

International Joint Commission
Review of Stage 2 Remedial Action Plan
for
Thunder Bay (Ontario) Area of Concern
June 2006

Introduction

Remedial Action Plans (RAPs) for designated Areas of Concern (AOCs) are to be developed and implemented by the Parties (Canadian and U.S. Governments) in cooperation with state and provincial governments. AOCs are geographic areas that fail to meet the general or specific objectives of the Great Lakes Water Agreement (the Agreement) where such failure has caused or is likely to cause impairment of beneficial uses or of the area's ability to support aquatic life. The RAPs are to be submitted to the International Joint Commission (Commission) for review and comment at three stages:

- Stage 1 - when a definition of the problem has been completed;
- Stage 2 - when remedial and regulatory measures are selected; and
- Stage 3 - when monitoring indicates that identified beneficial uses have been restored.

A Stage 2 RAP for Thunder Bay has been submitted by Environment Canada and the Ontario Ministry of Environment to the Commission for its review and comment. As defined in 4(d) (ii) and 4(a) (iii-vi), respectively, of Annex 2 of the Agreement, Stage 2 RAPs are to be submitted to the Commission for review and comment and are to contain:

- A. An evaluation of remedial measures in place;
- B. An evaluation of alternative additional measures to restore beneficial uses;
- C. A selection of additional remedial measures to restore beneficial uses;
- D. A schedule for their implementation; and
- E. An identification of the persons or agencies responsible for implementation of remedial measures.

In addition to these required Stage 2 elements, Annex 2 of the Agreement also details general principles for RAPs that include:

F. RAPs shall embody a systematic and comprehensive ecosystem approach to restoring and protecting beneficial uses in Areas of Concern; and

G. The Parties, in cooperation with state and provincial governments, shall ensure that the public is consulted in all actions undertaken pursuant to this Annex.

A. Have in-place remedial measures been evaluated?

The Thunder Bay AOC was classified as such due to degraded water quality associated with phenols, cresols, polycyclic aromatic hydrocarbons (PAHs), as well as contaminated sediment due to dioxins, furans, PAHs, and mercury. Until the mid-1990s, effluent from several industries received only primary treatment. The Thunder Bay water pollution control plant was upgraded to secondary treatment in 2005.

1. Measures to address the beneficial use impairment relating to fish tumours or other deformities:

Sediment contaminated with PAHs in Thunder Bay previously has been recognized as the principal cause of fish tumours. The Northern Wood Preservers Alternative Remediation Concept (NOWPARC) is the primary in-place remedial action to address removal of the contaminated sediment. The Stage 2 RAP document notes (on Page 28) that by 1998, approximately 11,000 cubic meters of contaminated sediment had been removed. Some contaminated sediment within the shipping channel east of the Northern Sawmills site was left in-place and allowed to undergo natural recovery. There is no further information noted in the RAP documentation or on its web page (http://www.on.ec.gc.ca/water/raps/thunder/intro_e.html) on either the quantity of this contaminated sediment undergoing natural recovery or any potential environmental impacts attributable to the contaminated material left in place. Other information provided in the 2002-2003 Biennial Progress Report for the 2002 Canada-Ontario Agreement (COA) (<http://www.ene.gov.on.ca/programs/5108e.doc>) indicates that the NOWPARC project removed 11,000 cubic meters of the total 60,000 cubic meters of contaminated sediment at this location; the Progress Report noted that an additional 21,000 cubic meters of contaminated sediment was confined by a rockfill berm, and the remainder, 28,000 cubic meters, was left in-place to undergo natural recovery. Thorough documentation of the volume and treatments selected for the various subsets of contaminated sediment would provide information needed for future evaluation of the remediation process.

The RAP states that benthic conditions are expected to improve now that contaminated sediment has been either removed or contained. The COA Progress Report document states that a post-construction study will determine the level of improvement in the sediment left in place for natural recovery. The RAP notes (on Page 43) that polycyclic aromatic hydrocarbon (PAH) concentrations in the contaminated sediment left for natural recovery are on average below 50 parts per million (ppm). While this level is low compared to the severe effect level of 10,000 ppm, it still exceeds Ontario's lowest effect level guideline of 4 ppm for total PAHs. As detailed in the Guidelines for the Protection and Management of Aquatic Sediment Quality in Ontario (<http://www.ene.gov.on.ca/envision/gp/B1-3.pdf>), sediment contamination that exceeds the lowest effect level may require further testing and a management plan. No further evaluation of

these measures is provided in the RAP. The RAP, however, notes that a NOWPARC monitoring program is under development and post-construction surveys were slated for 2004 and 2006. Additional RAP updates in regard to results of this monitoring will be important to further evaluate the success of remedial actions taken to restore beneficial uses and will provide a basis for assessing the resulting benefit to the AOC.

The relationship of the residual contamination to the continuing incidence of tumours or other deformities in white sucker has not been sufficiently addressed. While the RAP states that the beneficial use impairment relating to fish tumours or other deformities is now attributed to sources outside of the AOC, it does not provide supporting data or documentation as to the basis for this determination. Thus, until further information is gathered, the source of this impairment should be considered a result of the residual contaminated sediment within the AOC. Because the RAP does not specify either an acceptable level or what would be considered to be an elevated level of tumour incidence, further assessment of this impairment will be needed. Such information would allow comparison of the previous rate (1990) and current rate of tumour incidences in white sucker and also would provide evidence for determining any improvement in habitat conditions due to the removal of the most contaminated sediment. To date, evaluation of the in-place remedial measures to address this beneficial use impairment has not been sufficient. Upon confirmation of the incidence of tumours in white sucker, an assessment can be made to determine if this impairment still exists or if the level of sediment remediation selected by the RAP Team has been sufficient to remove the impairment. The outcome of the necessary monitoring activity, the outcome should be transmitted to the Commission and posted to the RAP's web page.

2. Measures to address the beneficial use impairments relating to the loss of fish and wildlife habitat and degradation of fish and wildlife populations:

The Stage 2 RAP describes the replacement of fish habitat lost due to dredging and infilling operations stemming from industrial, developmental, and navigational activities. It states, "As part of this compensation approximately 48,000 square meters of new or altered habitat was created in two areas" within the AOC. While this information would indicate some progress has been made to restore the beneficial use, evaluation of its sufficiency is made difficult as the targets for the quality or quantity of habitat lost or habitat quality gained through enhancement efforts is not described. Only the quantity of habitat is provided as a basis for compensation. While the RAP states that these areas will be monitored to track development or enhancement of fish habitat, the document does not designate which fish species are targeted or quantify the habitat units that are provided for this species.

The Stage 2 RAP document also describes actions to increase the extent of productive aquatic and terrestrial habitat by rehabilitating and protecting wetland and riparian environments. For example, Action FWH-1, a project to rehabilitate degraded walleye spawning habitat, was completed in 1991, and a monitoring program was established to evaluate the success of the project. The RAP states that assessment of the success of the effort is inconclusive to date. Another measure expected to provide hospitable environment for diverse benthic communities, Action FWH-4, describes a redesign of a waterfront park to protect and enhance shoreline of the Kaministiquia River. The project (estimated cost of \$1.5 million) includes an overlook

constructed in 1992 of sheet piling and concrete. In 1994, a sixty-meter riverfront promenade on steel piles was constructed away from the river bank and an additional 500 meters of boardwalk was constructed along the shoreline. In addition, docking facilities for a restored tug boat were constructed. The RAP makes a determination that the open pile construction of the boardwalk maximizes the development of aquatic habitat by providing instream cover and enhanced substrate diversity. The RAP does evaluate measures taken to document changes in habitat quality and quantity as a result of Action FWH-4. What the RAP provides as an indicator of the effectiveness of this effort, however, is a proposed monitoring plan of the City Recreation Department to measure public response and use of the area. Thus, given the information provided by the RAP, evaluation of the adequacy of the remedial measures taken to restore beneficial uses for fish and wildlife habitat and fish and wildlife populations is not possible.

B. Have alternative additional measures to restore beneficial uses been evaluated?

Because the RAP does not provide an evaluation of potential additional measures to address some remaining issue(s) of concern and it generally lacks well defined restoration goals for beneficial uses, an evaluation of the contribution of any alternative additional measure's contribution to the restoration of beneficial use(s) is precluded.

Rather than a description of alternative measures that will be required to address restoration of some remaining beneficial uses, the RAP provides a series of recommended options that are thought to be appropriate solutions to the environmental problems and conditions within the AOC. For example, evaluations and recommendations made by the consultants involved in the upgrade of Thunder Bay's wastewater treatment plant to secondary treatment standards were noted in the RAP. In 2004, the City of Thunder Bay was awarded the Federation of Canadian Municipalities-CH2M HILL Sustainable Community Award in the wastewater category for its innovation Pollution Prevention and Control Plan (PPCP).

Additionally, the RAP notes that sediment in the northern portion of the harbour has total mercury levels that exceed the severe effect level in an area covering approximately three hectares adjacent to the Cascades Fine Papers Group outfall. The RAP recommends that any associated data gaps be filled and a sediment management plan be developed for the Hg-contaminated area. To date, due to the lack of a sediment management plan, no alternative additional measures have been evaluated to address this site.

C. Have additional remedial measures to restore beneficial uses been selected?

The RAP provides an expansive list of the selected remedial actions. It includes twenty-seven completed RAP actions and eleven actions that are incomplete or underway. Currently, the selection of some additional remedial measures has not been detailed and this Stage 2 RAP requirement has not been fully met. Upon completion of the selection process, updated information on these measures should be provided to the Commission. In particular, details should be provided related to the selection of a remedial measure to address Hg-contaminated sediment.

While, the Stage 2 RAP document states that many of its delisting criteria were closely linked with corresponding remediation projects, these criteria as a whole would not appear to completely fulfill the requirements for delisting the beneficial use impairments. According to the document, many of the criteria do not have the degree of precision that will be required to confirm if beneficial uses have been restored.

D. Has a schedule for implementation been adopted and (E.) have persons and agencies responsible for implementation of remedial measures been identified?

The Stage 2 RAP document provides precise details of many proposed or completed actions, proponents, status, and cost. The inclusion of cost information provides a means of evaluating the adequacy of funding for RAP activities. This level of information is typically lacking in many RAPs. However, key details, including potential costs, regarding the remediation of contaminated sediment at the Cascade Fine Papers Group site are lacking. When available, documentation pertaining to this sediment management plan should be provided to the Commission.

The RAP also states that a follow-up survey of benthic community ecosystem improvements resulting from the NOWPARC project was to be completed in 2004, but it does not provide details to confirm if this schedule was met; the required costs for its completion are listed as unknown. Due to the reliance on natural recovery for remediation of some contaminated sediment, surveys of this nature are critical and long-term monitoring may be required to determine if this approach is satisfactory.

F. Has an ecosystem approach been taken to the restoration and protection of beneficial uses?

Based on the information presented in the Stage 2 RAP including the array of selected remedial actions, it appears that an ecosystem approach has been taken to the restoration and protection of beneficial uses in the Thunder Bay AOC.

G. Was the public consulted adequately?

The principal means of public involvement in the RAP was through the efforts of the Public Advisory Committee (PAC). This group worked in cooperation with the RAP Team and the former Lake Superior Programs Office. The RAP notes that PAC played an integral part in the process, voicing the concerns of the community. However, the RAP does not provide sufficiently detailed information on public consultations to allow a determination to be made of the adequacy of the public consultation effort.

Conclusion

The Commission views that some additional elements of a Stage 2 RAP should be addressed in an update in order to support a determination of the completion of all requirements of a Stage 2 RAP in the Thunder Bay AOC. In particular, additional information regarding the evaluation of in-place remedial measure to address the PAH-contaminated sediment within the shipping

channel east of the Northern Sawmills is needed. Further, information in regard to selection of a remedial measure to address Hg-contaminated sediment at the Cascade Fine Papers Group site should be provided. Additional documentation in regard to the current status of the incidence and cause of fish tumours or other deformities also is necessary. Until additional data demonstrate conclusively otherwise, the cause of this continuing impairment must be considered to be sources within the AOC.

On another important note, the Thunder Bay RAP web page should be updated to include the notable success of the upgraded Thunder Bay sewage treatment plant along with the latest information regarding the status and cause of the beneficial use impairment relating to fish tumours or other deformities.

Finally, in the past, the excellent advice that was provided by the PAC has been noted by the Commission. The contributions of a PAC would be extremely useful as the involved agencies look forward to the confirmation of restored beneficial uses and the eventual delisting of the AOC in the future.