

**ENVIRONMENTAL IMPACT ASSESSMENT REPORT**

**FUNDY REGION SANITARY LANDFILL**

Summary prepared by:

Department of the Environment

Province of New Brunswick

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## INTRODUCTION

The Fundy Solid Waste Action Team (Fundy SWAT) proposes to construct a regional sanitary landfill to serve the Fundy region. An Environmental Impact Assessment (EIA) has now been completed by Neill and Gunter Ltd. on behalf of Fundy SWAT.

The report describes the existing environment at two sites being considered for a landfill to serve the Fundy region. Those sites are Crane Mountain and Paddy's Hill. The report also outlines the operating plan for the proposed facility, and predicts the impacts which would be associated with the project, should Fundy SWAT receive provincial approval to proceed.

The EIA Report was prepared, as required, under the *Environmental Impact Assessment Regulation* administered by the Department of Environment. All regional waste management proposals in New Brunswick are subject to the EIA requirement.

The assessment process requires the project proponents to first submit its EIA report for review by a technical committee representing concerned provincial, municipal and federal agencies. This is followed by a public consultation program conducted by the Department of Environment. A final decision on the future of the project rests with the New Brunswick Government and will not be made until the technical review and public consultation process are complete.

The EIA Report has been reviewed by the following:

New Brunswick Department of Environment  
New Brunswick Department of Natural Resources and Energy  
New Brunswick Department of Health and Community Services  
New Brunswick Department of Transportation  
New Brunswick Department of Municipalities, Culture and Housing  
Environment Canada  
Fisheries and Oceans Canada  
City of Saint John  
New Brunswick Museum

Representatives from these agencies participated in an interdepartmental Review Committee. This group was responsible for examining the EIA documentation from a scientific and technical perspective. The attached Review Statement represents the overall response of the Review Committee to the EIA Report.

The complete EIA Report is more than 350 pages long and contains extensive, detailed technical information, maps and tables. This summary has been prepared by the Department of Environment to assist the public in understanding the main points of the document. For those interested in studying the full Report, it is available for review at the locations indicated below:

Grand Bay Town Office, 77 River Valley Dr., Grand Bay; Lorneville Convenience and Take-out, 600 King William Rd.; Saint John Free Public Library, 1 Market Square; West Branch Public Library, 621 Fairville Blvd.; Fundy SWAT, 33 Hanover St. Building B, Unit 8; Department of Environment, 439 Prince St. West, Suite 2077; and the Department of Environment in Fredericton, 364 Argyle St.

Further information about the EIA documentation and the related public consultation program is available by contacting the Department of Environment in Saint John at 658-2558, or Fredericton at 453-3700 (collect).

### Background

On Dec. 9, 1993, Fundy SWAT registered a project, under Regulation 87-83 of the Clean Environment Act of New Brunswick, to construct a containment landfill at one of two sites (Crane Mountain and Paddy's Hill) in the region to receive municipal solid waste. Background information submitted in support of the registration included numerous waste audits and assessments, site selection studies and conceptual designs.

Upon review of the registration documents, the Minister of the Environment notified Fundy SWAT that a full environmental impact assessment (EIA) would be required. Draft guidelines for assessment were issued by the New Brunswick Department of the Environment on Feb. 2, 1994. After a public review period, final guidelines were issued April 6, 1994.

## ETA Process\Site Selection

A series of studies were undertaken by Fundy SWAT beginning in 1990 to find a suitable site for a regional sanitary landfill. Fundy SWAT identified 157 potential landfill sites using Department of Environment siting guidelines. The number of sites was reduced by looking at their size and location, adopting more restrictive criteria, looking at transportation and economic factors, conducting field investigations, and inferring soil and bedrock conditions. The 157 sites were eventually reduced to two sites, Crane Mountain and Paddy's Hill.

## Project Rationale and Alternatives

The report states that Approximately 114,403 tonnes of municipal solid waste would be handled by the proposed facility annually. Even assuming no increase in per capita waste generation, this amount is predicted to grow to 145,627 tonnes by the year 2016 due to population increase and economic growth.

The existing Spruce Lake landfill, which serves the City of Saint John, is nearing capacity. None of the municipal and rural disposal sites in the region are designed to modern environmental standards and many of them are experiencing environmental problems.

Fundy SWAT's proposed landfill facility would serve the region for a minimum of 25 years. Some aspects of the strategy, including waste reduction and recycling, are still being examined. Waste collection would be provided to all residents of the region on behalf of the commission which would operate the Fundy region facility.

The landfill site would serve an estimated 40,162 households in 11 municipalities and nine local service districts. The municipalities are Westfield, Grand Bay, Saint John, Renforth, East Riverside - Kingshurst, Rothesay, Fairvale, Quispamsis, Gondola Point, Hampton, and St. Martins. The local service districts are Greenwich, Westfield West, Musquash, Simonds, Fairfield, St. Martins, Rothesay, Nauwigewauk, and Kingston.

The report states that in the short term, the alternative to the project would likely be extending the life of existing sites, thereby creating additional environmental problems at these sites.

Some areas of New Brunswick have been able to transport their waste to a facility in an adjacent region. The EIA report states it is unlikely that this will be possible given the amount of waste generated in the Fundy region. The report also says that associated transportation costs would make this a strategic impossibility.

Fundy SWAT examined several options, some of which include combining a solid waste management system with a maximized recycling facility. These options are still under study.

## **SITE OPERATIONS**

### **Disposal Cells**

Disposal cells are where most of the incoming residential and industrial, commercial and institutional waste would be deposited. The landfill area would be divided into a number of cells, each designed to accommodate waste for a finite period — two to three years for each cell as part of the initial construction phase.

Cell sizes would be determined through consideration of a number of factors, including sediment control, leachate management, site appearance, cost and weather conditions. Leachate is contaminated liquid generated at sanitary landfills as a result of precipitation percolating down through the waste deposits.

To ensure proper control on each operating day, the incoming waste would be deposited in a confined area, and compacted with a mobile waste compactor.

The daily working area would be about 300 to 400 m<sup>2</sup>. Department of Environment regulations require that all waste be covered with a minimum of 15 centimetres of clean fill at the end of each operating day. If available, cover material is obtained as a result of earthworks on site, but, if necessary, it would be trucked in from borrow pits in the vicinity of the landfill.

A variety of non-hazardous wastes would be handled by the landfill. These would only be accepted with the approval of the Department of Environment and in consultation with the landfill site commission. The solid waste commission would work with City of Saint John officials to determine whether the site would accept sanitary sewage sludges generated from various sewage treatment processes and domestic septic waste systems.

The report states that the commission also plans to handle petroleum waste by constructing a petroleum storage tank on site. A petroleum storage tank would accept incoming oil, which would later be picked up by waste oil recyclers. There are also plans to have the capability of accepting scrap metal for later sale to a scrap metal processing plant.

In the initial construction phase, and as disposal cells are added, soils would be disturbed, resulting in runoff of silt during rainfall events. To prevent the discharge of sediment to nearby streams, storm water would be collected and diverted to sedimentation ponds for treatment. Effluent from sedimentation ponds would be monitored regularly.

Due to the importance of protecting the groundwater resources in the vicinity of the sites, an extensive groundwater monitoring system will be installed. Wells will be located to provide monitoring of background water quality uphill of the waste disposal area, as well as downhill from it.

### Other Amenities at the Operating Facility

Weigh scales would be placed at the entrance of the landfill site. Vehicles hauling waste to the site would be weighed upon entering, and again as they leave, the difference being recorded as the amount of waste deposited. Computerized records will be kept of the waste loadings arriving from the various sources of the region. Users would be charged a "tipping fee" for the waste they bring to the site.

An administration building would be located at the landfill to ensure control over the day-to-day operations. Several bays would be provided for storage and maintenance of heavy equipment, pumps, etc... A separate access road would be constructed for moving the equipment from the disposal cells to the administration building.

Separate segregation compounds would be established to recover and separate construction and demolition material, waste tires, scrap and waste oil. Gates and barriers will provide site security and limit access to the site. Access to the disposal cells would not be permitted without first checking in at the administration area.



## EXISTING ENVIRONMENT

### Crane Mountain

The proposed Crane Mountain site is located approximately three kilometres south-southwest of Martinon and just west of Route 7 and its junction with Route 177. The area is in the eastern part of the Musquash lowlands (see attached map). The site area, including a buffer zone, consists of 160 hectares.

Forests at the high ground consists of mixed hard and softwoods, dominated by red maple, yellow birch and balsam fir with white cedar, white birch and red spruce. The low ground is swamp forest, alder thicket and bog. The western upland portion of the site was logged in 1993-94.

Crane Mountain is located primarily within a single drainage basin, and includes an unnamed stream which flows eastward and empties into Grand Bay at Martinon Beach.

On-site surface water is collected by a few small drainage courses which flow eastward and are intersected by the ditch along Route 7. Water from the northwest-southwest area collects in a boggy area 50 to 100 metres wide. Southward flowing ditch water from the northern portion of the site is conducted under Route 7 via a large culvert.

### Paddy's Hill

The Paddy's Hill site is located one kilometre south of Route 1 and three kilometres northwest of the community of Lorneville in the middle of a 30 square kilometre diamond-shaped headland. The headland is bounded to the north and south respectively, by the elongated Spruce Lake, by the Bay of Fundy shore, and to the west and east by Musquash and Lorneville Harbours. The site area, including the buffer, is 105 hectares.

The site consists of a series of dry ridges interspersed with alder and swamp forest bottoms with slow draining streams. The upland is dominated by balsam fir with few red and white spruce, white pine and larch. The site shows heavy budworm damage over the entire area, except at cedar stands, sphagnum bogs and the grass marsh along Burchills Brook.

Site surface water is collected by a few small drainage courses which flow eastward and are intersected by a ditch along Route 17. In the southern central portions of the site, the eastward flowing surface water collects in a flat northwest-southeast boggy area which is 50 to 100 metres wide, and 550 metres long.

### Zoning

About 70 per cent of the proposed Crane Mountain site area is currently designated as "rural" on municipal plans for the City of Saint John. The remaining 30 per cent falls under a "park" zone. As a result, this site would require rezoning to "heavy industrial" before a regional sanitary landfill could be permitted here.

Unlike Paddy's Hill, the Crane Mountain site is located on, and surrounded by, privately owned land. The Department of Supply and Services has taken options on some 247 hectares of land which surround the proposed site.

The Paddy's Hill site is located in the centre of a large area that is designated on the municipal and zoning maps as "Industrial Park". A landfill would not require rezoning, but the City of Saint John could attach conditions at the time the site development plan is submitted. The land was expropriated in the 1970's by the Province of New Brunswick in anticipation of industrial growth which has not occurred in Saint John or in the Lorneville area.

### Proximity of Residential Dwellings

One apartment building is located approximately 1.3 kilometres south of the Crane Mountain site. Some summer cottages are about the same distance southeast of the proposed site. The area within a two kilometre radius of the site is largely undeveloped woodland.

The Paddy's Hill site is approximately 2.3 kilometres from the nearest residential development, which is located along the northeastern end of the Lorneville Road.

## **PUBLIC PERCEPTIONS**

The EIA Report states that despite an extensive public consultation process, residents in communities neighbouring both sites, particularly Martinon and Lorneville, have a prevailing negative attitude towards the proposal. The report states initial attitudes of Lorneville residents were understandable, because they have seen much of the land around them expropriated for industrial development and there have been numerous environmental problems resulting from the landfill site at Spruce Lake.

The report also states it recognizes there is an on-going need for open and direct communication between Fundy SWAT and the local area residents in order that both groups become better informed and educated as to each others needs and concerns.

Some of the concerns voiced included: why not a more remote site, further from existing homes, and local watercourses; why the need for such a large area as that optioned at Crane Mountain; whether current zoning at Crane Mountain is there to prevent such a project; concerns about groundwater becoming contaminated; concerns about visibility of the site from Route 7; concerns about gulls, rodents, bears, truck traffic; concerns about property values declining if the project went forward.

The EIA report addresses the various Environmental Impact Assessment Issues as follows:

## **ENVIRONMENTAL IMPACT ASSESSMENT ISSUES**

### **Impacts on Plants and Animals**

There were no rare or endangered plants found at either the Crane Mountain or Paddy's Hill sites. But the development of either site would eventually include complete removal of existing vegetative cover from the active area (about 30 hectares).

The most likely final appearance of the site following closure would be a grassy mound.

Since large wildlife animals are generally mobile, the report expects those animals in the area would move to nearby similar habitats, when development of the site begins. Walkover surveys of the site, and interviews with the Department of Natural Resources and Energy, as well as the N.B. Museum, indicated there are no known unique habitats or resources at either site.

Both sites have been used by hunters. Deer yards and better hunting areas are closer to Musquash than they are to Lorneville and closer to Henderson Lake than they are to Crane Mountain. Cedar and Black Spruce growth attract deer, especially in the fall. Deer populations are more substantial in the Hoyt and Wirral areas and move closer to the coast where they tend to winter.

There appears to be an increased bear population in the Lorneville area that has varied over the years and has been attracted mainly by the existing landfill. The report refers to DNRE statements that the coyote population is down in the whole district due mainly to disease which resulted from overpopulation a few years ago.

It also quotes DNRE officials as saying there is not much fishing in the vicinity of the Lorneville site due mainly to concerns with water quality in Burchills Brook as a result of the existing landfill. Fishing is more common in brooks in the Crane Mountain area, in Henderson Brook, the unnamed brook, and in Mill Creek between the Saint John River and Route 7.

The report states that species such as coyotes, bears, and rats can be problematic at dumps, but have not proven to be a problem at the modern containment landfills currently operating in New Brunswick.

The only nuisance animal large enough to cause a potential safety problem when a site would be operational are bears. The EIA report states better site management practices than currently exist should prevent large concentrations of bears. If problems occur, it concludes that a trap and release program may be needed.

Gulls are common at many landfill sites. Proposed procedures by Fundy SWAT include compacting refuse continually and covering material being placed daily on site to limit the gulls' access to food. If unusual numbers of birds or animals are observed, then steps to control them, such as additional rodent control and insect spraying, would be employed.

## Traffic

The estimated traffic generated is the same at both the Crane Mountain and Paddy's Hill sites. It's estimated each site would generate about 194 vehicles daily, of which approximately 125 would be trucks.

The Crane Mountain site is located about 150 metres west of the Grand Bay highway interchange at Route 7 and 177. A problem identified in the report is that waste vehicles going to the Crane Mountain site from south of the Route 7\Route 177 interchange could cause traffic backups. These backups would occur during peak periods of traffic near a small connecting lane which provides traffic easier access to the Acamac Backland Road, west of Route 7.

There are several options to prevent this from happening, according to the report. One is to have an additional parallel lane added to the exit ramp from Route 7, northbound to Route 177, for the entire length. A second option would be to improve the Acamac Backland Road intersection entrance located near the overpass structure. This would minimize conflicts of turning traffic with the southbound traffic headed from Route 177 on through the interchange to Route 7 towards Saint John. A more expensive alternative would be to redesign and reconstruct the interchange to a full diamond interchange configuration.

Access to the Paddy's Hill site would come from an extension off the existing road which leads to the present landfill site at Spruce Lake. The road intersects with King William Road at a point approximately .6 kilometres west of its intersection with Lorneville Road.

For both sites, the additional traffic impacts on public health, in the forms of dust, exhaust emissions and noise by vehicles, is deemed insignificant by the report because of the high levels of traffic already present on the access routes near both proposed sites.

## Aesthetic Impacts

With respect to visibility of either proposed site, the report states that existing tree cover at Paddy's Hill almost totally obscures the site from view from Lorneville and those travelling eastbound on Route 1. Crane Mountain has tree cover on the north, east and west sides, but it would be impossible to completely hide the site from Route 7 viewed from the south.

According to the EIA Report, there are several options, including starting with cell construction from the north end of the site, and planting trees along the southern edge at the eastern portions of the site so that by the time the southern portion is used, a more effective screen would be in place.

## Litter

The effect wind can have on litter being blown around a landfill site would be controlled through daily operating procedures such as placing a daily cover of clean fill over refuse, minimizing the working face at the site and placing litter control fences at the site. Staff would be involved in a clean-up in the event of severe winds.

## Gases

So-called greenhouse gases, mainly carbon-dioxide and methane, are produced when organic wastes decompose. At the proposed landfill site, the report states these gases would be handled through a venting system in accordance with New Brunswick Department of Environment guidelines.

## Property Values

On the issue of land value, the Report says discussions with assessors and realtors in Saint John indicate the present dump sites in Grand Bay and in Lorneville have had a depressing affect on property sales and resale values along the Highland Road leading to the Grand Bay dump and in the Lorneville community.

While those facilities are not comparable to the proposed containment landfill site, they do show cause for concerns local residents have with respect to any proposal to locate a sanitary landfill in this area. Fundy SWAT recommends property assessment and land values be monitored to determine if any changes could be attributed to the landfill site.

The report refers to discussions held with provincial assessors of the Department of Municipalities, Culture and Housing to determine any resulting impacts on property values in the vicinity of regional solid waste facilities in Fredericton (Wilsey Road) and in the Nepisiguit Chaleur region (Red Pine Station). Assessors in Fredericton indicated that there have been no negative impacts on property values in areas along Doak Road, Glasier Road or in the Springwater Subdivision.

The report states there have been no concerns, questions or complaints from residents of those areas with respect to the solid waste site and no requests for reassessment. The Doak Road is unserviced while the other two areas have municipal or communal water and sewer services, as well as private/domestic wells.

In Nepisiguit-Chaleur, assessors report similar results, although Red Pine is not strictly comparable since the nearest residential development is 9 km from the site.

### Groundwater Resources

The possibility that existing or future domestic wells located downhill of either of the proposed sites might be contaminated as a result of waste disposal is identified as a major concern in the report.

If released in an uncontrolled manner, contaminants could enter the bedrock groundwater system.

To assess the rate of travel a contaminant would have in the groundwater, the report states that many tests were undertaken and samples gathered at both sites. The use of computer modelling was also used to predict impacts on surface and groundwater.



For leachate to reach the bedrock at a Crane Mountain site, the report states it would have to find its way through a synthetic liner, a one metre thick layer of recompacted clay and five metres of existing soil. The beneficial effect of the existing soil alone and passage through the recompacted clay layer would reduce the rate of leachate entering the ground and add 20 years to the travel times. The EIA report states that with this taken into consideration, coupled with tests carried out, there is a very small probability that wells downhill of the site would ever be affected by the proposed construction.

In the event that a leak should occur, the report concludes that more than 30 years would elapse before that groundwater originating at the site would reach Martinon Beach. Provided the situation is properly monitored, this would allow a response time of decades for remedial action or the provision of alternate water supplies to be undertaken. This would likely involve provision of a pump and treat system to ensure contaminated groundwater is captured and does not migrate toward wells.

Alternatively, replacement potable water could be supplied from newly drilled wells located beyond the influence of an identified contaminant, or by extending services from the City of Saint John's system.

In the case of the Paddy's Hill site, where groundwater discharges to the surface are more prevalent and there are no existing wells downhill from the site, the concerns are somewhat reduced but still deserve scrutiny.

Calculated rates of groundwater flow at Paddy's Hill are about one metre per year. Much of the groundwater occurring at depth beneath the proposed site would migrate south and east to discharge into the lower reaches of Mill Creek. In detailed design, the locations of active cells will be adjusted to avoid areas below which the near surface groundwater flows eastward.

Existing domestic wells in Lorneville would not be affected by any release of contaminant at the proposed site, the report says.



## Groundwater Monitoring

The report states that groundwater monitoring wells would be installed at strategic locations to detect potential losses from the leachate control system.

Groundwater samples would be collected in accordance with a set monitoring schedule that includes sampling frequency and the parameters to be identified in each of the wells.

Effluent from sedimentation ponds would be monitored regularly during periods of effluent discharge. Since influent to the ponds depends on storm events, there will not be a continuous discharge from the pond. To ensure the solids content of the effluent is below acceptable levels before being discharged, samples will be collected to determine solid content and to assess the need to add settling aids.

## Other Issues Studied

The EIA report also looked at other issues, and the possible effects a proposed landfill would have on air quality, archeology, and recreational activities. The report explains a proposed landfill would not have significant impact on any of these.

## Contingency Plans

The best way to minimize any potential impacts of unplanned accidental events is through a planned emergency response. A contingency plan forms an important part of environmental protection planning for projects such as the one under consideration.

A contingency plan would be developed for the spill of leachate which could occur either during its on-site handling or because of an accident during transportation. In the case of an on-site spill, site drainage will be arranged so that the spill can be confined and pumped out for off-site disposal or released after treatment to acceptable levels.

There will be earth moving equipment on site to help contain a spill. But depending on the situation, it may be desirable to have adsorbents and other containment devices such as sandbags on site.

In the case of a petroleum spill on site, adsorbents would be used to contain the spill and a manual will be developed which will include key telephone numbers to be called should a spill leave the boundaries of the property or be likely to do so.

A contingency plan would be developed to assure sediments do not escape from the site under extreme weather conditions. It would include the provision of material to contain and or reduce sediment loading in water leaving the site. Such measures would include the availability of precipitating agents such as alum, and the availability of material or devices such as sandbags to repair dikes which could be breached or erode.

**CRANE MOUNTAIN  
SITE LOCATION**

**PADDY'S HILL  
SITE LOCATION**

**MUSQUASH  
HARBOUR**

