



FACILITY PROFILE
J. D. Irving, Limited – Chipman Sawmill
Chipman, N.B.

Prepared by:
Authorizations Branch
New Brunswick Department of Environment and Local Government
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BACKGROUND:

The J. D. Irving, Limited - Chipman Sawmill is a softwood sawmill and planer mill operation located in Chipman, New Brunswick that produces approximately 360 million board feet of dimensional lumber per year. Presently, 250 million board feet of dimensional lumber per year comes from the J. D. Irving, Limited - Chipman Sawmill, while the remaining 110 million board feet of dimensional lumber per year comes from the J.D. Irving Limited - Sussex sawmill which is kiln-dried and dressed at Grand Lake Timber Limited. In early 1964, J.D. Irving Limited purchased the timberlands and the original sawmill at Grand Lake from Mr. F.E. Sayer. By the fall of that same year, a new sawmill was constructed and operated with logs from the Salmon River drive. At this time the mill employed 50 people and was closed during the winter when the river froze.

In 1992, modifications were made to modernize the mill. New technology and equipment, including computer-operated scanning equipment (optimizers), were installed. Since this time, improvements to keep the mill competitive have been continuous. In 1997, a 100,000 square foot planer mill was added and in 2002 a saw, equipped with some of the most sophisticated technology in North America, was installed at the mill. A second saw line was added in 2014 with a second hot pond. In 2021, the mill started up Canada's first continuous kiln.

Currently, the sawmill and planer mill operations run 24/7 with some scheduled downtime throughout the week for maintenance. The dry kiln operations run a 24-hour shift, 7 days a week. The mill today employs 345 people.

Irving foresters have achieved independent third-party certification of the company's forest management practices. All the woodlands that supply Grand Lake Timber have undergone rigorous audits and inspections by respected third party experts and have achieved environmental certification under the International Standards Organization (14001) and the Sustainable Forestry Initiative (SFI).

PROCESS DESCRIPTION:

SAWMILL

The J. D. Irving, Limited – Chipman Sawmill is a softwood sawmill that produces approximately 225 million board feet of dimensional lumber per year. Spruce Pine and Fir (SPF) are harvested and brought to the sawmill in lengths ranging from 10 to 16 feet. The sawmill has two separate sawlines, random and studs.

The logs are first submerged in the hot pond. The hot pond is fabricated of reinforced concrete and does not discharge effluent to the environment. The hot pond facilitates the removal of bark from the log before the log passes through the four ring de-barkers, two random and two studs.

RANDOM SAWLINE

The debarked logs are transported to the optimized primary breakdown line. The logs are scanned and rotated for optimum positioning. Primary breakdown consists of chipping parallel faces on the log to produce a cant and the sawing of sideboards. The sideboards are kicked off and proceed to the optimized edger for further processing. The cants proceed to the curve-sawing gang saw which will make lumber and then on to the trimline.

STUD SAWLINE

The debarked logs are either kicked outside to be batched into similar patterns or kicked inside to be processed right away. The DDM is a single pass machine, which chips, edges and saws the log at the same time. The lumber then proceeds to the trimline.

All boards pass through the optimized trimmer before being automatically sorted into a 75-bin drop-sorter. Once the bin is full, the bundles will go to the stacker, where they will get stacked with a sticker in between each tier, that helps air flow between the lumber for drying purposes. The bundles will then get loaded into the kilns.

KILNS

The J. D. Irving, Limited – Chipman Sawmill has 9 high-temperature dry kilns. All 9 operate at a maximum temperature of 116 °C. Four kilns have a charging capacity of 320,000 bf (board feet), 2 kilns have a capacity of 150,000 bf, 2 have a capacity of 230,000 bf and the continuous kiln has a charging capacity of 390,000 bf per day. They are all equipped with reversible fans to circulate the warm air within the kiln. A ventilation system with fresh- and exhaust-air vents serves to release excess humidity. A typical charge of green lumber requires 30-40 hours in the kiln to be dried. The kilns are shut down for 1.5 hours between loads to allow time for the removal of the dried lumber and to reload the kilns with a new charge of green lumber.

BOILER SYSTEMS

The heat required by the facility is produced by the biomass boiler, which burns approximately 60,000 GMT of woodwaste generated from the sawmill operation. This boiler has a 1.2 metre diameter stack that is 25 metres above ground level.

The facility is also equipped with two water tube boilers with the capacity to burn No. 6 fuel oil to heat the kilns. The main boiler has a maximum heating output of approximately 62 MBtu/hr (Million Btu per hour). This boiler has a 1.22 metre diameter stack that is 14.8 metres in height (above ground level). The flue gas exhausts through the stack at a maximum rate of 25,450 kg/hr. The second boiler has a maximum heat output of 31 MBtu/hr. The flue gas exhausts through the stack at a maximum rate of 12,750 kg/hr. This boiler has a 0.76 metre diameter stack, and the stack height is 14.8 metres above ground level. These boilers are used in the winter heating season, typically from November to April, and are on standby for emergency backup the rest of the year

The two wood waste boilers located in the sawmill are no longer used and have been dismantled.

PLANER MILLS

Once the boards are kiln-dried they are planed in a 100,000 square foot building that houses a planer mill and a value-added moulder operation that was added in 2019. The new planer mill processes wood with better than three times the efficiency of the old planer mill. An expansion was made in 2018 where a second bin drop sorter was added with optimizer capabilities that made the planer mill one of the most modern in North America. It is equipped with a cyclone dust collection system.

WOOD WASTE

Wood waste is generated during debarking, sawing, and planing. Most of the wood waste generated is transported offsite to various industrial operations, including: Kings Mines wood waste site, pulp and paper

plants, poultry farms and composting facilities. In the winter, much of the sawdust is maintained on site to fuel the Biomass Boiler.

POTENTIAL AIR QUALITY IMPACTS:

The main source of air emissions from the the J. D. Irving, Limited – Chipman operation is the Biomass boiler, where particulate matter is released from the combustion of woodwaste. When fired, the fuel oil boilers release sulphur dioxide, particulate matter and nitrogen oxides from the combustion of No. 6 fuel oil (these boilers are winter fired and are used only as emergency backup). The facility also produces particulate matter from the sawing and planing operations and the storage of sawdust, shavings and bark in piles located on site.

The following is a list of potential air quality impacts associated with the operation of the facility and which are the focus of the Air Quality Approval:

- Particulate emissions from the combustion of woodwaste;
- Sulphur dioxide, nitrogen oxides and particulate matter emissions from the combustion of heavy fuel oil (only if the boilers are fired);
- Particulate emissions from the sawing and planing operations; and
- Particulate emissions from the bark, shavings, and sawdust storage piles.

AIR POLLUTION CONTROL:

The biomass boiler is equipped with a multicyclone dust collection system. The sawmill and planer mill are equipped with cyclone dust collection systems. To control fugitive emissions from the planer mill being transported offsite, the facility has erected a mesh fence that is approximately 12 metres in height. This fence is situated along the bank of Elliot Brook.

AIR QUALITY COMPLIANCE AND ENFORCEMENT:

In New Brunswick, all sources of air emissions must operate in compliance with the *Clean Air Act* and the *Air Quality Regulation*. J. D. Irving Ltd – Chipman Sawmill must comply with these Acts and Regulations and with the specific conditions outlined in the Approval to Operate issued pursuant to Section 3 of the Air Quality regulation of the *Clean Air Act*. The Department's Compliance and Enforcement Policy outlines the actions that will be taken in situations of non-compliance with the *Clean Air Act*, the *Air Quality Regulation* or conditions of the Approval.

Compliance History

The terms and conditions of the current Air Quality Approval to Operate I-10819 (issued on February 5, 2020, expiring on March 31, 2024) and compliance history over the life of the Approval are summarized in the table below:

Condition #	Summary	Results
23, 24	Report environmental emergency and environmental non-emergency events.	The facility has been in compliance with these conditions.

25	The Approval Holder shall ensure that emissions resulting from the operation of the Facility are controlled to prevent the exceedance of the maximum ground level concentrations outlined in the <i>Air Quality Regulation 97-133</i> , filed under the <i>Clean Air Act</i> of the Province of New Brunswick.	The Department is not aware of any violations of this condition.
26	The Approval Holder shall ensure that odour, noise, fugitive particulate matter, and/or site run-off being released or discharged from the Facility do not cause adverse impacts to any off-site receptor. In the event impacts are suspected by the Department to be adversely impacting any off-site receptor, the Approval Holder may be required to investigate the degree of impact and/or develop, submit, and implement a Prevention and Control Plan in accordance with a timetable established by the Department. The plan shall be submitted in writing to the Department for review and approval prior to implementation.	The Facility has been in full compliance with this condition over the life of the current Air Quality Approval to Operate.
27	The Approval Holder shall ensure that smoke emissions do not exceed density Number 1, except for a period totaling not more than four (4) minutes each half hour where smoke may exceed density Number 1 but may not exceed density Number 2 as determined by the <i>Smoke Density Chart of the Province of New Brunswick</i> for normal operation of the Facility. In the case of a new fire, smoke may exceed density Number 2 for a period of three (3) minutes in each quarter hour period, but may not exceed density Number 3	The facility has been in overall compliance with these requirements. During the life of the current Air Quality Approval to Operate, there was one exceedance to the smoke density requirements. However, as this was linked to unexpected equipment failures or malfunctions, no enforcement actions were initiated by the Department.

28	The Approval Holder shall ensure that total emissions of Sulphur Dioxide (SO ₂) from the operation of the Facility do not exceed 430 metric tonnes per calendar year.	<p>The Facility has reported the following sulphur dioxide releases to atmosphere to the National Pollution Release Inventory, which are in full compliance.</p> <table border="1"> <thead> <tr> <th>Year</th> <th>Sulphur Dioxide (SO₂) Annual Release(tonnes/yr)</th> </tr> </thead> <tbody> <tr> <td>2018</td> <td>30.1</td> </tr> <tr> <td>2019</td> <td>83.9</td> </tr> <tr> <td>2020</td> <td>47.9</td> </tr> <tr> <td>2021</td> <td>215.7</td> </tr> <tr> <td>2022</td> <td>428.9</td> </tr> </tbody> </table> <p>Due to the biomass boiler being non-operational for most of 2022, the facility was required to burn significantly more fuel oil, which resulted in the elevated sulphur dioxide emissions in 2022.</p>	Year	Sulphur Dioxide (SO ₂) Annual Release(tonnes/yr)	2018	30.1	2019	83.9	2020	47.9	2021	215.7	2022	428.9
Year	Sulphur Dioxide (SO ₂) Annual Release(tonnes/yr)													
2018	30.1													
2019	83.9													
2020	47.9													
2021	215.7													
2022	428.9													
29	The Approval Holder shall ensure total emissions of Nitrogen Oxides (NO _x) from the operation of the Boilers do not exceed 153 metric tonnes per calendar year.	<p>The Facility has reported the following particulate matter releases to atmosphere to the National Pollution Release Inventory, which are in full compliance.</p> <table border="1"> <thead> <tr> <th>Year</th> <th>Particulate Matter (NO_x) Annual Release(tonnes/yr)</th> </tr> </thead> <tbody> <tr> <td>2018</td> <td>63.9</td> </tr> <tr> <td>2019</td> <td>69.9</td> </tr> <tr> <td>2020</td> <td>66.5</td> </tr> <tr> <td>2021</td> <td>59.7</td> </tr> <tr> <td>2022</td> <td>38.9</td> </tr> </tbody> </table>	Year	Particulate Matter (NO _x) Annual Release(tonnes/yr)	2018	63.9	2019	69.9	2020	66.5	2021	59.7	2022	38.9
Year	Particulate Matter (NO _x) Annual Release(tonnes/yr)													
2018	63.9													
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2022	38.9													
30	The Approval Holder shall ensure that total emissions of Particulate Matter (PM) from the operation of the Boilers do not exceed 175 metric tonnes per calendar year.	<p>The Facility has reported the following particulate matter releases to atmosphere to the National Pollution Release Inventory, which are in full compliance.</p> <table border="1"> <thead> <tr> <th>Year</th> <th>Particulate Matter (PM) Annual Release(tonnes/yr)</th> </tr> </thead> <tbody> <tr> <td>2018</td> <td>97.8</td> </tr> <tr> <td>2019</td> <td>106.6</td> </tr> <tr> <td>2020</td> <td>99.3</td> </tr> <tr> <td>2021</td> <td>75.1</td> </tr> <tr> <td>2022</td> <td>11.3</td> </tr> </tbody> </table>	Year	Particulate Matter (PM) Annual Release(tonnes/yr)	2018	97.8	2019	106.6	2020	99.3	2021	75.1	2022	11.3
Year	Particulate Matter (PM) Annual Release(tonnes/yr)													
2018	97.8													
2019	106.6													
2020	99.3													
2021	75.1													
2022	11.3													

31	The Approval Holder shall ensure that all site runoff is collected and any discharge to Salmon River, or any other watercourse, is less than 50 mg/l for suspended solids in a grab sample.	The Department is not aware of any violations of this condition.
32	The use of petroleum products as a dust control agent is not permitted .	The Department is not aware of any violations of this condition.
33	The Approval Holder is only permitted to use up to 15 litres per hour of self-generated used oil as a fuel at the Facility. The self-generated used oil is only to be used in a system that conforms with <i>CAN/CSA-B140.0-M87(R1991), General Requirements for Oil Burning Equipment</i> and/or <i>CAN/CSA-B140.4-1974(R1991), Oil-fired Warm Air Furnaces</i> . The burning of self-generated used oil greater than 15 litres per hour is not permitted at this facility. The burning of waste derived fuel is permitted at this Facility as described in Schedule B.	The Facility has been in full compliance with this condition over the life of the current Air Quality Approval to Operate.
34	<p>The Approval Holder shall ensure that all chemicals and hazardous waste stored at the Facility are located in a dedicated Chemical/Hazardous Waste Storage System. The system shall be set up to ensure that all chemicals/hazardous wastes are:</p> <ul style="list-style-type: none"> a) secured in sealed and chemically resistant containers; b) away from high traffic areas and protected from vehicle impacts; c) away from electrical panels; d) in a containment area that has secondary containment adequate to contain 110 % of the nominal volume of the largest container in the containment area; e) in a containment area that is designed to prevent contact between incompatible chemicals; and f) in a containment area designed to prevent the release or discharge of chemicals to the environment as a result of a spill. 	The Department is not aware of any violations of this condition.

35	The Approval Holder shall ensure that waste wood materials are not permanently stored at the facility. Wood waste shall be disposed of in a method acceptable to the Department either by transport to another facility for use or to an approved landfill. The Approval Holder shall not stockpile wood waste for a period greater than 60 days.	The Department is not aware of any violations of this condition.
36	The Approval Holder shall employ good housekeeping practices to ensure spillages of waste wood materials are cleaned up as soon as possible and handled in such a manner that fugitive emissions of wood materials do not leave the site of the facility.	The Department is not aware of any violations of this condition.
37	The Approval Holder shall ensure that all solid waste generated at the Facility is disposed of in a manner and at a location which is acceptable to an Inspector. One acceptable method of disposal is at an approved landfill.	The Department is not aware of any violations of this condition.
38	The Approval Holder shall maintain the large mesh fence located on the bank of Elliot Brook to ensure that fugitive particulate matter does not enter Elliot Brook.	The Facility has been in full compliance with this condition over the life of the current Air Quality Approval to Operate. Repairs have been conducted on the fence when needed, and a full replacement is planned in 2023/2024.
39	<p>The Approval Holder shall maintain a vegetated buffer zone for the purpose of reducing sediment runoff into the Salmon River, that is:</p> <ul style="list-style-type: none"> a) 15 metres wide; and b) as wide as practical in areas where existing permanent structures limit the buffer zone. <p>No further encroachment into the buffer zone is permitted. No activity is to take place inside this buffer zone, including but not limited to: equipment storage, stockpiling of logs, lumber, or woodwaste, <u>or</u> piling of snow from snow clearance, or vehicle traffic.</p>	The Facility has been in full compliance with this condition over the life of the current Air Quality Approval to Operate.
40	The Approval Holder shall ensure that no effluent is discharged from the hot ponds and that no chemicals are used in the operation of the hot ponds.	The Facility has been in full compliance with this condition over the life of the current Air Quality Approval to Operate.

41	The Approval Holder shall not do chemical sapstaining at this site.	The Facility has been in full compliance with this condition over the life of the current Air Quality Approval to Operate.
42	The Approval Holder shall conduct performance tests on atmospheric emissions of contaminants from the Facility or on ambient air quality at such times and in such a manner as the Director may, in writing, require.	No testing was required by the Director during the life of the current Air Quality Approval to Operate.
43	The Approval Holder shall ensure that all source testing is completed in conformance with the most recent version of the New Brunswick Department of Environment Guidance Document for Source Testing.	No testing conducted during the life of the Air Quality Approval to Operate. See note on Condition #44 for more information.
44	<p>Prior to November 30, 2021, the Approval Holder shall conduct performance tests to characterize the contaminants and gases being emitted from all currently operating boiler stacks. As a minimum, testing shall be conducted to quantify emissions of the following parameters:</p> <ul style="list-style-type: none"> i) particulate matter (PM); ii) carbon monoxide (CO); iii) nitrogen oxides (NO_x); iv) sulphur dioxide (SO₂); v) carbon dioxide (CO₂); and vi) oxygen (O₂). <p>A report on the results of the performance testing including the exhaust gas temperature in degrees Celsius, actual volumetric flow rate in m³/s (or ACFM), and quality-assured emissions testing data for all parameters shall be prepared in both hardcopy and electronic formats acceptable to the Director.</p>	In September of 2021, the biomass boiler had a pressure tube failure. A new boiler was commissioned, and was installation was completed in the spring of 2023. The boiler is currently operational but is not operating at optimal conditions due to a design issue with the air/fuel mixture. The site is currently investigating this issue and is planning on a shutdown to address the issue in the fall of 2023. Due to this, the required stack testing, particle size distribution study, and dispersion modelling have not been conducted at this time. J.D. Irving plans on conducting the stack emissions testing as soon as the issue with the air/fuel mixture is addressed.
45	Prior to May 31, 2022 , The Approval Holder shall complete an air quality dispersion modelling study immediately following any source testing activities required for a given year. The study shall determine the maximum 1 hour, 24 hour, and annual ground level concentrations in micrograms per cubic metre for the parameters specified in the source testing activities for that year and representing all point sources at the facility. The maximum concentrations shall be shown graphically as concentration contours in relation to the facility	Not conducted. See note on Condition #44.

	and off-site receptors within a five kilometre radius. The model to be used shall be a multisource model that is acceptable to the Department. The modelling shall use the previous 5 years hourly meteorological data from the nearest weather station.	
46	The Approval Holder shall ensure that where source testing for Particulate Matter is required, Particle Size Distribution is also undertaken to determine the concentration in milligrams per cubic meter and emission rate in grams per second of Total Particulate Matter, PM ₁₀ and PM _{2.5} released.	Not conducted. See note on Condition #44.
47	The Approval Holder shall monitor the TSS concentration of site runoff at such times and in such a manner as the Director may, in writing, require. The samples shall be taken at the inlet of the final discharge pipe where the runoff leaves the property, and shall be submitted to a laboratory approved by the Director for testing. Sampling is only required when there is discharge at this location.	No TSS sampling was required by the Director during the life of the current Air Quality Approval to Operate.
48	In the event the Approval Holder receives a complaint from the public regarding unfavourable environmental impacts associated with the Facility, the Approval Holder is to report this complaint by facsimile to the Department's applicable Regional Office within one business day of receiving the complaint.	The Facility has been in full compliance with this condition over the life of the current Air Quality Approval to Operate. Two occurrences were reported, involving ash fallout during the operation of the new boiler. The site reported that they were working on a plan to implement better combustion.
49	In the event of a small spill or leak of liquid materials, the Approval Holder shall act first to contain, and then to clean up the spilled or leaked material and mitigate any resulting impacts as soon as the spill or leak is detected. If the spill or leak results in an "environmental emergency" as defined in this Approval, the Approval Holder shall report the event in accordance with the Emergency Reporting section of this Approval. If the spill or leak is not an "environmental emergency", the Approval Holder shall report this event to the Department's applicable Regional Office by fax, within one business day, identifying the material spilled, the approximate amount of	The Department is not aware of any violations of this condition.

	liquid spilled, the location of the spill and the method(s) used to clean up the liquid.	
50	In the event the Approval Holder violates any Term and Condition of this Approval or the <i>Air Quality Regulation</i> , the Approval Holder is to immediately report this violation by facsimile to the Department's applicable Regional Office and the Central Office in Fredericton at (506) 453-2390 . In the event the violation may cause the health or safety of the general public to be at risk and/or significant harm to the environment could or has resulted, the Approval Holder shall follow the Emergency Reporting procedures contained in this Approval.	The Department is not aware of any violations of this condition.
51	By February 15 of each year , the Approval Holder shall submit a Final Report on the source testing to the Director for review and approval as required under Testing and Monitoring.	Not conducted. See note on Condition #44.
52	By February 15 of each year , the Approval Holder shall submit an Annual Environmental Report to the Director. The report shall include, as a minimum, the following information for the previous calendar year: i) the name of the fuel suppliers; ii) the types of fuel used; iii) the annual consumption of fuel oil and woodwaste in tonnes; iv) the average sulphur content of each type of fuel oil used; and v) a summary report of all small spill and/or leak events at the Facility during the previous year, including the date, location, approximate volume, and method of cleanup for each spill and/or leak.	J.D. Irving submits the Annual Air Quality Reports as required.

ENFORCEMENT ACTION:

Enforcement options used by the Department of Environment and Local Government are outlined in the Department's *Compliance and Enforcement Policy*. These may include but are not limited to: schedules of compliance, verbal and written warnings, orders, and prosecutions. Although not specifically outlined in the Policy, it is also possible to amend approvals with more stringent conditions, both during its valid period or at the time of renewal, to address specific compliance issues or to improve the environmental impact of the

facility. Most recently, a new Regulation under the Clean Air Act allows for the issuance of "administrative penalties" for minor violations as an alternative to traditionally used enforcement options.

During the life of the current Approval, no schedule of compliances, warnings or orders were issued to this facility, nor have there been any prosecutions initiated by this agency during this period, related to air quality.

PUBLIC OUTREACH:

Grand Lake Timber has worked and continues to work with community leaders and local citizens in supporting the rink, the bowling alley, playground equipment and a number of other worthwhile community groups. The company regularly hosts tours for both teachers and students and has also been internationally recognized for salmon conservation and other research initiatives as well as award winning education programs.

CONTACT INFORMATION:

For information on the operation of Grand Lake Timber Limited, please contact:

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