

**Expansion of the  
Almonte Generating Station  
Environmental Screening Report**

Prepared for:  
Mississippi River Power Corporation

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## **1.0 THE ENVIRONMENTAL SCREENING PROCESS**

### **1.1 General**

In March 2001, the Ontario Ministry of the Environment issued a document entitled “Guide to Environmental Assessment Requirements for Electricity Projects.”

The Mississippi Power Corporation wishes to proceed with the expansion of its Almonte Generating Station (Almonte GS) and has commenced the steps to comply with the above Guideline.

Certain fundamental issues must initially be addressed to determine the applicability of the Guideline to a specific undertaking.

These are dealt with below.

### **1.2 Is the Undertaking Designated Under the Electricity Projects Regulation?**

The Electricity Projects Regulation (O.R. 116/01) gives force of law to the Environmental Assessment Guideline.

The proposed undertaking at Almonte uses water power as its primary power source and has a nameplate capacity of less than 200 megawatts (MW). Thus, it satisfies the criteria to utilize the procedures under the Guideline described above in fulfillment of the requirements of the Environmental Assessment Act.

### **1.3 Into What Category Under the Guideline Does this Fall?**

Chart 1 at page 9 of the Guideline indicates that hydro electric projects having a capacity of less than 200 megawatts fall under Category B – Environmental Screening Process.

Thus, the proponent has proceeded with an Environmental Screening.

## **1.4 Environmental Screening Stage**

In this stage, the proponent applies environmental screening criteria, consults with the public and regulatory agencies, and identifies methods of mitigating and/or managing environmental effects.

If all environmental effects and impacts can be resolved, the Screening Report is completed, a Notice of Completion is published, the report is made available to the public and agencies for 30 days, and if no requests are made to “elevate” to the Environmental Review Stage, the project may proceed.

## **1.5 Present Status**

The proponent has proceeded with extensive agency and public consultation, has prepared background reports and mitigation proposals, and is of the opinion that all reasonable agency and public environmental concerns have been resolved.

This Screening Report describes the process followed, the agency and public concerns, the proposed mitigation measures, and the environmental commitments the proponent is prepared to undertake when the project is implemented.

## **2.0 BACKGROUND**

### **2.1 Location of the Project**

The project is located in the former Town of Almonte, Ontario, now part of the Municipality of Mississippi Mills located in the County of Lanark in eastern Ontario.

Specifically, the project is located at and adjacent to the existing hydroelectric generating station located on the Mississippi River at what is locally known as "*Middle Falls*".

The reader is referred to Figures 2.1 and 2.2 which follow, and which illustrate the regional and local context.

### **2.2 Description of the Project**

This project is an expansion of the capacity of the existing Almonte Generating Station from 2.4 MW to 5.0 MW. The existing Generating Station utilizes the hydraulic head available at Middle Falls. The Lower Falls in the Mississippi River at Almonte are located approximately 160 metres downstream from Middle Falls. This project will capture the additional head available at Lower Falls and use that head, along with the head presently utilized by the existing Generating Station at Middle Falls, to provide expanded capacity.

The reader is referred to Figures 2.3 and 2.4 which follow. These figures show the principal components of the existing generating station (Fig.2.3) and the proposed expansion (Fig. 2.4)

Specifically, the following are the key components of the expansion:

- The existing powerhouse and intake works will be converted to an intake structure. The existing turbines and generators will be removed and two 3-metre diameter penstocks will be constructed linking the intake to a new powerhouse, to be constructed below Lower Falls in Metcalfe Park;

- A tailrace will be excavated to allow discharge from the powerhouse to the Mississippi River below Lower Falls in Gemmill'sells Bay.
- The existing turbines will be removed, modified, fitted with larger generators, and re-installed in the new powerhouse, increasing the maximum output from 2400 kW to 5000 kW.
- The electrical output from the Generating Station will be reconnected to the local distribution system (operated by Ottawa River Power Company) utilizing underground cables.

The reader is referred to Appendix I which contains the preliminary engineering drawing for the proposed expansion.

### **2.3 Purpose of the Project**

The purpose of the project is to increase the output of electrical energy from the existing Generating Station. It is estimated that the proposed project will increase the capacity from 2.4 MW to 5.0 MW and the annual output from 10.9 million kilowatt hours (kWh) to 23.2 million kWh.

The Mississippi River Power Corporation, the owner of the existing Generating Station and the proponent of this project, is a corporation wholly owned by the Municipality of Mississippi Mills and was formed when the electrical generation and distribution industry in Ontario was de-regulated.

### **2.4 Technologies to be Used**

The following technologies will be utilized:

- hydraulic turbines;
- synchronous generators;
- control circuitry, including programmable logic controllers and ultrasonic level transmitters.

## **3.0 LOCAL ENVIRONMENT & CONDITIONS**

### **3.1 Geological Setting**

Almonte is located on the Mississippi River, which flows easterly from its source in the Madawaska Highlands towards Carlton Place then turns northeast to flow through Almonte, Packenham, and Galeta before discharging into the Ottawa River between Arnprior and Fitzroy Harbour. As the river drops in elevation, there are a number of sets of falls, some of which have been harnessed for small hydro-powered generating stations (e.g. Appleton and Galeta).

This part of Almonte is underlain by a sequence of deep water sediments of Ordovician age to the east of the river and some Cambrian sediments to the west where outcrops of pre-Cambrian Shield rocks are found. The bedrock upon which the falls at Almonte are located comprises, fresh to slightly weathered, thickly bedded, gray to brownish gray, fine-grained, medium strong, Lower Ordovician Dolostone and Sandstone. The Lower Falls, mentioned in this report, comprise a series of steps of the Dolostone that have formed ledges along dominant bedding planes. They are essentially clean of other debris.

### **3.2 The Built Environment**

European settlement at Almonte began in 1819 when David Shepheard obtained a Crown Grant of land and began construction of a gristmill and sawmill. He was followed by Daniel Shipman who, with several other settlers, developed grist and sawmills and in the next few years a blacksmith's shop, school, hotel, distillery, and other ventures. By 1870, Almonte was an incorporated village and boasted 30 stores and nearly 40 other businesses. Chief among these were the textile mills which brought Almonte its reputation as "the Manchester of North America". The rapid expansion of the national railway system coupled with the emergence of an industrialized middle class with cash to spend and a growing appetite for consumer goods spurred the spectacular growth of Almonte's textile industry. By the turn of the century, there were seven woollen mills operating at full production in Almonte. Central to the location of these woollen mills was the hydraulic power available at the falls which was utilized to provide motive power for the mills and, later, electrical power for the community.

These mills continued to operate at full production until the 1950s when production began to slow and, one-by-one, the mills closed. The last mill, Rosamond #1, shut its doors for good in the early 1980s.

Further information on the history of industrial development in Almonte is contained in The Phase I Archaeological Assessment which is provided in Appendix IX.

The built environment of the town reflects its history as a thriving industrial town more recently giving way to residential and tourism activities. Several of the buildings in the central commercial area reflect the use of indigenous stone for construction and make architectural statements as to the Scottish heritage of those who operated the woollen mill business for so long.

More recently, the old industrial buildings have been converted. For example, the Rosamond #1 Mill, the last to close, is now an attractive condominium project with a view of the lower river. Other mill and supporting buildings have been converted to restaurants, antique stores, art galleries, and retail space. The location adjacent to the river gives a pleasing environment which is attractive to visitors from the nearby large city of Ottawa.

The built environment also concentrated on the exploitation of the available hydraulic generating capabilities at Almonte.

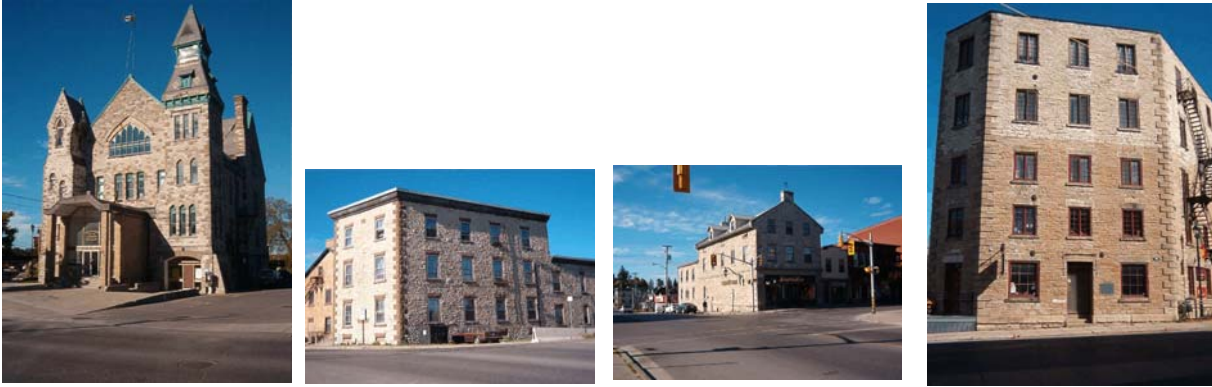
The existing falls on the Mississippi River at Almonte may be divided into three sections – the Upper Falls, Middle Falls, and Lower Falls.

The Middle Falls were the first to be exploited with a municipal electric light plant constructed around the turn of the century. This was replaced in the mid-1920s with a hydraulic generating station – the building remains today and is still in production. This is the existing generating station which is to be re-used as a part of the Almonte GS Expansion Project.

It should be noted that a secondary channel of the Mississippi River bypasses the Middle and Lower Falls, discharging directly to the lower river through a control structure known as West Falls.

The Upper Falls have also been utilized for generations, and a small privately owned plant remains in operation at this location (The “Enerdu” Plant).

The photographs which follow illustrate the built environment at Almonte.



### **3.3 The Mississippi River**

The Mississippi River watershed is located in southeastern Ontario and is composed of a complex network of rivers, streams, rapids, and over 250 lakes. The Mississippi River has a drainage area of 3,750 km from its headwaters in Kilpecker Creek, in the Township of Addington Highlands, to its outlet at the Ottawa River in the City of Ottawa.

The river is 212 km in length, and the river begins at elevations of 325 m (1,066 feet) in the west and drops 252 m (827 feet) gradually towards the east to an elevation of 73 m (240 feet) at the outlet to Ottawa River.

There are 23 water control structures within the Mississippi River watershed, including 7 water control structures (dams and weirs) and 5 hydroelectric generating station. There are an additional eleven water control structures and numerous smaller privately owned structures in the Mississippi River watershed. One of the hydroelectric generating stations is the Almonte Generating Station. An expansion of this facility is the focus of this report.

The watershed falls under the jurisdiction of the Mississippi Valley Conservation Authority (MVCA) headquartered in Lanark, Ontario. The Mississippi Valley Conservation Authority regulates development within the flood plain and other environmental hazards to reduce the risk to human life and property caused by inappropriate development practices.

The Authority and other stakeholders are in the final stages of preparation of the Mississippi River Water Management Plan which will assist in consistency of planning throughout the watershed area and will include operating parameters for hydroelectric plants and control structures. The Plan, when complete, will require approval from the Ontario Ministry of Natural Resources.

The Authority also administers the Fill, Construction, and Alterations to Waterways Regulations.

The Authority has prepared an analysis of flood flows and flood risk maps for the Mississippi River.

The 100 year flood is considered the Regional Flood, and is 254 cubic meters per second (cms) at Almonte.

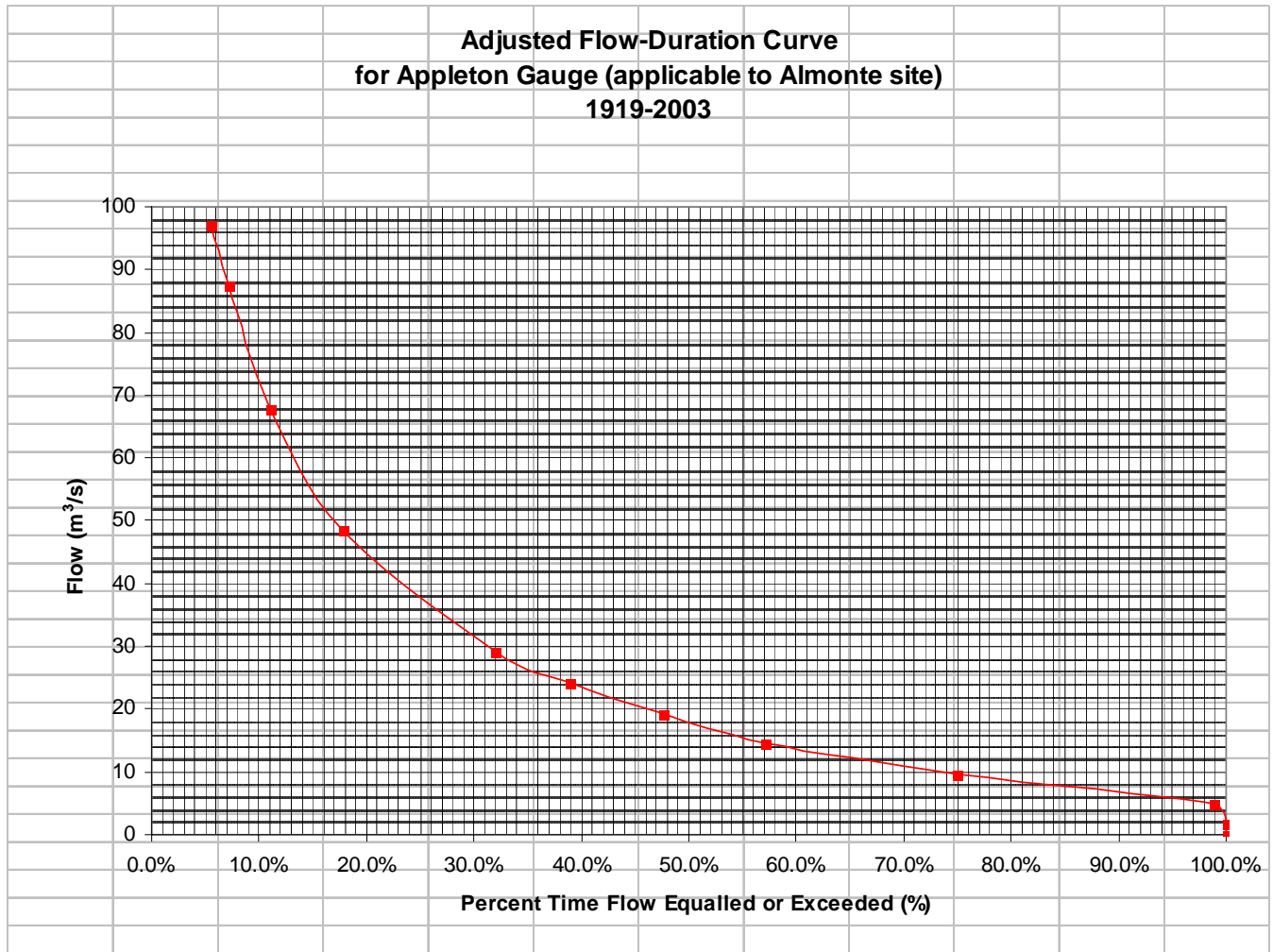
Monthly Average Flows are as follows:

**Figure 3.1  
Monthly Average Flows**

<b>Month</b>	<b>Average Flow (m<sup>3</sup>/s)</b>
January	26.3
February	26.1
March	41.5
April	95.5
May	64.5
June	28.1
July	13.3
August	10.3
September	10.5
October	12.4
November	19.6
December	25.5

*Source: Environment Canada Gauging Station 02KF006 Mississippi River at Appleton, adjusted for Almonte Site. Period of Record: 1919 to 2003*

The flow duration curve for the Mississippi River at Almonte is given in Figure 3.2 below.



Source: Environment Canada Gauge # 02KF006

### **3.4 Aquatic and Terrestrial Environment**

The aquatic and terrestrial environment in the vicinity of the proposed project is important and prominent. Specific studies were commissioned and undertaken to establish base-line environmental conditions and, subsequently, to predict impacts of the project. The reader is referred to the report in Appendix VIII for a description of the existing environment.

### **3.5 The Commercial and Social Environment**

The commercial and social environment in central Almonte is closely linked to the Mississippi River and, in particular, Middle and Lower Falls.

As previously mentioned, many of the early mill buildings have been converted to shops, restaurants, and galleries many of which focus on the panorama of the river and, more particularly, Middle Falls. The sight of a cascade of water over the Middle Falls weir is a key attraction for patrons of these establishments.

Metcalf Park, located on the shores of Gemmill's Bay at the foot of Lower Falls, is a popular spot for recreation, picnicking, observing the falls, and boat launching.

The Lower Falls are a key component of the vista available to residents south of Gemmill's Bay.

## **4.0 OTHER REQUIRED APPROVALS AND PERMITS**

### **4.1 General**

Approvals and permits are required for several aspects of this project. The timing of each of the approvals varies widely depending upon the specific enabling legislation, regulations and guidelines.

In the section which follows, a comprehensive list of all required approvals and permits is provided.

### **4.2 List of Approvals and Permits**

<b>Approval/Permit</b>	<b>Issued by</b>	<b>When Issued</b>	<b>Enabling Legislation</b>
Permit to Build in a Flood Plain	Mississippi Valley Conservation Authority	Prior to construction	Conservation Authorities Act (Ontario)
Building Permit (Powerhouse)	Municipality of Mississippi Mills	Prior to powerhouse construction	Building Code Act (Ontario)
Land Tenure (Lease)	MNR	After Crown Land survey complete	Public Lands Act
Location Approval	MNR	Early in design	Lakes and Rivers Improvement Act (Ontario)
Plans & Specifications	MNR	After location approval and prior to construction	Lakes & Rivers Improvement Act
Amendment to the Mississippi River Management Plan	MNR	Prior to changes to the operating regime of the Almonte Generating Station	Lakes & Rivers Improvement Act
Approval to Construct / Work Permit	MNR	Prior to any construction	Lakes and Rivers Improvement Act / Public Lands Act (Ontario)
Approval of Dam Safety Inspection Report	MNR	Prior to any construction	Lakes and Rivers Improvement Act (Ontario)
Permission to Harmfully Alter or Destroy Fish Habitat	DFO	Prior to in-water work	Fisheries Act (Canada)

Certificate of Approval (Air) (Noise)	MOE	Prior to construction of powerhouse	Environmental Protection Act (Ontario)
Permit to Take Water (Dewatering)	MOE	Prior to dewatering powerhouse or penstock excavation	Ontario Water Resources Act
Permit to Take Water (Permanent Diversion to Powerhouse)	MOE		Ontario Water Resources Act
Permission for Underwater Blasting	DFO	Prior to tailrace excavation	Fisheries Act (Canada)
Electrical Safety Approval	Electrical Safety Authority	Prior to commissioning	

## **5.0 SCREENING CRITERIA CHECKLIST AND OVERVIEW OF IMPACTS**

### **5.1 General**

The “Guide to Environmental Assessment Requirements for Electricity Projects” includes at Appendix C a mandatory Screening Criteria Checklist. A completed checklist is a required component of the Screening Report.

It is important to note that the checklist is to be completed indicating all potential negative environmental effects. Mitigative measures are then considered in a separate section of this report.

The completed Screening Criteria Checklist is provided in Appendix II to this report.

### **5.2 Overview of Impacts**

By far the most significant impact of this project is the diversion of a portion of the flow in the Mississippi River from Middle and Lower Falls to the generating station. While the same total flow will still discharge to Gemmill's Bay below the falls, the flow over Lower Falls will be significantly impacted, especially during low-flow months.

There will also be a change in rotation pattern in Gemmill's Bay.

To put these issues in context, the following figures are provided:

- Figure 5.1 which shows average monthly flows over Lower Falls before and after construction.
- Figure 5.2 illustrates the change in rotation patterns in Gemmill's Bay

## **6.0 AGENCY AND PUBLIC CONSULTATION**

### **6.1 Public Consultation**

The following public consultation activities took place:

- Notice of Commencement was published April 19 and April 22, 2005, in two local newspapers (see Appendix III)
- A Public Information Centre (PIC) #1 was held in the boardroom of the Mississippi River Power Corporation offices at 28 Mill St., Almonte, Ontario, on Wednesday, May 18 from 2-5 p.m and from 6-8 p.m. (see Appendix IV for the text of the display). During the Public Information Centre, staff from the consulting engineers were available to answer questions, comment sheets were made available, and attendees were invited to sign an attendance sheet so they could be kept informed as the project progressed. The attendance list and the comments received are also provided in Appendix IV.
- In response to concerns raised at PIC #1, a number of activities were carried out in order to provide responses and a second Public Information Centre was held at the same location on Wednesday, October 19, 2005, from 2-5 p.m. and from 6-8 p.m. A similar format was adopted at PIC #2. A copy of the text of the display, attendance list, and a summary of comments are provided in Appendix V.

### **6.2 Agency Contact List**

An Agency Contact List was drawn up and the following information sent to all persons on the list:

- Notice of Commencement
- Notice of PIC #1
- Text of PIC#1

- Notice of PIC #2
- Text of PIC #2

The Agency Contact List is given in Appendix VI.

A further consultation program was initiated after PIC #2 and preparation of the Draft Environmental Screening Report to explore any concerns which might have been held by First Nation communities, including the Algonquins of Pikwakanagan, the Ardock Algonquin First Nation, and the Sharbot Mishigama Anishinabe.

### **6.3 Agency Concerns**

Concerns expressed by review and approving agencies are listed below. The source of the concern is indicated in parentheses and the concerns have been numbered for reference in later sections of this report. Agency concerns are prefixed "A". Formal responses from agencies are provided in Appendix VII.

- A1. Impacts on the aquatic environment. (MNR/DFO)
- A2. Impacts on the terrestrial environment. (MNR)
- A3. Class EA for MNR Resource Stewardship and Facility Redevelopment Projects, MNR "Waterpower Site Release and Development Review Policy" should be harmonized with the "Guide to Environmental Assessment Requirements for Electricity Projects". (MNR, MOE)
- A4. Lakes and Rivers Improvement Act (LRIA) application required for diversion of water to penstocks. (MNR)
- A5. Public Lands Act Work Permit will be required for all work on shore lands regardless of whether the lands are in public or private ownership. (MNR)

- A6. An amendment to the Mississippi River Water Management Plan will be required for a change in the operating regime of the Almonte Generating Station. (MNR)
- A7. First Nations Consultation is required if there is a Crown Lands Disposition. (MNR)
- A8. Dam Safety Assessment required for existing dam and structures along with Operations, Maintenance and Surveillance Manual and an Emergency Preparedness Plan. (MNR)
- A9. Permit required to build new powerhouse in flood plain. (MVCA)
- A10. Approval may be required under the Navigable Water Protection Act. (MNR)
- A11. Sufficient river flow must be maintained for dilution of treated sewage effluent. (MOE)
- A12. Noise impacts should be considered both during construction and while in operation. (MOE)
- A13. Any air emissions will require a Certificate of Approval (Air). (MOE)
- A14. Any transformers on site will require Spill Containment. (MOE)
- A15. Permit to Take Water will be needed for permanent diversion as well as for dewatering during construction.  
(MOE)
- A16. Water removed from behind cofferdams - Approval will be required under Section 53 of the Ontario Water Resources Act for discharge of a waste stream as it is considered to be wastewater. (MOE)
- A17. A plan should be put in place for preventing and dealing with spills during construction and during operation.  
(MOE)

A18. Noise, dust and fly rock from blasting should be controlled. (MOE)

A19. Significant archaeological reserves should be preserved or protected (not explicitly requested by Ministry of Culture but the proponent undertook to conduct a Phase I Archaeological Assessment and advised Ministry of Culture of this commitment. The assessment has been completed and is reported on herein.)

#### **6.4 First Nations Concerns**

Three First Nation groups were consulted to enquire if the proposed expansion of the Almonte Generating Station gave rise to any concerns.

The First Nations consulted were:

- The Algonquins of Pikwakanagan
- The Ardock Algonquin First Nation
- The Sharbot Mishigama Anishinabe

One concern was raised, as follows:

The Algonquins of Pikwakanagan have indicated that they wish to explore ways in which they could share in the economic benefits of the project. Discussions between the Algonquins of Pikwakanagan and Mississippi River Power Corporation to address this issue are planned.

#### **6.5 Key Public Comments and Issues**

The following concerns were raised by the public through the two Public Information Centres and responses subsequently received. These have been numbered for ease of reference. Public concerns are prefixed "P". The concerns have been grouped where there are common issues.

## **Group 1**

### **6.5.1 Concerns Related to Reduction in Flow Over Middle and Lower Falls**

- P1. Impact on tourism of reduced flow over Middle Falls.
- P2. Impact of reduced flow over Lower Falls on tourism and local vistas.
- P3. Is the proposed 2.2 cubic metres per second (cms) compensation flow sufficient to maintain aesthetics of falls?
- P4. Can the proponent be sure 2.2 cms will be maintained at all times?
- P5. Does the proponent plan to maintain the 2.2 cms minimum flow day and night?
- P6. At what flow rate does it become impractical to run even one turbine?
- P7. Concern that the diversion of water from the Lower Falls will adversely impact or prevent the establishment of a planned beginners kayak school with subsequent loss of economic spin-off to the community.

## **Group 2**

### **6.5.2 Concerns Related to Impact of New Powerhouse and Tailrace on Metcalfe Park**

- P8. Project will negatively impact the use of Metcalfe Park
- Concern P9 New powerhouse could be visually offensive
- P10. Launching and docking of boats in Metcalfe Park could be negatively affected by the cross-current induced by the new tailrace.

P11. What plans are there to consult with local and out-of-town users of Metcalfe Park regarding impacts of the project?

P12. How will the increased public hazard in Metcalfe Park be addressed? Specifically, will public access to the river be restricted, and will there be hazard due to fluctuation in flows from the powerhouse?

### **Group 3**

#### **6.5.3 Concerns Related to Downstream Impacts**

P13. Re-directing the flow from the new powerhouse along the shores of Metcalfe Park could cause erosion of waterfront property in the southeast corner of Gemmill's Bay.

P14. The re-directing of flow from the new powerhouse might re-mobilize sediments deposited from earlier industrial operations.

P15. Impact of dissolved oxygen changes on assimilation capacity of the river with regards to sewage effluent.

P16. Will the re-direction of the flow downstream of the plant negatively or positively impact sewage treatment plant effluent dilution and assimilative capacity of the Mississippi River?

P17. Concerns regarding the proposal having no negative impacts on the diffuser which discharges sewage effluent

P18. Impact of lowering flow over Lower Falls on dissolved oxygen and the subsequent effect on the marine environment.

## Group 4

### 6.5.4 Other Concerns

P19. What flow rate will be maintained over the dam at the south end of Coleman Island?

P20. Pond on Coleman's Island – stream flowing to Mississippi River year round. Is proponent aware of this and will this remain undisturbed?

P21. Effects of Global Warming – should data from 1970 to 2004 be analysed for trends and recognized in engineering and business case?

P22. Zoning and OP should be checked for conformity.

P23. Can the proposed penstock excavation be carried out without compromising the highway bridge foundations, and is a rock trench in this location practical?

P24. How will environmental and construction constraints and rules be enforced during the construction period?  
Who will be the "policeman"?

## **7.0 PROPOSED MITIGATION AND IMPACT MANAGEMENT MEASURES**

### **7.1 Background Studies**

A number of background studies were prepared in order to determine the extent of impacts and to derive appropriate mitigation and compensation measures. These studies included the following:

- **Fisheries and Terrestrial Impacts:** This particular project has been under consideration by the Mississippi River Power Corporation since 2001. Beginning in 2002, fisheries studies were undertaken by Niblett Environmental Associates, and have been ongoing with seasonal fieldwork until 2005. A terrestrial assessment was conducted in 2005. Details of these studies are further elaborated on later in this report. Niblett's summary report, detailing both aquatic and terrestrial issues, is provided in Appendix VIII
- **Archaeological Resources:** A Phase I Archaeological Survey was undertaken by Kinickinick Heritage Consultants in 2005. This report is provided in Appendix IX, and the recommendations from that assessment have been carried forward into the proposed commitments in respect to environmental mitigation measures.
- **Visual Impact of Proposed Powerhouse in Gemmill's Park:** Commonwealth Consultants, an architectural firm specializing in heritage architecture and design, were retained to prepare concept plans to demonstrate the potential appearance of the powerhouse in Metcalfe Park using architecture compatible with the historic themes of Almonte. The results of this work, including renditions of the appearance of the powerhouse in the Metcalfe Park setting, are provided in the PIC #2 documentation (See Appendix V)
- **Feasibility Study in Respect to Rock Excavation – Penstock and Powerhouse:** Dr. David F. Wood, P.Eng, Consulting Engineer, was retained to report on the practicality of the proposed construction method for excavating and placing the penstocks. This report is provided in Appendix X.

- **Simulation of Proposed Minimum Flows Over Middle and Lower Falls:** Mississippi River Power Corporation undertook a simulation of the proposed minimum flows over the Middle and Lower Falls and provided photographic records of the visual appearance of both the Middle and Lower Falls under these flow conditions. See Appendix V – These photographs were presented at PIC #2.

## **7.2 Specific Mitigation and Impact Management Measures – Agency Concerns**

**7.2.1 Impacts on the aquatic environment. (MNR/DFO):** Aquatic environment studies by Niblett Environmental Associates commenced in 2001 and have continued until 2005 to assure an adequate field data collection program. Niblett's detailed report (See Appendix VIII) concludes that all aquatic impacts are mitigable. There will, however, be "Harmful Alteration Disruption or Destruction of Habitat" (HADD) requiring specific approval from The Department of Fisheries and Oceans under the Fisheries Act. The specific mitigation measures, which are expected to be the basis for the conditions attached to the HADD authorization, are presented in the Niblett Report and are summarised in Chapter 9.

**7.2.2 Impacts on the terrestrial environment. (MNR):** A terrestrial environmental inventory and impact analysis was conducted by Niblett Environmental Associates in 2005 (See Appendix VIII). The analysis concluded that no significant terrestrial impacts will occur if appropriate mitigation measures are followed. The appropriate mitigation measures are given in Appendix VIII and are summarized in Chapter 9.

**7.2.3 Class EA for MNR Resource Stewardship and Facility Redevelopment Projects, MNR "Waterpower Site Release and Development Review Policy" should be harmonized with the "Guide to Environmental Assessment Requirements for Electricity Projects". (MNR, MOE):** This has been accomplished throughout the environmental screening process.

**7.2.4 LRIA application required for diversion of water to penstocks. (MNR):** This is acknowledged and application will be made for construction approval when detailed engineering plans have been prepared. In the interim, a formal application for location approval has been made by submitting an application for a Work Permit.

**7.2.5 Public Lands Act Work Permit will be required for all work on shore lands, regardless of whether the lands are in public or private ownership. (MNR):** Application has been made and further applications will be required for specific aspects of construction prior to work taking place on the site.

**7.2.6 First Nations Consultation is required if there is a Crown Lands Disposition. (MNR):** Under the existing First Nations Land Claim Protocol, the Crown (through MNR), has undertaken to consult with appropriate First Nations on all Crown Land dispositions in this area. This consultation is being undertaken directly by MNR.

**7.2.7 Dam Safety Assessment required for existing dam and structures, along with Operations, Maintenance and Surveillance Manual and an Emergency Preparedness Plan. (MNR):** MNR have advised that prior to issuing final approval of plans under the Lakes and Rivers Improvement Act they will require the Mississippi River Power Corporation to prepare and submit a Dam Safety Assessment for the existing dam and structures along with Operations, Maintenance, and Surveillance Manuals and an Emergency Preparedness Plan. This work is already underway and is being undertaken by appropriately qualified consultants. It is expected that these documents will be submitted along with the plans and specifications at the time of seeking Second Stage Approval under the Lakes and Rivers Improvement Act. The level of detail will be appropriate to the small size of the dam and the minor consequences of failure.

**7.2.8 Permit required to build new powerhouse in flood plain. (MVCA):** Approval will be required from the Mississippi Valley Conservation Authority to locate the new powerhouse in the flood plain of the Mississippi River. Appropriate documentation will be submitted to the Mississippi Valley Conservation Authority along with supporting information in respect to designing the powerhouse and the surrounding area in such a way as to limit any harmful impacts on the hydraulic profile of the Mississippi River at the Regional Flood Stage.

**7.2.9 Approval may be required under the Navigable Water Protection Act. (MNR):** This matter has been reviewed, and it has been determined that the proposed works do not constitute an obstruction to navigation or navigable waters.

**7.2.10 Sufficient river flow must be maintained for dilution of treated sewage effluent. (MOE):** The sewage treatment and disposal system for the community of Almonte utilizes waste stabilization lagoons with the effluent discharging to the Mississippi River through an outfall located just downstream of the Lower Falls. The outfall relies upon the flow in the Mississippi River to achieve dilution of effluent to acceptable levels.

The reader is referred to Figure 5.2, which shows the location of the outfall relative to the Lower Falls and the proposed tailrace. As both the existing and the proposed hydroelectric plants operate as run of river, with no head pond storage, the total flow in the Mississippi River at this location will remain unchanged before and after construction. Further, it is anticipated that due to the diversion of a significant amount of the water which presently flows over the Lower Falls to the tailrace area, the back eddy, which presently does have the potential to pick up part of the effluent at the diffuser and take it back into Gemmill's Bay before discharge to the main river, will be reduced.

There is a secondary issue in respect to dilution of treated sewage effluent, and this relates to the period of time when the flow of water over the Middle and Lower Falls will be cut off to allow construction of the penstock. During this period, the total flow in the Mississippi River will be diverted to the west falls utilizing the existing channel. This will be mitigated by timing the period when flow is diverted away from the Middle and Lower Falls to coincide with the lowest flow period of the year (mid summer) and to also coincide with the portion of time when the sewage can be retained in the waste stabilization lagoons and not discharged to the Mississippi River.

**7.2.11 Noise impacts should be considered both during construction and while in operation. (MOE):**

Long-term noise impacts will be minimized by providing appropriate construction and sound insulation measures to assure that noise impacts at the nearest receptor meet Ministry of the Environment requirements. Given that the noise levels generated by traditional turbines and generators is not high and there is an excellent opportunity to install noise insulation measures while constructing a new powerhouse, it is not anticipated that there will be any significant difficulty in achieving this objective.

**7.2.12 Any air emissions will require a C of A (Air). (MOE):** This requirement is acknowledged and will be addressed at the time when detailed plans have been prepared and pre construction approvals are being sought.

**7.2.13 Any transformers on site will require Spill Containment. (MOE):** This is a standard requirement and will be incorporated into construction documents and appropriate submissions made. As a point of interest, at this stage in the project planning it has not been finally determined if there will be transformers at this location. Transformers are presently in place at the existing generating station, and it is possible that the output from the turbines will be taken by underground cable directly to the existing transformers.

**7.2.14 Permit to Take Water will be needed for permanent diversion as well as for dewatering during construction. (MOE):** This requirement is acknowledged and will be dealt with during the permitting process.

**7.2.15 Water removed from behind cofferdams - Approval will be required under Section 53 of the Ontario Water Resources Act for discharge of a waste stream as it is considered to be wastewater. (MOE):** This is acknowledged and will be dealt with by incorporation of appropriate requirements in the construction documents.

**7.2.16 A plan should be put in place for preventing and dealing with spills during construction and during operation. (MOE):** A spill prevention plan will be a requirement of the construction documents and will be required to be in place and to be implemented prior to construction operations commencing on the site.

A separate spill prevention plan will be drawn up and incorporated into the operation and maintenance manuals used by operating personnel on an ongoing basis.

**7.2.17 Noise, dust and fly rock from blasting should be controlled. (MOE):** Specific requirements will be built into construction documents to control blasting operations. These requirements will be similar to those currently in use on Highway and Utility construction projects in Ontario and specific reference will be made to standard MTO procedures.

**7.2.18 Significant archaeological reserves should be preserved or protected:** The following mitigative measures, as set out in the Consulting Archaeologist's Report in Appendix IX, will be implemented:

1. Conduct of a Stage 2 Archaeological Assessment of Part A of the study area, including the preparation of digital “as found” plans together with digital photographs of the location and elevation of all visible remains from previous industrial activity.
2. Conduct of a Stage 2 Archaeological Assessment of Part B of the study area by excavating test pits on a 5 meter grid and passing the excavated material through a sieve.
3. Conduct of a Stage 2 Archaeological Assessment of Part C of the study area (the marine portion), by scuba inspection or alternatively by a suitable means of remote sensing.

### **7.3 Specific Mitigation and Impact Management Measures – Public Concerns**

#### **Group 1**

##### **7.3.1 Concerns Related to Reduction in Flow Over Middle and Lower Falls**

*Concern P1 Impact on tourism of reduced flow over Middle Falls.*

*Concern P2 Impact on tourism and local vistas of reduced flow over Lower Falls.*

*Concern P3 Is the proposed 2.2 cms compensation flow sufficient to maintain aesthetics of falls?*

*Concern P4 Can the proponent be sure 2.2 cms will be maintained at all times?*

*Concern P5 Does the proponent plan to maintain the 2.2 cms minimum flow day and night?*

*Concern P6 At what flow rate does it become impractical to run even one turbine?*

*Concern P7 Concern that the diversion of water from the Lower Falls will adversely impact or prevent the establishment of a planned beginners kayak school, with subsequent loss of economic spin-off to the community*

It is proposed to address the concerns regarding the appearance of the Middle and Lower Falls by providing a base flow of 2.2 cms over both sets of falls at all times – 365 days a year, 24 hours per day. This flow rate was initially selected to provide a depth of flow over the Middle Falls weir of 0.025 m – judged to be an attractive “cascade”. There may be rare occurrences when the river flow falls below 2.2 cms, but these will be very rare – there is no documented occurrence of a flow this low in the last 30 years.

For 70 percent of the year, the flow over both sets of falls will be 2.2 cms. For the other 30 percent – largely the spring and early summer – the flow will exceed 2.2 cms.

The appearance of the falls with a flow of 2.2 cms was tested in 2005 by arranging for a flow equal to the proposed minimum and photographing both Middle and Lower Falls. These photographs were presented to the public at PIC #2 (See Appendix V).

This issue, along with the appearance of the powerhouse, was the main focus of dialogue during PIC #2. In general, most persons attending concurred that the minimum flows over Middle Falls provided vistas and scenic views which were acceptable.

There was less consensus on the Lower Falls. While most attendees indicated that they were satisfied with the minimum flows over Lower Falls, a total of four individuals remained concerned. Two of those suggested that at times of peak tourist activity (perhaps 2 p.m. to 6 p.m. in July and August) the minimum flow be increased to full river flow. It was also suggested that this measure be offset by reducing the minimum flow during hours of darkness.

Two attendees were of the opinion that no reduction in flow over Middle or Lower Falls was acceptable.

The proponent accepts that this is a subjective matter and takes the position that the proposed minimum flow of 2.2 cms over Middle and Lower Falls is adequate to maintain the appearance and vistas important to tourism and local enjoyment.

In respect to the ability to accurately maintain the minimum flow, it is planned to install sensitive level monitoring equipment at the Middle Falls weir and to automate the turbine wicket gates (which control flow) to assure minimum flow regulation.

In respect to the minimum flow to run one turbine, the proponent advised that a flow of 2 cms is needed. Thus, a river flow of 4.2 cms would be needed to provide the proposed flow over the falls in addition to running one turbine at minimum output.

In respect to the concern about a kayak school, the proponent has been advised by the potential kayak school operator that the minimum flow of 2.2 cms is adequate for his purposes.

## **Group 2**

### **7.3.2 Concerns Related to Impact of New Powerhouse and Tailrace on Metcalfe Park**

*Concern P8 Project will negatively impact the use of Metcalfe Park*

*Concern P9 New powerhouse could be visually offensive*

*Concern P10 Launching and docking of boats in Metcalfe Park could be negatively affected by the cross-current induced by the new tailrace.*

*Concern P11 What plans are there to consult with local and out-of-town users of Metcalfe Park regarding impacts of the project?*

*Concern P12 How will the increased public hazard in Metcalfe Park be addressed? Specifically, will public access to the river be restricted and will there be hazard due to fluctuation in flows from the powerhouse?*

Most of the concerns regarding the impact at Metcalfe Park are related to the appearance of the powerhouse.

In responding to this concern, the proponent engaged the services of an architect to prepare alternative concepts to illustrate to the public the appearance of the proposed powerhouse in the actual setting at Metcalfe Park. The reader is referred to the details on the display used at Public Information Centre #2 (See Appendix V). Public opinion regarding the two alternative designs was overwhelmingly in favour of the “stone barn” concept utilizing building materials commonly found and used in the Almonte area. The proponent is prepared to commit to utilizing this design concept in the implementation of the project.

In respect to the use of Metcalfe Park, the amount of traffic to and from the proposed powerhouse is very small – perhaps one visit per day – and it was acknowledged by some members of the public that the presence of operating staff on a daily basis may improve the situation in respect to preventing vandalism at the park, littering, and other problems.

In respect to the cross-current at the boat launch induced by the new tailrace, it is estimated that the current will be less than 0.8 ft./sec. This should not cause any significant difficulty in use of the boat launch. However, as a backup measure, the proponent is prepared to undertake to stockpile excavated limestone rubble from the project and to utilize this material to construct a small breakwater to protect boat launch users should it be determined after implementation that such a breakwater is necessary. It is noted that further review, permitting and occupation authority will be required if a breakwater is proposed.

In respect to consulting with local and out-of-town users of Metcalfe Park, the proponent is of the opinion that the consultation program already carried out by way of two Public Information Centres together with appropriate advertising in local and district newspapers has provided adequate opportunity for park users to make their concerns known.

In respect to the increased public hazard due to the proximity of the park to the tailrace, it is proposed to provide a barrier constructed of rough-hewn limestone blocks, on both sides of the tailrace in the areas where the public has access. The proponent advises that there will be no rapid fluctuations in flow in the tailrace.

### **Group 3**

#### **7.3.3 Concerns Related to Downstream Impacts**

*Concern P13 Re-directing the flow from the new powerhouse along the shores of Metcalfe Park could cause erosion of waterfront property in the southeast corner of Gemmill's Bay.*

*Concern P14 The re-directing of flow from the new powerhouse might re-mobilize sediments deposited from earlier industrial operations.*

*Concern P15 Impact of dissolved oxygen changes on assimilation capacity of the river with regards to sewage effluent.*

*Concern P16 Will the re-direction of the flow downstream of the plant negatively or positively impact sewage treatment plant effluent dilution and assimilative capacity of the Mississippi River?*

*Concern P17 Concerns re the proposal having no negative impacts on the diffuser which discharges sewage effluent.*

*Concern P18 Impact of lowering flow over Lower Falls on dissolved oxygen and the subsequent effect on the marine environment.*

In respect to erosion along waterfront properties at the south-east corner of Gemmill's Bay, calculations have shown that velocities in Gemmill's Bay in this area will be considerably below 0.8 ft./sec. and, under normal operating conditions, are not expected to cause any erosion. Flood flows which will continue to flow over the Lower Falls are expected to continue in their present pattern abated to a certain extent by the diversion to the

tailrace. In this respect, present erosion problems may be slightly mitigated due to the construction of the proposed powerhouse.

The proponent, as an additional precaution, will commit to retain some rock excavated from the project which could be used for shore-front protection on Gemmill's Bay should this become necessary. The proponent will monitor shoreline erosion for five years after project start-up and will undertake any required remedial works, subject to approval from MNR under the Public Lands Act.

In respect to the remobilizing of sediments deposited from earlier industrial operations, the maximum velocity impinging on any sediments outside of the excavated area for the tailrace will be equal to or less than 0.8 ft./sec. This velocity is less than the minimum eroding velocity for the finest grained sedimentary materials. Thus, no demobilization of sediments due to this project are anticipated.

In respect to dissolved oxygen changes, it is not anticipated that this project will significantly affect dissolved oxygen in the downstream reach of the river. However, as a precaution, the proponent is willing to commit to building aeration piping into the tailrace area of the proposed powerhouse so that additional aeration utilizing compressed air could be implemented in the future, if desired, for the purposes of increasing dissolved oxygen in the lower reach of the river.

In respect to the issue of impacts on the sewage diffuser, the reader is referred to Section 7.2.10 which deals with issues raised under Agency Concerns.

#### **Group 4**

##### **7.3.4 Other Concerns**

*Concern P19 What flow rate will be maintained over the dam at the south end of Coleman Island?*

*Concern P20 Pond on Coleman's Island – stream flowing to Mississippi River year-round. Is proponent aware of this and will this remain undisturbed?*

*Concern P21 Effects of Global Warming – should data from 1970 to 2004 be analysed for trends and recognized in engineering and business case?*

*Concern P22 Zoning and OP should be checked for conformity.*

*Concern P23 Can the proposed penstock excavation be carried out without compromising the highway bridge foundations, and is a rock trench in this location practical?*

*Concern P24 How will environmental and construction constraints and rules be enforced during the construction period? Who will be the “policeman”?*

In respect to the flow rate over the south end of Coleman Island, a very small amount of flow has historically been allowed to discharge here. Maintenance of this flow has been provided by the Mississippi River Power Corporation who routinely replace stop logs on the dam in the spring of each year. It is expected that this procedure will continue but that the actual operating parameters at this location will be more clearly defined in the Mississippi River Operating Plan presently under preparation.

In respect to the pond on Coleman Island, no disturbance of this pond is contemplated.

In respect to the effects of Global Warming, it is felt by the proponent that the impacts of Global Warming are not sufficiently defined as to be able to have an impact on the analysis of this project nor on the design parameters. Specifically, in respect to public safety, the regional storm is currently defined by the Mississippi Valley Conservation Authority and the proponent will rely upon the Conservation Authority for any required revisions to the regional flood.

In respect to zoning and official plan issues, it has been verified that this project fits within the constraints of these planning documents.

In respect to the feasibility of constructing a penstock in a rock excavation, the reader is referred to Appendix X, which indicates that the proposed construction method is feasible.

In respect to enforcement of environmental and construction constraints, the proponent will, through its consulting engineers, be the “first line” of enforcement. As an additional precaution and to aid in public communication, the proponent recommends that an environmental monitoring committee, made up of representatives from the interested public, appropriate government agencies, and the Mississippi River Power Corporation be established to coordinate and communicate in respect to environmental issues as the project proceeds.

## **8.0 NET IMPACTS**

### **8.1 General**

It is the writer's opinion that all identified impacts which are able to be quantified can be reasonably and effectively mitigated.

There remain two areas of impact which are less readily quantified. The proponent has engaged the public in discussions surrounding these matters, but, at the end of the consultation process agreement from all participating members of the public was not reached. These matters are:

- a. The impact of flow reduction in Lower Falls on the enjoyment of the view of the falls by those living adjacent to the river and those living on the south bank facing the Falls ( four individuals were not satisfied with the proposed minimum flow).
- b. The visual impact of the Powerhouse building in Metcalfe Park ( one participant was not satisfied with the commitment to construct using sympathetic materials and building style, preferring the alternative design presented at PIC #2).

In respect to these two issues, the Proponent undertakes to commit to the following mitigation measures:

- a. Maintaining a minimum flow of 2.2 cms in the Lower Falls at all times when the flow in the river is equal to or greater than 2.2 cms ( effectively, all the time).
- b. Constructing the Powerhouse using materials and architectural styles sympathetic to and complementing the themes of the existing adjacent historic buildings.

## **9.0 COMMITMENTS TO MITIGATION AND IMPLEMENTATION MEASURES**

### **9.1 Commitments**

The proponent is prepared to commit to the following mitigation and implementation measures.

1. The proponent will maintain a minimum flow of 2.2 cms over the Lower Falls at all times when the flow in the river is equal to or greater than 2.2 cms.
2. The proponent will construct the Powerhouse using materials and architectural styles sympathetic to and complementing the themes of the existing adjacent historic buildings.
3. The proponent will not operate the Generating Station in a mode which stores water in the headpond, thus assuring that normal river flows essential for downstream sewage effluent dilution will remain unchanged.
4. The proponent will construct the powerhouse using acoustic materials which will limit the noise impact at adjacent commercial and residential properties to levels at or below the acceptable levels given in the Ministry of the Environment Land Use Planning Guidelines.
5. The proponent will require contractors building this project to prepare acceptable spill prevention and siltation control plans for each contractor's portion of the project prior to receiving instruction to start work.
6. The proponent will construct a breakwater at the boat launch in Metcalfe Park if the cross-currents induced by this project require a breakwater.
7. The proponent will undertake to assure that there are provisions in the construction contracts for the project which require the following:
  - Excavation in the tailrace area will be confined to the period between July 1 and March 31.

- Turbidity curtains will be installed to contain the entire in-water work area.
  - Silt fencing will be installed to separate the work area from the River ensuring that they fully contain low-lying areas where runoff from the site may enter the River.
  - A stilling basin will be excavated some minimum distance from the River and lined with straw bales and/or rock. The stilling basin will collect sediment-laden water pumped from the excavation.
  - An access point for heavy machinery will be designated.
  - A spill prevention plan will be prepared which will include provisions requiring that machinery be inspected daily to ensure that no fuel or other chemicals are entering the water. Machinery and fuel will be required to be stored at least fifty metres from the water.
8. The proponent undertakes to facilitate the establishment and operation of an Environmental Monitoring Committee, with representation from the Mississippi River Power Corporation, citizens-at-large, and the consulting engineer, to review all environmental protection measures in the construction contracts and monitor the enforcement of those provisions.
9. The proponent undertakes to include the construction of aeration piping in the tailrace for future use in aerating the Mississippi River downstream of the project should this be desired by regulatory agencies.
10. The Proponent undertakes to liaise with the Town of Mississippi Mills and the contract operator of the Almonte Sewage Treatment facility to assure that diversion of flow from the Middle and Lower Falls for construction occurs in a time window when treated effluent can be stored at the Sewage Treatment facility.
11. The proponent undertakes to implement the recommendations of the Consulting Archaeologist (See Appendix IX) Including the following:

1. Conduct a Stage 2 Archaeological Assessment of Part A of the study area, including the preparation of digital “as found” plans together with digital photographs of the location and elevation of all visible remains from previous industrial activity.
  
  2. Conduct a Stage 2 Archaeological Assessment of Part B of the study area by excavating test pits on a 5-meter grid and passing the excavated material through a sieve.
  
  3. Conduct a Stage 2 Archaeological Assessment of Part C of the study area ( the marine portion, by scuba inspection or alternatively by a suitable means of remote sensing).
- 
1. The proponent undertakes to monitor shoreline erosion in Gemmills Bay for five years after project start-up, and undertake remedial shore protection works if damage from erosion occurs as a result of this project.

## **10.0 ENVIRONMENTAL ISSUES TO BE ADDRESSED THROUGH OTHER REQUIRED APPROVALS**

### **10.1 Ministry of the Environment - Permit to Take Water (dewatering) and Certificate of Approval for Sewage Treatment Works (discharge of dewatering stream, if greater than 50,000 litres/day)**

These approvals will spell out the details of the steps to clean up the water from dewatering operations and will authorize the withdrawal of water from the excavation on a temporary basis.

### **10.2 Department of Fisheries and Oceans - Environment Canada - Permission to Harmfully Alter, Disrupt or Destroy Habitat**

It is expected that this authorization will set out conditions relating to habitat protection.

### **10.3 Ministry of the Environment - Certificate of Approval (Air).**

This approval will deal with air emissions (unlikely to be an issue) and noise impacts.

## **11.0 SUMMARY OF MITIGATION, IMPACT MANAGEMENT AND MONITORING COMMITMENTS**

This section will be provided in the final report. It is essentially a summary of all the commitments given in this report.

It will be finalized after agency review of this draft report.