Regulation, site preparation activities will be initiated with respect to any outdoor structures or areas required to accommodate the Project. This is expected to include the possible excavation of areas for any exterior structures that may be required for the Project (e.g., conveyors, hoppers, and related equipment), as well as the pouring of concrete for any required footings and foundations.

If ground conditions for construction of exterior structures and equipment are not suitable to support the weight of the equipment, some limited pile driving may be required for a short period. However, blasting is not expected to be required to accommodate the physical construction of the Project.

2.4.2 Physical Construction and Equipment Installation

Following site preparation, the physical construction of buildings and structures required to accommodate the Project will be initiated. The activities will include construction of motor bases, floor trenches, electrical sub-station structures, and other ancillary equipment.

The physical construction of buildings and structures required to accommodate the Project will be initiated, including the construction of the new biomass boiler building, any exterior mechanical structures such as conveyors, bins, multi-cyclones, and similar equipment. The new Boiler and Fuel Storage Building will be constructed on reinforced concrete spread footing foundations from a pre-engineered building. The new biomass boilers and associated process units will be housed inside the new building.

It is expected that most process equipment and associated conveying systems required to support the operation of the Project will be fabricated off-site. The equipment will be transported by truck to the Project location as packaged units wherever possible. Once delivered, the equipment would be housed in the building or at the appropriate location outside the building.

Most of the required equipment for the Project will be delivered to the site in pre-assembled modules, ready to drop into place. All of these unit processes are linked by an advanced process control system as described previously.

The physical installation of all equipment would then be completed, including:

- The physical set-up of the equipment at the appropriate location;
- The installation of the new boilers and of associated equipment;
- The installation or rebuilding of ductwork, as necessary;
- The installation of conveyors, bins, multi-cyclones, stacks, and associated equipment; and
- The mechanical connection of all process unit operations, process control systems, electrical connections, instrumentation, and associated utilities.

2.4.3 Commissioning

The new biomass boilers and associated equipment would be commissioned after their construction is completed. The testing of the process unit operations and associated electrical, mechanical, and process control systems and associated instrumentation will be completed individually.

During commissioning, fuel will be introduced to the boilers, and performance testing of the equipment will be conducted to verify the compliance with the performance guarantees of the suppliers.

Following commissioning, the Biomass Energy Plant would be available for commercial operation.

2.4.3.1 Construction and Commissioning Schedule

The construction process described above would begin upon receipt of the required approval of the Project under the provincial *Environmental Impact Assessment Regulation*, as well as following the receipt of the subsequent Certificate of Approval to Construct from the NBENV.

Site preparation and physical construction is anticipated to begin in the period of Winter 2007 to Spring 2008, subject to the completion of the EIA review process by this time. A 6-8 month construction period is anticipated.

The commercial operation of the Project is expected to begin in the summer or fall of 2008.

2.4.4 Project-Related Emissions and Wastes

2.4.4.1 Air Contaminant Emissions

Given that the Project will be located on an existing industrial site, and since the Project involves the replacement of existing boilers and heaters with modest additional construction requirements, the physical Construction of the Project is not expected to result in any substantive emissions of air contaminants or greenhouse gases to the atmosphere.

There will be nominal emissions from the use of heavy construction equipment (e.g., front end loaders, heavy-duty trucks) at the site, as well as some limited amounts of fugitive dust associated with construction. The transportation of construction materials and equipment deliveries to and from the Project site and passenger vehicles accessing the site will also release air contaminants and greenhouse gases to the atmosphere. Emissions from these sources of air emissions, however, are not expected to be substantive and are expected to be generally confined to the Project site. Emissions will be mitigated by the use of water sprays or other approved dust suppressants as required, as well as by the careful scheduling of construction activities to minimize the off-site transport of dust.

Given the industrial nature of the site, the fact that there no nearby residential receptors within at least 3 km of the sawmill, and the rural nature of the area, the emissions from these sources during Construction are not expected to cause a nuisance to off-site receptors, to contribute measurably to ambient conditions in the Deersdale area, or cause the provincial ambient air quality standards to be exceeded.

2.4.4.2 Sound Emissions

During Construction, the potential exists for unwanted sound (“noise”) to be generated that could be considered to be a nuisance to receptors, primarily as a result of the operation of heavy equipment required to complete Construction. Equipment deliveries and construction traffic accessing the site although not expected to be substantive, may result in slightly increased traffic levels to the site and possibly result in increased sound pressure levels at nearby residential receptors. However, given that much of the required infrastructure for the Project already exists and the relatively modest construction requirements, these activities and the associated sound emissions are not expected to be substantive.

Some limited pile driving may also be required for the Construction of the Project, thereby potentially resulting in sound emissions. Commissioning activities for the Project and associated equipment may also generate sound emissions.

However, given the large surface area of the site, the fact that there no nearby residential receptors within at least 3 km of the sawmill, the rural nature of the area and the current industrial operation of the site, and since sound emissions tend to attenuate to near background levels within 1 km of the source, the sound pressure levels at these receptor locations are not expected to be distinguishable from current levels, most of the time. Mitigation will be employed wherever possible or required to minimize adverse environmental effects with respect to sound emissions.

2.4.4.3 Wastewater Generation

Since the Project will be constructed on an existing industrial site at the Deersdale sawmill, there will be little additional ground disturbance as a result of the Project. Other than site run-off during precipitation events (which already occurs, regardless of whether the Project proceeds), there are no activities during Construction of the Project that are expected to result in the generation of wastewater.

2.4.4.4 Waste Generation and Management

During Construction, there may be a requirement to dispose of some general construction wastes. These wastes may include wood, steel, cardboard or other packaging and other construction wastes. These wastes will be re-used or recycled wherever possible, by such means as cardboard and paper recycling, disposal of wood at construction and demolition debris sites, and recycling of metals at local salvage yards, where feasible.

Any solid wastes that cannot be re-used or recycled will be disposed of at the Fredericton Region Solid Waste Commission landfill.

2.5 Operation

2.5.1 General Operation of the Biomass Energy Plant

Once Construction and commissioning is completed, the Project would be available for commercial operation for the foreseeable future to supply steam to the dry kilns and other areas of the process at the Deersdale sawmill.

The Operation of the Biomass Energy Plant is briefly described below.

- The biomass will be transported by conveyor from the yard to covered storage bins. Each storage bin will have enough capacity to maintain enough material for up to 60 hours of operation. A paved area for uncovered fuel storage will be used as an overflow, pending combustion in the boilers. A front end loader will be used to build, manage and reclaim the outside storage pile as required.
- From the storage bins, the biomass will be fed into the boilers for combustion. The storage bins ahead of the combustion chamber are designed to prevent back draft and provide even fuel distribution to the grate system.
- Inside the new boilers, biomass will be combusted at high temperatures to generate steam from heat transfer from the combustion chamber, to feed water contained inside the boiler. The transferred heat will cause the boiler feed water to boil, generating steam for use in the dry kilns and other areas of the process.
- Boiler feed water will be sourced from the on-site fire pond, and will be softened prior to being introduced into the boilers.
- Flue gases from the combustion of the biomass in the boilers will be directed to multi-cyclone collectors for the removal of particulate matter in the exhaust gases. The fly ash removed by the multi-cyclone collectors will be stored in a small hopper equipped with a rotary air lock, and conveyed via covered conveyor to the covered ash storage bin outside.. The treated flue gases will then be monitored by continuous emission monitors (for oxygen only) prior to being released to atmosphere via the stack(s).
- The bottom ash generated from the combustion of the fuel in the boilers will be removed and will be stored in the covered ash storage bin. The bottom ash and fly ash will be transported via truck on a periodic basis to existing approved composting facilities for beneficial re-use of the ash as a soil amendment.

2.5.2 Phase 1 Operation

For the immediate future (Phase 1), the sawmill would continue to produce lumber at its historical production volumes of 165,200-176,980 m³/year (70-75 million FBM/yr) of lumber from spruce, pine, and fir trees. To meet the steam demand in the dry kilns for this level of production, the biomass boilers would consume a total of 20,000 GMt/year of biomass from sawmill residues.

2.5.3 Phase 2 Operation

In anticipation of future market demands and to take advantage of economies of scale, at some undetermined time in the future, additional operating hours at the sawmill will result in an increase in its production capacity of up to 235,970 m³/year (100,000,000 FBM/year), a 25% increase in production. This will simply be the result of operating longer hours compared to the current operation, and no physical modifications or expansion (beyond those described in this EIA Registration) are necessary to achieve the increased lumber production. Also, as described above, a fourth dry kiln would be added to meet the anticipated future drying demand as a result of the increased production.

Thus, at some undetermined time in the future (Phase 2), extended hours of operation will require the combustion of up to 25,000 GMt/yr of sawmill residues to generate the additional steam required to supply the dry kilns.

2.5.4 Summary of Intended Future Operation

In summary, following the approval of the Project under the *Environmental Impact Assessment Regulation*, and following the addition of the two biomass boilers, it is intended that the sawmill would operate in an interim capacity at its historical operation levels (Phase 1). At some time in the future, the sawmill production would be increased and a fourth dry kiln would be added (Phase 2). Summary details of these operating phases are provided in Table 2.2 below.

Table 2.2 Summary of Intended Future Operation of the Deersdale Sawmill

Phase	Description
Phase 1 (3 kiln operation, 75 million FBM/yr production, 20,000 GMt/yr biomass consumption)	<ul style="list-style-type: none">▪ An estimated sawmill production of 176,980 m³/year (75 million FBM/year);▪ A species mix of 70% spruce and 30% fir;▪ Three low temperature dry kilns (160-195°F) used to dry the lumber;▪ An estimated biomass consumption of 20,000 GMt/year (mainly bark);▪ An estimated biomass moisture content of 55%; and▪ The operation of two boilers, each with a capacity 5,890 kW (600 BHP) units.
Phase 2 (4 kiln operation, 100 million FBM/yr production, 25,000 GMt/yr biomass consumption)	<ul style="list-style-type: none">▪ An increased sawmill production up to 235,970 m³/year (100 million FBM/year);▪ A revised species mix of 50% spruce and 50% fir;▪ The operation of one high temperature dry kiln up to 240°F, in addition to the three existing low temperature dry kilns;▪ An estimated biomass consumption of 25,000 GMt/year (mainly bark);▪ The estimated biomass moisture content remains unchanged (55%); and▪ The operation of two boilers, each with a capacity 5,890 kW (600 BHP) units.

2.5.5 Ongoing Maintenance

Once operational, the Project will be monitored for performance, as required to meet the provincial regulatory requirements as may be specified in the Certificate of Approval to Operate for the facility. As designed, the process is expected to provide a high level of mitigation against potential adverse environmental effects caused by emissions of air contaminants. This will be accomplished by the installation and use of pollution control equipment (e.g., multi-cyclones), fugitive dust controls, and maximizing the amount of steam generated by the Project.

Maintenance will be conducted on the Project on a routine basis and as required to meet the manufacturer's specifications. Ongoing preventative maintenance of the equipment would be conducted at least on an annual basis, during an annual maintenance shutdown.

2.5.6 Project-Related Emissions and Wastes

2.5.6.1 Air Contaminant Emissions

The Operation of the Project, once in service, will result in the emission of particulate matter and combustion gases (sulphur dioxide, nitrogen oxides, and carbon dioxide) to the atmosphere from the stack(s) as well as potential emissions of fugitive particulate matter from the storage and handling of biomass fuel. However, fugitive particulate matter emissions are not expected to be substantive, given the relatively small quantities of biomass fuel stored on-site at a given time (i.e., a working inventory of 600-725 GMt of biomass fuel).

Based on the above information, the expected fuel consumption and steam production and associated emissions from the Biomass Energy Plant during Phase 1 and Phase 2 of the Operation of the Project are presented in Table 2.3.

Table 2.3 Estimated Fuel Consumption, Steam Production, and Emissions from the Proposed Future Operation of the Project (Phase 1 and Phase 2)

Parameter	Data	
PROPOSED FUTURE OPERATION – PHASE 1		
(3 Kiln Operation, 75 million FBM/year, 20,000 GMt/yr Biomass Consumption)		
Annual Average Lumber Throughput	165,200-176,980 m ³ /yr (70-75 million FBM/yr)	
Expected Steam Demand	Annual Average: 5,795 kg/hr (12,750 lb/hr) Maximum Peak: 15,560 kg/hr (34,240 lb/hr)	
Estimated Annual No. 6 Fuel Oil Consumption at Expected Steam Demand	N/A	
Estimated Annual No. 2 Fuel Oil Consumption at Expected Steam Demand	N/A	
Estimated Annual Biomass Consumption at Expected Steam Demand	20,000 GMt/yr	
Estimated Annual Emissions from Proposed Future Operation – Phase 1*		
Total Particulate Matter (PM)**	3.27 kg/hr	28.64 t/yr
Sulphur Dioxide (SO ₂)	0.23 kg/hr	2.05 t/yr
Nitrogen Oxides (NO _x as NO ₂)	2.05 kg/hr	18.00 t/yr
Carbon Monoxide (CO)	5.60 kg/hr	49.09 t/yr
Carbon Dioxide (CO ₂)***	0.00 kg/hr	0.00 t/yr

Table 2.3 Estimated Fuel Consumption, Steam Production, and Emissions from the Proposed Future Operation of the Project (Phase 1 and Phase 2)

Parameter	Data	
PROPOSED FUTURE OPERATION – PHASE 2 (4 Kiln Operation, 100 million FBM/year, 25,000 GMt/yr Biomass Consumption)		
Annual Average Lumber Throughput	235,970 m ³ /yr (100 million FBM/yr)	
Expected Steam Demand	Annual Average: 7,270 kg/hr (16,000 lb/hr) Maximum Peak: 18,180 kg/hr (40,000 lb/hr)	
Estimated Annual No. 6 Fuel Oil Consumption at Expected Steam Demand	N/A	
Estimated Annual No. 2 Fuel Oil Consumption at Expected Steam Demand	N/A	
Estimated Annual Biomass Consumption at Expected Steam Demand	25,000 GMt/yr	
Estimated Annual Emissions from Proposed Future Operation – Phase 2*		
Total Particulate Matter (PM)**	4.09 kg/hr	35.80 t/yr
Sulphur Dioxide (SO ₂)	0.29 kg/hr	2.56 t/yr
Nitrogen Oxides (NO _x as NO ₂)	2.57 kg/hr	22.50 t/yr
Carbon Monoxide (CO)	7.00 kg/hr	61.36 t/yr
Carbon Dioxide (CO ₂)***	0.00 kg/hr	0.00 t/yr

Legend:

kg/hr	kilograms per hour	L/yr	Litres per year
lb/hr	pounds per hour	bbl/yr	barrels of oil per year
GMt/yr	Green metric tonnes per year	N/A	Not applicable
t/yr	Tonnes of contaminant per year		

* Based on US EPA AP-42 Emission Factors (US EPA, 1995) for biomass combustion in small boilers <100 MMBTU/hr, normal firing, burning bark and wet wood, and equipped with mechanical collector (Tables 1.6-1, 1.6-2, and 1.6-3), and assuming operation of the units at the expected future annual fuel consumption for Phase 1 and Phase 2. Numbers presented in table may vary slightly due to rounding.

** Emissions estimation based on assumption of multi-cyclone collectors only on the new boilers

*** Emissions from biomass combustion are considered to be CO₂-neutral as they are part of the global carbon cycle.

It is noted that steam demand, fuel consumption, and emissions vary from year to year and season to season based on a number of factors, and thus the information presented below is intended for illustrative purposes only.

With respect to greenhouse gases, the CO₂ emissions from the combustion of biomass is not included in Canada’s National Inventory for Greenhouse Gases, compiled by Environment Canada (Environment Canada, 2007a), nor in the greenhouse gas reporting guidelines provided by the United Nations Framework Convention on Climate Change (UNFCCC) (Environment Canada, 2007a). This is because biomass combustion is considered to be part of the global carbon cycle, and is therefore CO₂-neutral. Thus, the Biomass Energy Plant is expected to be beneficial from the point of view of greenhouse gas emissions, as CO₂ emissions would otherwise result from the combustion of fossil fuels to generate an equivalent amount of energy.

Further details about air contaminant emissions from the Operation of the Project will be presented in Section 3.2.



2.5.6.2 Sound Emissions

Sound emissions will be generated during the Operation of the Project from the operation of the process and from vehicle movements to and from the site. There will be a limited amount of additional heavy equipment (beyond that required for the current operation of the sawmill) that will need to be operated on-site to accommodate the Project during Operation.

Any heavy equipment used for the purposes of carrying out the Operation of the Project will be limited both in terms of the number of heavy vehicles used, as well as the duration and frequency of their operation. Passenger vehicle traffic to and from the site, as well as equipment deliveries, associated with the Operation of the Project will be very limited beyond current levels, given the nature of the Project and the existing developed nature of the Deersdale sawmill.

Given the fact that there no nearby residential receptors within at least 3 km of the sawmill and given the rural nature of the area, the sound pressure levels at these receptor locations are not expected to be distinguishable from current levels, and therefore would not be considered “noise” (*i.e.*, unwanted sound).

2.5.6.3 Wastewater Generation

Since the sawmill is primarily a dry process, there is currently no wastewater treatment at the existing Deersdale sawmill.

During Operation, the Project is expected to generate the following wastewater streams:

- process wastewater from the operation of the Biomass Energy Plant (*e.g.*, boiler blowdown); and
- run-off from the biomass storage area and other areas of the site.

The wastewater quality, once the Project is operational, is not expected to be distinguishable from that of the existing operation, since the Project simply involves the replacement of existing boilers by new boilers and associated equipment. There are no features of the Project that would be expected to result in a markedly different wastewater volume or wastewater quality than the current operation.

Similarly, given the relatively limited scale of the Project, the quantities of site run-off to be managed during Operation of the Project are not expected to differ substantively from the existing volumes generated at the site. There are no features of the Project that would be expected to result in increased volumes of site run-off to be managed.

Wastewater quality will meet the requirements of the *Water Quality Regulation* under the New Brunswick *Clean Environment Act* as well as any federal standards that may apply. The wastewater will also continue to meet the requirements of the federal *Fisheries Act*.

2.5.6.4 Waste Generation and Management

During Operation, the Project will generate approximately 200-275 tonnes of ash per year from the combustion of biomass and secondary fuel. Approximately 40% of the ash is expected to be in the form of bottom ash, with the remaining 60% of the ash will be fly ash recovered from the multi-cyclones.

Ash generated by the Project will be stored in a covered bin on-site pending transportation, and directed to existing approved operations for beneficial re-use as a composting additive at existing approved composting facilities.

As a result, there will be no need for a solid waste disposal facility to dispose of solid wastes from the Project, and the volumes of solid waste materials directed to existing waste disposal facilities (such as the Fredericton Region Solid Waste Commission landfill) are expected to be nominal.

2.6 Decommissioning and Abandonment

The Project will be designed, built, and maintained to operate efficiently for several years to meet the steam needs of the Deersdale sawmill. Following replacement of the existing boilers, the life expectancy of the new biomass boiler plant will be approximately 35 years.

Once the Project is nearing the end of its useful life, a decommissioning and abandonment plan will be developed in accordance with the applicable regulations at that time. The decommissioning and abandonment plan will specify the procedures that will be followed with respect to the decommissioning, removal, and disposal of site equipment and structures and for site remediation if required. The decommissioning and abandonment plan will also contain measures to achieve targeted environmental goals and will have a contingency to allow for shutdown at any time during the anticipated project life, if required.

The specific details of the decommissioning and abandonment procedures will be provided in the decommissioning and abandonment plan, once developed at the appropriate time during the life of the Project.

2.7 Accidents, Malfunctions, and Unplanned Events

Accidents, malfunctions and unplanned events will be prevented and mitigated by taking a systematic approach to safeguarding worker health and safety and establishing a safety culture within the organization. The Proponent already has in place an extensive Health and Safety Policy aimed at preventing worker accidents, and routinely ensures that staff are properly trained in the proper practices to prevent workplace accidents including workplace hazardous materials (WHMIS), first aid, tag and lock procedures, and other training programs. Combined with the Proponent's Environmental Policy, these procedures are designed to prevent serious injury to staff and the general public as well as to minimize the occurrence of unplanned events and minimize any potential damage to the environment.

Where necessary, these existing plans will be updated or adjusted to ensure their applicability to the new processes and operations associated with the facilities being constructed as part of the Project,

and will be further supported by the development of comprehensive procedures and training to ensure worker safety, as required.

The key accidents, malfunctions, and unplanned events that may occur at various stages of the Project, and the mitigation procedures to be implemented in such events, are detailed in the sub-sections that follow.

2.7.1 Process Upsets

Process upsets are defined as any malfunction or unplanned event that occurs outside the realm of the normal operation of the process. Given the nature of the Project, process upsets include but are not limited to incidences of inefficient operation, mechanical breakdown of process unit operations, unit trips, and power interruptions.

Process upsets will be minimized to the extent possible by conducting the appropriate preventative and routine maintenance of all mechanical components of the Project, as well as the strict control of the process operation by a distributed control system (DCS) to be installed to control all components associated with the, including all operations and transport systems associated with raw material handling, conveying, combustion, and pollution control processes. The operation of modern air pollution control equipment (*i.e.*, low-NO_x burners, multi-cyclones) will also assist in mitigating any potential adverse environmental effects that could result from process upsets.

In the event of a process upset, operators would respond to the event by manually adjusting the relevant process parameters to resolve the issue as quickly as possible. For mechanical breakdowns, maintenance crews would be dispatched as soon as possible to conduct the required maintenance or repairs of the affected equipment. In the case of major process upsets, if the issue cannot be resolved internally in a timely fashion, the process would be shut down in a controlled manner to conduct the required repairs. All process upsets with adverse environmental consequences would be immediately reported to the NBENV Fredericton Regional Office.

2.7.2 Fires

Fires at the proposed facility could result from an accident, from spontaneous combustion of biomass, from potential fires within the control equipment (*e.g.*, multi-cyclones), or from natural causes such as a lightning strike. The immediate concern for a fire would be for human health and safety. Local air quality conditions may be influenced by emissions from a fire.

The emissions from a fire would likely consist mainly of smoke (particulate matter) and CO₂ but could also include CO, NO_x, SO₂, VOCs, and other products of incomplete combustion. A large fire could create particulate matter levels greater than the ambient air quality standard over distances of several kilometres, but such situations would be of short duration and are not expected to occur.

The Deersdale sawmill has fire trucks and other fire-fighting equipment on site, and has also trained its personnel in first responder fire fighting techniques. Personnel are adequately trained in fire-fighting procedures, to respond to any fire that may result from spontaneous combustion of biomass or other means. However, since limited quantities of biomass will be stored on-site, and since their storage will

be for a relatively short period of time, the risk of spontaneous combustion is not expected to be of substantive concern.

2.7.3 Vehicle Accidents

The potential for vehicle accidents exists for all phases of the Project. In addition to the employee related traffic to and from the site during construction and operation, the operation of heavy equipment on-site during construction and decommissioning as well as the operation of heavy trucks for equipment deliveries have the potential to result in vehicle accidents during construction.

The Project is located in a rural area, with minimal existing commuter and truck traffic. Although there will be increased truck traffic resulting from the Project, it is not expected that this increase would be distinguishable from current traffic volumes, and as such the potential for vehicle accidents is not expected to be adversely affected by the construction or operation of the Project.

3.0 EXISTING CONDITIONS AND POTENTIAL ENVIRONMENTAL EFFECTS

The existing conditions in the area of the Project, and the potential environmental effects that may result from the construction and/or operation of the Project, are provided in this Section. Where appropriate, mitigation measures have been identified and are intended to be implemented in order to minimize the potential for adverse environmental effects.

3.1 Physical Environment

3.1.1 Existing Conditions

3.1.1.1 Physical Setting

The Project will be built on land owned by the Proponent at the existing Deersdale sawmill in Deersdale. Although the Deersdale sawmill is located in a rural area, with no nearby properties developed, the property has been used for industrial purposes for several years.

There are few industrial or commercial facilities in the Deersdale Local Service District (LSD). The demographics of the Deersdale area are primarily rural. The nearest industrial facility to the Project location is the Atcon Veneer plant in Napadogan, approximately 15 km east of the Deersdale sawmill, followed by the Fraser Papers Sawmill, located in Juniper approximately 18 km northwest of the sawmill.

There are few developed residential properties in the vicinity of the Project. As shown in the aerial photograph presented in Figure 2.1, most of the land surrounding the Deersdale sawmill is rural and undeveloped. There are no residential communities within at least a 3 km radius of the subject property. The nearest owner-occupied residential property is believed to be at least 7 km from the Deersdale sawmill.

The Project site is situated in the Deersdale LSD along the Miramichi River. There are no watercourses on the property, although the Miramichi River runs along the southern property boundary. The topography of the site slopes gently to the south and west and the site is mostly developed (*i.e.*, either paved or covered with gravel).

3.1.2 Potential Environmental Effects

The Project site is not located near or within a protected watershed as defined under the *Watershed Protected Area Designation Order 2001-83 – Clean Water Act*, nor within a protected wellfield as defined under the *Wellfield Protected Area Designation Order 2000-47 – Clean Water Act*.

The Project will be situated on a previously developed industrial site. Although the Deersdale sawmill is located primarily in a rural area, with nearby properties being undeveloped, the property has been used for industrial purposes for several years.

Since the existing land use of the Project site is industrial, and since the Project itself is industrial, the Project is expected to be compatible with current or planned land uses for the area. Therefore, the facility setting is not expected to result in adverse environmental effects with respect to the Physical Environment.

3.2 Atmospheric Environment

3.2.1 Existing Conditions

3.2.1.1 Air Quality

As noted earlier, the Deersdale sawmill is located primarily in a largely undeveloped area in the Deersdale LSD, with no other large industries located nearby.

There exists limited ambient air quality monitoring infrastructure in the area of the Project, given its rural location. The nearest air quality monitoring stations to the Project site are located in Nackawic and Fredericton, approximately 60 km and 65 km (respectively) from the Project site. In the absence of any other ambient air quality monitoring information near the Project site, a brief discussion of existing conditions in the Project area shall be based on the monitoring data from these sites.

The Fredericton monitoring station is located in the city's downtown and the Nackawic monitoring station is located at the Caverhill Road in Nackawic. The two stations monitor for total suspended particulate (TSP), particulate matter with an aerodynamic diameter less than 2.5 μm ($\text{PM}_{2.5}$), nitrogen oxides (NO_x as NO_2), carbon monoxide (CO), sulphur dioxide (SO_2), and ground level ozone (O_3). Ambient air quality monitoring results for the two stations is published annually by the New Brunswick Department of Environment (NBENV). The reader is referred to the annual publication by the NBENV, entitled "*Report on Air Quality Monitoring Results in New Brunswick for the Year 2005*" (NBENV, 2007) and the previous years' publications of the same report, for a more complete description of existing and historical ambient air quality conditions in the Fredericton and Nackawic areas.

A full discussion of the ambient air quality monitoring results and historical trends in ambient air quality in the Fredericton and Nackawic areas is beyond the scope of this document. However, based on the most recent ambient air quality monitoring report published by the NBENV for the 2005 calendar year, there were no exceedances of the ambient standard for all averaging periods for all contaminants at both monitoring locations.

Therefore, in general terms, the monitoring results indicate that the ambient air quality standards are rarely exceeded, for all contaminants, each year based on data from the monitoring stations. The rate of compliance with the ambient air quality standards is generally 100% for the six contaminants for both stations. As such, the air quality in the Project area is considered to be very good, most of the time.

3.2.1.2 Sound Quality

Sound quality in the outdoor environment can be influenced by a variety of natural and anthropogenic factors. Sound quality may be affected by stationary and mobile sources, such as noise from industrial equipment, vehicle traffic, and the operation of heavy equipment such as bulldozers, trucks, or diesel

generators. It is also well known that sound propagation and the potential environmental effects of noise on nearby receptors is heavily influenced by weather conditions such as temperature, humidity, wind direction, and wind speed. Local topographical features such as hills or wooded areas may serve to attenuate sound levels. Also, large reflective surfaces such as waterbodies may serve to reflect sound to more distant locations than would occur in their absence. There may also be sound reflections if the atmospheric mixing height is low (a few hundred metres), or if solid structures are located close to sources of sound emissions.

Existing sound levels in the immediate vicinity of the Project have not been documented in this work or previous work. However, given the already developed nature of the Project site in an industrial setting, existing sound levels are expected to be typical of an industrial facility operating in a sparsely populated undeveloped rural area.

3.2.2 Potential Environmental Effects

3.2.2.1 Air Quality

3.2.2.1.1 Construction

During Construction, emissions of air contaminants to the environment may occur primarily from the operation of construction equipment associated with the Project (e.g., emissions from the combustion of fuel), and some limited amount of fugitive dust generated from earth moving activities on-site. However, given the limited amount of development of undisturbed land to enable the Project to be carried out, and given the existing industrial nature of the site (with existing facilities already in place for much of the Project), these emissions are expected to be very low, intermittent, and of short duration. Emissions from Construction of the Project are expected to be nominal in comparison to those potentially resulting from the existing operation of the facility.

Given that the existing Deersdale sawmill is a large existing industrial property, with existing industrial activity occurring on a daily basis with few (if any) air quality concerns documented, the potential for off-site adverse environmental effects to Air Quality from Construction-related emissions is considered to be low.

With respect to emissions of fugitive particulate matter (dust) during Construction, since the construction of the Project will involve little additional ground disturbance of the site, the generation of airborne dust is expected to be nominal. Any dust that might be generated from on-site construction activities is expected to be temporary, intermittent, of a relatively short duration, and is expected to remain generally confined to the property boundaries of the sawmill. Therefore, the potential for the construction activities to cause adverse environmental effects to Air Quality due to fugitive particulate matter emissions is expected to be low.

Given the current undeveloped state of the neighbouring properties to the Project, and since the Project is located in a primarily rural area with no residential neighbours within at least 3 km of the site, adverse environmental effects with respect to odours to off-site receptors are not expected. Odours that may occur during the Construction and commissioning of the facility would be limited to odours associated with the refueling and incomplete combustion of fuel in heavy equipment used during Construction.

These odours are expected to be very low, intermittent, and of very short duration. As a result, the potential for odours to cause adverse environmental effects to Air Quality during Construction is expected to be nominal.

Appropriate mitigation measures will be used as required to minimize the potential environmental effects associated with construction activities. These may include such practices as the use of low sulphur fuels in construction equipment and ensuring proper vehicle maintenance. The use of water sprays (or other approved dust suppressants) in unpaved areas may need to be considered during Construction, particularly during extended periods of dry weather during warmer months. Calcium chloride or magnesium chloride, if used for dust control, will only be used if authorized by government agencies and in strict accordance with the “Best Practices for the Use and Storage of Chloride-Based Dust Suppressants” (Environment Canada, 2007b).

Overall, the air contaminant emissions associated with the Construction of the Project are expected to be nominal. Given the limited nature of the Project and the relatively low magnitude of emissions expected as a result of its construction activities, and in light of the proposed mitigation, the Construction of the Project is not expected to result in adverse environmental effects to Air Quality.

3.2.2.1.2 Operation

The Project will generate steam for the Deersdale sawmill for use in the dry kilns and other areas of the process. The Operation of the Project is expected to result primarily in emissions of conventional air contaminants (particulate matter and combustion gases) from the combustion of biomass in the new boilers, but these emissions will be largely offset by a reduction in emissions from the existing oil fired boilers operated at the facility, which will no longer be operated upon completion of the Project unless in the case of an interruption in biomass supply or the unavailability of the biomass boilers. Although there are currently emissions of air contaminants from other sources at the sawmill (e.g., fugitive dust from sawing operations, storage of woodwaste), the emissions from these operations are expected to remain relatively the same during Operation of the Project and are thus not discussed further.

Additionally, the Project will provide energy from a renewable energy source that would likely otherwise be generated by fossil fuels, thereby reducing the sawmill’s reliance on fossil fuels in meeting its steam requirements and an attendant reduction in emissions associated with the combustion of heavy fuel oil in the existing boilers. Thus, the Project will generate steam from relatively clean burning sources (i.e., biomass) and reduce fossil fuel consumption and associated emissions.

The estimated emissions from the existing operation of the Deersdale sawmill and the proposed future Operation of the Project, based on expected fuel combustion, steam generation, and emission factors from the United States Environmental Protection Agency (US EPA) for the combustion of wood residue materials (US EPA, 1995), are presented in Table 3.1. The estimated Project-related emissions from the interim operation of the sawmill following completion of the boiler additions (Phase 1) and the future increased production of the sawmill (Phase 2) are provided in the table.

Table 3.1 Estimated Emissions from the Operation of the Project – Current Operation versus Proposed Future Operation (Phase 1 and Phase 2) *

Contaminant	Existing Boilers (No. 6 Fuel Oil) (t/yr) (A)	Existing Thermal Oil Heater (No. 2 Fuel Oil) (t/yr) (B)	New Biomass Boilers** (Biomass) (t/yr) (C)	Total Emissions (t/yr) (D=A+B+C)
Typical Existing Operation (see Table 2.1)				
Total Particulate Matter (PM)	3.25	0.08	--	3.32
Sulphur Dioxide (SO ₂)	81.54	2.77	--	84.31
Nitrogen Oxides (NO _x as NO ₂)	17.85	0.78	--	18.63
Carbon Monoxide (CO)	1.62	0.20	--	1.82
Carbon Dioxide (CO ₂)	8,114.74	871.28	--	8,986.02
Proposed Future Operation – Phase 1 (3 Kiln Operation, 75 million FBM/year, 20,000 GMt/yr Biomass Consumption) (see Table 2.3)				
Total Particulate Matter (PM)**	--	--	28.64	28.64
Sulphur Dioxide (SO ₂)	--	--	2.05	2.05
Nitrogen Oxides (NO _x as NO ₂)	--	--	18.00	18.00
Carbon Monoxide (CO)	--	--	49.09	49.09
Carbon Dioxide (CO ₂)***	--	--	0.00	0.00
Proposed Future Operation – Phase 2 (4 Kiln Operation, 100 million FBM/year, 25,000 GMt/yr Biomass Consumption) (see Table 2.3)				
Total Particulate Matter (PM)	--	--	35.80	35.80
Sulphur Dioxide (SO ₂)	--	--	2.56	2.56
Nitrogen Oxides (NO _x as NO ₂)	--	--	22.50	22.50
Carbon Monoxide (CO)	--	--	61.36	61.36
Carbon Dioxide (CO ₂)***	--	--	0.00	0.00

Notes:

- * Based on US EPA AP-42 Emission Factors (US EPA, 1995) according to the footnotes to Tables 2.1 and 2.3 of this EIA Registration, and assuming operation of the units at the expected future annual fuel consumption for Phase 1 and Phase 2. Numbers presented in table may vary slightly due to rounding.
- ** Emissions estimation based on assumption of multi-cyclone collectors only on the new boilers
- *** Emissions from biomass combustion are considered to be CO₂-neutral as they are part of the global carbon cycle.

Based on the data presented in Table 3.1 above, an overall comparison of emissions from the current operation of the Deersdale sawmill to the expected Project-related emissions following the implementation of the Project is presented in Table 3.2.

Table 3.2 Overall Summary of Estimated Emissions – Current Operation versus Proposed Future Operation (Phase 1 and Phase 2)

Contaminant	Typical Existing Operation – Total Emissions* (t/yr) (E)	Proposed Future Operation – Total Emissions* (t/yr) (F)	Increase (+) or Decrease (-) in Emissions (t/yr) (G = F-E)
Proposed Future Operation – Phase 1 (3 Kiln Operation, 75 million FBM/year, 20,000 GMt/yr Biomass Consumption) (see Table 2.3)			
Particulate Matter (PM)**	3.32	28.64	+25.31
Sulphur Dioxide (SO ₂)	84.31	2.05	-82.27
Nitrogen Oxides (NO _x as NO ₂)	18.63	18.00	-0.63
Carbon Monoxide (CO)	1.82	49.09	+47.27
Carbon Dioxide (CO ₂)***	8,986.02	0.00	-8,986.02
Proposed Future Operation – Phase 2 (4 Kiln Operation, 100 million FBM/year, 25,000 GMt/yr Biomass Consumption) (see Table 2.3)			
Particulate Matter (PM)**	3.32	35.80	+32.47
Sulphur Dioxide (SO ₂)	84.31	2.56	-81.75
Nitrogen Oxides (NO _x as NO ₂)	18.63	22.50	+3.87
Carbon Monoxide (CO)	1.82	61.36	+59.55
Carbon Dioxide (CO ₂)***	8,986.02	0.00	-8,986.02

Notes: * Based on US EPA AP-42 Emission Factors (US EPA, 1995) according to the footnotes to Tables 2.1 and 2.3 of this EIA Registration, and assuming operation of the units at the expected future annual fuel consumption for Phase 1 and Phase 2. Numbers presented in table may vary slightly due to rounding.

** Emissions estimation based on assumption of multi-cyclone collectors only on the new boilers

*** Emissions from biomass combustion are considered to be CO₂-neutral as they are part of the global carbon cycle.

It should be noted that the emissions estimates presented in Tables 3.1 and 3.2 are based solely on conceptual information available at the time of writing this EIA Registration. As further information becomes known about the Project and as engineering design considerations are refined, the estimated emissions may vary slightly from those provided above.

The data in Tables 3.1 and 3.2 show that the emissions of sulphur dioxide and carbon dioxide associated with the Project during Phase 1 and Phase 2 are expected to decrease substantially as compared to existing emissions associated with steam generation at the sawmill. However, the particulate matter and carbon monoxide emissions are expected to increase for both phases. There is no substantive difference in NO_x emissions from either phase of the Project compared to existing emission levels. Specific observations are as follows.

- Substantive reductions in sulphur dioxide emissions are expected (a reduction of up to 82 tonnes per year) compared to the current operation, as a result of the displacement of No. 6 fuel oil and No. 2 fuel oil currently burned by the existing boilers. Given that sulphur dioxide emissions can at times be problematic near industrial facilities, and given that sulphur dioxide is a precursor to acid rain formation and subject to a provincial reduction target of 50% reduction by 2010, the Project is



consistent with these initiatives. It is noted that ambient levels of sulphur dioxide in the area are likely currently well within the New Brunswick ambient air quality standards.

- Given that biomass combustion is considered to be carbon dioxide neutral, the substantive reductions in CO₂ emissions from the mill as a result of Phase 1 and Phase 2 of the Project are consistent with emerging federal and provincial Climate Change policy initiatives.
- While an increase in particulate matter emission is expected from the operation of Phase 1 and Phase 2 compared to the current operation, these emissions will remain at a generally low order of magnitude – less than 33 tonnes per year – despite the use of multi-cyclone collectors as part of the Project compared to no emission controls currently. This is because of the nature of biomass combustion, which tends to result in higher particulate matter emissions. Particulate matter emissions tend to be a localized concern from fallout rather than a regional concern. Given the relatively low magnitude of emissions, the lack of nearby residential receptors, and the relatively localized nature of the concern, these emissions are not expected to cause adverse environmental effects to air quality.
- Nitrogen oxides emissions during Phase 1 are expected to remain essentially the same as for the current operation of the sawmill steam supply sources, and result in a nominal increase during Phase 2 (up to 3 tonnes per year).
- Carbon monoxide emissions will increase from the operation of both Phase 1 and Phase 2 of the Project. The emission factors for biomass combustion are substantially higher than for fuel oil, likely to reflect the fact that the moisture in biomass must be evaporated in the boiler prior to burning the biomass, resulting in a thermal penalty and some effect on flame temperature, both of which tend to result in increased CO emissions. These emissions can be mitigated by the optimal operation of the boilers and careful process control. These increases, while potentially important in magnitude, are not expected to adversely affect ambient air quality. The magnitude of these emissions is small on a provincial scale, and is not expected to be discernible from provincial totals.

Although carbon monoxide, nitrogen oxides, and particulate emissions are expected to increase, it is not expected to substantively reduce ambient air quality in the Deersdale area due to the relatively small scale of the Operation of the new biomass boiler plant. As such, the Project is not expected to result in adverse environmental effects, and in some respects is expected to result in environmental improvements, particularly with respect to SO₂ and CO₂ emissions. Dispersion modeling of the emissions associated with the operation of the existing boilers at the sawmill, and those expected to result from the operation of the new biomass boilers in the future (Phase 1 and Phase 2), will be conducted in the near future and will be forwarded as additional information for the TRC's consideration under separate cover.

The Project, once in operation, and the Deersdale sawmill itself will likely be subject to the reporting requirements of the National Pollutant Release Inventory (NPRI), administered by Environment Canada under the *Canadian Environmental Protection Act*. As such, any emissions resulting from the operation of the Project or the sawmill itself that meet the reporting thresholds of the NPRI will be reported accordingly on an annual basis under that program. This may include emissions of criteria air contaminants listed above as well as emissions of other compounds that are determined to be reportable under the NPRI (e.g., possible reporting of emissions of PAHs, dioxins and furans, trace metals, etc).



Some fugitive emissions of particulate matter are possible from the on-site storage of biomass (due to wind erosion) and from biomass loading operations. Since the biomass is expected to consist primarily of larger diameter materials such as bark and chips, the emissions of fugitive particulate matter due to wind erosion and from load-out operations are not expected to be substantive. In addition, only a relatively small amount of biomass fuel will be stored on-site, which will be quickly cycled to the boiler for combustion. Since the biomass fuel will remain in storage for a short period of time until used in the process, and since biomass is expected to be relatively wet (approximately 55% moisture), the emissions of fugitive particulate matter from the outdoor storage and handling of biomass are not expected to be substantive.

Steam may be released from dry kilns as well as from the boiler stacks as a result of the evaporation of moisture in the biomass fuel. However, there are no requirements for controlling steam emissions from such operations. Quantities of steam released are not expected to be substantive, and are not expected to interfere with visibility on highways or the nearby airstrip, nor to cause freezing conditions on roadways or the airstrip.

With respect to the potential for odours during operation, the Project is not expected to result in the emission of odours, other than for a characteristic “wood” smell which is not expected to be objectionable. The biomass fuel material will quickly be cycled and used in the process and is not expected to remain on-site for more than a few days. This greatly reduces the potential for odours to be generated from the decay of biomass on-site. There are no other features of the Project that would indicate the potential for emissions of odours. Odours from the Operation of the Project are not expected to cause adverse environmental effects to Air Quality.

Overall, the Operation of the Project is not expected to result in adverse environmental effects with respect to Air Quality.

3.2.2.2 Sound Quality

During Construction, sound emissions are expected to be primarily related to the operation of heavy equipment and related construction activities. Any unwanted sound (“noise”) produced as a result of construction activities is expected to be intermittent and of relatively short duration, and will be limited to those periods during which construction activities are occurring. Since the Project will be constructed on an existing industrial site and given the Project site’s relative distance to the nearest residential receptor (approximately 3 km), the potential for construction-related sound emissions to adversely affect residential receptors are expected to be minimal and largely confined to the Project site. Sound emissions should attenuate as a result of increasing distance from the site to near background levels by the time they reach the nearest residential receptor. All Construction-related sound emissions are expected to remain at levels that are typical of industrial operations.

Sound emissions will be minimized during Construction by the careful planning of construction activities, and using conventional mitigation measures such as maintaining mechanized equipment in accordance with the manufacturer’s specifications and ensuring that all equipment is equipped with proper mufflers. Therefore, the potential for adverse environmental effects to Sound Quality during the Construction of the Project is expected to be minimal.

During Operation, sound emissions are not expected to be distinguishable from the sound pressure levels associated with the current operation of the existing Deersdale facility, nor are the sound emissions expected to differ greatly from that associated with other similar industrial facilities. As stated previously, the area is generally rural in nature, and the Deersdale site itself is relatively large. There are no residential properties or developments within at least 3 km of the facility, and thus any sound emissions associated with the Operation of the Project should be attenuated to background levels by the time they reach the nearest residential receptor. Therefore, the potential for sound emissions from the Project to adversely affect nearby residences or the general public is expected to be very low, and likely largely confined to the Project site.

Overall, the Construction and Operation of the Project is not expected to result in adverse environmental effects with respect to Sound Quality.

3.3 Groundwater Environment

3.3.1 Existing Conditions

There are no sources of potable water groundwater within at least 3 km of the Project site. There is no municipal water supply in Deersdale. Potable water within the Deersdale LSD is supplied from private wells, but these are located several kilometres from the Project location.

The fresh water needs of the existing Deersdale sawmill boilers are currently supplied from an existing well located near the existing boiler plant at the sawmill. Fire protection is accomplished by the presence of an existing Fire Pond at the sawmill. The existing boilers currently use an estimated 12.9m³/day (1.97 igal/minute) of fresh water from the existing well.

3.3.2 Potential Environmental Effects

There will be a nominal increase in the water consumption for the fresh water requirements of the new biomass boilers. In Phase 1, the anticipated water consumption for the new biomass boilers is estimated at 16.4 m³/day (2.51 igal/minute) of fresh water. In Phase 2, the water consumption of the new biomass boilers is estimated at 20.6 m³/day (3.15 igal/minute) of fresh water. While the water requirements of the Project during both phases will increase over existing levels, there is no reason to suggest that these water requirements would be unsustainable nor cause unacceptable environmental effects on the aquifer.

The boiler feed water for the Project will be supplied from a new well to be drilled on-site, near the new Boiler and Fuel Storage Building. The new well will be drilled by an approved well driller and according to the requirements of the New Brunswick *Clean Water Act* and regulations thereunder.

The Project will be constructed on previously developed industrial land within the Deersdale sawmill site, and will require little additional ground disturbance of previously undisturbed land. The Project will be fuelled primarily by biomass, and no new petroleum product storage systems are required on-site to support the Project during Construction or Operation. Any existing petroleum storage tanks on-site are approved for operation under the *Petroleum Product Storage and Handling Regulation – Clean Environment Act*, and are not associated with the Project, and would present no greater risks to the groundwater environment than currently.

In consideration of the nature and location of the Project, no interactions with local potable water supplies are expected from the Construction or subsequent Operation of the Project, and therefore adverse environmental effects to the Groundwater Environment are not expected to occur.

3.4 Freshwater Environment

3.4.1 Existing Conditions

There are no watercourses on the sawmill property. The nearest freshwater body is the Southwest branch of the Miramichi River, which runs parallel to the southwestern boundary of the property and is located approximately 200 m southwest of the Project site.

The fresh water needs of the existing Deersdale sawmill boilers are currently supplied from an existing well located near the existing boiler plant at the sawmill. Fire protection is achieved by the presence of an existing Fire Pond at the sawmill. Water is not actively drawn from the Fire Pond except in the event of a fire on site.

3.4.2 Potential Environmental Effects

The Project will be constructed on an already-developed industrial site, and will require little additional physical ground disturbance of previously undisturbed lands at the site. Most of the site is currently used for industrial purposes and thus already developed (consisting of gravel or paved surfaces). As such, siltation or soil erosion, which might otherwise be a concern for fish and fish habitat, is not expected to be of significant concern as a result of the Project.

Fire water use for the Project will continue to be sourced from the existing Fire Pond located on-site, but this is not expected to result in an increase in water consumption as a result of the Project.

No new sources of wastewater will be released directly into the Freshwater Environment. Although, the nearest freshwater body runs relatively close to southwestern property boundary of the Deersdale sawmill, the Project will be constructed and operated on an already-developed industrial site, and will involve little additional ground disturbance beyond that already developed for past activities at the site. There are no new effluents expected to result from the Project, except for boiler blowdown which essentially should displace the blowdown currently being released from the existing boilers. Site runoff may occur from the Project footprint, but with the proper mitigation (e.g., sedimentation control devices such as silt barriers and hay bales) there are no features of the Project that would be likely to cause the site runoff during Construction or Operation to be substantively different than currently. These releases are not expected to exceed federal or provincial effluent release standards or guidelines, nor to cause the deposit of a deleterious substance in waters frequented by fish in contravention of Section 36 of the *Fisheries Act*.

Therefore, adverse environmental effects to the Freshwater Environment, including water quality, fish, and fish habitat, are not expected to occur as a result of the Construction or Operation of the Project.

3.5 Terrestrial and Wetland Environment

3.5.1 Existing Conditions

The existing conditions with respect to the Terrestrial Environment at the Project site have not been documented specifically for this work. However, the site is industrial and developed, and the surrounding land uses are mostly rural and undeveloped. Many of the facilities required for the Project currently exist, and additional disturbance to accommodate the Project will be minimal. The areas where the Project will be constructed and operated were previously cleared of vegetation several years ago in preparation for the development of the site for the sawmill, and most of the site either currently consists of gravel areas, paved areas, or other disturbed areas.

There are no wetlands in the immediate vicinity of the Project site and the Project does not propose any breaking new (undeveloped) ground or forming hydrological connections of any kind.

3.5.2 Potential Environmental Effects

The Project will be constructed on previously disturbed land at the Deersdale sawmill, and very limited disturbance of the surrounding land on the site will be required to accommodate the Project. Given the industrial nature of the Deersdale sawmill site, and since the Project will be carried out largely using existing structures or on other areas of the site that are currently fully developed and mostly covered with gravel or paved, the Project site is not known to support wildlife or important species of vegetation, and similarly, it is highly unlikely to harbour important migratory bird habitat.

Therefore, interactions with the Terrestrial Environment on or in the vicinity of the Project site, including vascular and non-vascular plants, mammals, mammal habitats, migratory birds, or sensitive ecosystems are not expected to cause adverse environmental effects during the Construction and Operation of the Project. Nonetheless, the requirements of the *Migratory Birds Convention Act*, the *Species at Risk Act* and the *New Brunswick Endangered Species Act* will be observed during Construction of the Project to ensure that adverse environmental effects to migratory birds, species at risk, or species of conservation concern do not occur.

Similarly for wetlands, the Project will be located on an already-developed industrial site, with no known wetlands or other similar ecosystems on or in the immediate vicinity of the site, and with little additional disturbance of surrounding lands required to accommodate the Project.

Therefore, in light of the nature of the Project and the Project location being far from potential wetlands, direct interactions with wetlands are not expected to occur from the Construction or Operation of the Project. Thus, the Construction and Operation of the Project are not expected to result in adverse environmental effects with respect to the Terrestrial or Wetland Environment.

3.6 Land Use

3.6.1 Existing Conditions

The Project will be constructed and operated on existing industrial land at the Deersdale sawmill in Deersdale. The Deersdale sawmill has been in operation for several years under current ownership. The sawmill is a major employer in the Deersdale area and is a large part of the community.

As discussed in Section 3.1, the land use in the vicinity of the Project is primarily rural and undeveloped. The Project site is industrial and the surrounding area is generally rural and undeveloped, and the Project will be constructed on already-developed industrial land.

3.6.2 Potential Environmental Effects

The Project is industrial in nature, and will be situated on an existing industrial site within a generally rural area, with little additional development of surrounding lands required to accommodate the Project. The Project is therefore expected to be compatible with current and future planned land uses at the site and in the general vicinity of the sawmill.

Since there are no residential properties in the vicinity of the Project site, it is expected that there will be no land use conflicts, especially since the subject property has been used for industrial purposes for several years.

Considering the nature and location of the Project, and since the Project site is currently used for industrial activities, no substantial interactions with respect to Land Use are expected to occur from the Construction or Operation of the Project.

3.7 Heritage and Archaeological Resources

3.7.1 Existing Conditions

The area in and around the Miramichi River Valley is generally considered to have a relatively high potential for heritage and archaeological resources, due to the potential for Aboriginal peoples to have historically used the waters of the Miramichi River for navigation, settlement, and/or traditional activities.

The specific property upon which the Project will be built has been used for industrial purposes for several years, and the Project involves little development of additional land. The Project site is primarily used for industrial or commercial purposes, and the site has been developed and/or in operation for several years.

3.7.2 Potential Environmental Effects

Despite the general area of the Miramichi River Valley having a relatively high potential for heritage and archaeological resources, the specific property upon which the Project will be built has been used for industrial purposes for several years.

The Project involves little additional ground development of previously undisturbed land at the site. Although the Project will be constructed on an existing industrial property within an existing industrial setting, since there is a relatively high potential for heritage and archaeological resources near the site, there could be potential interactions between the Project and Heritage and Archaeological Resources within the Project site. However, the likelihood of discovering or affecting any object of archaeological significance at the Project site is very low, given its historical industrial use.

Nonetheless, any areas of ground disturbance will be monitored prior to and during Construction as a precaution to minimize adverse environmental effects. With these measures, adverse environmental effects to Heritage and Archaeological Resources are not likely to occur from the Construction or Operation of the Project.

3.8 Labour and Economy

Analyses of the environmental effects of a project on labour and the economy commonly accompany major project plans and environmental assessments to alert the local community and all provincial residents to the extent of labour and economic activity generated by the Project. These environmental effects are referred to as economic externalities of a project, in that they generate employment and economic activity outside the intended purpose of the project.

There are few statistics available on local employment in Deersdale or other parts of rural New Brunswick. However, the Project will create up to 50 construction jobs and such an investment in the facility will ensure employment at the sawmill for the foreseeable future.

3.8.1 Potential Environmental Effects

Virtually all activities and physical works associated with all phases of the Project will result in job creation and business expenditure.

During construction, the Project is expected to create direct construction labour employment for up to 50 people for a period of 6-8 months. Other economic spin-offs include opportunities for local manufacturing industries, contractors, and supply firms. The total capital investment of the Project is estimated at approximately \$5 million.

Employment opportunities will also occur during decommissioning and abandonment of the Project, at the appropriate time. All other past, present and future projects that overlap with the Project will result in changes in employment and business expenditure.

The increased demand for labour and anticipated employment opportunities and related economic spin-offs of the Project are expected to result in positive environmental effects on Labour and Economy.

3.9 Road Transportation

3.9.1 Existing Conditions

The transportation of materials to and from the Project location will be required during the construction and operation of the Project. As part of the Project, there will be a need to transport the following:

- Construction materials and equipment to the Project site;
- Waste construction materials from the Project site; and
- Ash resulting from the combustion of the biomass to existing approved composting facilities.

The transport of the above materials will be accomplished by trucks on the local road transportation network. Some transport of lumber products from the sawmill will continue to occur by rail, although this is related to the ongoing operation of the sawmill and not resulting from the Project itself. Other modes of transportation including marine, rail and air will not be used during Construction or Operation of the Project.

There will be a nominal increase in passenger vehicle traffic during Construction and Operation of the Project.

The Project site is located in Deersdale, New Brunswick. Access to Deersdale from southern New Brunswick is via Route 107. Route 107 connects Nashwaak Bridge and Bristol via Stanley, Napadogan and Juniper. Route 107 connects with Route 8 in Nashwaak Bridge, then heads northwest through Stanley, Napadogan, Deersdale, and Juniper, then moves west to eventually to connect Route 105 at Bristol, which then connects with Route 2.

Route 107 is a two-lane highway designated as a provincial collector highway and is constructed to accommodate trucks of gross vehicle mass of 62,500 kg on a year-round basis.

3.9.2 Potential Environmental Effects

There will be some Project-related localized increases in vehicle traffic within the Deersdale LSD, particularly during Construction of the Project. However, it is not expected to be substantively different than the existing conditions and will not cause any adverse environmental effects.

3.9.2.1 Construction

The Project is relatively limited in nature and scope, with little infrastructure and additional ground disturbance of the site required to accommodate the Project. Few buildings and structures are required, and the process equipment and associated conveying systems required to support the operation of the Project would be fabricated off-site and be transported by truck to the Project location as packaged units wherever possible. This reduces the need for transportation of construction materials to the site.

There may be a requirement to dispose of some general construction wastes during Construction, which will be transported to existing recycling operations or to the Fredericton Region Solid Waste Commission landfill for disposal. However, the volumes of waste materials to be managed and transported from the site during Construction are expected to be low.

Construction will require up to 50 passenger vehicles moving to and from the site to transport the construction workers, split between the morning and afternoon arrivals and departures. This traffic is not expected to result in a substantive increase in traffic.

Therefore, given that the site is accessed via a provincial collector highway already able to accommodate intermediate volumes of traffic, the Construction of the Project is not expected to result in adverse environmental effects to Road Transportation.

3.9.2.2 Operation

During Operation, approximately 200-275 tonnes per year of ash are expected to be generated as a result of the combustion of biomass for the Operation of the Project. This translates into approximately 1 truck every 45-60 days to transport ash from the site. Ash will be transported on existing truck routes to existing approved composting operations for beneficial re-use.

The Project is not expected to result in additional passenger traffic to the site during Operation, as the existing staff complements of the sawmill will be sufficient to operate the Project.

The increased truck traffic resulting from the Project is not expected to be distinguishable from current traffic volumes. Given the expected small increase in traffic levels from the Operation of the Project, the Operation of the Project is not expected to result in adverse environmental effects to Road Transportation.

3.10 Current Use of Land and Resources for Traditional Purposes by Aboriginal Persons

3.10.1 Existing Conditions

The traditional use of land and resources by Aboriginal persons at the Project location specifically has not been documented. The nearest First Nation communities to the Project location are the Woodstock First Nation and the Tobique First Nation, located approximately 60 km southeast and 65 km northeast of the Project site, respectively.

The lands in the vicinity of the Project may have historically been used by Aboriginal persons for traditional hunting, fishing, and gathering activities for subsistence purposes, particularly in Pre-Contact periods by Europeans; however, the Project site has been developed for industrial purposes for several years.

3.10.2 Potential Environmental Effects

Given that the Project will be situated on an existing developed industrial site, and that the site has been used for industrial purposes for several years, it is unlikely that the Project location has been used for traditional hunting, fishing, and gathering activities by First Nation communities in recent decades.

In light of the already-developed nature of the Project site, no adverse environmental effects of the Project on the Current Use of Land and Resources for Traditional Purposes by Aboriginal Persons are expected.

3.11 Public Health and Safety

Public Health and Safety is a component of the environment that relates to the health and safety of the general public, and the occupational health and safety of site workers associated with the Project.

3.11.1 Existing Conditions

The Project will be situated in a primarily rural area with few residential neighbourhoods in the vicinity of the site. As discussed in Section 3.2 of this EIA Registration, during Operation, the Project is generally expected to result in decreased emissions of some air contaminants from the Deersdale sawmill, with some exceptions. Emissions of particulate matter and carbon monoxide are expected to increase, but these emissions are not expected to cause ambient ground level concentrations distinguishable from current levels in the Deersdale area.

As discussed in Section 3.9 of this EIA Registration, during Construction, the Project is expected to result in a slight increase in traffic in the Deersdale LSD. However, the Project site is located along a major truck route (Highway 107) with existing transport traffic already making use of this route.

Accidents, malfunctions, and unplanned events resulting in harm to workers, the public, or the environment may occur as a result of activities during Construction, Operation, and Decommissioning from any industrial project, but there are no features of the Project that would result in a higher potential for such accidents to occur, as compared to other similar industrial projects.

3.11.2 Potential Environmental Effects

Emissions of some air contaminants from the Deersdale sawmill are expected to decrease as a result of the Project, as presented in Section 3.2 of this document. Although the emissions of particulate matter and carbon monoxide are expected to increase following implementation of the Project, the magnitude of these increases are not expected to be substantive and are not expected to adversely affect ambient air quality in the Deersdale area.

Since a decrease in emissions from the Deersdale sawmill is expected to occur for some contaminants as a result of the Project, and in light of the nature of the fuel used (biomass), the emission controls to be implemented, and the expected emission profile of the Project, it is not believed that the Project will result in a significant cause for concern with respect to the exposure of the human population to

ambient concentrations of contaminants. Ambient air quality concentrations resulting from the Project are not expected to be influenced substantively.

Given that the predicted changes in air emissions are very small, adverse environmental effects on air quality in relation to Public Health and Safety are not expected to occur from the Construction or Operation of the Project.

The traffic associated with the Construction and Operation of the Project is expected to be nominal. In addition, the Project-related traffic is expected to be confined to existing truck routes, including Highway 107. Therefore, adverse environmental effects to Public Health and Safety are not expected to occur as a result of the traffic associated with the Project.

There are no features of the Project that would result in a higher potential for accidents, malfunctions, and unplanned events resulting in harm to workers, the public, or the environment to occur, as compared to other similar industrial projects. The Proponent already has implemented extensive environmental policies, as well as worker health and safety policies and programs for its numerous operations, which have been successful in minimizing worker accidents. The Deersdale sawmill has enjoyed an excellent safety record and the existing environmental policies and worker health and safety programs will be extended to the Project, and will be adhered to during all phases of the Project to decrease the potential for accidents, malfunctions, and unplanned events resulting in harm to workers, the public, or the environment. As such, it is not expected that there will be any major concern for Public Health and Safety with respect to the occurrence of such incidents as a result of the Project.

In this light, the potential for adverse environmental effects to Public Health and Safety during the Construction or Operation of the Project is expected to be minimal.



4.0 OTHER CONSIDERATIONS

4.1 Project-Related Documents

Other than this document, there are currently no publicly-available project-related documents that have been developed, or are currently being developed, in support of the registration of the Project under the New Brunswick *Environmental Impact Assessment Regulation – Clean Environment Act*.

4.2 Approval of the Undertaking

The main permits, approvals, licenses, or other forms of authorization that may be required provincially for this undertaking include the following:

- Registration under the *Environmental Impact Assessment Regulation – Clean Environment Act*;
- Certificate of Approval to Construct under the *Air Quality Regulation – Clean Air Act* and/or the *Water Quality Regulation – Clean Environment Act*;
- Amended Certificate of Approval to Operate under the *Air Quality Regulation – Clean Air Act*;
- Boiler inspection certificates under the *Boiler and Pressure Vessel Act*; and
- Building, electrical, and plumbing permits as applicable.

No other permits, approvals, licenses or authorizations are believed to be required from local or provincial regulatory authorities at this time.

With respect to the possible requirement of any federal permits, approvals, licenses, or other forms of authorization, the Project will be privately funded by the Proponent, on land owned by the Proponent. There are no known authorizations required under the *Law List Regulations* under the *Canadian Environmental Assessment Act (CEAA)* to enable the Project to be carried out. Therefore, the Project does not “trigger” *CEAA*, and thus an environmental assessment under *CEAA* is not required, nor is it believed that there are any requirements for authorizations to be issued for the Project by any federal government department or agency.

4.3 Funding

At this time, it is expected that the Project will be privately funded entirely by the Proponent, and no direct funding or other forms of financial assistance are being sought from the federal or provincial governments to enable the Project to be carried out. Indirect provincial funding may be provided at a later time through financial assistance programs being developed for forestry operations.

4.4 Regulatory, Public, and Stakeholder Consultation

NBENV (2005) states that it is the Proponent’s responsibility to design, implement and document the public involvement program, and to provide documentation of the public involvement activities conducted and its results to the Department. The goal of public involvement at the Registration stage is to ensure those potentially affected by a project are aware of the Registration, are able to obtain additional information about the project, and are able to express any concerns they may have.

J.D. Irving, Limited will provide opportunities for public, stakeholder, and regulatory input into the EIA review process for the Project, consistent with the NBENV requirements. It is noted that, based on the level of interest regarding the Project and the nature and type of issues raised as the process unfolds, the program may be modified to achieve the stated goals of ensuring that the public and other stakeholders have ample opportunity to provide their views on the Project.

4.4.1 Regulatory Consultation

The New Brunswick Department of the Environment (NBENV) was initially notified about the Project in October 2005 in the context of other similar biomass combustion projects being considered by the Proponent.

Following the registration of the Project with the NBENV, the Proponent's representatives would be pleased to meet with members of the Technical Review Committee (TRC) to discuss the Project or to provide a presentation as required. This may assist in facilitating the review process, as well as to answer any questions or clarify any aspects of the Project.

4.4.2 Public / Stakeholder Notification

Upon submission of this EIA Registration, a newspaper advertisement of the Project will be provided in the *Telegraph Journal* to notify the public about the registration, in accordance with the requirements of the EIA Registration Guide (NBENV, 2005). Copies of the EIA Registration will be made available at the following locations for public viewing:

- The Project Assessment and Approvals Branch of the NBENV at Marysville Place in Fredericton;
- The NBENV's Region 5 Office NBENV, located on Priestman Street in Fredericton;
- The J.D. Irving, Limited Deersdale Sawmill main office (viewing by appointment only); and
- The Juniper Elementary School Community Access Centre located at 267 Juniper Road in Juniper.

Given that the Project will be developed on an already developed industrial site, no further public or stakeholder consultation activities are planned at this time for the purposes of the Determination Review under the *Environmental Impact Assessment Regulation*.

Direct notification will be provided to the Local Service District of Deersdale. However, since there are no residential properties or other developments within at least 3 km of the Project location, further notifications or distribution of information brochures are not envisioned.

4.5 Project Schedule

Assuming a timely EIA review process, construction is expected to begin in the fall of 2007, following approval of the Project under the *Environmental Impact Assessment Regulation*. The expected in-service date for the operation of the Project would be the summer/fall of 2008.

5.0 CLOSING REMARKS

This report has been prepared by Jacques Whitford for the sole benefit of J.D. Irving, Limited. The report may not be relied upon by any other person or entity, other than for its intended purposes, without the express written consent of Jacques Whitford and J.D. Irving, Limited.

This report was undertaken exclusively for the purpose outlined herein and was limited to the scope and purpose specifically expressed in this report. This report cannot be used or applied under any circumstances to another location or situation or for any other purpose without further evaluation of the data and related limitations. Any use of this report by a third party, or any reliance on decisions made based upon it, are the responsibility of such third parties. Jacques Whitford accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions taken based on this report.

Jacques Whitford makes no representation or warranty with respect to this report, other than the work was undertaken by trained professional and technical staff in accordance with generally accepted engineering and scientific practices current at the time the work was performed. Any information or facts provided by others and referred to or used in the preparation of this report were assumed by Jacques Whitford to be accurate. Conclusions presented in this report should not be construed as legal advice.

The information provided in this report was compiled from existing documents and data provided by J.D. Irving, Limited and by applying currently accepted industry standard mitigation and prevention principles. This report represents the best professional judgment of Jacques Whitford personnel available at the time of its preparation. Jacques Whitford reserves the right to modify the contents of this report, in whole or in part, to reflect the any new information that becomes available. If any conditions become apparent that differ significantly from our understanding of conditions as presented in this report, we request that we be notified immediately to reassess the conclusions provided herein.

This report has been prepared by a team of Jacques Whitford professionals on behalf of J.D. Irving, Limited. If you have any questions or concerns about this report, please do not hesitate to contact the undersigned.

JACQUES WHITFORD LIMITED



Denis L. Marquis, M.Sc.E., P.Eng.
Project Manager, Senior Air Quality Engineer
(506) 457-3200





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APPENDIX A

Additional Information ("General Information Requirements" in NB EIA Guide)



Additional Information

(“General Information Requirements” in NB EIA Guide)

The following is intended to fulfill the additional information required for registration of the Project, as outlined in the New Brunswick EIA Guide (NBENV, 2005).

1.0 THE PROPONENT

- | | |
|--|---|
| i) Name of Proponent | J.D. Irving, Limited |
| ii) Address of Proponent | 5120 Route 107
Deersdale, NB E7L 1W5 |
| iii) Chief Executive Officer (or designate) | Not applicable. |
| iv) Principal Contact Person for the purposes of Environmental Impact Assessment | Mr. John Lawless, P.Eng.
Project Engineer
J.D. Irving, Limited
P.O. Box 5777, 300 Union Street
Saint John, New Brunswick E2L 4M3
Telephone: (506) 632-6091
Fax: (506) 632-6408
Email: lawless.john@jdirving.com |
| v) Property Ownership | The property upon which the Project will be carried out is owned by J.D. Irving Limited. |

2.0 THE PROJECT

- | | |
|---|---|
| i) Name of the Undertaking | Deersdale Sawmill Biomass Energy Plant Project.
(Revised September 2007) |
| ii) Project Overview | Please refer to Section 1.2 of the EIA Registration document. |
| iii) Purpose / Rationale / Need for Undertaking | Please refer to Section 1.3 of the EIA Registration document. |

No alternatives to the Project were considered, as they would not meet the Project purpose.



iv) Project Location

The Project is located at the Deersdale sawmill in Deersdale, New Brunswick. The street address of the Deersdale sawmill is 5120 Route 107, Deersdale, New Brunswick. The Project is within the County of York.

The approximate centre of the Project is at:

- Latitude: 46° 30' 01" N
- Longitude: 67° 02' 28" W

The Parcel Identification Number (PID) of the Deersdale sawmill is: 75145623.

Please refer to Figure 1.1 of the EIA Registration document for a site location map, and to Figure 2.1 of the EIA Registration document for an aerial photograph showing the location of the Project.

v) Siting Considerations

The Project will be constructed in an existing industrial complex at the Deersdale sawmill. The property has been used for industrial purposes for several years. No alternative sites were considered as they would not meet the Project purpose.

The Project is not located within 30 metres of a wetland or watercourse.

The Project is not located within a designated wellfield or watershed.

The Project is not located within Coastal Zone A or B.

vi) Physical Components and Dimensions of the Project

A description of the Project components is provided in Section 2.3 of the EIA Registration document. Project design is underway. More detailed information or plans can be provided once design has been completed, if required.



vi) Physical Components and Dimensions of the Project (Continued)	Please refer to Figure 2.1 of the EIA Registration document for an aerial photograph showing the location of the Project, and to Figures 2.2 and 2.3 for a site layout plan of the Project.
vii) Construction Details	<p>An overview of the construction activities for the Project is provided in Section 2.4 of the EIA Registration document.</p> <p>The construction schedule is discussed in Section 2.4.3.1 of the EIA Registration.</p> <p>Site access would be provided via existing entrances to the Deersdale sawmill, on Route 107. The site has good access given its location directly on Highway 107, a provincial collector highway.</p> <p>No merchantable timber will be removed for the Project, and any topsoil removed will be stored on-site for grading and landscaping purposes following Project construction.</p>
viii) Operation and Maintenance Details	<p>An overview of the operation and maintenance of the Project facilities, and some details on the supply of biomass to the Project, are provided in Section 2.5 of the EIA Registration document.</p> <p>The estimated life span of the Project is 25 years.</p>
ix) Future Modifications, Extensions, or Abandonment	Not applicable at this time.
x) Project-Related Documents	At this time, there are no Project-related documents that are available publicly.

3.0 DESCRIPTION OF THE EXISTING ENVIRONMENT

The descriptions of all relevant features that are found within the Project location and surrounding areas that could be potentially affected by the Project are provided in Section 3.0 of the EIA Registration, in each relevant subsection of each of the Valued Environmental Components (VECs). The existing environment is described in each VEC within a subsection entitled “Existing Conditions”, for the following VECs:



- Section 3.1: Physical Environment;
- Section 3.2: Atmospheric Environment;
- Section 3.3: Groundwater Environment;
- Section 3.4: Freshwater Environment;
- Section 3.5: Terrestrial and Wetland Environment;
- Section 3.6: Land Use;
- Section 3.7: Heritage and Archaeological Resources;
- Section 3.8: Labour and Economy;
- Section 3.9: Road Transportation;
- Section 3.10: Current Use of Land and Resources for Traditional Purposes by Aboriginal Persons; and
- Section 3.11: Public Health and Safety.

4.0 SUMMARY OF ENVIRONMENTAL IMPACTS

Potential environmental effects, or “impacts”, of the various Project phases are summarized within each section listed above.

5.0 SUMMARY OF PROPOSED MITIGATION

Proposed mitigation for the Project is addressed within Sections 2.0 (Project Description and Mitigation) and 3.0 (Existing Conditions and Potential Environmental Effects) of the EIA Registration document, where appropriate.

6.0 PUBLIC INVOLVEMENT

A brief summary of the public involvement activities conducted or planned as part of the Project is provided in Section 4.4 of the EIA Registration document.

7.0 APPROVAL OF THE UNDERTAKING

Permits, licenses, approvals, or other authorizations that may be required for the Undertaking are discussed briefly in Section 4.2 of the EIA Registration document.



8.0 FUNDING

Possible sources of funding to assist in carrying out the Project are discussed briefly in Section 4.3 of the EIA Registration document.

9.0 SIGNATURE



Chief Executive Officer (or designate)

SEPT 07 / 07

Date