FACILITY PROFILE – AV GROUP NB INC.

Dissolving Grade Pulpmill
Atholville, N.B.

Department of Environment and Local Government
June 2019

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BACKGROUND

Ferguson Point, in Atholville, has been utilized by the commercial forest products industry since 1920 when the Fraser family built one of the province's largest sawmill facilities on the site now occupied by the AV Cell pulpmill. Chemical pulping began at the site in 1930 when the Restigouche Company Limited constructed a 45,000 tonnes per year bleached sulphite pulpmill. A short time later, the mill was upgraded to produce dissolving grade pulp for rayon and cellophane. In the 1950s, production was converted from calcium-based dissolving grade to ammonia-based market pulp.

In 1974, Noranda Forest Inc. acquired the company and, during the 1980s, upgraded the mill by switching to magnesium bisulfite with full chemical recovery, adding a hog fuel steam boiler and turbine generator, and primary effluent treatment. During this period, the mill produced fully-bleached magnesium bisulphite softwood and hardwood pulp at a rate of 109,000 tonnes per year.

In 1990, Noranda added an oxygen delignification system to the bleach plant that enabled the mill to produce elemental chlorine free (ECF) and totally chlorine free (TCF) pulp. In November 1991, Noranda closed the mill due to poor pulp markets.

Repap purchased the mill from Noranda in 1994 and renamed it ALCell Forest Products Inc., with the *intention* of converting it to Repap's patented ALCell® alcohol based pulping process. Repap ran the mill briefly, from November 1995 to February 1996, producing market sulfite pulp. Under Repap's brief ownership, an oxygen activated sludge secondary effluent treatment plant was constructed. As well, an electrostatic precipitator was installed on the woodwaste boiler stack. In February 1996, the mill shut down to correct design deficiencies in the effluent treatment plant and remained closed due to poor market conditions.

In January 1998, AV Cell, a joint venture of Quebec-based forest products company Tembec and Indian textile manufacturer Aditya Birla Group, purchased the mill. AV Cell registered a project under the Department's *Environmental Impact Assessment Regulation* for the conversion of the mill from market sulfite pulp to dissolving grade pulp. Market sulfite pulp production resumed in May 1998 and by August 1998 the mill had satisfied the EIA requirements and had converted its operation to produce dissolving grade pulp.

In December 2003, AV Cell registered a project under the *Environmental Impact Assessment Regulation* seeking approval under that Regulation to increase the nominal average daily production capacity of the pulp mill from 300 air-dry tonnes per day to 360 air-dry tonnes per day.

The project included:

(a) the addition of 2 batch digesters for a total of seven;
(b) increasing the pulp drying capacity by raising the steam temperature to the dryers;
(c) increasing the liquor burning capacity of the recovery boiler by increasing the induced draft and forced draft fan capacity and its steam generating capacity by adding a second economizer section;
(d) modification of the recovery boiler scrubber internals;
(e) modifications to the effluent treatment plant including CO2 stripping of the effluent;

(f) replacement of outdated distributed control systems.

The project did not require changes to the SO_2 or particulate matter (PM) emission limits set in the Approval to Operate. The project was given permission to proceed by the Minister in a Determination letter dated April 30, 2004, and construction was completed in various stages.

The recovery boiler upgrades, listed in (c) above were completed in June 2004. No.6 digester was commissioned in February 2005 and No.7 digester was commissioned in March 2005.

During the 2004 EIA project, partial retubing of the evaporator bodies was done to replace plugged tubes and a provision was made to add one new body in the future depending on the improvements achieved. Data trending and analysis proved that the addition of one new evaporator body was required in order for the evaporator system to be able to handle the 360 air-dry tonnes per day pulp production. The addition of the new evaporator body was completed in December 2008.

In February 2010, AV Cell registered a project under the *Environmental Impact Assessment Regulation* seeking approval under that Regulation to install an Anaerobic Effluent Treatment Plant. The project included BIOPAQ® internal circulation (IC) reactor, one feed tank, associated piping and equipment, one biogas holding tank, one biogas flare and biogas pipeline and associated equipment to direct the biogas to AV Cell's Woodwaste boiler for combustion.

The project did not require changes to the SO_2 or particulate matter (PM) emission limits set in the Approval to Operate. The project was given permission to proceed by the Minister in a Determination letter dated July 14, 2010, construction was completed and the plant was commissioned in February 2012.

On April 5, 2016 the Approval to Operate was amended to change the Approval Holder name from AV Cell Inc. to AV GROUP NB INC.

Today, AV GROUP NB INC. Atholville Pulp Mill produces approximately 400 air-dry tonnes per day of dissolving grade magnesium bisulfite pulp from a 50% softwood / 50% hardwood blend, for use in the Viscose Staple Fibre (VSF) industry which supplies fibre to the rayon textile and non-woven fibre industries.

PROCESS DESCRIPTION

The AV GROUP NB INC. pulpmill currently produces approximately 400 air-dry tonnes per day of dissolving grade pulp. This pulp is a critical input for Aditya Birla Group's Viscose Staple Fibre (VSF) business which produces fibre for use in the rayon textile and non-woven fibre industries.

At AV GROUP NB INC. Atholville pulp mill, wood fiber, in the form of hardwood and softwood chips, is delivered to the mill by truck and is stored outside in large piles. While AV GROUP NB INC. no longer operates a conventional woodroom with debarking and chipping at the Atholville mill, a portable debarking unit and chipping plant was brought onto the site in November 2003 to supplement the supply of purchased chips. The portable plant processes approximately 75,000 tonnes per year of hardwood logs. Bark produced by the portable plant is burned in AV GROUP NB INC.'s woodwaste boiler along with purchased hog-fuel.

When the Atholville pulp mill went into production in May 1998, the furnish was 100% softwood. By November 2002, the furnish had been gradually switched to a 50% softwood / 50% hardwood blend and at present the mill uses a 50% softwood / 50% hardwood furnish.

Chips are reclaimed from the outside storage piles and following screening, are fed to batch digesters. Heat (in the form of steam) and chemicals (in the form of magnesium bi-sulfite cooking acid) are added to the chips and under conditions of high temperature and pressure, the chips are cooked over a six-hour period.

During this cooking process, lignin, the material which binds the cellulose fibers together, is dissolved, allowing the cellulose fibers, or pulp, to be separated and recovered. The pulp then leaves the digester, is screened to remove any knots or uncooked wood chips, and then passes through an unbleached pulp washing stage where the dissolved lignin and spent cooking chemicals are collected and directed to the chemical recovery system.

In the bleachplant, caustic, chlorine dioxide (ClO_2), a second caustic stage with peroxide addition, and hypochlorite (hypo) are used in sequence to bleach the pulp, by removing any residual lignin, from its natural brown colour to white. The bleached pulp proceeds to the pulp machine where it is formed into a continuous sheet and on to the pulp dryer. The dried pulp sheet is then cut, baled, wrapped and sent to the warehouse for shipping.

Recovery and regeneration of the spent cooking chemicals and combustion of the dissolved lignin for energy production are considered economically essential components of the operation of the AV GROUP NB INC. mill. Magnesium and sulfur dioxide (SO_2) are referred to as the "base chemicals" for the mill and these materials are recycled within the mill through the cooking and chemical recovery processes.

Weak liquor, a dilute solution of dissolved lignin and spent cooking chemicals, is recovered at the unbleached pulp washers, and is then concentrated in a four body / eight effect vapor recompression evaporator train by removing water vapor. The resulting heavy liquor, now capable of being burned, is fired in the Babcock & Wilcox recovery boiler. The liquor is fired through liquor guns, similar to oil guns, and, upon combustion, the magnesium contained in the liquor is liberated as a fine white dust of magnesium oxide (MgO and referred to as "Mag"). The combustion gases pass through an electrostatic precipitator (ESP) which removes the Mag dust and returns it to the mill process.

The combustion gases, still rich in SO_2, carry on through the ESP and into the recovery boiler scrubber. In a four-stage process, using a magnesium hydroxide ($(Mg(OH)_2$) solution produced from the Mag recovered in the ESP, the SO_2 is scrubbed out and returned to the process.

The Foster-Wheeler woodwaste boiler, installed in 1983, burns purchased bark and the bark from the portable debarking and chipping unit as well as uncooked knots from the cooking process, a mixture of primary and secondary effluent treatment plant sludges and sawdust from the chip screens. Steam produced by the burning of this biomass displaces fossil fuel and is used throughout the mill for heating purposes. In late 1996, an electrostatic precipitator (ESP) was commissioned on this source for the purpose of removing soot and fly ash from the combustion gases leaving the woodwaste boiler stack.

As mentioned earlier, the AV GROUP NB INC. bleachplant uses caustic, chlorine dioxide (ClO_2), peroxide and hypochlorite to bleach the pulp. Two potential sources of release are associated with the bleaching process. Chlorine dioxide (ClO_2), being an unstable gas, must be produced onsite in the Solvay ClO_2 generator using sodium chlorate, sulfuric acid and methanol. The ClO_2 gas is absorbed in cold water into a solution for use in the bleaching process. Any residual ClO_2 that is not absorbed in the water solution is released to the atmosphere. Various bleach washer hoods, which collect vapours over the pulp washing equipment, are vented to atmosphere.

In the process of cooking and bleaching the wood fiber and in recovering energy and chemicals from the spent cooking liquors, air contaminants are released from several points within the process. Emissions can also occur from miscellaneous storage tanks and process vents. AV GROUP NB INC. has two separate gas collection systems in operation. The first system collects organic vapors from areas such as the evaporators and directs these to the combustion zone of the recovery boiler where they are incinerated. A second collection system collects SO_2 rich streams from sources, such as the unbleached washer hood, and directs these to the recovery boiler scrubber. Dissolving grade pulp is cooked and bleached more rigorously than market pulp using stronger cooking liquor. For this reason, and as a component of the conversion to dissolving grade pulp, AV GROUP NB INC. expanded these collection systems.

Effluent treatment plants can also be a source of air emissions. In the case of the AV GROUP NB INC. plant, the reactors are enclosed sealed units and do not normally release air emissions. However, the secondary clarifiers are open to atmosphere and occasionally release heat to the atmosphere in the form of steam rising from them, particularly on cold days.

POTENTIAL AIR QUALITY IMPACTS

The principle sources of air emissions at the AV GROUP NB INC. mill are the recovery boiler, the wood waste boiler, the oil-fired package boiler and the bleachplant. The following list of potential air quality impacts are associated with these sources and are the focus of the Terms & Conditions of the Approval issued to AV GROUP NB INC. by the Department:

- SO_2 and particulate emissions from the recovery boiler;
- SO_2 and particulate emissions from the woodwaste boiler;
- SO_2 and particulate emissions from the package boiler;
- Chlorine, chlorine dioxide and chloroform emissions from the bleachplant.

AIR QUALITY COMPLIANCE

All sources of air emissions in the province, including the AV GROUP NB INC. pulpmill, must operate in compliance with the *Clean Air Act* and the *Air Quality Regulation*. AV GROUP NB INC. must, in addition, comply with the site-specific conditions contained in Approval to Operate I-8787 issued pursuant to Section 5(3) of the *Air Quality Regulation* of the *Clean Air Act*, which are aimed at preventing adverse impacts on the environment as a result of the operation of the mill.

Compliance with the Terms and Conditions of Air Quality Approval to Operate I-8787:

AV GROUP NB INC. is currently operating under the authority of Approval to Operate I-8787. The approval was amended on April 5, 2016 to reflect the name change of the company and at the same time a modification to the stack testing requirements were made as well as adding condition related to Green House Gas emissions required by Environment Canada. The following is a summary of the conditions of the Approval and an accompanying compliance history:

Note: Items 1-6 of the Approval are definitions and are not considered "conditions of approval".

Condition 7: Emergency Reporting

AV GROUP NB INC. is required to immediately report to the Department releases of air contaminants that cause, or have the potential to cause, concern for the health or safety of the public, significant harm to the environment, and/or, public complaints.

A file review completed by the Department in May 2019 confirmed that AV GROUP NB INC. provides these reports to the Department in compliance with this requirement.

Condition 8: Non-emergency Reporting

AV GROUP NB INC. is required to report to the Department the release of air contaminants and any other air-quality related incident or situation, which is not of an emergency nature, but results in a violation of the Approval to Operate, the *Air Quality Regulation*, and/or the *Clean Air Act*, within one working day.

A file review completed by the Department in May 2019 confirmed that AV GROUP NB INC. provides these reports to the Department in compliance with this requirement.

Condition 9: Annual SO_2 and PM Emission Cap

AV GROUP NB INC. is required to limit the annual emission of SO_2 and PM from all combustion and process sources at the mill to less than 1000 tonnes and 150 tonnes per year respectively and is required to submit an annual SO_2 and PM Emission Report to the Department.

Annual Reports are submitted as required by AV GROUP NB INC. and document that AV GROUP NB INC. has operated the mill in compliance with the annual SO_2 and PM emission caps during the 5-year review period as shown in the table below:

YEAR	SO_2 emission (tonnes/year)	PM emission (tonnes/year)
2018	593	71.8
2017	641	69.7
2016	693	124.8
2015	841	47.8
2014	991	40.0

Condition 10, 11, 15(b) and 27(k): Recovery Boiler SO_2 Limit

AV GROUP NB INC. must limit the emissions of SO_2 from the Recovery Boiler to less than 500 parts per million and must report these readings to the Department. AV GROUP NB INC. is also required to perform two SO_2 emission tests per year and report the results to the Department.

The Babcock & Wilcox recovery boiler is a source of SO_2 emissions. The Approval to Operate limits the maximum allowable concentration of SO_2 in the boiler exhaust gas to 500 parts per million (ppm), at stack conditions, for any 1-hour average. The Approval to Operate includes one exception to this limit, applicable in rare cases, during power failures when the gas flowrate in the stack is low. In such cases, the SO_2 concentration limit is 1500 ppm. Such cases must be reported to the Department within one working day, and AV GROUP NB INC. must demonstrate that there has been no significant impact to the environment.

SO_2 emissions are measured continuously using an SO_2 continuous emission monitor (CEM) and the Approval requires that the results be submitted to the Department on a monthly basis for review. In addition, any exceedance of the 500-ppm limit must be reported to the Department.

During the 5-year review period, 34 exceedances of the 500-ppm limit have been reported.

YEAR	Annual Average Recovery Boiler SO2 Concentration (ppm)	# of hourly average SO_2 >500 ppm
2018	42.5	7
2017	59.7	6
2016	62.5	2
2015	63.8	9
2014	98.0	10

For the most part, these exceedances have been due to equipment malfunctions or operating problems during startups or shutdowns and have been dealt with promptly by AV GROUP NB INC. such that no further action was deemed necessary by the Department.

Two annual stack tests are conducted by AV GROUP NB INC. as required by the Approval and the results are submitted to the Department. AV GROUP NB INC. has been in compliance with this limit for all tests done during the 5-year review period as shown in the table below:

YEAR	Stack Test #1 SO_2 Concentration		Stack Test #2 SO_2 Concentration	
	(ppm)	(kg/hr)	(ppm)	(kg/hr)
2018	26.2	11.029	33.3	13.471
2017	107.7	41.505	76.4	33.532
2016	74.6	31.516	70.8	30.732
2015	10.3	19.019	13.3	5.525
2014	14.1	5.992	71.4	46.631

Condition 12 and 13: Recovery Boiler Monitors

AV GROUP NB INC. is required to operate and maintain a continuous SO_2 monitor and a continuous oxygen monitor, in the recovery boiler stack. These monitors must be maintained in good repair and calibration. The SO_2 monitor must be able to provide the one-hour average concentration and have an alarm that set off when the concentration is above 400 ppm.

An audit done by the Department confirmed that the recovery boiler stack is equipped as required.

Condition 14, 15(a) and 27(h): Recovery Boiler Particulate Limit

AV GROUP NB INC. must limit the emission of particulate matter from the recovery boiler stack to less than 70 milligrams per cubic meter (mg/m^3) of dry stack gas at 21°C and 101.3 kPa. AV GROUP NB INC. is required to conduct two particulate tests per year and to report the results to the Department. The second particulate test in a given year is not required if the first test results were below 35 mg/m^3.

Maximum allowable particulate emissions are set in the Approvals of all New Brunswick pulp mills with chemical recovery boilers and these mills are required to conduct particulate emission performance tests on these boilers. The AV GROUP NB INC. recovery boiler has an emission limit of 70 mg/m^3.

Annual stack tests are conducted by AV GROUP NB INC. as required by the Approval and the results are submitted to the Department. AV GROUP NB INC. has been in compliance with this limit for all tests done during the 5-year review period as shown in the Table below:

YEAR	Stack Test #1 Result		Stack Test #2 Result	
	(mg/m^3)	(kg/hr)	(mg/m^3)	(kg/hr)
2018	13.1	2.085	*	*
2017	18.1	2.623	14.3	2.361
2016	45.4	6.987	24.4	4.004
2015	11.4	1.864	12.5	1.962
2014	12.4	1.969	15.0	2.667

*no testing performed since test #1 was below 35 mg/m^3

Condition 16: Woodwaste Boiler Opacity Meter

AV GROUP NB INC. is required to operate an opacity meter on the woodwaste boiler stack and must report these readings to the Department.

AV GROUP NB INC. must operate in compliance with the Smoke Density Standards of the *Air Quality Regulation*. To determine compliance with the Smoke Density Standard direct visual observation of the stack must be compared to the Ringleman Chart described in the Regulation.

Opacity is a measure of the light obscuring properties of the stack gas stream. Opacity is not a measurement of smoke density but it can be used to *infer* periods of darker than normal emissions. AV GROUP NB INC. reports the opacity readings to the Department each month.

In an effort to more effectively correlate the opacity readings with smoke density, AV GROUP NB INC. was required to develop a "Critical Level" Opacity/Smoke Density relationship for emissions from the woodwaste boiler. The results of this project were submitted in June 2005. Deficiencies in the Opacity monitoring system resulted in the installation of a new unit during the June 2007 Mill Shutdown.

The primary function of the opacity meter is to provide this information the boiler operators so that optimal combustion conditions can be achieved.

Condition 17, 18 and 27(h) Woodwaste Boiler Particulate Limit

AV GROUP NB INC. is required to limit the particulate emissions from the Woodwaste Boiler to less than 130 mg/m^3 of dry stack gas at 21^{o}C and 101.3 kPa and corrected to 12% CO_2. AV GROUP NB INC. is required to conduct two particulate tests and two SO_2 emission tests per year and to report the results to the Department. The second particulate test in a given year is not required if the first test results were below 65 mg/m^3.

All New Brunswick pulpmills are required to conduct particulate emission performance tests on woodwaste boilers and have maximum allowable particulate emission rate from this source set in the Approval. The AV GROUP NB INC. woodwaste boiler has an emission limit of 130 mg/m^3 at 21^{o}C and 101.3 kPa and corrected to 12% CO_2. The test results for the 5-year review period are shown below:

Particulate Matter				
YEAR	Stack Test #1 Result		Stack Test #2 Result	
	(mg/m^3)	(kg/hr)	(mg/m^3)	(kg/hr)
2018	41.8	7.813	21.6	4.429
2017	24.6	4.340	14.4	2.628
2016	35.5	7.094	34.3	7.394
2015	11.6	2.442	22.3	4.098
2014	16.7	3.434	9.0	1.744

AV GROUP NB INC. is also required to perform two SO_2 emission tests per year on the woodwaste boiler. The woodwaste boiler does not have any specific SO_2 emission limit, but its emissions are taken into account in the facility's total emission. The test results for the 5-year review period are shown below:

SO_2				
YEAR	Stack Test #1 Result		Stack Test #2 Result	
	(mg/m^3)	(kg/hr)	(mg/m^3)	(kg/hr)
2018	96.9	44.473	76.5	41.678
2017	97.5	58.686	54.4	25.966
2016	17.5	9.227	139.4	75.795
2015	141.1	53.526	99.0	48.364
2014	141.1	77.483	130.8	67.412

Condition 19: Woodwaste Boiler Fuel Quality

AV GROUP NB INC. is permitted to burn woodwaste material in their woodwaste boiler. The Approval includes a condition requiring that this material be free of salt and not be contaminated with salt water or any other salt source.

Chlorinated dioxins and furans can be formed and released when woodwaste containing a chlorine source, such as sea salt, is burned.

In support of the Department's Implementation Plan for the Canada Wide Standards for Dioxin and Furans, AV GROUP NB INC. has been prohibited from burning woodwaste that has come into contact with salt water or any other chlorine source.

An audit done by the Department confirmed that the wood waste burned at the AV GROUP NB INC. mill has not come into contact with salt water.

Condition 20 and 21: Burning Self-Generated Used Oil and Waste Derived Fuel

AV GROUP NB INC. is permitted to burn self-generated used oil and waste derived fuel in its woodwaste and recovery boilers.

When used properly, these fuels produce significantly lower emissions (particularly SO_2) than an equivalent amount of Bunker C. The Approval includes limitations on the use and specifications of these fuels, to ensure that metals and other potential contaminants do not cause environmental damage.

Although permitted to do so by their Approval, AV GROUP NB INC. has not burned used oil or waste derived fuel during the 5-year review period.

Condition 22: Burning of oily waste

AV GROUP NB INC. is permitted to burn small amounts of oily waste such as might result from regular maintenance work or the cleanup of small spills, in the woodwaste boiler. The Approval to Operate specifies that these materials must be added directly to the woodwaste stream entering the boiler, to prevent exposure of the material to rain.

Oily waste collection stations are set up around the mill and when full of oily rags, gloves, absorbents, etc. this material is taken to the bark feed and fed directly into the boiler.

Condition 23: Gas Collection System No.1

AV GROUP NB INC. is required to operate a non-condensable gas collection and incineration system which collects SO_2 rich gases from various process points and directs them to the recovery boiler scrubber for recovery.

An audit done by the Department confirmed that Gas Collection System No.1 is configured and operated as required.

Condition 24: Gas Collection System No.2

AV GROUP NB INC. is required to operate a non-condensable gas collection and incineration system which collects gases rich in organics from various process points and directs them to the recovery boiler combustion zone or to the recovery boiler scrubber.

An audit done by the Department confirmed that Gas Collection System No.2 is configured and operated as required.

Condition 25(a): Bleachplant Emissions Testing

AV GROUP NB INC. is required to measure annually and report chlorine (Cl_2), chlorine dioxide (ClO_2), and chloroform ($CHCl_3$) emissions from the bleachplant:

All New Brunswick pulp mills that bleach with chlorine and/or ClO_2 are required to measure and report emissions associated with the bleachplant on an annual basis. Four locations at the Atholville mill are measured annually: the ClO_2 generator absorption tower, bleachplant washer hood exhaust, ClO_2 bleach tower vent and the hypochlorite bleach tower vent. There are currently no emission standards for these substances in New Brunswick. The Table below shows the results of the bleachplant measurements:

Year	Total Cl_2 (kg/hour)	Total ClO_2 (kg/hour)	Total $CHCl_3$ (kg/hour)
2018	0.235	0.209	0.155
2017	0.984	0.566	0.635
2016	3.520	0.931	<14.377[1]
2015	1.446	0.873	0.336
2014	2.035	1.222	1.249

[1]lab could not obtain analysis with a proper detection limit.

Condition 25 (b) and (d): Bleachplant CEM

AV GROUP NB INC. is required to operate the Bleachplant CEM at all times that the ClO_2 generator is in operation. The facility is to limit the Cl_2 and ClO_2 emissions to 4 kg/hr each.

The annual average, as well as the number of hour the reading was above 4 kg/hr, for each contaminant since 2015, at which time the date needed to be reported, are listed in the table below:

Year	Cl_2		ClO_2	
	Average CEM Reading (kg/hr)	# Hours Reading > 4kg/h	Average CEM Reading (kg/hr)	# Hours Reading > 4kg/h
2018	0.06	0	0.3	0
2017	0.3	0	0.4	3
2016	0.3	0	0.5	1
2015	0.5	0	0.5	6

Condition 25(e): Emission exceedances

AV GROUP NB INC. was required to report any exceedance of the limits in (d) or if visible green or yellow emissions are observed from the bleachplant stacks to the DELG Regional office in Bathurst within one business day.

The exceedance reports have been submitted as required by the AV GROUP NB INC.

Condition 25(f): Bleachplant Dispersion Modeling

AV GROUP NB INC. was required, by July 31, 2015, to perform computer modeling to predict ground level concentration (1/2 hours and 24 hour) of Cl_2, ClO_2 and $CHCl_3$ using (i) the actual emissions, (ii) the 4kg/hr limit, and (iii) the highest recorded value. The predicted values were to be compared with the Ontario Ministry of Environment Standards.

AV GROUP NB INC. has performed the computer modeling as required by the approval. The computer model predicts that, during normal operation of the bleachplant, the maximum ground level concentration of ClO_2 and chloroform will exceed the Ontario regulatory limit (no limit currently available in NB) for both the ½-hour and 24-hour averaging period. The computer model predicts that maximum ground level concentration of Cl_2 will be lower than the Ontario regulatory limit for both the ½-hour and 24-hour averaging period. Finally, the computer model predicts that maximum ground level concentrations for all three parameters are below the Ontario upper risk threshold for both averaging periods. It should be noted, that the modeling predicts that all exceedance areas are located within the AV GROUP NB INC. property.

The results of the modeling for each contaminant can be found in the tables below.

Averaging time	Maximum Predicted Ground Level **ClO_2** Concentration ($\mu g/m^3$)				Ontario Regulatory Limit ($\mu g/m^3$)**	Ontario Upper Risk Threshold ($\mu g/m^3$)
	Using Emission Limit (4kg/hr) as Model Input	Using Spring 2015 Stack Test Measured Emission as Model Input	Using Bleachplant CEMS Measured Emissions* as Model Input	Using Max Bleachplant CEMS Emission (6.3 kg/hr) as Model Input		
½-hour	177.9	34.4	24.5	257.7	**6**	**60**
24-hour	27.0	10.8	7.7	80.7	**2**	**24**

*using bleachplant CEMS measured emissions from April 01, 2014 to June 20, 2015
** as per O. Reg. 419/05, section 42, regulatory limit no longer applies to Pulp Mills

Averaging time	Maximum Predicted Ground Level **Cl_2** Concentration ($\mu g/m^3$)				Ontario Regulatory Limit ($\mu g/m^3$)**	Ontario Upper Risk Threshold ($\mu g/m^3$)
	Using Emission Limit (4kg/hr) as Model Input	Using Spring 2015 Stack Test Measured Emission as Model Input	Using Bleachplant CEMS Measured Emissions* as Model Input	Using Max Bleachplant CEMS Emission (2.59 kg/hr) as Model Input		
½-hour	177.9	56.3	24.5	106.3	**30**	**300**
24-hour	27	17.6	7.7	33.3	**10**	**100**

*using bleachplant CEMS measured emissions from April 1, 2014 to June 30, 2015
****** as per O. Reg. 419/05, section 42, regulatory limit no longer applies to Pulp Mills

Averaging time	Maximum Predicted Ground Level **$CHCl_3$** Concentration ($\mu g/m^3$)	Ontario regulatory Limit ($\mu g/m^3$)	Ontario Upper Risk Threshold ($\mu g/m^3$)
	Using Spring 2015 Stack Test Measured Emission as Model Input		
½-hour	3.6	**3**	**300**
24-hour	1.2	**1**	**100**

AV GROUP NB INC. also used the model to determine the maximum emission rate of each contaminant to be in compliance with the Ontario limits. The results are in the table below.

Contaminant	½-Hour Averaging Limit ($\mu g/m^3$)	Predicted Bleachplant Emission (kg/hr) to Achieve ½-Hour Limit	24-Hour Averaging Limit ($\mu g/m^3$)	Predicted Bleachplant Emission (kg/hr) to Achieve 24-Hour Limit
ClO_2	6	0.14	2	0.31
Cl_2	30	0.68	10	1.49
$CHCl_3$	3	0.07	1	0.14

Condition 26: Ambient Monitoring

AV GROUP NB INC. is required to operate two ambient SO_2 monitoring stations and a meteorological station at locations near the mill.

All sources of SO_2 emission in New Brunswick must operate within the limits for ground level ambient SO_2 prescribed in the *Air Quality Regulation*. SO_2, for any one-hour average, must not exceed 900 $\mu g/m^3$ (micrograms per cubic meter), the 24-hour average must not exceed 300 $\mu g/m^3$ and the annual average must not exceed 60 $\mu g/m^3$. For the purpose of demonstrating compliance with these standards, AV GROUP NB INC. operates ambient SO_2 monitors at locations near the mill. The Dairy Queen Station is located approximately 1000 meters east of the mill and the Boom Road station is located approximately 1000 meters west of the mill. Data from these stations are submitted to the Department on a monthly basis.

During the 5-year review period, there have been 8 exceedances of the 24-hour average limit. These exceedances have been linked to an unexpected failure or malfunction of equipment, therefore the Department determined that no further actions were deemed necessary.

The Table below shows the results from the SO_2 ambient monitoring stations during the 5-year review period.

YEAR	Beauvista (Dairy Queen)			Boom Road		
	1-hour violations	24-hour violations	Annual average ($\mu g/m^3$)	1-hour violations	24-hour violations	Annual average ($\mu g/m^3$)
2018	0	0	13.8	0	0	8.7
2017	0	0	23.7	0	0	9.9
2016	0	4	26.8	0	0	8.6
2015	0	4	15.6	0	0	5.0
2014	0	0	14.2	0	0	6.7

Condition 27: Annual Air Quality Report

AV GROUP NB INC. is required to provide to the Department an Annual Air Quality Report containing the information outlined in the Approval.

These reports have been submitted as required by the AV GROUP NB INC.

Condition 28: Monthly Air Quality Report

AV GROUP NB INC. is required to provide to the Department a Monthly Air Quality Report containing the information outlined in the Approval.

These reports have been submitted as required by the Approval.

Condition 27(l) and 28(e): Package Boiler

AV GROUP NB INC. is approved to operate the package boiler providing that the number of hours that the boiler operates each month is reported.

The package boiler is a “standby” unit and logs minimal operating hours. For that reason, no conditions have been set on its operation other than documenting the number of hours that it operates as shown below:

Year	Hours of Operation
2018	0
2017	0
2016	0
2015	0
2014	0

Condition 29: GHG Emissions Reporting

Beginning in 2016, AV GROUP NB INC. was to submit an annual GHG emission report to the Department by means of the SWIM System.

These reports have been submitted by AV GROUP NB INC. as required by the Approval.

Condition 30: Management of GHG Emissions

Prior to November 1st, 2016, AV GROUP NB INC. was to submit an GHG emission Management Plan in accordance to the Guidelines for Greenhouse Gas Management for Industrial Emitters in New Brunswick. Beginning in 2017, AV GROUP NB INC. was to submit an Annual GHG Progress Report to the Department.

Being that AV GROUP NB INC. emits less than 25,000 tonnes of CO_2e per year, they were exempt from submitting the GHG Management Plan and progress reports.

ENFORCEMENT ACTION:

The Department’s *Compliance and Enforcement Policy* outlines the actions that will be taken in situations of non-compliance with the Department’s Acts, Regulations and Approvals. A review of the file confirms that no enforcement actions were taken against AV GROUP NB INC. since the issuance of Approval to Operate I-8787 on January 1st, 2015.

PUBLIC OUTREACH

AV GROUP NB INC. has demonstrated its community involvement in numerous occasions in the past years. Recent projects include: 1) Funding to Ducks Unlimited for the Atholville Marsh Project, 2) Funding of the Tide Head Marsh Project where ponds were made for ducks because the marsh is drying out, 3) Scholarships for local schools and, 4) Maintenance of the Old Athol Cemetery on the AV GROUP NB INC. site (which is open to the public) to name a few.

AV GROUP NB INC. also sponsors various local athletic organizations, and participates in such programs as Curl for Cancer, Terry Fox Run and Heart & Stroke Foundation Big Bike Ride.

Furthermore, company representatives provide public education through the provision of speakers to local schools and local events.

CONTACT INFORMATION

For information about the AV GROUP NB INC. facility itself, its operation and environmental control equipment, etc., please contact:

Facility contact: Tina McCormack, P.Eng., MBA
SHE (Safety, Health & Environment) Manager
Tel: (506) 789-4363
Fax: (506) 789-4197
Email: tina.mccormack@avg.adityabirla.com

For further information on the AV GROUP NB INC. Air Quality Approval and how the Department deals with environmental issues related to the mill contact:

Central Office contact:

André Fortin, P.Eng.
Acting Senior Approvals Engineer
Authorizations Branch
Authorizations and Compliance Division
Department of Environment and Local Government
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Acting Regional Director
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For information about the Public Participation Process, or to relay comments or questions about the internet site, please contact:

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