Appendix A - SEQRA Documents

FINAL SCOPE

FOR THE

DRAFT SUPPLEMENTAL GENERIC ENVIRONMENTAL IMPACT STATEMENT (DSGEIS)

FOR THE LAKE GEORGE DELTAS SEDIMENT MANAGEMENT/SHORELINE RESTORATION PROJECT

PURSUANT TO 6NYCRR PART 617.9, TITLE 6, NYCRR
August 25, 2011

Lake George Delta Dredging Proposals

Project Names and Numbers: Finkle Brook 5-5220-00346/00001
Hague Brook 5-5226-00159/00001
Indian Brook 5-5220-00035/00005

PURPOSE AND SCOPE

This document presents the scope of the issues and analyses to be included in draft Supplemental Generic Environmental Impact Statement (draft SGEIS) for the Lake George Deltas Sediment Management/Shoreline Restoration Project. It has been prepared pursuant to the requirements of the State Environmental Quality Review Act, or SEQR (Article 8 of the Environmental Conservation Law with implementing regulations at 6 NYCRR Part 617). This draft SGEIS is a supplement to the Final Generic Environmental Impact Statement for the Lake George Deltas Sediment Management/Shoreline Restoration Project that was previously accepted by the Lake George Park Commission, as lead agency, on April 20, 2004 (FGEIS).

The primary goal of scoping is to focus the DSGEIS on potentially significant impacts and to eliminate consideration of those impacts that are irrelevant or not significant.

This document reflects the findings of the DEC as lead agency with respect to the scope of relevant and significant issues to be included in the DSGEIS for the Lake George Deltas Sediment Management/Shoreline Restoration Project.

Section 2 briefly describes the proposed action.

Section 3 provides a summary of the various measures provided for notification and solicitation of public participation in the scoping process.

Section 4 provides a listing of potentially significant adverse impacts that have been identified to-date, an identification or mitigation measures, and reasonable alternatives that will be considered in this DSGEIS.

Section 5 provides an identification of information/data that will be included in an appendix rather than the body of the DSGEIS.

Section 6 identifies prominent issues that were raised during scoping and determined to not be relevant or not environmentally significant or that have been adequately addressed in a prior environmental review.

DESCRIPTION OF THE PROPOSED ACTION

Sediment deltas have formed along the shoreline of Lake George at locations where brooks discharge into the lake. The brooks carry sediments derived from human and naturally occurring forces within the watershed. As the brooks empty into the lake, the water velocity decreases, causing sediments to drop out and accumulate in the near-shore areas.

The potential environmental impacts of the delta remediation project were analyzed in the FGEIS, and findings issued on May 25, 2005. In the GEIS, the environmental review was focused on two methods for removing the sediment, “conventional mechanical removal” and “hydraulic removal” As described in DGEIS section 3.2 and the depicted on the conceptual plans, conventional removal would be carried out by excavating the delta sediments from the lake bottom, using clamshells or other excavating equipment located on barges. The sediments would then be placed in roll-off boxes located on other barges, which would then be transported to the designated upland transfer location for that project. Hydraulic removal would be carried out by pumping sediments from the lake bottom using a hydraulic dredge mounted on a barge. Sediment slurry would be pumped through flexible floating pipelines to a temporary onshore pretreatment area, where the sediments would be dewatered. The clean water would then be returned to the work site via a second line.

The scope of the proposed action is to examine alternative methods of dredging and any potential environmental impacts, not previously discussed. Particularly, mechanical dredging from access pads, in-water mechanical dredging, suction-dredging, and establishing a minimum criteria and potential environmental impact thresholds for sediment removal generally.

The specific project being contemplated as part of the proposed action is the mechanical excavation of sediment by tracked excavators operating from atop access pads constructed with dredged material. The Finkle Brook delta project involves an expected sediment removal of 8,217 +/- cubic yards over 3 +/- acres of delta surface area. The Hague Brook delta project involves an expected sediment removal of 27,347 +/- cubic yards over 9.8 +/- acres of surface area. The Indian Brook delta project involves an expected 25,000 +/- cubic yards of sediment removal over 8.3 +/- acres of delta surface area.

POTENTIAL SIGNIFICANT ADVERSE IMPACTS, REQUIRED INFORMATION, INITIAL MITIGATION MEASURES AND REASONABLE ALTERNATIVES

In reviewing the potential significant adverse impacts associated with the proposed action, the SEIS will be limited to the comparison, evaluation, and recommendation of the different dredging methods, as the dredging itself, and a majority of the impacts from dredging in general have already been considered previously in the duly adopted GEIS. Moreover, the original GEIS previously considered potential environmental impacts on the area within the "controlled work zone" and found that these areas would be impacted and focused the environmental review on impacts outside of the silt curtains and potential impacts post-dredging, once the silt curtains have been removed. To further this discussion, the SGEIS will address practices for reducing the potential for algae blooms and colonization by non-native aquatic species by avoiding the creation of unnatural bed conditions resulting from the dredging and prolonged work area containment. The SGEIS shall analyze all measures to mitigate the impacts from the physical reorganization and biological availability of suspended sediment-bound and soluble nutrients that occurs during the dredging operations, including an analysis of removing the work area containment curtains to disperse nutrients remaining in suspension.

<u>Potential Significant Adverse Impacts</u>:

1. Water quality and benthic impacts resulting from the construction of in-lake roads built with dredged materials, and from the operation of mechanized excavating and support equipment directly in the lake.
2. Creation of an unnatural and fertile lake bed resulting from the dredging activities and subsequent prolonged containment of the work area, adding to the increased potential for colonization by non-native aquatic nuisance species.

<u>Potential Mitigation Measures</u>

1. Minimize on-shore work area requirements, land disturbance
2. Restore work site to existing or improved conditions
3. Use excavated sediments for land reclamation
4. Develop/implement sediment and erosion control plan for on-shore work activities
5. Provide transition of slope to shoreline
6. Use of silt curtains – type, effectiveness, recommended extent and duration of use
7. Provide post-remediation substrate that is less advantageous for colonization by non-native aquatic species
8. Provide post-remediation plantings to lessen the opportunity for colonization by non-native aquatic species
9. Continue upland erosion and sedimentation control initiatives to reduce the sediment and nutrient transport into the lake

<u>Reasonable Alternatives To Be Considered</u>

1. Comparison/evaluation/recommendation of possible dredging methods, including operation of equipment directly on the deltas.
2. Sediment and nutrient source control initiatives, including clarification of the FGEIS' alleged pre-requisite to the removal of the deltas.
3. No-action alternative

INFORMATION / DATA FOR INCLUSION IN AN EIS APPENDIX

The following information / data will be included as an appendix to the DSGEIS rather than being included within the body of the DSGEIS.

1. Pertinent Correspondence

2. Delta Management Plans

PUBLIC NOTIFICATION AND SOLICITATION

The public comment period was established by the DEC for receipt of written public scoping comments. The public comment period ran from May 18, 2011 to June 6, 2011. Public notification of the public comment period was provided by the DEC within its notification and publication of the Positive Declaration on April 25, 2011. A copy of the Positive Declaration was provided by the DEC to the following:

- NYS Adirondack Park Agency
- NYS Office of General Services, Bureau of Land Management
- NYS Environmental Facilities Corporation, Division of Engineering, Metropolitan Project Section
- NYS Office of Parks, Recreation and Historic Preservation
- Lake George Park Commission

A notice of the Positive Declaration was published in the Environmental Notice Bulletin on May 4, 2011. A notice of the Public Scoping Meeting ran in the Environmental Notice Bulletin on May 18, 2011.

A public scoping meeting was held on May 25, 2011 to solicit public input with respect to the scope. Public notification of the Public Scoping Meeting was provided by the DEC as part of its publication and notification of the Positive Declaration of April 25, 2011.

PROMINENT NON-RELEVANT OR PRIOR-REVIEW ISSUES

The DEC, as Lead Agency, has determined that the following issues that were raised during the SEQR scoping process are not relevant or have been adequately addressed in a prior environmental review.

1. *Storm water management implementation measures for the reduction of sedimentation near the sources. The need for stream corridor management regulation. The need to adequately mitigate watershed erosion and sedimentation and the potential for future delta reduction*

These topics were addressed in the GEIS, as a function of the sediment management aspect of the analysis, in the absence of any proposed project. However, the three projects under this SEQR review are for the removal of delta sediments in the lake. Dredging is not a watershed management tool - rather it is a delta management tool. The direct and indirect impacts from these delta removal actions do not cause, or have potential to cause erosion, siltation and sedimentation in the watershed, and therefore is not required to be considered as a requisite for dredging. However, upland erosion and sedimentation control initiatives to reduce the sediment and nutrient transport into the lake must continue, to minimize contribution to the delta areas and maximize long-term benefits of the dredging.

2. Development of TMDLs for Lake George as required under the Clean Water Act.
Sediment is the only pollutant for which Lake George and its tributaries are 303(d) listed. For all intents and purposes, the water quality standard for sediment in the Lake George watershed is none in any amounts from manmade sources. Also, ECL 17-1709 prohibits point source discharges in the basin. Given these factors, a TMDL would be moot because the allocated load of sediment from controllable point and nonpoint sources would both be zero. EPA Region 2 has verbally agreed with this philosophy.

3. *Generic potential environmental impacts of dredging.*
The merits and potential environmental impact of dredging has been addressed in the GEIS. The primary scope of this review will be the comparative analysis of the different methods of dredging and the various potential environmental impacts that may result from the different methods. Moreover, there were a number of substantive comments that were included in the response letters to the draft scope. These comments will be included in the Draft Supplemental EIS and responded to where appropriate.

STATE OF NEW YORK
LAKE GEORGE PARK COMMISSION

STATE ENVIRONMENTAL QUALITY REVIEW ACT FINDINGS STATEMENT FOR FINAL GENERIC ENVIRONMENTAL IMPACT STATEMENT FOR

THE LAKE GEORGE ASSOCIATION, INC.'S LAKE GEORGE DELTAS SEDIMENT MANAGEMENT/ SHORELINE RESTORATION PROJECT

May 25, 2004

Pursuant to the State Environmental Quality Review Act, Environmental Conservation Law ("ECL") Article 8 ("SEQR"), 6 NYCRR Part 617 and ECL Article 43, the Lake George Park Commission, as lead agency, hereby makes the following findings:

I. Name of Action: Lake George Deltas Sediment Management/ Shoreline Restoration Project

II Project Sponsor: The Lake George Association, Inc.

III. Date of Acceptance of Final GEIS: April 20, 2004

IV. Description of Action: The Lake George Deltas Sediment Management/Shoreline Restoration Project ("the Project") is being facilitated by The Lake George Association, Inc. ("LGA") on behalf of the various towns and one village surrounding Lake George. The Project involves remediation of tributary brook deltas that have formed along the shoreline of Lake George due to excessive sedimentation caused by upland development, highway sand spreading, land clearing and logging and other human causes. Most typically, the deltas have formed where tributary brooks enter the Lake, but the Project is intended by LGA to also encompass deltas that may also occur where any engineered drainage structures, such as culverts, empty into the Lake.

The Project consists of removal of uncontaminated sediments in the upper portion of the each delta, from the shoreline outward to a maximum water depth of two meters, for restoration of navigability to pre-existing conditions.

The Draft Generic Environmental Impact Statement ("DGEIS") included conceptual delta management plans for seven existing tributary brook deltas presently identified by LGA for remediation. These deltas are East Brook, West Brook and English Brook in the Town of Lake George, with the West Brook and English Brook deltas also being located in the Village of Lake George; Finkle Brook and Indian Brook in the Town of Bolton; Hague Brook in the Town of Hague; and Foster Brook in the Town of Dresden. Due to their proximity, East Brook and West Brook, and Finkle Brook and Indian Brook, were combined into single conceptual plans. The five conceptual plans are contained in appendices to the DGEIS.

For each delta, two basic methods of sediment removal, conventional mechanical removal and hydraulic removal, were assessed. Conceptual plans for each method were prepared for each of the seven sites, including general mapping of the area to be dredged, an upland staging and processing area and an upland sediment reuse area.

As described in DGEIS section 3.2 and the conceptual plans, conventional removal would be carried out by excavating the delta sediments from the lake bottom, using clamshells or other excavating equipment located on barges. The sediments would then be placed in watertight rolloff boxes located on other barges, which would then be transported to the designated upland transfer location for that project. The boxes would then be trucked to the designated upland reuse area.

Hydraulic removal would be carried out by pumping sediments from the lake bottom using a hydraulic dredge mounted on a barge. Sediment slurry would be pumped through flexible floating pipelines to a temporary onshore pretreatment area, where the sediments would be dewatered. The clean water would then be returned to the work site via a second line. The sediments would then be trucked to the designated upland reuse area.

With either alternative, all in-water work areas would be surrounded by floating silt curtains to contain any suspended sediments in the work area until they settle back to the bottom.

Both sediment removal methods, as designed for the Project, would not create any significant adverse environmental impacts.

The conceptual plans do not select a preferred method from among the two methods studied, leaving that choice to Phase 2 of the Project, to be decided on a case-by-case basis for each delta. It is anticipated that the municipalities may be able to reuse the materials removed from the deltas, pursuant to Beneficial Use Determinations to be obtained from the New York State Department of Environmental Conservation ("NYSDEC") under 6 NYCRR Part 360.

Actual remediation of the individual deltas will most likely be undertaken by the towns or the village within which the individual deltas are located. Other governmental agencies or private entities are not precluded from also advancing individual delta remediation projects. To this end, LGA has structured the overall Project into three (3) phases. Phase 1 consists of preparation of the Generic Environmental Impact Statement ("GEIS") and concurrent preparation of conceptual delta management plans for the seven tributary brook deltas that have presently been identified by LGA for remediation.

Phase 2 will consist of preparation of individual detailed design plans and specifications and preparation of applications for procurement of all necessary regulatory permits and approvals for remediation of the individual deltas. Phase 3 will consist of implementation of the approved delta remediation measures for the individual deltas and completion of any post-remediation monitoring measures that may be required. It is likely that the individual delta remediation projects will proceed individually and that not all of them will proceed at the same time.

It is anticipated that funding for Phases 2 and 3 of the Project will be provided to the municipalities from a combination of public and private funds, with the municipalities providing any necessary matching funds. Matching funds may be provided by the municipalities by providing "in-kind" services to the projects.

V. SEQR Process:

The Project has been the subject of a GEIS prepared under 6 NYCRR § 617.10. The GEIS was intended to identify potential adverse environmental impacts which might arise from the Project and to identify mitigation measures and alternatives that would avoid or mitigate such impacts. As was fitting for a GEIS, the preparers of the GEIS did not undertake complete detailed site studies for each of the individual delta sites that were the subject of the GEIS. In addition, the GEIS was intended to include the potential for the remediation of delta deposits in Lake George at sites other than the seven sites that were specifically identified in the GEIS.

Therefore, it is anticipated that when each individual delta remediation project is proposed and proceeds to the detailed Phase 2 design and engineering process, additional SEQR procedures will be required pursuant to 6 NYCRR § 617.10(d). Each individual project will conform to the conditions and criteria set forth below, and if any one project does not conform, it will be required to undergo further SEQR review, including possibly the preparation of a site-specific supplemental EIS.

A. THE SEQR PROCESS FOR THE DGEIS

The SEQR process for the Project was initiated on January 31, 2000 by LGA's submittal of a Full Environmental Assessment Form ("Full EAF") for the Project to potential involved agencies. LGA's Full EAF identified multiple potential involved agencies for the Project. Following consultation with the other potential involved agencies, and with the concurrence of these agencies, on May 23, 2000 the Lake George Park Commission ("LGPC") accepted the role of SEQR Lead Agency for the Project.

Based on its review of LGA's January 31, 2000 Full EAF, the LGPC issued a SEQR Positive Declaration for the Project on June 27, 2000, indicating that the Project may have a significant impact on the environment and directing that an environmental impact statement be prepared. Specifically, the LGPC directed that a "generic" environmental impact statement be prepared for the Project.

In its June 27, 2000 Positive Declaration, the LGPC indicated that it would conduct public scoping for the DGEIS. The public scoping was conducted during a defined scoping period by solicitation and receipt of written and oral public comments via public meetings and exchange of written information. In conjunction with receipt of a draft scope for the DGEIS prepared by LGA, the LGPC conducted public scoping for the DGEIS from June 28, 2000 to August 11, 2000. Following completion of this scoping period, the LGPC issued a final scope for the DGEIS to LGA and the involved agencies on March 20, 2001. A copy of the DGEIS final scope is provided in Appendix A of the DGEIS. The final scope provides, in part, a detailed description of the public scoping process conducted by the LGPC for the DGEIS.

The DGEIS was prepared by Earth Tech, Inc. for LGA. It is broken down into 18 substantive areas, plus an introduction and a section for generic SEQR conditions and criteria. Five of these sections discuss the Project's general purposes, actions, setting, impacts and alternatives. Thirteen of them address a specific set of environmental resources. Each contains a description of the existing environmental concluding setting, potential significant adverse impacts on the environmental resource in question, mitigation measures that are proposed as part of the Project's design, an analysis of reasonable alternatives, and identification of unavoidable adverse impacts.

The DGEIS was accepted by LGPC as complete on September 4, 2002. The public comment period was duly noticed in the Environmental Notice Bulletin and in local newspapers. A public hearing on the DGEIS was held by LGPC on September 23, 2002 at Canoe Island Lodge at Diamond Point, in the Town of Lake George. In addition, LGA and Earth Tech conducted public information sessions on the DGEIS on September 23, 2002 at the Lake George Town Center and on September 24, 2002 at the Hague Community Center. Written comments were accepted by LGPC from September 4, 2002 to December 23, 2002. Comments were received from some of the affected municipalities, involved state agencies, adjoining landowners to the delta sites, conservation groups and the general public.

B. THE FGEIS

A final GEIS ("FGEIS") was prepared by Earth Tech for LGA and presented to LGPC in December 2003. The FGEIS was accepted by LGPC as complete on April 20, 2004. The FGEIS (pages 1 & 5) states that LGA has not modified the Project since the acceptance of the DGEIS by LGPC. The FGEIS provides a response to all written and oral comments received by LGPC during the public comment period.

The FGEIS also assessed the effects on the Project of a potential change in DEC's dredging standards. Sections 6.2(3), 6.3(1), and 6.4(1) of the DGEIS, and Section 3.2 of each conceptual delta management Plan (DGEIS Appendix C), had compared the Project to NYSDEC's 1994 Interim Guidance for Freshwater Navigational Dredging and found that the Project, as proposed, would conform to these standards. The DGEIS further stated that if site specific conditions, such as contaminant levels in sediments, might cause an exceedence of the standards contained in the Interim Guidance, additional SEQR review would be required during Phase 2 of the Project.

After the close of the public comment period on the DGEIS, NYSDEC released for public comment its draft TOGS 5.1.9 guidance document for In-Water and Riparian Management of Sediment and Dredged Material. This document, if adopted by NYSDEC, would replace the 1994 Interim Guidance. Section 1.4 of the FGEIS (pages 5 to 7) contains a discussion of draft TOGS 5.1.9 and its relationship to the Project.

The FGEIS finds that, if the TOGS 5.1.9 is adopted by NYSDEC, the contaminant levels in the studied deltas will most likely not exceed the levels set in the TOGS for Class A sediments. During Phase 2 of the Project, sediment sampling will be required and the levels of contaminants in the samples will be compared to the Class A levels in the applicable NYSDEC guidance document in effect at that time. If sediments at any site exceed those levels, additional SEQR review will be required to assess the Project's impacts and help determine the proper course of action. Thus, the potential replacement of the 1994 Interim Guidance by TOGS 5.1.9 should not affect the regulatory or environmental viability of the Project or increase its environmental impacts.

C. PROCEDURES FOR FUTURE SEQR REVIEW OF INDIVIDUAL DELTA REMEDIATION PROJECTS

In accordance with the requirements of 6 NYCRR § 617.10(d) concerning the scope of applicability of a Generic Environmental Impact Statement, the actual proposed delta remedial project measures for the individual deltas will be compared with the overall results of the DGEIS and FGEIS and their review process, as part of the Phase 2 detailed design and permitting phase. The criteria for this comparative analysis are detailed in Section 1.2.4 of the DGEIS and also below. This comparative analysis will be completed to determine the possible need for additional potential environmental impact analysis of any actual project components that were not addressed during Phase 1 of the Project.

It is likely that for individual delta remediation projects which were not among the seven sites specifically studied in the GEIS, site specific assessments will be more likely to be required for certain types of resources, than for the seven sites which were assessed in the GEIS.

During the Phase 2 engineering and permitting process for an individual delta remedial activity, the requirements for compliance with SEQR must be generally consistent with the SEQR procedures of 6 NYCRR §617.10, as summarized in Section 1.2.1 of the DGEIS. The first agency receiving a individual permit application will be required to confirm all other permitting and approval agencies for the individual remedial project. These agencies will then need to coordinate among themselves designation of a SEQR Lead Agency.

The likely involved agencies include the Adirondack Park Agency, NYSDEC, New York State Office of General Services, U.S. Army Corps of Engineers, LGPC and the local town and/or village.

The Lead Agency will have the primary responsibility for confirming conformance of the individual delta remedial project with the requirements of SEQR, by confirming consistency of the proposed individual delta remedial measures with the GEIS, including the thresholds and criteria stipulated below, and the agency findings

statements on the GEIS. The Lead Agency shall require the municipal applicant to submit a brief assessment of the consistency of the actual proposed remedial measures with the various Project GEIS thresholds and criteria, as set forth below.

Pursuant to 6 NYCRR § 617.10(c), the future Phase 2 and Phase 3 actions of the Project will conform to the thresholds and criteria established in the DGEIS and the FGEIS, including the thresholds and criteria set forth below in section V(D). In the event of a conflict between these findings and the DGEIS or FGEIS, these findings shall control.

These issues will be assessed for the actual individual proposed delta remedial measures during Phase 2, for purposes of possible additional environmental review requirements that may be required under SEQR. If an individual project in Phase 2 conforms to these thresholds and criteria, and they are otherwise satisfied during Phase 2, and the individual Phase 2 project otherwise conforms to the GEIS, then no further SEQR review will be required, pursuant to 6 NYCRR 617.10(d)(1). If not, then pursuant to 6 NYCRR § 617.10(d)(2), (3) or (4), additional SEQR review will be required, resulting in either a negative declaration or a positive declaration and the preparation of a site-specific supplemental EIS.

D. CONDITIONS AND CRITERIA FOR FUTURE SEQR REVIEW

Project Purpose and Need

1. *Project Purpose and Need:* The primary purpose and need for remediation of the seven tributary deltas presently identified for remediation by LGA is summarized as removal of uncontaminated sediments in the upper portion of the overall delta area (i.e., sediment removal limited to water depth of less than 2 meters) for restoration of navigability to pre-existing conditions. In the event that a differing purpose and need forms the basis for proposed remediation of an individual delta, the proposed purpose and need will be examined for any additional potential significant environmental impacts. A

differing project purpose and need may directly result in a differing proposed remedial plan and attendant potential significant environmental impacts.

General Project Description

2. *Current Proposed Action:* If any of the individual delta remedial actions is designed in a way that varies significantly from the proposed action described in the DGEIS and the conceptual delta management plans, then the individual delta remedial project will be the subject of additional evaluation of potential significant adverse impacts, so as to ensure conformance with the requirements of SEQR. Typical examples of such differing proposed actions are summarized by the following items #3 to #6.

3. *Chemical Characterization of Sediments Proposed for Removal:* The Project encompasses only removal of delta sediments meeting the NYSDEC 1994 Interim Guidance thresholds for both Class A sediments and Placement Category 1 sediments. Sediments meeting both of these thresholds are considered to have no appreciable contamination and are able to be reused in the upland environment in an unrestricted manner. Sediments meeting both of these NYSDEC - Division of Water thresholds will also likely be successfully approved by the NYSDEC - Division of Solid and Hazardous Waste for upland reuse under a Beneficial Use Determination.

   During Phase 2, these sediments will be tested under the NYSDEC testing protocols in effect at the time. In the event that removal of sediments exceeding any one or more of these NYSDEC thresholds is subsequently proposed for an individual delta remedial action, this individual proposed action will be the subject of additional environmental review to ensure full conformance with the requirements of SEQR. [If NYSDEC replaces the 1994 Interim Guidance with TOGS 5.1.9, then the new standards should be applied to this issue and each of the issues discussed below. If the project conforms to TOGS 5.1.9, then it should be considered to be conforming to these conditions and criteria.]

4. *Chemical Characterization of Remaining Substrate:* It is intended that the bottom sediment substrate remaining after removal of the delta sediments will exhibit the characteristics of, and not the thresholds for, NYSDEC 1994 Interim Guidance Class A sediments. This will be confirmed based on detailed testing to be done during Phase 2 of the Project. In this manner, the Project will prevent exposure of any sediments exceeding the Class A thresholds, such that these types of sediments would be exposed for potential re-dispersal into the lake waters by subsequent wave and storm actions.

   In the event that sediments exceeding Class A thresholds are proposed during Phase 2 to form the bottom substrate remaining after completion of the sediment removal measures for an individual delta remedial project, this individual proposed action will be the subject of additional environmental review to ensure full conformance with the requirements of SEQR.

5. *In-water Sediment Disposal:* The Project currently proposes to employ upland disposal of removed sediments. Under the NYSDEC's 1994 Interim Guidance, in-water disposal of confirmed Class A sediments is an acceptable method of sediment disposal. In Lake George, for example, this could include hydraulic removal of the delta sediments and direct underwater discharge of the hydraulic slurry in deeper portions of the lake; upon discharge the sediments would be expected to settle to the lake bottom and be incorporated into the existing sediment substrate in the deeper lake area.

   The Project encompasses only upland reuse of confirmed Class A sediments, and such in-water disposal methods are not proposed. In the event that in-water disposal of the delta sediments is proposed as part of an actual individual delta remediation project, this individual proposed action will be the subject of additional environmental review to ensure full conformance with the requirements of SEQR.

6. *Riparian Sediment Disposal:* The Project currently proposes to employ upland disposal of removed sediments. Under the NYSDEC's 1994 Interim Guidance, riparian disposal of confirmed Class A sediments is an acceptable method of sediment disposal. Riparian disposal sites are sites adjacent to or within the floodplain of surface waters for which sediment removal is proposed. These sites are typically diked with controlled outlets, allowing for retention of the sediments and the controlled discharge of the return water, after final settling of the entrained sediments.

   The Project encompasses only upland reuse of confirmed Class A sediments. In the event that riparian disposal of the delta sediments is proposed as part of an actual individual delta remediation project, this individual proposed action will be the subject of additional environmental review to ensure full conformance with the requirements of SEQR.

Potential Environmental Impacts

7. *Section 6 - Water Quality:* Section 6 of the DGEIS and the conceptual delta management plans (DGEIS Appendix C) describe how the individual delta remedial projects will preclude significant adverse impacts to water quality, and how all applicable standards will be met. In the event that the detailed design work that will be provided during Phase 2 for an individual delta remedial project indicates that applicable regulatory requirements, standards or thresholds relative to water quality may be exceeded, then the individual delta remedial project will be subject to further SEQR review and analysis.

8. *Section 7 - Eurasian Watermilfoil:* Section 7 of the DGEIS and section 2.7 of FGEIS describe how the individual delta remedial projects will avoid contributing to the spread of the nuisance aquatic plant species Eurasian Watermilfoil ("EWM"). If an individual project cannot be designed to avoid work in an area of heavy EWM growth not amenable to hand harvesting, or so that project boat routes avoid areas of heavy EWM growth, then the individual delta

remediation project will be the subject of additional evaluation of potential significant adverse impacts, so as to ensure conformance with the requirements of SEQR.

9. *Section 8 - Other Aquatic Plants and Animals; Aquatic Wetlands:* Section 8 of the GEIS describes potential adverse impacts to aquatic plants, animals and wetlands. No significant potential adverse impacts to aquatic wetlands or animals were identified in the GEIS. No rare, threatened or endangered species of animals were identified in any of the potential project areas.

   Ogden, et al (1976) and Madsen, et al (1989) previously observed four aquatic plant species designated as rare and endangered in New York during previous lake-wide aquatic plant surveys of Lake George. Eichler, et al (1992) observed three of these designated species during their supplemental surveys of twenty-one tributary brook deltas in the lake's south basin in 1991. The New York State Natural Heritage Program has reported that one of these four designated species, Water Milfoil (*Myriophyllum alterniflorum*, a species related to, but distinct from, the nuisance species EWM) has been observed at the location of one of the seven tributary deltas presently identified for remediation by LGA and in near proximity to the proposed onshore material staging area for one of the seven deltas. Water Milfoil is presently designated by NYSDEC as "Rare" in New York state. Cursory surface reconnaissances via snorkeling of the seven delta areas by Earth Tech project personnel in July 2000 also identified the occurrence of scattered Water Milfoil plants at two of the seven presently identified deltas, including the one delta location noted by the NYS Natural Heritage Program. This information indicates that one or more rare, threatened or endangered species and/or their critical habitat may occur at a specific delta proposed for active sediment removal during Phase 2.

   A detailed aquatic plant survey of the proposed active sediment removal zone as well as the adjacent fringe areas will be conducted by qualified

personnel as part of the Phase 2 Pre-Design Investigation for each individual delta remedial project. In the event that the actual occurrence of any rare, endangered or threatened species and/or their critical habitat in these project areas is confirmed during this detailed aquatic plant survey, then this confirmed observation will be the subject of additional evaluation of potential significant adverse impacts to the observed plant species, to ensure conformance with the requirements of SEQR.

10. *Section 9 - Fisheries:* Section 9 of the DGEIS describes how the individual delta remedial projects will preclude significant adverse impacts to fisheries. In the event that the detailed design work that will be provided during Phase 2 for an individual delta remedial project indicates that significant adverse impacts to fisheries may occur, then the individual delta remedial project will be subject to further SEQR review and analysis.

11. *Section 10 - Terrestrial (Upland) Plants and Animals and Wetlands:* Section 10 of the DGEIS describes how the individual delta remedial projects will preclude significant adverse impacts to terrestrial plants and animals and wetlands. In the event that the detailed design work that will be provided during Phase 2 for an individual delta remedial project indicates that significant adverse impacts to a protected plant or animal species will occur or that unauthorized impacts to regulated wetlands will occur, then the individual delta remedial project will be subject to further SEQR review and analysis.

12. *Section 11 - Other Upland Resources:* Section 11 of the DGEIS describes Project components and activities that will be provided to preclude significant adverse impacts to shoreline areas and to upland resources that could be adversely impacted by uncontrolled stormwater drainage and erosion and sedimentation. In the event that the detailed design work that will be provided during Phase 2 for an individual delta remedial project indicates that significant adverse impacts to such resources may occur, then the individual delta remedial project will be subject to further SEQR review and analysis.

13. *Section 12 - Aquatic Cultural and Archaeological Resources:* Section 12 of the DGEIS sets forth a process for locating and protecting aquatic cultural and archaeological resources, through the standard NYS OPRHP process and, if needed, the implementation of a data recovery plan ("DRP"). It is anticipated that such a process and DRP will avoid any adverse impacts to such resources and that no additional evaluation of potential significant adverse impacts will be required if any such resources are discovered. Only in the event that, in the judgment of OPRHP, a feasible DRP is not available for any such resources that are discovered, will additional SEQR evaluation of potential significant adverse impacts be required, so as to ensure conformance with the requirements of SEQR.

14. *Section 13 - Upland Cultural and Archaeological Resources:* Section 13 of the DGEIS finds that there will be no significant adverse impacts to upland cultural and archaeological resources, due to the lack of any known such resources in the affected upland areas. Only in the event that any such resources are discovered, will additional evaluation of potential significant adverse impacts be required, so as to ensure conformance with the requirements of SEQR.

15. *Section 14 - Visual and Aesthetic Resources:* Section 14 of the DGEIS finds that the only adverse visual and aesthetic impacts of the delta remedial measures will be temporary and thus, not significant. Only in the event that long term adverse impacts are discovered, will additional evaluation of potential adverse impacts be required, so as to ensure the conformance with the requirements of SEQR.

16. *Section 15 - Recreational Resources:* Section 15 of the DGEIS finds that any adverse impacts to recreation will be temporary and thus, not significant. Only in the event that long term adverse impacts are discovered, will additional evaluation of potential significant adverse impacts be required, so as to ensure conformance with the requirements of SEQR.

17. *Section 16 - Transportation:* As described in Section 16 of the DGEIS, significant traffic congestion is not expected to occur as a result of the individual delta remedial projects. In the event that the detailed design work that will be provided during Phase 2 for an individual delta remedial project indicates that significant traffic congestion may occur, then the individual delta remedial project will be subject to further SEQR review. Likewise, in the event that the Phase 2 detailed design indicates that roadways may be significantly damaged during an individual delta remedial project, then the individual delta remedial project will be subject to additional SEQR review.

18. *Section 17 - Noise:* Section 17 of the DGEIS finds that the only adverse noise impacts of the delta remedial measures will be temporary. These short-term effects of noise are expected to be limited by the types of equipment used, so that they will not be significant. If different equipment is chosen for any individual delta remediation project that may create significantly more noise than the types described in this DGEIS, then additional evaluation of potential significant adverse impacts may be required, so as to ensure conformance with the requirements of SEQR.

19. *Section 18 - Community Resources:* Section 18 of the DGEIS finds that the Project will not have a significant adverse impact on community resources. Only in the event that significant adverse impacts to community resources are discovered, will additional evaluation of potential significant adverse impacts be required, so as to ensure conformance with the requirements of SEQR.

VI. Facts and Conclusions Supporting Findings:

1. As outlined above at Section VD, the GEIS found that the Project, as designed, would not have significant adverse environmental impacts in any of the 15 substantive resource areas discussed in the DGEIS. This conclusion appears to be reasonable, due to the design of the Project

and the conditions and criteria set forth above at Section VD.

2. As outlined above at Section VD, the GEIS found that further study will be needed in Phase 2 of the Project to ascertain the potential site specific impacts of any individual delta remediation project in certain resource areas. These resource areas are:

a. Chemical composition of sediments proposed for removal and for post-removal bottom sediments.
b. Eurasian watermilfoil.
c. Protected aquatic plants and wetlands.
d. Aquatic archeological and cultural resources.
e. Protected terrestrial plants.
f. Possible spawning use of tributary by salmon.
g. Shoreline features.
h. Current direction and velocity.
i. Existing levels of recreational use.

The DGEIS and FGEIS, including the conceptual delta management plans in Appendix C of the DGEIS, describe how these additional site specific assessments will be undertaken during the Phase 2 detailed design process for each individual delta remediation project. The GEIS also describes how each individual project will be designed to minimize impacts in all 15 resource areas studied. These findings are summarized above at section VD.

3. In addition, if the on-site conditions or Phase 2 individual project design for any individual delta remediation project vary significantly from the findings of the GEIS, additional SEQR review will be required.

4. For individual delta remediation projects which were not among the seven delta sites specifically studied in the GEIS, site specific assessments will be required for all resource types.

5. <u>Potential Adverse Impacts and Mitigation Measures</u>

The GEIS has identified a number of potential adverse environmental impacts that could be caused by a project such as this. As described above, the design of this Project and the potential mitigation measures identified in the GEIS will avoid or mitigate such impacts to the maximum

extent practicable, such that the Project will not have a significant adverse impact. All mitigation measures described in the GEIS are incorporated herein by reference. These identified mitigation measures include, but are not limited to, the following:

Water Quality (DGEIS Section 6): Proposed mitigation measures include the use of best management practices as specified by the NYSDEC 1994 Interim Guidance, removal of only Class A sediments, use of silt curtains, turbidity monitoring during sediment removal, control measures for potential oil discharges, slurry pretreatment, providing alternate sources of potable water where needed, and an inspection and contingency response program.

Eurasian Watermilfoil (DGEIS Section 7): The individual delta remediation projects will be designed to minimize and control the fragmentation and spread of EWM. EWM plants in and near the sediment removal zones will be hand-harvested prior to the commencement of removal operations. The sediment transfer routes (barge or slurry pipeline) will be designed to avoid EWM beds or else the EWM will be removed from those routes. Following completion of the sediment removal project, follow-up monitoring and hand-harvesting of EWM will be used to prevent EWM from colonizing the areas where sediment has been removed.

Aquatic Plants, Animals and Wetlands (DGEIS Section 8): No mitigation measures were identified as necessary, except possibly for protected plants which may exist at one or more delta sites. Inspection of the sites for the presence of protected plant species during Phase 2 of the Project will determine whether specific mitigation measures and further SEQR review are needed for each site. If previously unknown protected animal species are subsequently discovered, further SEQR review will be required.

Wetlands impacts would come under the jurisdiction of the Adirondack Park Agency (APA). APA staff will do site visits of Project sites located in or near wetlands and review erosion control plans for those sites where it has jurisdiction. This process will help ensure that wetlands impacts are avoided or properly mitigated.

Fisheries (DGEIS Section 9): Proposed mitigation measures include seasonal scheduling of the work to avoid spawning periods for many species, sequencing of work to avoid blocking use of tributaries by spawning fish, and, if identified in Phase 2 as necessary, compensation by stocking for impacts to salmon spawning.

Terrestrial Plants, Animals and Wetlands (DGEIS Section 10): Wetlands near the East and West Brook upland staging site will be protected by silt fence and/or hay bales or other appropriate sediment controls. No other mitigation measures were identified as necessary, except possibly for impacts to protected plants, if any exist at one or more upland sites. Inspection of the sites for the presence of protected plant species during Phase 2 of the Project will determine whether specific mitigation measures and further SEQR review are needed for each site. If previously unknown protected animal species are subsequently discovered, further SEQR review will be required.

Other Upland Resources (DGEIS Section 11): If identified as needed during Phase 2, rip-rap or other erosion control methods will be used to prevent increased shoreline erosion due to potential changes in shoreline energy due to delta removal. Sediment controls and drainage controls will be provided, where needed, to control stormwater runoff impacts at the upland sites.

Aquatic Cultural and Archeological Resources (DGEIS Section 12): It is possible that submerged cultural resources exist at one or more delta sites. Phase 2 of the Project, for any site proposed for active sediment remediation, will include detailed archeological surveys pursuant to the requirements of OPRHP and applicable federal guidelines. If any protected resources are identified at that time, appropriate mitigation measures will be implemented, such as project redesign or data recovery.

Upland Cultural and Archeological Resources (DGEIS Section 13): No potentially significant adverse impacts were identified, and no mitigation is proposed and no conditions or criteria are proposed.

Visual and Aesthetic Resources (DGEIS Section 14): Any such impacts will be temporary and will occur in already

developed areas. Nevertheless, project design and mitigation to minimize such impacts include seasonal scheduling of the work during off-peak seasons, minimizing the duration of the project, restoring the on-shore sites to their prior conditions, and the use of temporary screening at the on-shore sites, where appropriate.

Recreational Resources (DGEIS Section 15): Any such impacts will be temporary. Nevertheless, project design and mitigation to minimize such impacts include seasonal scheduling of the work during off-peak seasons, minimizing the duration of the project, submerging floating hydraulic slurry lines in certain locations to allow boats to pass through, safety markings to warn boaters and restoring the on-shore sites to their prior conditions.

Transportation Systems (DGEIS Section 16): Any such impacts will be temporary. Nevertheless, project design and mitigation to minimize such impacts include seasonal scheduling of the work during off-peak seasons, and the providing of flagpersons, where needed, to ease the flow of trucks into traffic on the roadway system.

Certain local roads that may be used by Project trucks may suffer damage due to the truck traffic. Such roads are owned by the same municipalities that would be carrying out the individual delta remediation projects. It will be up to these municipalities to decide whether to go forward with the projects and whether to build the cost of roadway repair into the project cost.

Noise Impacts (DGEIS Section 17): Any such impacts will be temporary. Nevertheless, project design and mitigation to minimize such impacts include seasonal scheduling of the work during off-peak seasons, minimizing the duration of the project, adhering to all local noise control ordinances, use of mufflers and proper equipment maintenance measures on equipment, use of best management practices for noise control, and use of noise screening in some instances.

Community Resources (DGEIS Section 18): No significant impacts on community emergency services were identified in the GEIS. The project sponsors and their contractors will work with local emergency services providers to minimize safety and security problems and allow for appropriate responses to emergencies.

Cumulative Impacts (DGEIS Section 19): No significant cumulative impacts were identified in the GEIS. Cumulative impacts will be minimized by the geographic distance between the delta sites, the short-term nature of many of the identified impacts, the fact that no significant adverse impacts have been identified, and the likelihood that the individual delta remediation projects will not all occur at the same time.

6. Discussion of Alternatives:

The GEIS found that there are no reasonable general alternatives for the Project that are consistent with the Project's purpose and identified need. Navigation can not be restored to pre-existing levels without the Project. It is not practicable to relocate the shoreline owners whose access has been limited by the formation of the deltas. Extending their docks further into the Lake could create a safety hazard. Additional warning buoys and safety devices may not alleviate all hazards to navigation arising from the deltas and/or extended docks.

The alternative in-water and riparian sediment disposal methods described above, while commonly used elsewhere were deemed currently unacceptable on Lake George, due to the availability of upland reuse/disposal sites and the potential for greater adverse impacts from the alternatives.

Upland controls designed to limit the deposition of sediment in the Lake would slow the growth of the deltas, but would not eliminate the currently existing deltas.

The no action alternative would not remediate the deltas, remove safety hazards or restore navigability. There would also be continued impacts on aesthetics and fisheries.

7. Project Purpose, Need and Benefits

The purpose of the Project is to remediate the deltas that have formed in Lake George due to excessive sedimentation caused by human activities in upland drainage basins. This will be achieved by the removal of delta sediments from the Lake and disposal of those sediments in upland locations, for possible reuse.

The need for the Project derives from interference with navigation and safety hazards caused by delta sediments creating shallow areas in the Lake that are too shallow for customary navigation in the affected areas. The deltas also affect the aesthetics of the affected areas of the Lake by creating a brownish shallow water look instead of the natural blue color of deeper water. The deltas are also believed to interfere with fish spawning in tributary brooks.

The anticipated benefits of the Project include restoring navigability to areas where deltas currently impede navigation, restoring access to shoreline properties and docks, reducing the need for offshore docks or longer docks, preserving the assessed value of impacted onshore properties, improving safety of navigation, restoring aesthetics in those areas, improving the accessibility of tributary streams for fish spawning, improving DEC's fish netting program at Hague Brook, and providing reusable sediment materials for use by the participating municipalities.

An assessment during Phase 2 of individual delta project benefits may be needed to allow the APA to make any necessary findings under the Freshwater Wetlands Act for individual projects over which it has jurisdiction. Such a site-specific assessment may also help to prioritize these projects on a lake-wide basis if multiple projects are competing for limited funding.

The individual delta remediation projects will be coordinated with the completion of upstream sediment control initiatives being advanced by LGA, the New York Department of State, the municipalities surrounding the Lake, the several County Soil and Water Conservation Districts, and the Department of Transportation, in concert with the other members of the Lake George Watershed Conference. The objectives of these coordinated efforts that (1) undertake physical improvements to stormwater control/conveyance and control systems; (2) identify and implement best management practices to control and/or treat stormwater runoff; and (3) institute application of positive impact, land use management practices, are to minimize and/or control sources of non-point source pollution that, left unfettered, would allow for ever-increasing amounts of delta-causing sedimentation flows.

During Phase 2 of the Project, the municipality within which each delta is located will review and consider the anticipated efficacy of the proposed delta remediation measures in terms of the anticipated rate of re-sedimentation of the delta, in light of the status and efficacy of the completed upstream control measures and other relevant factors. This comprehensive approach should extend the useful life of the Project, by slowing the re-growth of the deltas.

Interested entities such as LGA, LGPC, the affected towns and the Department of State Division of Coastal Resources, as well as other members of the Lake George Watershed Conference, should work together during Phase 2 of the Project to identify priorities for funding the individual Phase 2 projects. The factors to be considered and balanced in setting those priorities should include, but not be limited to, and if determined to be applicable at that time, the following factors:

- available funding;
- the status of completion of all identified and reasonably achievable upstream sediment control projects for each delta;
- the efficacy of existing land use controls in each delta's basin to control sedimentation;
- the efficacy of maintenance standards for existing sediment control basins and other such devices in each delta's basin to ensure that such devices continue to function properly;
- the level of adverse impacts from the existing deltas relative to the other deltas;
- the level of interest from the involved municipalities and affected landowners and Lake users;
- the extent to which the individual project can be carried out in conformity with the GEIS, without additional SEQR review; and
- any other factors found at that time to be relevant.

VII. SEQR Findings:

1. The requirements of ECL Article 8 and 6 NYCRR Part 617 have been met.
2. These findings and future phases of the Project are conditioned upon the Project being undertaken in all ways consistently with the project parameters, conditions and criteria, mitigation measures and future SEQR processes described in the GEIS and herein.
3. The Project will not have any significant adverse impacts on the environment, and will only have temporary, non-significant impacts. The Commission finds in weighing those impacts against the potential benefits of the Project, that the Project's benefits outweigh its adverse impacts.
4. Pursuant to 6 NYCRR § 617.10(c), the conditions and criteria contained in the GEIS (DGEIS section 20) and set forth above at section VD, under which future phases of the Project will be undertaken or approved, are adequate to identify any site specific potential adverse impacts that were not identified in the GEIS and Phase 1 of the Project, and to ensure that SEQR is complied with in future phases of the Project.
5. Consistent with social, economic and other essential considerations, from among the reasonable alternatives available, the Project avoids or minimizes adverse environmental impacts to the maximum extent practicable and incorporates all practicable mitigation measures.

This findings statement was approved by a majority vote of the Commissioners of the Lake George Park Commission on May 25, 2004.

_____ Date:_____

Michael P. White
Executive Director
LAKE GEORGE PARK COMMISSION

Appendix B - Correspondence

Appendix C – Conceptual Delta Management Plans

Lake George Deltas Sediment Management/Shoreline Restoration Project

Conceptual Deltas Management Plans

General Conceptual Design Parameters/Issues/Assumptions –All Deltas
Earth Tech, Inc.
August 2000

1. Delta sediments will be removed to the modeled (estimated) original lake/delta bottom, from the shoreline outward to the 2-meter bathymetry contour.

2. The delta extent and quantity of sediments to be removed per item 1 above for each delta is shown on Earth Tech's preliminary "Conceptual Delta Management Plan". A copy of this preliminary plan is being transmitted to each Town in which the individual delta is located.

3. The project will consist of hydraulic dredging of the delta sediments and on-shore pre-treatment of the dredged slurry (solids and water as pumped from the lake) to remove turbidity and solids. The pre-treated water fraction will be returned directly to the lake and the removed solids will be trucked to an upland disposal/reuse site.

4. Project work to-date indicates that the in-lake work activities will be able to occur only during the period of the day after Labor Day to on-or-around November 1st (assumed to allow for 8 weeks of in-lake work) and that available, near-by on-shore areas of sufficient size for the slurry pre-treatment operations are limited

5. Following from item 4, above, two leading critical conceptual design parameters are identified:

   - Work Duration The overall work duration period must be minimized. In addition to the active sediment removal activities, the work duration must include contractor's mobilization and demobilization time. For purposes of the conceptual design work, mobilization and demobilization is aggressively assumed to be one-week each. This aggressive timeframe will tend to increase project costs. Out-of-lake demobilization activity can take longer. Work duration can primarily be decreased by increasing sediment removal production (hourly, daily, etc.). Generally, for smaller-duration jobs, increased production rates will tend to increase slurry pre-treatment costs and increase space/area requirements. Production rates are ultimately limited by the available water draft and, for this project, the dredge "size" that can be transported over-the-road and put into the lake.

     Project work days and hours will be designated/authorized directly by the individual Towns. Town approval to work on Saturdays as well as extend daily hours will also directly reduce the overall work duration.

   - Type/Equipment for Slurry Pre-treatment The amount of area available for slurry pre-treatment will directly effect the type and cost of pre-treatment. Settling basins (portable, modular tanks for this project, etc.) are generally cheaper but require relatively more area. More intensive pre-treatment equipment/operations, such as the use of filter presses, are generally more expensive, but require relatively less space.

Following from the above information, the following key conceptual design parameters are presently being used by Earth Tech for the Conceptual Delta Management Plans for all of the deltas:

1. Estimated percent solids in the hydraulic dredge slurry – 10%
2. Allowable daily work hours – 8 hours
3. Allowable work days per week – 5 days
4. Net truck capacity for off-site solids trucking – 20 cubic yards

Lake George Deltas Sediment Management/Shoreline Restoration Project

Conceptual Deltas Management Plans

Individual Delta Conceptual Design Parameters/Issues/Assumptions
Earth Tech, Inc.
August 2000

Finkle Brook Delta

1. Slurry pre-treatment is proposed to be conducted in the paved parking lot for the Town of Bolton's Veterans Memorial Park. Confirmation by the Town of the use of this area is required. Evaluation of the type/equipment for slurry pre-treatment that can be accommodated by the area provided by this location is in-progress.

2. For an average hourly dredging production rate of 4,000 gallons per minute (considered to be somewhat above average in size/production rate), the "active" work duration (i.e. active sediment removal activities) will require 5.5 weeks. The addition of two weeks for mobilization/demobilization results in a total in-lake work duration of 7.5 weeks, just inside the assumed work duration "window" of 8 weeks.

3. Outbound solids truck rate would be approximately 32 trucks per day. Support operations (contractor's work force, service and supplies, oversight/inspection personnel, etc.) will add additional hourly/daily vehicle counts.

4. Disposition for the proposed quantity of sediments to be removed (total of approximately 13,238 cubic yards) must be identified as soon as practical to allow for project evaluations of potential impacts associated with transport to and use of sediment disposition location.

Conceptual Delta Management Plan
Finkle Brook & Indian Brook Deltas
Town of Bolton, New York

Lake George Deltas Sediment Management/ Shoreline Restoration Project

Prepared for:
Town of Bolton
P.O. Box 698
Bolton Landing, New York 12814

Prepared on Behalf of:
The Lake George Association, Inc.
P.O. Box 408
Lake George, New York 12845

Prepared by:
Earth Tech, Inc.
40 British American Boulevard
Latham, New York 12110

With:
Roberts Environmental Consulting, Inc.
273 Haviland Road
Queensbury, New York 12804

July 2002

ACKNOWLEDGEMENT

This document was prepared by The Lake George Association, Inc. for the New York Department of State with funds provided under Title 11 of the Environmental Protection Fund Act and grants from the Helen V. Froehlich Foundation.

PREFACE

This Conceptual Delta Management Plan for the Finkle Brook and Indian Brook deltas in Lake George has been prepared for the Town of Bolton by The Lake George Association, Inc. (LGA) solely as an informational and planning tool for use by the Town in proceeding with remediation efforts for the Finkle Brook and Indian Brook deltas. To this end, this Plan suggests management methods and alternatives for appropriate remediation of the Finkle Brook and Indian Brook deltas. This Plan has been developed with the support and assistance of the Town. However, as an unsolicited informational and planning tool, this Plan does not require formal acceptance and/or approval by the Town. The Town is not bound or limited by the suggested delta management methods and alternatives discussed herein, for actual management of the Finkle Brook and Indian Brook deltas.

This Conceptual Delta Management Plan for the Finkle Brook and Indian Brook deltas is also being concurrently used by the LGA as a component of the Draft Generic Environmental Impact Statement (DGEIS) prepared by LGA for its Lake George Deltas Sediment Management/Shoreline Restoration Project (Project). This DGEIS has been prepared by LGA to address the requirements of the State Environmental Quality Review Act (SEQR) and its implementing regulations (6 NYCRR Part 617) for remediation of any brook delta (or any delta resulting from similar surface water discharge) occurring in Lake George, including the Finkle Brook and Indian Brook deltas.

As a component of the DGEIS, this Conceptual Delta Management Plan describes various actions that will be taken by the Town in remediation of the deltas. These actions are attributed to the Town herein solely for the purposes of identifying a proposed “action” for evaluation under SEQR. As stated above, the Town is not bound by the suggested delta remedial measures described herein.

Prior to proceeding with actual remediation of the Finkle Brook and Indian Brook deltas, the Town of Bolton will evaluate the consistency of the actual proposed delta remediation measures with the Project DGEIS, the subsequent Final Generic Environmental Impact Statement (FGEIS) and its resultant Findings Statement, in accordance with the requirements of §617.10(d). Any inconsistencies that may exist between the actual proposed delta remedial measures and the DGEIS, the FGEIS and/or the Findings Statement will be the subject of a negative declaration of significance, a supplement to the Project DGEIS/FGEIS, or a modified Findings Statement, as appropriate, in accordance with the requirements of §617.10(d).

This Conceptual Delta Management Plan for the Finkle Brook and Indian Brook deltas has been developed in concert with the Project DGEIS and is intended to be reviewed in direct conjunction with the DGEIS. To this end, in certain instances the Plan contains direct references to appropriate sections of the Project DGEIS, for information pertinent and applicable to remediation of the Finkle Brook and Indian Brook deltas.

TABLE OF CONTENTS

Chapter **Page**

1.0 INTRODUCTION 1
1.1 PURPOSE AND SCOPE 1
1.2 ORGANIZATION OF DOCUMENT 2

2.0 WATERSHED AND BROOK DATA 3
2.1 FINKLE BROOK AND INDIAN BROOK WATERSHEDS 3
2.1.1 Finkle Brook Watershed 3
2.1.2 Indian Brook Watershed 3
2.2 WATERSHED PROJECTS AND INITIATIVES 4
2.2.1 Finkle Brook Watershed 4
2.2.2 Indian Brook Watershed 4
2.3 FINKLE BROOK AND INDIAN BROOK 4
2.3.1 Finkle Brook 4
2.3.2 Indian Brook 5

3.0 EXISTING DELTA CONDITIONS 6
3.1 PHYSICAL CHARACTERIZATION 6
3.1.1 Finkle Brook 6
3.1.2 Indian Brook 7
3.2 CHEMICAL CHARACTERIZATION 8
3.2.1 Finkle Brook 8
3.2.2 Indian Brook 8
3.3 SUBSTRATE AND VEGETATION OBSERVATIONS 8
3.3.1 Finkle Brook 9
3.3.2 Indian Brook 9
3.4 PAST AND CURRENT RATE OF GROWTH 10
3.4.1 Finkle Brook 10
3.4.2 Indian Brook 10

4.0 PROJECT PURPOSE AND EFFICACY 11
4.1 PROJECT PURPOSE 11
4.2 PROJECT EFFICACY 11

5.0 PLANS, SPECIFICATIONS AND PERMIT APPPLICATIONS (PROJECT PHASE 2) 13
5.1 OVERVIEW 13
5.2 BASE MAP PREPARATION AND PRELIMINARY SURVEYING 14
5.3 PRE-DESIGN INVESTIGATION 15
5.4 PLANS AND SPECIFICATIONS 17
5.5 PERMIT APPLICATIONS 20

6.0 CONCEPTUAL DELTA MANAGEMENT MEASURES (PROJECT PHASE 3) 21
6.1 GENERAL 21
6.2 DELTA-SPECIFIC COMPONENTS AND LOCATIONS 26
6.3 PRODUCTION AND PROJECT DURATION 26
6.4 POST-REMEDIAL MEASURES 28

7.0 CONCEPTUAL COST ESTIMATES 29
7.1 PHASE 2 CONCEPTUAL COST ESTIMATE 29
7.2 PHASE 3 CONCEPTUAL COST ESTIMATE 30

8.0 ALTERNATE REMEDIAL MANAGEMENT MEASURES 31

9.0 REFERENCES 32

LIST OF FIGURES

Figure 1 Site Location Map
Figure 2 Conceptual Delta Management Plan
Figure 3 Mechanical Removal Methods – Conceptual Solids Transfer Plan (Generic Delta)
Figure 4 Hydraulic Removal Methods – Conceptual Slurry Pretreatment Plan (Generic Delta)
Figure 5 Conceptual Delta Removal Plan
Figure 6 Conceptual Details (Generic Delta)
Figure 7 Conceptual Solids Roadway Transfer Route

APPENDICES

A Federal and State Permit Application Summaries

1.0 INTRODUCTION

1.1 PURPOSE AND SCOPE

This document presents the Conceptual Delta Management Plan (Plan) for the Finkle Brook and Indian Brook deltas (the deltas) located along the shoreline of Lake George, in the Town of Bolton, New York. This Plan has been prepared by The Lake George Association, Inc. (LGA) for the Town of Bolton (the Town) for use by the Town in proceeding with remediation of the deltas (the Project). This Plan has been prepared at the conceptual level only and provides suggested remedial management methods and alternatives, cost estimates and related information for the future delta remediation efforts.

Figure 1 provides the Site Location Map for the deltas. As shown on this map, Finkle Brook and Indian Brook discharge into Lake George on the west side of Lake George, in the Town of Bolton. As the brooks discharge to the Lake, the velocity of the moving water slows significantly, causing sediments transported by the moving water to settle to the Lake bottom. Heavier sediments settle to the Lake bottom near the mouth of the brook while the lighter sediments tend to settle somewhat farther from the mouth. Over time this accumulation of sediments near the mouth of the brooks have resulted in the formation of sediment "deltas" within the Lake, resulting in a significant decrease in the Lake water depth in these areas. Remediation of the deltas will be advanced by the Town to address adverse impacts caused by this localized accumulation of sediments within the Lake.

This Plan has also been concurrently developed by LGA as a component of its overall Lake George Deltas Sediment Management/Shoreline Restoration Project. This overall Project is a lake-wide effort being facilitated by LGA on behalf of the municipalities surrounding Lake George and is intended by LGA to help advance appropriate remedial measures for all significant shoreline deltas occurring in Lake George.

LGA has structured its Lake George Deltas Sediment Management/Shoreline Restoration Project into three (3) phases. Phase 1 consists of preparation of conceptual delta management plans (including this Plan) for certain tributary brook deltas that have been presently identified to-date by LGA for remediation, and preparation of an accompanying Generic Environmental Impact Statement (GEIS) for all of the deltas. Phase 2 will consist of preparation of individual detailed design plans and specifications and preparation of applications for procurement of all necessary regulatory permits and approvals for remediation of the individual deltas. Phase 3 will consist of implementation of the approved delta remediation measures for the individual deltas as well as any necessary post-remediation monitoring measures. Individual remediation of the Finkle Brook and Indian Brook deltas by the Town will proceed under this general organizational approach.

As noted above, this Plan has been prepared at a conceptual level and is based on cursory site inspections and review of existing information and data only. No new detailed field investigations or sampling and analysis of the Finkle Brook and Indian Brook deltas sediments were conducted, with the exception of preparation of a bathymetric map of the Indian Brook delta. To assist with preparation of this Plan, Earth Tech project personnel, including Dr. Deborah Roberts of Roberts Environmental Consulting, Inc. (Queensbury, New York) conducted a cursory visual reconnaissance of the near-shore (i.e., less than 2-meter water depth) delta surfaces via snorkeling on July 11, 2000. As described in the following sections, additional delta mapping and field investigations, including sampling and analysis of the delta sediments and detailed vegetative characterization of the deltas, will be necessary in order to develop the detailed Project plans, specifications and regulatory permit applications required for actual remediation of the deltas. This additional information will be collected and developed as part of Phase 2 of the Project.

1.2 ORGANIZATION OF DOCUMENT

Section 2 provides a brief summary of information available on the Finkle Brook and Indian Brook deltas and their watersheds, for background purposes.

Section 3 provides a brief summary of the physical, chemical, substrate and vegetative setting of the deltas, based on existing information and Earth Tech's cursory visual reconnaissance. This section also provides brief qualitative information relative to the past and current rate of growth of the deltas.

Section 4 summarizes the purpose and efficacy of remediation of the deltas. This remedial purpose provides the basis for development of the suggested delta remedial management measures and various alternatives provided herein. The efficacy of the delta remediation measures is summarized in terms of the expected rate of return of the remediated portion of the deltas, following completion of the remedial measures.

Section 5 summarizes the various project requirements and components that will be addressed by the Town in Phase 2 of the Project, including preparation of the detailed project plans, specifications and regulatory permit applications.

Section 6 summarizes suggested management measures for remediation of the deltas, for Phase 3 implementation of the Project. These suggested remedial management measures address removal of the sediments from the Lake, onshore material handling measures, the location for initial upland disposition of the removed sediments and possible post remediation and/or monitoring measures of the delta areas, following removal of the sediments from the deltas.

Section 7 provides conceptual cost estimates for Phases 2 and 3 of the Project, as described in Sections 5 and 6, respectively.

Section 8 references possible alternate measures for various components of the delta remedial measures, from the suggested measures summarized in Section 6.

Section 9 identifies references used in preparation of this Plan.

2.0 WATERSHED AND BROOK DATA

2.1 FINKLE BROOK AND INDIAN BROOK WATERSHEDS

2.1.1 Finkle Brook Watershed

- The Finkle Brook watershed encompasses approximately four (4) square miles on the western side of Lake George, within the Town of Bolton.

- Under the Adirondack Park Agency's (APA's) officially adopted Adirondack Park Land Use and Development Plan Map (APA, 1996), the lower portions of the watershed include areas designated for hamlet and low intensity use. The upper portions of the watershed include areas designated for low intensity use.

- Within the Town of Bolton, the watershed includes areas zoned by the Town (Town of Bolton, 2001) as GB (General Business), RL-3 (Residential Low Density), RCM-1.3 (Residential Commercial Medium Density), RM-1.3 (Residential Medium Density), LC-25 and LC-45 (Land Conservation), RR-5 (Rural Residential) and State Forest.

- Approximately 65% of the watershed is forested, and most of the developed areas consist of residential units situated adjacent to roads and highways that traverse the watershed. Only about one percent of the total watershed area is covered by impervious structures. There are several areas in the watershed where road surfaces are directly adjacent to the brook channel, providing a potential source of sediment to the brook from winter road sanding.

- Within the overall Lake George watershed, the Finkle Brook watershed can be considered to have a relatively high intensity of development, related to development in the lower portions of the watershed associated with the Town of Bolton and Bolton Landing.

2.1.2 Indian Brook Watershed

- The Indian Brook watershed encompasses approximately 4.1 square miles on the western side of Lake George, within the Town of Bolton.

- Under the Adirondack Park Agency's (APA's) officially adopted Adirondack Park Land Use and Development Plan Map (APA, 1996), the lower portions of the watershed include areas designated for moderate intensity use. The upper portions of the watershed include areas designated for low intensity and rural use.

- Within the Town of Bolton, the watershed includes areas zoned by the Town (Town of Bolton, 2001) as RL-3 (Residential Low Density), RCM-1.3 (Residential Commercial Medium Density), RM-1.3 (Residential Medium Density), LC-25 and LC-45 (Land Conservation), and RR-5 (Rural Residential.

- In comparison to the overall Lake George watershed, the Indian Brook watershed can be considered to have a relatively low intensity of development. Lower portions of the watershed include development associated with the Town of Bolton and Lake-side development. The upper portion of the watershed is bisected by North Bolton Road.

2.2 WATERSHED PROJECTS AND INITIATIVES

2.2.1 Finkle Brook Watershed

- The draft *Lake George – Planning for the Future* (Lake George Plan and Update Committee, 2001) notes that state and local highway departments have been working in concert to implement best management practices relating to winter road maintenance, for purposes of minimizing release of contaminants to the Lake. The draft further recommends that additional best management practices and equipment for this activity continue to be identified and implemented, in accordance with recent studies.

- Construction of an in-stream sedimentation basin at Artist Falls has been completed. This basin is anticipated to collect and retain up to 70% of the runoff sediments generated in the watershed.

- The pending Finkle Brook Watershed Remediation Project will consist of various stormwater improvements at four specific sites in the watershed. Improvements will include installation of paved gutters, stone-lined ditches and drywells for upland stormwater infiltration, streambank relining with vegetation and rip rap, seeding of denuded areas, restoration of a small pond and construction of upland reservoir and other infiltration structures. The draft *Lake George – Planning for the Future* (Lake George Plan and Update Committee, 2001) recommends that the project be progressed through final design and constructed in 2001. At present the project is scheduled for construction in 2001.

2.2.2 Indian Brook Watershed

- The draft *Lake George – Planning for the Future* (Lake George Plan and Update Committee, 2001) notes that state and local highway departments have been working in concert to implement best management practices relating to winter road maintenance, for purposes of minimizing release of contaminants to the Lake. The draft further recommends that additional best management practices and equipment for this activity continue to be identified and implemented, in accordance with recent studies.

- The pending Stormwater Management Improvement Project for the watershed consists of several stormwater management improvements identified for the watershed, and includes roadside drainage improvements at several critical roadways which are directly adjacent to the brook, repair of significant erosion problems at several locations where the brook crosses roads, in-stream controls and enlargement of an existing small detention basin. Construction of the most critical of these needed improvements is the roadside drainage improvements; this work is scheduled for 2002.

2.3 FINKLE BROOK AND INDIAN BROOK

2.3.1 Finkle Brook

- The main channel of Finkle Brook is approximately three (3) miles long, extending upstream in a general northwest direction from its mouth at Lake George.

- The headwaters of Finkle Brook originate at approximately 1,980 feet above mean sea level (amsl). The brook discharges to Lake George at South Sawmill Bay at approximately 320 feet amsl, resulting in an average slope of approximately 9.1 percent for the main channel.

- Finkle Brook is classified by New York State as Class AA-Special fresh surface waters (6 NYCRR Part 700, et al). The best usages of Class AA-Special waters are: a source of water supply for drinking, culinary or food processing purposes (with disinfection), primary and secondary contact recreation and fishing. Class AA-special waters shall also be suitable for fish propagation and survival.

- Finkle Brook is included on the New York State Priority Waterbodies List (PWL). The PWL is maintained by the New York State Department of Environmental Conservation (NYSDEC) as a component of its Unified Watershed Assessment prepared by the NYSDEC in accordance with state requirements under the federal Clean Water Act. The PWL is a list of surface waters determined by the NYSDEC, with public input, to have their uses precluded, impaired, stressed or threatened. Finkle Brook is included on the PWL as an impaired water body, with fish propagation identified as the primary use impairment, and silt and sediment from road sand and other sources identified as primary pollutants (NYSDEC, 1996).

2.3.2 Indian Brook

- The main channel of Indian Brook is approximately six (6) miles long, extending upstream in a general northwest direction from its mouth at Lake George.

- The headwaters of Indian Brook originate at approximately 1,240 feet above mean sea level (amsl). The brook discharges to Lake George at approximately 320 feet amsl, resulting in an average slope of approximately 2.5 percent for the main channel.

- Indian Brook is classified by New York State as Class AA-Special fresh surface waters (6 NYCRR Part 700, et al). The best usages of Class AA-Special waters are: a source of water supply for drinking, culinary or food processing purposes (with disinfection), primary and secondary contact recreation and fishing. Class AA-special waters shall also be suitable for fish propagation and survival.

- Indian Brook is included on the New York State Priority Waterbodies List (PWL). The PWL is maintained by the New York State Department of Environmental Conservation (NYSDEC) as a component of its Unified Watershed Assessment prepared by the NYSDEC in accordance with state requirements under the federal Clean Water Act. The PWL is a list of surface waters determined by the NYSDEC, with public input, to have their uses precluded, impaired, stressed or threatened. Indian Brook is included on the PWL as an impaired water body, with fish propagation identified as the primary use impairment, and silt and sediment from road sand and other sources identified as primary pollutants (NYSDEC, 1996).

3.0 EXISTING DELTA CONDITIONS

3.1 PHYSICAL CHARACTERIZATION

3.1.1 Finkle Brook

The Finkle Brook delta is situated at Bolton Landing, west of Green Island, along the west shore of the South Basin of Lake George. The island shelters this area from waves generated by the broad lake fetch to the southeast, creating a lower energy setting than would exist without the island.

Bathymetric mapping of the submerged delta to the five-meter depth was developed in 1998 by the Darrin Fresh Water Institute (DFWI) (Eichler, et al. 1998). Figure 2 depicts the submerged delta as mapped by DFWI at this time. The delta extends out more than 600 feet into the lake, and appears to continue into waters deeper than the 5 meter limit of the DFWI survey. The delta is nearly 700 feet wide.

As shown on Figure 2, the upper nearshore part of the delta is relatively level at a water depth less than 0.5 meters within approximately 280 feet of the shoreline. A low sandy spit is present at the brook mouth. The delta gradually slopes downward toward deeper waters to the east. A ring of navigational buoys marks the delta's perimeter.

In plan view, the Finkle Brook delta has a rounded triangular shape, with an axis of symmetry oriented northeast-southwest and perpendicular to the shoreline. The bathymetric contours on the northern side of the delta appear to be slightly steeper than the southern side, suggesting that the more exposed northern side is slightly more erosive, and the more sheltered southern side more depositional. The fact that the delta's axis appears to be shifted slightly to the south of the brook is consistent with a prevailing current direction from the north, as observed during the site reconnaissance. The bathymetric contours in the shallow 0.5-1.0 meter depth range provide evidence of some channeling in the north side of the delta, possibly related to past sediment removal activity.

A limited amount of physical data currently exists for the Finkle Brook delta. Additional data will be obtained during Phase 2 of the project. The available sediment grain size data collected by DFWI (1997) indicate that the surficial sediments consist primarily of relatively uniform, poorly graded, medium sands, with negligible fines (silts and clays finer than the #200 sieve). The sediments are substantially finer grained at the 2-meter water depth, where the sediment is primarily fine sand and finer material. The relative proportion of fines increases as water gets deeper.

The relatively higher percentage of fines in the deeper waters at Finkle Brook, as compared to the shallow waters at this location and other deltas (Foster Brook and West Brook), may be related to the local environment. The Finkle Brook delta is in an area of relatively low energy, sheltered from the main lake body by Green Island. The source of fine-grained material is provided by the upland watershed which is mantled with a layer of glacial till that contains a significant percentage of silt. The low percentage of fines at the shallow 1 meter depth is likely caused by the winnowing effect of wave action and prop wash which re-suspend the fines that eventually settle in deeper water.

At Finkle Brook, the percentage of organic matter entrained with the sediment samples followed a pattern similar to, but more subdued than, the distribution of fine-grained material. The average percent organic matter was substantially lower at the 1-meter depth (2.4%), increased to 7.3% at 2 meters, then increased again at the 3-5 meter water depths (11.4%-11.7%).

Based on an extrapolation of ambient Lake-bottom contours beneath the delta (Figure 2), the maximum thickness of sediments in the submerged portion of the delta appears to be approximately 8 feet. The

sampling conducted by DFWI may have penetrated only the approximately upper tenth of the recent delta deposits. Sediment characteristics may change significantly with increasing depth beneath the lake bottom.

As shown on Figure 2, the delta is immediately adjacent to six individual shoreline properties. This includes land occupied by DFWI and land owned by the Town.

3.1.2 Indian Brook

The Indian Brook delta is situated along a long straight stretch of exposed shoreline along the western side of Northwest Bay in the South Basin of Lake George. The mouth of Indian Brook is near the southern end of the delta, and a smaller un-named tributary brook that is approximately 1400 feet to the north of Indian Brook, is near the north end of the delta. This northern tributary brook appears to have its own much smaller delta.

The Indian Brook delta was not surveyed by DFWI. Bathymetric data collected by Earth Tech indicates that the delta, as defined by the 5-meter depth contour, extends more than 600 feet offshore, and spans a width along shore of approximately 1,400 feet. A ring of navigational buoys marks the delta's perimeter.

The bathymetric contours indicate that the northern side of the delta is slightly steeper than the southern side, suggesting relative erosion on the north and deposition on the south. This pattern of erosion and deposition is consistent with the prevailing longshore currents flowing north to south, which were observed during the site reconnaissance on July 11, 2000. However, this does not explain why the rounded triangular main part of the delta appears to be displaced to the north relative to the mouth of Indian Brook.

As shown on Figure 2, the Indian Brook channel makes an abrupt turn to the north before turning abruptly back east and discharging into the lake. The delta's axis of symmetry is perpendicular to the shoreline, but the main mass of the delta appears to be displaced approximately 400 feet north of the brook mouth.

The delta's shape is uncertain if it is to be explained only by recent sedimentation processes. The delta's apparent displacement may be related to a different circulatory flow pattern in this part of Northwest Bay when the bulk of the sediments were deposited, or to a different location of the mouth. Another possibility is that the force of Indian Brook flows transported sediments northward, with subsequent reworking by Bay currents.

It is also possible that the delta may be superimposed on a submerged glacial deposit. The upper part of the delta consists of broad shallows that extend out into the Bay beyond a submerged escarpment that parallels the shoreline and is about 150-200 feet offshore. The edge of this escarpment occurs in waters typically between 1 and 2 meters deep. The escarpment extends to the south and north of the delta. The full length and origin of this escarpment, which extends north and south of the mapped delta, were not investigated. However, its 23-degree angle slope is consistent with the angle of repose of subaqueous granular sediment, such as glacial outwash. If this is the case, the broad shelf of sediments alongshore in this part of the Bay may be associated with a submerged glacial terrace or glaciolacustrine terrace upon which the more recent delta has been deposited and is superimposed.

Given the size and location of this delta, and the relatively undeveloped nature of the watershed, the origin of this delta may be other than construction and road sanding as was suggested by Rasmussen (1980) for the English Brook delta. Accelerated runoff, erosion and sediment loads that may have accompanied past intensive logging practices in the watershed may have been a contributory factor.

Based on an extrapolation of ambient Lake-bottom contours beneath the delta (Figure 2), the maximum thickness of sediments in the submerged portion of the delta appears to be approximately 13 feet.

Existing physical data (i.e., particle size type and distribution, depth and areal extant, etc.) for the delta sediments is not available. This data will be obtained during Phase 2 of the project.

As shown on Figure 2, the central part of the delta is adjacent to ten individual shoreline properties.

3.2 CHEMICAL CHARACTERIZATION

3.2.1 Finkle Brook

A limited amount of chemical data is available for the Finkle Brook delta sediments. Additional sampling and analysis of the sediments proposed for removal will be conducted during Phase 2, in accordance with NYSDEC guidance for this activity, entitled *Interim Guidance – Freshwater Navigational Dredging* (NYSDEC, 1994; hereafter "NYSDEC interim guidance"). Also reference Section 5.3, below, and DGEIS Sections 3.3.2 and 5.4.

The Darrin Fresh Water Institute collected sediment samples at various water depths and locations at the Finkle Brook delta and analyzed them for the following metals: chromium, copper, lead, zinc, manganese, and magnesium. Findings are presented in the DGEIS (Section 5.4). Of the parameters analyzed, only two metals, copper and lead, are included as sediment screening parameters in NYSDEC's interim guidance.

The average concentrations for the heavy metals tested in the "shallow" (2 meter) water depth sediments at the Finkle Brook delta were <u>not</u> within the NYSDEC's interim guidance for Sediment Class A and Placement Category 1 thresholds. The average concentrations of copper in the surficial Finkle Brook sediments at this depth were high enough for these sediments to be considered moderately contaminated under the NYSDEC's interim guidance (i.e., Sediment Class B / Placement Category 2). DFWI indicates that the elevated levels of copper in the Finkle Brook delta sediments may be attributable to the use of copper sulfate for algae control in Edgecomb Pond. This pond serves as the source of Bolton's municipal drinking water supply and is located in the Finkle Brook watershed.

Although the average concentrations for lead in the "shallow" water sediments fall within Class A and Category 1 thresholds, one individual sample at the 1-meter water depth, and three samples at the 2-meter depth, exceeded these thresholds.

3.2.2 Indian Brook

Existing chemical data for the delta sediments is not available. Sampling and analysis of the sediments proposed for removal will be conducted during Phase 2, in accordance with NYSDEC guidance for this activity, entitled *Interim Guidance – Freshwater Navigational Dredging* (NYSDEC, 1994; hereafter "NYSDEC interim guidance"). Also reference Section 5.3, below, and DGEIS Section 3.3.2.

3.3 SUBSTRATE AND VEGETATION OBSERVATIONS

The following summary observations relative to the deltas' substrate and biological/ecological conditions were made by Earth Tech project personnel, including Dr. Deborah Roberts, Ph.D., of Roberts Environmental Consulting, Inc., during the cursory site reconnaissance of the deltas on July 11, 2000.

3.3.1 Finkle Brook

Very sparse vegetation was present on the shallow sandy areas of the delta near the mouth of the brook and the DFWI docks. The substrate is sandy and gravelly out to approximately 200 feet from shore, beyond which the substrate grades to well-sorted fine-medium sand. The east and south edges of the delta had more gradual slopes than the north side.

In less than 1 meter of water, there was a sparse cover of *Potamogeton perfoliatus*, *Vallisneria americana*, and *Sagitarria graminea*. *S. graminea*, some of which was flowering, was dominant in 1-2 meters of water. In water greater than 2 meters deep, the macrophyte community was dense and included *Elodea canadensis, Nitella sp., Isoete sp., Myriophyllum alterniflora, S. graminea, P. amplifolius, P. epihydrus, P. perfoliatus, P. robinsii*, and *Rannunculus sp*.

To the north side of the delta, *P. perfoliatus, V. americana, E. canadensis, Nitella sp., Isoetes sp. and M. alterniflora* were observed. A vegetative mat with some entrained fine-grained sediment was also present to the south side of the delta. The presence of this soft mat caused some difficulty with anchoring of the survey boat.

DFWI reported in 1997 that aquatic plant growth in this area is dense from 2 to 5 meters in depth (DFWI, 1997).

3.3.2 Indian Brook

Indian Brook delta had very little vegetation on the shallow areas with very coarse sandy and coarse gravelly substrate near the mouth of the brook. The sand was micaceous indicating the metamorphic origin of its parent material. A boulder (1-foot diameter) stream was present along the 20-30 foot wide submerged part of the brook channel. This suggests the high energy of historic storm flows in the brook. A large submerged log, 10-feet long, was also observed.

The lake water in this area appeared to have a brownish tint, probably from the decay of natural organic materials. Gas bubbles were released when the bottom substrate was disturbed, further suggesting the presence of a significant amount of buried organic material.

To the immediate south of the delta, large cobbles on the substrate were covered with dense growth of green algae. Such algae was not observed at the other six deltas visited and may suggest a local source of nutrients.

In areas less than 2 meters of water, the very sparse vegetation present included *Potamogeton perfoliatus*, *Vallisneria americana*, and *Sparganium sp*. In approximately 2 meters of water, species *included V. americana, Sparganium sp*., and *P. epihydrus*.

The density of aquatic plants was relatively greater to the north of the delta and included *Potamogeton spp*. and a few areas with shallow mats of macrophytes similar to those observed at the mouth of the brook. Species included *Myriophyllum tenellum, Lobelia dortmanna, M. alterniflorum, S. graminea, V. americana, Isoetes sp. and Chara sp*. Discontinuous pockets of leaf litter and organic detritus were observed, particularly between ripple marks troughs near the brook mouth.

The north and south edges of the delta were very indistnct, the eastern side was much more abrupt and well-defined. The north edge was very indistinct and not discerned during the biological survey.

3.4 PAST AND CURRENT RATE OF GROWTH

3.4.1 Finkle Brook

No direct data or documentation is currently available with respect to the past or current rate of growth of the Finkle Brook delta.

3.4.2 Indian Brook

No direct data or documentation is currently available with respect to the past or current rate of growth of the Indian Brook delta. Myers Engineering estimates that from 1966 to 1990, the delta grew in area by approximately 140,000 square feet and in volume by approximately 30,000 to 40,000 cubic yards (Myers Engineering, 2000).

4.0 PROJECT PURPOSE AND EFFICACY

4.1 PROJECT PURPOSE

The primary purpose of the Project is to restore the level of navigability that has been lost in the area of the current submerged deltas due to the recent excessive accumulation of human-derived sediments (also reference Section 2.0 – Project Purpose, Need and Benefits of the DGEIS). This will be accomplished by removal of the existing delta sediments to the "original" (estimated) Lake bottom, from the existing shoreline outward to the 2-meter bathymetry contour (reference Section A—A' on Figure 2). As shown on Figure 2, this will encompass removal of approximately 13,238 cubic yards of sediments extending over approximately 4.5 acres of the submerged Finkle Brook delta. It will encompass approximately 37,215 cubic yards of sediments extending over approximately 14.53 acres of the submerged Indian Brook delta

For purposes of development of this Plan, it is assumed that the delta sediments that will be removed will be classified as Class A sediments meeting Placement Category 1 thresholds, under the NYSDEC's interim guidance (NYSDEC, 1994) for this activity (DGEIS Section 3.3.2). As noted above, appropriate sampling and analysis and final regulatory classification of the sediments proposed for removal will occur during Phase 2 of the project, under review and approval of the NYSDEC. As necessary, the specific depth and extent of sediments proposed for removal from the deltas will be revised during Phase 2, based on the results of the this detailed testing program, to ensure conformance with these Project criteria. If the Phase 2 sampling results indicate that the majority of the sediments proposed for removal are contaminated, then further project evaluation and environmental considerations will be provided by the Town or the individual delta remedial project will be abandoned.

4.2 PROJECT EFFICACY

The efficacy of the delta remediation measures can be estimated in terms of the expected rate of return of the remediated portion of the delta, following completion of the remedial measures.

Estimating the expected rate of return for the delta following removal of the upper portion (less than two meters) of the deltas is difficult, due to the variety of factors involved. A significant amount of delta sediments originate from bedload transport along the stream bed; past or current bedload transport monitoring data (as would be obtained through use of a bedload sampler) is not available for any tributary brook in the Lake. Sedimentation at the mouth of the brook is a natural process that will continue after completion of the watershed improvements, at a reduced rate. Sediment accumulation at the delta is a dynamic activity; sediments originally deposited at the mouth of the brooks are continually reworked by waves and currents and are redeposited in deeper waters. Sediment accumulation at the mouth of the brook occurs when the Lake's capacity to transport these sediments away from the shoreline areas through wave and current action is exceeded. Waves and longshore currents may also transport sediments from other parts of the lake to the delta location, where they may be deposited as they reach the lower energy of the shallow delta areas. Most importantly, as indicated by Rasmussen (1980) for the English Brook delta, transport and deposition of the delta sediments is likely episodic, rather than slow and steady (i.e., erosion, transport and deposition of large "slugs" of sediments as a result of heavy, periodic storm events, as opposed to a continual, steady-state rate of sediment transport and deposition). Heavy storm events may erode stream banks and other watershed features that otherwise appear to be stable; estimating the rate of sedimentation occurring from these events is more difficult that estimating sedimentation resulting from steady-state processes.

The low energy environment of the Finkle Brook delta, resulting from sheltering from wave actions from nearby Green Island, makes comparison of this delta to estimated growth rates for other deltas that exist

in higher energy environments difficult. The Finkle Brook watershed is relatively small in area (4 square miles) but it has a relatively high average slope for its main channel (9.1%). One estimate of the growth rate for the English Brook delta at less than two meters is approximately 2,625 cubic yards per year; the slope of the main channel of English Brook is approximately 8%, similar to the main channel average slope for Finkle Brook, while the areas of the English Brook watershed is approximately twice that of the Finkle Brook watershed (reference the Conceptual Delta Management Plan for the English Brook delta). Using an estimated rate of return for the Finkle Brook delta of one-half that for English Brook (due to the watershed area being one-half the size), or approximately 1,312 cubic yards per year, the Finkle Brook delta would return in approximately 10 years, following removal of approximately 13,238 cubic yards of sediment.

As noted above, Myers Engineering (2000) estimates that from 1966 to 1990, the entire Indian Brook delta grew in volume by approximately 30,000 to 40,000 cubic yards, or approximately 1,250 to 1,666 cubic yards per year. Assuming that this value corresponds to twice the rate of return for the delta at water depths less than two meters, an annual rate of return of approximately 625 to 833 cubic yards per year is estimated. At this estimated rate of return, the Indian Brook delta would return in approximately 44 to 60 years, following removal of approximately 37,215 cubic yards of delta sediments.

Planned or proposed upland watershed improvement projects will serve to significantly reduce opportunities for stream bank and road-related erosion, thereby reducing delivery of sediment to the lake and the actual return rate of the deltas. These measures will serve to extend the life of delta remediation projects.

5.0 PLANS, SPECIFICATIONS AND PERMIT APPPLICATIONS (PROJECT PHASE 2)

5.1 OVERVIEW

Remediation of the two deltas will be provided separately by the Town, at different times. Plans, specifications and regulatory permit applications for remediation of each of the deltas will be prepared during Phase 2. In general, the Phase 2 work will consist of a detailed Pre-Design Investigation, to obtain all necessary field information and data, and development of the various Phase 2 documents, based on the results of the Pre-Design Investigation. It is expected that the Town will retain an environmental engineering consulting firm to provide the Phase 2 work.

Actual remediation of the deltas will occur in the late summer and fall (i.e., in-lake work commencing after Labor Day). The Pre-Design Investigation will generally be completed in the summer months, due to the nature of the required field work. The Pre-Design Investigation will be conducted in the *summer months of the year before* the actual delta remediation activities will occur, in order to ensure sufficient time is available to prepare the various Phase 2 documents and to receive all necessary permits and approvals. Conducting the Pre-Design Investigation the summer *immediately before* the delta remedial measures are to occur will likely not provide sufficient time to fully complete the Phase 2 work prior to planned commencement of the remedial activities. Accordingly, the Town will have to initiate the Phase 2 work in the *spring of the year before* the delta remedial measures are to occur.

It is expected that the Town, together with its consultant, will attend pre-application meeting(s) with appropriate regulatory agencies during the early stages of Phase 2. The pre-application meeting(s) will allow the Town the opportunity to receive detailed Project-specific review and guidance from the agencies early in the regulatory process to ensure efficiency and completeness of the Phase 2 permit application process, etc. For example, it is expected that specific details for sampling and testing of the delta sediments, including the specific number and location of samples, sampling and testing methods and testing parameters, will be reviewed and confirmed during the pre-application meeting(s), to ensure that all required field data is efficiently obtained during the Pre-Design Investigation. Pre-application meeting(s) may be appropriate with the NYSDEC, the APA and the U.S. Army Corps of Engineers (USACE).

It is anticipated that the deltas will be remediated using either conventional mechanical or hydraulic sediment removal methods, or an appropriate combination of these two methods. As noted in Section 3.0, above, available data is limited and additional physical and chemical data are required to characterize the delta sediments. This information will be obtained during Phase 2 Pre-Design Investigation. These results will then be used, in part, to select and advance the more appropriate of these two conventional sediment removal methods (or an appropriate combination) through the Phase 2 stage.

Remediation of the deltas will encompass Project activities at three separate locations, as follows:

- *Delta* The delta occurs within the Lake itself, adjacent to the shoreline. The specific location of the adjacent shoreline will vary based on the varying elevation of the Lake surface.

- *Onshore Material Staging Areas* Following removal from the delta the sediments will be transferred to an on-shore area for processing and/or staging prior to transfer to a designated upland reuse area.

- *Upland Reuse Area* The delta sediments will be transferred from the onshore material staging area to a designated upland reuse area, where the sediments will either be directly

reused onsite as a grading material or temporarily stockpiled onsite prior to subsequent reuse by the Town

The Phase 2 plans, specifications and permit applications will encompass and address all project activities occurring in these three locations consistent with applicable regulatory requirements.

5.2 BASE MAP PREPARATION AND PRELIMINARY SURVEYING

A base map for each the three locations encompassed by the delta remedial work will be developed during the initial stages of Phase 2. The base maps will provide the basis for development of the subsequent detailed design plans and drawings. It is expected that the base maps will be prepared using a combination of existing maps and site-specific surveying work. Of the three project locations for which a base map will be required, the base map for the deltas and adjacent areas will be the most extensive and critical. Minimum components for the three base maps are summarized below.

Delta Base Maps

- As noted in Section 4.1, above, the project is primarily intended to provide increased water depth for improved navigation. The water level in the lake varies on a yearly and seasonal basis, in response to both natural precipitation inflows and human manipulation via controlled discharge (DGEIS Section 5.3). Accordingly, the observed water depth (and shoreline location) that will result from sediment removal will vary as the water surface varies. A "design" lake level will be determined, in consultation with the Town, as the basis for the subsequent detailed project design. The "design" lake level elevation (i.e. the resulting "design shoreline") will be determined and demarcated on the base map.

- The demarcation line between the underwater land owned by the State of New York and the adjacent upland private property will be delineated and recorded on the base map. This demarcation line corresponds to the mean low water line for Lake George as recognized by the Office of General Services (which administers underwater lands owned by the State). This recognized mean low water line is 317.74 feet above mean sea level (amsl). All elevations indicated on the map will be referenced to the same vertical datum , NGVD 1929.

- The demarcation line for the extent of "waters of the United States" under jurisdiction of the USACE Section 404 permit program (33 CFR Parts 323) will be delineated and recorded on the base map. The USACE Section 404 jurisdiction will extend to the "ordinary high water mark" as defined at 33 CFR §328.3(e).

- In accordance with the NYSDEC interim guidance (NYSDEC, 1994), pre-remediation bathymetry for the deltas will be obtained at minimum one-foot contour intervals, across the proposed extent of the sediment removal areas.

- Pertinent shoreline topography, property limits for the properties adjacent to the deltas and any shoreline appurtenances and other features that may impact the delta remedial activities will be delineated and mapped. Existing boat docks and moorings located within the proposed work areas will be identified and mapped.

- Shoreline areas that may be susceptible to increased erosion resulting from increased wave energy that may result following removal of the delta sediments will be specifically identified and mapped.

- Adjacent shoreline owners and/or local "community" and "non-community" water supply systems may have water supply lines extending into the lake, across or under the deltas. All adjacent property owners will be queried as to the possible existence of such lines and their locations. Any such private water supply lines identified will be located (to the extent possible), recorded and mapped.

- Any other existing submerged or shoreline features or conditions pertinent or appropriate to the project design and regulatory requirements will be delineated and included on the base maps.

Onshore Material Staging Area Base Map

- For the designated onshore material staging area that will be used to support hydraulic sediment removal methods, the existing topography of this area will be surveyed and recorded (if not already available), as the required base map information for these areas. All other additional existing site features appropriate for inclusion on the base map for this area (i.e., property lines, structures, utilities, etc.) will be delineated and recorded on the base map.

- For the designated onshore material staging area that will be used to support mechanical sediment removal methods (i.e., the temporary rock work pad and related appurtenances), information similar to that listed above for the delta base maps will be delineated and recorded, as appropriate for the design and regulatory requirements for this area and activity.

Upland Reuse Area Base Map

- The existing topography and any pertinent existing features and site conditions at the designated upland reuse area will be delineated and mapped, as the required base map information for this area.

5.3 PRE-DESIGN INVESTIGATION

The Pre-Design Investigation will include the following minimum components.

Sediment Sampling and Testing

At a minimum, the delta sediments will be sampled and tested in accordance with appropriate regulatory requirements and guidance to provide a comprehensive chemical and physical characterization of the sediments proposed for removal. The results of this program will significantly guide the specific sediment removal and upland management methods that will be selected and subsequently designed, as well as the proposed upland reuse of the removed sediments. This sediment testing program will address three separate components, as follows:

- *Chemical Testing for Removal Methodology* The sediments will be sampled and analyzed for chemical constituents in accordance with the NYSDEC interim guidance (NYSDEC, 1994) for this activity (reference Section 3.3.2 of the DGEIS). The NYSDEC guidance details the minimum number and depth of samples required to be obtained and the minimum set of analytical parameters required for testing.

- *Physical Testing for Removal Methodology* The sediments will be sampled and tested for pertinent physical characteristics (grain size distribution, hydrometer analysis, water content,

organic matter content, etc.).These results will be used, in part, to determine and advance the preferred methodology for sediment removal.

- *Chemical Testing for Upland Reuse* In conjunction with the chemical testing to be provided for removal methodology, the sediments will be further tested for any additional parameters required by the NYSDEC for upland reuse. This additional chemical testing will address the NYSDEC guidance requirements as well as New York State solid waste management requirements (i.e., issuance of a Beneficial Use Determination under 6 NYCRR Part 360) for unrestricted upland reuse of the sediments.

All sediment sampling locations will be surveyed and recorded on the base map.

Aquatic Plant Survey and Potential Wetland Review and Documentation

A detailed, systematic survey of aquatic plants occurring at and immediately adjacent to delta areas proposed for remediation will be conducted, during the summer months. This survey will also include the location of the proposed temporary shoreline transfer rock work pad, in the event that mechanical sediment removal methods are used. The aquatic plant survey will be conducted by a qualified aquatic biologist/wetland scientist. This survey will document the type and relative density of individual plant species at the proposed work locations, as well as any rooted plant assemblages that may occur in these areas. In particular, the aquatic plant survey will ascertain the existence of any endangered, threatened or rare aquatic plant species that may occur in or adjacent to the proposed work areas.

The aquatic plant survey will be also used, in part, for an initial evaluation as to the potential existence of wetlands under the jurisdiction of the APA and/or the USACE. In the event that regulated wetlands and/or vegetated shallows are determined to potentially exist in or adjacent to the proposed work areas, these potential wetland areas will be delineated and mapped in accordance with appropriate regulatory requirements. In accordance with regulatory requirements, the APA and/or the USACE will be requested to provide a corresponding field inspection and acceptance of the wetland/vegetated shallows delineation.

Site inspections of the upland portion of the designated onshore material staging area and the designated upland reuse area will also be provided by the wetland scientist, as necessary, to confirm that regulated wetlands do not occur in or immediately adjacent to these areas. Any regulated wetlands that do occur in these areas will be similarly delineated and mapped.

Delineated regulated wetlands that may occur in any of the project work sites, as accepted by the regulatory agencies, will be appropriately incorporated into the Phase 2 detailed design.

Threatened and Endangered Species Review

Correspondence will be submitted to the United States Fish and Wildlife Service and the NYS Natural Heritage Program to obtain updated information on the known occurrence of federal and/or state-listed or proposed threatened or endangered species in the various project locations. This updated information will be incorporated into the project design as appropriate.

Phase I Archeological Survey

A Phase I Archeological Survey will be conducted to ascertain the presence or absence of any archeological site or other cultural resources that may occur in the deltas or adjacent areas. The Survey will extend a minimum of 100 feet outside of the specific delta areas to be remediated (i.e., proposed limit

of disturbance). The Phase I Survey will be conducted in two progressive stages. Phase 1A will include a literature search and sensitivity assessment and an initial field inspection of the project areas. Phase 1B will include a subsurface testing program.

Fisheries Investigation

A determination will be made regarding whether landlocked salmon utilize the tributary brook deltas for spawning. Available documentation and data will be reviewed; if insufficient data exists for a conclusive determination, appropriate in-water investigation(s) will be conducted during the fall spawning season.

Shoreline Reconnaissance and Inspection

A detailed inspection of the shoreline areas adjacent to the delta areas proposed for remediation will be conducted. All shoreline features that may be impacted by the delta remedial measures will be evaluated and documented. For example, all docks, moorings and water intakes existing along the delta areas proposed for remediation will be inspected and evaluated by a qualified engineer with respect to possible project impacts. The detailed design for the remedial measures will address logistics and requirements for removal of delta sediments occurring beneath or adjacent to these shoreline features.

Current Direction and Velocity

The potential impact of current direction and velocity on the detailed design will be further evaluated. If appropriate, delta-specific information for current velocity direction and velocity will be obtained during the Pre-design Investigation.

Other Considerations

Quantification of the extent of existing navigation and recreation occurring in the deltas will be identified, if necessary. Information on the quality and availability of data on the lake bottom characteristics that existed prior to the more recent rapid delta growth will be obtained, if appropriate. Information on existing land uses at and adjacent to the deltas will also be obtained, if appropriate.

5.4 PLANS AND SPECIFICATIONS

The results of the Pre-Design Investigation will be used to prepare the detailed plans and specifications for remediation of each of the deltas. A design analysis report will also be prepared to describe and document the technical basis for the detailed design and corresponding plans and specifications. Contract documents will also be prepared for use by the Town in soliciting bids from contractors to provide the sediment removal measures (as Phase 3 of the Project). Primary components of these documents are summarized below.

Design Analysis Report (DAR)

In general the DAR will provide a comprehensive narrative description and technical analysis and support for the proposed design for the sediment removal activities and the subsequent upland reuse measures. The DAR will also identify and address specific regulatory requirements applicable to the delta remedial activities. The DAR will include, in part, the following items:

- The DAR will include and discuss the results of the Pre-Design Investigation and how these results are incorporated into the detailed design. In this manner, the DAR will describe, in part, the horizontal and vertical extent of the delta sediments that are proposed for removal.

- Bench scale settling tests of samples of the delta sediments collected during the Pre-Design Investigation may be conducted as part of the detailed design work, as necessary to assist with selection of the preferred sediment removal method and for the detailed design of the solids pretreatment system (if hydraulic methods are used).

- The results of the physical testing program for the delta sediments, together with the results of the bench scale settling tests (if conducted), will be used to design the specific types of silt curtain(s) that will be installed around the active in-lake work areas, to preclude movement of any suspended solids into the open water. This work will also designate specific locations and minimum time frames for deployment of the silt curtains.

- It is anticipated that routine monitoring for turbidity and/or suspended solids will be conducted during the active (in-Lake) work periods. The DAR will provide rationale and details for this monitoring program, including threshold action levels, etc.

- If hydraulic sediment removal methods are to be used, the DAR will provide a detailed description, analysis and technical support for the pretreatment system that will be required prior to returning to the Lake the incidental lake water collected as part of this activity.

Plans

A set of detailed construction plans (i.e., engineering drawings) will be prepared to describe and control the proposed delta remediation activities. Typical sheets that will be included in this plan set will include, in part, the following:

- Existing Conditions Map
- Site Layout and Construction Limits
- Sediment Removal Plan (extent and depth of sediment removal, etc.)
- Sediment Removal Details (silt curtains, turbidity monitoring equipment and locations, etc.)
- Solids Transfer Plan (for mechanical methods)
- Pretreatment System Process Flow Diagram and Schematic (for hydraulic methods)
- Pretreatment System Plan (for hydraulic methods)
- Grading Plan (for temporary upland sediment stockpiling)
- Erosion and Sedimentation Control Measures (for temporary upland sediment stockpiling)

Specifications

Written specifications will be prepared to accompany the plans and to further guide and control the sediment removal activities. In general the specifications will be balanced between detailed (prescribed) work specifications and more general, performance-based specifications, the latter to take advantage of work efficiencies that may be proposed by the bidding contractors. The specifications will consist of both General Specifications and Technical Specifications. The General Specifications will address various administrative procedures and oversight and control requirements for the contractor, such as site access and control, Contractor's submittals, Contractor's health and safety requirements, Contractor's maintenance of record documentation, etc. The Technical Specifications will address the various technical work items, such as the sediment removal work, silt curtains, the turbidity and suspended solids

monitoring program, etc. A Construction Quality Assurance/Quality Control Plan will also be developed in conjunction with the specifications, to ensure that adequate inspection and control of the sediment removal work is provided.

Contract Documents

Contract documents will be prepared for use by the Town in soliciting bids from contractors for the Phase 3 sediment removal work. The contract documents will incorporate the detailed plans and specifications. The Contract Documents will include, in part, the following components:

- Advertisement and Notice to Bidders
- Bidding Information and Requirements
- Bid Schedule
- Contract Form and Terms and Conditions

GPS and GIS

It is expected that the majority of the field data to be obtained during the Pre-Design Investigation will be recorded using Global Positioning System (GPS) equipment and methods. GPS uses measurements obtained from orbiting satellites to digitally record ground surface point locations, with accuracy to within several meters. Using GPS computer software, the recorded GPS location point associated with the field data point can be directly imported into design software that will be used to develop the project design (engineering) drawings.

It is expected that the project engineering drawings and related work products will be developed using Geographic Information System (GIS) equipment and methods. GIS is an automatic system that enables the analyst to capture, store, integrate, analyze and display digital data (such as collected by GPS methods) which are spatially referenced to the Earth's surface. One benefit of the use of GIS is that it will allow the specific project location information to be directly imported into other, larger scale work products, for example, basin-wide or Lake-wide GIS mapping projects.

Significant Design Issues

Significant design issues specific to the proposed remedial measures for the deltas include the following:

- In the event that conventional hydraulic methods are to be used for sediment removal, the hydraulic slurry will be pumped from the deltas across the lake to Veteran's Park located in the Town of Bolton. While this Park is in close proximity to the Finkle Brook delta, it represents a pumping distance of approximately 10,000 feet from the Indian Brook delta (Section 6.3, below). In order to provide for sufficient pumping over this distance, "booster" pump station(s) may be required to be temporarily provided in the lake. The pipe would be anchored underwater across most of its length, to preclude surface interference with boat traffic. Detailed engineering analysis and design for this slurry conveyance system will be required as part of the Phase 2 work.

- Existing, preliminary chemical data for the Finkle Brook delta (Section 3.2.1, above) indicates that the delta sediments may exceed Sediment Class A/Placement Category 1 thresholds, under the NYSDEC's interim guidance. As previously indicated, additional testing will be required during Phase 2 to confirm the regulatory classification of the sediments proposed for removal from this delta.

5.5 PERMIT APPLICATIONS

The various documents developed during Phase 2, as described above, will be used to prepare applications for all permits and approvals required for remediation of the deltas. In general, the DAR, plans and specifications will provide the base documents upon which the individual applications will be based. The applications will be tailored to the specific individual permit being applied for. Section 3.3 of the DGEIS provides a brief summary discussion of the various permits and approvals that will (or may) be required for remediation of the deltas. This information indicates that the following permits and approvals will (or may) be required for the delta remedial activities (as currently proposed in Section 6, below):

- Clean Water Act (CWA) Section 404 Permit, from the USACE;
- 6 NYCRR Part 608 (Protection of Waters) Permit, including a CWA 401 Water Quality Certification, by the NYSDEC;
- 6 NYCRR Part 578 (Freshwater Wetlands) Permit, from the APA;
- 6 NYCRR Part 360 Beneficial Use Determination (for upland sediment reuse), from the NYSDEC;
- 6 NYCRR Part 421 (Mined Land Reclamation Permit), from the NYSDEC;
- Underwater Land Use Authorization (by NYS, as owner of the lake bottom) pursuant to the NYS Public Lands Law, from the NYS Office of General Services; and
- 6 NYCRR Part 646 Local Stormwater Management Permit, from the Town of Bolton (as delegated to the Town from the Lake George Park Commission).

Appendix A provides a regulatory reference and summary of the required content for the applications for the listed Federal and State permits and approvals.

6.0 CONCEPTUAL DELTA MANAGEMENT MEASURES (PROJECT PHASE 3)

6.1 GENERAL

As noted in the sections above, the delta sediments will be removed by use of either conventional mechanical methods or conventional hydraulic methods (or an appropriate combination of both methods, as may be subsequently determined during Phase 2). For purposes of this Plan and the following conceptual descriptions, it is assumed that one or the other method will be used, without combination (at present, without detailed sediment characterization information, no basis for the possible use of both methods in combination is available).

Mechanical Methods

For this project, mechanical sediment removal would be provided in the following manner:

- The sediments will be excavated directly from the Lake bottom using a clamshell-type excavating bucket operated by a crane mounted on a barge situated directly over the deltas. The barge upon which the crane will be mounted will be composed of several smaller "sectional" barges connected together to provide a larger, stable working platform. Such sectional barges have been previously used in the Lake and are easier to transport than larger platform barges. Small tugboats or similar workboats will be used to move and position the crane barge. The specific type of excavating bucket that will be used will be determined during the Phase 2 detailed design phase.

- The sediments collected by excavating bucket will be placed into 20-cubic yard capacity rolloff boxes that will be staged on a barge positioned adjacent to the crane barge. This adjacent barge will also be composed of several connected "sectional" barges, likewise moved and positioned by small tugboats or workboats. It is anticipated that at least five (5) rolloff boxes can be situated on a single barge (i.e., one barge consisting of multiple sectional barges), such that the single barge will provide at least 100 cubic yards of sediment capacity.

- The rolloff boxes will be specially adapted rolloff boxes intended to directly provide for sufficient dewatering of the containerized sediments at the deltas. For example, several types of "dewatering boxes" are commercially available and are designed to allow drainage of free liquids from the box. These types of boxes have been specifically developed for dewatering and handling of water-bearing materials and similar materials. (It is anticipated that the delta sediments will consist largely of sand, although silts and vegetative material may be present in varying amounts). Also commercially available are several types of "container filters" that have likewise been developed for handling and transport of water-bearing materials. Container filters typically consist of a basket which lines the box and a filter medium which is attached to the inside of the perforated basket. Free liquids are able to drain through the basket to the base of the rolloff box while the solids are retained in the box. The free liquids collected in the base of the rolloff box are then allowed to drain. The container filter can be used in rolloff boxes that are specifically designed to accommodate container filters. For example, liquid drainage ports and valves can be directly incorporated into the rolloff box for drainage of the liquids collected in the base of the box, or the container filters can be used on standard rolloff boxes modified to allow for liquid drainage. The specific type of rolloff boxes that will be used for the mechanical sediment removal activities will be determined during the Phase 2 detailed design work, utilizing the results of the Pre-design Investigation.

- The active in-Lake work area, including the loaded rolloff boxes temporarily staged at the deltas for completion of dewatering, will be encircled by silt curtain to control and contain turbidity (i.e., referred to as the "controlled work zone").

- As the rolloff boxes are in the process of being filled with sediment by the crane operator, incidental water entrained in the sediments will begin to drain to the bottom of the rolloff box, as described above. At the same time, some of the incidental water may also rise to the surface of the box, as it is displaced upward by additional sediments placed in the box. As the rolloff box is filled to near the top, any such incidental water will overflow out of the top of the box and drain off of the barge back into the Lake, within the controlled work zone. After the box is filled to its design capacity, the crane operator will begin filling the next empty box. After all five rolloff boxes are filled to capacity, the "loaded" barge will be moved away from the crane barge and an "empty" barge will be positioned next to the crane barge.

- The "loaded" barge will be temporarily retained inside of the controlled work zone until gravity dewatering of the filled rolloff boxes has been completed. Water collecting in the bottom of the box will be allowed to drain back into the Lake. Any incidental water retained on the top surface of the filled rolloff box will be manually decanted by an operator utilizing a portable hand pump, with the decant water returned to the Lake, within the controlled work zone. The operator will also wash and/or sweep any incidental sediments that may have accumulated on the barge deck into the lake, within the controlled work zone. Once all five "loaded" rolloff boxes are sufficiently drained and the barge deck has been cleaned, the "loaded" barge will be "released" from the active work zone and moved by a barge to the temporary solids transfer area.

- Figure 3 depicts a typical temporary rock work pad that will be constructed to allow for onshore transfer of the loaded rolloff boxes. The temporary rock work pad will be constructed of pre-constructed gabion baskets placed into the lake to create an above-water working platform. Approximate minimum surface dimensions for this pad are 30 feet by 20 feet, sufficient to provide a working platform for a track-mounted crane. A floating oil boom and silt curtain will be placed around this structure, to contain and collect any incidental sediments and floating material that may drain from the rock pad and crane.

- The "loaded" barge will be moored to the rock pad and the crane operator will pick up and move the loaded boxes to an adjacent onshore staging area. Following offloading of the "loaded" rolloff boxes the crane operator will transfer "empty" rolloff boxes onto the moored barge. The barge will then be released from the rock pad and will be moved to the active delta work zone to continue the sediment removal process.

- As shown on Figure 3, sufficient draft must be available for the rolloff box barge to moor alongside the rock work pad. Up to five feet of draft may be necessary to allow for mooring of a loaded barge. If necessary the required draft can be provided by extending the rock working pad farther out into the lake and/or providing for initial sediment removal along the path of transport for the rolloff box barges.

- After unloading by the crane, the "loaded" rolloff boxes will be trucked to the designated upland reuse area, where the sediments will be unloaded. The empty rolloff boxes will be returned to the solids transfer area for continued reuse.

- Following completion of the sediment removal activities the temporary rock working pad will be removed from the Lake and the shoreline area will be returned to pre-existing conditions.

Hydraulic Methods

For this Project, hydraulic sediment removal would be provided in the following manner:

- A hydraulic dredge positioned over the delta will be used to remove the sediments from the lake bottom via pumping. Pumping of the sediments by hydraulic methods also entrains a large volume of water, resulting in a sediment/water "slurry".

- The slurry will be pumped across the Lake surface through a pipe to the designated onshore material staging area. A slurry pretreatment system will be provided at this location to remove the sediments and suspended solids from the slurry prior to returning the water back to the lake. Figure 4 depicts a conceptual slurry pretreatment system that will be used for this purpose.

- The slurry will first pass through a bar rack and screen unit, to remove any debris and coarse materials that may be entrained in the slurry. These materials will be separated from the slurry and placed in rolloff boxes. These materials will be disposed of in a permitted landfill (approval for alternate use/disposal will be requested from the NYSDEC as part of the Phase 2 detailed design and permitting phase).

- From the bar rack and screen the slurry will enter hydrocyclones, where the relatively larger solids (i.e., for example, fine sands and coarser material greater than 0.25 millimeters in diameter) will be separated from the slurry. The separated solids will be conveyed to linear motion shakers which will be used to provide initial "dewatering" of these solids. From the linear motion shakers the solids will be conveyed to a plastic-lined, bermed impoundment for final gravity dewatering.

- The slurry remaining following passage through the hydrocyclones, together with the liquid effluent draining from the linear motion shakers, will be conveyed to a series of portable settling tanks. The settling tanks will provide quiescent "residence time" for the slurry and effluent, providing for settling of finer-grained sediments and suspended solids entrained in the slurry. The fine-grained material will settle to the bottom of the portable tanks.

- After passage through the portable settling tanks the resulting overflow water will be conveyed to multimedia pressure filter units which will remove any remaining fine-grained sediments and suspended solids. From the multimedia filter units the resulting pretreated water will be routed to a clear well (a portable holding tank) followed by return to the Lake.

- As depicted on Figure 4 and as summarized above, solids will be removed from the slurry at several locations in the pretreatment process. If sufficiently "dewatered" at this initial point of generation, the solids will be loaded into trucks or rolloff boxes and directly transported offsite to the designated upland reuse area. If the solids are not sufficiently dewatered at this point of initial generation, they will be moved to the plastic-lined, bermed impoundment for further gravity dewatering. The "wet" solids will be conveyed to the impoundment using either portable slurry pumps or water-tight equipment, as most appropriate.

- The plastic-lined, bermed impoundment will be used to provide gravity dewatering of the solids removed from the slurry. A sump will be installed in the corner(s) of the impoundment to promote drainage. Following sufficient dewatering the solids will be loaded into trucks or rolloff boxes by mobile equipment for offsite transfer to the designated upland reuse area.

- As depicted on Figure 4, various water effluents and process backwash waters, containing residual entrained sediments and suspended solids, will be generated at several locations in the pretreatment system. These effluent streams will be recirculated back into the pretreatment system at appropriate locations for continuing pretreatment, as depicted in Figure 4. In this manner, only "clean" water will be ultimately returned to the Lake from the pretreatment system, from the final multimedia pressure filter units and the temporary clear well.

- As summarized above, all solids generated by the pretreatment process will be sufficiently dewatered prior to offsite transport. At the completion of the overall project and pretreatment processing, a small volume of fine-grained sediments and solids not amenable to sufficient dewatering by gravity may remain. In particular, fine-grained materials collected in the bottom of the settling tanks may mot be amenable to gravity drainage. In this event, a commercial solidification agent will be mixed with the wet materials to provide a stable material for offsite transport. This solidified material will be transported to an approved solid waste landfill for disposal.

- Following completion of the sediment removal activities the slurry pretreatment system will be dismantled and the site will be restored to its pre-existing conditions.

Common Components

Project components that will be common to use of either of the two types of sediment removal methods include the following:

- *Seasonal Scheduling* The sediment removal activities will occur in the late summer and Fall (i.e., in-Lake work commencing after Labor Day). The sediment removal activities as summarized above will require mobilization by the contractor prior to commencement of the active sediment removal activities. In-Lake mobilization will commence only after Labor Day, while mobilization for onshore or upland project work may commence prior to Labor Day, following review and approval by the Town. The contractor will be allowed to work as far into the fall as necessary, weather permitting.

- *Daily Work Scheduling* Subject to review and approval by the Town, the sediment removal contractor will work six days per week (Monday through Saturday), commencing no earlier than 7:00 a.m. The contractor will generally be allowed to work until dusk; no work will occur after dusk.

- *In-Lake Equipment Mobilization* As summarized in the above sections, the sediment removal activities will require use of various heavy equipment pieces in the lake, such as dredges, sectional barges, cranes, tugboats and workboats, etc. Since the lake is "landlocked", with respect to movement of heavy equipment into the lake, the equipment will be mobilized to the lake via the local roadway system. The equipment will be moved into the lake using either existing available docks or boat launching ramps or it can be "swung " into the Lake using land-based cranes, etc. The specific locations and logistics for mobilizing the project

equipment into the Lake will be determined during Phase 2, as part of the detailed project design.

- *Lake-bottom Vegetation Removal* In the event that Eurasian Watermilfoil (Section 7 of the DGEIS) is present in or immediately adjacent to the proposed limit of disturbance for the sediment removal activities, these plants will be removed by hand prior to beginning the sediment removal activities. The plants will be removed from the Lake and appropriately disposed of upland. Remaining existing Lake-bottom plants may be removed prior to beginning the sediment removal activities, depending on the actual density of plant growth and the actual sediment removal methodology to be used. Removal of bottom vegetation would likely not be necessary in advance of mechanical sediment removal activities, while it may likely be appropriate for hydraulic sediment removal activities, to prevent fouling of the hydraulic slurry lines and equipment. The specific need and actual method for removing Lake-bottom vegetation prior to commencing sediment removal will be investigated and confirmed as part of the Phase 2 detailed design phase.

- *Use of Silt Curtains and Floating Oil Booms* For both types of sediment removal methods, silt curtains and floating oil booms will be positioned and maintained around critical working areas, to contain and control turbidity and incidental oils generated by the work activities. For mechanical sediment removal, the "loaded" rolloff boxes will be retained at the delta within a work area encircled by silt curtains and a floating oils boom until the in-box dewatering process is complete; at this point the rolloff box will be "released" from the silt curtain area. The general use of silt curtains and floating oil booms is further described in Section 6.3 of the DGEIS. Typical types of silt curtains that will be utilized are depicted in Figure 6. Floating material and vegetative material contained by the silt curtain and floating oil boom will be removed and placed in rolloff boxes. When full the rolloff boxes will be disposed of at an appropriate permitted disposal facility.

- *Turbidity Monitoring Program* A turbidity monitoring program will be implemented during the active sediment removal activities. The turbidity monitoring program that will be provided is summarized in Section 6.3 of the DGEIS. A typical turbidity monitoring station is depicted in Figure 6.

- *Erosion and Sediment Control Measures* Appropriate erosion and sediment control measures and structures will be provided for all onshore work areas. For example, as shown on Figure 4, silt fence and/or hay bales will be installed around the perimeter of the hydraulic slurry pretreatment system, to contain and control drainage from the active work areas, etc. Complete erosion and sediment control measures will be developed as part of the Phase 2 detailed design work.

- *Upland Transport and Reuse* From the onshore material staging area the dewatered sediments will be trucked to the designated upland reuse area, where they will be either directly used onsite for grading purposes or temporarily stockpiled for subsequent reuse by the Town. Appropriate stormwater management controls and erosion and sedimentation control measures will be provided and maintained for this activity at the upland reuse location.

6.2 DELTA-SPECIFIC COMPONENTS AND LOCATIONS

Figure 5 provides the conceptual delta removal plans that provides the basis for sediment removal by either of the two proposed sediment removal methods. In combination with the general sediment removal measures summarized above, delta-specific components and locations include the following:

- In the event that mechanical sediment removal methods are used, Veteran's Park will be used to accommodate the onshore transfer of the sediments. The Park is available for public access to the Lake. As shown on Figure 5, this area is located a short distance to the southwest of the Finkle Brook delta and nearly two miles south of the Indian Brook delta. The temporary solids transfer rock work pad, as depicted in Figure 3, will be installed in this location, as described above.

- In the event that hydraulic sediment removal methods are used, the hydraulic slurry will be pumped through a pipe also to Veteran's Park. This area and local vicinity are shown on Figure 5. A slurry pretreatment system will be furnished in this area to remove the sediments and suspended solids from the slurry, prior to returning the pretreated water to the Lake, offshore of the Park.

- From Veteran's Park the dewatered sediments will be trucked Town property located to the immediate north of the Town's closed landfill. Figure 7 shows the location of this site as well as the transport route that the sediment trucks will follow, from the material staging area. Detailed information regarding the transport route is provided in Section 16 of the DGEIS.

6.3 PRODUCTION AND PROJECT DURATION

In general, due to the limited time frame available to complete the sediment removal activities for each delta, including time for mobilization and demobilization by the sediment removal contractor and restoration of onshore areas to pre-existing conditions, minimizing the project duration will be of utmost importance. It is anticipated that the work will be provided by the contractor on a per unit basis (such as in-place cubic yards of sediment removed to the upland reuse area), as opposed to a time-and-materials basis. Procuring the work on a per unit basis generally provides impetus to the contractor to complete the work in as short of a duration as possible.

The project duration will predominately be based on daily production rates attained by the contractor. Maximum attainable production rates will likely be limited by space, available equipment size/capacity and/or operational constraints (i.e., as production rates increase the contractor's ability to safely operate, control and monitor the active work may tend to decrease). As part of the Phase 2 detailed design work the potential limiting factors for maximizing daily production rates will be specifically reviewed and addressed, such that the maximum possible daily production rate can be estimated and incorporated into the overall project design.

The following brief conceptual information regarding production rates and the overall project work duration is provided. For this information, an average working day is assumed to be 10 hours, with the active sediment removal activities "operational" for 8 hours (i.e., accounting for operational down time, start-up and shut-down, etc.)

Mechanical Methods

- For this work for each delta, in-Lake mobilization will be required prior to sediment removal (to construct the temporary rock work pad). This in-lake mobilization cannot commence until after Labor Day. It is assumed that the gabion baskets can be built up-land prior to Labor Day and transported to the shoreline location after Labor Day. Overall project mobilization is estimated to require one full week.

- Production as described above for this method will likely be limited to the rate that the crane operator can load the rolloff boxes with the excavating bucket and/or the time for controlled, in-Lake dewatering of the rolloff boxes to be completed. For the Finkle Brook delta, utilizing one crane/bucket unit a daily production rate of 450 cubic yards (cys) of in-place sediment is estimated. For the Indian Brook delta, due to the relatively large quantity of delta sediments proposed for removal, it is assumed that two crane/bucket units will be concurrently utilized, for an overall estimated daily production rate of 900 cys per day.

- Over a six day work week, for 13,238 cubic yards of delta sediments for the Finkle Brook delta, a production rate of 450 cys/day will require approximately 30 working days, or approximately 5 active work weeks. For the Indian Brook delta, for 37,215 cubic yards of sediments, a production rate of 900 cys/day will require approximately 41 working days, or approximately 7 active work weeks. In the event that weather constraints prohibit completion of the work during the initial late summer and fall work period, the work would be resumed and completed in the following fall. All project structures and onshore features would be removed prior to completion of work in the fall and re-installed for the work in the following fall. If mechanical sediment removal methods are used for the two deltas at the noted estimated rate and for the current estimated total sediment quantity, it is expected that the delta remedial measures can be completed in one season.

- For the Finkle Brook delta, for an estimated daily production rate of 450 cys/day, and assuming that the rolloff boxes realize a payload capacity of 18 cys/box, approximately 25 vehicle trips (or 50 vehicle passes) per day will be required for transport of the sediments to the upland reuse area. Over a 10-hour working day, this is an average of 2.5 vehicle trips (or 5 vehicle passes) per hour. For the Indian Brook delta, for an estimated daily production rate of 900 cys/day, and assuming that the rolloff boxes realize a payload capacity of 18 cys/box, approximately 50 vehicle trips (or 100 vehicle passes) per day will be required for transport of the sediments to the upland reuse area. Over a 10-hour working day, this is an average of 5 vehicle trips (or 10 vehicle passes) per hour.

Hydraulic Methods

- For this method, substantial in-Lake mobilization will be required (i.e., installation of the hydraulic slurry pipe conveyance system, from the deltas to Veteran's Park). Also, Veteran's Park will not be available for installation of the slurry pretreatment system until after Labor Day. The pretreatment equipment will need to be delivered and temporarily stored offsite prior to Labor Day. Overall project mobilization in the Lake and at Veteran's Park may be provided in one week, commencing after Labor Day, but could take up to two full weeks.

- For this application, the limiting production factor may be the rate at which the slurry pretreatment system can process the sediment/water slurry without upset. For both deltas, a production rate for this method is assumed to be 4,000 gallons per minute (GPM) for

pumping of the sediment/water slurry; this is considered to be somewhat of an "above average" production rate for this type of application. An estimated daily sediment production rate corresponding to this slurry pumping rate is 650 cys/day.

- Over a six day work week, for the Finkle Brook delta, for 13,238 cubic yards of delta sediments, a production rate of 650 cys/day will require approximately 20working days, or approximately 4 active work weeks. For the Indian Brook delta, for 37,215 cubic yards of delta sediments, a production rate of 650 cubic yards will require approximately 57 working days, or approximately 10 active work weeks. In the event that weather constraints prohibit completion of the work during the initial late summer and fall work period, the work would be resumed and completed in the following fall. All project structures and onshore features would be removed prior to completion of work in the fall and re-installed for the work in the following fall. If hydraulic sediment removal methods are used at the estimated rate and for the current estimated total sediment quantity, it is likely each of the individual delta remedial projects can be fully completed in one season.

- For each delta, for an estimated daily production rate of 650 cys/day, and assuming that the sediment transport vehicle working payload capacity is 18 cys/vehicle, approximately 36 vehicle trips (or 72 vehicle passes) per day will be required for transport of the sediments to the upland reuse area. Over a 10-hour working day, this is an average of 3.6 vehicle trips (or 7.2 vehicle passes) per hour.

- As suggested by Figure 4, the slurry pretreatment system as currently conceptualized may require a minimum of approximately 2.5 acres. Veteran's Park in total is approximately 3.3 acres in size, including the paved parking lot which itself is slightly less than one acre in size. Depending on detailed characterization of the delta sediments, the actual pretreatment system will be able to be "reduced" in size in order to fit wholly into the paved parking lot area. For example, this could be accommodated by providing additional means of "active" sedimentation by mechanical equipment, in lieu of the "passive" gravity sedimentation provided by the portable stilling basins. Such active/mechanical methods and equipment would require less space than stilling basins. The actual "size" required for the pretreatment system will be dependent on the actual level of pretreatment that will be required, as based on the detailed sediment characterization to be determined during Phase 2.

6.4 POST-REMEDIAL MEASURES

No appropriate and/or required post-remedial measures are identified to-date. Such measures may be identified during the Phase 2 detailed design and permitting work, as more detailed delta-specific information and data is obtained and the detailed project design is completed. In particular, regulatory agencies may condition permits and approvals that may be issued for the work with requirements for post-remediation measures. Such measures could include monitoring of the rate of continued sediment accumulation in the remediated area, monitoring of the reestablishment of pre-existing aquatic plant species in the affected work areas and monitoring for and hand-removal of Eurasian Watermilfoil plants that may become established in the affected delta areas.

7.0 CONCEPTUAL COST ESTIMATES

7.1 PHASE 2 CONCEPTUAL COST ESTIMATE

The Phase 2 conceptual cost estimate for each delta is based on the assumption that the required work will be provided by an environmental engineering consulting firm, utilizing subconsultants or subcontractors for specialty work and expertise, as necessary. The Phase 2 conceptual cost estimate includes the following assumptions and work components:

- In-Lake work relative to determining whether landlocked salmon utilize the tributary for spawning will not be required;
- Any property and/or right-of-way access agreements that may be required for the project work will be procured by the Town;
- Preparation of a supplemental environmental impact statement (SEIS) under SEQR will not be required;
- Project background review and understanding, existing document review and preliminary site inspections;
- Base map preparation and detailed surveying for each of the three (3) project locations, including updated delta bathymetry, and detailed site reconnaissance and inspections of the three project locations;
- Delta sediment sampling and testing;
- Wetland delineation, mapping and coordination for regulatory review and acceptance (wetland mitigation and/or compensation plan not included);
- Updated threatened and endangered species review, for both in-Lake and upland work activities;
- Phase I cultural resources (archaeology) survey (Phase II and III survey not included);
- Preparation of a draft and final Design Analysis Report;
- Preparation of draft and final plans (engineering drawings);
- Preparation of draft and final contract specifications;
- Preparation of draft and final contract documents;
- Preparation of draft and final individual permit applications (as listed in Section 5.5, above).
- Attendance at multiple project meetings with regulatory agencies; and
- Routine project management services, including routine project meetings.

Based on these items, it is estimated that the Phase 2 work will cost approximately $100,000 for the Finkle Brook delta and approximately $95,000.00 for the Indian Brook delta.

7.2 PHASE 3 CONCEPTUAL COST ESTIMATE

The Phase 3 conceptual cost estimate for each delta is based on the assumption that the required work will be provided by an sediment removal contractor, utilizing subcontractors for specialty work and expertise, as necessary. The Phase 3 conceptual cost estimate includes the following work components and assumptions:

- All equipment will be furnished, installed, operated, maintained, removed and retained by the contractor;
- All necessary labor will be provided by the contractor;
- Sediment removal will occur by conventional mechanical or hydraulic methods, but not in combination;
- The contractor will restore all disturbed onshore and upland work locations to pre-existing conditions;
- In-Lake restoration work above and beyond sediment removal to the approved design depths and slopes will not be required;
- Post-remedial work will not be required;
- Analytical work (i.e., sediment sampling and analysis) other than for the turbidity monitoring program and for monitoring of the hydraulic slurry return water for suspended solids will not be required ;
- Independent oversight and certification of the contractor's work will not be required.
- All project work will be fully completed in a single, initial late summer and fall season, including contractor's mobilization/demobilization and required site restoration work.

Based on these items, it is estimated that the Phase 3 work, if provided by conventional mechanical methods as described in this Plan, will cost approximately $450,000.00 for Finkle Brook and approximately $1,800,00.00 for Indian Brook.

Based on these items, it is estimated that the Phase 3 work, if provided by conventional hydraulic methods as described in this Plan, will cost approximately $525,000.00 for Finkle Brook and approximately $1,600,000.00 for Indian Brook.

8.0 ALTERNATE REMEDIAL MANAGEMENT MEASURES

The DGEIS identifies and evaluates reasonable alternatives to various components of the suggested delta remedial measures. The Town can incorporate any such alternatives into the proposed remedial plan for the Finkle Brook and Indian Brook deltas at its discretion, either at present and/or during the Phase 2 detailed design and permitting phase.

A general Project alternative that may lessen certain potential environmental impacts is the use of an alternate location for the onshore material staging area, from the area(s) presently proposed herein. It is anticipated that the Town will continue to review the availability of any such sites that may offer the potential for reduced impacts. The Town is not precluded from pursuing any appropriate available commercial or private properties for such use. Written land use approvals and/or site access agreements would likely be required for use of these types of properties.

As shown on Figure 1, Green Island is located just offshore of Bolton Landing, opposite Veteran's Park. The NYSDEC operates a Lake-side maintenance facility on the northwest portion of this island. Cursory inspection of the maintenance facility indicates that limited space would likely be available for onshore processing of the delta sediments, by either mechanical or hydraulic methods. However, depending on the overall space requirements needed by the NYSDEC for this facility during the post-Labor Day period, etc., the maintenance facility may provide a feasible alternate onshore material staging area for the delta remedial measures. Additional investigation with NYSDEC would be required to more fully explore the feasibility of using the maintenance facility for this purpose during the Lake's off-season. It is noted that trucking of the sediments to the upland reuse area from this location would route Project traffic through more "sensitive" locations (i.e., through Green Island and into the north side of Bolton Landing), prior to proceeding north on NYS Route 9N. It is understood that the bridge leading from Bolton Landing to Green Island has recently been reconstructed and improved. Its capability to accommodate sediment transport trucks would need to be verified.

Deepwater mooring is available in the vicinity of the deltas at the Town's Roger's Memorial Park facility, located along the Lake in the southern portion of the Town of Bolton. However, cursory inspection of this facility indicates that sufficient space for the onshore material processing activities for either mechanical (for onshore transport of containerized sediments) or hydraulic (for locating a hydraulic slurry pretreatment system) sediment removal methods is likely not available. This site is used for mooring of commercial boats for a portion of the post-Labor Day season. Further investigation of this possible site during Phase 2 may be appropriate, in concert with the detailed design work for the individual delta remedial measures.

For the Indian Brook delta, NYS Route 9N runs northward approximately 1,000 feet west of and upslope from the delta. Undeveloped, cleared land of sufficient size may be available along this portion of NYS Route 9N for staging of the slurry pretreatment system, for hydraulic sediment removal methods. In this event, the hydraulic slurry line and the pretreated return water line would extend from the delta to this area. For such sites located on the west side of NYS Route 9N, the slurry lines could be extended beneath NYS Route 9N via a small tunnel bore or similar construction measure. Inbound and outbound traffic on NYS Route 9N would likely require control and management by flagpersons.

9.0 REFERENCES

Adirondack Park Agency, 1996. Adirondack Park Land Use and Development Plan Map

Eichler, L. W., Posner, E., 1997, Revised June 1999. *Analysis of Sedimentary Metals Associated with Stormwater Runoff in the Lake George Basin.* Darrin Fresh Water Institute Technical Report 97-4.

Eichler, L. W., Howe, E., and Boylen, C. W., 1998. *Bathymetric Mapping of Selected Delta Areas of Lake George, New York.* Darrin Fresh Water Institute Technical Report #99-6.

Lake George Plan and Update Committee, 2001. *Lake George – Planning for the Future.* Draft Plan for Public Review and Comment. April 2001.

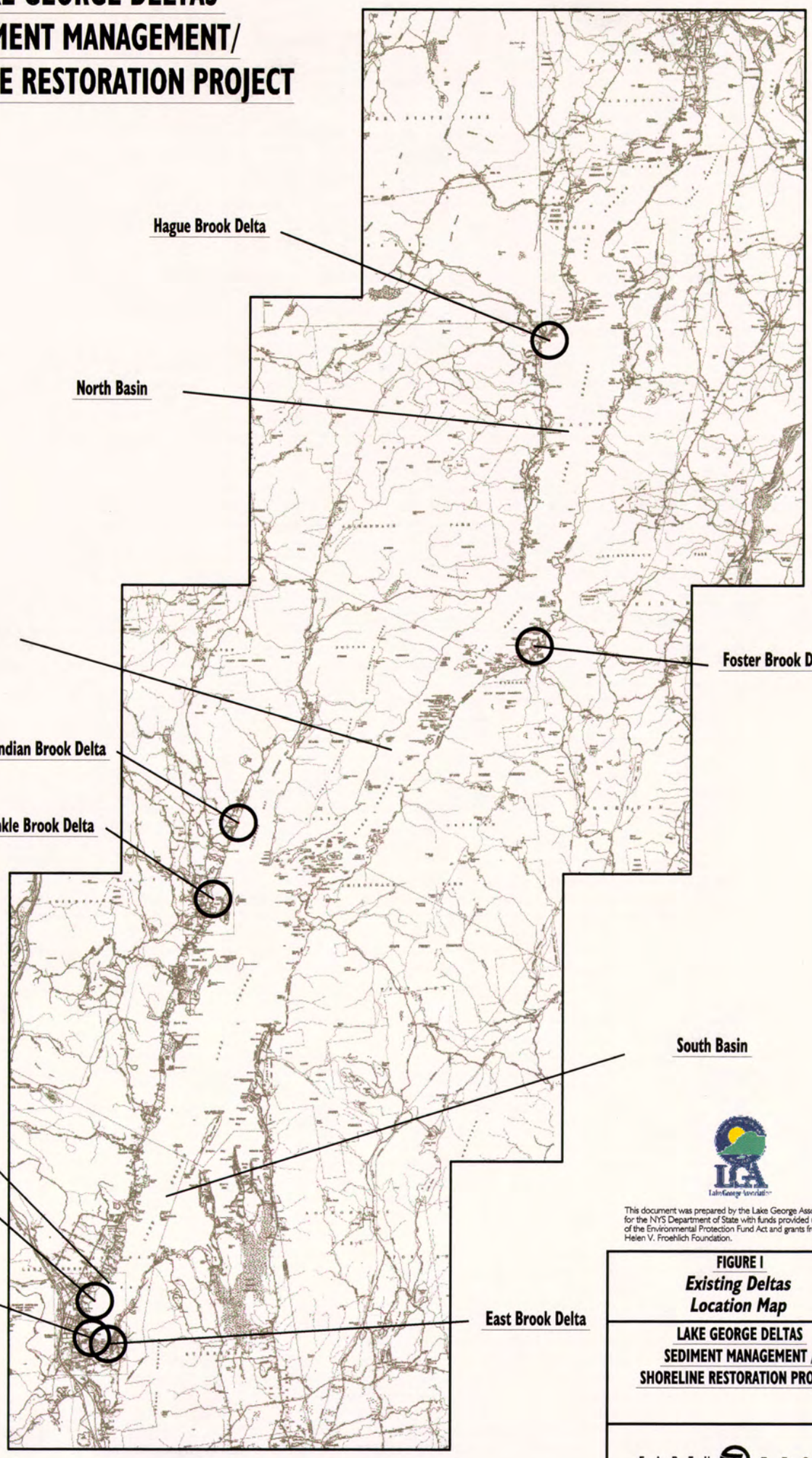
Myers Engineering, 2000. Summary Report, Conceptual Design of Upstream Improvements in Stormwater Management, Indian Brook Project. Town of Bolton, New York.

New York State Department of Environmental Conservation, 1994. Interim Guidance – Freshwater Navigational Dredging. Division of Water.

New York State Department of Environmental Conservation, 1996. The Lake Champlain Drainage Basin Biennial Report 1993-1994. Rotating Intensive Basin Studies – Water Quality Assessment Program.

Town of Bolton, 4-24-2001,. Zoning Map and Zoning Code

LAKE GEORGE DELTAS SEDIMENT MANAGEMENT/ SHORELINE RESTORATION PROJECT



MAP REFERENCE:
U.S.G.S. 7.5 MINUTE SERIES BOLTON LANDING, GRAPHITE, LAKE GEORGE, PUTNAM, PUTNAM MTN., SHELVING ROCK, SILVER BAY, TIACONDEROGA.

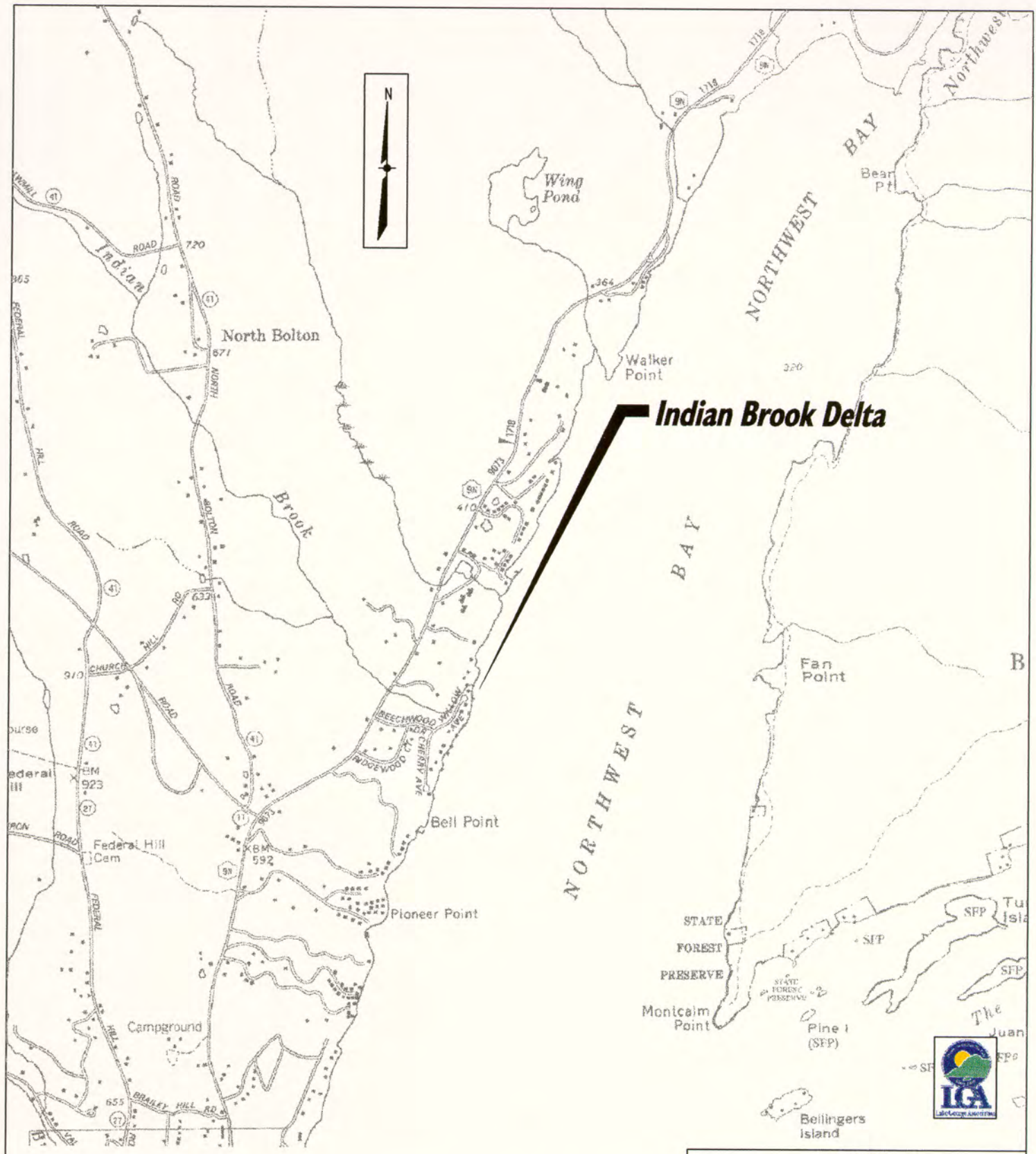
This document was prepared by the Lake George Association for the NYS Department of State with funds provided under Title 11 of the Environmental Protection Fund Act and grants from the Helen V. Froehlich Foundation.

FIGURE I
Existing Deltas Location Map

LAKE GEORGE DELTAS SEDIMENT MANAGEMENT / SHORELINE RESTORATION PROJECT

EARTH TECH
A tyco INTERNATIONAL LTD. COMPANY

September 2000 39446



MAP REFERENCE:
U.S.G.S. 7.5 MINUTE SERIES BOLTON LANDING

This document was prepared by the Lake George Association for the NYS Department of State with funds provided under Title 11 of the Environmental Protection Fund Act and grants from the Helen V. Froehlich Foundation.

FIGURE I

Site Location Map
Indian Brook
Town of Bolton, New York

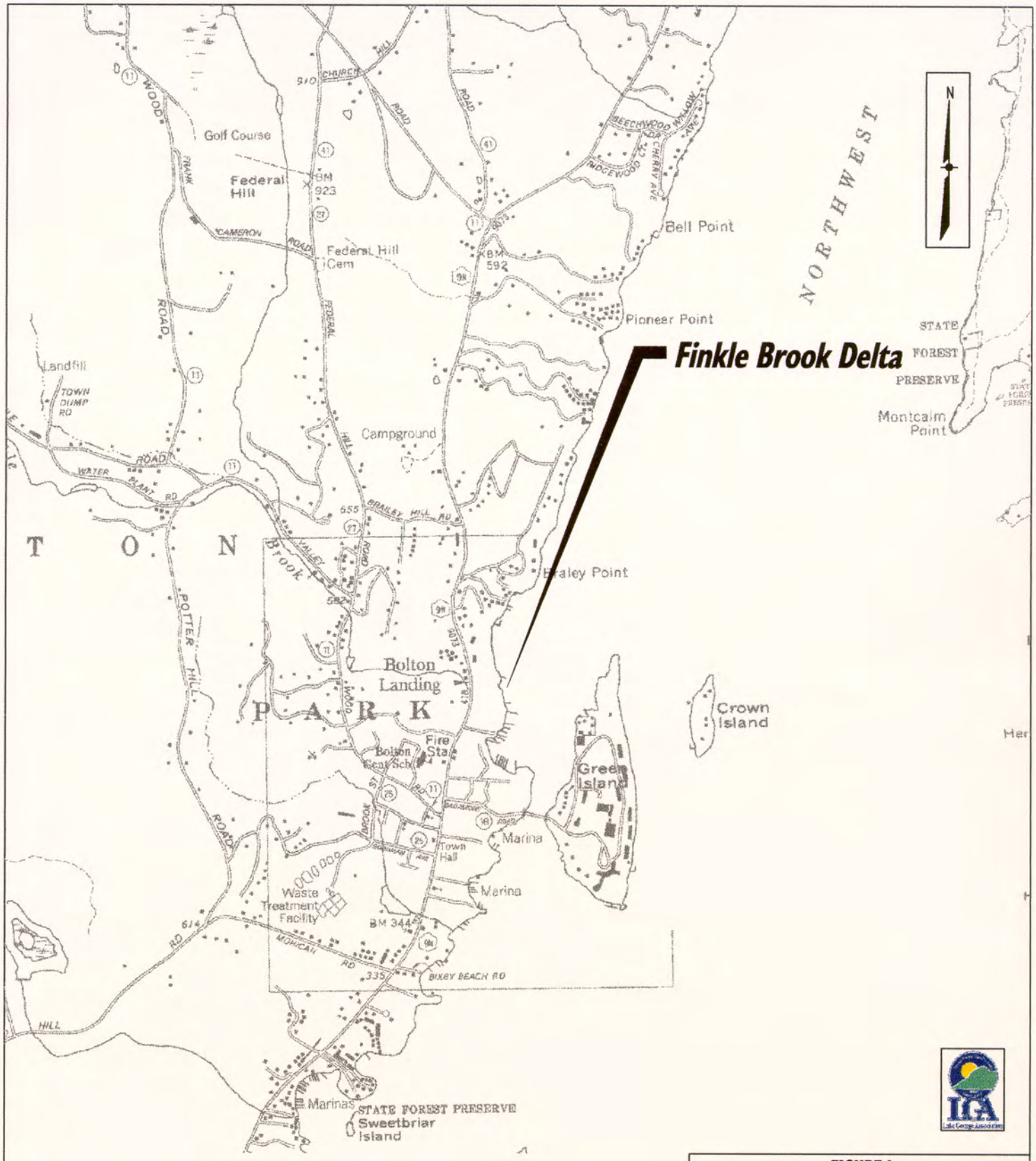
EARTH TECH
A tyco INTERNATIONAL LTD. COMPANY

0' 2000' 4000'
SCALE

September 2000

39446

LAKE GEORGE DELTAS
SEDIMENT MANAGEMENT / SHORELINE RESTORATION PROJECT



MAP REFERENCE:
U.S.G.S. 7.5 MINUTE SERIES BOLTON LANDING

This document was prepared by the Lake George Association for the NYS Department of State with funds provided under Title 11 of the Environmental Protection Fund Act and grants from the Helen V. Froehlich Foundation.

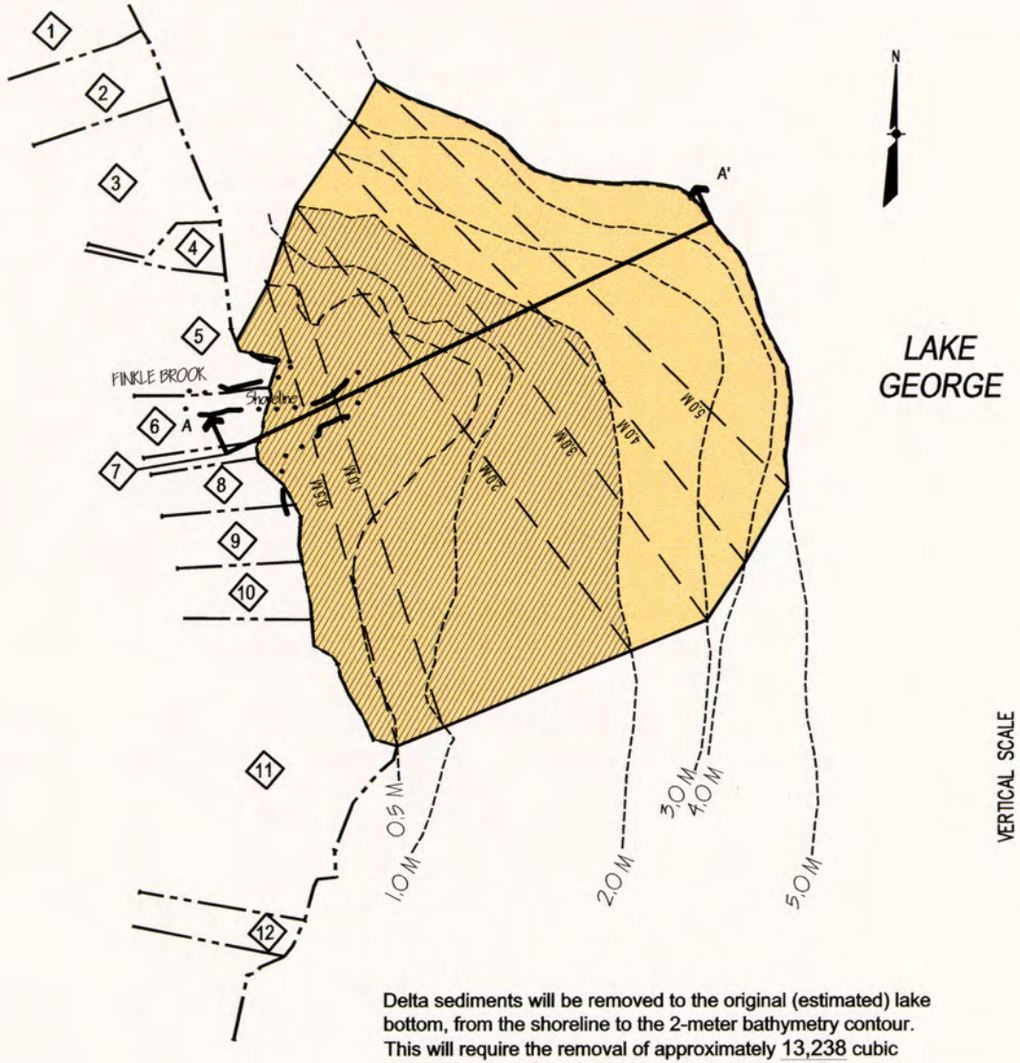
FIGURE I

Site Location Map
Finkle Brook
Town of Bolton, New York

EARTH TECH
A tyco INTERNATIONAL LTD. COMPANY

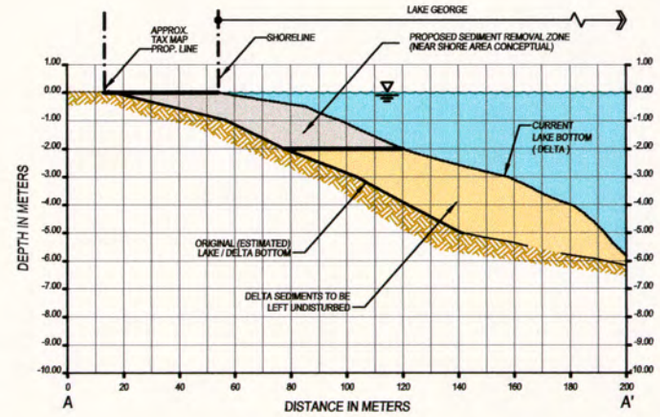
0' 2000' 4000'
September 2000 SCALE 39446

LAKE GEORGE DELTAS
SEDIMENT MANAGEMENT / SHORELINE RESTORATION PROJECT

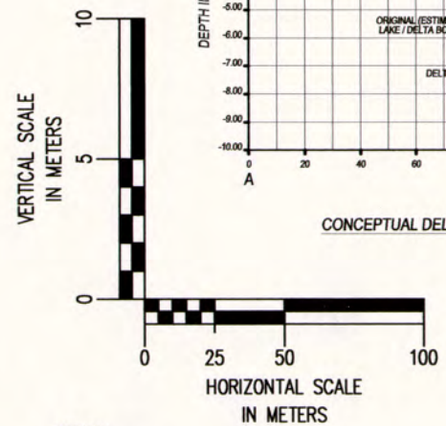


PROPERTY OWNERS OF RECORD

1. ROBERT, GETRUDE PEEBLES & OTHERS
2. MICHAEL & DANIEL O'BRIEN
3. EDWIN F. JR., & MARGARET F. WILLIAMS
4. WILLIAM WILLIG
5. RENSSELAER P.I., C/O DONNA HILBERT
6. RAYMOND F. JR., & JOANNA SPARLING
7. RAYMOND F. JR., & JOANNA SPARLING
8. WILLIAM, WILLIAM JR., & ROBERT T. TODD
9. KATHY L. & PETER M. ROSENTHAL
10. MAUREEN, REHM E. & KNEESHAW J. FERRIS
11. TOWN OF BOLTON
12. RODERICK & MARY OWENS



CONCEPTUAL DELTA MANAGEMENT SCENARIO - SECTION A - A'



Delta sediments will be removed to the original (estimated) lake bottom, from the shoreline to the 2-meter bathymetry contour. This will require the removal of approximately 13,238 cubic yards of sediments.

KEY :

- Estimated Area of Delta (to the 5.0 m depth)
- Conceptual Area of Sediment Removal (4.52 Acres)
- Approximate Parcel Boundary from Tax Maps
- Approximate Shoreline at Time of Bathymetric Survey by DFWI
- 5.0 M — Bathymetry Contour Depth Indicated in Meters
- 1.0 M — Original (Estimated) Lake/Delta Bottom

NOTES :

1. This Plan Was Compiled In Part From:
   a) U.S.G.S. 7.5 Min. Quad Bolton Landing
   b) Municipal Tax Mapping
   c) A Report entitled "Darrin Fresh Water Institute (DFWI) at Lake George Bathymetric Mapping of Selected Delta Areas of Lake George New York 1998, Survey date: 11/19/98." Lake Level 319.13 Feet AMSI / (Rogers Rock)
2. Detailed shoreline issues including property line locations, mean high and mean low water lines, transition slopes and shoreline erosion control measures to be determined during the detailed design phase.

This document was prepared by the Lake George Association for the NYS Department of State with funds provided under Title II of the Environmental Protection Fund Act and grants from the Helen V. Froehlich Foundation.

FIGURE 2

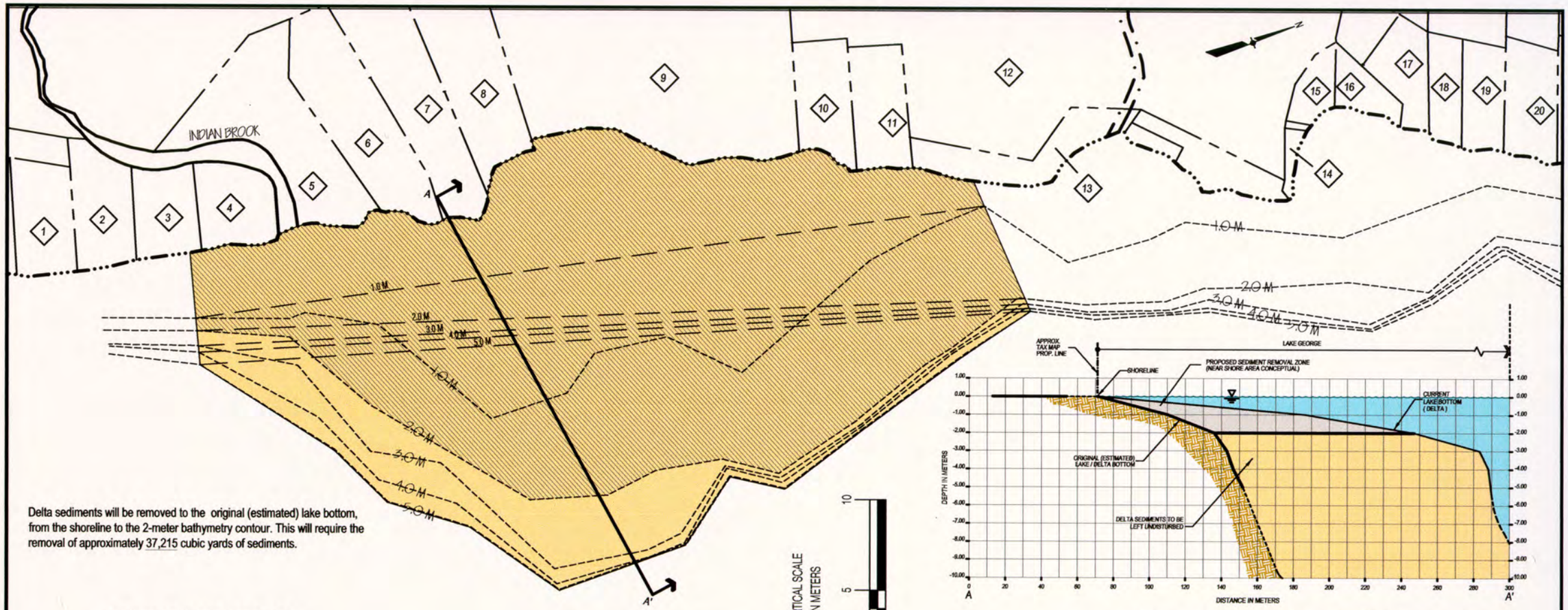
Conceptual Delta Management Plan
Finkle Brook
Town of Bolton, New York

LAKE GEORGE DELTAS SEDIMENT MANAGEMENT / SHORELINE RESTORATION PROJECT

EARTH TECH
A tyco INTERNATIONAL LTD. COMPANY

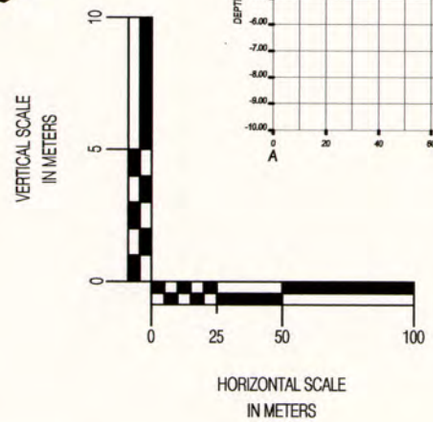
SEPTEMBER 2000 39446

PLOT DATE: 09-18-2000 CAD FILE NAME: L:\...\39446\JUNE_2000\FINKLE\FINKLE.dwg IMAGE: L:\...\39446\IMAGES\FINKLE2.JPG XREF: (NONE)



Delta sediments will be removed to the original (estimated) lake bottom, from the shoreline to the 2-meter bathymetry contour. This will require the removal of approximately 37,215 cubic yards of sediments.

CONCEPTUAL DELTA MANAGEMENT SCENARIO - SECTION A - A'



PROPERTY OWNERS OF RECORD

1. CADY, DAVID & SUZANNE
2. JOHNSEN, JOHN T. & ANN MARIE
3. FUNICIELLO, DONNA M.
4. SONDERS, MARTIN
5. VANLEEUEWEN, ELIZABETH ANN
6. MANCINI, JO ANN
7. WATERHOUSE, LAWRENCE M. JR.
8. INDIAN BROOK ASSOC., INC.
9. KOLVEK, RICHARD H. & MARY F.
10. O'HEARN, JAMES T. & KARLEEN
11. LICHTENSTEIN, ROBERT R.
12. BROOK HILL DEV., INC.
13. BROOK HILL DEV., INC.
14. WAEHNER, RUDOLPH
15. WAEHNER, ROSE B.
16. WAEHNER TRUST
17. WAEHNER TRUST
18. CHECCHI, FRANK & SANDRA
19. WAEHNER, GLEN & OTHERS
20. ENGELKE, ROSE QPRT

KEY :

- Estimated Area of Delta
- Conceptual Area of Sediment Removal (14.53 Acres)
- Approximate Parcel Boundary from Tax Maps
- Approximate Shoreline at Time of Bathymetric Survey by Earth Tech
- 5.0 M — Bathymetry Contour Depth Indicated in Meters
- 1.0 M — Original (Estimated) Lake/Delta Bottom

NOTES :

1. This Plan Was Compiled In Part From:
   a) U.S.G.S. 7.5 Min. Quad Bolton Landing
   b) Municipal Tax Mapping
   c) Bathymetry conducted by Earth Tech July 30, 2000, Lake level 319.68 feet AMSL.
2. Detailed shoreline issues including property line locations, mean high and mean low water lines, transition slopes and shoreline erosion control measures to be determined during the detailed design phase.

FIGURE 2

Conceptual Delta Management Plan
Indian Brook

Town of Bolton , New York

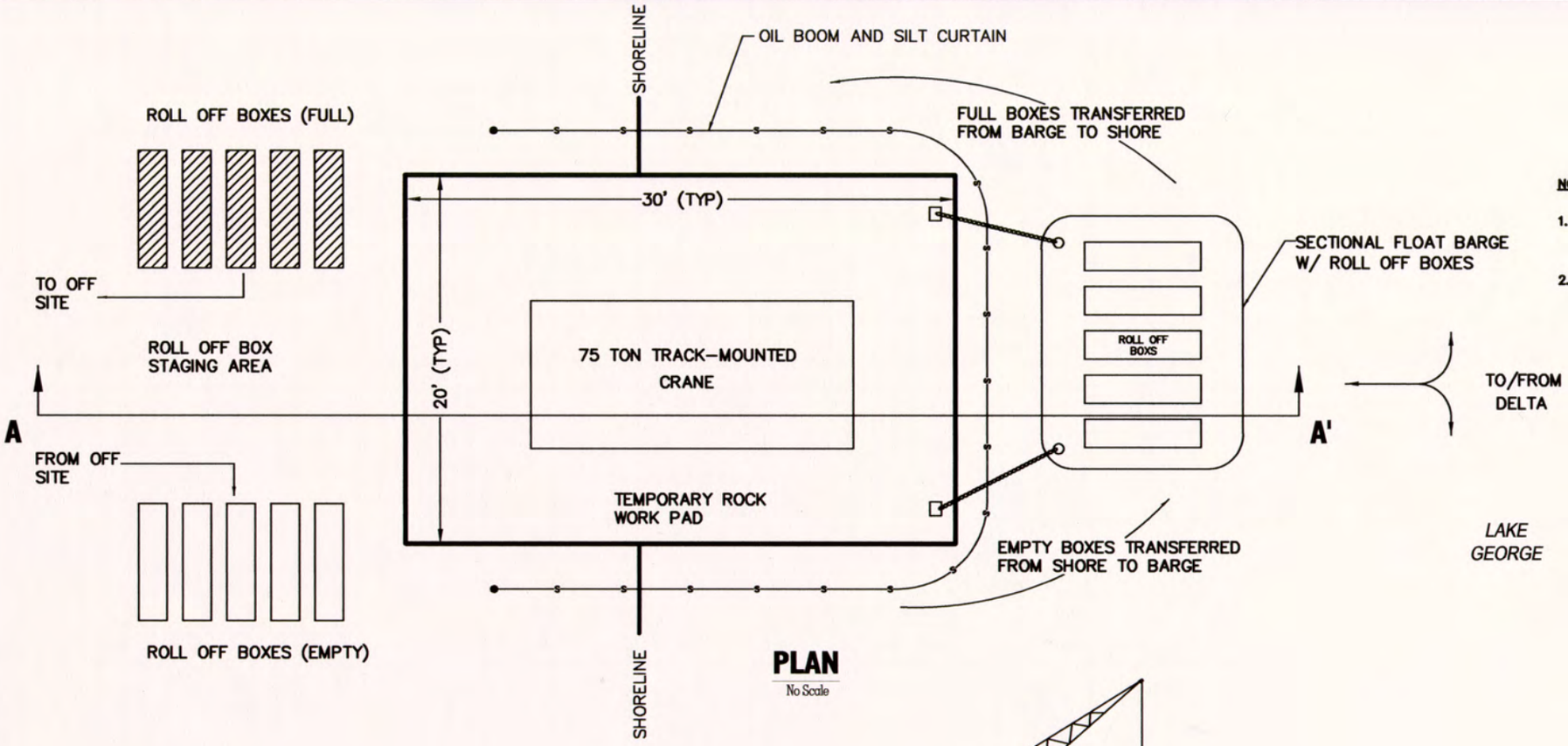
LAKE GEORGE DELTAS SEDIMENT MANAGEMENT / SHORELINE RESTORATION PROJECT

EARTH TECH

A tyco INTERNATIONAL LTD. COMPANY

SEPTEMBER 2000 39446

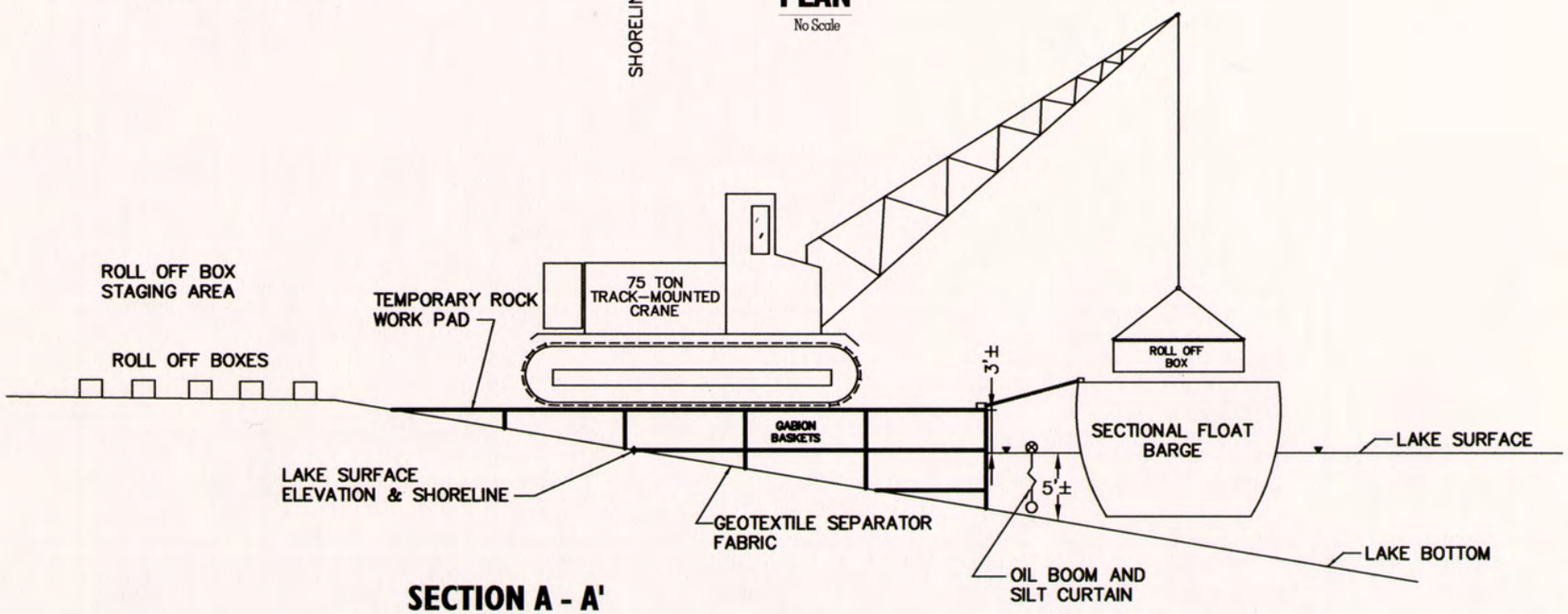
This document was prepared by the Lake George Association for the NYS Department of State with funds provided under Title 11 of the Environmental Protection Fund Act and grants from the Helen V. Froehlich Foundation.



PLAN
No Scale

NOTES:

1. TYPICAL PRODUCTION RATE FOR A 10-HOUR WORK DAY DAY IS 450 CYS/DAY, RESULTING IN 25 TRIPS/DAY FOR ROLL OFF BOX TRANSPORT (AT 18 CYS/BOX).
2. GABION BASKET ARE LOOSE ROCKS ENCASED IN A SYNTHETIC "BASKET". TYPICAL GABION BASKETS FOR THE APPLICATION WILL BE 3' x 3' x 6' WITH 6-INCH ROCKS.



SECTION A - A'
No Scale

This document was prepared by the Lake George Association for the NYS Department of State with funds provided under Title 11 of the Environmental Protection Fund Act and grants from the Helen V. Froehlich Foundation.

FIGURE 3

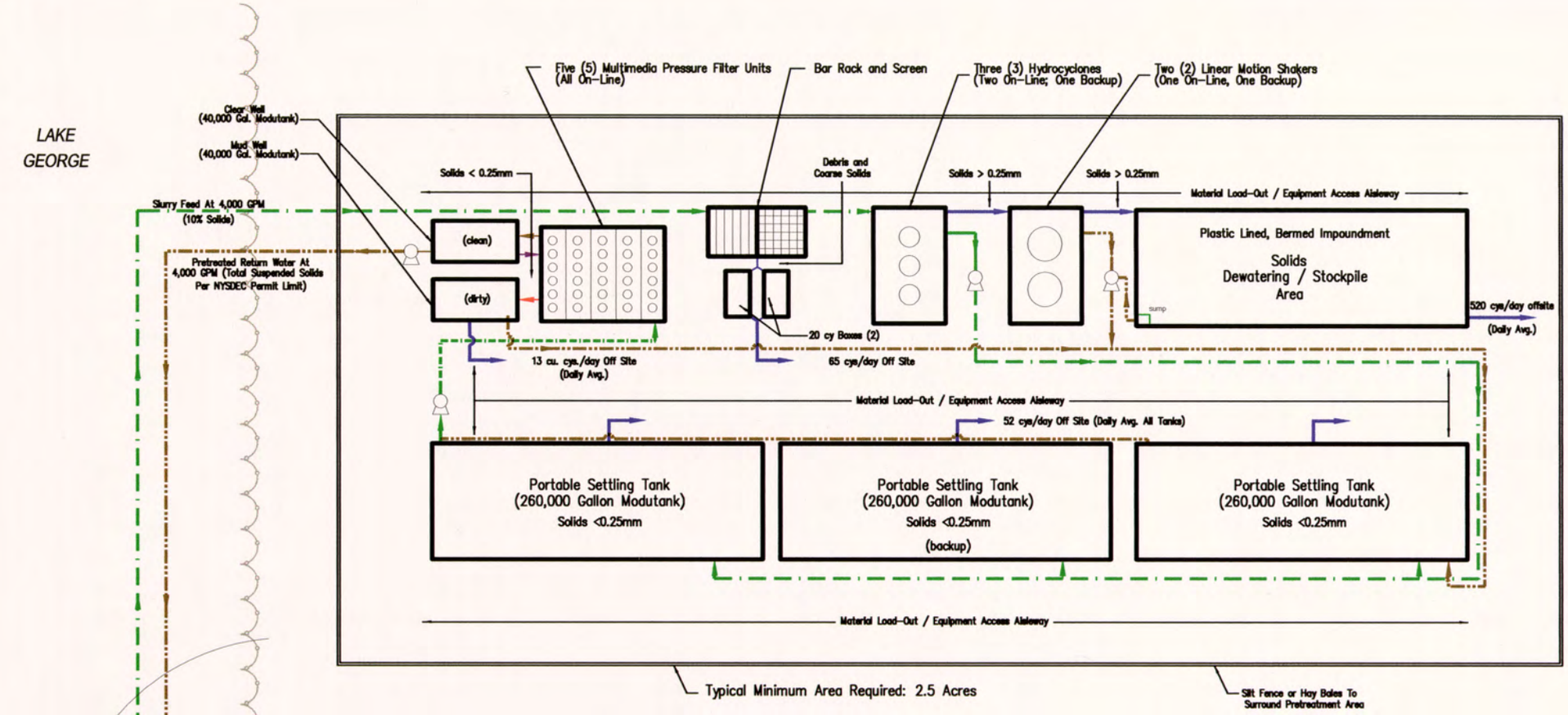
Mechanical Removal Methods- Conceptual Solids Transfer Plan Generic Delta

LAKE GEORGE DELTAS SEDIMENT MANAGEMENT / SHORELINE RESTORATION PROJECT

EARTH TECH
A tyco INTERNATIONAL LTD. COMPANY

SEPTEMBER 2000 39446

PLOT DATE: 10-22-2000 CAD FILE NAME: L:\...\39446\JUNE 2000\FIG-3\FIG-3.DWG IMAGE: (NONE) XREF: (NONE)



LEGEND

- DREDGE SLURRY (WATER AND SOLIDS)
- SOLIDS
- EFFLUENT (WATER)
- BACKWASH WATER
- PROCESS FLOW DIRECTION
- PROCESS EQUIPMENT UNIT (TYP)
- TRANSFER PUMP

NOTES:

1. This plan provides a typical pretreatment plan for the removal of suspended solids from the hydraulic slurry. The actual pretreatment plan will be designed in Phase 2, using the results of the detailed Phase 2 Pre-Design Investigation.
2. Pumps shown are typical. Additional pumps will likely be required.
3. Typical production rates are shown for a 10-hour work day. Actual production rates will vary based on individual delta sediment characteristics, available working hours, system down time, etc.

This document was prepared by the Lake George Association for the NYS Department of State with funds provided under Title II of the Environmental Protection Fund Act and grants from the Helen V. Froehlich Foundation.

FIGURE 4

Hydraulic Removal Methods- Conceptual Slurry Pretreatment Plan Generic Delta

LAKE GEORGE DELTAS SEDIMENT MANAGEMENT / SHORELINE RESTORATION PROJECT

EARTH TECH

A tyco INTERNATIONAL LTD. COMPANY

SEPTEMBER 2000 39446

PLOT DATE: 08-22-2000 CAD FILE NAME: L:\...\39446\JUNE_2000\FIG-5\PRO-DIA.DWG IMAGE: (NONE) XREF: (NONE)

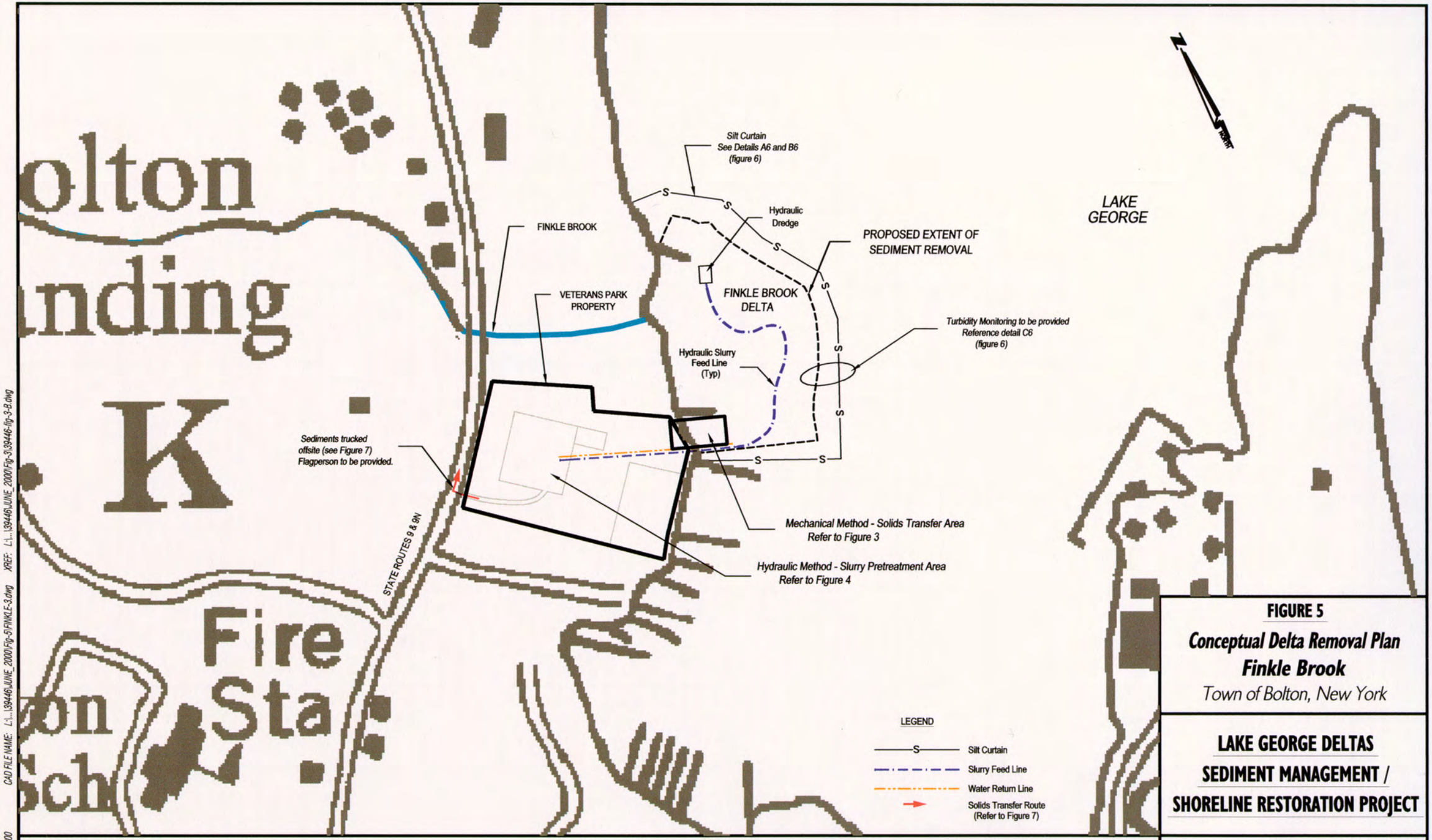


FIGURE 5

Conceptual Delta Removal Plan
Finkle Brook
Town of Bolton, New York

LAKE GEORGE DELTAS
SEDIMENT MANAGEMENT /
SHORELINE RESTORATION PROJECT

0 100 200 400
SCALE IN FEET

1. Delta sediments will be removed by either mechanical or hydraulic methods. Conceptual plan locations are shown for each method.

This document was prepared by the Lake George Association for the NYS Department of State with funds provided under Title 11 of the Environmental Protection Fund Act and grants from the Helen V. Froehlich Foundation.

Map Reference
Base map source : U.S.G.S. 7.5 minute Quadrangle Bolton Landing

EARTH TECH
A tyco INTERNATIONAL LTD. COMPANY

SEPTEMBER 2000 39446

PLOT DATE: 06-14-2000 CAD FILE NAME: L:\...\39446\JUNE_2000\Fig-5\FINKLE-3.dwg XREF: L:\...\39446\JUNE_2000\Fig-3\39446-fig-3-B.dwg

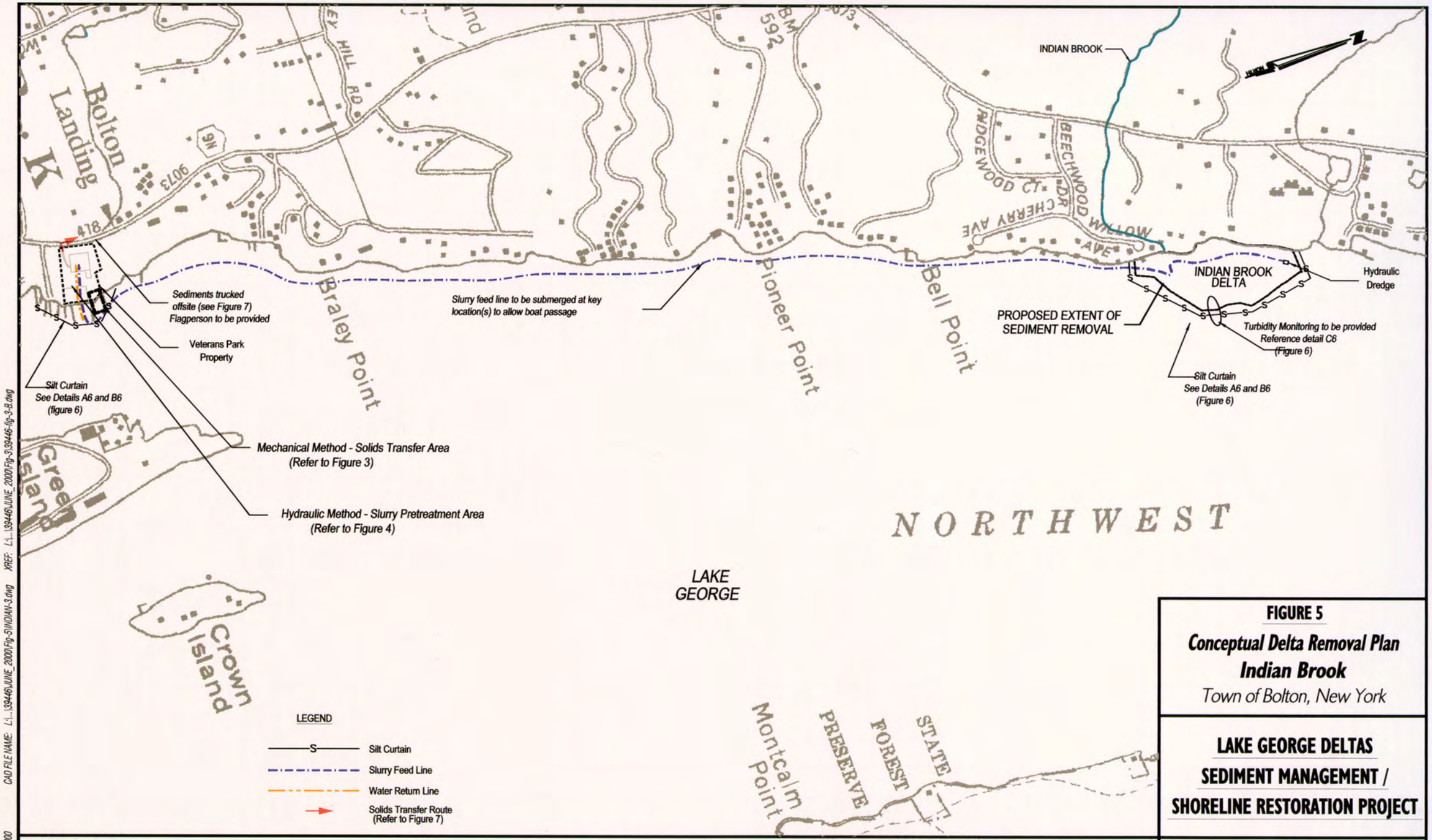


FIGURE 5

Conceptual Delta Removal Plan
Indian Brook
Town of Bolton, New York

LAKE GEORGE DELTAS
SEDIMENT MANAGEMENT /
SHORELINE RESTORATION PROJECT

This document was prepared by the Lake George Association for the NYS Department of State with funds provided under Title 11 of the Environmental Protection Fund Act and grants from the Helen V. Froehlich Foundation.

Map Reference
Base map source : U.S.G.S. 7.5 minute Quadrangle Bolton Landing

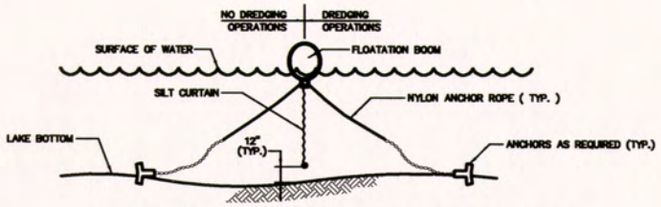
0 400 800 1600
SCALE IN FEET

1. Delta sediments will be removed by either mechanical or hydraulic methods. Conceptual plan locations are shown for each method.
2. For Hydraulic Method - Pretreated water wil be returned to the lake directly offshore of Veterans Park, inside of a silt curtain.

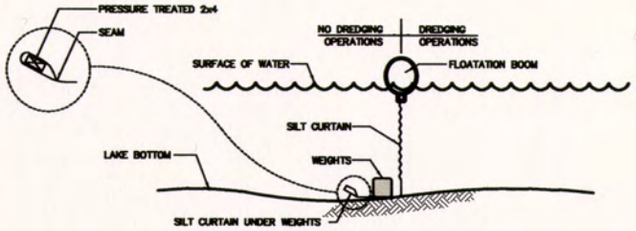
EARTH TECH
A tyco INTERNATIONAL LTD. COMPANY

SEPTEMBER 2000 39446

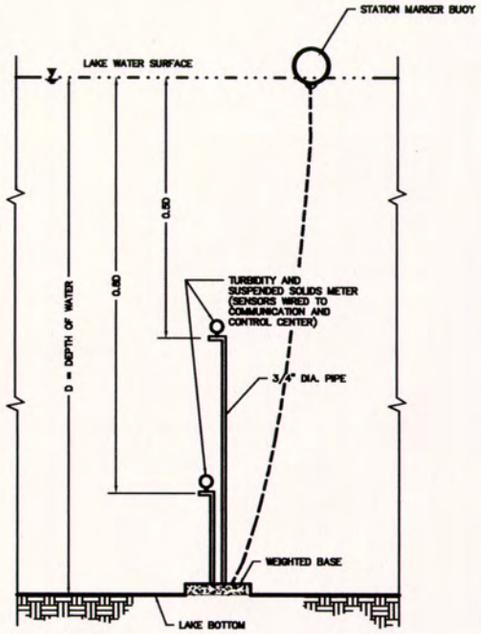
CAD FILE NAME: L:\...\39446\JUNE_2000\Fig-5\INDIAN-3.dwg XREF: L:\...\39446\JUNE_2000\Fig-3\39446-fig-3-B.dwg PLOT DATE: 06-14-2000



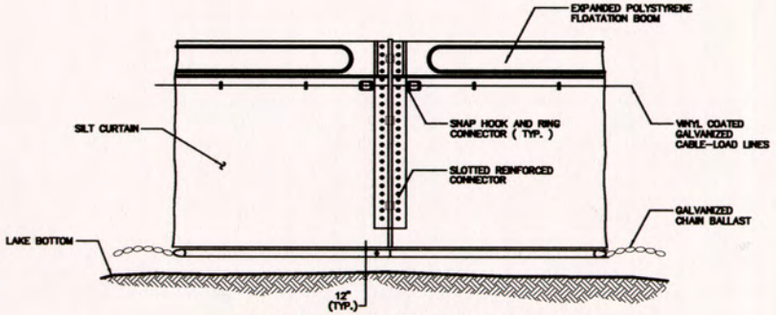
A1 / 6 TYPICAL WORK ZONE SILT CURTAIN DETAIL
NO SCALE



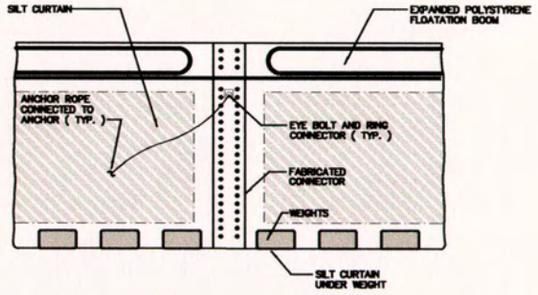
B1 / 6 TYPICAL FIXED SILT CURTAIN DETAIL
NO SCALE



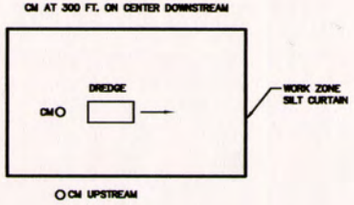
C2 / 6 TYPICAL CONTINUOUS MONITORING (CM) STATION DETAIL
NO SCALE



A2 / 6 TYPICAL WORK ZONE SILT CURTAIN PANEL CONNECTION DETAIL
NO SCALE



B2 / 6 TYPICAL FIXED SILT CURTAIN PANEL CONNECTION DETAIL
NO SCALE



C1 / 6 TYPICAL WORK ZONE MONITORING PLAN
NO SCALE

NOTE :
1. "CM" DENOTES CONTINUOUS TURBIDITY MONITOR

FIGURE 6
Conceptual Details
Generic Delta

LAKE GEORGE DELTAS
SEDIMENT MANAGEMENT /
SHORELINE RESTORATION PROJECT

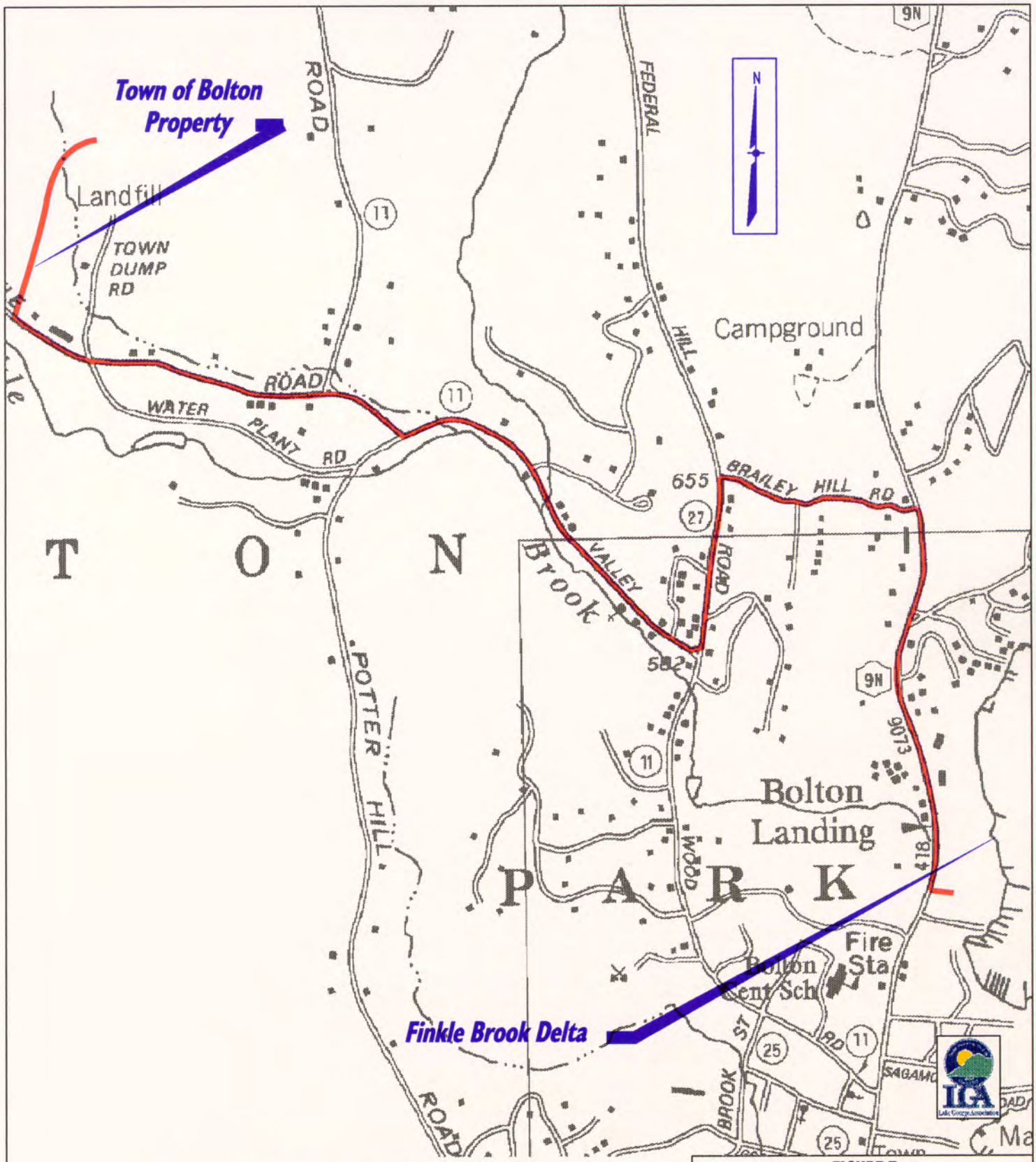
LGA Lake George Association

This document was prepared by the Lake George Association for the NYS Department of State with funds provided under Title 11 of the Environmental Protection Fund Act and grants from the Helen V. Froehlich Foundation.

EARTH TECH
A tyco INTERNATIONAL LTD. COMPANY

SEPTEMBER 2000 39446

PLOT DATE: 06-14-2000 CAD FILE NAME: L:\...\39446\JUNE_2000\FIG-4DETAILS.DWG IMAGE: (NONE) XREF: (NONE)



Roadway Transfer Route

MAP REFERENCE:
U.S.G.S. 7.5 MINUTE SERIES BOLTON LANDING

This document was prepared by the Lake George Association for the NYS Department of State with funds provided under Title II of the Environmental Protection Fund Act and grants from the Helen V. Froehlich Foundation.

FIGURE 7

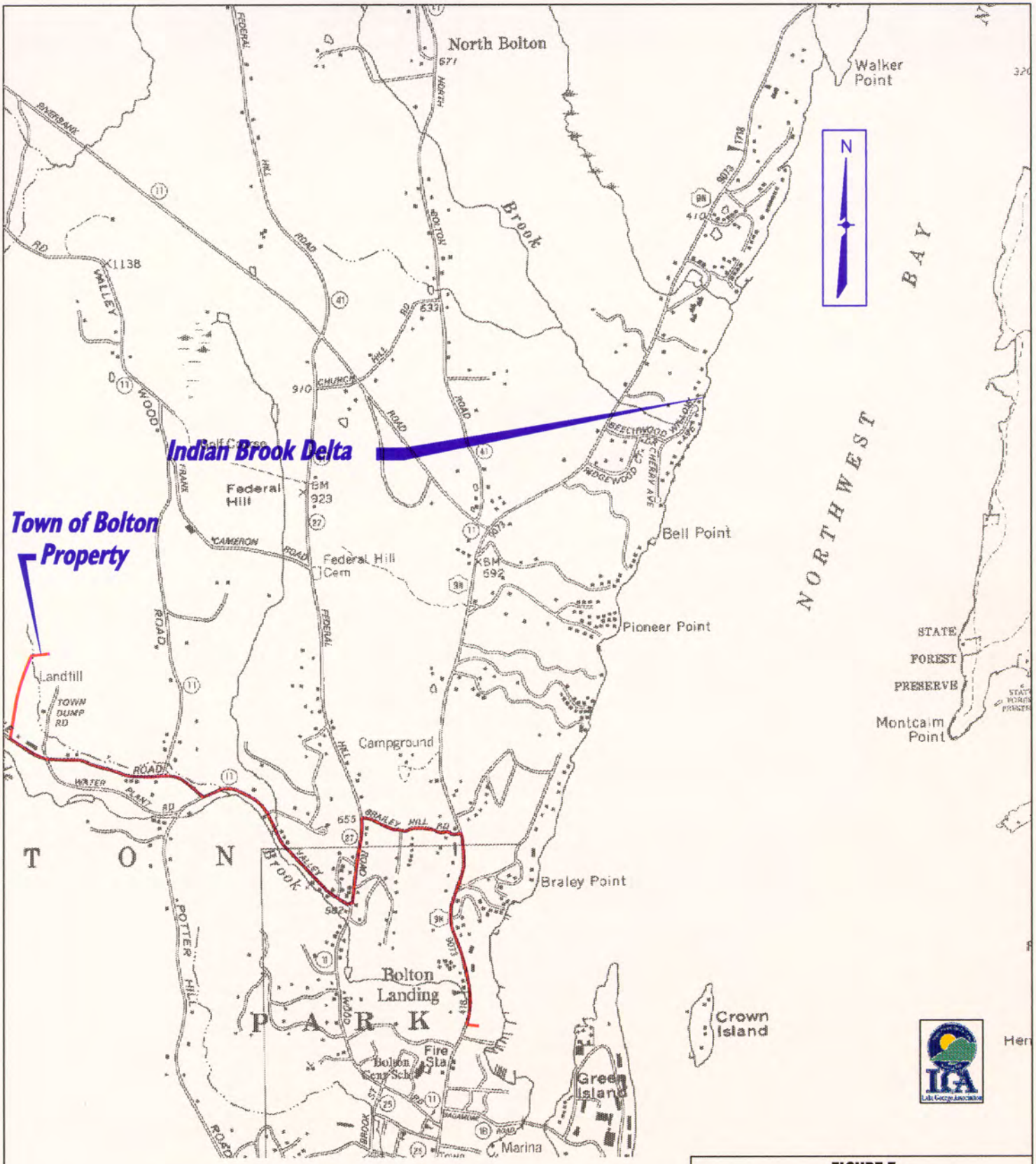
Conceptual Solids Roadway Transfer Route
Finkle Brook
Town of Bolton, New York

EARTH TECH
A tyco INTERNATIONAL LTD. COMPANY

0' 1000' 2000'
September 2000 SCALE 39446

LAKE GEORGE DELTAS
SEDIMENT MANAGEMENT / SHORELINE RESTORATION PROJECT

FILE NAME: FINKLE-7 IMAGE: BASE.TIF PLOT DATE: 08-09-2000



MAP REFERENCE:
U.S.G.S. 7.5 MINUTE SERIES BOLTON LANDING

This document was prepared by the Lake George Association for the NYS Department of State with funds provided under Title 11 of the Environmental Protection Fund Act and grants from the Helen V. Froehlich Foundation.

FIGURE 7

Conceptual Solids Roadway Transfer Route
Indian Brook
Town of Bolton, New York

EARTH TECH
A tyco INTERNATIONAL LTD. COMPANY

0' 2000' 4000'
September 2000 SCALE 39446

LAKE GEORGE DELTAS
SEDIMENT MANAGEMENT / SHORELINE RESTORATION PROJECT

FILE NAME: Indian-7 IMAGE: BASE.TIF PLOT DATE: 08-09-2000

Appendix D – Phase 2 Dredging Plans