

## **FACILITY PROFILE**

### **New Brunswick Power Generation Corporation for the Belledune Thermal Generating Station**

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### **BACKGROUND**

The New Brunswick Power Generation Corporation (NB Power) operates the Belledune Thermal Generating Station. The Province's newest electricity generating plant, commissioned in 1993, the Belledune Thermal Generating Station is located in the Village of Belledune, in northern New Brunswick. It was also the first electricity generating plant in Canada designed with a Flue Gas Desulphurization system (also referred to as a "scrubber"). The facility, the

second largest fossil fuel-fired generating station in New Brunswick, generates up to 490 megawatts of electricity from the combustion of pulverized coal as the primary fuel and petroleum coke as a blended supplemental fuel, in one large boiler.

As required under the *Air Quality Regulation – Clean Air Act* (reference 1), the station must conduct its operations according to conditions outlined in an Approval to Operate issued pursuant to that Regulation. The Approval to Operate specifies conditions that must be complied with in order to prevent unfavourable air quality conditions. Conditions in approvals are generally quite wide-ranging, and may include such requirements as limitations on operational parameters, requirements for testing and monitoring, requirements to operate air pollution control equipment, limits on emissions released to the atmosphere, provisions for equipment upgrade and/or maintenance, requirements for environmental emergency and/or compliance reporting, and a variety of other conditions aimed at minimizing the facility's impact on the environment. The Regulation provides for approvals to be issued by the Minister of the Environment for a specified period, not exceeding five years.

The Belledune Thermal Generating Station's Approval to Operate pursuant to the *Air Quality Regulation*, with identification number I-4631, expires on March 31, 2010. The *Public Participation Regulation – Clean Air Act* (reference 2) requires that a public participation process be conducted prior to the renewal of Approvals to Operate for large sources of emissions (termed "Class 1 sources"), including the Belledune Generating Station. This Facility Profile will provide background information on the operation of the Belledune Thermal Generating Station, including its design, air quality impacts, and compliance with its approval.

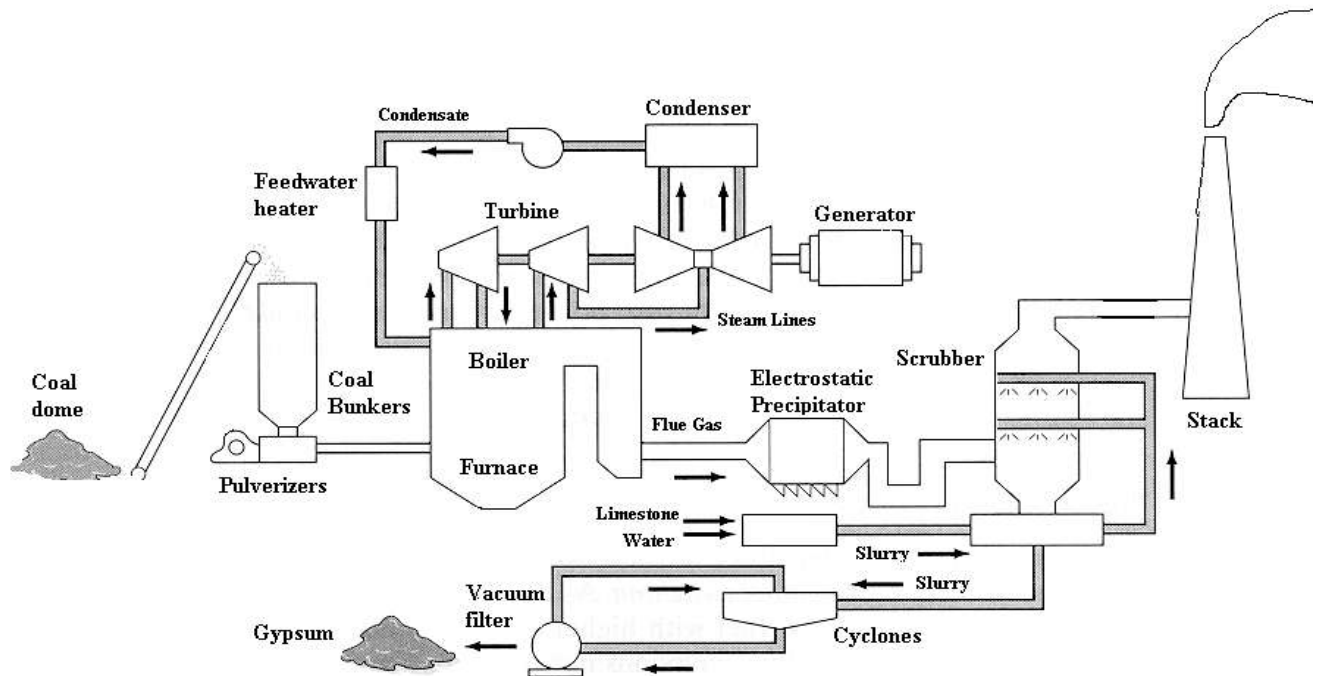
## **PLANT DESIGN**

The Belledune Thermal Generating Station is the second largest fossil fuel-fired generating station in New Brunswick with a total generating capacity of about 490 megawatts-electrical. The Belledune station is classified as a base-loaded station (as opposed to a peaking station, which operates only during peak power demands) and therefore operates virtually all the time under near full load conditions. The station consists of one steam generating boiler, referred to as Unit 2, and is fuelled by imported coal blended with petroleum coke as a supplemental fuel.

### **Process Description**

Figure 1 presents a schematic of the thermal power generation process used at the Belledune Thermal Generating Station, including the combustion process, steam and power cycle, and air pollution control equipment.

Figure 1: Belledune Thermal Generating Station process (reference 3)



In the thermal electricity generation process used at this facility, steam is generated by the combustion of imported coal blended with petroleum coke. Imported coal is unloaded from ships arriving at the Port of Belledune using a continuous ship unloader, which removes coal at a rate of 1750 tonnes per hour. The coal is then conveyed via an enclosed conveyor system to a fully enclosed coal dome located on the facility's site. Reserve coal is also stored outside the dome in a storage pile. The coal dome is 42 metres high and 139 metres in diameter, and has a capacity to store approximately 120,000 tonnes of coal, enough to operate the plant for a month. The coal is spread inside the coal dome by a mechanical spreader/reclaimer, and is eventually fed via enclosed conveyor belts to coal bunkers. From the coalbunkers, coal is sent to pulverizers where it is ground into a fine powder and finally combusted in the boiler.

In the combustion process, the pulverized coal is injected into the boiler where it is mixed with air under high temperature conditions. The coal and air undergo a chemical reaction, which results in the burning of the coal, thereby releasing large amounts of heat. Heat from the combustion reaction is transferred through the boiler tube walls to water flowing within the boiler tubes, which causes the water to boil off to generate steam. The steam is superheated in the upper section of the boiler, and is then directed to a turbine, which rotates from the heat energy of the steam. The rotating motion of the turbine drives a generator, which converts the mechanical energy into electricity for the New Brunswick electrical grid. The steam is then condensed and reused in the process.

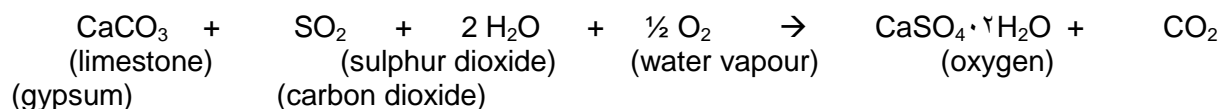
The remainder of the process equipment at the station deals with the environmental control of contaminants generated from the combustion of coal. The combustion reaction generates exhaust gases from the burning of the carbon and volatiles in the coal. The exhaust gases generally consist of solid particles (referred to as "particulate matter") and combustion gases (such as sulphur dioxide, nitrogen oxides, carbon monoxide, carbon dioxide, air, and water vapour). This air pollution control equipment is discussed below.

## Air Pollution Control Equipment

The Belledune Thermal Generating Station is equipped with some of the most modern air pollution control equipment in existence today, considered to be the “best available control technology” for particulate matter and sulphur dioxide. The facility was the first in Canada to be built in accordance with the federal performance standard for power plants that existed at the time of construction, entitled *Thermal Power Generation Emissions – National Guidelines for New Stationary Sources* (reference 4), published under the *Canadian Environmental Protection Act*. This guideline established emission limits for particulate matter, sulphur dioxide, and nitrogen oxides; required continuous monitoring of emissions; required utilities to be able to achieve 90% removal of sulphur dioxide created in their process; and required regular emissions testing to ensure compliance.

In the furnace, low-NO<sub>x</sub> burners are in place to increase the efficiency of the combustion, thereby reducing the generation of nitrogen oxides (NO<sub>x</sub>). The flue gases from the boiler are then directed to an electrostatic precipitator, which removes the particulate matter generated from the combustion by electrically charging the particles with an electric current, and collecting the energized particles. The electrostatic precipitator is designed to remove 99.5% of the particles passing through it.

Once the solid particles are removed from the flue gases, the gases are directed to a Flue Gas Desulphurization (FGD) system, which is commonly referred to as a scrubber. The scrubber is designed to remove more than 90% of the sulphur dioxide in the flue gases from blended coals with up to 2.9% sulphur, and also to achieve some removal of nitrogen oxides as well as fine particulate matter not removed in the electrostatic precipitator. In the scrubber, the sulphur dioxide reacts with limestone (CaCO<sub>3</sub>) and water to produce gypsum (CaSO<sub>4</sub>·½H<sub>2</sub>O), which is sold as a by-product, thereby reducing the concentration of sulphur dioxide emitted to the atmosphere to less than 100 parts per million (ppm). The chemical reaction is as follows (3):



The scrubbed flue gases are then released to the atmosphere via a stack with a height of 168 meters (551 feet) above ground level. Continuous emission monitors in the stack monitor the levels of sulphur dioxide, carbon dioxide and nitrogen oxides being emitted. The opacity (that is, the darkness) of the plume is also continuously monitored in the ducts following the electrostatic precipitator and before the scrubber.

## Operational Procedures

The station carries out a daily air quality prediction program using what is called a Supplementary Control System (SCS). This program enables plant operators to determine the station’s maximum contribution to ambient levels of contaminants for every hour over a 24-hour period.

The SCS consists of a sophisticated, site-specific air quality dispersion model. The SCS inputs include data on the temperature profile of the atmosphere, the hour-by-hour weather forecast from Environment Canada, the hour-by-hour load forecast for the station, and data from the

most recent fuel analysis. The model then calculates the maximum expected ground-level concentration of sulphur dioxide from the facility for each hour of the day. If an exceedance of ambient air quality standards were predicted, the station would not operate at the given load/emissions forecast, in order to prevent an exceedance. Instead, the model would be run again with a reduced load/emissions forecast until an acceptable air quality impact were obtained, and the facility would operate at that particular load for the given hour(s) of the day. Thus, the facility operates a proactive sulphur dioxide response program, and in effect is always operating in a manner, which should prevent ambient air quality exceedances.

## **Continuous and Ambient Monitoring**

All NB Power plants, including Belledune, have continuous emission monitoring systems (CEMs) in place to continuously measure emission levels to the atmosphere, which places them in a unique position in the Canadian utility industry. At Belledune, emissions of sulphur dioxide (SO<sub>2</sub>), carbon dioxide (CO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>) and opacity are monitored by continuous emission monitors. These monitors allow NB Power to measure emission rates of these pollutants continuously, and to adjust operating parameters when contaminant levels would indicate a potential emission problem.

In addition, the station operates an ambient air quality monitoring network in the surrounding area to continuously monitor the ground-level concentrations of SO<sub>2</sub>, NO<sub>x</sub> and fine particulate matter (PM<sub>2.5</sub>) in ambient air. The network consists of five air quality monitoring stations located in Madran, Pointe Verte, Belledune East, Municipal Hall, and Jacquet River, with SO<sub>2</sub> monitors at each of these five locations. NO<sub>x</sub> and PM<sub>2.5</sub> monitors are located at Belledune East and Municipal Hall. In addition, NB Power operates three PM<sub>10</sub> monitors. Two of these PM<sub>10</sub> monitors are located on the station property and one is a mobile unit. If station emissions or atmospheric conditions result in elevated concentrations of either sulphur dioxide or nitrogen oxides to more than one-half of the provincial ambient air quality standard for each parameter, the station will reduce its generating load (and therefore its emissions) in order to prevent an exceedance of the standard.

NB Power also assists the Department of Environment with the operation of three acid deposition monitoring stations within a radius of 120 kilometres of the facility, in order to monitor deposition levels of wet sulphate, wet nitrate, and acidity in the area. These stations are located at Petit Paquetville, Roberville, and St. Maure.

## **Pollution Prevention Initiatives**

The concept of pollution prevention is strongly supported by regulatory agencies worldwide as an effective strategy for protection and enhancement of the environment. Pollution prevention aims to reduce and minimize the formation of environmental contaminants through a number of operational changes, rather than to attempt to control the emission of such contaminants after they have been generated. Pollution prevention offers the added advantage of reducing emissions of several pollutants at once, rather than adding expensive air pollution control equipment, which is generally designed to control emissions of only one particular contaminant.

Several pollution prevention initiatives have been implemented at the Belledune station. Pollution prevention measures aimed at minimizing air quality impacts from the station include the Supplementary Control System (SCS) as described above, the presence of dry low-NOx

burners in the furnace, and the use of relatively low sulphur offshore coal (1-2% sulphur by weight). Other pollution prevention initiatives at the station include the sale of gypsum by-product from the scrubber for use in the production of wallboard, and the sale of fly ash from the boiler for use in the construction industry as a concrete additive. The sale of such by-products is beneficial, as they would otherwise be disposed of in an engineered landfill.

The introduction of environmental management system (EMS) standards such as ISO 14000 offers significant promise in the advancement of the pollution prevention concept. NB Power began its implementation of an EMS consistent with the ISO 14000 standard at the Belledune Generating Station in 1998.

## **POTENTIAL AIR QUALITY IMPACTS**

Studies conducted before the construction of the Belledune Thermal Generating Station have revealed that the facility was not expected to have a significant impact on ambient air quality in northern New Brunswick (references 5 and 6). Historical data from several monitoring stations operated in the area has shown that the station has not significantly increased concentrations of sulphur dioxide or other contaminants.

### **Ambient Air Quality Impacts**

The station operates five ambient air monitoring stations near the site, located in Madran, Pointe Verte, Belledune East, Municipal Hall, and Jacquet River. Each of these monitoring stations continuously monitors sulphur dioxide levels in the airshed, while two monitoring stations (Belledune East and Municipal Hall) also monitor nitrogen oxides and fine particulate matter concentrations. A nearby meteorological tower provides continuous readings of weather conditions near the plant, including ambient temperature, wind speed, wind direction and barometric pressure. Data collected by these monitors since the commissioning of the plant have not revealed any appreciable concentrations of sulphur dioxide or nitrogen oxides. Occasional excursions have been noted for sulphur dioxide, but these are generally short-lived and rarely cause an exceedance of the ambient air quality standards. These monitors detect the integrated concentrations from background and regional and local sources in the area. With most of the contaminants removed at the station by modern pollution control devices, the station is not likely to be an important contributor to these excursions.

NB Power also assists the Department of Environment with the operation of three acid deposition monitoring stations within a 120-kilometre radius of the facility, located in Petit Paquetville, Robertville, and St. Maure. A review of acid deposition monitoring data collected over the last decade shows a general downward trend in acid deposition in northern New Brunswick.

As a result of data gathered over ten years of operation of the station, it has been determined that emissions from the Belledune station rarely impact northern New Brunswick, and they are also unlikely to impact other locations due to a high stack, use of modern air pollution control equipment, and favourable atmospheric dispersion conditions from the station.

### **Sulphur Dioxide Emissions**

Table 1 summarizes the historical sulphur dioxide emissions from NB Power in total and for Belledune specifically, for the past ten years.

**Table 1: Historical Sulphur Dioxide (SO<sub>2</sub>) Emissions from NB Power Total and Belledune**

Year	NB Power Total SO <sub>2</sub> Emissions (tonnes per year)	Belledune SO <sub>2</sub> Emissions (tonnes per year)
1994	85,600	2,200
1995	67,300	2,700
1996	51,600	2,700
1997	85,000	2,800
1998	99,100	2,200
1999	84,100	3,430
2000	97,300	2,850
2001	110,400	2,600
2002	83,110	2,070
2003	72,030	2,070
2004	70,500	2,730
2005	52,600	5,170
2006	27,900	5,590
2007	33,400	5,120
2008	21,800	5,630

The SO<sub>2</sub> emissions from NB Power, as a whole, follow a downward trend. The Flue Gas Desulphurization (FGD) unit is an effective emissions control device, considering that the Belledune station is the second largest fossil fuel-fired generating station in New Brunswick.

The station is required to comply with emission limits specified in its Approval to Operate, which are consistent with the federal performance standard for power plants that existed at the time of construction; the *Thermal Power Generation Emissions – National Guidelines for New Stationary Sources* (reference 4). For sulphur dioxide, the Approval specifies that the emission rate of SO<sub>2</sub> must be less than 258 nanograms per Joule of heat input to the boiler as measured by a 720-hour rolling average and a target of 400 nanograms per Joule of heat input to the boiler as an hourly average. These limits are considered to be stringent. The station consistently meets these limits as a result of the scrubber operation.

### **Nitrogen Oxides Emissions**

Nitrogen oxides are formed in any combustion process from the dissociation of nitrogen in the air (termed “thermal NO<sub>x</sub>”) and from the nitrogen content of the fuel (termed “fuel NO<sub>x</sub>”). In almost every case, thermal NO<sub>x</sub> is dominant since the nitrogen content of fossil fuel is relatively low. Once emitted into the atmosphere, nitrogen oxides participate in a secondary chemical reaction with volatile organic compounds in the presence of sunlight to form ground-level ozone, the major component of photochemical smog. Ground-level ozone is generally not problematic in northern New Brunswick. It is widely known that, in general, the ground-level ozone experienced in New Brunswick originates from the long-range transport of pollutants from the eastern United States and central Canada. Nitrogen oxides may also combine with water



vapour in the atmosphere to form wet nitrate, which is later deposited at ground level and may cause acidification.

Table 2 summarizes the nitrogen oxide emissions from Belledune and the total NB Power network since 1994.

**Table 2: Historical Emissions of Nitrogen Oxides (NO<sub>x</sub>) from NB Power Total and Belledune**

Year	NB Power Total NO <sub>x</sub> Emissions (tonnes per year as NO <sub>2</sub> )	Belledune NO <sub>x</sub> Emissions (tonnes per year as NO <sub>2</sub> )
1994	17,070	5,200
1995	16,560	6,100
1996	12,033	5,600
1997	20,050	5,100
1998	27,260	5,450
1999	22,457	5,870
2000	25,765	6,019
2001	29,260	6,060
2002	22,360	5,730
2003	24,160	6,560
2004	20,005	6,230
2005	16,059	5,820
2006	10,910	6,070
2007	13,484	7,200
2008	12,332	7,300

NO<sub>x</sub> emissions from Belledune vary slightly from year to year, but they have historically ranged from 5,000 to 7,500 tonnes per year. Belledune's Approval to Operate limits NO<sub>x</sub> emissions on an ongoing basis to 258 nanograms per Joule of heat input to the boiler as measured by a 720-hour rolling average, with a target of having no hourly average greater than 400 nanograms per Joule of heat input. These limits have not been exceeded since the station was commissioned.

### **Particulate Matter Emissions**

Particulate matter forms in a combustion process from the incomplete combustion of fuel, as well as from various impurities that may be contained in the fuel such as trace metals. Particulate matter is significant mainly from a nuisance point of view, where particles ("soot") may deposit on neighbouring properties. However, fine particulate matter is causing increasing concern due to the potential health effects of inhaling such fine particles, which can become lodged inside the human lung.

At the Belledune station, particulate matter emissions are controlled using an electrostatic precipitator that is designed to achieve up to 99.5% removal. Historical particulate emissions at the facility have ranged between 60 and 690 tonnes of particulate per year, which is a relatively low amount given the size of the facility.

Table 3 summarizes the particulate matter oxide emissions from Belledune and the total NB Power network since 1994.

**Table 3: Historical Emissions of Particulate Matter from NB Power Total and Belledune**

Year	NB Power Total PM Emissions (tonnes per year)	Belledune PM Emissions (tonnes per year)
1994	1,166	310
1995	786	140
1996	672	140
1997	1,031	180
1998	1,045	100
1999	1,114	200
2000	1,266	60
2001	2,057	180
2002	1,570	148
2003	920	150
2004	850	90
2005	2,152	690
2006	447	76
2007	367	75
2008	728	378

The facility's Approval to Operate specifies a particulate matter limit of 160 milligrams of particulate per cubic metre of air (under standard conditions of 25°C and 101.3 kilopascals and corrected to 3% oxygen). This is the same limit as established in the *Thermal Power Generation Emissions – National Guidelines for New Stationary Sources* (reference 4). Based on source testing conducted on an annual basis, particulate emissions have been demonstrated to be well within that limit. For example, source testing conducted in 2004, 2005, 2006, 2007 and 2008 revealed particulate concentrations of 7.7, 52.1, 7.21, 6.2 and 33.1 milligrams per cubic metre, respectively. Therefore, the station is not a significant contributor to particulate matter emissions.

### Impact on Climate Change

In June 2007, the Province of New Brunswick released the *New Brunswick Climate Change Action Plan* (reference 7). As a result of the New Brunswick-led initiatives in the plan, the target is to reduce annual greenhouse gas (GHG) emissions in the province by 5.5 megatonnes (Mt) by 2012. With the addition of federal initiatives, GHG emissions are anticipated to be reduced to 1990 levels by 2012.

NB Power plays a role in achieving the reduction targets established in the New Brunswick Climate Change Action Plan and is taking measures to reduce GHG emissions:

- NB Power has committed to at least 400 megawatts of electricity generation to come from renewable resources, such as wind power, by the year 2016. This will displace some of the electricity that is currently produced from the use of GHG-generating fossil fuels.

- In 2007, NB Power acquired additional renewable energy through the purchase of the Nepisiguit Falls Hydro Generating Station, located south of Bathurst on the Nepisiguit River, which has a capacity of 10.8 megawatts (reference 8). NB Power currently owns and operates six other hydro generating stations as well.
- NB Power is currently refurbishing the Point Lepreau Nuclear Generating Station to extend the useful life of this nuclear power plant. This will result in incremental, real and quantifiable GHG emission reductions extending for 25 years. The operation of the 635 megawatt Point Lepreau Nuclear Generating Station avoids emissions of more than three million tonnes of GHGs annually.
- With the reduced operation of the Coleson Cove Generating Station in recent years, GHG emissions from this facility have been reduced from more than three million tonnes per year to approximately one million tonnes per year.

### **Impact on Acid Deposition**

Emissions of sulphur oxides, nitrogen oxides and other acid gases, when combined with water vapour in air, can contribute to the formation of acid deposition. It has been estimated in studies conducted in 1991 and 1993 that approximately 80 to 85% of wet sulphate deposition and 98% of wet nitrate deposition experienced in our region are the result of long-range transport of pollutants from areas outside New Brunswick.

Three wet deposition monitoring stations have been operating in the area near the Belledune Thermal Generating Station since 1991. These were installed to assess any changes that may occur from the operation of the power plant. Given the use of low sulphur offshore coal and the presence of a Flue Gas Desulphurization system at the station, the impact on acid deposition is minimal.

### **ENVIRONMENTAL COMPLIANCE**

The Belledune Thermal Generating Station operates under terms and conditions established in its Approval to Operate, issued pursuant to Section 3 of the *Air Quality Regulation – Clean Air Act*. Conditions are aimed at ensuring that the station’s environmental impact during its day-to-day operations does not adversely affect air quality in surrounding areas, as well as regionally and globally. Compliance with the conditions of approval is mandatory, and any violations may be subject to enforcement measures as described in the Department of the Environment’s *Compliance and Enforcement Policy* (reference 9).

### **Summary of Requirements of the Approval to Operate**

The main conditions of the Approval to Operate for the Belledune Thermal Generating Station can be summarized as follows:

1. Limit the rate of discharge of particulate matter from the stack to less than 160 milligrams per cubic metre of flue gas (at standard conditions and corrected to 3% oxygen).

2. Limit the rate of discharge of nitrogen oxides from the stack to less than 258 nanograms per Joule of heat input to the boiler based on a 720-hour rolling average, and the hourly average not exceeding 400 nanograms per Joule of heat input to the boiler.
3. Limit the rate of discharge of sulphur dioxide from the stack to less than 258 nanograms per Joule of heat input to the boiler based on a 720-hour rolling average, and the hourly average not exceeding 400 nanograms per Joule of heat input to the boiler.
4. Ensure that the facility's contribution to ambient ground-level concentrations of sulphur dioxide does not exceed 450 micrograms per cubic metre (170 ppb) on a one-hour basis, 150 micrograms per cubic metre (57 ppb) on a 24-hour basis, or 30 micrograms per cubic metre (11 ppb) on an annual basis. As well, the facility was not to cause an exceedance of the ambient air quality standards in Schedule B of the *Air Quality Regulation*.
5. Minimize fugitive dust by paving roads or spraying roads with approved dust suppressants to ensure that the ambient concentration of particulate matter does not exceed the maximum permissible ground level concentration of suspended particulate beyond the property boundaries.
6. Operate a continuous emission monitoring (CEM) system to continuously measure the rates of discharge of sulphur dioxide and nitrogen oxides from the stack, and to maintain records of such measurements.
7. Perform stack sampling of the flue gases on an annual basis to determine the emission rate of sulphur dioxide, nitrogen oxides, and particulate matter using approved methodology, and to provide a report of such measurements to the Department of Environment.
8. Operate an ambient air quality monitoring network in the area of the facility with at least five fixed SO<sub>2</sub> monitors, two NO<sub>x</sub> monitors and two PM<sub>2.5</sub> monitors, capable of continuous feedback to the facility.
9. Submit a quarterly report on the operation of the facility, to include details of any upsets or abnormal conditions, any violations of the emission limits for sulphur dioxide and nitrogen oxides, and to provide all quality-assured CEM data.
10. Submit an annual report on the quantities and quality of any fuel burned each year, along with the calculated emission rates of sulphur dioxide, nitrogen oxides, particulate matter, and carbon dioxide.
11. Submit a detailed annual report on the operation of the facility, to include summary information on any violations, the annual capacity factor, and a summary on the operation of the ambient air, CEM and acid deposition monitoring systems.

### **Compliance with Conditions of Approval**

All conditions of the Approval to Operate I-4631 have been met to date since the issuance of the Approval on April 1, 2005. In accordance with the main conditions of Approval listed above, the following is a summary of the facility's compliance with these conditions over the calendar years 2004 through 2008:

1. Stack sampling of the flue gases was performed each year, and the results have shown that the emission rate of particulate matter is well below the limit of 160 mg/m<sup>3</sup>.
2. The emission limits for nitrogen oxides were not exceeded for either the hourly average or the 720-hour rolling average during the calendar years 2004 through 2008.
3. The emission limits for sulphur dioxide were not exceeded for either the hourly average or the 720-hour rolling average during the calendar years 2004 through 2008.
4. During the calendar years 2004 through 2008, there were few exceedances of the ambient air quality control limits and of the ambient air quality standards as detailed in Schedule B of the *Air Quality Regulation*. All of the observed exceedances either occurred while the station was not operating or when it was operating with the flue gas desulphurization system in service, which would indicate another possible source. The following summarizes the exceedances observed during the calendar years 2004 through 2008:

Type of exceedance	2004	2005	2006	2007	2008
Hourly SO <sub>2</sub> average greater than 450 µg/m <sup>3</sup> (172 ppb) ambient control limit	18	20	10	6	1
Hourly SO <sub>2</sub> average greater than 900 µg/m <sup>3</sup> (344 ppb) ambient standard	0	3	2	0	0
24-hour SO <sub>2</sub> average greater than 150 µg/m <sup>3</sup> (57 ppb) ambient control limit	0	11	0	0	0
24-hour SO <sub>2</sub> average greater than 300 µg/m <sup>3</sup> (114 ppb) ambient standard	0	0	0	0	0
Annual SO <sub>2</sub> average greater than 30 µg/m <sup>3</sup> (11 ppb) ambient control limit	0	0	0	0	0
Annual SO <sub>2</sub> average greater than 60 µg/m <sup>3</sup> (23 ppb) ambient standard	0	0	0	0	0

5. Much of the site has been paved, and water sprays are used under extremely dry conditions. There have been no measured events where the ambient concentration of particulate matter exceeded the maximum permissible ground level concentration of suspended particulate beyond the property boundaries.
6. Continuous emission monitoring systems for sulphur dioxide and nitrogen oxides were operated continuously throughout the period of the approval, with greater than 96% reliability. CEM systems were verified quarterly and annually according to the Environment Canada protocol.

7. Stack sampling for particulate matter, sulphur dioxide and nitrogen oxides was conducted annually by qualified personnel and the results were reported to Department of Environment.
8. Five ambient SO<sub>2</sub> monitors were in operation throughout the period of the approval, except during periods of calibration and regular maintenance, which were generally short-lived. There has been no reliability problems observed with the monitors. In addition, two NO<sub>x</sub> monitors and two PM<sub>2.5</sub> monitors were operated. All monitors have a continuous feedback to the station's control room and readings are monitored by plant operators.
9. Quarterly reports have been submitted on time and were complete.
10. Annual fuel consumption and fuel quality reports have been submitted on time and were complete, in addition to calculated emission rates of sulphur dioxide, nitrogen oxides, particulate matter, and carbon dioxide.
11. Detailed annual reports have been submitted on time and were complete.

## **Enforcement**

Enforcement options used by the Department of the Environment are outlined in the Department's *Compliance and Enforcement Policy* (reference 9). 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, either 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.

Since initial start-up of the plant in 1993, there has been no air quality-related warnings or orders issued to the Belledune Thermal Generating Station. In addition, no prosecutions have taken place in regard to air quality matters.

## **PUBLIC OUTREACH**

NB Power's position on public outreach is that in order to foster positive community relations, and as an accountability measure with New Brunswick ratepayers, it has an open-door policy regarding all of its facilities including Belledune, whereby any member of the public or interested party wishing to obtain further information about the operation of its generating facilities may contact NB Power during regular business hours. The agency may also make arrangements for a tour of the facility or other community interaction as appropriate.

In late 2007, NB Power established a Community Relations Committee in Belledune to work with their neighbours and inform them of what is happening at the Belledune Generating Station. This committee also provides a forum for the community to engage NB Power about any concerns they may regarding the operation of the power plant.

NB Power makes available information on its generating facilities through the annual publication of an "Environmental Performance Report", which is available to any member of the public upon

request. The Corporation also maintains an Internet web site, which provides information about electricity, generation facilities, environmental performance, and a variety of other issues.

## **CONTACT INFORMATION**

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