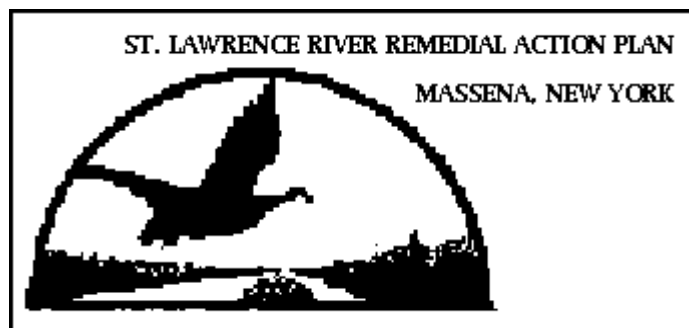


**ST. LAWRENCE RIVER
AT MASSENA, NEW YORK
REMEDIAL ACTION PLAN
1995 UPDATE**



April 1995

New York State Department of Environmental Conservation
Division of Water
50 Wolf Road
Albany, New York 12233-3502

The St. Lawrence River at Massena Remedial Action Plan, 1995 Update, was prepared by the New York State Department of Environmental Conservation in cooperation with the Massena Remedial Advisory Committee. Advisory Committee members are listed in Appendix D. The content of this Update document was distributed for formal review; all substantive comments have been incorporated into this final publication. Copies of Remedial Action Plan documents are available from NYSDEC, Division of Water, Great Lakes Section, 50 Wolf Road, Albany, New York, 12233-3502, phone (518)-457-7470.

TABLE OF CONTENTS

	PAGE
I. INTRODUCTION	1
A. Background	1
B. The Remedial Action Plan (RAP) Goal	1
C. The Remedial Action Plan (RAP) Process	2
D. 1995 RAP Update Content Synopsis	4
II. AREA OF CONCERN SUMMARIES	7
A. Location	7
B. Use Impairments and Causes	8
C. Source Identification	9
D. Remedial Progress	9
E. Long Term Strategy	12
III. REMEDIAL ACTION PLAN PROGRESS	15
A. Use Impairment / Remedial Activities Matrix	16
B. Use Impairment Restoration and Protection Strategies	23
1. Fish and Wildlife Consumption Restrictions	27
2. Loss of Fish and Wildlife Habitat	28
3. Transboundary Impacts	29
4. Degradation of Fish and Wildlife Populations	30
5. Fish Tumors or Other Deformities	31
6. Bird and Animal Deformities or Reproductive Problems	32
7. Degradation of Benthos	33
8. Restrictions on Dredging Activities	34
9. Beach Closings	35
10. Degradation of Plankton Populations	36

C. Current Programs and Remedial Activity Update	37
1. Hazardous Waste Site Remediation	37
2. Contaminated River Sediments	46
3. State Pollution Discharge Elimination System (SPDES)	48
4. Nonpoint Source Pollution Control	52
5. Air Pollution Control	55
6. Fish and Wildlife Assessments/Actions	61
7. Health and Environmental Assessments/Actions	64
8. RAP Public Participation and Outreach	71
9. Investigations and Monitoring Activities	74
D. Recommendations / Commitments Update	82
1. Hazardous Waste Site Remediation	
2. Transboundary Impacts	
3. Industrial Point Source (SPDES) Discharges	83
4. Best Available Technology Guidelines	
5. Reclassification of St. Lawrence River	
6. Water Quality Enhancement and Protection Policy	84
7. Municipal Discharges / CSO Elimination	
8. Contaminated River Sediments	
9. Nonpoint Source Management	85
10. Education and Training	
11. Air Toxics	
12. Pollution Prevention	86
13. Investigations	
E. Priority Remedial Activities	87
1. Remedial Activity Strategies	
2. Investigation and Assessment Activities	88
F. International Joint Commission Comment Review, Evaluation and Strategy Response	89

IV.	ADDITIONAL INITIATIVES TO ENHANCE AREA OF CONCERN	97
	RESTORATION ACTIVITIES	
A.	Local Initiatives	97
B.	Other Public Participation / Education and Training	99
C.	NYS Coastal Program	100
D.	Natural Resource Damages	102
E.	Pollution Prevention	103
F.	RAP Financing	108
G.	Cleanup Policy and Guidelines	113
H.	Water Quality Enhancement and Protection Policy	113
I.	Joint Problem Statement	116
J.	Joint Monitoring Workshop	116
K.	Rotating Intensive Basin Studies	116
L.	Presumptive Remedies	117
M.	EPA Contaminated Sediment Management Strategy	118
N.	Great Lakes Water Quality Initiative	120
O.	County Water Quality Strategies	122
P.	Research Initiatives	124
Q.	North American Free Trade Agreement (NAFTA)	127
V.	APPENDIX	128

LIST OF FIGURES, TABLES, AND FORMS

Figure 1.	The RAP Process Model	5
Figure 2.	Area of Concern Map	6
Table 1.	Summary of Use Impairment Indicators	13
Table 2.	Summary of Causes and Sources of Use Impairments	14
Table 3.	Use Impairment / Remedial Activity Matrix	18-22
Table 4.	NYSDEC Monitoring Activities	76-81
Forms 1-10	Use Impairment Restoration and Protection Strategy Management Forms	27-36

LIST OF APPENDICES

A.	Remedial Progress Highlights (Major Activities Chronology)	129
B.	Use Impairment Strategy Management Form (Blank)	134
C.	IJC Listing/Delisting Guidance	135
D.	List of Remedial Advisory Committee Members	139
E.	List of Acronyms	140
F.	References	142

I. INTRODUCTION

A. Background:

The International Joint Commission (IJC) has identified 43 Areas of Concern (AOCs) in the Great Lakes drainage basin where pollutants are impairing beneficial uses of a waterbody. The St. Lawrence River near Massena/Cornwall is one of these Areas of Concern.

The 1987 amendments to the United States-Canada Great Lakes Water Quality Agreement (GLWQA) called for Remedial Action Plans (RAPs) to be developed by the respective governments and for them to make recommendations for correcting the use impairments in the AOCs. Annex 2 of the GLWQA specifies requirements for developing Remedial Action Plans. The Annex also provides a list of fourteen indicators of use impairment that serve as a guide for analyzing the pollution problems in each AOC. If any one of the indicators is found to exist or if other related use impairments are identified in the AOC, the causes and sources are to be listed and remedial actions are to be developed and implemented to restore beneficial uses. The International Joint Commission's guidelines for listing and delisting use impairments from an Area of Concern are delineated in Appendix C.

New York State, the other Great Lakes states and the Province of Ontario, are preparing and implementing Remedial Action Plans for the remediation of the problems in the Areas of Concern under the requirements of the Great Lakes Water Quality Agreement. For the St. Lawrence River (Cornwall/Massena) AOC, the development of the RAP is proceeding as two separate documents: the Cornwall (Ontario, Canada) RAP and the Massena (New York, United States) RAP. As a first step in preparing the Massena RAP, the New York State Department of Environmental Conservation (NYSDEC) formed a Citizens' Advisory Committee (CAC) that included residents of the St. Lawrence River Basin, industry representatives, union officials, outdoor sports enthusiasts, environmentalists, research scientists and local government representatives. Their task was to define the use impairments and to identify causes and remedial actions. NYSDEC staff and the more recently formed Remedial Advisory Committee (RAC) are continuing the efforts of the original CAC and are working together to update and to implement the Massena RAP.

The Cornwall RAP is being developed for the Cornwall-Lake St. Francis area in Ontario and Quebec under a joint effort by Canada and Ontario according to the Canada/Ontario Agreement.

B. The Remedial Action Plan (RAP) Goal:

NYSDEC, the Massena RAC, the Cornwall RAP team and the Cornwall Public Advisory Committee (PAC), in consultation with Quebec and the Mohawk Nation at Akwesasne, developed a single goal for the two RAPs. The goal recognizes that pollution affects more than the immediate area of a particular jurisdiction and that attention should also be turned to downstream and cross-stream areas that are impacted by pollution from the Area of Concern.

The goal of the Cornwall and Massena Remedial Action Plans is to restore, protect and maintain the

chemical, physical and biological integrity of the St. Lawrence River ecosystem and in particular the Akwesasne, Cornwall-Lake St. Francis and Massena Area of Concern in accordance with the Great Lakes Water Quality Agreement. The Remedial Action Plans include protecting the downstream aquatic ecosystem from adverse impacts originating in the AOC and its watershed. This goal was agreed upon by NYSDEC, the Massena Citizen Advisory Committee (CAC), the Canadian governments, the Cornwall Public Advisory Committee (PAC) and the Mohawks at Akwesasne.

Current New York State (NYS) programs which will help meet the RAP goal include: The Federal Clean Water Act, New York's Water Quality Classification and Standards, State and Federal Hazardous Waste Remediation Programs, New York State Pollutant Discharge Elimination System (SPDES), the New York Coastal Management Program, nonpoint source pollution management and the pollution prevention program.

C. The Remedial Action Plan (RAP) Process:

The RAP process embodies an aquatic ecosystem approach to restore and to protect the biota and water quality in the Area of Concern. Implementation of remedial activities to correct use impairments and to protect against threats to human health and the environment will contribute to overall improvement of environmental conditions in the river and in the Great Lakes system. A Remedial Action Plan is a sequence of steps or a phased process that defines problems and their causes, identifies sources of pollution or disturbances, makes recommendations and implements commitments for remedial measures, and then establishes a post-remedial monitoring system to document success. Development of a Remedial Action Plan is a three stage process:

- * **Stage 1** - Stage 1 describes the environmental problems and the use impairments of the Area of Concern, the pollutants causing the impairments, and the sources of those pollutants. The Stage 1 Massena RAP was completed in November, 1990 by the CAC and NYSDEC. The Stage 1 Cornwall RAP was completed in August 1992 by the Canadian St. Lawrence RAP Team under the guidance of the Canada-Ontario RAP Steering Committee. The Canada-Ontario RAP team consisted of representatives from the Cornwall Public Advisory Committee, the Mohawk Council of Akwesasne, and number of other government agency staff.

- * **Stage 2** - Stage 2 in the RAP process describes remedial activities and strategies, recommends remedial actions, makes specific remedial commitments and describes methods for monitoring remedial progress in the AOC. Remedial strategies are then further developed and detailed, and kept current, in the RAP Update. This update document continues to incorporate an ecosystem approach with the objectives of restoring beneficial uses within the St. Lawrence River Massena AOC and eliminating adverse impacts to downstream areas.

Following the completion of the Stage 2 RAP in August 1991, a Remedial Advisory Committee (RAC) was formed to assist NYSDEC in the remediation process. Much like its predecessor (the CAC), the RAC is representative of concerned groups within the community that have an interest in the St. Lawrence River Area of Concern. In addition to RAC members, agencies at all levels of government will be asked to participate and provide input to RAP implementation as needed. The Cornwall RAP Team is currently involved in producing a Stage 2 document.

To track the implementation of the Remedial Action Plan, NYSDEC intends to issue a periodic RAP Update to describe current remedial activities/strategies, report on remedial progress and identify new commitments and resource needs. This 1995 RAP Update document is the second update for the St. Lawrence River at Massena RAP.

- * **Stage 3** - Stage 3 in the RAP process will occur when significant progress has been achieved in documenting the correction of use impairments. Conducting extensive investigations, studies and ongoing monitoring activities as well as implementing required remedial actions are all necessary elements of a strategy to achieve the Stage 3 goal of restoring and protecting beneficial uses. As restoration of beneficial uses occurs and as further remedial activities are implemented, a success story will emerge to fulfill a Stage 3 document.

The RAP goal sets the stage for the development and planning of a RAP. The Remedial Action Plan is actually a continuing process to facilitate, track and report progress on the remediation of known problems and to conduct investigations needed to further identify, characterize and address the correction of use impairments and their causes. **Figure 1 - The RAP Process Model** (on page 5), illustrates the cycle of the RAP planning and implementation process. Implementation of a Remedial Action Plan continues as long as there is work to be done towards reaching the RAP goal. Monitoring progress in all phases, evaluating actions and implementing adjustments as part of management planning are each instrumental to RAP success. Therefore, long-term monitoring that documents the implementation of remedial activities is fundamental to providing the information needed to report on the restoration and to make recommendations to delist an Area of Concern. NYSDEC will use the RAP process to determine priority remedial activities (Section IV.E), to seek support from funding sources, to commit resources to implement specific remedial actions and to monitor and report on progress through the RAP Update.

To facilitate remedial activity strategy development, implementation, tracking and reporting, a RAP Summary has been developed. This shortened version of the 1995 RAP Update provides essential parts of the remedial activity strategy and is intended to serve as a "working document" for the Remedial Advisory Committee and other interested parties to focus on current planning, implementation and progress tracking activities. This RAP Summary / working document contains the Use Impairment Restoration and Protection Strategy management forms introduced herein; develops a new table focusing on contamination sources and impairment concerns; and, identifies priority remedial activities (also listed herein).

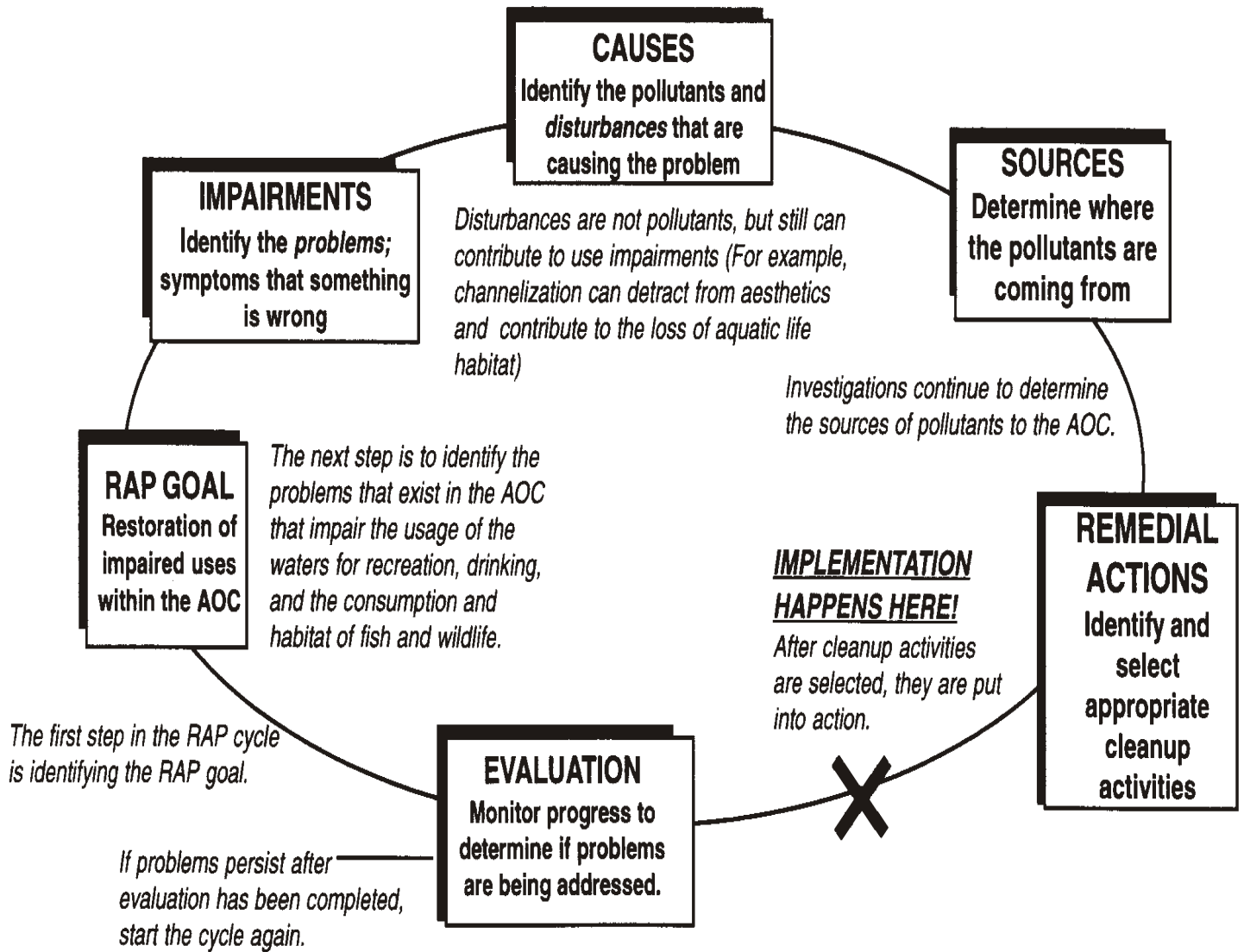
D. 1995 RAP Update Content Synopsis:

Specific descriptions concerning the basis for use impairments definitions and sources of contamination are presented in detail in the Stage 1 RAP (11/90) publication. An updated summary of the status of the Stage 1 use impairment indicators, their causes and the sources of contamination are to be provided in each RAP update. Similarly, details concerning the evaluation and determination of initial remedial activities, environmental control programs, recommendations and commitments are presented in the Stage 2 RAP (8/91) publication. An updated summary of the Stage 2 RAP implementation, showing the current status of ongoing and planned remedial activities and strategies, is also to be provided in each RAP update.

A chronological summary of highlights of completed remedial activities for the Massena Area of Concern, since commitment to RAP development in 1985, is provided in Appendix A of this 1995 RAP Update. In **Section II** of the Update, summaries of the AOC location description, use impairments and causes, source identification and remedial progress are provided. Details of current remedial activity progress are listed in **Section III** which also includes specific strategies developed for the restoration of each beneficial use. Remedial strategies, investigative needs and priorities are evaluated in a set of matrices introduced in Section III.A by identifying the direct and indirect effects of remedial actions upon restoring/protecting beneficial uses. The matrices group remedial activities into three major functions: 1) physical construction improvement activities (current, planned, proposed, or needed); 2) management practices, plans and use controls; and, 3) investigations. By assessing the effect of implementing various remedial activity options (both ongoing and needed), priorities can be identified to establish corrective strategies for each use impairment. The resulting RAP "strategy management forms" (developed in Section III.B) provide a use impairment restoration and protection strategy for each use impairment that serves to facilitate the RAP process and document progress towards the restoration of each beneficial use. **Section IV** describes initiatives that support the RAP process.

The 1995 RAP Update has a revised format to more specifically address the correction of use impairments and contamination sources. As already noted, a summary of this RAP Update has been developed to provide the Remedial Advisory Committee and other interested parties a working document to focus on the ongoing implementation activities, progress, plans and priorities for 1995 as well as the corrective strategies for future years.

The Massena RAP is unique in that a number of large remedial actions are actually proceeding independent of the RAP process and goals; however, these actions support and are key parts to the strategies in RAP process. In order to restore and protect the ecosystem of the AOC, it is fundamentally important to proceed with these hazardous waste site remedial activities now. Reassessment of the extent of any remaining use impairments will then be needed. The 1995 RAP Update reports and comments on the effect of these remedial activities so that the interests and concerns of all stakeholders are addressed. This effort of incorporating all program activities, and then trying to influence remedial activity implementation towards satisfying the RAP goal, embodies the ecosystem approach. This comprehensive approach is needed to achieve restoration of beneficial uses as set forth in the Great Lakes Water Quality Agreement.



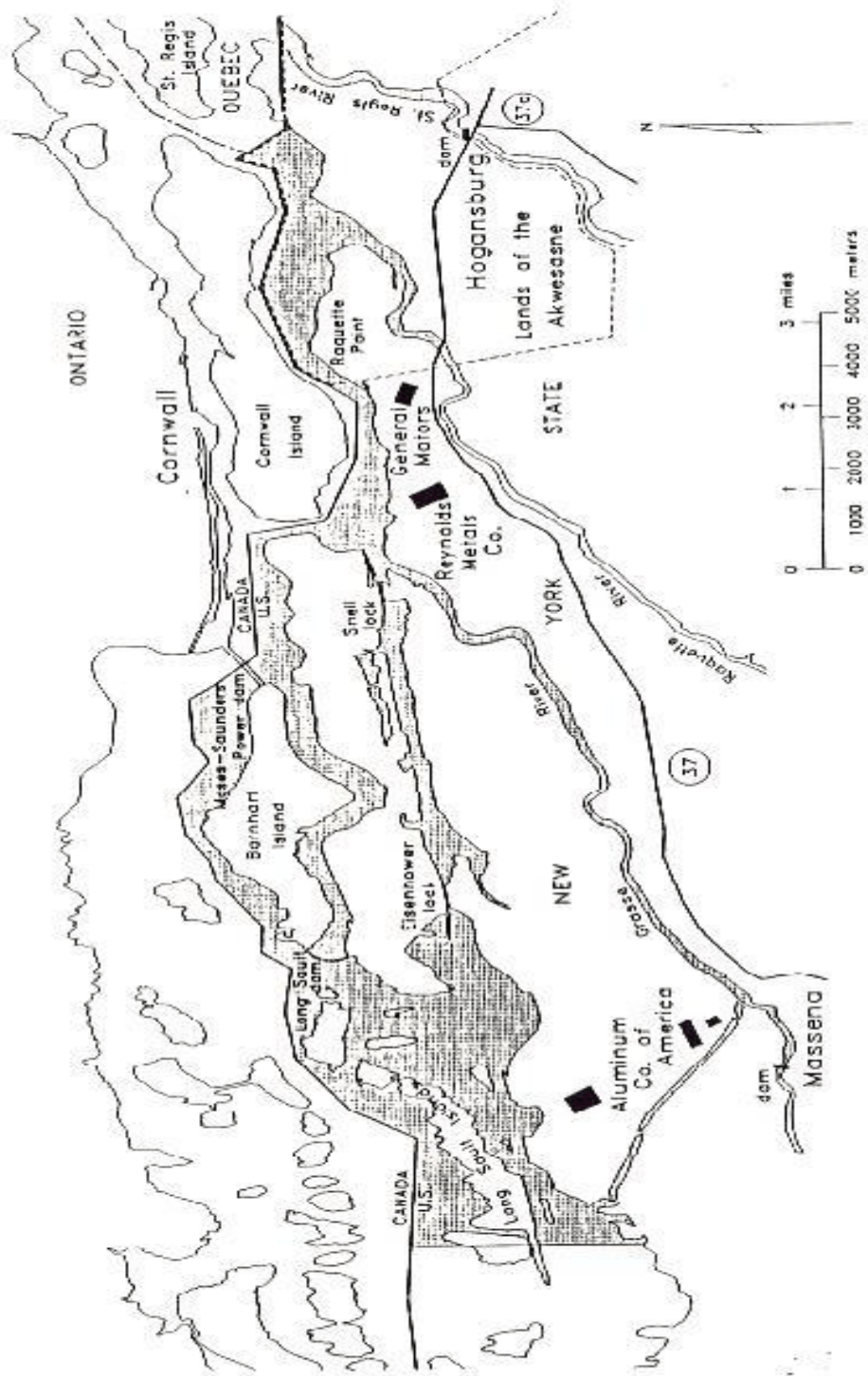


Figure 1 The Massena Area of Concern

II. AREA OF CONCERN SUMMARIES

A. Location:

The St. Lawrence River at Massena Remedial Action Plan (RAP) addresses an Area of Concern (AOC) within the legal boundaries of New York State. The AOC begins above the dams at the Massena Village water intake and follows the river downstream to the international boundary. The Area of Concern also includes portions of the Grasse, Raquette and St. Regis Rivers. A second area of special interest includes the non-United States waters from the Moses-Saunders Power Dam to the eastern outlet of Lake St. Francis. Canadian studies have documented use impairments in the downstream and cross-channel waters attributable to pollutants from the Cornwall and Massena areas. Sources of pollutants to the Massena Area of Concern and sources potentially causing downstream or cross-channel impairments are identified in the Stage 1 RAP document.

The focus of the Massena RAP is to correct the causes and sources of use impairments within the Massena AOC watershed which includes problems associated with segments of the St. Lawrence River and the three tributary rivers noted above. **Figure 2** is a location map for the St. Lawrence River Area of Concern at Massena, NY that shows these river segments. The intent is to mitigate and/or eliminate any sources of pollution entering or leaving the Massena AOC boundaries that causes local or transboundary impairments.

Inputs of pollutants from the St. Lawrence River and its tributaries upstream of the Massena AOC are identified where they contribute to impairments in the Massena AOC. The sources of pollutants to Lake Ontario and the other Great Lakes which eventually contribute as inputs to the Massena AOC are not identified in this RAP. They are more appropriately addressed in the Lakewide Management Plans (LaMPs) being developed under the Great Lakes Water Quality Agreement.

The St. Lawrence River is the outlet of the Great Lakes Basin, connecting Lake Ontario to the Atlantic Ocean. Near Massena it has an average flow of 245,000 cfs (6030 cms). Tributaries to the St. Lawrence River in the Massena part of the AOC include the Grasse River with an average flow of 900 cfs (25 cms), the Raquette River with a flow of 1306 cfs (37 cms) and the St. Regis River with an average flow of 1049 cfs (30 cms).

Three major dams are located along the St. Lawrence River in the Massena area: the Moses-Saunders Power Dam used to generate hydroelectric power, the Long Sault Spillway Dam used to pass excess flow in time of high water or when the turbines are shutdown on the power dam, and the Iroquois Dam which controls the outflow from Lake Ontario and the level of Lake St. Lawrence. Built jointly by the New York Power Authority and Ontario Hydro, this power project on the St. Lawrence River has provided some of the continent's least-expensive electricity since it started operation in 1958. Its construction led to the fulfillment of a second dream, started by Franklin Delano Roosevelt: the opening of the St. Lawrence Seaway, the deep-water shipping route between the Great Lakes and the Atlantic Ocean. Construction of the Seaway proceeded concurrently with the work on the hydroelectric facilities. Two of the seven large locks along the St. Lawrence River

are on the United States side of the river and are located in the Massena area. This U.S. portion of the seaway was constructed and is currently operated by the St. Lawrence Seaway Development Corporation.

The river provides habitat for many species of game and non-game fish, waterfowl, mammals and aquatic plants. The New York State (NYS) Significant Habitat Inventory lists several areas in the AOC as important habitat for waterfowl, raptors and sturgeon. A total of twenty-one different species are listed as inhabiting or using the Massena area that are considered rare, endangered, threatened or of concern relative to NYS criteria.

B. Use Impairments and Causes:

The waters and river bottoms of the Area of Concern have been impacted by industrial discharges from both sides of the river, physical disturbances, upstream sources including Lake Ontario, municipal treatment facilities, atmospheric deposition and non-point source discharges. The Stage 1 RAP identified industry as a major source of contaminants to the AOC. Stage 1 also confirmed three use impairments and identified four other use impairments that may exist. A summary of use impairment indicators, their updated impairment classification or status and the known causes of impairment is provided in **Table 1**. The "transboundary impacts" use impairment indicator is included in Table 1 in addition to the fourteen indicators described by the International Joint Commission listing/delisting guidelines shown in Appendix C.

The primary use impairment in the St. Lawrence River at Massena Area of Concern is "restrictions on fish and wildlife consumption". These restrictions are related to the larger lakewide use impairment of consumption advisories involving Lake Ontario. The primary cause contributing to this impairment is the evidence involving PCBs. Another use impairment "loss of fish and wildlife habitat" is believed to be caused by physical disturbances and contaminated sediments. Transboundary impacts of contaminants from sources in New York State are recognized; their impacts must be monitored and assessed as part of a binational undertaking. Examples of binational efforts to address transboundary concerns include the development of a "Joint Problem Statement" (four-party Stage 1 document) and the development of a listing of overall AOC monitoring activities. The preparation of the Joint Problem Statement along with the proceedings from the Joint Monitoring Workshop have been major steps towards the accomplishment of a binational understanding and a presentation of a joint U.S./Canadian endeavor to resolve impairments in the Area of Concern. These efforts, along with the added transboundary impacts use impairment indicator, serve to address the desire for an international RAP for the entire connecting channel of the Massena/Cornwall AOC.

C. Source Identification:

Table 2 lists an updated status of use impairments and likely use impairments in the Massena Area of Concern and summarizes the causes of these use impairments and their known or potential sources. The data used to identify sources usually does not provide direct evidence to identify sources with complete certainty. The link between an impairment and a source must be logically inferred in most instances.

Sources of pollutants come in two varieties: point and nonpoint sources. The point sources are municipal and industrial discharges of wastewater that are regulated by point source discharge permits (SPDES permits). Current point source discharge permitting practices provide extensive control of point source discharge wastewaters. Combined sewer overflows that include stormwater and receive less treatment than normal have been identified for remedial action. Nonpoint sources of pollution are also a focus for remedial and preventive measures that primarily include implementation of improved management practices. Nonpoint pollution is characterized by releases from contaminated sediments, runoff/leachate from hazardous waste sites, erosion and storm flow in developing areas, or poor agricultural land practices.

Known and potential sources of use impairments in the Massena AOC include inactive hazardous waste sites, some point source discharges, contaminated sediments, erosion, and atmospheric deposition. Lake Ontario and the Canadian part of the AOC (Cornwall area) also contribute to the transboundary impacts within the Area of Concern and downstream. Historical activities involving the St. Lawrence Seaway construction, commercial fishing practices, industrial discharges, dredging, waste sites, and other nonpoint sources of pollution have contributed to impacts on the beneficial uses within the AOC.

D. Remedial Progress:

Appendix A presents highlights of a chronology of major remedial activities in the Massena Area of Concern to date. Concurrent with the RAP process, many NYSDEC environmental program activities are in place and progressing as part of State environmental protection laws and policies, and therefore may be implemented independent of the RAP process. The RAP strategies make use of all resource commitments and remedial actions and strive to incorporate an ecosystem approach into such resources to restore beneficial uses. One purpose of the Remedial Advisory Committee is to assure that all stakeholders' interests and concerns have been satisfactorily investigated and resolved as much as possible. A key to this is securing implementation commitments to achieve RAP objectives.

In order to facilitate reporting of remedial activity progress, the RAP subject matter has been separated into nine major program area / remedial activity topics. Brief progress summaries of the nine environmental program activity areas are described below. Project details of the progress of implementation in each of these areas of the Remedial Action Plan are presented in Section III.C of this Update report entitled "Current Programs and Remedial Activity Update". Also in this RAP Update report, the recommendations and commitments, as first presented in the Stage 2 document, are further updated and refined in Section III.D.

1. Hazardous Waste Site Remediation

USEPA and NYSDEC have issued various Administrative Orders that require land-based as well as contaminated river sediment remediation. Implementation of these orders is fundamental to Area of Concern rehabilitation and forms a basis for most initial remedial strategies. Completion and settlement of these remediation activities includes Natural Resource Damage Claims that address recovery for damages and injury to the natural resources. Land-based remedial actions are required at each of the three large Massena area industrial sites. Active remediation is proceeding at the ALCOA and Reynolds Metals sites. Progress on the GM site is planned to proceed following the contaminated river sediment removal scheduled for 1995. Remedial activities at other hazardous waste sites within the watershed are associated with localized problems with less impact in the Area of Concern. These sites are also described in this current RAP Update.

2. Contaminated River Sediments

Contaminated river sediment dredging projects were planned for the summer and fall of 1994 at ALCOA, Reynolds Metals and General Motors; however, each project was postponed due to various problems. The Administrative Orders that require sediment removal work are designed so that there is no lapse of responsibility for the remediation of PCB contaminated areas along the Grasse River and into and including downstream portions of the St. Lawrence River. In other words, all major contaminated sediment areas are addressed under one of the three federal orders such that where one facility's investigative and remedial dredging responsibility ends another facility's responsibility takes over. These contaminated river sediment dredging projects are expected to commence in the Spring of 1995.

3. Point Source Discharges

A significant reduction in the mass of PCBs and other contaminants discharged from the Massena area industries (primarily stormwater/site related) has been achieved by the installation of improved wastewater treatment systems, implementation of best management practices, and interim remediation activities. The permit renewal process involving the three major industrial companies has the goal of achieving non-detectable discharge levels of PCBs as well as reduced discharges of other contaminants for each water discharge. Although PCBs are no longer used, past waste disposal practices have so contaminated the facility sites that stormwater runoff is contaminated. Site remediation work is required to cleanup PCB contamination.

4. Nonpoint Source Pollution Control

Excessive nutrients (phosphorus) and sedimentation (erosion) from agriculture are believed to be the main nonpoint source pollution problems in the St. Lawrence River Basin. County Water Quality Management Strategies have been developed to address

nonpoint source pollution. Implementation of these County Water Quality Management Strategies and related Best Management Practices (BMPs), including improvements to stormwater management, is recommended and is progressing. Various funding programs (grants) now support and are available to assist in the implementation of these nonpoint source pollution control efforts.

5. Air Pollution Control

The remedial strategy calls for the reduction of hydrogen fluoride and other contaminant emissions from the major industrial facilities in the AOC. The Clean Air Act Amendments of 1990 require air discharges to comply with Maximum Achievable Control Technology (MACT) limits which address hydrogen fluoride emissions. When further developed, NYS Air Standards may require treatment beyond MACT to be phased in over a period of time.

6. Fish and Wildlife Assessments/Actions

Many of the use impairments are based on fish and wildlife conditions and considerations. Some fish and wildlife investigative information has been reported; many investigations remain unfunded. Consumption restrictions and habitat impairments are known. Environmental monitoring, as well as further habitat study and assessment, is needed to keep advisories current and to establish required remediation.

7. Health and Environmental Assessments/Actions

Three studies and the resulting report documents that evaluate human health risks and focus on the Akwesasne Mohawk population have been completed. Follow-up studies and public outreach activities have been identified that are needed to monitor and to reduce the exposure of local persons. For example, maintaining current and useful contaminated fish consumption advisory information serves to reduce exposure of user groups. Funding is needed for follow-up investigations.

8. Public Participation and Outreach

Regular meetings of the Remedial Advisory Committee (RAC) throughout the implementation of the Stage 2 Remedial Action Plan process, and documentation of the Stage 3 RAP, will continue to keep stakeholders informed of remedial activities and progress and will continue to provide a means for local concerns to be addressed. Field trips are used to learn more about the specifics of remedial activities and to respond to committee interests. An informational video describing the Massena Area of Concern has been prepared to increase public awareness about the restoration and protection activities and needs of this important geographic area. A newsletter, promotional brochure, and RAP display are other examples of outreach activities that have been incorporated into the public participation activities involving the Massena

AOC. The Remedial Advisory Committee will continue to provide advice and consultation.

9. Investigations and Monitoring Activities

Monitoring plans are applied to contaminated sediment removal and land-based hazardous waste remediation projects. The development and implementation of these plans are subject to regulatory review and approval. These activities will be closely monitored. The focus of these projects and environmental monitoring is to minimize the local and downstream impacts resulting from the remedial activities and to comply with cleanup criteria. In addition to the remedial activity monitoring required of the industries, pre- and post-cleanup assessments directed at evaluating the extent of the restoration of beneficial uses will be needed. These further health, fish, wildlife, plankton, and macroinvertebrate studies and investigations are needed to better define a change in status of use impairment indicators under the RAP process. Funding for these additional investigations and assessments is limited and in most cases is subject to specific priorities. For example, grant funding scopes are defined and other project money may very well have specific requirements attached. Table 4 has been developed to list and describe the variety of NYSDEC monitoring activities being conducted. Ongoing monitoring programs include air sampling, Rotating Intensive Basin Studies (RIBS), point source discharge permits (SPDES), and fish studies. Priorities for these remedial activities are further developed and identified in Section III.E.

E. Long Term Strategy:

Implementation of the St. Lawrence River at Massena Remedial Action Plan is a dynamic process that will incorporate improvements and provide periodic update reports as knowledge of the use impairments, location of sources, and effectiveness of remedial action implementation advances. Ultimately, the RAP must develop and implement a comprehensive water quality and use surveillance plan to evaluate and to verify restoration of beneficial uses.

Because of the international nature of this Area of Concern, a joint U.S./Canadian statement of progress and resolution of use impairments will also be sought. Cleaning up the known sources of pollutants of this shared multi-use waterbody is fundamental to reclaiming and maintaining the valuable resource of the St. Lawrence River.

TABLE 1 - USE IMPAIRMENT STATUS
St. Lawrence River at Massena Remedial Action Plan

USE IMPAIRMENT	STAGE 1 STATUS	CURRENT STATUS	AREA OF CONCERN COMMENT
Fish and Wildlife Consumption Restrictions	Impaired	Impaired	Primary cause is PCBs; Need post remediation study and non-AOC determination
Loss of Fish and Wildlife Habitat	Impaired	Impaired	Seaway and Dam changed features; need reassessment based on current conditions
Transboundary Impacts	Impaired	Impaired	Post remediation studies will be key; consider AOC and watershed effects downstream
Degradation of Fish and Wildlife Populations	Likely	Likely	Need AOC assessment / study to verify (and define desired population levels)
Fish Tumors or Other Deformities	Likely	Likely	Need AOC assessment / study to verify
Bird or Animal Deformities or Reproductive Problems	Likely	Likely	Need AOC assessment / study to verify
Degradation of Benthos	Likely	Likely	Need AOC assessment / study to verify (with community structure focus)
Restrictions on Dredging Activities	Not Impaired	Not Impaired	Not impaired for maintenance dredging; (to review potential expanded dredging)
Beach Closings	Not Impaired	Not Impaired	No beach impairment; (to expand review for partial body contact considerations)
Degradation of Plankton Populations	Unknown	Unknown	Need AOC assessment / study to determine
Tainting of Fish and Wildlife Flavor	Not Impaired	Not Impaired	Tumor assessment / study will further support
Eutrophication or Undesirable Algae	Not Impaired	Not Impaired	Added partial body contact review under "Beach Closings" will aid determination
Drinking Water Restrictions, Taste and Odor Problems	Not Impaired	Reopened for determination	The Village of Massena water supply has reported repeated occurrence of taste and odor problems; additional treatment may be needed.
Degradation of Aesthetics	Not Impaired	Not Impaired	Survey would be useful
Added Costs to Agriculture or Industry	Not Impaired	Not Impaired	Need to verify no transboundary impact

TABLE 2 - USE IMPAIRMENT CAUSES AND SOURCES
St. Lawrence River at Massena Remedial Action Plan

USE IMPAIRMENT	CAUSES	SOURCES
Fish and Wildlife Consumption Restrictions	PCBs, Mirex, Dioxin	Inactive hazardous waste sites, Contaminated sediments, Industrial discharges
Loss of Fish and Wildlife Habitat	Physical disturbances, Natural erosion Contaminated sediments, Foreign species	Dredging, natural erosion
Transboundary Impacts	PCBs, DDE, Phosphorus, Metals, Mercury, Sediments, (Cornwall Phos.)	Waste sites, Atmospheric deposition, Pt. source discharges, Lake Ontario
Degradation of Fish and Wildlife Populations	PCBs, DDE, Mercury, Physical disturbances, Fish overharvest	Point source discharges, Hazardous waste sites, seaway construction, Cornwall AOC Commercial fishing (historic), L.Ontario
Fish Tumors or Other Deformities	PAHs	Contaminated sediments
Bird or Animal Deformities or Reprod. Problems	PCBs	Contaminated sediments
Degradation of Benthos	PCBs, PAHs, Lead, Copper, Physical disturbances	Pt. source discharges, Contaminated sediments, waste sites, nonpoint sources
Restrictions on Dredging Activities	To consider larger area for PCBs, Arsenic, Chromium, Copper, Nickel, Zinc	If any: Contaminated sediments, Inactive haz. waste sites, Industrial discharges
Beach Closings	To consider partial body contact downstream from combined sewer overflows	If any: Municipal discharges, CSOs
Degradation of Plankton Populations	Not believed impaired	If any: Contributing sources above
Tainting of Fish and Wildlife Flavor	Not impaired	None known
Eutrophication or Undesirable Algae	Not impaired	None known
Drinking Water Restrictions, Taste and Odor Problems	Geosmin and 2-methylisoborneol (MIB)	Two compounds (geosmin and MIB) commonly occur in water supplies.
Degradation of Aesthetics	Not impaired	None known
Added Costs to Agriculture or Industry	Not impaired	None known

III. REMEDIAL ACTION PLAN PROGRESS

Implementation of the Remedial Action Plan is proceeding. Highlights of a chronology of major remedial activities since the United States and New York State governments committed to RAP development in 1985 are presented in Appendix A. By applying the RAP process model, we are constantly monitoring and adjusting the strategies needed to accomplish the goals. Details of these strategies and the Remedial Action Plan progress are developed and described in this section of the 1995 RAP Update under the following six topics:

- * Use impairment / remedial activity matrix
- * Use impairment restoration and protection strategies
- * Current programs and remedial activity update
- * Recommendations / commitments update
- * Priority remedial activities
- * International Joint Commission comment review

Implementation of physical remedial construction activities, best management practices and improved regulatory controls, and investigation and monitoring activities are well underway and progressing in the Massena Area of Concern. Each of these remedial activities has an effect on, or can cause some effect towards, restoring and/or protecting a beneficial use. In fact, there are numerous remedial measures that can be listed under each one of these three larger groups of remedial activities (physical construction, plans and controls, investigations). To evaluate the effect that each remedial activity can have towards restoring/protecting a beneficial use, a matrix is useful to make cross references. Such a matrix has been developed in **Section III.A** below which describes the effects of implementing these remedial activities on each use impairment.

In **Section III.B**, by applying the remedial activities that are considered to have the most significant effects, we are able to develop a use impairment restoration and protection "strategy management form" for each use impairment. By taking into account the resources involved, commitments made and remedial action needs of each use impairment, we are able to use these strategy management forms to describe and track restoration strategies.

Following the use impairment strategy management forms (ten in all), details of the current programs and remedial activities are updated in **Section III.C**. The nine primary environmental program activity areas introduced in section II.D are used to present the details of current program activities. By describing the specifics under each of the nine areas, a firm foundation is established that supports the strategy management forms. Construction activities updates, study and report results, and planned investigations are discussed under the nine headings.

In **Section III.D**, updates are presented on the recommendations and commitments established in the Stage 2 Remedial Action Plan. Emphasis is directed at focusing on the key strategy elements and the needs that are identified to accomplish implementation.

For the coming year, priority remedial activities are listed in **Section III.E**. This section is planned to be further

developed to examine closer and link the causes, sources, investigations and remedial action needs. After all, because the RAP process identifies the cyclic nature of RAP implementation based on monitoring and assessment, this priority remedial activity section is needed to form a current statement of priorities and to maintain a remedial focus.

In **Section III.F**, an evaluation of the International Joint Commission's (IJC) Stage 1 and Stage 2 review comments (made in 1992) and the current RAP strategy responses are provided.

III.A. Use Impairment / Remedial Activities Matrix:

A comprehensive matrix has been developed to assist in evaluating the effectiveness of implementing remedial activities to restore beneficial uses. **Table 3** includes a key with four pages of matrix tables that together describe this evaluation of the array of remedial activities available to address use impairments in the AOC. By separating remedial activities into three major groups: 1) physical construction activities; 2) management practices, plans and controls; and, 3) investigation and monitoring activities; and then, by listing specific remedial activities under each group, an evaluation of the effect that implementing each of these remedial measures would have on restoring and/or protecting a beneficial use has been done. The first page of the matrix table therefore evaluates the physical construction improvement actions; the second page evaluates management practices, plans and controls; and, the third and fourth matrix pages evaluate investigative and monitoring activities.

The assessment of the effect of implementing each remedial activity leads to an improved understanding of RAP priority activities that are needed to address each use impairment. By applying the matrix tables, activities identified as having a significant direct effect (indicated by "D") and a significant indirect effect (indicated by "I") are priorities. Such activities include: site remediation, removing contaminated river sediments, implementing management plans, conducting investigations, and providing public participation/outreach.

The last two rows on each matrix table have been included to assist in identifying remedial activity focuses (priorities) and the anticipated role public participation can play in implementation. Remedial activities having significant direct "D" and significant indirect "I" effects towards restoring and protecting beneficial uses are therefore considered priorities. Many priorities have been identified. Public participation/outreach can also have a significant direct effect on facilitating the success of these remedial activities.

HOW TO USE THE MATRIX (TABLE 3): Locate the variety of remedial activities across the top of each

matrix. Now, move down the column to determine the evaluated effect that implementing the remedial activity will have towards correcting each use impairment shown in a row. Some examples of matrix use include:

- * Direct Significant Effect "D": Construction of new or improved point source wastewater treatment facilities (matrix sheet 1) before wastewater discharge is expected to have a direct significant effect on addressing fish and wildlife consumption restrictions and restoring the beneficial use.
- * Indirect Significant Effect "I": Construction (cleanup) of land-based hazardous waste sites (matrix sheet 1) is expected to have a significant indirect effect on preventing the degradation of benthos and restoring the beneficial use.
- * The development and implementation of contaminated sediment controls (removal plans and the application of criteria on matrix sheet 2) is expected to have a significant indirect effect on protecting against many use impairments (e.g. tainting, tumors, benthos degradation). It will have no significant effect towards restoring several other beneficial uses.
- * Conducting investigations and assessments that involve bioaccumulation studies, health risks assessments (matrix sheet 3), and fish and wildlife tissue studies (matrix sheet 4) are needed because they are expected to have direct significant effects towards addressing the use impairment of fish and wildlife consumption restrictions. These same investigations and studies are not applicable or will have no significant effects towards addressing the use impairment involving eutrophication or undesirable algae.

The four page Use Impairment / Remedial Activity Matrix identifies numerous remedial activity priorities and needs. In the next section (III.B) these priorities and needs are applied as strategy elements to the restoration and protection of each beneficial use. In other words, the development and implementation of a priority remedial activity has now been linked as it relates to the correction of each use impairment. A step by step implementation plan is therefore laid out for the restoration and protection of each beneficial use. Because this is a dynamic process, the tracking and documenting of the status of remedial activities will require updating.

Remedial Activity →	Physical Construction Improvements (current, planned, proposed, or needed)						
↓ Impairments ↓	Hazardous Waste Site Remediation (Land-based)	Contaminated Sediments Remediation (Dredging)	Pt. Source (SPDES) Discharge Treatment (Includes un-permitted)	Nonpoint Source Structural Control Construction	Air Pollution Treatment	Fish Habitat Remediation/Construct	Wildlife Habitat Remediation/Construct
Restrictions on fish and wildlife consumption *	I	D	D	is	is	NA	NA
Loss of fish and wildlife habitat *	ds	dm	is	ds	is	D ²	D ²
Transboundary Impacts *	I	D	D	is	is	NA	NA
Degradation of fish and wildlife populations L	is	D	D	dm	is	D ²	D ²
Fish tumors or other deformities L	is	D	ds	is	is	NS	NS
Bird or animal deformities or reproduction problems L	is/ds	I	ds	is	is	NS	NS
Degradation of benthos L	I	D	dm	is	is	NA	NA
Restrictions on dredging activities R	NA	D	NA	NA	NA	NA	NA
Beach Closings R	NA	NS	NS	NS	NS	NS	NS
Degradation of phytoplankton & zooplankton populations U	I	im	ds	is	is	NA	NA
Tainting of fish and wildlife flavor O	NS	NS	NS	NS	NS	NS	NS
Eutrophication or undesirable algae O	NS	NS	NS	NS	NS	NS	NS
Restrictions on drinking water consumption, or taste and odor problems O	NS	NS	NS	NS	NS	NS	NS
Degradation of Aesthetics O	NA	NS	NS	NS	NS	NS	NS
Added costs to agriculture or industry O	NA	NS	NS	NS	NS	NA	NA
↓ Activity Focus: ↓							
Overall Activity Effect	I	D	D	im	im	D	D
Public Participation/Outreach	dm	dm	dm	D	dm	D	D

USE IMPAIRMENT/REMEDIAL ACTIVITY MATRIX

Remedial Activity ~		Development/Implementation of Plans & Improved Controls											
↓Impairments↓	Point Source SPDES (reduce)	Contaminated River Sediment Criteria	Runoff Controls Stormwater BMPs	Water Conservation	Agricultural BMPs	Industrial, Municipal, Pretreatment BMPs	Air Pollution	Pollution Prevention	Fish/Aquatic Management Plans	Wildlife Management Plans	Human Health Management Strategy	Land Use Controls	Hazardous Waste Sites BMPs
Restrictions on fish and wildlife consumption *	D	D	is	is	is	I	is	is	I	I	D	im	D
Loss of fish & wildlife habitat *	s	dm	ds	ds	ds	ds	is	is	dm	dm	NA	D	D
Transboundary Impacts *	D	D	is	is	is	is	is	is	I	I	D	im	D
Degradation of fish & wildlife populations L	D	I	dm	dm	dm	dm	is	is	I	I	NA	I	D
Fish tumors or other deformities L	ds	I	is	is	is	is	is	is	I	I	NA	NA	is
Bird or animal deformities or reproduction problems L	ds	I	is	is	is	is	is	is	I	I	NA	im	is
Degradation of benthos L	dm	I	is	is	is	is	is	is	I	I	NA	im	is
Restrictions on dredging activities R	NA	D	NA	NA	NA	NA	NA	NA	NS	NS	NS	NS	is
Beach Closings R	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	D	dm	D
Degradation of phytoplankton & zooplankton populations U	ds	im	is	is	is	is	is	is	NS	NS	NA	dm	D
Tainting of fish and wildlife O	NS	I	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	is
Eutrophication or undesirable algae O	NS	is	NS	NS	NS	NS	NS	NS	NS	NS	NS	D	NS
Restrictions on drinking water consumption or taste & odor problems O	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	D	dm	D
Degradation of aesthetics O	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	dm	NS
Added costs to agriculture or industry O	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	D	D
↓Activity Focus↓:													
Overall Activity Effect	D	D	D	im	im	im	im	I	D	D	D	D	D
Public Participation/Outreach	dm	dm	D	dm	D	dm	dm	D	D	D	D	D	dm

USE IMPAIRMENT/REMEDIAL ACTIVITY MATRIX

Remedial Activity →		Investigations & Sampling/Analyses/Assessment									
↓ Impairments ↓		Health Risk Assessment	High Volume Air	Mobile Air Lab	Remediation Site Air	Remediation Site Soil	Contaminated Sediment	Toxic Test Bio Assay	Bioaccumulation	Ambient Water	DO / Eutrophication
Restrictions of fish & wildlife consumption *	*	D	is	is	is	is	I	I	D	I	NS
Loss of fish & wildlife habitat *	*	NA	is	is	NS	NS	I	D	D	D	D
Transboundry Impacts *	*	D	is	is	is	is	I	I	D	I	NS
Degradation of fish & wildlife populations L	L	NA	is	is	is	is	I	D	D	I	I
Fish tumors or other deformities L	L	NA	is	is	is	is	D	D	D	D	NS
Bird or animal deformities or reproduction problems L	L	NA	ds	dm	is	is	I	D	D	D	NS
Degradation of benthos L	L	NA	is	is	is	I	I	D	D	D	NS
Restrictions on dredging activities R	R	NA	NA	NS	NS	NS	D	D	D	NA	NS
Beach closings R	R	D	NA	NS	NS	NS	is	NA	NS	D	NS
Degradation of phytoplankton & zooplankton populations U	U	NA	is	is	NS	NS	I	D	D	D	D
Tainting of fish & wildlife flavor O	O	NA	is	is	NS	NS	I	I	D	I	NS
Eutrophication or undesirable algae O	O	NA	NA	NS	NS	NS	I	NS	NS	D	D
Restriction on drinking water consumption or taste and odor problems O	O	D	is	ds	ds	ds	I	D	I	D	NS
Degradation of aesthetics O	O	NA	is	ds	NS	NS	is	NA	NS	D	D
Added costs to agriculture or industry O	O	NA	ds	ds	NS	NS	NS	D	dm	D	NS
↓ Activity Focus ↓:											
Overall Activity Effect		D	im	im	im	im	D	D	D	D	D
Public Participation Outreach		D	ds	ds	dm	dm	D	D	D	D	D

USE IMPAIRMENT/REMEDIAL ACTIVITY MATRIX

Remedial Activity →		Investigations & Sampling/Analyses/Assessment										
↓ Impairments ↓		Vegetation	Point Sources (SPDES)	Groundwater	Fish Tissue	Fish Survey	Fish Deformity	Wildlife Tissue	Wildlife Survey	Deformity Wildlife	Plankton	Macro-invertebrae
Restrictions of fish & wildlife consumption *	*	NS	I	is	D	NA	D	D	NA	D	im	im
Loss of fish & wildlife habitat *	*	D	D	is	D	D	I	I	D	D	D	I
Transboundary Impacts *	*	NS	I	is	D	NA	D	D	NA	D	im	im
Degradation of fish & wildlife populations L	L	D	I	is	I	D	NA	NA	D	I	I	D
Fish tumors or other deformities L	L	NS	I	is	D	NA	D	NA	NA	NA	NS	NA
Bird or animal deformities or reproduction problems L	L	im	I	is	D	NA	NA	I	D	D	ds	NA
Degradation of benthos L	L	ds	I	is	is	NA	NA	NA	NA	NA	I	D
Restrictions on dredging activities R	R	is	I	NA	NA	I	I	NA	NA	NA	NA	NA
Beach closings R	R	D	D	NA	NA	NA	NA	NA	NA	NA	D	D
Degradation of phytoplankton & zooplankton populations U	U	D	dm	ds	NA	NA	NA	NA	NA	NA	D	D
Tainting of fish & wildlife flavor O	O	NS	I	is	D	NA	NA	D	NA	NA	ds	is
Eutrophication or undesirable algae O	O	dm	NA	NS	NA	NA	NA	NA	NA	NA	D	dm
Restriction on drinking water consumption or taste and odor problems O	O	D	D	D	NA	NA	NA	NA	NA	NA	D	NA
Degradation of aesthetics O	O	D	D	NA	NA	NA	NA	NA	NA	NA	D	NA
Added costs to agriculture or industry O	O	I	I	dm	D	NA	D	NA	NA	NA	D	NA
↓ Activity Focus ↓:												
Overall Activity Effect		im	im	im	D	D	D	D	D	D	dm	D
Public Participation Outreach		ds	ds	ds	dm	dm	dm	dm	dm	dm	ds	ds

TABLE 3 - USE IMPAIRMENT \ REMEDIAL ACTIVITY MATRIX

Remedial Activity Indicators Key:

(Denotes Improvement, Restoration or Protection Expected and/or Knowledge Gained.)

- D = Direct significant effect
- dm = direct moderate effect
- ds = direct small effect

- I = Indirect significant effect
- im = indirect moderate effect
- is = indirect small effect

- NA = Not Applicable
- NS = No Significant effect
- 1 = visual/odor effect
- 2 = outside chemically effected area

Impairment Indicators Key:

(Denotes Current Rating of Use Impairment Indicator, as noted on the matrix in Column one.)

- * = Impaired
- L = Impairment likely
- O = No impairment identified
- R = Reopened for impairment assessment
- U = Under review

(Note: see text for matrix use instructions)

III.B. Impaired Use Restoration and Protection Strategies:

As presented in the use impairment / remedial activity matrices above, there are three major remedial activity groups: physical construction, development/implementation of plans and controls,

and investigations. By combining the most effective remedial activities in each of these groups, as defined above by the matrix, with actions that have been taken or are currently in progress or planned, we can establish an integrated strategy for managing the restoration and protection of the beneficial uses involving each use impairment indicator.

This remedial strategy development effort has been initiated by identifying the specific actions and needs that should restore and protect beneficial uses. Further, the current status of these remedial strategies for each use impairment is defined as well as a projected completion date with an identification of a responsible party (as much as possible). This information for each use impairment has been consolidated on a single page form entitled the "Use Impairment Restoration and Protection Strategy" management form. These strategy management forms are to be updated periodically to document the status of remedial progress and strategy modifications.

Each Use Impairment Restoration and Protection Strategy management form therefore targets a specific use impairment indicator and provides descriptive data, a remedial strategy plan with status, and narrative comments. Summary descriptions of the remedial strategies for the ten use impairments identified as impaired or as requiring further investigation for the St. Lawrence River at Massena Area of Concern are presented below. Following these summaries, the strategy management forms for each use impairment are provided. A blank strategy management form is included in Appendix B. Each use impairment form indicates its impairment rating as either "impaired", "likely" impaired, "unknown" impairment, or "reopened" for further impairment assessment.

Also, to assist in the problem definition of a use impairment and the description of the desired restored condition, the International Joint Commission has developed a very useful table for defining the fourteen use impairment indicators. This table that describes the indicator criteria is presented in Appendix C and serves as a guideline for recommending the listing and delisting of use impairments in an Area of Concern.

Narrative summaries describing the status of each Use Impairment Restoration and Protection Strategy management form for the Massena Area of Concern are presented below:

1. Fish and Wildlife Consumption Restrictions

This use impairment is caused by PCBs. The sources include industrial discharges, inactive hazardous waste sites, contaminated sediments, air deposition and Lake Ontario. Following the removal of sediments from the St. Lawrence and Grasse Rivers by the three major Massena industries, investigations and long term monitoring will be needed to evaluate the extent of any remaining impairment. The land-based inactive hazardous waste site remediation and the modification of point source discharge permits will contribute to the restoration and protection of the beneficial use. The establishment and implementation of any additional Best Management Practices (BMPs) for fish, aquatic and wildlife as well as human health considerations will also

benefit the restoration and protection of this and other beneficial uses involving various use impairment indicators.

[Note: Stage 1 and 2 of the RAP previously identified mercury, dioxin, and mirex as likely causes of this use impairment. In New York State, mercury and dioxin have not contributed to health advisories on fish. Mirex is no longer believed to be a significant cause for health advisories in the Massena area. This is based on fish examined by Sloan and Jock (1990) where most fish examined had mirex concentrations below or near the reporting limit of 0.01 ug/g, an order of magnitude below the USFDA action limit of 0.1 ug/g. Therefore, these three chemical causes (mercury, dioxin, and mirex) are no longer identified with the fish and wildlife consumption restriction use impairment indicator.]

2. Loss of Fish and Wildlife Habitat

This use impairment is due to contaminated river sediments and physical disturbances. Loss of fish and wildlife habitat involves the presence of elevated levels of PCBs, metals and PAHs that are most likely impacting the benthos. Dredging, natural erosion, and other sediment disturbances (e.g. prop wash) are sources. Long-term monitoring and reassessment of this use impairment indicator will be needed following the implementation of needed investigative work and required remedial activities.

3. Transboundary Impacts

This additional use impairment indicator (used to address binational considerations) is rated as impaired and is believed to be caused by the pollution transport of PCBs, phosphorus, nitrogen, metals and contaminated sediments to downstream Canadian St. Lawrence River areas. Sources of pollutant transport include land-based hazardous waste sites, contaminated river sediments, point source discharges including combined sewer overflows (CSOs), suspended solids, Lake Ontario, and potentially atmospheric deposition and nonpoint sources. Also, as noted under the beach closings use impairment indicator (#9), further assessment is needed concerning the existence and extent of any partial-body contact use impairment in non-bathing beach areas downstream of combined sewer overflows.

4. Degradation of Fish and Wildlife Populations

This likely use impairment is caused by PCBs, mercury, DDE, physical disturbances and fish overharvesting. The sources include industrial discharges, inactive hazardous waste sites, contaminated sediments, Lake Ontario, the Cornwall AOC and the International Seaway. Further studies are needed to define the extent of any impairment and to assess the results of implementing the required remedial activities

noted in item 1 above. Fish and wildlife habitat that is near the AOC but outside the defined boundary, and was created as a result of the St. Lawrence Seaway construction, needs to be assessed as to its contribution towards the restoration of this beneficial use.

5. Fish Tumors or Other Deformities

This likely use impairment is probably partially due to PAHs from contaminated river sediments. Current studies are needed and, after conducting the land-based hazardous waste site and contaminated river sediment remediation work, investigations and longer term monitoring will be needed to define the existence and extent of any use impairment. Additional fish/aquatic/wildlife management plans may also be needed.

6. Bird and Animal Deformities or Reproductive Problems

This likely use impairment is probably caused by PCBs from contaminated river sediments. Current studies are needed and, after conducting the land-based hazardous waste site and contaminated river sediment remediation work, investigations and longer term monitoring will be needed to define the existence and extent of any use impairment. Additional fish/aquatic/wildlife management plans may also be needed.

7. Degradation of Benthos

This likely use impairment is probably due to PCBs, PAHs, lead, copper and physical disturbances that come from industrial discharges, contaminated river sediments, inactive hazardous waste sites, nonpoint sources and river activity. Current studies are needed and, after conducting the land-based hazardous waste site and contaminated river sediment remediation work, investigations and longer term monitoring will be needed to define the existence and extent of any use impairment. Additional fish/aquatic/wildlife management plans may also be needed.

PAHs have been added as a cause of the degradation of benthos use impairment indicator because studies have shown PAHs to have caused substantially altered benthic populations at Reynolds Metals. These studies were required of Reynolds by NYSDEC as preliminary monitoring for the dredging project.

8. Restrictions on Dredging Activities

Although this use impairment indicator has been determined unimpaired for the ongoing St. Lawrence Seaway navigational channel maintenance dredging, it is believed an impairment is likely to exist when considering expanded dredging proposals outside the seaway maintenance channel. Here, there is concern about chemicals such as PCBs, arsenic, chromium, copper, nickel and zinc that are known to be present in contaminated river sediments. After implementing the required contaminated river sediment removal projects, and defining further the contaminated sediment guidelines, investigations will be needed: sediment analyses, toxicity tests, benthic studies, bioaccumulation studies, fish surveys and deformity assessment. Based on this knowledge, determinations on the extent of any dredging restrictions and/or any further required remedial actions and dredging decisions can then be made.

During the remedial dredging activities, there will be substantial restrictions on conducting dredging and spoil/water disposal. For example, spoils are to be placed in approved landfills, return water will undergo treatment by flocculants and activated carbon, and certain monitoring activities and studies must be conducted.

9. Beach Closings

Although this use impairment indicator has been determined unimpaired for the New York State portion of the AOC, further assessment is needed concerning the existence and extent of any partial-body contact use impairment in non-bathing beach areas downstream of combined sewer overflows (CSOs). Following the development and evaluation of additional data, which should include bacteria, an assessment of any impairment will be made.

10. Degradation of Plankton Populations

The existence and extent of any use impairment is unknown. Current studies are needed and, following the completion of ongoing and planned land-based hazardous waste site and contaminated river sediment remediation, investigations and long term monitoring will be needed to assess the status of this use impairment indicator.

USE IMPAIRMENT RESTORATION and PROTECTION STRATEGY

REMEDIAL ACTION PLAN: ST. LAWRENCE AT MASSENA, NY FORM#: 1

USE IMPAIRMENT INDICATOR: Fish & Wildlife Consumption Restrictions
IJC#: 1 AOC LOCATION: St. Lawrence, Grasse & Raquette Rivers

IMPAIRMENT RATING & CAUSES: IMPAIRED - PCBs

POLLUTION SOURCES: AOC industrial discharges, inactive hazardous waste sites, Lake Ontario, contaminated sediments

=====

<u>TARGET</u> <u>DATE:</u>	<u>RESP.</u> <u>PARTY</u>	<u>REMEDIAL STRATEGY / ACTION ITEM:</u>	<u>STATUS:</u>
1. Ongoing	NYSDEC	Renew major industrial SPDES permits	I
2. 12/96	GLRC	Evaluate Aquaculture Contam. Study (Grant)	U
3. 9/98	Indust.	Complete haz. waste rem. & implement BMPs	I
4. 12/98	Indust.	Verify site cleanup standards achieved	I
5. 12/98	Indust.	Report on success of remediation in AOC	N
5. Ongoing	NYSDEC	Document F & W study contam. levels	N
6.	NYSDEC	Establish any add'l F & W management plans	N
7.	NYSDOH	Declare no health advisories (AOC caused)	N
9.	DEC/DOH	Establish any add'l health mgt. strategy	N
10.	RAC/DEC	Reassess use impairment status	N

=====

COMMENTS: Contaminant levels in fish & wildlife exceed current stds., guidelines or objectives; public health advisories are in effect. Contaminated sediment removal and haz. waste land based remediation projects are the first large steps towards restoration of impaired uses. Follow-up on mgt. plans, investigations and long term monitoring will provide needed documentation. As determined by the Division of Fish & Wildlife in 1994, Mirex is no longer considered a significant impairment cause. Hg and Dioxin have not contributed to health advisories on fish and are also deleted.

STATUS KEY:

I = Implementation progressing	
C = Completed	U = Under development/assessment/investigation
P = Planned	N = Needs development/assessment/investigation
D = Deferred	R = Required by enforcement/permit/agreement

USE IMPAIRMENT RESTORATION and PROTECTION STRATEGY

REMEDIAL ACTION PLAN: ST. LAWRENCE RIVER AT MASSENA FORM#: 2

USE IMPAIRMENT INDICATOR: Loss of Fish and Wildlife Habitat

IJC#: 14 AOC LOCATION: Within AOC

IMPAIRMENT RATING & CAUSES: IMPAIRED - contaminated sediments and physical disturbances from construction of dams and seaway.

POLLUTION SOURCES: Elevated levels of contaminants including PCBs, metals and PAHs most likely impact benthos; dredging and potentially natural erosion disturbances are sources.

=====

<u>TARGET</u> <u>DATE:</u>	<u>RESP.</u> <u>PARTY</u>	<u>REMEDIAL STRATEGY / ACTION ITEM:</u>	<u>STATUS:</u>
-------------------------------	------------------------------	---	----------------

1. _____ NYSDEC ___ Establish habitat baseline (post 1959) * _____ N_
2. 9/98 ___ Indust. ___ Complete haz. waste rem. & implement BMPs _____ I_
3. _____ NYPA _____ Implement FERC relicensing requirements _____ N_
4. _____ NYSDEC ___ Assess quantity & quality of habitat areas _____ N_
5. _____ NYSDEC ___ Verify adequate habitat (amt./type/quality) _____ N_
6. _____ NYSDEC ___ Verify mgt. plans in place to protect habitat _____ N_
7. _____ RAC/DEC ___ Reassess use impairment status _____ N_

=====
COMMENTS: Localized habitat impairment within the AOC has been identified as part of fish and wildlife management programs. Contamination of water and sediment of wetlands is directly related to loss of habitat. * The construction of the power dam and the St. Lawrence Seaway dramatically altered habitat after its 1959 completion. Changed habitat areas within and outside the Area of Concern need to be assessed and a habitat baseline established. The creation of new habitat areas will also serve to restore this impairment. Overall habitat assessment should include the development of non-indigenous and non-AOC habitat use plans as well as an assessment of the cause impacts from zebra mussels and purple loosestrife.

STATUS KEY: I = Implementation progressing
 C = Completed U = Under development/assessment/investigation
 P = Planned N = Needs development/assessment/investigation
 D = Deferred R = Required by enforcement/permit/agreement

USE IMPAIRMENT RESTORATION and PROTECTION STRATEGY

REMEDIAL ACTION PLAN: ST. LAWRENCE RIVER AT MASSENA FORM#: 3

USE IMPAIRMENT INDICATOR: Transboundary Impacts

IJC#: 15 AOC LOCATION: Binational issues; downstream St. Lawrence River impacts.

IMPAIRMENT RATING & CAUSES: IMPAIRED - Probable causes are downstream transport of PCBs, phosphorus, nitrogen, metals and sediments. Cross-river transport not likely.

POLLUTION SOURCES: Inactive hazardous waste sites, point source discharges, CSOs, Lake Ontario and potentially atmospheric deposition and nonpoint sources. No direct evidence documented.

=====

<u>TARGET</u>	<u>RESP.</u>		
<u>DATE:</u>	<u>PARTY</u>	<u>REMEDIAL STRATEGY / ACTION ITEM:</u>	<u>STATUS:</u>
1. 9/98	Indust.	Complete haz. waste rem. & implement BMPs	I_
2. 12/98	Indust.	Verify cleanup levels achieved	N_
3. Ongoing	EPA/DEC	Verify ambient water quality stds. achieved	N_

4. Ongoing EPA/DEC Verify contam. river sediment criteria met N
5. EPA/DEC Establish no transboundary effect * N
6. EPA/DEC Verify flora/fauna health criteria met N
7. EPA/DEC Verify LaMP addresses Lake Ontario effects N
8. NYSDEC Dev./Impl. any add'l needed BMP's N
9. RAC/DEC Reassess use impairment status N

=====
COMMENTS: Indirect evidence exists for downstream St. Lawrence River impacts from the Massena AOC, Cornwall AOC and upstream (Lake Ontario) sources. Cross-river impacts are not likely. * Need to establish no contributory effect from the Massena portion of the AOC and its watershed to the Cornwall portion of the AOC and downstream and document that the LaMP addresses any upstream (Lake Ontario contributions).

STATUS KEY:
 C = Completed I = Implementation progressing
 P = Planned U = Under development/assessment/investigation
 D = Deferred N = Needs development/assessment/investigation
 R = Required by enforcement/permit/agreement

USE IMPAIRMENT RESTORATION and PROTECTION STRATEGY

REMEDIAL ACTION PLAN: ST. LAWRENCE AT MASSENA FORM#: 4

USE IMPAIRMENT INDICATOR: Degradation of Fish and Wildlife Populations

IJC#: 3 AOC LOCATION: St. Lawrence, Grasse & Raquette Rivers

IMPAIRMENT RATING & CAUSES: LIKELY - PCBs, Mercury, DDE, physical disturbances and fish overharvesting

POLLUTION SOURCES: AOC industrial discharges, Lake Ontario, Cornwall AOC, international seaway, inactive haz. waste sites and contaminated sediments

=====

<u>TARGET</u>	<u>RESP.</u>		
<u>DATE:</u>	<u>PARTY</u>	<u>REMEDIAL STRATEGY / ACTION ITEM:</u>	<u>STATUS:</u>
1. <u>NYSDEC</u>		Develop baseline community data (post 1959)	<u>N</u>
2. <u>NYSDEC</u>		Assess F & W numbers and balance goals	<u>N</u>
3. <u>9/98</u>	<u>Indust.</u>	Complete haz. waste rem. & implement BMPs	<u>I</u>
4. <u>NYSDEC</u>		Verify acceptable F & W population levels	<u>N</u>
5. <u>NYSDEC</u>		Confirm no significant toxicity	<u>N</u>
6. <u>NYSDEC</u>		Document F & W targets/mgt. goals achieved	<u>N</u>
7. <u>RAC/DEC</u>		Reassess use impairment status	<u>N</u>

=====
COMMENTS: This use impairment was identified by fish and wildlife management programs. YOY trend analyses and management goals are needed to provide for the assessment and protection of piscivorous wildlife. In the vicinity of the AOC, haz. waste site remediation and habitat mgt. plans (for fish/aquatic/wildlife) will be key elements. The RAP needs to document that environmental threats are addressed by the remediation. Fish and Wildlife community survey and structure data (number & balance) are needed to document that goals are achieved, that there is not toxicity from sediments present, and that a healthy reproducing population of bentivores and poscivores exists.

STATUS KEY: I = Implementation progressing
 C = Completed U = Under development/assessment/investigation
 P = Planned N = Needs development/assessment/investigation
 D = Deferred R = Required by enforcement/permit/agreement

USE IMPAIRMENT RESTORATION and PROTECTION STRATEGY

REMEDIAL ACTION PLAN: ST. LAWRENCE AT MASSENA FORM#: 5

USE IMPAIRMENT INDICATOR: Fish Tumors or Other Deformities

IJC#: 4 AOC LOCATION: Within AOC

IMPAIRMENT RATING & CAUSES: LIKELY - PAHs

POLLUTION SOURCES: Potentially contaminated sediments

=====

<u>TARGET</u>	<u>RESP.</u>	<u>REMEDIAL STRATEGY / ACTION ITEM:</u>	<u>STATUS:</u>
<u>DATE:</u>	<u>PARTY</u>		
1. _____	NYSDEC	Dev./Imp. fish pathology study(tumors/def.)	N_
2. 9/98	Indust.	Complete haz. waste rem. & implement BMPs	I_
3. _____	NYSDEC	Conduct fish survey (liver tumors)	N_
4. _____	NYSDEC	Verify compliance (fish tissue stds./objs.)	N_
5. _____	NYSDEC	Verify no observed reproductive deformities*	N_
6. _____	RAC/DEC	Reassess use impairment status	N_
7. _____			

=====

COMMENTS: Limited data and reports have indicated tumor rates exceed those in unimpacted areas. A current fish pathology study and fish survey are needed to verify compliance with fish tissue standards and objectives and to verify no observed reproductive deformities. Studies should be conducted before and after sediment removal. The most significant concentration of PAHs is located in the river off of the Reynolds site. The use impairment is resolved when the incidence rates of fish tumors and other deformities do not exceed unimpacted areas;

survey data confirm the absence of liver tumors in bullheads or suckers; fish tissue stds. are achieved; and, there are no deformities observed in resident fish.

STATUS KEY: I = Implementation progressing
C = Completed U = Under development/assessment/investigation
P = Planned N = Needs development/assessment/investigation
D = Deferred R = Required by enforcement/permit/agreement

USE IMPAIRMENT RESTORATION and PROTECTION STRATEGY

REMEDIAL ACTION PLAN: ST. LAWRENCE AT MASSENA FORM#: 6

USE IMPAIRMENT INDICATOR: Bird or Animal Deformities or
Reproductive Problems

IJC#: 5 AOC LOCATION: Within AOC

IMPAIRMENT RATING & CAUSES: LIKELY - PCBs

POLLUTION SOURCES: Potentially contaminated sediments

=====

<u>TARGET</u>	<u>RESP.</u>		
<u>DATE:</u>	<u>PARTY</u>	<u>REMEDIAL STRATEGY / ACTION ITEM:</u>	<u>STATUS:</u>
1. 9/98	Indust.	Complete haz. waste rem. & implement BMPs	I
2. 12/98	Indust.	Verify cleanup levels attained	N
3. Ongoing	NYSDEC	Attain State, Fed, IJC tissue stds./objs.	N
4. Ongoing	NYSDEC	Confirm incident rates < inland controls	N
5. Ongoing	NYSDEC	Confirm wetlands support healthy community	N
6. Ongoing	NYSDEC	Biomonitoring results better than controls*	N
7.	RAC/DEC	Reassess use impairment status	N
8.			

=====

COMMENTS: Indirect evidence relative to fish tissue, frog coordination and reduced mink animal populations exists. No data on unusual incidents of cross-bill syndrome, egg-shell thinning or eagle populations exists. The delisting criteria are satisfied when studies demonstrate compliance with tissue standards and objectives and healthy communities of significant species are observed. Incidence rates should not exceed control sites. An extensive * biomonitoring program is not warranted unless sufficient evidence suggests that deformities or reproductive impairment is probable.

STATUS KEY: I = Implementation progressing
C = Completed U = Under development/assessment/investigation

P = Planned
D = Deferred

N = Needs development/assessment/investigation
R = Required by enforcement/permit/agreement

USE IMPAIRMENT RESTORATION and PROTECTION STRATEGY

REMEDIAL ACTION PLAN: ST. LAWRENCE AT MASSENA FORM#: 7

USE IMPAIRMENT INDICATOR: Degradation of Benthos
IJC#: 6 AOC LOCATION: St. Lawrence, Grasse & Raquette Rivers

IMPAIRMENT RATING & CAUSES: LIKELY - PCBs, lead, copper, PAHs and physical disturbances

POLLUTION SOURCES: Potentially industrial discharges, contaminated sediments, inactive hazardous waste sites, nonpoint sources and physical disturbances.

=====

<u>TARGET</u> <u>DATE:</u>	<u>RESP.</u> <u>PARTY</u>	<u>REMEDIAL STRATEGY / ACTION ITEM:</u>	<u>STATUS:</u>
1. 9/98	Indust.	Complete haz. waste rem. & implement BMPs	I
2. 12/98	Indust.	Verify cleanup levels attained	N
3. _____	NYSDEC	Conduct benthic community structure studies	N
4. _____	NYSDEC	Confirm sediment quality criteria achieved	N
5. _____	NYSDEC	Verify populations of mesotrophic species	N
6. _____	NYSDEC	Bioassay results better than controls	N
7. _____	RAC/DEC	Reassess use impairment status	N
8. _____			

=====

COMMENTS: PAHs were added as a cause. A 1979 study indicated somewhat declining benthic populations. Data is needed to document that the macroinvertebrate community structure does not significantly diverge from unimpaired area. Also, data is needed to document no significant toxicity (bioavailability) of sediment-associated contaminants. The delisting criteria are satisfied when benthic surveys demonstrate a healthy community. In the absence of community data, sediment quality criteria are to be achieved such that no threat is evident. The emphasis is on demonstrating the absence of toxic effects of sediment associated contaminants and on demonstrating bioassay results comparable to controls.

STATUS KEY:
C = Completed
P = Planned
D = Deferred
I = Implementation progressing
U = Under development/assessment/investigation
N = Needs development/assessment/investigation
R = Required by enforcement/permit/agreement

USE IMPAIRMENT RESTORATION and PROTECTION STRATEGY

REMEDIAL ACTION PLAN: ST. LAWRENCE AT MASSENA FORM#: 8
USE IMPAIRMENT INDICATOR: Restrictions on Dredging Activities
IJC#: 7 AOC LOCATION: AOC beyond navigation channel

IMPAIRMENT RATING(S) & CAUSES: UNIMPAIRED - (seaway channel navigational maintenance dredging only)
 LIKELY - concern for expanded dredging proposals outside the seaway channel for: PCBs, Arsenic, Chromium, Copper, Nickel & Zinc.

POLLUTION SOURCES: Contaminated sediments from hazardous waste sites and industrial discharges.

=====

<u>TARGET DATE:</u>	<u>RESP. PARTY</u>	<u>REMEDIAL STRATEGY / ACTION ITEM:</u>	<u>STATUS:</u>
1. 9/98	Indust.	Complete haz. waste rem. & implement BMPs	I
2. 12/98	Indust.	Verify cleanup levels attained	N
3.	EPA/DEC	Define contaminated sediment criteria	N
4.	NYSDEC	Define span of AOC dredge area	N
5.	NYSDEC	Conduct sediment analyses and evaluate	N
6.	NYSDEC	Confirm sediment criteria achieved	N
7.	NYSDEC	Assure dredging restrict. safe/approved*	N
8.	RAC/DEC	Reassess use impairment status	N

=====

COMMENTS: Seaway dredging is not impaired. Need to review expanded dredge area for restrictions on dredging and/or disposal activities. Because disposal of dredged material in the St. Lawrence River is prohibited, proper disposal plans for dredge spoils must be approved. * Delisting criteria are satisfied when the sediment criteria are achieved and any restricted dredging activities are approved & registered. Studies should confirm that the cause of any restrictions is not the result of currently active AOC or watershed sources. Spoil disposal must not contribute to use impairments and beneficial uses must be protected.

STATUS KEY:
 C = Completed I = Implementation progressing
 P = Planned U = Under development/assessment/investigation
 D = Deferred N = Needs development/assessment/investigation
 R = Required by enforcement/permit/agreement

USE IMPAIRMENT RESTORATION and PROTECTION STRATEGY

REMEDIAL ACTION PLAN: ST. LAWRENCE AT MASSENA FORM#: 9
USE IMPAIRMENT INDICATOR: Beach Closings
IJC#: 10 AOC LOCATION: Downstream of Massena area CSOs, downstream in the St. Lawrence River, and in the Canadian AOC (beach closure impairment).

IMPAIRMENT RATING(S) & CAUSES: UNIMPAIRED - (defined by Stage 1 and Stage 2 documents for the New York State portion of the AOC)

FURTHER ASSESSMENT - (needed for partial body contact downstream of CSOs, for bacteria in Canadian AOC, and for downstream St. Lawrence River bathing and partial-body contact area impacts)

POLLUTION SOURCES: none documented

=====

<u>TARGET</u> <u>DATE:</u>	<u>RESP.</u> <u>PARTY</u>	<u>REMEDIAL STRATEGY / ACTION ITEM:</u>	<u>STATUS:</u>
1. 9/96	DEC/RAC	Assess Canadian beach closing indicator	P
2.	NYSDEC	Obtain water quality data (partial contact)	N
3.	NYSDEC	Evaluate WQ data against stds./guidelines	N
4.	NYSDEC	Verify coliform standards achieved	N
5.	NYSDEC	Assess CSO impact (on part.body contact)	N
7.	RAC/DEC	reassess use impairment status	N

=====

COMMENTS: Further documentation of water quality data is needed to evaluate any exceedance of standards or guidelines in the St. Lawrence River near: 1) Canadian beaches; 2) Mohawk Nation at Akwesasne non-bathing beach areas; 3) partial-body contact areas downstream of CSOs. Delisting criteria are satisfied when bathing beach and partial body contact water standards and guidelines are achieved. The concentrations of fecal coliform and E. coli are to be consistently below 100 colonies per 100 ml samples.

STATUS KEY:
C = Completed I = Implementation progressing
P = Planned U = Under development/assessment/investigation
D = Deferred N = Needs development/assessment/investigation
 R = Required by enforcement/permit/agreement

USE IMPAIRMENT RESTORATION and PROTECTION STRATEGY

REMEDIAL ACTION PLAN: ST. LAWRENCE AT MASSENA FORM#: 10

USE IMPAIRMENT INDICATOR: Degradation of Plankton Populations

IJC#: 13 AOC LOCATION: Investigation needed

IMPAIRMENT RATING & CAUSES: UNKNOWN

POLLUTION SOURCES: Past hazardous waste disposal areas; physical habitat changes.

=====

<u>TARGET</u> <u>DATE:</u>	<u>RESP.</u> <u>PARTY</u>	<u>REMEDIAL STRATEGY / ACTION ITEM:</u>	<u>STATUS:</u>
1. 9/98	Indust.	Complete haz. waste rem. & implement BMPs	I

=====

2. _____ NYSDEC ___ Obtain plankton community structure data _____ N_
3. _____ NYSDEC ___ Confirm no sign. divergence from controls _____ N_
4. _____ NYSDEC ___ Bioassays confirm no toxicity (No #2 *) _____ N_
5. _____ RAC/DEC ___ Reassess use impairment status _____ N_
6. _____

=====

COMMENTS: Phytoplankton and Zooplankton population data are needed to evaluate if plankton community structure significantly diverges from unimpacted control sites of comparable physical and chemical characteristics. * In the absence of community structure data, an evaluation requires plankton bioassays to confirm no toxicity impact in ambient waters. A helpful indicator is to observe a healthy fish community in the AOC. Delisting criteria are satisfied when a healthy fish community can be demonstrated. Bioassay data should confirm no significant toxicity in ambient waters. A favorable comparison to unimpacted areas should be observed for the plankton community structure.

STATUS KEY:

I = Implementation progressing
C = Completed
P = Planned
D = Deferred
U = Under development/assessment/investigation
N = Needs development/assessment/investigation
R = Required by enforcement/permit/agreement

III.C. Current Programs and Remedial Activity Update:

Significant progress has occurred since the August 1992 Update of the St. Lawrence River at Massena RAP was published. Details of current programs and remedial activities are described below as they are linked or directed by remedial action strategies. In this Section III.C, the current program updates are separated into nine major environmental program area/remedial activity topics which are presented in the following order:

1. Hazardous Waste Site Remediation
2. Contaminated River Sediments
3. State Pollution Discharge Elimination System (SPDES)
4. Nonpoint Source Pollution Control
5. Air Pollution Control
6. Fish and Wildlife Assessments/Actions
7. Health and Environmental Assessments/Actions
8. RAP Public Participation and Outreach
9. Investigations & Monitoring Activities

As appropriate, when the details of a remedial activity description exceed the scope of one program area, cross-referencing among these nine areas is made in order to avoid duplicate reporting. Reference is also made to other sections in the Update (such as the additional initiative descriptions in Section IV). This nine program area/remedial activity breakdown is necessary to create an organized and current report that describes the details of RAP progress.

The progress of each of these nine environmental program areas involves multiple interested parties, issues and concerns that must take on an ecosystem approach to assure success of individual projects. The anticipated effects of the numerous remedial activities as related to the restoration of beneficial uses has already been described in the Table 3 matrix. Likewise, the identification of ongoing and/or necessary remedial activity strategies, as they are related to the correction of a specific use impairment, has already been developed in the ten Use Impairment Restoration and Protection Strategy management forms. Now, details of the specific remedial activities, involving each of these nine program area/remedial activity topics, are described below:

III.C. 1. Hazardous Waste Site Remediation (Land-Based)

As experience and expertise have grown in remediation work, a goal of shortening the time and lessening the costs of implementing a remedial program without sacrificing the protection of public health and the environment has been achieved. Steps have been taken to rapidly clean up sites by using Interim Remedial Measures (IRMs) which are actions that can be taken without long, formal investigations. The result has been that the site investigation process has undergone major changes: the former time-consuming Phase I and Phase II Investigations have now been combined into a single, condensed, comprehensive Preliminary Site Assessment (PSA). Built into a PSA are decision points which allow the classification or delisting of a site as soon as enough information

exists to evaluate the situation against the state's criteria for defining an inactive hazardous waste site. The number of class "2a" sites (those requiring more information) has been dramatically reduced and of those sites remaining, most are currently under investigation. NYSDEC's priority ranking system, for inactive hazardous waste sites listed as class "2" (those requiring remedial action), contains a RAP component that can raise the priority of implementing remediation based on the relationship to a Remedial Action Plan. Improvements in public interaction have been enhanced by state regulation requiring a citizen participation plan for every hazardous waste site undergoing remediation. Public comment opportunities are also provided prior to site delistings. Useful fact sheets are available that describe the stages of the remediation process. (see part C.8 below and Section IV.B for additional public participation details).

The sites described below are land-based remediation projects only and are high priorities thought to be likely sources of contaminants contributing to use impairments in the AOC. The "River Rap" newsletter (Spring 1995) provides further industrial remediation activity descriptions of these sites.

C.1.a. ALCOA Plant Site

ALCOA has agreed by consent order to remediate fourteen hazardous waste sites on its 3,500 acre site. Two Record of Decisions address these activities. Nine priority sites have been identified for remediation that are thought to be likely sources of contaminants to the Area of Concern. A large four cell secure landfill is currently under construction on-site for disposal of various hazardous wastes resulting from ALCOA remediation projects. The first cell is complete and started receiving contaminated material during the 1994 construction season; a second cell is 50% complete and should be ready for filling during the 1995 construction season. Details of the remedial actions involving the nine priority sites follow.
[A new tank site (now site #15) was listed in 1994 for remediation].

*** ALCOA Potliner Disposal Site "A"**

A Remedial Investigation/Feasibility Study (RI/FS) has been completed for this 1.5 acre site. Groundwater analysis has confirmed the presence of PAHs, PCBs and benzene. Cyanide has also been identified as exceeding applicable groundwater standards. A Remedial Design (RD) is currently underway that calls for this disposal area to be excavated and placed in a dedicated cell within the large on-site secure landfill. Additional groundwater management work may be required at the site which will be backfilled and capped.

*** ALCOA General Refuse Landfill and Annex**

The Record of Decision (ROD) for this 17 acre landfill site calls for the installation of a hazardous waste cap, an upgraded groundwater diversion trench, and a leachate collection system. The remedial design has been completed, and construction of the diversion trench and leachate collection system commenced; completion is expected this year. The waste in the 5 acre landfill annex has been contained in place through the construction of a perimeter slurry wall, a hazardous waste cap and a leachate collection system.

* ALCOA Potliner Disposal Site "I"

This four acre site has caused contamination of local groundwater, two nearby drainage ditches and nearby Robinson Creek. A RI/FS was completed and the ROD requires containment of the site in-place through the construction of a perimeter slurry wall, a hazardous waste cap and a leachate collection system. This work was completed. A second ROD has been issued that requires installation of a groundwater recovery system for which remedial design is underway.

* ALCOA Dennison Road Site

This .75 acre inactive landfill site is located in a ravine formed by river dredge material. The area was used for the disposal of drums of oily sludges, solvents, degreasers and solvent degreasing still bottoms. Groundwater contamination has resulted. Liquids were taken to the waste oil lagoon and the site was covered with soil, regraded and planted. Test soil borings and surface samples confirm contamination. A RI/FS was completed and the ROD requires excavation of wastes and soils with secure landfill disposal as necessary. The remedial design was completed in early 1994 and construction is proceeding. Groundwater contamination will need to be monitored. Residents have been supplied with a permanent municipal water supply to replace the temporary carbon filters used on their groundwater supplies.

* ALCOA Wastewater and Waste Oil Lagoons

This site is made up of five waste lagoons (operable units): the primary lagoon, the 60 acre lagoon, the soluble oil lagoon, the waste oil lagoon and the sanitary waste lagoon. The primary lagoon received air emission scrubblings and discharged to the 60 acre lagoon (which is actually 83 acres). Storm sewer and process cooling waters also enter the 60 acre lagoon. The soluble oil lagoon is 3 acres and was a holding pond. The waste oil lagoon (1.5 acres) is now capped and was also a holding pond. The sanitary lagoon is 18 acres and serves as a treatment pond for sanitary and storm waters. Each lagoon has a completed RI/FS and is addressed by one of the RODs. Remedial designs are currently being developed. Primary contaminants are PCBs, PAHs, cyanides, fluorides, and phenols. Waterfowl have been impacted.

* ALCOA Oily Waste Landfill

Two pits were used for the disposal and solidification of lubricating oils and sludges. Liquids were removed, wastes solidified and the pits were capped. In accordance with the RI/FS and ROD, the waste and underlying soils will be excavated and landfilled. Some materials may need treatment prior to secure landfilling. Remedial design was completed in 1994 and construction is proceeding.

* ALCOA West Marsh

Process wastewater mixed with stormwater contained significant PCB contamination. Acting under an Interim Remedial Measure (IRM), 8,000 cu. yds. were excavated for off-site disposal. The remaining waste marsh sediments were removed and placed into the adjacent landfill Annex, backfilled and capped.

* ALCOA East Marsh

Surface water discharged from the West Marsh, the General Refuse Landfill and the Soluble Oil Lagoon went to the East Marsh. Acting under the second ROD, contaminated marsh sediments and soils are to be excavated and placed in the secure landfill. Remedial design was completed in 1994 and construction is proceeding.

* ALCOA Unnamed Tributary

This site received stormwater flow from the smelting area since 1958 and flows 1.5 miles before discharge to the Grasse River. Tributary sediments samples contain elevated levels of PCBs, PAHs and cyanide. An IRM conducted in 1990 removed 1,500 cu.yds. of PCB sediments from the first 400 feet of the tributary. Under the RI/FS and ROD, ALCOA has developed a proposed remedy which is currently under review by NYSDEC. Construction is projected to occur in late 1995, after the discharge from the smelting area has been eliminated. This tributary is not within the secure industrial complex and is accessible to the public.

C.1.b. Reynolds Metals Company Plant Site

This site consists of the entire Reynolds Metals Company facility (112 acre plant on a total 1600 acre site) and adjacent areas which have been impacted by the handling and disposal of hazardous wastes. The major areas of concern are Black Mud Pond, the Landfill and Former Potliner Storage Area, Wetlands, North Yard, Potliner Pad, and Miscellaneous Areas including the Rectifier Yard and adjacent drainage ditch as well as an area north of Haverstock Road. Black Mud Pond and the Landfill no longer receive wastes and the landfill has been capped. A leachate collection system has been installed but is only partially effective. Site runoff has resulted in wetlands contamination. Historical waste handling and disposal practices have resulted in site-wide PCB, cyanide, fluoride, and sulfate contamination that poses a threat to health and the environment. The Remedial Investigation/Feasibility Study was completed in 1991 and a Record of Decision issued 1/92. In March 1993, NYSDEC issued a consent order requiring implementation of remedial design and remedial actions which commenced construction in October 1993. Remedial activities are scheduled for completion in March 1998. Similar to the ALCOA remediation project which has been divided into nine priority sites, the Reynolds remediation project has been divided into six priority sites each of which is addressed by the March 1993 Remedial Design/Remedial Action (RD/RA) Consent Order:

*** Reynolds Black Mud Pond**

The selected remedy for the site includes dewatering and capping in-place of all wastes within the Black Mud Pond and the soils beneath contaminated by the wastes. Following capping, groundwater levels will be measured monthly to monitor the effectiveness of capping. If the monitoring data indicate to NYSDEC that the water table has not been lowered below the contaminated soil and waste as a result of capping, the installation and operation of perimeter groundwater collection and treatment system will be required. A long-term groundwater monitoring program will be implemented to monitor both the vertical migration and the horizontal migration of contaminants and to ensure leaching is not occurring.

*** Reynolds Industrial Landfill and Former Potliner Storage Area**

A new and upgraded groundwater and leachate collection and treatment system will be installed which will be keyed into highly impermeable material below the landfill. Collected groundwater will be treated at the North Yard activated carbon system. The capacity and effectiveness of the activated carbon system will be evaluated and approved by NYSDEC. If necessary, a pretreatment system will be installed. A hazardous waste landfill cap will be installed over the entire area. Before the installation of the landfill cap, low level contaminated soils from the Wetlands, Potliner Storage Pad and the Miscellaneous Areas, are planned to be consolidated in the Landfill and Former Potliner Storage Area. The landfill has been closed and an

interim cap has been installed. The landfill and former potliner area are contaminated with PCBs, cyanides and fluorides.

* Reynolds Potliner Storage Pad

All contaminated soils at the Potliner Storage Pad and adjacent drainage ditches will be excavated to achieve cleanup goals and will be transported to the Former Potliner Storage Area for disposal under the landfill cap. The excavated ditches will be backfilled with crushed stone. The excavated area surrounding the Potliner Pad will be backfilled and paved and the Potliner pad may be rehabilitated. The groundwater and the surface water from the newly paved area and the West Ditch will be monitored. Additional monitoring wells will be needed. If monitoring indicates the potential for continuing environmental impacts, additional remedial actions will be considered (e.g. surface water and/or groundwater collection/treatment systems)

* Reynolds Wetlands

The selected remedy is to dewater the currently impacted area of the wetlands and to excavate the soils in this area and the adjacent drainageways to meet cleanup goals. The excavated material will be placed in the Former Potliner Storage Area for management under a RCRA approved cap and leachate collection system. Restoration and/or mitigation of the Wetlands destroyed or impacted as a result of Reynolds disposal activities will be the subject of further study and planning (approvable by NYSDEC) to determine the scope of appropriate alternatives consistent with applicable State laws, regulations, policy and guidance.

* Reynolds North Yard Area

All soils in the North Yard contaminated with 25 ppm PCBs or above will be excavated and treated in an on-site treatment unit. Treated residuals may be used as backfill. On-site infrared thermal treatment was evaluated in the feasibility study. Once excavation is complete, the remaining area where PCB contamination exceeds 10 ppm in soils will be graded and capped. The existing surface water and shallow groundwater collection system will be modified and enhanced and/or a new collection and treatment system will be installed. Long-term monitoring will be performed.

* Miscellaneous Areas

The remedy includes the excavation of soils and site sediments with PCB concentrations equal to or greater than 1 ppm. The excavated areas will be backfilled, graded and seeded. Once restoration is completed, the surface water from each area will be monitored. Soils with PCB concentrations greater than or equal to 50 ppm will be shipped off-site to a USEPA approved PCB landfill. Soils and sediments with PCB concentrations equal to or greater than 25 ppm and less than 50 ppm will be treated on-site. Treated soils may be used as backfill on-site. Soils and sediments with PCB concentrations less than 25 ppm will be landfilled in the Landfill/Former Potliner Storage Area prior to capping. The remedial design for the Haverstock Rd. area, the Rectified Yard Ditch, and other remaining cleanup areas is under development.

C.1.c. General Motors Corporation, Central Foundry Division Site

This facility encompasses approximately a 270 acre site. Land-based remedial activity areas include an industrial landfill area, north and east sludge disposal areas, various soil and groundwater contamination sites, off-site St. Regis Mohawk Tribe contamination, St. Lawrence and Raquette River shoreline locations, and an unnamed tributary area to the St. Lawrence River. The industrial landfill has been temporarily capped. USEPA has issued two Record of Decisions to address all site remedial actions (identified as Operable Units 1 & 2). Administrative orders have also been issued by USEPA that require implementation (remedial design and remedial action) of the RODs. The selected remedies consist of: (1) excavation of PCB contaminated sludges, soil, and debris in the North Disposal Area, in and around the four Industrial Lagoons, and in other areas on GM property; (2) excavation of PCB contaminated soil on the St. Regis Mohawk Reservation land adjacent to the GM facility; (3) recovery and treatment of groundwater downgradient from the site; (4) treatment of excavated and dredged material by biological treatment or thermal destruction to be determined by USEPA following treatability testing (treated residuals are planned to be disposed of on-site); and (5) excavation, dredging, and treatment of soils and sediments along the riverbanks, in the wetlands and on the bottom of the St. Lawrence River, Raquette River and Turtle Creek (details of dredging activities are provided in the Contaminated River Sediments section that follows this land-based remedial actions section). Remedial design plans for the collection and treatment of site stormwater have been submitted by GM. USEPA is the lead agency for both the land-based and contaminated river sediment remediation projects at the General Motors facility.

C.1.d. Other Hazardous Waste Sites

- * North Lawrence Oil Dump

This area was used for the disposal of waste oils and sludges in the 1960's. The disposal area is adjacent to a wetland. Information provided by local residents has indicated that this site was operated in conjunction with the York Oil dump in Moira, just over the Franklin County line. A State funded Remedial Investigation/Feasibility Study (RI/FS) was completed in early 1993. A Record of Decision (ROD) was issued in March 1993. The ROD calls for the on-site stabilization and solidification of different spoils from two areas: contaminated soils to be excavated from the lagoon, and PCB contaminated sediments to be excavated from the wetland. A work assignment to conduct pilot testing of the stabilization and solidification of the contaminated soils was issued in February of 1994.

* Sealand Restoration Inc.

Sealand Restoration Incorporated (SRI) purchased a former dairy farm in a rural part of St. Lawrence County. The farmland was used for the disposal of uncontaminated waste oils and cleanup debris from spills. The waste was landspread on the fields or placed in a disposal cell. The Company had a NYSDEC solid waste Part 360 permit for this operation. SRI violated their permit by improperly constructing a disposal cell, and stockpiling and/or disposing of unauthorized hazardous wastes (most of which were solvents and degreasers). In March of 1980, NYS Department of Health sampled several downgradient drinking water wells and found no site related contamination. In June of 1980, DEC revoked SRI's permit. SRI was later fined and ordered to cleanup the disposal cell, but they did not comply. The company filed for bankruptcy in late 1981. In 1986, St. Lawrence County completed the removal of stockpiled waste. Subsequently, Phase I and Phase II investigations were completed for the site. A Remedial Investigation/Feasibility Study (RI/FS) was then initiated which revealed low level localized groundwater contamination. By early 1990, an initial remedial action that excavated and removed contaminated soil and buried waste in the disposal cell was completed. Again, the NYSDOH sampled drinking water wells and no site related contamination was discovered. The site has been placed on the National Priorities List (NPL) and USEPA has taken over as lead agency. A supplemental RI/FS was started in 1990; a Record of Decision is scheduled to be issued in May 1995.

* York Oil Company

This is a Federal Superfund site, located on the south side of County Rd. #6, two miles northwest of the Hamlet of Moira. The site consists of three lagoons approximately three acres in size and two 25,000 gallon storage tanks used as part of an oil recovery

and salvage operation. The oils were found to be contaminated with PCBs. PCB contamination has been found throughout the nine acre parcel used for the oil salvage and recovery operation and has been found in groundwater south of the parcel and in surface water and soil up to two and one-half miles north of the facility in a drainage pathway. Remedial investigations to assess the extent of the contamination at the facility were completed in February 1988. The feasibility study for the on-site remedial program was completed in March 1988. USEPA issued a Consent Order for on-site remediation that includes a groundwater pump and treatment system, destruction of waste oils by incineration, and solidification of soils. An additional USEPA Consent Order has been issued requiring an off-site RI/FS that is expected to be completed in 1995. Projects under both Consent Orders are in progress. This site is on the federal NPL list.

* Mineral Processing

The Mineral Processing Company, in the Town of Massena, operated as a processor of aluminum dross which was obtained from the nearby General Motors foundry. In addition to processing dross, the company also cut up old machinery for sale as scrap. In the process of cutting up machinery, hydraulic oil containing PCBs was frequently spilled in and around the facility resulting in site contamination. The site is located adjacent to the St. Regis Mohawk Tribe Reservation. NYSDEC investigation and sampling has confirmed the presence of PCBs at levels that will require remedial cleanup. An Interim Remedial Measure (IRM) has been designed to remove PCB contaminated soil and debris from inside and outside the building structure including sediments in a drainage ditch. Also required is: the disposal of drums containing personal protective equipment (PPE); high pressure washing of the building floor; and, the installation of groundwater monitoring wells as part of a Remedial Investigation/Feasibility Study. NYSDEC will implement this remedial cleanup action which is expected to begin in May 1995 and to be completed in the fall of 1995. The State Superfund is to pay for the remedial work. When the remediation is completed, NYSDEC will evaluate the results to determine whether cleanup standards for soil, groundwater and the building have been achieved and if any additional remedial work is necessary.

III.C. 2. Contaminated River Sediments

USEPA is the lead agency in the St. Lawrence River AOC contaminated river sediment remediation projects. These include the remedial activities associated with the Grasse and Raquette Rivers and other Massena AOC tributaries to the St. Lawrence River. Among the three major industries

affecting the AOC, NYSDEC is the lead agency concerning land-based remedial actions involving ALCOA and Reynolds Metals; General Motors is entirely under USEPA enforcement orders. In September 1989, USEPA issued unilateral administrative orders to ALCOA and Reynolds Metal requiring the investigation and remediation of contaminated river sediments in the waters of the Area of Concern. General Motors is under a 1985 consent order requiring a Remedial Investigation / Feasibility Study as well as follow-up administrative orders that address sediment remediation. Separate Record of Decisions (ROD) contain the details of river sediment remediation for General Motors and Reynolds; Alcoa's ROD for sediment remediation has not yet been finalized.

EPA is proposing a Contaminated Sediment Management Strategy that describes specific actions that EPA plans to take to address environmental and human health risks associated with contaminated sediment. The development of an EPA contaminated sediment criteria guidance document is part of this strategy. Refer to Section IV.M for additional details of this strategy and criteria development. In addition, NYSDEC's Divisions of Fish and Wildlife and Marine Resources have produced a document entitled "Technical Guidance for Screening Contaminated Sediments", July 1994. This guidance is applied to sediment decisions in the Massena industrial area. Consideration must be given to the timing of introducing any new criteria as to how they will apply to past and future projects.

The St. Lawrence River segment within the Massena Area of Concern associated with contaminated sediment remediation extends from the St. Lawrence-Franklin County line upstream to Snell Lock, and along the south shore of the St. Lawrence River out of the shipping channel; then up the Grasse River to the Massena Power Canal Discharge. The geographic breakdown of responsibilities among the three separate USEPA administrative orders is: 1) ALCOA is to address the Grasse River; 2) Reynolds is to address the area from the confluence of the Grasse and St. Lawrence Rivers downstream to the International Bridge; and 3) GM is to address the portion of the St. Lawrence River from the bridge downstream to the area where sampling results show PCB concentrations at a level below 1 ppm. PCB sediment contamination is concentrated in the rivers near the ALCOA, Reynolds and General Motors wastewater and stormwater discharge points. Polynuclear Aromatic Hydrocarbons (PAHs), cyanide, fluoride, lead, cadmium and chromium contamination have also been found in site sediments. Analysis of fish and wildlife from the sites and surrounding environs have revealed high levels of PCB contamination. Elevated levels of dioxins and dibenzofurans have also been detected in some of the samples taken. Specifics of each of the three major industrial contaminated river sediment remedial activities are presented below:

C.2.a. ALCOA

An Interim Remedial Measure (IRM) was planned to remove 3,500 cu.yd. of PCB contaminated sediment from the Grasse River at the main plant outfall during 1994. Because of unforeseen river bottom conditions involving large rocks, dredging has been postponed until the 1995 season. ALCOA submitted a design proposal for

dredging in April 1994 that included an Environmental Monitoring Plan. NYSDEC suggested and is proceeding with an additional monitoring activity to evaluate the bio-uptake of toxics contained in sediments. This test involves exposing the worm "Lumbriculus variegatus" to sediments for 28 days to measure bioaccumulation of PCBs. In addition to pre- and post-dredging monitoring activities, some monitoring during active dredging is planned. USEPA is to address monitoring plan consistency among the dredging projects in the AOC. Plans are to be finalized after receiving NYSDEC review and USEPA approval. Within ALCOA's Grasse River IRM dredge area, an 11,000 ppm PCB "hot-spot" is expected to be removed until all sediments remaining contain a maximum of 10 ppm PCBs in the removal area.

The final extent of Grasse River remediation will be defined once the RI/FS is completed and the EPA Record of Decision issued. We know that PCB contamination exists along the entire river bottom of the Grasse River below ALCOA. PCB concentrations are commonly above 1.0 ppm which is currently the cleanup criterion being used at Reynolds and General Motors. A thorough evaluation of alternatives for this seven mile river reach is needed. This situation has the potential for being a very large remedial project.

C.2.b. Reynolds Metals

This is the largest of the three contaminated sediment removal projects involving 51,500 cubic yards of sediment and river bed materials. Initially, only 9,000 cu.yds. are planned for removal. The site is downstream of the ALCOA dredge site and is located within the St. Lawrence River below where the Grasse River enters. This site has swifter moving waters and a rocky bottom. The Reynolds Metals PCB "hot-spot" near outfall 001 contains sediments with PCB concentrations as high as 1,300 ppm PCBs. Extensive monitoring and follow-up investigation work will be required to meet the cleanup levels of 1 ppm PCBs, 10 ppm PAHs and 1 ppb total dibenzofuran. According to the ROD, materials with PCB concentrations above 25 ppm are planned to be treated by thermal desorption. In September 1993, USEPA issued a Record of Decision addressing contaminated river sediment remediation for Reynolds Metals. Although it was hoped to commence Phase I of the dredging in 1994, plans are now being directed at starting in the 1995 season. Construction was started on an interim storage pad and dewatering bed to handle dredged sediments.

C.2.c. General Motors

The first ROD issued in December 1990, addresses contaminated river sediment remediation. A two year dredging plan, that has been delayed, called for removal of 5,000 cu.yd. of PCB contaminated sediments in 1994 and another 25,000 cu.yd. in 1995. The 500 ppm PCB "hot-spot" is planned to be removed with the first phase of

remedial dredging. In late 1994, General Motors announced that because of technical difficulties with their silt curtains, in the proposed contaminated sediment removal project, GM will delay the start of dredging to the 1995 construction season. Alternative sediment containment systems are being evaluated as well as how to proceed with dredging activities when large rocks are encountered. Large sediment sludge filter presses and separate wastewater treatment units are planned to be operated on-site. Because of the concern about wave action and bottom disturbance, extra monitoring precautions are to be employed. In fact, Environment Canada has offered to conduct additional dye studies during dredging activities to assist USEPA in site monitoring. One plan calls for the analysis of PCBs in the river water when triggered by elevated measurements of TSS as performed with the dye testing. The results of the remedial dredging actions are to be assessed and presented in future RAP Update documents. The success of these remedial dredging activities is expected to have a significant effect on the restoration and protection of beneficial uses in the Area of Concern.

III.C. 3. State Pollution Discharge Elimination System (SPDES)

With the initiation of the Division of Water's Environmental Benefit Permit Strategy (EBPS) in April 1992, point source discharge permits are now given priority for renewal modifications based on the identification of environmental/water quality benefits. A ranking system has been implemented that provides higher priority for permit modifications based on permit need factors and their impact towards environmental improvements. A Great Lakes Area of concern (AOC) component based on bioaccumulation and persistent toxic chemicals is one element of this priority system. An identification with an AOC based on this bioaccumulative/persistence factor will therefore provide additional weight in the priority ranking system for working on a point source discharge permit renewal/modification. The EBPS is proving to be very successful. Significant SPDES permits and associated priority modifications in the Massena area that are likely to have an impact on the restoration and protection of beneficial uses are discussed below.

In addition, as part of EPA's Contaminated Sediment Management Strategy (described in Appendix IV.M), EPA is developing a sediment quality criteria user's guide to assist in interpreting sediment chemistry. The goal is to apply this EPA technical guidance in evaluating

dredged material testing, dredged material disposal site selection, and disposal alternatives to ensure continued disposal of dredged material in an environmentally sound manner. At the same time, NYSDEC has developed and is using guidance from a July 1994 publication entitled: "Technical Guidance for Screening Contaminated Sediments". The application of sediment quality criteria can be very useful in making hazardous waste site assessments and proposed sediment dredging and disposal decisions. The criteria could also be adopted as part of state water quality standards and

applied to help establish water permit discharge limits.

INDUSTRIAL POINT SOURCE PERMITS:

The three major industries in the Massena AOC are in various stages of the SPDES permit renewal/modification process. Details are presented below. Overall, and with consideration for the requirements proposed under the Great Lakes Water Quality Guidance, we can expect to see more stringent permit discharge limits with the primary emphasis on parameters identified as bioaccumulative chemicals of concern (BCCs) as well as other toxic substances. Process and stormwater discharge management practices require industries to comply with best available technology (BAT) and water quality based effluent limits and controls.

C.3.a. ALCOA

The current SPDES permit (NY-0001732) became effective March 1, 1985 and has been modified several times, most recently in April 1994 concerning PCBs. The discharge points (consisting of four effluent outfalls to receiving water and five internal facility outfalls) are regulated by parameter limits for conventional parameters, metals and organics, fluoride, cyanide, PCBs, and approximately 25 action levels for other toxic chemicals of concern. The most recent draft permit renewal includes a new outfall representing the centralized treatment of BAT regulated waste streams. A number of process wastestreams passing through the five internal outfalls are comprehensively regulated by this permit renewal modification. Following meetings with the company, a final revised draft permit will be prepared and public noticed for comments. In addition to conventional parameter limits, specific monitoring requirements for numerous toxic, metal, and organic parameters are to be established (including interim and final limits that replace most action levels). The draft permit also defines compliance criteria for PCBs (non-detectable) and requires a Toxicity Testing Program. The additional PCB requirements are to be placed in a Consent Order that will accompany the permit depending on compliance follow-up needs (i.e. source trackdown, control and elimination). Special conditions also require the development and implementation of a Best Management Practices (BMP) plan to address runoff, spill drainage, sludge/waste disposal, and storage and handling.

The more stringent discharge limits, additional monitoring, and Best Management Practices plan implementation requirements imposed by the draft SPDES permit renewal/modification, will all contribute either directly or indirectly to the restoration and protection of beneficial uses and to the documentation of the progress needed to report on and verify success.

To meet its wastewater discharge requirements, ALCOA is developing a Wastewater Management Plan for its Massena Operations. (This plan is in draft form as some of the capital cost items will require corporate approval for funding). The draft plan provides for the elimination of the caustic etch process from manufacturing area 1 (outfall 001). This process elimination would result in significant reductions in BAT limited discharges. Site remediation of the 60 acre lagoon (as required by a NYSDEC Division of Hazardous Waste Remediation administrative order) and re-routing of process and stormwater discharges are included in this plan. In the smelting area the completion of the Anode Quench Recycle System will also result in significant reduction in the discharge of BAT limited parameters. Construction of additional impoundments is under consideration (one at outfall 002 and another to replace the 60 acre lagoon). Construction of new ore unloading facilities will improve the discharge associated with outfall 003. Increased treatment capacity is to be provided by additional sand filters on outfall 004. Implementation of Best Management Practices and the PCB trackdown program will also contribute to wastewater discharge improvements. As already mentioned, a Consent Order will be needed with the permit renewal because of statutory requirements and the need for a formal compliance schedule.

Various administrative orders have already been issued involving ALCOA. An August 1991 order required PCB reductions from the facility, installation of carbon treatment for two outfalls (complete), reduction in wastewater flows to approximately 6 mgd., congener specific PCB sampling, pretreatment studies on two outfalls, and bioaccumulation monitoring (complete). It also provided interim effluent limits and set Method Detection Limits (MDLs) for discharges. These limits have been extended to date. A July 1991 penalty order involving SPDES violations required ALCOA to pay \$3.75 million (an equal \$ amount was also required to be paid for criminal actions involving the illegal storage, shipping and disposal of hazardous waste).

C.3.b. Reynolds

The current SPDES permit became effective 11/1/85. Three outfalls are regulated by conventional parameter discharge limits and other limits that include: several metals, oil & grease, cyanide, phenols, chlorine, fluoride, benzo (a) pyrene and

PCBs. A draft permit renewal/modification provides for more stringent discharge limits similar to those involved with the ALCOA permit. Reynolds will also need to develop a wastewater management plan to describe implementation for compliance tracking.

Various administrative orders have been issued involving Reynolds Metals. A March

1992 consent decree required a \$420,000 penalty and corrective projects to remediate PCBs. This action settled a 1988 case involving the Atlantic States Legal Foundation, NYS Attorney General's Office, and NYSDEC as well as the 1989 permit modification process. Besides the legal fees and penalties, other payments included: \$120,000 to support the Akwesasne Aquaculture Project and related monitoring (described in section IV.A.2); \$30,000 to support PCB study in the Area of Concern; and \$25,000 to support American Clean Water biological studies between the City of Ogdensburg and Village of Massena.

A special short-term monitoring program is currently underway by Reynolds Metals. Following the receipt of the results of this report, a redraft of the SPDES permit renewal will commence. Consideration for all the requirements presented above under ALCOA permit renewal will be included in the Reynolds permit renewal. When complete, a final revised draft permit will be public noticed for comments. As with the ALCOA permit, the additional PCB requirements are to be placed in a consent order that is to accompany the permit depending on compliance follow-up needs (i.e. source trackdown, control and elimination).

C.3.c. General Motors

The SPDES permit was modified in March 1989. Three outfalls are regulated by conventional parameter discharge limits and other limits that include: several metals, five organic action levels, phenols, PCBs, and oil & grease.

Land-based and contaminated river sediment remedial activities are under federal EPA orders. Following final issuance of either the ALCOA or the Reynolds SPDES permit, the General Motor's permit will be developed with consideration for the requirements included in these other large Massena area industrial permits. Future RAP Updates will track SPDES permit progress and report on the effects the permit modification requirements have on restoring and protecting beneficial uses in the Massena AOC waters.

MUNICIPAL POINT SOURCE PERMITS:

Although the municipal permits in the Massena AOC tend to not score high on the EBPS ranking system for environmental benefits of permit modifications, there are issues that are forefront in the concern of these discharge permits which include combined sewer overflow (CSO) controls, stormwater management and pretreatment program elements. From the two

major municipal dischargers in this area (the Village of Massena and the City of Ogdensburg), the further control of combined sewer overflows is of concern. Stormwater and pretreatment program requirements also need review. In 1993 USEPA and NYSDEC developed CSO strategies through regulatory negotiation that require minimum controls for CSO system operation and maintenance, minimization of overflows using existing infrastructure, pollution prevention, prohibition of dry weather discharges, public notification and monitoring. Long-term plans that will result in compliance with water quality standards and uses are also required. Special protection must be provided to sensitive areas such as endangered species habitat and public drinking water intakes. Under the proposed reauthorization of the Clean Water Act, CSOs would be subject to additional regulations (announced 4/11/94 by EPA) and long-term control strategies (compliance schedules).

Current stormwater management requires municipalities to reduce pollution to the maximum extent practicable, use any controls necessary to comply with water quality standards, and prohibit non-stormwater discharges into storm sewers. Pretreatment program requirements address industrial user and municipal program needs to meet discharge limits and prevent pollution. Along these lines, there is a need for monitoring PCBs in municipal discharge effluent. In regard to the Village of Massena, this effort is to ascertain any PCB contribution so as to account for all potential inputs of PCBs to the Grasse River system.

Specific additional requirements that may be incorporated in the Village of Massena and the City of Ogdensburg SPDES permits are to be described in future RAP Update reports as these conditions are developed and implemented.

III.C. 4. Nonpoint Source Pollution Control

Nonpoint sources have been identified as the primary source of water quality problems in more than 1,300 water body segments (92%) included on New York's 1993 Priority Water Problems (PWP) list. NYSDEC maintains descriptive data on each of these PWPs. There are over 40 subcategories of sources that are considered nonpoint sources contributing to water quality problems. These range from sources such as atmospheric deposition and contaminated sediments, that will have to be addressed by state and/or federal level programs, to categories such as on-site wastewater treatment systems and agricultural runoff that are best addressed through local implementation efforts and involve land use decisions.

Nonpoint source pollutants include pathogens, sediments, nutrients, toxics, thermal energy and oxygen-demanding organics. For example, pathogens have been identified as responsible for the

closing of shellfish beds and bathing beaches on Long Island. Sediment can destroy fish habitat through the blanketing of fish spawning and feeding areas and the elimination of certain food organisms. Nutrients contribute to eutrophication in lakes, reservoirs and marine waters.

Within the St. Lawrence River watershed that drains to the Massena area, further evaluation of any nonpoint source causes of use impairments need to be performed. Physical disturbances, contaminated sediments, land-based hazardous waste sites, and watershed practices concerning fertilizer and pesticide use are examples of sources of nonpoint source pollution causes. For example, the incident of the Wal Mart watertower construction area landslide into the Grasse River needs to be evaluated as to its impact on use impairments. Liability, including the assessment of environmental penalties, as well as a review of construction regulations and Best Management Practices need to be evaluated for requirements concerning remedial and preventive measures to address this landslide incident and any future similar unexpected events. A comprehensive review of project planning is recommended.

NYSDEC has begun to identify projects to address water quality problems in New York State and to fund some of these activities using federal funds appropriated under Sections 319 and 604(b) of the Clean Water Act. In the last two years, nearly \$1 Million has been made available for locally-based nonpoint source pollution control activities. Other funding sources exist that support RAP goals for the development and implementation of specific projects; these funding sources are listed and described in Section IV.F entitled RAP Financing.

Passage of the federal Water Quality Act of 1987 led New York State to take a more active role in dealing with nonpoint source pollution problems. As required by Section 319 of the Act, NYSDEC coordinated the preparation of a Nonpoint Source Assessment Report and a Nonpoint Source Management Program. In the years since 1989, NYSDEC has: developed guidance materials on source categories and public outreach; joined forces with the USDA Natural Resources Conservation Service (formerly the USDA Soil Conservation Service) to provide technical training; formed cooperative agreements with the Natural Resources Conservation Service and the NYS Soil and Water Conservation Committee; funded aspects of County Water Quality Coordinating Committee efforts; funded specific county-based implementation projects in the Great Lakes Basin; and, supported various other nonpoint source pollution projects including groundwater protection across the state.

Working in conjunction with the NYS Soil and Water Conservation Committee (NYSSWCC), DEC has encouraged the development of county water quality strategies. Grants were made available to each county that completed a strategy; in fact, almost all NYS counties did this. These strategies therefore have become a part of RAP strategies and provide blueprints for actions to address nonpoint source pollution in a particular watershed.

In applying the RAP Process to provide an ecosystem approach to protect and restore beneficial uses, a watershed approach is necessary to trackdown sources and to implement remedial/preventive measures. Nonpoint source pollution control is essential to remedial strategies. Much work has been accomplished in the development and implementation of nonpoint source management. Plans,

guidance and actions have been established and work is continuing.

Federal guidance has established some fundamental elements that form the basis for the application of best management practices used in a nonpoint source pollution control program. These elements have been incorporated into an EPA guidance document entitled "The Stream Protection Approach". The Stream Protection Approach incorporates the integration of six elements into a cyclic development, planning, implementation and review process. This guidance document provides us with a model that can be applied to New York State nonpoint source pollution control efforts. The six broad elements encompass the following protection strategies:

- * Protect key resource area from development (these include wetlands, floodplains, steep slopes, streams, forests, habitat, and open space).
- * Establish buffers to protect resource areas (includes aspects of delineation, construction and management).
- * Provide sediment and erosion control (address clearing, grading, sediments, construction sequence, disturbance limit, and revegetation).
- * Reduce site imperviousness (use cluster development, provide infiltration and design requirements such as porous pavement and concrete grid).
- * Provide stormwater management (address quantity and quality of runoff, treatment, controls, protection and BMPs).
- * Provide watershed maintenance (employ inspections, enforcement, maintenance, assistance, and restoration activities).

NYSDEC's Division of Water is in the process of producing various guidance document sections for the Management Practices Catalogue for Nonpoint Source Pollution Prevention and Water Quality Protection in New York State. Most of the nine parts of this Management Practices Catalogue have been finalized that deal with: stormwater runoff, agriculture, construction practices, roadway maintenance practices, on-site wastewater treatment systems, silviculture, spills, resource extraction and hydrologic/habitat modification.

Implementation of initiatives outlined in the Nonpoint Source Management Program includes many elements and is an ongoing effort of nonpoint source control. Local involvement is essential and Best Management Practices establish fundamental strategies. The cooperative agreements with county districts and the State Soil and Water Conservation Committee are key factors to implementation. Education and training continue to be needed.

III.C.5. Air Pollution Control

New York State has put together a comprehensive program to improve air quality and to bring the State into compliance with the 1990 federal Clean Air Act Amendments (CAAA). The amendments address chronic air pollution and require states to bring their air quality into compliance with federal standards by specific dates. Substantial new obligations to control urban smog, acid rain, toxic pollution and pollution from smokestacks are required to be implemented under meaningful, rigorous timetables. States that fail to meet these obligations will be subject to federally-imposed economic sanctions. Major provisions of the 1990 CAAA include:

Title I: Nonattainment - This title classifies geographic areas that do not meet federal standards for particulate matter, nitrogen dioxide, carbon monoxide, lead sulfur dioxide and ozone (VOCs and NOx). It also sets acceptable air quality limits, progress requirements and emissions control guidelines for both mobile sources (cars, trucks) and stationary sources (utilities, industries).

Title II: Mobile Sources - For all types of motor vehicles, this title sets standards for emissions testing, certification and warranties. It also directs the federal Environmental Protection Agency (EPA) to develop regulations for formulating motor fuels and to set standards for clean alternative fuels.

Title III: Air Toxics - This program lists 189 chemicals to be regulated and includes a procedure for EPA to add and delete chemicals from this list. It directs EPA to identify toxic source categories and to establish emissions limits and siting requirements for municipal waste incinerators.

Title IV: Acid Rain - This title describes plans for reducing emissions of sulfur dioxide and oxides of nitrogen, and it directs EPA to establish limits on electric utility plant emissions of these pollutants.

Title V: Permits for Stationary Sources - States are directed to adopt and implement an air pollution permit program that includes emissions limits and standards, compliance schedules and reporting requirements. Provisions are made for assistance to small businesses to help them comply. Fees are required to be established and collected for the support of the program.

C.5.a Source Strategies for Air Pollution Control

In order to meet the goals of the CAAA, New York State's air pollution control

program will concentrate on mobile sources (cars and trucks), stationary sources (utilities and industries), and area sources (consumer products). Strategies for the implementation of these three air pollution control activities are:

* Mobile Sources

For vehicles, increase the amount of oxygen contained in gasoline sold in areas with carbon monoxide pollution problems; adopt strict emissions standards for new passenger vehicles; enhance the State's motor vehicle inspection and maintenance programs; and, require motor vehicle trip reduction plans for companies that have 100 or more employees and are located in areas with severe air quality problems.

* Stationary Sources

For companies, require the installation of basic air pollution controls that use reasonably available control technologies (RACT), and includes offsets for major new sources of air pollution at a ratio which is greater than 1.15 to 1, or 1.3 to 1 in areas of severe nonattainment.

* Area Sources

For products, regulate the amount of solvent in paints & inks and other consumer products such as hair spray.

C.5.b Air Pollution Programs Affecting Rap Strategies

* Air Toxics

The air toxics program is required to set emissions limits for 189 hazardous air pollutants that affect the public health. Provisions call for use of maximum achievable control technologies (MACT). EPA is required to develop, implement and enforce regulations establishing requirements for air pollution control technology, pollutant trading and the assessment of residual health risks caused by pollutants in the air. These requirements apply to stationary sources which discharge specific amounts or types of air pollutants. For major and area sources, the CAAA lists 189 hazardous air pollutants that take into account toxicity, reaction with other substances, and persistence in the environment.

Major sources are any stationary source or group of stationary sources that emit 10 tons per year or more of any single hazardous air pollutant, or 25 tons per year or more of any combination of hazardous air pollutants. Area sources are smaller sources

which emit less than either the 10 or 25 tons per year thresholds.

Changes to the hazardous air pollutant list can be made. EPA is required to establish separate standards for municipal waste incinerators that provide maximum reductions in air emissions, taking into account cost, health/environmental impacts, and energy requirements. It is expected that the new control standards will require additional emissions reductions of 75-90 percent below current levels.

After the control technologies are in place, New York State must assess the public health risk which remains and oversee the permit, program modification, and offset programs as required by the CAAA. New facilities are subject to emissions standards that are tighter than those applicable to existing facilities.

NYSDEC has a comprehensive air toxics program that accommodates the 1990 CAAA. State air regulation Part 212 and New York's Air Guide-1 provide the foundation. Air Guide-1 contains specific chemical control guidance for over 240 chemicals categorized as either high, moderate or low toxicity air contaminants. Stack testing to assure compliance is provided.

* Ozone Transport

Recognizing that a combined and coordinated effort among states would be needed to solve the ozone transport problem in the Northeast, Congress established the Ozone Transport Commission (OTC) as part of the 1990 CAAA. The OTC addresses the regionwide transport of ground-level ozone and its precursor emissions of volatile organic compounds (VOCs) and nitrogen oxides (Nox). The OTC includes members from Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, Pennsylvania, Rhode Island, Vermont, Virginia, and Washington, D.C.

Under the CAAA, the following control measures are required by the OTC states: an enhanced vehicle emissions inspection program in all areas with populations greater than 100,000; basic controls on most stationary sources; new source review for offsets of major stationary sources; and, cleaner fuels.

* Small Business Assistance Program

The Small Business Assistance Program is an opportunity for businesses to obtain the information and technical assistance necessary for compliance with the CAAA. In

order to meet the many new air quality standards and to control toxic emissions, which requires installation of air pollution controls and knowledge of complex regulations, Congress ordered EPA and the states to help small businesses by providing technical assistance and compliance information. The three key components of the program are an Ombudsman's Office, a Technical Assistance Program, and a Compliance Advisory Panel.

The Ombudsman Office will serve as the representative of small businesses. The office will be located at the New York State Department of Economic Development. The office will handle complaints, provide outreach and help small businesses gain access to program services.

The Technical Assistance Program, located within the New York State Environmental Facilities Corporation, will work independently from NYSDEC. This program will aid small businesses in understanding federal and state requirements, assist in filling out permit applications, and provide technical advice on compliance with the regulations.

A Compliance Advisory Panel will be established to render advisory opinions, determine the overall effectiveness of the technical assistance program, and review information to assure it is easily understood.

Any business which is independently owned and employs less than 100 people and is not a major source of air pollution (as defined by appropriate regulations) will qualify for assistance.

C.5.c Air Program Investigations / Initiatives

*** Ambient Air Monitoring Networks**

NYSDEC Division of Air conducts routine air monitoring through two statewide air monitoring networks: air toxics and acidic deposition. A mobile air laboratory is also used to monitor ambient air that operates a Trace Atmospheric Gas Analyzer (TAGA). The networks provide data to identify state air quality in terms of heavy metals and volatile and semivolatile organics. Transport and conversion mechanisms are also understood.

Fluoride emissions from the two primary aluminum industries, ALCOA and Reynolds Metals, represents the major air pollution concern in the Massena area. A NYSDEC air study report (1991) found some ambient hydrogen fluoride levels exceeding standards. PCBs were detected in air samples on the St. Lawrence River near General Motors and PCB vapors were detected downwind of remediation site. Further ambient

air study and assessment is needed.

* Vegetation Sampling for Fluoride

Because of the concern about local industrial fluoride emissions, the NYSDOH in conjunction with NYSDEC and the Akwesasne conduct annual vegetation analyses for fluoride. The trend has been for decreasing levels in areas away from the industries; however, close non-agriculture lands do exceed allowable fluoride levels. Further ambient air study and assessment is needed.

* Fugitive Emissions

Air discharges that are not captured by a pollution control system and thus are released to the atmosphere at the source rather than a stack are fugitive emissions. In some cases such emissions may be a significant source of atmospheric pollution. Therefore, NYSDEC is promulgating a fugitive emission regulation which calls for a 50 percent reduction of all unregulated air releases from a 1987 baseline emission inventory.

* Atmospheric Deposition

By late 1995, EPA must use the results of studies on toxic pollution of the Great Lakes resulting from atmospheric deposition to develop regulations, if necessary, to combat the air toxics problem.

The Great Waters Report (May 1994) provides a discussion of the problems and recommendations relative to the deposition of air pollutants to the Great Lakes. Atmospheric deposition may be a significant nonpoint source of pollution to the Great Lakes basin; however, direct evidence is needed of any effect on water quality by air sources in the Massena Area of Concern.

* National Urban Air Toxics Strategy

EPA is responsible to propose a national urban air toxics strategy by 1995 which contains specific actions designated to reduce cancer risks from urban sources by 75 percent. Although development of the strategy is behind schedule, full implementation is called for by 1999. Because the Massena area is not in a designated national urban area, New York State regulations under the maximum achievable control technology (MACT) requirements will apply.

* Source Category Regulation

EPA is responsible to list sufficient area source categories of air pollution to regulate 90 percent of emissions of the 30 most hazardous area source pollutants. Regulations requiring generally available control technology for the sources must be adopted by

the year 2000. Maximum achievable control technology (MACT) requirements are also being developed for various source categories.

* Source Discharge Air Permits Program

The CAAA Title V requires that individual facilities whose emissions of certain contaminants exceed specified thresholds or that are subject to specific federal New Source Performance Standards (NSPS), National Emission Standards for Hazardous Air Pollutants (NESHAP), or other federal standards, obtain operating permits under Title V. Individual emission point permits (as currently required by NYSDEC) are not required, although there are provisions for individual process operations within a facility. The intent is to incorporate the federal facility discharge permit strategy into NYSDEC's permitting program while maintaining the state's already enhanced discharge controls. Facilities not required to obtain a facility permit will be regulated by the current emission point program with some major improvements: separate construction permits will not be needed and long term permits will be provided for unchanged processes.

A separate category of facility permit, referred to as a general permit, will also be available for certain facilities through the proposed permit revisions that are intended to integrate the two programs (i.e. facility permit and emission point permits). Under this system, a single permit will be issued to cover a category of operation after the fulfillment of public participation requirements. Facilities within that category wishing to operate under the general permit must submit an application similar to that required for conventional facility permits, but are not required to undergo further public review in most cases. The elimination of this step will simplify the permitting process for these facilities, and relieve some of the administrative burden.

* Facility Specific Air Permits

Reynolds Metals stack testing in 1991 showed no violations of hydrogen fluoride standards. This permit requires an identification, trackdown and elimination/minimization program for all contaminants other than fluorides. Reynolds conducted stack testing under this program in 1992 and has produced a final report which is under NYSDEC review. A determination will be based on the design of the new air discharge permit to meet Clean Air Act Amendments and NYSDEC implementation strategy. Reynolds is also preparing a fugitive emissions plan which will outline best management practices (BMPs) to control fugitive emissions. BMP requirements are expected to be incorporated as special permit conditions in the facility's air discharge permit.

Similarly, stack testing, permit determinations and best management practice requirements are under consideration for ALCOA and General Motors facility air discharge permits. Future RAP updates are to provide details of the progress of air

pollution control activities as related to the RAP strategies and the goal to restore and protect the beneficial uses of the waters in the Area of Concern.

III.C. 6. Fish and Wildlife Assessments/Actions

Results of fish and wildlife investigation, environmental monitoring and habitat restoration and protection activities in the St. Lawrence River Area of Concern are being generated as part of remedial actions. Studies have been and are continuing to be performed/funded by USEPA, NYSDEC, NYSDOH, major Massena industries, and consultants. Deformity, transboundary impact, and additional population studies are areas of investigative needs that remain to be funded and examined. Habitat assessment also requires closer examination. Below are details of the progress in implementing current fish and wildlife program activities:

C.6.a. Investigations

* Fish Tumors

In order to better define the use impairment "Fish Tumors and Other Deformities", funding is needed for an investigation. Fish tumor studies could be conducted in cooperation with Cornell University where research has already been performed regarding fish lesions in the Oswego River AOC in New York State.

* Young-of-the-Year Fish Studies

NYSDEC plans to conduct pre- and post-dredging fish flesh analysis of spottail shiners. Post-dredging sampling should occur in late 1996 or 1997. The pre-dredging data for YOY fish was published by DEC in August 1994 in a document entitled "Identification of and Changes in Chemical Contaminant Levels in Young-of-the-Year Fish from New York's Great Lakes Basin". Assessment of the data in this report as related to the status of use impairments in the Massena AOC needs to be made to determine if any documented changes in fish flesh contamination have occurred. Trend analyses of future data concerning the contaminant levels in YOY fish studies will also be helpful in making use impairment assessments.

* Fish Flesh Analysis

USEPA in conjunction with NYSDEC conducted pre-dredging fish flesh analyses that are presented in the April 1990 report of chemical contaminants in fish near General Motors (the study/risk assessment is described in Section III.C.7.a). Post-dredging sampling is planned for late 1996 or 1997.

* Deformity and Populations

Some population data is reported along with the fish analysis noted above and is required as part of environmental monitoring described below. Deformity data is difficult to acquire and will need specific funding beyond the routine deformity notes that are made as part of other investigations and evaluations. Therefore, specific fish and wildlife deformity collection investigations and data development will be needed.

C.6.b. Environmental Monitoring

As part of implementing the approved remedial actions, the major industries are required to perform various monitoring activities. For example, the ALCOA dredging project for the Grasse River contains an Environmental Monitoring Plan that must be approved by USEPA and involves the monitoring activities listed below. General Motors will have similar requirements, as will Reynolds Metals. Monitoring/sampling activities are to address pre-, during and post-dredging aspects and will consist of:

1. River sediment sampling/survey
2. Water column sampling (local and fixed)
3. Biota sampling (resident and caged fish, benthic community)
4. Bioaccumulation
5. Corrective action analysis (turbidity and visual)

C.6.c. Habitat

Habitat protection and pollution prevention are two high priorities for the Department of Environmental Conservation. Habitat protection includes the implementation of Best Management Practices involving all environmental quality programs. Localized habitat impairment within the AOC has been identified as part of fish and wildlife management programs. Contamination of water and sediment of the wetlands is directly related to loss of habitat. Remedial activities being conducted and planned for the hazardous waste sites in the Massena AOC are expected to remove significant amounts of contamination so that normal fish and wildlife habitat conditions can be restored and protected and will prevail.

The North American Waterfowl Management Plan identifies the St. Lawrence River as part of one of five "Priority Habitat Ranges" for waterfowl habitat restoration in North America. Activities pursued by governments and required of industries pursuant to program and legal activities, could create habitat or restore habitat useful to waterfowl. Such actions would be consistent with the plan objectives.

The construction of the St. Lawrence Seaway dramatically altered habitat after its 1958 completion. New and modified habitat areas outside the immediate AOC but within the St. Lawrence River drainage basin provide an additional remedy to address and improve upon the habitat areas in the basin. Some of these area projects receive federal funding support. For example, the Fish Creek Wildlife Management Area involves construction of a \$500,000 dam (dike) that will impound 8 million gallons of water and create new habitat. Such a water level control structure is important to many habitat areas. An inventory of waterfowl species is also being conducted in the Fish Creek area.

Great Lakes water levels is an issue that involves many organizations and people. Mr. Tom Brown, Regional Director of DEC's Region 6 Office, is a member of the Water Level Control Board, which deals with the Canadian government and the International Joint Commission on this issue. Currently, the practice is to lower the river level in early winter which improves ice coverage but drains marsh areas. These areas are subsequently flooded in the spring by raised river levels that harm habitat areas. Improvements to many habitat areas in the St. Lawrence River watershed could be accomplished by providing water control structures. Some areas that could be improved include:

1. French Creek Wildlife Management Area
2. Point Pinnacle Area
3. Lake View Marshes*
4. Deer Creek Marshes*
5. Black Pond

* EPA Habitat Restoration Sites

The New York State Coastal Program (described in Section IV.C) includes two significant habitat areas within the AOC that have been identified for the development of fish and wildlife management plans.

C.6.d. Guidance

The EPA reference document entitled "Wildlife Exposure Factors Handbook" provides guidance, data, and references for conducting exposure assessments for wildlife species exposed to toxic chemicals in their environment. A consistent approach to wildlife exposure and risk assessments is fostered.

III.C. 7. Health/Environmental Risk Assessments/Actions

Human health and environmental risk assessments and actions, as well as those involving fish and wildlife, have only just begun in the Area of Concern. Implementation strategies designed to restore and to protect beneficial uses need to identify investigative requirement needs to determine the ultimate remedial cleanup levels and the extent to which any risks are acceptable. Below are summaries of some current studies with results and risk assessment determination needs that have been made concerning several remediation projects issues/actions:

C.7.a. General Motors (RI/FS) Studies/Assessments

Human health risk assessments were required to be performed as part of the Remedial Investigation / Feasibility Study conducted under the GM Consent Order. Negotiations among General Motors, USEPA Region 2, NYSDEC and New York State Department of Health resulted in the requirement of a four part Health Risk Assessment (HRA) study. The HRA is designed to estimate potential exposure of people in the region (and in particular, residents of the Mohawk Nation at Akwesasne) to PCBs and a limited number of other chemical contaminants, which have been found at elevated levels in fish, wildlife and human breastmilk, and to characterize the potential health risks from the consumption of these foods. The Health Risk Assessment study has produced four reports:

- * "Chemical Contaminants in Fish from the St. Lawrence River Drainage on Lands of the Mohawk Nation at Akwesasne and Near the General Motors Corporation/Central Foundry Division Massena, New York Plant", NYSDEC, April 1990. -

This study involved sampling at twelve locations within the Area of Concern. The purposes were to provide information to assist in the development of a health risk assessment of fish species utilized by the populace and to evaluate spatial relationships of contaminants with respect to sources. All locations exhibited PCB in the lipid of the fish at concentrations above what would be considered background conditions in New York State (i.e. generally less than 5 ppm on a lipid basis). The small embayment adjacent to the General Motors landfill produced fish with the highest concentrations of PCB and dibenzofuran compared to the other sampling locations. PCB concentrations were also relatively high in the north channel around Cornwall Island and at the mouth of the Grasse River.

PCB concentrations in fish at all locations exceeded published New York criterion of 0.1 ppm established for the protection of fish eating wildlife. Fatty species such as carp and channel catfish also exceeded the federal tolerance level of 2 ppm at all

locations. Lipid based PCB levels ranged from 3 ppm in the St. Regis River above Hogansburg to nearly 8,000 ppm in a sample at the mouth of the unnamed tributary. Although dioxin, dibenzofuran, organochlorine pesticides, lead and mercury could be found at all locations, determinations of source trackdown and the extent of source contamination were not part of this study.

- * "Chemical Contaminants in Wildlife from Akwesasne and the Vicinity of the General Motors Corporation/ Central Foundry Division Massena, New York Plant", NYSDEC, October 1992. -

This study involved tissue samples analysis from wildlife species used as food by residents of the Mohawk Nation at Akwesasne that were analyzed for PCBs, dioxins, dibenzofurans, chlorinated hydrocarbon pesticides, and heavy metals. The purposes were to provide information to assist in the development of a health risk assessment and health advisories on the consumption of wildlife, and to evaluate the relationship between wildlife contaminant levels and potential contaminant sources. Specimens collected included two species of frogs, three species of turtles, seven species of mammals (primarily herbivores), and eight species of birds (primarily waterfowl). Specimens were obtained from a variety of locations within the AOC including near the Akwesasne and major industrial impacted sites.

Elevated concentrations of PCBs occurred in all common mergansers sampled and in frogs, turtles, and waterfowl collected in the proximity of General Motors. The limited data for other sites suggests Reynolds and ALCOA are also significant contributors of PCB to the St. Lawrence and Grasse Rivers, respectively. Piscivorous wildlife contained the greatest PCB and organochlorine pesticide concentrations followed by water borne wildlife within close proximity to chemical sources. Land based herbivorous wildlife have a much reduced propensity for accumulation of persistent organochlorine compounds.

When the U.S. Food and Drug Administration guidelines are extrapolated to wildlife, PCB concentrations in frogs, turtles and waterfowl from the vicinity of the aluminum industries frequently exceed the guidelines. This is also true when the data are compared with guidelines for the protection of sensitive wildlife species. The accumulation of dibenzofurans, a contaminant of PCB, tends to mirror patterns for PCB in wildlife. In contrast, dioxins were generally not significant contaminants in the wildlife examined, but with the exception of snapping turtles and common mergansers. Expressed on a 2,3,7,8-TCDD equivalent basis, dioxins and dibenzofurans in snapping turtles and waterfowl exceed criteria for the protection of human health and other sensitive consumers of wildlife.

Of the remaining chemicals analyzed, only mirex, DDT and its metabolites, and chlordane related compounds in piscivorous wildlife demonstrated elevated concentrations with respect to federal or other guidelines. However, the aluminum industries are not known to be sources of these compounds. No Mirex was detected in mammal tissue or frog legs; however it was detected in snapping turtle livers and the fat and skin of common mergansers ducks. Source trackdown was not a part of this study.

- * "Chemical Contaminants in the Milk of Mohawk Women From Akwesasne", NYSDOH, October 1992. -

This study was conducted to investigate the levels of 68 PCB congeners, total PCB, dichlorodiphenyl dichloroethene (DDE), mirex, and hexachlorobenzene (HCB) in the milk of Mohawk women from Akwesasne. Data from the study is to provide information for the health risk assessment and to evaluate the major potential pathways of human exposure to PCBs and related compounds in the food chain at Akwesasne. Women who gave birth from 1988-90 provided a breast milk sample and survey information on their lifestyles and dietary histories.

The results indicated that local fish consumption has declined significantly over time among the Mohawks. That is, the mothers reported on average of 2 local fish meals per month for the period more than one year before the index pregnancy, compared to less than 0.5 local fish meals per month during pregnancy. This decrease is probably related to the advisories that have been issued by Mohawk, state, and federal agencies against the eating of any fish from that area of the St. Lawrence River by women of child-bearing age. It attests to the concerns of the mothers about the potential health effects of environmental contamination at Akwesasne. However, 45 percent still ate local fish (usually yellow perch) at least once during pregnancy and 12 percent did so at the rate of one or more meals per month. Further public education efforts are needed, together with suggestions for alternative protein sources. Except for deer, relatively few Mohawk (less than 10%) women reported consuming local wildlife at any point during their life.

In evaluating total PCB in breast milk fat, there was no significant difference between the Mohawks in either the controls or populations from other published studies, which is consistent with the current limited rate of local fish consumption. Although the actual concentrations were low, the Mohawks did have significantly higher levels of 2,5,3'-trichlorobiphenyl relative to the controls. This congener is not typically found in human milk because it is easily metabolized and excreted; however, it is present in Aroclor 1248, the suspect PCB mixture at the GM, Reynolds and ALCOA facilities, and was detected in fish taken at the mouth of the unnamed tributary near General

Motors. The geometric mean concentration of mirex (a known Lake Ontario and St. Lawrence River contaminant) in Mohawk breast milk fat was more than double that among the controls. For HCB or p,p'-DDE, no significant difference was observed.

From 1986-89, there was a positive association between estimated lifetime exposure to PCBs from the consumption of local fish among the Mohawks and their milk PCB concentrations. These differences according to lifetime fish consumption, however, were no longer apparent among women who participated in 1990. This lack of an effect in 1990 is probably due to the fish advisories and resulting lower rate of fish consumption. This supports the contention that such a change in behavior can correspond to a decreasing body burden over time.

The study concludes that future efforts should focus upon the role of locally produced foodstuffs in addition to fish and wildlife, as well as congener-specific exposure through inhalation and dermal contact. Evaluation of these pathways will require detailed environmental sampling of air, soil, and drinking water near the residences of study participants. Such efforts should include Cornwall Island and other areas of the Reserve that to date have not been well characterized environmentally. The study also states it may be useful to assess the possibility of subtle biologic effects such as the induction of liver enzymes by using safe, non-invasive techniques such as the caffeine breath test.

- * "Health Risk Assessment for the Akwesasne Mohawk Population from Exposure to Chemical Contaminants in Fish and Wildlife from the St. Lawrence River Drainage on Lands of the Mohawk Nation at Akwesasne and Near the General Motors Corporation Central Foundry Division Facility at Massena, New York", NYSDOH, Draft October 1993. -

This report is a summary health risk assessment that uses the results of the three previous studies described above to estimate Mohawk exposure to chemical contaminants in fish, wildlife and breastmilk and to characterize the health risk from eating these foods. Exposure and risk were also estimated for recreational anglers eating fish from five major New York State waterbodies. Because the average Mohawk eats more sportfish and PCB levels in local rivers are elevated, the Mohawks were found to have greater health risks. The report concludes, as the three reports above detail, that the greatest exposure to PCB for the Mohawks comes from eating fish and wild ducks and that public education serves to decrease this exposure. The report was in final form in December 1994.

C.7.b. ALCOA Remediation Assessments

Although no formal health/environmental studies and assessments are yet accomplished at the ALCOA site, health considerations and evaluations are an ongoing part of all remedial activities. Requirements for specific studies and assessments need to be further identified as part of project implementation and long-term monitoring. Pursuant to specific remedial activities, the following assessments and needs have been conducted or determined:

* **Dennison Road Area Water Wells**

Samples of drinking water wells indicate low levels of contamination related to the ALCOA site. Carbon filters were installed as an interim measure on all potentially affected homes; however, a municipal water supply has now been installed as a permanent remedy for the residents. Remediation of the groundwater is to be addressed as part of the land-based remediation activities (Section III.C.1).

* **Grasse River**

ALCOA's PCB discharges have impacted wildlife and fishing: contaminants are in the food chain and a fish consumption advisory is in affect. NYSDEC is conducting sediment bioaccumulation potential testing on the Grasse River upstream and downstream of the ALCOA dredge site. Samples are to be collected before, during and after dredging to evaluate changes in PCB uptake potential resulting from the dredging project. A 28-day exposure test of oligochaete worms to sediment samples and subsequent analysis for PCBs and other persistent non-polar organic contaminants is being used. Comparison of Grasse River sediment with pre-exposure and control worm contaminant concentrations will measure the bioavailability of sediment pollutants.

* **Site Groundwater Contamination**

Contravention of groundwater standards has been documented. Site remediation is to address this problem.

* **Site Surface Water Contamination**

Waterfowl and biota inhabiting lagoons and marsh areas have been impacted by contaminants. Site remediation is to address this problem.

* **Site Soil Contamination**

Site remediation is to address site soil contamination problems. Extensive excavation,

use of the new large on-site secure landfill and other in-place remedial actions are being implemented.

C.7.c. Reynolds Metals Remediation Assessments

Although no formal health/environmental studies and assessments are yet accomplished, health considerations and evaluations are an ongoing part of all remedial activities. Requirements for specific studies and assessments need to be further identified as part project implementation and long-term monitoring. Pursuant to specific remedial activities, the following assessments and needs have been conducted or determined:

* Akwesasne Water Supply

The nearest public water supply, downstream three miles of the Reynolds facility, is the Mohawk intake for the Reservation's water treatment plant. This water has been closely monitored by NYSDOH and no detectable PCBs are present in finished water.

* Site Contamination

Vegetation stress is evident in the wetlands adjacent to the landfill; groundwater and sediments are also of concern. Overland flow and drainage ditches that carry PCBs to the St. Lawrence will be remediated as part of the NYSDEC Record of Decision and Consent Order requiring remedial action implementation. Air emissions from the production facility will need further evaluation.

C.7.d. Fish and Wildlife Consumption Advisories

Contamination of river sediments has been confirmed in the St. Lawrence and Grasse Rivers. Bio-accumulation of contaminants in fish and wildlife and the threat this poses to human health are to be addressed by the remedial activities involving the three major industries. In the interim, consumption advisories have been placed into effect. Long-term monitoring, studies and assessment reports will continue to be needed to define the extent of residual contamination and further requirements for health/environmental controls or investigations. The specific type of investigations, remedial activities and reports that are planned and needed are further detailed below in Section III.C.9 (Investigations and Monitoring Activities identification) and Section III.E (Priority Remedial Activities). These planned and needed remedial activities are also listed as strategies on the Use Impairment Restoration and Protection Strategy

management form that addresses the consumption restrictions use impairment (Form #1).

C.7.e. Other Hazardous Waste Site Health Studies/Assessments

* Mineral Processing

The site is entirely enclosed with a chain link fence and has no nearby residences. Potential PCB leaching to groundwater and migration to nearby rivers is a concern. Because of this, NYSDEC will implement a remedial cleanup action to remove PCB contamination from concrete floors and walls of the Mineral Processing building and remove contaminated soil from the site. Remediation is expected to begin in May 1995 and to be completed in the fall of 1995. The State Superfund is to pay for the remedial work. When the remediation is completed, NYSDEC will evaluate the results to determine whether cleanup standards for soil, groundwater and the building have been achieved and if any additional remedial work is necessary.

* York Oil Co.

The site is securely fenced. NYSDOH sampling of private wells in the area has shown no contamination; however, off-site groundwater contamination has been documented. Contamination of downgradient soils and wetland areas pose a threat to groundwater and wildlife habitat.

* Sealand Restoration

Low-level groundwater contamination by aromatic hydrocarbons found in 1987 is being further investigated; an EPA report is expected. NYSDOH has sampled downgradient private water wells and found no contamination. EPA has installed bedrock monitoring wells around the former waste disposal pit to further evaluate groundwater quality in the deep aquifer. A 1993 sampling indicated the presence of some semi-volatile compounds that are to be further evaluated by NYSDOH for connection to the site.

* North Lawrence Oil Dump

Although this site is in a remote location, and no homes or private drinking water supplies are near the site, it does present a significant threat to the nearby wetland environment. Groundwater contamination appears to be limited to the disposal pit area. Results of the remedial investigation do not indicate that off-site exposures to site contaminants is occurring. Access restrictions and long-term monitoring are to be employed to limit the potential for exposure to residual contamination and to assure

that no significant environmental or health risk is likely to exist.

C.7.f USEPA Health Study

USEPA has made the protection of human health one of the cornerstones of its environmental protection activities and has incorporated this into all of its programs. The Agency is particularly concerned with the potential health effects of consuming Great Lakes fish. To address this, a Congressionally mandated study is being conducted by USEPA and the Agency for Toxic Substances and Disease Registry (ATSDR) in the Great Lakes basin. This study will identify human populations residing in the Great Lakes who may be at risk due to contact with chemical contaminants and what to do to prevent adverse health effects. Some of the studies are being conducted in Great Lakes Areas of Concern and the findings are to be disseminated throughout the basin. (Refer to Section IV.P.4 for other health research initiative descriptions.)

III.C.8. RAP Public Participation and Outreach

The Massena Remedial Advisory Committee continues to advise NYSDEC during the implementation of Remedial Action Plan recommendations. The ten member committee meets quarterly with DEC staff to discuss RAP related issues and activities.

NYSDEC and the Massena Remedial Advisory Committee continue the commitment to public participation and public outreach for the St. Lawrence River at Massena RAP. Below are examples of the public outreach and public participation activities undertaken for the St. Lawrence River at Massena Remedial Action Plan.

C.8.a. Video and Slide Show

A video has been produced from the Massena RAP slide show. The purposes of the video are to provide information about the St. Lawrence River at Massena Area of Concern, local industries and the cultural diversity of the area, and also, to increase public awareness and involvement in the Massena Remedial Action Plan. The video is approximately 25 minutes in length and is suitable for community groups, high school classes and other interested organizations and individuals that want to learn more about the Massena RAP and how to get involved. For more information, please contact: Wendy Rosenbach, Public Participation Section, NYSDEC, 50 Wolf Road, Albany, NY 12233-3501, phone (518) 457-0669.

C.8.b New York State RAP Display

NYSDEC's Public Participation Section is producing a New York State RAP display. The purpose of the exhibit is to introduce the public to Remedial Action Plans in New York State, what actions are currently underway and what needs to be done to effectively clean up New York's RAP Areas of Concern. The display will be used at Great Lakes and RAP functions across the basin. A brochure, entitled *RAPs in Action*, has been developed to augment the message of the exhibit. The brochure provides more detailed information on remedial activities that are being implemented to restore and to protect beneficial uses in New York State's RAP Areas of Concern. For more information, please contact: Wendy Rosenbach, Public Participation Section, NYSDEC, 50 Wolf Road, Albany, NY 12233-3501, phone (518) 457-0669.

C.8.c RAP Promotional Brochure

A RAP promotional brochure entitled, *Getting the Word Out*, has been developed. The purpose of the brochure is to provide a description of public outreach and educational materials (audiovisuals, brochures, fact sheets, etc.) produced by and/or for the RAPs or the Lake Ontario Lakewide Management Plan (LaMP). The brochure is targeted at RAP coordinators, educators, environmental/advocacy groups and community groups in New York State so they are able to choose among diverse materials when promoting New York State RAPs, the Lake Ontario LaMP, and general Great Lakes issues. For a copy of the brochure, please contact: Wendy Rosenbach, Public Participation Section, NYSDEC, 50 Wolf Road, Albany, NY 12233-3501, phone (518) 457-0669.

C.8.d *River Rap* Newsletter

The *River Rap* is an annual newsletter that is dedicated to increasing awareness about water quality and RAP issues in the St. Lawrence River at Massena Area of Concern. To keep people informed, the *River Rap* articles address the plans and progress of remedial activities, local economic development projects, and stewardship initiatives. The newsletter is produced by the New York Department of Environmental Conservation and the Massena Remedial Advisory Committee. For more information or to be put on the newsletter mailing list, please contact: Wendy Rosenbach, Public Participation Section, NYSDEC, 50 Wolf Road, Albany, NY 12233-3501, phone (518) 457-0669.

C.8.e Remedial Advisory Committee (RAC) Meetings

NYSDEC and the Remedial Advisory Committee hold quarterly meetings to provide updates and gain input on current and planned RAP activities. The meetings also provide an opportunity for the committee to address local concerns as related to remedial activities being implemented in the Area of Concern. Field trips to learn more about ongoing remedial activities at Massena's local industries are often conducted in conjunction with the committee meetings. In 1994, tours of both the ALCOA and General Motors remediation sites in the Massena area were conducted. Cornwall PAC representatives also attended these tours.

C.8.f International Cooperation

The St. Lawrence River at Massena and Cornwall RAP advisory committees keep informed of the remedial activities occurring in each of their respective portions of the entire international Area of Concern. Committee meetings, on both sides of the river, are regularly attended by representatives from each others RAP advisory committee. Members of both RAP advisory committees look forward to co-sponsoring RAP events in the future.

C.8.g Keeping up on RAP Information and Progress

If you would like to receive remedial advisory committee meeting minutes, newsletters, announcements and updated reports about the Massena RAP, please send your name, address and specific request to: NYSDEC Division of Water, Public Participation Section, 50 Wolf Road, Albany, NY 12233-3502.

III.C. 9. Investigations and Monitoring Activities

Table 4 lists the NYSDEC monitoring activities being conducted or planned for the St. Lawrence River at Massena Area of Concern. A wide range of monitoring activities is listed. This table provides an update of NYSDEC information that was first presented in the document: "Proceedings of the St. Lawrence Joint Monitoring Workshop" conducted in April of 1992 (copies of this document are available as referenced in Appendix F, item 1.c). This workshop was the first step towards the development of coordinated monitoring activities for the St. Lawrence River. Environment Canada is assembling updated investigation and monitoring activity information for the Area of Concern from all major agencies in order to update this table.

The 1992 monitoring workshop conducted three separate activity sessions where each session identified current monitoring programs, requirements and recommendations. Some highlights of each of the three sessions are presented below:

C.9.a. Water and Sediment Investigative Needs

1. Determine specific pathways for contaminant uptake by biota.
2. Develop new methods to determine benthos relationships.
3. Survey of bacterial organisms.
4. Provide transboundary contamination studies.
5. Perform mass balance assessment.
6. Assess pre-, during and post-remediation.

C.9.b. Point and Nonpoint Source Investigative Needs

1. Fish and wildlife consumption, population and deformities data.
2. Groundwater and agriculture impact data.
3. Transboundary flux and dredging flux data.
4. Relative loading contributions data.
5. Determinations of the extent of monitoring requirements.

C.9.c. Biological Investigative Needs

1. Improve standardization of protocols and species.
2. Increase frequency of monitoring.
3. Research: impact of water levels; impact of zebra mussel.
4. Define links of specific chemicals and tumors.
5. Develop comprehensive mgt. plan for fish habitat; include wetlands.
6. Determine chemical/population relationships.

The goal is to design monitoring activities so that adequate before, during and after remediation information is known, as well as sufficient control data, so that updated use impairment determinations can be made and beneficial use issues can be resolved in the most efficient manner. From the Use Impairment / Remedial Activity Matrix developed in Section III.A (Table 3), investigations, sampling/analysis and assessment needs are identified that will have significant effects upon gathering the information necessary to reassess use impairment determinations. Six investigative need areas were defined in the Stage 2 document: population studies, fish tumors, deformities, benthos, plankton, and transboundary impact. These needs are consistent with the recommendations made by the 1992 workshop and have been incorporated into the individual strategies to restore and protect beneficial uses. The ten Use Impairment Restoration and Protection Strategy management forms contained in Section III.B incorporate this information. Investigation project specifics (progress and needs) are further described in appropriate progress update sections in this report, referenced by documents in the Appendix, and identified in the Priority Remedial

Activities in Section III.E.

Priorities for investigations are currently focused on the activities involving hazardous waste site remediation (both land-based and contaminated river sediment removal). Area of Concern investigative priorities are further developed and identified in Section III.E below. A high priority has already been placed on removing and/or containing PCBs and other detrimental chemicals that are known sources of the use impairments. Research efforts must not dilute or delay these priority activities to the detriment of the natural resources. Planning objectives need to address conducting studies and research in concert with these required remedial activities that involve physical construction actions. **Table 4**, that follows, lists NYSDEC monitoring activities being conducted or planned for the St. Lawrence River at Massena Area of Concern.

TABLE 4 - NYSDEC MONITORING

activity	location	duration	stations
<p>Health Risk Assessments: based on three separate studies (required as part of RI/FS at GM on fish tissue, wildlife tissue and breast milk). A summary report was completed in 1994. Additional monitoring and long-term assessment needed.</p> <p>Purpose: Health Risk</p> <p>Agency: Cooperative effort among NYSDEC/NYSDOH/GM/EPA/ Mohawk Nation at Akwesasne.</p> <p>Contacts:</p> <p>-Larry Skinner (NYSDEC) Div. of Fish & Wildlife Bur. of Environ. Protect. 518-457-1769 (FAX:485-8424)</p> <p>-Anthony Forti (NYSDOH) Bur. Toxic Subs. Assessment 518-458-6409 (FAX:458-6434)</p> <p>-Ken Jock (Akwesasne) Mohawk Nation Environ. Div. Mohawk Comm. Health Bldg. 315-358-3141 ext. 101 [for details see 1995 Update, Section III.C.7.a]</p>	<p>Massena Area of concern (AOC); Akwesasne people</p>	<p>Completed three studies and summary report</p>	<p>Long-term assess-ment needed</p>
<p>High Volume Air Monitoring: for particulates, heavy metals and flouride.</p> <p>Purpose: Regulatory network sampling</p> <p>Agency: Cooperative effort</p> <p>Contacts:</p> <p>-Phil Galvin/Bill Smollin NYSDEC, Division of Air Bur. of Air Quality Surveil. 518-457-7127</p> <p>-Les Benedict; Mohawk Nation at Akwesasne, Environ. Div. 315-358-3141</p>	<p>AOC</p>	<p>Once/week sample for 6 full days (24 hr. sampling)</p>	<p>1-part of statewide network</p>

<p>Mobile Air Lab: (NYSDEC) using Trace Atmospheric Gas Analyzer (TAGA) to monitor ambient air quality. Purpose: Ambient monitoring targeted at HF gas, PAHs, and VOCs (styrene) as appropriate.</p> <p>Contacts: -S.H.Mo ; Division of Air Bur. of Toxic Air Sampling 518-457-7454 (FAX: 457-0794) -Les Benedict Mohawk Nat. at Akwesasne Mohawk Environ. Div. 315-358-3141</p>	<p>Massena Area</p>	<p>Annual since 1988</p>	<p>10-15 mobile unit locations</p>
<p>Site Remediation Air Sampling: remediation activities ongoing at ALCOA & Reynolds; GM to proceed. Purpose: evaluate air quality during remediation and afterwards for effectiveness and safety. PCB volatiles considered here.</p> <p>Contact: -Phil Galvin (NYSDEC) Division of Air Bur. of Air Quality Surveil. 518-457-7127</p>	<p>Hazardous waste remedial sites</p>	<p>Construction season to project end</p>	
<p>Site Remediation Soil Sampling: ALCOA & Reynolds ongoing; GM to proceed. Purpose: assess effectiveness of onsite remedial actions.</p> <p>Contacts: -Bill Jesmore for ALCOA; -Phil Waite for Reynolds;and, -Peter Ouderkirk for GM. Each person at NYSDEC Reg. 6 Watertown: 315-785-2513</p>	<p>ALCOA, GM, and Reynolds' hazardous waste sites on facility property</p>	<p>As part of remedial actions according to Record of Decisions (RODs); GM is NPL site.</p>	

<p>PCB Bioaccumulation Analyses: Purpose: assess PCB bioaccumulation and calculate uptake rates if any. Contact: -Ed Kuzia, Div. of Water Bur. of Monitor.& Assessment 518-485-7786 (FAX: 485-7786) -Reynolds report completed 1/26/94; ALCOA reports 7/92, 9/92 and 10/92; both show no statistically sign. change</p>	<p>At ALCOA and Reynolds' point source discharge (SPDES) outfalls</p>	<p>Reports completed [no significant change; no uptake calculated]</p>	<p>ALCOA= 3; Reynolds Metals= 3</p>
<p>Contaminated River Sediment and Water Quality Sampling: Purpose: to assess status and effectiveness before, during and after contaminated sediment removal. Includes biomonitoring (bio-uptake, toxicity testing and benthic community evaluations) and water & sediment chemistry analyses. Contacts: NYSDEC overview at ALCOA and Reynolds before construction: -Bill Daigle & Don Hesler Div. Hazardous Waste Remedi. Central Rem. Action Bur. 518-457-1741 (FAX:457-1088) Overview during/after construction including entire General Motors project: -Div. Hazardous Waste Remedi. Joe Yavonditte, NYSDEC Albany: 518-457-9280 Peter Ouderkirk, DEC Reg.6 Watertown: 315-785-2513 -Frank Estabrooks (NYSDEC) Division of Water Bur. Monitoring & Assessment Contaminated Sediment Sec. 518-457-8819 (FAX: 457-7786)</p>	<p>Grasse River segment as contaminated by ALCOA; St. Lawrence River segments contamin. by GM and Reynolds</p>	<p>Part of remedial actions according to EPA orders and Record of Decisions</p>	<p>ALCOA's dredging in the Grasse R. planned for 1995. Reynolds and GM also plan to remove sediment during 1995. ALCOA, Reynolds & GM plans under review. (DEC may perform added monitoring)</p>

<p>Vegetation Sampling for Fluoride Content: Purpose: vegetation analyses as related to industrial fluoride air emission compliance Agency: NYSDEC / NYSDOH / and Akwesasne. Contact: -David Prosser; DEC Region 6 Div. of Fish & Wildlife 315-785-2513</p>	<p>Akwesasne Reserve, Cornwall Island, and Massena / Cornwall area</p>	<p>Performed annually since 1970 with gradually increased number of stations</p>	<p>28 total (4 on the Reserve, 3 on Cornwall Island)</p>
<p>Point Source Discharge Permits (SPDES): 1. Reynolds Metals- monitor flow, BOD, TSS, O&G, Al, Fl, CN, Zn, Phenols, Cl2, pH, Temp. As, PCB, Fecal Coli., plus 8 organic Action Levels. 2. ALCOA- Monitor flow, TSS, BOD,O&G,Fl,Cu,Zn,Al,CN,PCB, PAH,pH,Temp.,Cl2, Fecal Coli., 5 organics and numerous Action Levels, plus groundwater mon. program. 3. General Motors- Monitor flow, CBOD, TSS, COD, TOC, PCBs, T.Phenol, Cr, Cu, Fe, Al, O&G, pH, Temp, Cl2 and 5 organic Action Levels. 4. Massena (V)- Monitor flow, BOD, TSS, SS, TKN, NH3, pH, Temp., Fecal Coli, Purpose: Regulatory self- monitoring program Contact: -Bruce Butler (NYSDEC Reg. 6) Division of Water 315-785-2236</p>	<p>Reynolds SPDES permit # NY0000132</p> <p>ALCOA SPDES Permit # NY0001732</p> <p>GM SPDES # NY0000540</p> <p>Massena SPDES # NY0031194</p>	<p>Monthly reporting</p> <p>Monthly reporting (passed 1990-91 toxicity testing)</p> <p>Monthly reporting</p> <p>Monthly reporting</p>	<p>4 outfalls</p> <p>4 outfalls</p> <p>3 outfalls</p> <p>1 outfall</p>
<p>Annual Water Column Analyses: (as part of Rotating Intensive Basin Studies- RIBS) Purpose: annual water column chemistry assessment. Contact: -Jeff Myers, Div. of Water Bur. of Mon. & Assessment 518-457-8819 (FAX: 485-7786)</p>	<p>St. Law. River at Moses Power Dam</p>	<p>Annually (4-5 times)</p>	<p>One location of the 31 statewide stations</p>

<p>Rotating Intensive Basin Studies (RIBS): includes: -conventional and toxic water quality parameters in water column samples -biological sampling: (macroinvertebrate community evaluation);toxicity testing; and some fish tissue analyses as coor. w/ Div. of F&W work. -Ocassional bottom sediments analyses Purpose: Ambient surface water monitoring and assessment program Contact: -Jeff Myers / Bob Bode NYSDEC, Div. of Water Bur. of Mon. & Assessment 518-457-8819 (FAX: 485-7786)</p>	<p>4 of 6 sampling sites are in the Massena area; one location in each local river: St. Law, Grasse, Raquette, St. Regis</p>	<p>Basin monitored for two consecu-tive years in a 6-year cycle; Done: '91-'92, Next: '97-'98.</p>	<p>Three of the four stations in the Massena area are projected for continued future analyses.</p>
<p>Fish Tissue Monitoring: Analyses performed for heavy metals and organochlorines. Data is evaluated by NYSDOH for health risk advisories Contact: -Larry Skinner (NYSDEC) Div. of Fish & Wildlife Bur. of Environ. Protection 518-457-1769 (FAX: 485-8424) -Antony Forti (NYSDOH) Bur. Toxic Subs. Assessment 518-458-6409 (FAX: 458-6434)</p>	<p>St. Law., Grasse & Raquette Rivers</p>	<p>Regular monitor-ing</p>	

<p>Young-of-the-Year Analyses: Monitoring of Spottail Shiners for organochlorines; Also look at Hg, As, PAHs, chlorobenzenes. Final report completed August 1994. Contact: -Larry Skinner (NYSDEC) Div. of Fish & Wildlife Bur of Environ. Protection 518-457-1769 (FAX: 485-8424)</p>	<p>Down-stream of 3 major industry remedial sites</p>	<p>On a five year cycle</p>	<p>Eight stations in the Massena area; minimum of four locations sampled</p>
---	--	------------------------------------	---

<p>Fish / Wildlife / Health Risk Assessments associated with River Sediment Remediation & Overall AOC Assessment: Purpose: Perform pre/during/post remediation studies and monitoring including "caged fish study", resident species PCB analyses, PCB water column, suspended solids transport, sediment characterization (core & surface), young-of-the-year, macroinvertebrate community eval., fish and wildlife pop.& habitat assessments. Contacts: -Larry Skinner (NYSDEC) Div. of Fish & Wildlife Bur. of Environ. Protection 518-457-1769 (FAX: 485-8424) -For ALCOA & Reynolds: Don Hesler (NYSDEC) Div. Hazardous Waste Remedi. Central Rem. Action Bur. 518-457-1741 (FAX:457-1088) -For General Motors: Joe Yavonditte, NYSDEC Div. Hazardous Waste Remedi. 518-457-9280 (FAX:457-7743) -Anthony Forti (NYSDOH) Bur. Toxic Subs. Assessment 518-458-6409 (FAX: 458-6434) -Ken Jock (Akwasasne) Mohawk Nation Environ. Div. Mohawk Comm. Health Bldg. 315-358-3141 ext.#101 -Frank Estabrooks (refer to specific remediation projects for contaminated sediments above)</p>	<p>Initial site is the Grasse River dredging of PCBs planned for 1995. (6 miles upstream of St. Law.)</p>	<p>Site specific and long-term</p>	<p>To define controls and downstream stations</p>
---	--	---	--

III.D. Recommendations / Commitments Update

Stage 2 of the St. Lawrence River at Massena RAP contained a number of recommendations that were updated in the 1992 RAP Update report and are further updated here. Development of the Use Impairment Restoration and Protection Strategy management forms for each use impairment and the implementation of these strategies will lead to improved tracking and facilitation of the recommendations and commitments. These current strategies, as developed from the revised format in this Update document, have been incorporated into updating the recommendations and commitments as outlined below. A paraphrase of the original recommended action (Rec.Action) is included prior to the update of each recommendation status description below:

D.1. Hazardous Waste Site Remediation

(Rec.Action: Give high priority to likely contaminant sources)

In December 1992, a priority ranking system was defined in a technical guidance memorandum by NYSDEC's Division of Hazardous Waste Remediation (DHWR). This guidance states that for all class "2" inactive hazardous waste sites for which the remedial action process has not yet begun, there will be three levels of priority to establish where remedial actions should be implemented. (Class 2 sites present a significant threat to human health or the environment and require remedial action.) Within this priority system, there are factors that may enhance a site's rank one whole level. These factors include the identification of a site as part of an IJC Remedial Action Plan (RAP). This RAP component can therefore raise the priority of taking remedial action. Determining the extent of the remedial cleanup needed and whether the criteria of restoring and protecting a beneficial use has been satisfied are now the issues that need to be addressed. Answering these questions is a fundamental part of assessing whether remedial activities have achieved RAP considerations. The revised Update format that focuses on beneficial use restoration will assist in meeting these RAP goals

D.2. Transboundary Impacts

(Rec.Action: Consider transboundary environment fully)

Remedial activities in the AOC need to be accomplished with full consideration of the possible transboundary effects to both the Akwesasne and Canadian environment. This intent is consistent with remedial action implementation (e.g. contaminated river sediment dredging monitoring); however, again, the extent of the remedial cleanup and whether the needs of restoring and protecting a beneficial use are adequate need to be determined. Addressing this recommendation appears to be accomplishable after the ongoing and required large remedial work has been performed. At this point, an assessment can be made and further required remedial action, if any is determined

necessary, can be driven by the RAP criteria and RAP process. Considerations include cost effectiveness and an effort to avoid duplication of remedial work already accomplished.

D.3. Industrial Point Source (SPDES) Discharges

(Rec.Action: Continue to lower limits and apply new technology)

The recommendation and ongoing process to continue to require lower allowable discharges in SPDES permits (especially for RAP critical pollutants) is proceeding as discussed above in Section III.C.3. Advancements in discharge permit drafting strategies, guidance and policy have resulted in very comprehensive final effluent limits and requirements for point source dischargers. When public noticed, these discharge permits may receive numerous comments which can lead to an administrative hearing. Negotiations to resolve permit requirement issues and to develop compliance schedules to achieve stricter discharge conditions can result in a delay of the final issuance of SPDES permits. Therefore, in the interim, current permit requirements and any related amendments remain in full force. The effect of the final rule of the Great Lakes Water Quality Guidance is expected to result in stricter discharge requirements for point source dischargers as discussed in Section IV.N of this 1995 RAP Update report.

D.4. Best Available Technology (BAT) Guidelines

(Rec.Action: Continue to develop/update)

BAT requirements and guidelines are continuing development and periodic updating. The effect of the final rule of the Great Lakes Water Quality Guidance is expected to be stricter discharge requirements as discussed in Section IV.N.

D.5. Reclassification of St. Lawrence River

(Rec.Action: Pursue this change)

The reclassification of the St. Lawrence River from "A" to "A-Special" (International Boundary Water) is proceeding. A review of the impact of this change on SPDES permits indicates that additional, and more stringent, discharge requirements will not be imposed in the drainage basin (e.g. phosphorus). This special classification is therefore an identifier rather than a move towards more stringent discharge requirements. Water quality standards between these two classes are now very similar. One noticeable difference, although certainly not major for the St. Lawrence River, would be the raising of the minimum dissolved oxygen level from 5 mg/l to 6 mg/l. There is also a narrative radioactivity prohibition under the A-Special class. NYSDEC is planning to conduct public hearings on the proposed reclassifications in

the St. Lawrence River drainage basin in 1995. Some delays in the hearing process that involves this reclassification rulemaking are being experienced. Potential enhanced protection is expected from this class change and therefore future RAP updates will document any improvements.

D.6. Water Quality Enhancement and Protection Policy

(Rec.Action: Develop/implement)

Some progress has been made in the development and implementation of this policy which includes discharge restriction categories, antidegradation and substance bans. Two new discharge restriction categories have been added to the surface and groundwater classification system concerning new dischargers and new discharges of a specified substance. The antidegradation policy is under development and will be linked closely to the antidegradation requirements to be established under the recently promulgated Great Lakes Water Quality Guidance (GLWQG) regulation. NYSDEC is studying the regulatory impacts of substance bans with technical support from EPA before any provisions are considered under the Water Quality Enhancement and Protection Policy (WQEPP). Section IV.H provides a description of the three major elements addressed under the WQEPP.

D.7. Municipal Discharges / CSO Elimination

(Rec.Action: Implement upgrades; pursue maximum CSO elimination)

Upgrades of municipal treatment systems and the elimination of combined sewer overflows are objectives pursued by NYSDEC. The effect of the final rule for the Great Lakes Water Quality Guidance is expected to be stricter discharge requirements as discussed in Section IV.N. Further development and implementation of pretreatment program requirements is needed to improve reduction and prevention of toxic discharges to municipal systems.

D.8. Contaminated Sediments

(Rec.Action: Remediate upstream sources first; exceptions apply)

USEPA, NYSDEC, Environment Canada, the Akwesasne, Ontario Province, the industries and other local interests desire successful contaminated river sediment remediation. Efforts to accomplish dredging and to minimize downstream effects are of utmost concern. Upstream sediment sources should be remediated first to avoid recontamination of downstream areas; however, some immediate or isolated projects should proceed. The extent of the cleanup and whether the needs of restoring and protecting a beneficial use have been achieved will be issues that need to be addressed as part of RAP considerations. The development and application of criteria for the

evaluation of contaminated sediments will be instrumental in making these cleanup decisions.

NYSDEC's Divisions of Fish and Wildlife and Marine Resources have produced a document entitled "Technical Guidance for Screening Contaminated Sediments", July 1994, that is being used to assist in sediment decisions in the Massena industrial area. Consideration must be given to the timing of introducing any new criteria as to how this guidance will apply to past and future projects.

EPA is proposing a Contaminated Sediment Management Strategy that describes specific actions that EPA plans to take to address environmental and human health risks associated with contaminated sediment. The development of an EPA contaminated sediment criteria guidance document is part of this strategy. Refer to Section IV.M for additional details of this strategy and criteria development.

D.9. Nonpoint Source Management

(Rec.Action: Implement program; problem area focus)

Some progress is being made in the implementation of New York State's Nonpoint Source Management Program with emphasis on areas identified by NYSDEC's 1993 Priority Water Problem List (PWP). A progress report is contained in Section III.C.4. Descriptions of grant funding programs (e.g. NYS Environmental Protection Fund and EPA section 319 CWA grants) are in Section IV.F.

D.10. Education and Training

(Rec.Action: Increase opportunities; BMP and NPS focus)

There has been some increase in the education and training opportunities for local land owners and governments to learn best management practices (BMPs). Efforts have been directed at areas with nonpoint source (NPS) problems. Two examples of resources are: development of the nine sections of the Best Management Practices Catalog (this is well underway) and communications provided through local County Water Quality Coordinating Committees. (See Section IV.O)

D.11. Air Toxics

(Rec.Action: Address H2F and remedial activity emissions)

Initiatives under the Clean Air Act amendments of 1990 (as discussed above in section III.C.5) are to address the concerns for the reduction of hydrogen fluoride (H2F) emissions from facilities in the AOC to assure standards (including ambient air, discharge permits and forage grass concerns) are met. To address the concern for the

control of air transport of contaminants during remediation (e.g. PCBs), proposals have been submitted that base monitoring activities on the measurement and control of particulate matter. Protocols are to be established.

D.12. Pollution Prevention

(Rec.Action: Incorporate practices as much as possible)

In order to implement pollution prevention practices to the maximum extent practicable at all sources in the St. Lawrence River drainage basin, a partnership among industries and governmental agencies is needed and is under development. Although regulations are pending, the strategy for implementing pollution prevention embraces a cooperative partnership effort by industries and government to reduce and to eliminate toxics, particularly persistent ones.

Congress passed the Pollution Prevention Act of 1990 which established a hierarchy of waste reduction and disposal practices. Pollution prevention initiatives are well underway to accomplish the strategies and principles of pollution prevention implementation. These include the federal goal to reduce the overall discharges of specific toxic chemicals 50 percent by 1995, the New York State goal to reduce hazardous waste generation 50 percent by 1999, emphasis on multimedia methods, use of the Toxic Release Inventory (TRI) data, and providing technical assistance. In addition, the review, approval, and implementation of required hazardous waste reduction plans for industrial generators, as well as the review and implementation of currently voluntary reduction plans for water and air dischargers provide a structure to achieve reductions and the cooperative effort needed. Additional details of these pollution prevention initiatives are described in Section IV.E.

D.13. Investigations

(Rec.Action: Complete needs for use impairment assessments)

Six investigation are listed in the Stage 2 that are needed to provide a more thorough definition of use impairments. These are:

- * Fish and wildlife population study
- * Fish tumor investigation
- * Bird and animal deformity/reproduction investigation
- * Benthos investigation
- * Phytoplankton/zooplankton investigation
- * Transboundary impact investigation

The status and progress of these investigations/studies is designed to be updated in Section III.C.9 above (also use Table 4). Priority remedial activities are further summarized in Section III.E below.

III.E. Priority Remedial Activities:

Based on state-of-the-art remedial activity strategies, a schematic that provides a path for the flow of actions needed to address a use impairment or contamination source for the St. Lawrence River at Massena AOC is desired and planned to be developed as part of future RAP Update documents. Basically, this schematic, or line diagram, will show the flow of remedial actions that is necessary to satisfactorily address the use impairments and contamination sources. Remedial actions that restore/protect beneficial uses and document improvements (such as implementing remedial actions that mitigate sources, creating habitat, or conducting investigations) are intended to be shown on this schematic; in fact, many of these elements have already been defined in this Update and are summarized below. Implementing these activities will then lead to the restoration and protection of beneficial uses and the documentation of improvements and accomplishments.

A summary of the priority remedial activity strategies as well as the investigative and assessment activities needs is presented in this section to assist in the identification of priority implementation actions and events.

E.1. Remedial Activity Strategies:

The Use Impairment Restoration and Protection Strategy management forms, developed in Section III.B, list the remedial strategies identified to address each use impairment, its contamination sources, and their causes. By applying the results of the remedial activity effects evaluation performed in the development of the Use Impairment / Remedial Activity Matrix (Section III.A), the priorities or next step remedial activity strategies for the coming year have been identified and are highlighted here:

- a. Continue the ALCOA land-based remediation.
- b. Proceed with ALCOA's Grasse River contaminated sediment removal (dredging) in 1995.
- c. Initiate Reynolds Metals and General Motors St. Lawrence River dredging (after ALCOA).
- d. Proceed with General Motors land-based remediation.
- e. Continue Reynolds Metals land-based remediation.
- f. Issue ALCOA's SPDES permit renewal/modification.
- g. Proceed with other SPDES permit renewal/modifications.
- h. Conduct contaminated river sediment studies and dredging monitoring.
- i. Decide the next step, if any, for human health assessment.
- j. Evaluate fish and wildlife studies and investigative needs.
- k. Development of contaminated sediment criteria.

E.2. Investigative and Assessment Activities:

Again, by reviewing the Use Impairment Restoration and Protection Strategy management forms in conjunction with the Use Impairment / Remedial Activity Matrix, the priorities or next steps for investigative and assessment activities for the coming year have been identified.

A Remedial Advisory Committee task force is recommended to define the extent of the investigative and assessment needs. Included in this effort is the task to develop a list of documentation needs that will be required to establish a record that remedial activities have satisfactorily restored beneficial uses. The task force's work should produce a table or listing from which priorities can be established. For the coming year investigative and assessment priorities include:

- a. Assessment of the contaminant release associated with the planned contaminated sediment removal projects involving the three Massena AOC industries (pre-, during, and post- condition assessments are needed).
- b. Monitoring and assessment of additional fish/wildlife consumption data.
- c. Monitoring, evaluation and assessment of fish and wildlife habitat impairment.
- d. Assessment of the restrictions on dredging as a use impairment; establishment of contaminated sediment criteria.
- e. Assessment of non-bathing beach water contact as a use impairment.
- f. Initiation of transboundary use impairment assessment and resolution strategy.

III.F. International Joint Commission Review - Evaluation and Strategy Response

The International Joint Commission's (IJC) review of St. Lawrence River at Massena Stage 1 and 2 Remedial Action Plan was completed June 7, 1993. Fourteen people with a wide range of technical backgrounds performed the review. The International Joint Commission advocates the concept of an international RAP for the St. Lawrence River, a position that the Mohawk Nation at Akwesasne has taken since 1988. New York State Department of Environmental Conservation and the Canada-Ontario RAP Team are pursuing Remedial Action Plans for their respective portions of the Area of Concern. An effort to consolidate problem definitions and the restoration strategies of these RAPs is envisioned as taking place through the development of binational statements that can be produced periodically as implementation of the separate RAPs progresses. The development of the first of these binational statements, the "Joint Problem Statement" was published as final in late 1994. This Stage 1 Summary is referenced in Appendix F as item 1.b; a copy is available upon request. A description of this document is provided in Section IV.I.

The text of the comments or "points of emphasis" from the International Joint Commission's review of the Stage 1 and 2 documents are also referenced in Appendix F as item 1.a (copies also available). These IJC points of emphasis have been summarized into the nineteen points listed below as items F.1 through F.19. A response that describes the actions taken and/or the remedial activity strategy planned to address the concerns of each point of emphasis follows:

F.1. The degree of use impairments and the geographical extent of these impairments require additional description.

Response: NYSDEC recognizes that data gaps and investigative needs exist. These needs are specifically identified in the Priority Remedial Activities (Section III.E.2) of the 1995 RAP Update as investigative and assessment needs. Resources continue to be an issue. Specific remedial activity strategies designed to restore beneficial uses are intended to address the degree and extent of impairments in order to document restoration.

F.2. The designation of two use impairments, "Restrictions on Dredging Activities" and "Beach Closings", should be reconsidered.

Response: The 1995 RAP Update includes the Use Impairment / Remedial Activity Matrix and the Use Impairment Restoration and Protection Strategy management forms that provide further review and clarification of the remedial activity commitments and needs concerning the degree and extent of any impairment involving these two criteria. In effect, these two indicators of use impairment have been reopened for further evaluation of impairments. In regard to "Restrictions on Dredging Activities": any expanded dredging proposal (i.e. additional dredging outside the limits of current navigational dredging for seaway maintenance), as well as the development of contaminated sediment criteria and remediation disposal requirements associated with this and other contaminated

sediment removal projects, will have bearing on the impairment definition. Remediation of contaminated river sediments within the United States portion of the Massena Area of Concern is scheduled to occur; therefore, further evaluation and assessment of the extent of any remaining use impairment in the AOC is planned. The Massena RAC committee has already expressed concern about complications that may occur when United States and Canadian criteria are not consistent. In regard to "Beach Closings": partial body contact in non-bathing beach areas is discussed further in IJC point of emphasis F.3 below.

F.3. IJC states that there are areas downstream of combined sewer overflows where partial-body contact recreation is impaired. Under the Beach Closings use impairment, standards or guidelines may be exceeded.

Response: Additional data and/or health risk assessment statements are needed to define any use impairment. Bathing beach waters are protected by both water quality criteria and NYS Department of Health bathing beach standards, where as partial-body contact waters are protected primarily by ambient water quality criteria. The City of Ogdensburg and Village of Massena both have combined sewer overflows and are continuing to implement operational, maintenance, and corrective actions to meet the objectives of NYSDEC combined sewer overflow policy (as described in Stage 2, page 2-16). The existence and extent of any use impairment involving partial-body contact in regard to the storm events and to the proximity of the stormsewer overflows has not been identified. Current environment protection provided for by NYSDEC's Combined Sewer Overflow (CSO) policy emphasizes the elimination of dry weather overflows and the treatment of stormwater overflows in areas identified as "Priority Water Problems" that have or are experiencing use impairments.

F.4. IJC commends the RAP team for the use of the "Transboundary Impacts" use impairment which allows for a recognition of international concerns. The removal of contaminated sediments must have adequate safeguards to prevent pollutant transport.

Response: NYSDEC and USEPA are taking steps to make sure adequate precautions and monitoring are implemented for all proposed remediation projects to assure protection of downstream users and prevent transboundary impacts. Environment Canada has offered to participate in the contaminated sediment removal monitoring activities. Descriptions of the implementation plans and precautions to be applied for contaminated river sediment removal projects are further developed in the 1995 RAP Update in Section III.C.2. Specific details of the monitoring and safety precautions are contained in the environmental monitoring plans for each proposed project which are subject to regulatory review and approval.

F.5. IJC applauds as a sound practice the approach of using indirect evidence to define "likely"

use impairments until a confirmatory study can be conducted.

Response: Indirect evidence was applied in the determination of a likely impairment for the use impairment indicator "Fish Tumors or Other Deformities". In addition, an assessment of the indirect effect of remedial activities has been incorporated into the Use Impairment / Remedial Activity Matrix in the 1995 RAP Update. The matrix provides an evaluation of the indirect and direct effects of numerous potential remedial activities on restoring and protecting each beneficial use in the Area of Concern.

F.6. Broader study concerning the health effects on the Mohawk Nation at Akwesasne are recommended.

Response: Three specific studies were conducted since this IJC review statement. Results of these studies are summarized in the 1995 RAP Update in Section III.C.7. A summary statement concerning the health risk assessment of these three studies has been finalized by NYSDOH. Further studies planned or needed to be conducted by New York State and/or the Massena area industries will be reported on and identified in future RAP Updates. The soundness of the health effects studies, as well as the conclusions and recommendations, is a point that stakeholders must pursue and the RAP strategies need to incorporate to assure restoration and protection of beneficial uses. This process should identify long term monitoring and investigative needs.

F.7. The Stage 2 RAP Update documents need to go beyond just making statements of ongoing programs and include an evaluation of alternative additional measures and a selection of the actions needed to restore and protect beneficial uses.

Response: The format of the 1995 Massena RAP Update has been revised to address this concern. The development of the Use Impairment / Remedial Activity Matrix provides an assessment of the effect of alternative remedial activities towards restoring and protecting beneficial uses. The link of this matrix assessment to the development and implementation of specific remedial strategies is provided by the "Use Impairment Restoration and Protection Strategy" management form developed for each use impairment. Improved communications concerning the evaluation, selection, implementation, and effect of remedial activity strategies is expected to be facilitated by use of the matrix and strategy management forms. Because the goal of the RAP is to restore, protect and maintain the chemical, physical and biological integrity of the Area of Concern and downstream/cross-stream affected areas, the decision making process must employ both an ecosystem and watershed approach. This means upstream drainage basin causes and sources must be addressed as they contribute to Area of Concern use impairments. However, upstream St. Lawrence River contributions may actually be part of a larger Lake Ontario problem that must be addressed under the Lake Ontario Lakewide Management Plan.

The RAP should categorize contamination coming from outside the AOC, such as Lake Ontario, and to the extent possible be quantitative on the degree of contamination and the extent of contributions to use impairments in the AOC. Appropriate remedial activities can then be developed and implemented. The new Priority Remedial Activities identification in the 1995 Update (Section III.E) addresses this need.

F.8. Superfund program actions do not make clear the extent to which beneficial uses will be restored.

Response: A challenge of the RAP process is to accomplish a focus on the priority remedial activities needed to restore beneficial uses and then to measure/document implementation success. The format of the 1995 Massena RAP Update has been revised to address this challenge. The development of the Use Impairment / Remedial Activity Matrix provides an assessment of the effect of alternative remedial activities (including superfund actions) towards restoring and protecting beneficial uses. The link of this assessment to the development and implementation of specific remedial strategies is provided by the Use Impairment Restoration and Protection Strategy management forms developed for each use impairment indicator. Hazardous waste remediation projects are to consider RAP requirements in their projects. Maintaining and improving communications are essential to incorporating and facilitating RAP process considerations in the evaluation, selection, implementation, and monitoring of the effect of remedial actions. Independent actions, like some superfund program remediation actions, serve as steps in the process to address use impairments. The importance of monitoring plans, evaluations, investigations and the development and implementation of best management practices is underscored when determining the extent to which beneficial uses have been restored by these independent actions. Therefore, the thought process described by the matrix and management forms, initiated in the 1995 RAP Update, provide a means to influence and incorporate independent activities towards accomplishing the RAP goal. When, and if, Superfund actions fall short of beneficial use restoration, the RAP process must continue to describe needs. Further responsibilities and resource commitments, if any, can then be identified. It is also very important that remedial measures be cost effective to implement and non-duplicative in nature. Remedial activities that accomplish steps towards the restoration of beneficial uses will continue to be described in future RAP Update documents and ultimately are to be summarized in a Stage 3 beneficial use restoration document.

F.9. Commitments are expected to contain schedules of implementation for remedial measures and identification of responsible parties. Expanded involvement of locals, the Akwesasne and federal agencies (USFW, USACOE, USGS) is desired.

Response: The "Use Impairment Restoration and Protection Strategy" management forms developed in the 1995 RAP Update provide the integrated system approach to establishing and tracking commitments. Expanded involvement of all identified responsible parties and expanded commitment of needed resources are objectives we share in RAP implementation. As the large hazardous waste site remediation projects are being implemented, we recognize that other initiatives,

such as pollution prevention, will play increasingly more important roles in restoration strategies. Existing and newly identified responsible parties are expected to be involved in these remedial activities.

F.10. A description of monitoring activities and a tracking system are desired elements of a Stage 2 RAP. Resource needs, including costs, need evaluation. Links to specific use impairments should be identified. The Joint Monitoring Workshop conducted in 1992 should be followed-up on by formation of a committee.

Response: These concerns focus on the monitoring element of remedial activities. The format of the 1995 Massena Update has been revised to identify needs and make links to use impairments. In Section III.E of the 1995 Update, priority remedial activities for the coming year are identified that include remediation, investigation, assessment, documentation and monitoring. Further, Table 4 (contained in Section III.C.9) provides a current description of NYS investigation and monitoring activities that is to be used for updating the Joint Monitoring Workshop proceedings. Followed-up on the preparation of an overall listing of Area of Concern monitoring activities is currently being conducted by Environment Canada. This effort responds to the call to build on the international cooperation already commenced in this Remedial Action Plan. Reporting on the details of specific monitoring projects and needs is to be further developed and documented in future RAP Update documents.

F.11. Further emphasis on integrating disciplines and transboundary impacts is required in order to accomplish a comprehensive ecosystem approach to restore and protect beneficial uses in the (Massena & Cornwall) Areas of Concern.

Response: The development of the Use Impairment Restoration and Protection Strategy management form for the transboundary impact use impairment (indicator #15) in conjunction with the goal to develop future binational statements on the AOC are intended to address this integration objective. A systematic and comprehensive ecosystem approach is desired and planned to be incorporated in all strategies to restore and protect beneficial uses in the AOC. Because of the implementation of the large hazardous waste site remediation activities, including the pending contaminated river sediment remediation, significant progress in advancing the St. Lawrence at Massena RAP is expected. The relationship of these remedial activities to downstream and cross-stream impacts needs further development and documentation as to any continuing use impairment effects.

F.12. The Massena Remedial Advisory Committee (RAC) needs to include additional local agencies and representatives to increase effectiveness in forming environmental partnerships; a local coordinator for the RAC is needed to serve as a point of contact.

Response: The RAC has accomplished local leadership through the establishment of a chairperson. Changes in the RAC team have occurred; however, further additional membership is believed to be linked to the progress of the implementation of remedial activities and the availability of local commitments. The RAC Committee will continue its effort to attract interested and needed parties.

F.13. An assessment of damaged resources pursuant to a Natural Resource Damages Claim can serve as an additional data base for definition of use impairments.

Response: This subject is related to the remedial activities required by the formal enforcement actions involving the three major Massena area industries. Current descriptive information involving Natural Resource Damage Assessment activity is provided in the 1995 Massena Update in Section IV.D. The Massena RAC agrees that as natural resource assessments are initiated, the information developed will serve to further define use impairments. The RAP intends to incorporate this information.

F.14. Public participation concerns about the continuity of RAC meetings and the sharing of power by the RAC team are expressed. It is noted that an active public outreach program exists.

Response: The appointment of a new RAC chairperson along with an improved focus on implementing the Stage 2 remedial activity strategies, as further developed in the revised format in the 1995 RAP Update, will address these concerns. Public Participation activities including the RAP newsletter, a slideshow and new video, a display that is under development, and the documentation of quarterly meetings with follow-up are examples of strong outreach efforts. There is, however, room for improvement. These needs include: identify and propose solutions for public participation problems; follow-up on short term objectives to provide better continuity; and, ask the question "have we done a good job?" and assess the outcome after the technical considerations and remedial activities have been implemented. In regard to the sharing of power concern, there is a need to define what power the RAC actually has in facilitating the implementation of innovative solutions and to pursue applying the power of the RAC to accomplish incremental steps towards restoration of beneficial uses. A statewide RAP Forum, that is planned in 1995, is expected to contribute to identifying useful ideas and practical steps for implementing improvements to address the two concerns of continuity and sharing of power. Public participation in local stewardship activities is also encouraged.

F.15. The International Joint Commission is dissatisfied over the split of the St. Lawrence River Area of Concern into the Massena and Cornwall RAPs. Acknowledgement of the positive efforts to make cooperative progress are represented by the Joint Monitoring Workshop, draft binational statement, transboundary impact considerations, attendance at U.S. or Canadian meetings and commenting on U.S. or Canadian documents. The absence of the

Mohawk Nation at Akwesasne as representatives on either RAP team is an issue that must continually be addressed in the RAP process.

Response: The Massena and Cornwall RAPs address these concerns through a written cooperative approach and strategy for information exchange and input. Primary examples include: 1) the Joint Problem Statement described in Section IV.I of the 1995 RAP Update which provides the framework for continued separate development of the Canadian and U.S. Remedial Action Plans, and 2) the binational Joint Monitoring Workshop and report prepared for the AOC and described in Section IV.J. Opportunities are continually presented to seek Mohawk participation. The international aspects of use impairment definitions as well as downstream concerns of remedial activities are inherent in the overall restoration of the AOC. Because of the large remedial activities that are occurring now in Massena, it is important that the Massena RAP implementation and documentation proceed. The RAP process will incorporate these actions, assess results, and to the degree practicable, influence the extent and effect of these actions.

F.16. The Stage 1 Massena RAP needs additional data to adequately define use impairments. Because the RAP process is an iterative one, the problem definitions can be further developed as studies and investigations are completed. IJC urges the RAP team to reconsider the use impairment designations for "Dredging Restrictions" and "Beach Closings".

Response: The identification of Priority Remedial Activities (Section III.E in the 1995 Update) has been developed to identify remedial actions for the coming year as well as investigation and assessment needs. Implementation of these priority activities will provide the needed additional data to further define use impairments. As recognized, the RAP process is an iterative one and by definition will improve as studies and investigations are conducted. Further consideration for the designation of the two referenced indicators of use impairments is planned. Details are provided in the responses to points of emphasis F.2 and F.3 above. In effect, reconsideration of use impairments for these two indicators has been reopened in regard to 1) partial-body contact in waters near combined sewer overflows, and 2) expanded dredging outside the seaway maintenance channel.

F.17. The Stage 2 Massena RAP needs to target restoration of beneficial uses with its remedial strategies. Stakeholder actions and commitments need to be incorporated into remedial strategies that are currently made up of mostly NYSDEC commitments. Implementation schedules and longer term monitoring/surveillance plans need to be better defined.

Response: The format of the 1995 Massena RAP Update has been revised to address this concern. The development and application of the Use Impairment / Remedial Activity Matrix and the Use Impairment Restoration and Protection Strategy management forms will address and accomplish this key RAP process requirement.

F.18. IJC recommends that other government agencies (USEPA, local DOH) be represented in the RAP process and preferably on the RAP team (RAC).

Response: The Massena RAC has discussed the expansion of representation on the RAC Committee and will continue its effort to attract interested and necessary parties to participate.

F.19. IJC views the RAP process as iterative and looks forward to annual updates on progress towards restoration and protection of beneficial uses in the St. Lawrence AOC.

Response: NYSDEC and the Remedial Advisory Committee agree and support this goal.

IV. ADDITIONAL INITIATIVES TO ENHANCE / SUPPORT AREA OF CONCERN RESTORATION ACTIVITIES:

IV.A. Local Initiatives:

A.1. St. Lawrence Aquarium and Ecological Center Inc.

Work is continuing on the planning and funding efforts for the proposed St. Lawrence Aquarium and Ecological Center (The Center). The Remedial Advisory Committee unanimously endorses the Center [as did the Citizens Advisory Committee (CAC)] as a facility that will increase environmental and ecological awareness in the St. Lawrence River Valley. The Center continues to enjoy widespread support including that of a "sister project" in the Province of Ontario. As a result, a strong international linkage has developed.

State Senator William Sears, along with strong public and private support, has secured an additional \$250,000 of development funds for the Center. These funds, combined with \$190,000 Senator Sears had previously secured, have moved the project into a new phase which includes programming, public relations, and the services of professional fund counsel.

The Center with its objectives of education, research, and interpretation is expected to play a significant role and have a positive impact on the environmental and ecological challenges with which the St. Lawrence River Valley is confronted.

A.2. Aquaculture Project

The Akwesasne Task Force on the Environment (ATFE) is actively raising caged fish (trout and salmon) that are sold to residents and restaurants in the local community. Tests indicate that cage-raised fish contain significantly decreased levels of contaminants in their flesh. The Great Lakes Research Consortium has awarded a 1994/95 small research grant to look at the impact of toxics on potential aquaculture projects in native communities near the St. Lawrence River.

Research investigators from Ontario and New York will be joining forces with environmental specialists from the Mohawk Nation of Akwesasne to look at issues associated with caged aquaculture in contaminated waters. Thomas Moon of the University of Ottawa, and Joseph Butner of SUNY Brockport have received a small grant for a project that will help determine whether and how different caged fish accumulate and/or detoxify pollutants downstream from a sediment remediation project.

Previous Consortium sponsored work clearly demonstrated that black bullheads (*Ameiurus melas*) raised in a contaminated waters could be kept contaminant-free if fed uncontaminated food. Other work has shown that caged rainbow trout (*Oncorhynchus mykiss*), however, accumulate a variety of toxicants directly from water. These two species each have aquaculture potential and may incorporate chemical contaminants in very different ways. In addition to studying these contrasting species-specific biochemical mechanisms, the new study also offers an opportunity to study the impact on downstream fishes of dredging for sediment remediation. This project is part of a long term investigation into the possibilities of aquaculture in the St. Lawrence as an economic issue, especially to native communities. For more information contact Dr. T.W. Moon at 613-564-2338.

A.3. Local Waterfront Revitalization Program

Implementation of program plans approved by the New York State Department of State for various St. Lawrence River communities are proceeding. The Village of Massena is pursuing funding for the development of a Waterfront Revitalization Plan.

A.4. Massena Towne Center

Implementation of the shopping mall area (that includes various shopping locations that are centrally located) is well underway. Most store facilities have been constructed. Further development of the Towne Center is pending.

A.5. Other Town Concerns

- a. Wal Mart Landslide - The incident of the Wal Mart watertower construction site landslide into the Grasse River needs to be evaluated. An assessment of penalties for environmental damage, as well as a review of construction regulations and Best Management Practices need to be conducted and appropriate requirements incorporated into necessary permits. To prevent recurrence of similar unexpected events, a comprehensive review of project planning is recommended for future projects that are to be constructed adjacent to area rivers.
- b. Marina Construction - In the late 1980's, a private interested party proposed to build a marina on the Grasse River downstream from the ALCOA industrial outfall. NYSDEC raised concern about PCBs involving the proposed dredging and motorboat activity. A site assessment was determined necessary. Subsequently, the required sampling to obtain project approval was not performed and the project never came to fruition.

Although both of these projects (Wal Mart and the Marina) had considerable

Town support, the issues raised, and not satisfactorily addressed, point out the need for improvements in land use control and project approval procedures.

A.6. Pesticide Collection

This program is mentioned here as a local initiative that may be applicable for county government implementation. In the Fall of 1993, Erie County conducted such a program. NYSDEC and USEPA have provided support to county governments to conduct an amnesty collection of ineffective, unusable or unwanted agricultural pesticides. The purpose of such a "Clean Sweep" program is to provide county farmers, agribusinesses and owners of former farmland the opportunity to dispose of a variety of agriculture pesticides in an environmentally sound manner without fear of liability. By proper disposal of these chemicals, a potential threat to the watershed is removed. Phase II multi-county pesticide collection programs are being planned for several western New York State county areas.

IV.B. Other Public Participation/Education and Training:

B.1. Site Specific Citizen Participation Guidebook

NYSDEC's Division of Hazardous Waste Remediation is currently revising/tailoring the statewide Citizen Participation Plan (CPP) that was adopted by the state in 1988 to improve the effectiveness of site-specific citizen participation programs. State regulation requires a citizen participation plan for every hazardous waste site undergoing remediation. Detailed citizen participation activities must be provided that will be carried out for a specific site. The revised CPP includes a guidebook that is in draft form. The objectives of the plan are to: ensure opportunities for involvement, create flexibility during scoping of all major remedial stages, foster confidence and trust through communication, provide a systematic structure, and ensure effective implementation through accountability and tracking. For more information contact DHWR Citizen Participation Section (1-800-342-9296).

B.2. Best Management Practices Catalogue

NYSDEC's Division of Water is in the process of finalizing various sections of the Management Practices Catalogue for Nonpoint Source Pollution Prevention and Water Quality Protection in New York State. Most of the nine parts of this document have been finalized that deal with stormwater runoff, agriculture, construction practices, roadway maintenance practices, on-site wastewater treatment systems, silviculture, spills, resource extraction and hydrologic/habitat modification.

B.3. New York State's "LaMP-Light" Publication

The LaMP-Light is a brochure published by NYSDEC that describes activities being conducted in and around Lake Ontario as related to the Lakewide Management Plan (LaMP). Information is presented concerning initiatives, issues and use impairments that have a more regional involvement and are, in many cases, linked to Remedial Action Plans. Public involvement activities and program descriptions are emphasized. Fish & wildlife consumption restrictions are a main concern.

IV.C New York State Coastal Program:

As pollution from point sources is controlled, pollution from diffuse sources, such as runoff, become a greater portion of the remaining problem. In fact, NYSDEC estimates that 90 percent of the water quality impairments in NYS are primarily due to pollutants from nonpoint sources rather than the traditional (and more easily managed) point sources. As the focus shifts to nonpoint source pollution control, new programs provide assistance and establish requirements. Among these is the federal Coastal Zone Act Reauthorization Amendments of 1990 (CZARA).

Under the federal Coastal Zone Act Reauthorization Amendments of 1990, Section 6217, coastal nonpoint pollution control is addressed which requires states with approved coastal management programs, such as New York, to develop and implement programs to control nonpoint pollution from a wide range of sources to restore and protect coastal waters. At the federal level, the program is administered jointly by the USEPA and NOAA (National Oceanic and Atmospheric Administration), the federal water quality and coastal management agencies. This joint approach is echoed at the state level where NYSDEC and the Department of State (DOS) Division of Coastal Resources are responsible for program development and implementation.

The most significant change which Section 6217 represents (to the federal Coastal Zone Management Act of 1972) is that the program must now be "enforceable"; states must go beyond traditional voluntary approaches to address nonpoint pollution. Congress required EPA and NOAA to develop guidelines to address the various types of nonpoint pollution. EPA and NOAA divided nonpoint pollution into six categories: agriculture, forestry, marinas, hydromodifications (dredging, dams), urban (includes roads, buildings, and onsite waste disposal systems), and wetlands. Management measures are defined within each category. These management measures include enforceable goals specific to each source of pollution. For example, spill cleanup measures are defined for marinas.

Because management goals are enforceable, specific management measures and practices are defined as possible ways to achieve these goals. Flexibility is provided by allowing different courses of action to achieve the same goal. The federal guidance lists 57 management measures in the six categories. NYSDEC and DOS have determined, after a review of existing programs, approximately two-thirds of the management measures are already in place in New York State. For example, state waste oil recycling and wetland protection programs achieve many of the goals of the 6217 program.

The Center for the Great Lakes (an Illinois non-profit organization) concluded that while the federal coastal zone management program could do more to assist AOC cleanups, state coastal programs lacked the jurisdictional and authority needed to fully implement RAPs. Despite this, coastal programs can assist in RAP development and implementation by:

- **Funding RAP Objectives** - Funds from state coastal programs can make up a key part of the financing that assists RAP objectives.
- **Providing Public Education** - RAPs depend on successful public education and stewardship programs to build support for AOC cleanup and to motivate residents to do their part to reduce harmful runoff and pollution.
- **Creating Demonstration Projects** - Provisions that create successful projects involving setback, stormwater, wetland protection, and erosion controls set good examples that spread throughout a watershed as beneficial effects are recognized.
- **Building Networks and Establishing Consistency** - Cooperative partnerships and consistency are needed to make RAPs succeed. RAPs must use already well established networks to further a watershed/ecosystem approach.

The New York State Coastal Program, administered by the Department of State, was established pursuant to the federal Coastal Zone Management Act and the State Waterfront Revitalization and Management Act of 1981 and therefore includes local initiatives involving waterfront improvements such as the Massena Local Waterfront Revitalization Program discussed above that is overseen by the Department of State. The Town of Massena is pursuing funding. In addition the State Coastal Management Program contains a policy to protect fish and wildlife habitats of statewide significance. Forty St. Lawrence River habitat areas have been designated as Significant Fish and Wildlife Habitat. The next step is to develop policies and implement management plans for these areas. Two significant fish and wildlife habitat areas are located within the Massena Area of Concern:

- * Moses-Saunders Power Dam Tailwaters
- * NE Long Sault Islands

IV.D. Natural Resource Damage Assessment:

D.1. Trustees for Natural Resources (St. Lawrence Environment Trustee Council)

The Commissioner of the New York State Department of Environmental Conservation, the St. Regis Mohawk Nation, the United States Department of Commerce (National Oceanic and Atmospheric Administration), and the United States Department of the Interior, are the trustees for various natural resources for the St. Lawrence Massena environment. These parties comprise what is known as the St. Lawrence Environment Trustee Council. Trustees for natural resources are required to act on behalf of the public to assess damages (injury) to natural resources, recover the damages from responsible parties, and implement a plan to restore, rehabilitate or acquire the equivalent of the injured natural resources.

D.2. Legal Basis for Natural Resource Damage (NRD) Claims

State and Federal law, as applicable, provide that Trustees may recover damages for the injury to, loss of, and/or destruction of natural resources caused by a release or discharge of hazardous substances, petroleum products, or other substances. "Natural Resources" include, but are not limited to, land, fish, wildlife, biota, air, water, groundwater, drinking water supplies, and other such resources belonging to, managed by, controlled by, or appertaining to the State of New York. Damages include (among others) the monetary value of resource injury and the residual injury following remediation.

D.3. The Natural Resource Damage Program

To meet the Natural Resource Damage program objectives, the Commissioner, as Trustee, established a Natural Resource Damage Unit within NYSDEC and charged this NRD Unit to undertake a variety of tasks designed to establish a NRD Program for New York State. Organization and Delegation Memorandum #94-28 placed the NRD Unit in the Division of Fish and Wildlife, Bureau of Environmental Protection. Generally, the NRD Unit recommends systems and procedures for the strategic, organizational and logistical operation of the NRD Program within the NYSDEC. Additionally, the NRD Unit enhances communication among programs concerning Natural Resource Damages, coordinates agency activities, secures participation from appropriate program specialists, facilitates the pursuit of potential NRD cases, and coordinates the pursuit of all major NRD cases. The St. Lawrence Massena NRD Claim is a major claim.

D.4. Assessment Plan Development for the Massena Area

Previously, ALCOA, Reynolds Metals and General Motors provided the Trustee Council with \$600,000.00 for the development of an NRD Assessment Plan. The Trustee Council is developing this plan with the assistance of the consultant firm of RCG/Hagler, Bailly, Inc.

IV.E. Pollution Prevention:

Congress passed the Pollution Prevention Act of 1990 which established a hierarchy of preferred waste reduction strategies to minimize waste generation and disposal. Today, new dynamic methods are being advanced by a government and industry partnership and multimedia approaches to solve pollution problems and reduce risks to human health and the environment. The hierarchy listed below calls for pollution prevention and recycling practices to be implemented to the maximum extent practicable:

- * Prevention or reduction of pollution at the source wherever feasible (includes process changes, equipment changes, chemical substitution and reduction strategies);
- * Recover, reuse and recycle wastes in an environmentally safe manner (on-site practices first and then off-site);
- * Treatment of wastes in an environmentally safe manner where feasible and where prevention or recycling cannot be achieved; and
- * Disposal or other release/discharge as a last resort conducted in an environmentally safe manner (disposal of wastes, other than treated and safe residual, is to be phased out).

Numerous multimedia pollution prevention initiatives and strategies are taking place to achieve program objectives. These include:

E.1. EPA Strategies

Five themes or organizational principles have been recently laid out around which national pollution prevention efforts will occur:

- a. Make pollution prevention the first choice in all work and the preferred means to enhance environmental stewardship. Incorporate multimedia aspects in all activities including rulemaking, enforcement, training and grants. The focus will be on the statutorily mandated regulations for 17 industrial categories.
- b. Build and facilitate a network of prevention programs among states and local governments. Provide assistance through grant funding and technology transfer.

- c. Generate and share information to promote prevention, track progress for measurement systems, and recognize successes.
- d. Pioneer new environmental programs that emphasize cross-media pollution prevention and that represent new models for government and industry interaction.
- e. Develop partnerships and technological innovation with the private sector. These voluntary partnership programs between government, industry and the public allow environmental results to occur more rapidly than by regulation alone, and in the most cost effective manner. Examples of these voluntary programs are described here:

- * **The 33/50 Program** - seeks a national reduction of 33% in 1992 and 50% in 1995 of the environmental releases and transfers of 17 pollutants reported in the Toxic Releases Inventory (TRI). Using the 1988 TRI baseline of toxic wastes, reported reduction commitments were nearly 40% achieved by 1992.

- * **WastewiSe** - promotes cost-effective steps to reduce solid waste from businesses. To participate, companies commit to reducing waste generation, recycling and buying and making recycled products. Company reports are encouraged to trend success.

- * **Climate-Wise** - is designed to stimulate greenhouse gas reductions across all sectors of the economy. Participants are challenged to identify and implement creative methods to reduce, limit, or mitigate greenhouses gases.

- * **WAVE** - the Water Alliance for Voluntary Efficiency is designed to focus attention on the value of water and the need for efficient use of this important natural resource. The lodging industry is encouraged and expected to reduce water use and pollution by 15 to 30 percent or more.

- * **Energy Star Buildings** - energy saving are to be achieved by planning and implementing commercial and industrial building upgrades to heating and ventilation equipment.

- * **Energy Star Computers** - is designed to reduce air pollution emissions from electricity generation for computers. Automatic computer "power-down" features are to be incorporated into desktop computers and printers.

- * **Green Lights** - reduces air pollution by promoting energy efficient lighting.

* **Design for the Environment (DfE) Program** - works with businesses to facilitate information exchange and research on pollution prevention techniques. DfE is administered by EPA's Office of Pollution Prevention and Toxics. The program involves industry, trade groups, and environmental groups in cooperative projects to identify and incorporate alternative products and processes. Current projects include the printing industry, the dry cleaning industry and computer workstation manufacturing.

E.2. Integrated Facility Management

To achieve the appropriate level of pollution prevention and control with a more efficient use of resources, we need to focus on the multimedia aspects of a facility. This requires providing consideration to many functions that can no longer be viewed independently but must be intertwined to achieve Multimedia Pollution Prevention Integrated Facility Management (M2P2 IFM) objectives. These components include an integrated technical review and coordination of requirements of regulations, permitting, enforcement, data systems, training, and other regulatory elements. NYSDEC's Pollution Prevention Unit facilitates these efforts. Four hundred (400) facilities that generate and release 95% of the toxic chemicals to the air and waters of New York State, as identified from the Toxic Release Inventory (TRI), are to be the primary focus of the integrated facility management approach. Being included on the "400/95" list means a company warrants a proactive effort to reduce releases. The approach actually considers all facilities and is initiated by selecting facilities as multimedia inspection candidates. Industries have the responsibility to consider methods to reduce waste generation and releases and to conduct environmental audits of their facilities to assure compliance. Implementation of source reduction, waste minimization and remediation activities is encouraged and may be required by a formal enforcement action. In the Massena Area of Concern, Reynolds Metals has been selected as a candidate for multimedia evaluation. A comprehensive inspection should provide opportunities for pollution prevention, permit coordination and remediation initiatives.

E.3. Toxic Chemical Reduction Plan Regulation (proposed Part 378)

New York State's hazardous waste reduction statute of 1990 requires those who release hazardous wastes into the environment to reduce the volume and toxicity of such wastes. The law applies to the generation, treatment and disposal of wastes in permitted facilities. Decreasing thresholds are phased in over a five year period that lowers the discharge/generation level at which reduction plans are required. Plans are to be implemented using the hierarchy of waste management practices presented above to the maximum extent technically feasible and economically practicable. The rulemaking process for the Part 378 regulation, that will implement the law, is on-

going.

E.4. Technical Assistance

Various program assistance activities are available. For additional information on these subjects contact the Pollution Prevention Unit at 518-457-2480:

- a. Pollution Prevention Guidance for Local Governments: This November 1993 NYSDEC publication is available from DEC as a guide to localities in developing approaches for pollution prevention. Summary information on regulations and techniques is provided.
- b. The Environmental Self-Audit for Small Businesses: This January 1994 publication provides a quick and easy guide to evaluate a small business's environmental compliance.
- c. Fact Sheets: Success stories describing implementation of pollution prevention practices and technologies at specific facilities.
- d. New York State Pollution Prevention Information Clearinghouse (NYS PPIC): Over 700 new pollution prevention related documents have been received from the Great Lakes Technical Resource Library (GLTRL) and other sources and added to the library. A brochure is available.
- e. Commercial Printing and Pollution Prevention: A chart has been prepared that summarizes the types of printing process wastes and possible waste minimization and pollution prevention methods that can be implemented. A team made up of Great Lakes regulatory and economic development agencies including EPA, printing business members and environmental groups has made recommendations to make pollution prevention a standard practice in the printing industry (The Great Printers Project).
- g. Department of Economic Development (DED) Programs: An Industrial Effectiveness Program (IEP) has been created to assist small manufacturers to become more efficient in their operations. Some grants are available to identify improvement opportunities in plant layout, processes, quality control and human resources. An Industrial Technology Extension Service (ITES), administered by the NYS Science & Technology Foundation uses local ITES field specialists to determine company needs for the IEP. (Contact DED at 518-474-1131).
- h. Small Business Assistance Program (SBAP): This technical assistance unit located in the NYS Environmental Facilities Corporation at NYSDEC assists

small businesses in understanding federal and state requirements, filling out permit applications and providing pollution prevention advice. This unit is part of the larger NYS Small Business Stationary Source Technical and Environmental Compliance Assistance Program. Contact SBAP at 1-800-882-9721. DEC has been awarded grants by EPA under the Pollution Prevention Incentives for States (PPIS) to support small business projects.

- i. New York Manufacturing Extension Partnership (NYMEP): This program is provided by the New York Science & Technology Foundation to assist small businesses to achieve increasingly higher standards. NYMEP works with DED's IEP program. An Environmental Services Program (ESP) is currently under development. Contact the NYMEP program at (518)283-1010.
- j. Directory of New York State Pesticide Programs: This February 1993 publication describes pesticide programs and where to refer inquiries (includes the Departments of Environmental Conservation, Health, Labor, Agriculture & Markets, Law and Public Service). Contact NYSDOH (800)458-1158 (#402).

E.5. Proceedings of the 6th Annual Pollution Prevention Conference

This March 1994 publication provides details of presentations, panel discussions and case studies. Key topics include:

- a. Integrated Facility Management: As discussed above implementation of this multimedia pollution prevention approach will create many opportunities and challenges. This topic will be a focal point of such efforts.
- b. Sustainable Development and Bio-Diversity: Sustainable development holds that growth must take place in such a way that it will not destroy or deplete natural resources so that future generations will be able to benefit from them and not be compromised. Sustainable development then is growth without loss or depletion of species or genetic diversity. Maintaining biodiversity or the variety of living organisms and habitats is critical to richer and more productive natural systems.

IV.F. RAP Financing:

Although there is currently no specific funding dedicated solely to the implementation of Remedial Action Plans, there are numerous environmental program activities, project proposals, and grants available that provide funding or are conducted that support RAP needs and strategies. Some of these funded activities directly support RAP goals and others provide indirect benefits that assist RAP strategies. Sources of these funds, program activities, available grants and potential sources of funding include:

F.1. Great Lakes Protection Fund

This Great Lakes area regional fund (the nation's first multi-state environmental endowment) was created in 1989 by the governors of the Great Lakes states who have pledged \$97 million. The Fund supports projects that identify, demonstrate and promote regional action to enhance the health of the Great Lakes ecosystem. The Fund has four primary goals: 1) prevent toxic pollution; 2) support effective cleanup approaches in AOCs; 3) support natural resource stewardship; and 4) clarify health effects of toxic pollution on humans and wildlife.

The Great Lakes Protection Fund encourages a range of strategies to meet these goals, including demonstration projects, applied research, data management, policy analysis and evaluation and various public participation/education actions. The Fund awards planning grants to help organizations develop the basin-wide collaboration and detailed work plans required for many projects. If the planning phase is successful, the applying organization may then propose a full-scale project. In 1994 there were two request for proposal dates. For more information call the Great Lakes Protection Fund at (312)201-0660.

F.2. New York State Great Lakes Protection Fund (NYGLPF)

The NYGLPF is funded by a portion of the interest earned on New York State's contribution to the Great Lakes Protection Fund established by the Great Lakes states. DEC expects to grant several awards for one-year projects of up to \$50,000. Public agencies, academic institutions, industry and non-governmental agencies, etc. are eligible for funding.

New York projects should emphasize efforts to reduce the impacts of toxic substances and restore and protect the Great Lakes ecosystem by: improving the understanding of the economic, environmental and human health effects of contamination to the Great Lakes; collection and analysis of data; development of improved environmental cleanup technologies; assessment of current pollution control policies and assessment of the health of Great Lakes fish and wildlife. There is a pre- and full proposal application procedure. Priority categories for funding include: 1) populations at risk, 2) pollution prevention, and 3) policy, public participation and education. NYSDEC's

contact is Mr. Gerald F. Mikol, Great Lakes Program Coordinator (518)457-6610.

F.3. NYGLPF Small Grants Program

NYSDEC in conjunction with the New York Great Lakes Research Consortium and the New York State Great Lakes Basin Advisory Council have joined to offer a small grants program to provide initial funding for new, cooperative approaches to research on the environmental quality of the Great Lakes and its impact on the health and livelihood of the people of New York. Funding is provided from a portion of the New York Great Lakes Protection Fund and is intended to supplement the Great Lakes Research Consortium's small grants program for preliminary research to expand the small grants program to include: cooperative projects between academic institutions, local governments, non-profit organizations, school districts and others. Small grants of up to \$7,000 each will be awarded for innovative projects.

F.4. Great Lakes Research Consortium (Small Grants Program)

Small annual grants are awarded to support and encourage collaboration among the New York State's colleges and universities by providing seed money to joint research projects. The purpose is to continue to improve understanding of the scientific and environmental management problems of the Great Lakes while building multi-disciplinary research teams involving investigators at several cooperating colleges and universities. A current grant award is looking at the impact of toxics on aquaculture. (For additional detail see the Aquaculture Project description in Section IV.A.2).

F.5. New York State Environmental Protection Fund (EPF)

In 1993, former NYS Governor Cuomo and the legislature worked together to enact the Environmental Protection Fund (EPF), creating the State's first permanently dedicated fund to meet environmental needs. This newly created fund is to receive \$31.5 million this state fiscal year and under an enhanced proposal is expected to receive larger amounts each year thereafter. Future unclaimed beverage container deposits have also been discussed as going into this fund. One million dollars has been made available from the EPF to fund environmental projects. As a result, two New York State Departments, Agriculture & Markets and Environmental Conservation, are proceeding with the implementation of Requests For Proposals (RFPs) under the New York State EPF:

- a. The Department of Agriculture & Markets through the New York State Soil and Water Conservation Committee (NYSSWCC) will implement a \$800,000 grants program for agriculture projects. Project selection will be sometime after the

10/7/94 submission deadline. Under the Agriculture Nonpoint Source Abatement and Control Grant Program, projects that will be funded will consist of plans and activities that will reduce, abate, control, or prevent nonpoint source pollution originating from agriculture sources. Projects must be located within a watershed of a priority waterbody (PWP) as identified by NYSDEC. Projects must propose to implement Best Management Practices (BMPs) as defined in Section 3 of the Soil and Water Conservation Districts Law. The "Agricultural Management Practices Catalog" published by NYSDEC will serve as the official guidance document for the BMP selection. Funds may be used for preventative or remedial initiatives.

- b. The Department of Environmental Conservation through the Division of Water will grant \$200,000 for non-agriculture projects. In state fiscal year 1994, NYSDEC combined this \$200,000 with the \$750,000 in grant money, provided by a federal Environmental Protection Agency Section 319 Clean Water Act grant, to make a total of \$950,000 available for implementing nonpoint source pollution control measures to protect and improve the quality of New York's water resources. The Request For Proposals (RFP) closed December 1, 1994. In fiscal year 1995, a larger sum of grant money is expected to be available. The Section 319 funding source is described below.

F.6 Environmental Protection Agency Section 319 CWA Grant

EPA Section 319 Clean Water Act funding has provided \$750,000 in grant money to implement nonpoint source pollution control measures to protect and improve the quality of New York's water resources. As discussed above, \$200,000 from the NYS Environmental Protection Fund (non-agricultural EBF grant) has been combined with this federal money so that \$950,000 is available for funding projects in New York State to reduce the impacts of nonpoint source pollution and address issues contained in County Water Quality Strategies. (Descriptions of County Water Quality Strategies are provided Section IV.O). Additional Section 319 federal grant funding is expected in fiscal year 1995.

F.7. Remediation Projects

Federal and state funded remedial actions [e.g. under the Superfund programs and federal Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)], and private responsible party funded remediation projects, provide a great financial resource for environmental cleanup activities. These projects include required remedial actions or those that are conducted as part of ongoing environmental quality and natural resource programs.

F.8. Other EPA Great Lakes Grants

This source includes funding for Great Lakes, contaminated sediment, and other Nonpoint Source Management Program activities and projects through NYSDEC annual workplan grants. Section III.C.4 describes nonpoint pollution control projects and Section III.C.8 describes investigations and monitoring activities; many of which are federally funded. Another example is the Great Lakes National Program Office (GLNPO), established by Section 118 of the Clean Water Act, which makes grants for RAP projects, such as demonstration projects on the feasibility of controlling and removing toxic wastes.

Water Quality Management Planning Grants, issued under Clean Water Act Section 605(b), are awarded by USEPA to the states for projects, that determine the nature, extent and causes of water quality problems in the state and identify the most cost-effective measures to meet and maintain water quality standards. At least 40% of these funds must be passed through to regional public comprehensive planning organizations. Citizen Advisory Committees activities can be eligible. Also, USEPA research grants support pollution prevention programs with a multimedia approach that have the objective of preventing the generation of potentially harmful pollutants. These grants are authorized under 104(b)(3) of the Clean Water Act, as well as sections of the Resource Conservation and Recovery Act, the Clean Air Act, and the Safe Drinking Water Act.

F.9. Other Federal Program Monies

Funding is provided for other federal agency and department programs and projects that benefits RAP implementation. Examples include: technical and engineering assistance provided by the U.S. Army Corps of Engineer under the Water Resources Development Act, the National Oceanic and Atmospheric Administration (NOAA), the Natural Resources Conservation Service (formerly Soil Conservation Service), the Oil Pollution Act (OPA), the Coastal Zone Management Act (where Section 306 grants are awarded to states), the 1990 U.S. Farm Bill, and other federal department Great Lakes related programs.

F.10. NYSDEC Investigations

Table 4 (in Section III.C.9 of this 1995 RAP Update) describes NYSDEC investigation and monitoring activities related to Remedial Action Plans. Funding and implementation of many of these investigative activities are based on the projects having a high regional program priority (e.g. air, water, and other nonpoint pollution studies) that directly benefit RAP strategies.

F.11. NYSDEC Funding

NYSDEC administers grant funding that supports local Water Quality Management Advisory Committee and County Water Quality Coordinating Committee project development and implementation. Descriptions of County Water Quality Strategies are in Section IV.O.

F.12. Other State Program Monies

Funding that supports other state agencies such as the Department of Health, the Department of Agriculture & Markets, and the Department of State, provides programs and services that contribute to AOC watershed protection and restoration activities.

F.13. Local Monies

Local funding committed to implementing strategies to protect and restore beneficial uses of water resources will benefit RAP objectives. These include activities of County Water Quality Coordinating Committees, Water Quality Coordinating Committees, Citizen Advisory Committees, etc.).

F.14. State Funding Mechanisms

Financing options exist to potentially develop new sources of state revenue to assist in Remedial Action Plan implementation. These include: general revenues derived from a variety of state taxes, user fees, dedicated revenues, bonds, loans, special assessments, and special contribution projects.

F.15. State Revolving Fund (SRF) Loan Program

Although originally established by the federal government for states to upgrade sewage treatment facilities through construction grants, a portion of the loan money may now also be used to fund a wide variety of nonpoint control projects and best management practices (BMPs). The reauthorization of the Clean Water Act is expected to expand the use of SRF monies to include specific water protection and water quality improvement projects. Provisions for the special needs of small or disadvantaged communities requiring financial and technical assistance is also expected in the reauthorization.

F.16. Natural Resource Damage Claims

A discussion of the resources available as part of Natural Resource Damage (NRD) Claims is provided above in Section IV.D.2.

F.17. Private Foundation Grant Funds

This source of remedial activity funding to support RAP goals includes any private party cleanup, financing or program activities.

F.18. Enforcement Actions

Formal enforcement actions result in administrative orders that may require the development and implementation of remedial activities. These formal actions as well as new or modified permit requirements, such as Best Management Practices and other special study and report conditions requirements, can result in activities (e.g. investigations, pollution prevention) that contribute to the furtherance (financing) of Remedial Action Plan objectives.

IV.G. Cleanup Policy and Guidelines:

A draft document was published in October 1991 that discussed the policy, guidelines and general procedures to determine the cleanup level where remediation is undertaken. The development of cleanup criteria for air, water, soil and sediments are needed before work can resume on finalizing an overall cleanup policy. Emphasis is currently being placed on the development of aquatic sediment criteria. The Division of Fish and Wildlife and the Division of Marine Resources have developed a technical guidance for screening contaminated sediments that is referenced as in Appendix F as item 2.s.

IV.H. Water Quality Enhancement and Protection Policy:

NYSDEC is developing the Water Quality Enhancement and Protection Policy (WQEPP) with the purpose to maintain the high quality of New York's waters and to continue to move forward the goals of federal and state laws and regulations to eliminate the

discharge of pollutants. While parts of the WQEPP will be required specific to the Great Lakes Basin, New York State is considering applying all three parts of the policy statewide. The WQEPP policy has three main parts, each aimed at a specific goal:

- * Discharge Restriction Categories - needed to protect sensitive waters that cannot assimilate the effects of additional discharges or additional discharges of specified substances.
- * Antidegradation - needed to maintain the high quality of waters that are currently cleaner than standards now require.
- * Substance Bans - needed to protect all waters from specific persistent toxic substances.

The Great Lakes Water Quality Initiative (Section IV.N) has resulted in part in the promulgation of new regulations for the basin, called the Great Lakes Water Quality Guidance. The Great Lakes Water Quality Guidance includes procedures for an antidegradation policy. New York State will be revising its antidegradation procedures as necessary in order to meet the requirements of the Great Lakes Water Quality Guidance.

Summaries of the three main parts of the Water Quality Enhancement and Protection Policy are provided below:

H.1. Discharge Restriction Categories

Discharge Restriction Categories (DRCs) rulemaking was adopted and became effective October 7, 1993 as amendments to 6NYCRR PART 701. Two new categories have been added to the NYSDEC water use classification system: "No New Discharge" prohibits any new discharges to a receiving water and "No New Discharge of a Specified Substance" prohibits new discharges of a particular substance. The categories are to be applied to specific waters through the stream classification process. The types of waterbodies to which DRCs could be assigned are waters of public health concern, waters of significant ecological or recreational value, and sensitive waters at risk from additional discharges. An implementation strategy issues paper has been developed and comments were requested. NYSDEC is considering a range of options for establishing an implementation strategy that include: additional formal rulemaking, guidance or strategy document, and case by case review.

H.2. Antidegradation

To further protect the waters that are of higher quality than New York State standards require, NYSDEC is considering modifications to its existing antidegradation policy. The revised antidegradation policy would specify a process for reviewing proposed actions that would result in discharges that significantly lower water quality. The process is expected to require the consideration of alternatives that would first reduce or prevent the discharge of pollutants and then would weigh the social and economic benefits of actions that could still significantly lower water quality after alternatives have been explored.

The final rule for the Great Lakes Water Quality Guidance, developed under the Great Lakes Water Quality Initiative, was published in the Federal Register on March 23, 1995. New York State's antidegradation policy will be further revised as necessary based on the requirements of the new regulation.

H.3. Substance Bans

Certain persistent toxic substances present a threat to the environment when present in extremely small amounts. The only way to avoid release to the ecosystem is to ban their use, manufacture and storage. NYSDEC lacks statutory authority to ban substances but believes there is a need to further develop this part of the WQEPP. Therefore, NYSDEC is evaluating the issue of substance bans by looking at three components: 1) screening and prioritizing of chemicals through the use of a screening criterion, regulatory review, use-tree or life cycle analysis, and waterbody impairment analysis; 2) legal authority options analysis; and, 3) public participation.

In addition, several other regional initiatives exist that may influence the direction of future substance ban efforts:

- * The International Joint Commission's "Virtual Elimination Workgroup" Report.
- * USEPA Virtual Elimination Project.
- * Proposal under the Toxic Substances Control Act to quantify the ecological threat from specific chemicals.

NYSDEC is currently investigating the issue of substance bans with technical support from USEPA.

IV.I. Joint Problem Statement:

A final report that summarizes information and conclusions on environmental conditions as described in the Canadian and United States Stage 1 reports for the St. Lawrence River Area of Concern has been accomplished. This binational statement is dated 1994 and is referenced in Appendix F as item 1.b; copies are available upon request. Similarities and differences in the physical conditions and jurisdictional frameworks on both sides of the river are acknowledged. The goal is to restore, protect and maintain the Cornwall-Lake St. Francis and Massena Area of Concern and includes protection of the downstream ecosystem. The Joint Problem Statement establishes a framework for continued separate development of Canadian and U.S. RAP documents that provides for the continuation of joint statements. After comparing the status of use impairments reported by the Canadian and U.S. Stage 1 documents, we find that additional considerations for better defining the use impairments in the Massena RAP need to be evaluated. Among these are:

1. Restrictions on dredging need reconsideration for areas outside the routine channel dredging and in regard to comparing dredging spoils contamination to the development of sediment criteria.
2. Beach closings need reconsideration for secondary contact beyond beaches and downstream of combined sewer overflows.
3. Restrictions on drinking water need further downstream assessment with the application of lower detection levels.
4. Degradation of plankton populations need further study downstream.

IV.J. Joint Monitoring Workshop:

In addition to the Joint Problem Statement, the Joint Monitoring Workshop provides another binational effort that identifies and summarizes monitoring activities, needs and recommendations for data collection, interpretation and presentation. Additional discussion is included in section III.A.8 under investigations and monitoring activities. The report entitled "Proceedings of the St. Lawrence Joint Monitoring Workshop" dated April 1992, is referenced in Appendix F as item 1.c. The monitoring and research activities table and contact list directory included in this report were revised and updated in July 1994. Copies of both the proceedings and updates are available upon request.

IV.K. Rotating Intensive Basin Studies (RIBS):

In conducting the Rotating Intensive Basin Studies, a statewide sampling cycle repeats every six years. The drainage basins in New York State are divided into three groups and each group is studied intensively over a two year period. The St. Lawrence drainage basin was sampled during the final two years of the first six year RIBS sampling cycle

that ran from 1987 until 1992. Various types of studies are performed at a number of sites.

The St. Lawrence River drainage basin has six sites that are monitored; although there are significant problems in a couple of specific river segments, water quality is generally good. Four of the six intensive RIBS study sites in this basin were rated as having good water quality. The other two sites, the St. Lawrence and Grasse Rivers near Massena, were rated as poor due to fish consumption advisories and moderately impacted macroinvertebrate communities that exist largely as a result of past discharge practices in these areas. Water quality parameters of concern were identified as iron, copper, zinc, lead and mercury. Past samples have not found lead and mercury which may indicate a quality control problem.

Sampling studies include a wide range: 1) conventional and toxic water quality parameters in the water column, 2) biological sampling including macroinvertebrate community assessments, toxicity testing and some fish tissue analysis, and 3) some bottom sediment analysis. Details of the RIBS study are contained in the report referenced in Appendix F as item 1.e; copies are available upon request.

IV.L. Presumptive Remedies:

Since the federal Superfund's beginning in 1980, remedial programs have identified that certain categories of sites have similar characteristics, such as types of contaminants, types of disposal practices and the contaminant effects on environmental media. Based on more than ten years of remedial experience, EPA is developing presumptive remedies to streamline investigations and speed up remedy selections at these sites. Presumptive remedies are identified based on historical patterns of remedy selection and engineering evaluation of the performance of the remedy. The intent is to minimize the duplication of work involved in assessing all alternatives. Under this new method, data collection is to focus on confirming the site type, alternative analysis is to be shortened, and the feasibility study is to be limited to evaluating the presumptive remedy technologies. For example, EPA has established presumptive remedies for Volatile Organic Compounds (VOCs) in Soils and Municipal Landfills. For sites with VOC contaminated soils the presumptive remedies are limited to: 1) soil vapor extraction, 2) thermal desorption, and 3) incineration. For municipal landfills the remedy is defined as containment of mass and collection/treatment of landfill gas and leachate. Plans call for the development of presumptive remedies for VOCs for wood treaters, contaminated groundwater, PCBs, coal gasification and grain storage sites.

IV.M. EPA Contaminated Sediment Management Strategy:

The U.S. Environmental Protection Agency has developed a comprehensive, multimedia Contaminated Sediment Management Strategy. The proposed strategy describes specific actions that EPA will take to reduce environmental and human health risks associated with contaminated sediment. The strategy does not propose new regulation. The intent is to implement policies to consistently assess, prevent, and remediate contaminated sediments. EPA has taken the unusual step of requesting public comment on this internal strategy.

EPA's proposed Contaminated Sediment Management Strategy describes actions that the agency will take to accomplish the following four strategic goals: 1) prevent further sediment contamination that may cause unacceptable ecological or human health risks; 2) cleanup existing sediment contamination, when practical, that adversely affects the Nation's waterbodies or their uses, or that causes other significant effects on human health or the environment; 3) ensure that sediment dredging and dredged material disposal continue to be managed in an environmentally sound manner; and 4) develop and consistently apply methodologies for analyzing contaminated sediments.

The Strategy is comprised of six component sections: assessment, prevention, remediation, dredged material management, research, and outreach. In each section, EPA describes actions that are to be taken to accomplish the four broad strategic goals:

M.1. Assessment

EPA program offices are to use standard sediment toxicity test methods and chemical-specific sediment quality criteria to determine whether sediments are contaminated. A national inventory of sites and sources of sediment contamination (National Sediment Inventory) is proposed to be used to target sites for remedial activities.

M.2. Prevention

To prevent sediments from reaching the environment and regulate the use of pesticides and toxic substances that accumulate in sediment, EPA proposes the use of acute sediment toxicity tests to support registration of chemicals under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) and the Toxic Substances Control Act (TSCA). In the Strategy, EPA also proposes: developing effluent guidelines for industries that discharge sediment contaminants in significant amounts; using pollution prevention policies to reduce or eliminate sediment contamination resulting from noncompliance with permits; preparing guidelines for the design of new chemicals to reduce the bioavailability and the partitioning of toxic chemicals to sediment; and implementing point and nonpoint source controls that will protect sediment quality. Preventive actions are intended to stop further contamination of sediments and to reduce ecological and human health risks.

M.3. Remediation

EPA proposes using multiple statutes to require contaminated sediment remediation by parties responsible for pollution. These statutes include the Comprehensive Emergency Response, Compensation, and Liability Act (CERCLA), the Resource Conservation and Recovery Act (RCRA), Superfund Amendment and Reauthorization Act (SARA), the Clean Water Act (CWA), the Toxic Substances Control Act (TSCA), the Rivers and Harbors Act, and the Oil Pollution Act (OPA). The proposed strategy states that EPA will not proceed with a cleanup if a combination of pollution prevention and source controls will allow the sediments to recover naturally in an acceptable period of time. EPA's remedial actions are designed to cleanup sediment contamination that adversely affects the Nation's waterbodies.

M.4. Dredged Material Management

EPA proposes the development of technical guidance regarding dredged material testing, disposal alternatives consideration, and dredged material disposal site selection to ensure continued disposal of dredged material in an environmentally sound manner. (Note: NYSDEC has developed and is using a July 1994 publication, "Technical Guidance for Screening Contaminated Sediments" as referenced in Appendix F, document #2.s.)

M.5. Research

EPA proposes a program of investigative research that is needed to: develop and validate new chemical-specific sediment criteria and other sediment assessment methods; improve EPA's understanding of the transfer of sediment contaminants through the food chain; and develop and evaluate a range of technologies for remediating contaminated sediments.

M.6. Outreach

Public outreach activities are planned to demonstrate EPA's commitment to, and accountability for, sediment management efforts. Regular status reports on sediment management activities are to be provided.

IV.N. Great Lakes Water Quality Initiative:

The 1972 **Great Lakes Water Quality Agreement (GLWQA)** between the United States and Canada established common water quality objectives for the Great Lakes System. The chief objective was the reduction of phosphorus levels to no more than 1 ppm in large municipal discharges to Lake Ontario and Lake Erie. Some new limits were also placed on industrial discharges including the elimination of oil, visible solid wastes and other nuisance conditions. The 1978 Great Lakes Water Quality Agreement shifted the focus from solely the control of nutrients to include the control of toxic substances and called for the virtual elimination of the discharge of persistent toxic chemicals. The 1987 Amendments to the GLWQA centered on technology advancements and the need to clarify the roles of the two governments and the International Joint Commission (IJC).

In 1989, the **Great Lakes Water Quality Initiative (GLWQI)** was introduced by USEPA (Region V) to provide a forum for State and EPA development of uniform water quality criteria and implementation procedures. The GLWQI has focused on water quality criteria and the control of point sources of toxics that are persistent and bioaccumulative. In 1990, Congress passed the Great Lakes Critical Programs Act that required EPA to publish water quality guidance and procedures for the Great Lakes states. The proposed Great Lakes Water Quality Guidance component of the GLWQI focuses on point source discharges of bioaccumulative chemicals of concern (BCCs). The nonpoint source element of the GLWQI is being addressed through the Great Lakes Toxic Reduction Effort. Both are described below.

The purpose of the **Great Lakes Water Quality Guidance (GLWQG)** is to establish a consistent level of water quality protection in the Great Lakes States with emphasis on BCCs. Elements of the GLWQG addressing antidegradation, new water quality criteria and the limited use of mixing zones will result in SPDES permit limits for many substances at the limits of analytical detection. It is expected that new, improved and required effluent limits will be achievable through the implementation of extensive pollution prevention measures, such as reduced use or product substitution, as well as through advanced treatment technology in some situations.

The GLWQG was promulgated as federal regulation effective April 24, 1995. The new final regulation contains provisions that require enhanced and new water quality criteria for the protection of aquatic life as well as human health and wildlife. The expected results are additional point source discharge permit controls, additional remedial activities and some modification to state policies and procedures and possibly state regulations. The Great Lakes' States have two years to comply. Details of the steps to be taken by affected program areas, will be developed as the implementation strategy is developed and finalized. A set of 26 chemicals known to bioaccumulate have been identified on a list of bioaccumulative chemicals of concern (BCCs) that potentially can have more stringent limits imposed. The methodology used to identify these BCCs uses a bioaccumulation factor (BAF) of greater than 1,000. This means that the substances build up in fish tissue to levels toxic to humans and wildlife originate from concentrations in the water column which are so low that they cannot be easily detected. A BAF of 1000 is characteristic of chemicals which

bioaccumulate due to significant dietary uptake, or the point at which build up of the contaminant in fish tissue due to food chain contamination can account for 10 to 100 times the build up in fish tissue due to the contaminant in the water column alone. The provisions in the GLWQG for BCCs include an antidegradation policy, procedures for calculation of total maximum daily loads, and procedures for determining water quality based effluent limits. NYSDEC is required to adopt implementation procedures and water quality standards consistent with the federal GLWQG regulation within two years of the regulation's March 23, 1995 final publication date.

In order to focus on identifying, assessing, and reducing nonpoint source loadings of BCCs, a program called the **Great Lakes Toxic Reduction Effort (GLTxRE)** is under development. This effort has two proposed multimedia tracks: the "pathways" track focuses on BCCs entering the Great Lakes System, and the "Virtual Elimination" track focuses on a detailed analysis of a small number of BCCs. A description of each of these approaches that make up the Great Lakes Toxic Reduction Effort is provided below:

N.1. Pathways

The pathway approach applies a multimedia effort, with representatives from water, waste, air, and pesticides, as appropriate, to identify and address any gaps or barriers in existing regulatory and nonregulatory programs to reduce loadings of BCCs. The pathway approach focuses on nonpoint source pathways relative to:

- * Air deposition
- * Sediments
- * Spills (storage, handling and transport)
- * Combined sewer overflows/storm water
- * Waste sites
- * Agricultural sources - Programs are underway to remove banned and restricted persistent toxic pesticides from unused stockpiles and implement "Whole Farm Management" to minimize the use of pesticides and fertilizers.

N.2. Virtual Elimination

The virtual elimination approach selects a small group of BCCs and performs an in-depth analysis of their uses, sources, releases, and opportunities for reduction (currently reviewing mercury and PCBs). The goal is to generate ideas concerning regulatory and non-regulatory gaps and identify actions that can be taken to reduce the use of targeted chemicals. The virtual elimination project is chaired by the Great Lakes National Program Office and will build on existing information and programs including the Lakewide Management Plans (LaMPs), the Lake Superior Pollution Prevention Strategy and recommendations of the International Joint Commission's Virtual Elimination Task Force.

IV.O. County Water Quality Strategies:

O.1. County Water Quality Coordinating Committees

Nonpoint sources of pollution have been identified as the primary source of water quality problems on more than 1300 water body segments listed on New York's Priority Water Problem (PWP) list. Due to the nature of nonpoint source pollution and the types of actions needed to address the resulting water quality problems, local implementation efforts based on locally established priorities are essential.

To facilitate these local implementation efforts, the NYS Soil and Water Conservation Committee (NYSSWCC), in conjunction with NYSDEC, encouraged the formation of County Water Quality Coordinating Committees (CWQCCs) to prepare county water quality strategies. Committee membership is voluntary and is comprised of representatives from local organizations involved in preventing nonpoint source pollution. Each committee, through its strategy, identifies and sets local priorities for nonpoint source pollution prevention.

Minimum requirements for county strategies were established by the NYS Soil and Water Conservation Committee and the NYSDEC. They are as follows:

- * Statement of who the committee reports to (if applicable).
- * Mission/purpose statement.
- * Description of function.
- * Summary of the individual agencies' roles and responsibilities.
- * Watershed-specific list of PWP focusing on county-wide issues.
- * List of goals and objectives.
- * List of work tasks, contact, timing, costs, and funding.
- * Committee's role in implementation of the strategy.

Counties that developed strategies meeting these minimum requirements were eligible to receive a one-time payment of \$4,750 to implement a component of their strategy. A total of 55 of the 57 counties outside New York City completed their strategy in time to qualify for this payment. This relatively low level of funding is expected to increase. Implementation of County Water Quality Strategies is

important towards achieving a watershed/ecosystem approach to restore and protect beneficial uses of waters in the Area of Concern.

O.2. St. Lawrence County Water Quality Strategy

The St. Lawrence County Water Quality Strategy was prepared by the St. Lawrence County Water Quality Advisory Committee. The committee works to coordinate efforts to improve water quality in the county, especially through the development and implementation of a strategy to control nonpoint source water pollution.

The southern one third of St. Lawrence County is located within the Adirondack Park, which is the source of four major rivers which traverse the county, including the Oswegatchie, Grasse, Raquette and St. Regis. The Water Quality Advisory Committee (WQAC) plans to concentrate on nonpoint source water pollution problems. Nonpoint sources are seen as a threat or potential threat to water quality in all of the county's major watersheds. Sources of nonpoint pollution include: agricultural and related runoff (fertilizers and pesticides), sedimentation from erosion, septic system failure, and other runoff from sources such as road salt, leaking underground storage tanks and other chemical containers.

It is the mission of the St. Lawrence County Water Quality Advisory Committee to work to maintain, enhance and restore the quality of St. Lawrence County's water resources, through a cooperative, coordinated manner which will include educational and technical efforts and which will serve to implement the County Water Quality Strategy. The goals of the advisory committee are primarily to:

- * Establish a cooperative, locally based effort to identify nonpoint source pollution problems in the county and develop a comprehensive strategy to address these problems.
- * Utilize educational, technical, and other non-regulatory means to implement the comprehensive strategy.
- * Focus on the prevention, reduction and remediation of nonpoint source problems according to the priorities established in the Strategy.

IV.P. Research Initiatives:

This research initiatives section is included to provide a checklist of more current research projects and/or references developed that have been or could be of assistance to RAP

implementation. The main listing of RAP references is provided in Appendix F.

P.1. Great Lakes Information Network (GLIN)

The Great Lakes Commission [established to implement the elements of the Great Lakes Basin Compact among the eight Great Lakes states], has developed a computer network for Great Lakes data and information exchange entitled the Great Lakes Information Network. A grant from Ameritech Foundation has provided the Great Lakes Commission with funding for a two-year pilot project to link agencies, organizations and individuals via the Internet on the World Wide Web (WWW). GLIN partners, including USEPA, NOAA, Environment Canada, and others are contributing their organization's data and information. To obtain more information about GLIN, call (313)665-9135.

P.2. Virtual Elimination Task Force

Reference document: International Joint Commission. 1993. A Strategy for Virtual Elimination of Persistent Toxic Substances. Report of the Virtual Elimination Task Force to the International Joint Commission. IJC Great Lakes Regional Office, 100 Ouellette Ave, 8th Floor, Windsor, Ont. N9A 6T3. This report consists of two volumes:

- * **Volume 1.** ISBN 1-895085-65-9. 72 pages. Recommends that the virtual elimination goal be achieved by the implementation of a broad array of activities that focus on persistent toxics. These activities include legislation, regulations, technology, economic instruments, education and consultation. Terminology, criteria and strategy considerations are discussed.
- * **Volume 2.** ISBN 1-895085-66-7. 112 pages. Appendices entitled "Seven Reports to the Virtual Elimination Task Force". Includes background reports on: the application of the virtual elimination strategy to PCBs and Mercury; a long-term chlorine strategy, Pulp and Paper Industry application, and case study; economic incentives, assessment and policy; injury impact assessment; and, progress discussion.

P.3. The Great Lakes Research Review

The "Great Lakes Research Review" is a new publication from the Great Lakes Program of SUNY Buffalo, the Great Lakes Research Consortium at SUNY College of Environmental Science and Forestry and New York Sea Grant. The publication will provide the Great Lakes community an easy-to-understand summary of current

research efforts taking place in New York State, the Province of Ontario and other Great Lakes states. This semi-annual publication will be presented in two-issue sets. The first issue, "Understanding Toxic Exposure in the Great Lakes", focuses on research related to the fate and transport of toxic substances and is targeted for mid-August. The second issue will concentrate on "Human and Ecological Effects of Toxics". For more information contact the Great Lakes Program at SUNY Buffalo, 207 Jarvis Hall, Buffalo, NY 14260, (716)645-2088.

P.4. Human Health Considerations

This 1995 RAP Update document contains a number of descriptions of ongoing activities relative to human health considerations. These human health consideration activities include narratives that describe the following initiatives:

1. Three health studies conducted by AOC industries and described under Section III.C.7.a.
2. USEPA and ATSDR Great Lakes basin health study described under Section III.C.7.f.
3. Fish and wildlife consumption advisories discussed under Section III.C.7.d.
4. Investigations and study needs, and priorities identified in Sections III.C.9 and III.E.4.
5. Injury assessment being conducted under the Natural Resource Damage Assessment program described in Section IV.D.
6. USEPA's Contaminated Sediment Management Strategy, described in Section IV.M, that addresses reduction and prevention of health risks.
7. Air toxics health risk assessment required by the CAAA and discussed in Section III.C.5.b.

In addition to these ongoing human health study and assessment initiative descriptions, there are two human health research topics that warrant further discussion:

*** Incorporating Human Health Considerations into RAPs**

A workshop conducted in February of 1995 sponsored by the Great Lakes Research Consortium, the Great Lakes Protection Fund, and the Agency for Toxic Substances

and Disease Registry identified five approaches for incorporating human health considerations into RAPs. Each of these approaches relies on certain key elements:

1. Evaluation of the impairments of beneficial uses.
2. Development of other indicators to evaluate and to measure environmental health, public perception, body burden and illness considerations.
3. Development and evaluation of community and participatory health exposure

- concerns and assessment data.
4. Development and assessment of exposure data.
 5. Communication of public health risks/advisories.

A proceedings document from the workshop is expected to provide broader descriptions of these approaches and to identify implementation needs.

* **Endocrine Disruptors and Human Health**

Recently published articles have highlighted the known fact that some chemicals, such as PCBs and DDT, at sufficiently high levels, can disrupt the normal reproduction and sexual behavior of some organisms. In response to the significant reductions in the levels of these chemicals and other environmental contaminants that have occurred over the last two decades, New York State Great Lakes' fish and waterbirds have been observed to be currently reproducing normally. This observation suggests that the levels of these contaminants of concern are below the adverse effect level for these organisms. The primary concern then focuses on humans who consume contaminated Great Lakes fish and wildlife that could biomagnify these contaminants in their tissues to levels which could pose potential health problems.

A number of scientists have noted that these chemicals appear to mimic or interfere with the action of sex hormones (particularly the female hormone, estrogen) during embryonic development. Questions have been raised as to whether changing rates of human reproductive tract disorders and breast and testicular cancers may be related in part to chemicals released into the environment. The endocrine and reproductive effects of these chemicals are believed to be due to their ability to mimic the effects of endogenous hormones and disrupt their synthesis and metabolism.

Recognizing the potential environmental health threats posed by this class of contaminants, state and federal environmental programs have targeted bioaccumulative toxic contaminants, such as PCBs and DDT, for elimination from the Great Lakes ecosystem. There is insufficient evidence to indicate that the health of New York State RAP human populations are directly or significantly impacted by present levels of Great Lakes' contaminants. Basic research is incomplete regarding what levels of these contaminants would be required to cause human reproductive or cancer-causing effects. Given the problems in separating out the very complex influences and interaction of diet, weight, work place exposures, lifestyle variables (i.e. exercise, smoking), naturally occurring carcinogens, virus and genetic factors, it will be extremely difficult to establish any link between anthropogenic Great Lakes' contaminants and measurable levels of human health problems.

The potential reproductive and cancer-causing effects of bioaccumulative toxics is a topic that merits and demands further research. General agreement already exists that persistent toxic substances have no place in the environment and that they need to be

reduced and ultimately eliminated. Remedial Action Plans and Lakewide Management Plans, as well as other water quality, Great Lakes, and human health data collection and assessment programs, are already being further developed to achieve this end. Consideration must be given as to where limited RAP resources should be directed. Managers need to decide if resources should be used to better evaluate the problem through research projects or if these resources should be used to further identify and eliminant contaminant sources.

IV.Q. North American Free Trade Agreement:

The North American Free Trade Agreement (NAFTA) requires that the United States and Canada "harmonize" their environmental rules. An assessment of laws and regulations will determine where more stringent rules apply. Following this identification process, determinations of what additional measures need to be adopted can be made. Implementation procedures will then need to be agreed upon in order to comply with the agreement.

V.	APPENDIX	PAGE
A.	Remedial Progress Highlights (Major Activities Chronology)	129
B.	Use Impairment Strategy Management Form (Blank)	134

C.	IJC Listing/Delisting Guidance	135
D.	List of Remedial Advisory Committee Members	139
E.	List of Acronyms	140
F.	References	142

APPENDIX A

REMEDIAL PROGRESS HIGHLIGHTS

This table is summary of major remedial activities involving the St. Lawrence River at Massena Area of Concern since the United States and New York State committed to Remedial Action Plan (RAP) development and implementation in 1985.

Date	Action
-------------	---------------

Overall RAP Progress and Accomplishments:

1985	U.S. government/New York State commit to RAP development/implementation.
12/87	Massena Citizens' Advisory Committee (CAC) formed.
11/90	Stage I RAP completed.
8/91	Stage II RAP completed.
8/92	RAP Update completed.
8/92	Proceedings of St. Lawrence Joint Monitoring Workshop prepared.
6/93	International Joint Commission provides review comments of Stage 1 & 2.
1/94	Final draft of Joint Problem Statement (Stage 1) prepared.
1994	Land-based industrial site remediation proceeding. Contaminated sediment removal planned for 1995.
4/95	Second RAP Update completed.

ALCOA Hazardous Waste Sites (land-based and contaminated river sediments):

1/85	NYSDEC issues consent order requiring investigation and remediation of all land-based hazardous waste sites at the facility.
8/87	ALCOA completes Remedial Investigation report (volumes I & II).
3/89	Supplemental Remedial Investigation report completed.
9/89	EPA issues unilateral administrative order requiring investigation and remediation of contaminated river sediments in the waters of the Area of Concern.
Fall 89	A leachate collection system is installed at the general refuse landfill as an interim remedial measure to intercept contaminant migration to the East Marsh.
Fall 90	Contaminated sediment is excavated and shipped off-site from the West Marsh (8,000 cubic yards) and the first four hundred feet of the unnamed tributary stream bed (1,500 cubic yards) at a cost of \$7 million.
10/90	NYSDEC issues a modified consent order to establish further investigative, remedial design and implementation requirements.
11/90	Feasibility Study finalized for nine ALCOA plant site areas.
12/90	The General Refuse Landfill ceases to receive waste and an interim cap is installed.
2/91	ALCOA completes Feasibility Study for the remaining plant sites.
3/91	NYSDEC issues a Record of Decision (ROD) to document specific remedial alternatives to be implemented at eight of the ALCOA plant sites. The remedies includes a combination of waste

removal, treatment and containment requirements (estimated cost is \$46-52 million).

- 1/92 NYSDEC issues a second ROD for the remaining six sites on the ALCOA property. The remedies includes leachate collection, groundwater treatment, and removal and treatment of soils and sediments (estimated cost is \$90-127 million).
- 1994 Significant progress achieved on construction of secure landfill and site remediation.
- 1995 Contaminated sediment removal planned for the Grasse River.

General Motors Hazardous Waste Sites (land-based and contaminated river sediments):

- 4/85 EPA issues a consent order requiring a Remedial Investigation/Feasibility Study concerning land-based and contaminated river sediment remediation.
- 5/86 General Motors submits draft Remedial Investigation report to EPA.
- 1987-88 General Motors implements interim remedial measures including the closing, grading and temporary capping of the industrial landfill.
- 5/88 General Motors submits phase II Remedial Investigation report to EPA.
- 11/89 General Motors submits draft feasibility study report to EPA.
- 12/90 EPA issues Record of Decision (ROD) for first operable unit that includes contaminated river sediment remediation, land-based soil and sludge excavation and treatment, as well as groundwater recovery and treatment (estimated cost is \$78 million).
- 3/92 EPA issues ROD for second operable unit which addresses the industrial landfill and east disposal area remediation not covered in the 1st ROD (estimated cost is \$33-47 million).
- 3/92 EPA issues administrative order compelling implementation of the first operable unit ROD.
- 8/92 EPA issues administrative order compelling implementation of the second operable unit ROD.
- 1994 Contaminated sediment removal project postponed to 1995 due to silt curtain problem and large rocks located in dredging area.
- 1995 Contaminated sediment removal planned for St. Lawrence River area near outfall.

Reynolds Metals Hazardous Waste Sites (land-based and contaminated sediments):

- 9/87 NYSDEC issues a consent order requiring development and implementation of a facility wide Remedial Investigation/Feasibility Study (RI/FS).
- 1988 Interim remedial measures implemented: removal of contaminated sediments and capping north yard drainage ditch (outfall 004). Other highly contaminated areas were capped and fenced.
- 9/89 EPA issues unilateral administrative order requiring investigation and remediation of contaminated river sediments in the waters of the Area of Concern.
- 1989 Interim remedial measures implemented: completion of yard drainage ditch sediment removal, capping

and relocation for outfall 004. Outfall 002 is diverted to a treatment system that includes carbon adsorption.

- 7/90 Remedial Investigation report completed.
- 1990 Approximately 2,875 cubic yards of contaminated material is excavated from the 002 outfall ditch and disposed.
- 2/91 Construction completed to permanently divert outfall 004 to a activated carbon treatment system. Also, a shallow groundwater collection system installation is completed.
- 8/91 Feasibility study report completed.
- 1/92 NYSDEC issues Record of Decision for remedial actions that include: removal and/or treatment of contaminated soils and land-based sediments; upgrade of groundwater, surface water, and leachate collection and treatment systems (estimated cost is \$37 million).
- 3/93 NYSDEC issues a consent order requiring implementation of remedial design and remedial actions (construction started 10/93; expected completion is 3/98).
- 9/93 USEPA issues Record of Decision for contaminated river sediment remediation.
- 1994 Land-based remediation proceeding along St. Lawrence River.
- 1995 Contaminated sediment removal project planned.

Point Source Discharge Controls (SPDES Permits):

- Fall 85 General Motors completes installation of carbon adsorption unit for some stormwater discharges (GM has had carbon treatment on process discharge since 1981).
- 7/88 Reynolds adds carbon adsorption treatment to one of its outfalls.
- 2/89 NYSDEC issues draft SPDES permit modifications to ALCOA, General Motors, and Reynolds Metals, requiring PCB limits of nondetectable at the Method 608 detection limit of 0.065 ug/l. This limit was subsequently challenged.
- 2/91 Installation of the North Yard treatment system at Reynolds Metals
- 6/91 ALCOA adds carbon adsorption to one outfall.
- 7/91 ALCOA required to pay \$7.5 million in penalties to New York State (\$3.75 million civil penalty for SPDES permit wastewater discharge violations, and \$3.75 million criminal fine for illegal storage, shipping and disposal of hazardous waste).
- 8/91 ALCOA enters into a consent order with NYSDEC that outlines actions to reduce PCB discharge from the facility. This settles the 2/89 SPDES permit issue involving PCBs.
- 12/91 ALCOA installs a dry scrubber (replacing a wet system) for air pollution control and implements other water use/reduction actions resulting in a dramatic wastewater discharge reduction from 12 MGD to 6 MGD.
- 3/92 ALCOA installs carbon treatment on a second outfall.

- 3/92 Reynolds Metals agrees to a consent order that includes nondetectable levels of PCB in discharges, bioaccumulation monitoring and continued site remediation. This settles the 2/89 SPDES permit issue involving PCBs.
- 1994 Permit renewal process at the three major industries proceeding. Non-detectable PCB discharge levels sought by NYSDEC for all outfalls.

Nonpoint Source Management Activities:

- 1/90 NYSDEC completes Nonpoint Source (NPS) Program.
- 6/90 NYSDEC completes NPS assessment report for all counties in the basin.
- 6/90 NYSSWCC & NYSDEC complete "Guidelines for Establishing Water Quality Strategies".
- 4/91 NYSDEC completes a Best Management Practices manual for agricultural NPS control.
- 4/92 NYSDEC completes Best Management Practices catalog for agricultural sources.
- 1993 Most County Water Quality Strategies completed.
- 1994-95 Nonpoint source program implementation grants being provided.

Air Pollution Control:

- 1990 Federal Clean Air Act Amendments address chronic air pollution to control urban smog, acid rain, toxic pollution, mobile and stationary (smokestack) sources. Emphasis on Nonattainment areas to control particulate matter, nitrogen dioxide, carbon monoxide, lead, sulfur dioxide and ozone.

Fish and Wildlife Assessments/Actions:

- 8/94 NYSDEC technical report 94-4 published on the "Identification of and Changes in Chemical Contaminant Levels in Young-of-the-Year Fish from New York's Great Lake Basin". Additional fish tumor and fish flesh data needed.

Health and Environmental Assessments/Actions:

- 4/90 First report of the Health Risk Assessment (HRA) study published (required as part of the RI/FS under the General Motors order). This HRA focuses on the residents of the Mohawk Nation at Akwesasne near the GM facility. The first report investigated exposure of people to chemical contaminants in fish.
- 10/92 Second and third reports of the HRA study published. Chemical contaminants in wildlife and chemical contaminants in the milk of Mohawk women from Akwesasne were investigated.
- 12/94 Forth report of the HRA study completed that summarizes the results of the three earlier reports.

Investigations and Monitoring Activities:

2/95 RAP Update completed that summarizes and provides details of ongoing investigations and monitoring activities (Table 4) and identifies priority remedial activities (Section III.E).

Public Participation and Outreach:

11/91 Remedial Advisory Committee (RAC) replaces CAC for implementation activities; quarterly meetings conducted.

1993-94 Newsletter entitled "River Rap" produced by NYSDEC Public Participation Section.

1993-94 St. Lawrence River at Massena RAP slideshow produced by NYSDEC & RAC; conversion to a video is being implemented.

1994 NYSDEC Public Participation Section develops a display for public meetings.

Other Initiatives:

4/93 Natural Resources Damages Unit established within DEC (a pre-assessment screen to summarize potentially impacted natural resources in the Massena Area of Concern was completed in 9/90).

2/92 The St. Lawrence Environmental Trustee Council (consisting of government representatives from New York State, the St. Regis Mohawk Nation and the U.S. Federal government) hires a consultant to prepare a Natural Resource Damages Assessment Plan for the Massena area.

1/93 The Pollution Prevention Unit established in DEC to work to reduce pollutant generation, encourage waste minimization and promote efficient and wise consumption of resources.

10/93 Discharge Restriction Category amendment to 6NYCRR Part 701 made. Addresses "no new discharge" and "no new discharge of a specified substance".

2/94 Rotating Intensive Basin Studies Water Quality Assessment Report 1991-92 published for the St. Lawrence River Basin.

7/94 NYSDEC publishes Technical Guidance for Screening Contaminated Sediments.

3/95 Great Lakes Water Quality Guidance (GLWQG) final rule promulgated.

APPENDIX B

Strategy Management Form

Presented below is the shell of the Use Impairment Restoration and Protection Strategy management form. This blank form is provided as a worksheet to update the ten completed strategy management forms that follow and are described herein in Section V of this 1996 Remedial Action Plan Summary Update:

USE IMPAIRMENT RESTORATION and PROTECTION STRATEGY

REMEDIAL ACTION PLAN:

FORM#:

USE IMPAIRMENT INDICATOR:

IJC#:

AOC LOCATION:

IMPAIRMENT STATUS & CAUSES:

POLLUTION SOURCES:

=====

<u>TARGET</u>	<u>RESP.</u>	<u>REMEDIAL STRATEGY / ACTION ITEM:</u>	<u>STATUS:</u>
<u>DATE:</u>	<u>PARTY</u>		
1.	_____	_____	_____
2.	_____	_____	_____
3.	_____	_____	_____
4.	_____	_____	_____
5.	_____	_____	_____
6.	_____	_____	_____

=====

COMMENTS:

STATUS KEY:

- | | |
|----------------------|---|
| C = Completed | I = Implementation progressing |
| P = Planned | U = Under development/assessment/investigation |
| D = Deferred | N = Needs development/assessment/investigation |
| | R = Required by enforcement/permit/agreement |

APPENDIX D

IJC Listing / Delisting Guidance

Note: A separate generalized process for IJC review of a Stage 3 RAP and application of guidelines used to make recommendations on delisting Areas of Concern is available in separate IJC documentation. Following a diagram, IJC presents three pages of guidelines recommended for listing and delisting Great Lakes AOCs. These guidelines remain useful for general review; however, the definitions of criteria, targets, endpoints for individual AOCs have been further developed in the RAP Status Reports themselves.

APPENDIX D

LIST OF REMEDIAL ADVISORY COMMITTEE MEMBERS

1. Dave Arquette St. Regis Mohawk Tribe
St. Regis Mohawk Tribe 518-358-5937
Community Building
Hagansburg, NY 13655
2. Luke Dailey League of Woman Voters
469 Chapel Hill Road 315-265-2404
RD 1, Box 485
Colton, NY 13625
3. John Feeley St. Lawrence Aquarium and
41 Main Street Ecological Center
PO Box 87 315-769-0787
Massena, NY 13662

4. Stacy Hammill League of Woman Voters, EMC
19 Goodrich Street 315-386-3789
Canton, NY 13617
5. Robin McClellan Northern Consulting
Northern Consulting 315-265-6375
PO box 638
Potsdam, NY 13676
6. Ron McDougall UAW Local 465
2 Windsor Road 315-764-0271
Massena, NY 13662 315-769-7032
7. Doug Premo GM Foundry
Central Foundry 315-764-2233
Division of General Motors
Massena, NY 13662
8. Rick Georgeson N.Y. State Department of
NYSDEC, Region 6 Environmental Conservation
State Office Building 315-785-2238
Watertown, NY 13601
9. Tom Young
Clarkson University 315-268-4430
PO Box 5715
Potsdam, NY 13699

**APPENDIX E
LIST OF ACRONYMS**

AOC	Area of Concern
ARCS	Assessment and Remediation of Contaminated Sediments
ATFE	Akwesasne Task Force on the Environment
ATSDR	Agency for Toxic Substances and Disease Registry
BAF	Bioaccumulation Factor
BAT	Best Available Technology
BCC	Bioaccumulative Chemicals of Concern
BMP	Best Management Practice
CAAA	Clean Air Act Amendments
CAC	Citizen Advisory Committee
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CPP	Citizen Participation Plan
CSO	Combined Sewer Overflow
CWA	Clean Water Act
CWQCC	County Water Quality Coordinating Committees
CZARA	Coastal Zone Act Reauthorization Amendments

DDE	Dichlorodiphenyl-dichloroethene
DDT	Dichlorodiphenyltri-chloroethane (Dicophane)
DED	Department of Economic Development
DfE	Design for the Environment (EPA Program)
DHWR	Division of Hazardous Waste Remediation
DOW	Division of Water
DRC	Discharge Restriction Categories
EBPS	Environmental Benefit Permit Strategy
EPF	Environmental Protection Fund
ESP	Environmental Services Program
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
GLIN	Great Lakes Information Network
GLNPO	Great Lakes National Program Office
GLTRL	Great Lakes Technical Resource Library
GLTxRE	Great Lakes Toxic Reduction Effort
GLWQA	Great Lakes Water Quality Agreement
GLWQG	Great Lakes Water Quality Guidance
GLWQI	Great Lakes Water Quality Initiative
GM	General Motors
HCB	Hexachlorobenzene
HRA	Health Risk Assessment
IEP	Industrial Effectiveness Program (DED)
IFM	Integrated Facility Management (M2P2)
IJC	International Joint Commission
IRM	Interim Remedial Measure
ITES	Industrial Technology Extension Service
LaMP	Lakewide Management Plan
M2P2	Multimedia Pollution Prevention
MACT	Maximum Achievable Control Technology
MDL	Method Detection Limits
NAFTA	North American Free Trade Agreement
NESHAP	National Emission Standards for Hazardous Air Pollutants
NOAA	National Oceanic and Atmospheric Administration
NPL	National Priorities List
NRA	Natural Resource Damage
NSPS	New Source Performance Standards
NYMEP	New York Manufacturing Extension Partnership
NYS	New York State
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	NYS Department of Health
NYSDOS	NYS Department of State
NYSPPIC	NYS Pollution Prevention Information Clearinghouse
NYSSWCC	NYS Soil and Water Conservation Committee
OPA	Oil Pollution Act
OTC	Ozone Transport Commission
PAC	Public Advisory Committee
PAHs	Polynuclear aromatic hydrocarbons
PCBs	Polychlorinated Biphenyls
PPIS	Pollution Prevention Incentives for States

PRP	Potentially Responsible Parties
PSA	Preliminary Site Assessment
PWP	Priority Water Problem
RAC	Remedial Action Committee
RAP	Remedial Action Plan
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RD/RA	Remedial Design/Remedial Action
RFP	Request for Proposal
RI/FS	Remedial Investigation/Feasibility Study
RIBS	Rotating Intensive Basin Studies
ROD	Record of Decision
SARA	Superfund Amendment and Reauthorization Act
SBAP	Small Business Assistance Program
SPDES	State Pollution Discharge Elimination System
SRF	State Revolving Fund
TAGA	Trace Atmospheric Gas Analyzer
TRI	Toxic Releases Inventory
TSCA	Toxic Substances Control Act
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compounds
WQEPP	Water Quality Enhancement & Protection Policy
WQMAC	Water Quality Management Advisory Committee
WWW	World Wide Web
YOY	Young-of-the-Year (fish Study)

APPENDIX F

REFERENCES

- 1. Primary Documents:** (available upon request)
 - a. International Joint Commission Review of the St. Lawrence River at Massena Stage 1 & 2 Remedial Action Plan IJC Review Comments. June 7, 1993. 8 pp.
 - b. Joint Problem Statement. St. Lawrence River AOC, Cornwall-Lake St. Francis & Massena Remedial Action Plans. Stage 1 Summary Report. 1994. 17 pp.
 - c. Proceedings of the St. Lawrence Joint Monitoring Workshop. Massena, NY, April 28-29, 1992. Prepared for Environment Canada and USEPA Region II by Geomatics International Inc. 44 pp. Monitoring Activities and Contact List revised July 1994. 21 pp.
 - d. Progress in Great Lakes Remedial Actions Plans. RAP Summary for St. Lawrence River at Massena. From EPA document 905-R-24-020, September 1994, pg. 201-208.
 - e. Rotating Intensive Basin Studies. Water Quality Assessment Program 1991-92 Biennial Report. St. Lawrence River Basin. February 1994. New York State

Department of Environmental Conservation. pg. 115-141.

f. St. Lawrence at Massena Remedial Action Plan documents: Stage 1, 1990; Stage 2, 1991; Update, 1992. NYSDEC.

2. **Supporting Documents**

a. Fitzgerald, E.F., S. Hwang, K. Brix, B. Bush, J. Quinn, and K. Cook. 1992. Chemical contaminants in the milk of Mohawk women from Akwesasne. NYSDOH and Akwesasne Task Force. Technical Report. 125 pp.

b. Forti, A., K.G. Bogdan, and E Horn. 1994. Health risk assessment for the Akwesasne Mohawk population from exposure to chemical contaminants in fish and wildlife from the St. Lawrence River drainage on lands of the Mohawk Nation at Akwesasne and near the General Motors Corporation Central Foundry Division Facility at Massena, New York. NYSDOH. Technical Report. 25 pp.

c. Giesy, J.P., J.P. Ludwig and D.E. Tillitt. 1994. Deformities in birds of the Great Lakes region: assigning causality. *Environmental Science & Technology*, 28, No. 3, 128A-135A.

d. Great Lakes Fishery Commission. 1987. Guidelines for fish habitat management and planning in the Great Lakes. Special publication 87-1.

e. Hartig, J.H. and M.A. Zarull (eds.). 1992. Under RAPs: Toward Grassroots Ecological Democracy in the Great Lakes Basin. Univ. of Michigan Press, P.O. Box 1104, Ann Arbor, Mi 48106-1104. 289 pp.

f. Hartig, J.H. 1993. A survey of fish-community and habitat goals/objectives/targets and status in Great Lakes areas of concern. *Great Lakes Fish. Comm.* 95 pp.

g. Hovinga, M.E., M. Sowers and H.E.B. Humphrey. 1993 Environmental exposure and lifestyle predictors of lead, cadmium, PCB, and DDT levels in Great Lakes Fish eaters. *Arch. Environ. Health*, 48, No.2, 98-104.

h. Horner, R.R. and J.J. Skupien. 1994. Fundamentals of urban runoff management: technical and institutional issues. 302 pp.

i. IJC. 1993. Great Lakes - St. Lawrence Research Inventory 1991-1992. ISBN 1-895085-73-X. 148 pp.

j. Longabucco, P. 1991. Controlling agricultural nonpoint source water pollution in New York State: a guide to the selection of best management practices to improve and protect water quality. NYSDEC, Albany, N.Y. 169 pp.

k. National Association of Conservation Districts. 1994. The District Role in Developing and Implementing Remedial Action Plans for AOCs in the Great Lakes Basin. 5 pp.

- l. New York State Department of Environmental Conservation. Technical Guidance for Screening Contaminated Sediments. July 1994. Division of Fish & Wildlife, Division of Marine Resources. 36 pp.
- m. NYSDEC. 1993. Pollution Prevention Guidance for Local Governments.
- n. NYSDEC. 1990. Nonpoint Source Management Program.
- o. NYSDEC. 1992. Reducing the impacts of stormwater runoff from new development. 178 pp.
- p. NYSDEC. Management Practices Catalogue for nonpoint source pollution prevention and water quality protection in New York State: a nine section document of best management practice categories.
- q. NYSDEC. 1993. Priority Water Problem List: summary and county listing documents.
- r. NYSDEC. 1992. New York State 25-Year Plan for the Great Lakes.
- s. NYSDEC. July 1994. Technical Guidance for Screening Contaminated Sediment. Divisions of Fish and Wildlife and Marine Resources. 36 pp.
- t. PCB Bioconcentration in Flathead Minnows Exposed to Selected Effluents. Three study reports: 1) Reynolds Metals Company prepared by Woodward-Clyde, January 1994; 2) ALCOA, Inc. Phase I, July 1992; and 3) ALCOA, Inc. Phase II, September 1992 and October 1992. Concluded no significant differences.
- u. Schueler, T.R. 1994. The Stream Protection Approach: Guidance for developing effective local nonpoint source control programs in the Great Lakes region. 66 pp.
- v. Skinner, L.C., S.J. Jackling and R.W. Karcher. August, 1994. Identification of and changes in chemical contaminant levels in young-of-the-year from New York's Great Lakes Basin: 1992. Tech. Report 94-4 (BEP), NYSDEC, Albany, NY. 44 pp.
- w. Skinner, L.C. 1992. Chemical contaminants in wildlife from the Mohawk Nation at Akwesasne and the vicinity of the General Motors Corporation/Central Foundry Division Massena, New York plant. Tech. Rep. (BEP), Division of Fish and Wildlife, NYSDEC, Albany, NY. 112 pp.
- x. Sloan, R.J., and K. Jock. 1990. Chemical contaminants in fish from the St. Lawrence River drainage on lands of the Mohawk Nation at Akwesasne and near the General Motors Corporation/Central Foundry Division Massena, New York plant. Tech. Rep. 90-1(BEP), Division of Fish and Wildlife, NYSDEC, Albany, NY. 96 pp.
- y. The Center for the Great Lakes. 1991. Making RAPs happen: financing and managing cleanups at Great Lakes Areas of Concern.
- z. USEPA & NYSDEC. June 1994. Lakewide Impacts of Critical Pollutants on

United States Boundary Waters of Lake Ontario.

aa. USEPA, Office of Water. August 1994. Developing Successful Runoff Control Programs for Urbanized Areas. EPA 841-K-94-003, 94 pp.

bb. USEPA, Office of Water. August 1994. EPA's Contaminated Sediment Management Strategy. EPA 823-R-94-001, 130 pp.

cc. USEPA, Office of Water. September 1993. Proceedings of the U.S. Environmental Protection Agency's nation technical workshop "PCBs in Fish Tissue". EPA/823-R-93-003,

dd. USEPA. March 1994. Urbanization and Water Quality: A guide to protecting the urban environment. Typical runoff pollutants, pg.3; Table of urban BMPs, pg.37; List of federal watershed restoration and pollution control programs, pg.59.

ee. USEPA Office of Research and Development. 1993. Wildlife Exposure Factors Handbook, Volume I of II. EPA document 600/R-93/187a.

ff. USEPA. September 1994. Polychlorinated Biphenyls (PCBs): Sources and Regulations, background information for the virtual elimination pilot project. Prepared by Ross & Associates for GLNPO. 29 pp.