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New York State Department of Environmental Conservation
Office of Environmental Quality, Region 4
1150 North Westcott Road, Schenectady, New York 12306-2014
Phone: (518) 357-2045 • **FAX:** (518) 357-2398
Website: www.dec.state.ny.us

Erin M. Crotty
Commissioner

November 23, 2004

Mr. James F. Morgan, Environmental Analyst
Niagara Mohawk
300 Erie Boulevard West
Syracuse, NY 12302-4250

Dear Mr. Morgan:

Re: School Street Fire Training Area.
Site No. 401040

The New York State Department of Environmental Conservation and New York State Department of Health have completed their review of the October 2004, Revised Focused Feasibility Study Report for the School Street Fire Training Area. The report addresses the outstanding issues remaining from the original report and is approved.

As you are aware, I am currently developing the Proposed Remedial Action Plan in cooperation with your consultants and appreciate your assistance as the project moves forward.

Of course, if you have any questions, feel free to call.

Sincerely,

Walter Wintsch

Walter Wintsch
Engineering Geologist 2
Region 4

cc	Keith Goertz	DEC
	Ed Belmore	DEC
	Mark Van Valkenburg	NYSDOH
	Maureen Schuck	NYSDOH
	John Brussel, PE	Blasland, Bouck & Lee Inc ✓

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Niagara Mohawk
A **National Grid** Company

Transmitted Via U.S. Mail

Mr. Walter F. Wintsch
Engineering Geologist 2
New York State Department of Environmental Conservation
Region 4 Headquarters
1150 North Westcott Road
Schenectady, NY 12306-2014

Re: Brascan Power New York
(Former Reliant Energy/Niagara Mohawk, a National Grid Company)
School Street Hydroelectric Station
Cohoes, New York
NYSDEC Site No 401044

Dear Mr. Wintsch:

Please find enclosed for your review, three copies (one unbound) of the Focused Feasibility Study (FFS) Report prepared by Blasland, Bouck & Lee, Inc. (BBL, July 2003, Revised October 2004) for the above-referenced site. The report evaluates potential remedial alternatives for nearshore sediment within the Mohawk River east of the former fire training area.

Following the New York State Department of Environmental Conservation's (NYSDEC's) approval of the FFS Report, Niagara Mohawk, a National Grid Company (Niagara Mohawk) and Reliant Energy will assist the NYSDEC in soliciting public comment on the FFS Report and Proposed Remedial Action Plan in accordance with the existing Order on Consent (Index No. A4-0416-003).

Please do not hesitate to call me at (315) 428-3101 or Mr. John C. Brussel, P.E., of BBL at (315) 446-9120 if you have any questions or require additional information.

Sincerely,

James F. Morgan

James F. Morgan
Senior Environmental Engineer

MCJ/jlc
Enclosure

cc: Mr. Michael J. Komoroske, P.E., New York State Department of Environmental Conservation (w/2 enclosures)
Ms. Deborah W. Christian, Esq., New York State Department of Environmental Conservation
Ms. Maureen E. Schuck, New York State Department of Health
Mr. Ronald L. Groves, P.E., Albany County Health Department
Ms. Deborah Canzan, Cohoes Public Library
Mr. Jeffrey M. Auser, P.E., Brascan Power New York
Mr. Joseph L. Viau, P.E., Brascan Power New York
Mr. Samuel S. Hirschey, Brascan Power New York
William J. Holzhauer, Esq., Niagara Mohawk, a National Grid Company
Mr. David J. Ulm, Blasland, Bouck & Lee, Inc. (w/o enclosure)
Mr. James M. Nuss, P.E., Blasland, Bouck & Lee, Inc.
Mr. Michael C. Jones, Blasland, Bouck & Lee, Inc.
Mr. John C. Brussel, P.E., Blasland, Bouck & Lee, Inc.

Focused Feasibility Study Report

Brascan Power New York
(Former Reliant Energy/Niagara Mohawk,
a National Grid Company)
School Street Hydroelectric Station
Cohoes, New York

July 2003
Revised October 2004

Focused Feasibility Study Report

Brascan Power New York
(Former Reliant Energy/Niagara Mohawk,
a National Grid Company)
School Street Hydroelectric Station
Cohoes, New York

July 2003
Revised October 2004

BLASLAND, BOUCK & LEE, INC.
engineers, scientists, economists

Certification Statement

I, James M. Nuss, as a licensed Professional Engineer in the State of New York, to the best of my knowledge and based on my inquiry of the persons involved in preparing this document under my direction, certify that the Focused Feasibility Study (FFS) for nearshore sediment of the Mohawk River east of the former fire training area at the Reliant Energy (former Orion Power/Niagara Mohawk, a National Grid Company [Niagara Mohawk]) School Street Hydroelectric Station located in Cohoes, New York, was completed in general accordance with the following:

- an Order on Consent (Index No. A4-0416-0003) between Niagara Mohawk Power Corporation and the New York State Department of Environmental Conservation (NYSDEC);

- the NYSDEC-approved *Remedial Investigation/Feasibility Study Work Plan* (BBL, 2000); and

- a January 10, 2002 letter from the NYSDEC to Niagara Mohawk, which provides approval of the *Remedial Investigation Report* (BBL, 2001a).

Pursuant to the above documents, and with NYSDEC concurrence, this FFS Report identifies and evaluates potential remedial alternatives to address the presence of polychlorinated biphenyls in nearshore river sediment.

STATE OF NEW YORK
JAMES M. NUSS
067963
LICENSED PROFESSIONAL ENGINEER

James M. Nuss, P.E.
Vice President
NY P.E. License No. 067963

Blasland, Bouck & Lee, Inc.
6723 Towpath Road, P.O. Box 66
Syracuse, New York 13214-0066

Table of Contents

1. Introduction

1.1 General

This revised Focused Feasibility Study Report (FFS Report) identifies and evaluates potential remedial alternatives to address the limited presence of polychlorinated biphenyls (PCBs) in nearshore sediment of the Mohawk River east of a former fire training area at the Brascan Power New York (former Reliant Energy/ Niagara Mohawk, a National Grid Company [Niagara Mohawk]) School Street Hydroelectric Station (the "site") located in Cohoes, New York. This revised FFS Report has been prepared by Blasland, Bouck, & Lee, Inc. (BBL) on behalf of Brascan Power New York (hereinafter referred to as "Brascan") and Niagara Mohawk in accordance with:

- an Order on Consent (Consent Order) between the New York State Department of Environmental Conservation (NYSDEC) and Niagara Mohawk (Index No. A4-0416-003), which became effective on March 31, 2000;

- the NYSDEC-approved *Remedial Investigation/Feasibility Study Work Plan* (BBL, 2000); and

- a January 10, 2002 letter from the NYSDEC to Niagara Mohawk, which provides approval of the *Remedial Investigation Report* (BBL, 2001a) and requests that Niagara Mohawk prepare an FS concentrating on nearshore river sediment.

The NYSDEC provided comments on the initial FFS Report (submitted in July 2003) in an October 28, 2003 letter to Niagara Mohawk. The New York State Department of Health's (NYSDOH's) comments on the report were provided in an October 16, 2003 letter to the NYSDEC that was attached to the NYSDEC's October 28, 2003 letter. In response to the NYSDEC's and NYSDOH's comments, and based on follow-up telephone conversations and e-mail correspondence with the NYSDEC, Niagara Mohawk submitted a June 25, 2004 letter to the NYSDEC proposing to implement additional nearshore sediment removal activities. The proposed additional sediment removal activities are incorporated into this revised (second version) FFS Report.

This revised FFS Report has also been prepared in general accordance with the following guidance, directives, and other publications:

- NYSDEC Technical and Administrative Guidance Memorandum (TAGM) #4025 titled, *Guidelines for Remedial Investigations/Feasibility Studies* (NYSDEC, 1989);

- NYSDEC TAGM #4030 titled, *Selection of Remedial Actions at Inactive Hazardous Waste Sites* (NYSDEC, 1990);

- United States Environmental Protection Agency (USEPA) guidance document titled, *Guidance for Conducting Remedial Investigations and Feasibility Studies Under the Comprehensive Environmental Response, Compensation, and Liability Act* (CERCLA), Interim Final (USEPA, October 1988);

- applicable provisions of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) regulations contained in Title 40 of the Code of Federal Regulations (CFR) Part 300; and

- applicable provisions of the New York State Environmental Conservation Law (ECL) and associated regulations, including Title 6 of the New York Code of Rules and Regulations (6NYCRR) Part 375.

However, as permitted by NYSDEC TAGM #4030, this revised FFS Report does not include a preliminary screening of remedial alternatives because only seven potential alternatives are under consideration. Each of the seven alternatives has undergone a detailed evaluation as specified in the guidance, directives, and other publications related to FS preparation.

Interim remedial measure (IRM) removal activities conducted between July 2002 and October 2002 addressed the presence of PCBs in upland soil in the vicinity of the former fire training area and sediment within a small area along the shoreline east of the former fire training area. The IRM soil removal activities addressed a potential source of PCBs to groundwater beneath the site and sediment within the Mohawk River adjacent to the site. The removal activities also mitigated potential human and wildlife exposures to PCBs in soil and nearshore sediment. The IRM activities were conducted in accordance with the NYSDEC-approved *Interim Remedial Measures Work Plan* (BBL, 2001b). A detailed summary of the IRM activities is presented in the NYSDEC-approved *Interim Remedial Measure Summary Report* (BBL, 2003).

Groundwater monitoring was conducted at the site during May 2003 and May 2004 in accordance with the NYSDEC-approved *Interim Remedial Measures Work Plan* (BBL, 2001b). The purpose of the monitoring was to evaluate the potential presence of PCBs in groundwater following completion of the IRM activities. Validated laboratory analytical results for the most-recent (May 2004) groundwater monitoring event indicate that PCBs were not detected above the laboratory detection limit of 0.05 parts per billion (ppb) in groundwater samples collected from three of the four bedrock monitoring wells at the site (monitoring wells MW-1, MW-2D, and MW-4). PCBs were identified in the May 2004 groundwater sample and duplicate sample collected from the remaining bedrock monitoring well (well MW-3) at "estimated" concentrations of 0.027 ppb and 0.040 ppb, which are less than the 0.09 ppb New York State groundwater quality standard presented in the NYSDEC Division of Water, Technical and Operational Guidance Series (TOGS 1.1.1) document titled, *Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations*, (NYSDEC, 2000). A concentration is referred to as "estimated" when laboratory mass spectral data indicates the presence of a compound with a result less than the laboratory detection limit.

The PCB concentrations identified in the post-IRM groundwater samples collected from monitoring well MW-3 are lower than the concentrations previously identified in samples collected from the same well prior to the IRM. Additionally, while PCBs were identified in the May 2003 groundwater sample collected from monitoring well MW-4 at an estimated concentration of 0.021 ppb, PCBs were not identified in the May 2004 groundwater sample collected from the well. The post-IRM groundwater analytical results are summarized in letter reports from Niagara Mohawk to the NYSDEC dated July 25, 2003 and September 9, 2004.

Based on the results of the Fish and Wildlife Impact Analysis (FWIA) completed as part of the RI, the relatively low PCB concentrations detected in the nearshore sediment east of the former fire training area are not expected to contribute significantly to PCB exposures to aquatic biota of the Mohawk River. However, there may be a potential for future human exposure to PCBs associated with possible future hydroelectric station maintenance activities that could disturb nearshore sediment containing low concentrations of PCBs (such as repairs to concrete piers supporting the existing ice fender), although such activities are not currently planned. This hypothetical future exposure pathway is addressed by this FFS Report. Following NYSDEC review and approval of this FFS Report, a Proposed Remedial Action Plan (PRAP) will be developed by NYSDEC that will identify the preferred remedial alternative, summarize the alternatives considered, and provide the rationale for the preferred remedy. The PRAP will be subject to a 30-day public comment period. Following the public comment period, the NYSDEC will prepare a Record of Decision (ROD), which will identify the selected remedial alternative and include a responsiveness summary to public comments and concerns raised during the public comment period.

1.2 Purpose and Objective

The purpose of this FFS Report is to identify and evaluate remedial alternatives that are appropriate for site-specific conditions, protective of human health and the environment, and consistent with the aforementioned laws, regulations, and guidance documents. The overall objective of this FFS Report is to recommend an appropriate remedial alternative for nearshore sediment that satisfies the remedial action objectives for the site.

1.3 Report Organization

This FFS Report has been organized into the following sections:

Section		Purpose
Section 1 -	Introduction	Provides background information relevant to the development of the FFS Report and remedial alternatives evaluated.
Section 2 -	Standards, Criteria, and Guidelines	Identifies the standards, criteria, and guidelines (SCGs) that guide the development and selection of remedial alternatives.
Section 3 -	Remedial Action Objectives	Develops and presents remedial action objectives (RAOs) for the nearshore sediment.
Section 4 -	Detailed Analysis of Remedial Alternatives	Presents a detailed description and screening of remedial alternatives using NCP evaluation criteria.
Section 5 -	Comparative Analysis of Remedial Alternatives	Presents a comparative analysis of each remedial alternative and the recommended remedial alternative.
Section 6 -	References	Provides a list of references cited in the FFS Report.

1.4 Background Information

This section presents relevant background information used to develop and evaluate the remedial alternatives for the site. A description of the site is presented below, followed by a summary of relevant historical information, topography and drainage in the vicinity of the site, the geologic and hydrogeologic setting of the site, and surface water quality in the Mohawk River east of the site. This section also summarizes results obtained for previous sediment investigation activities, a human exposure evaluation, and fish and wildlife impact analysis (FWIA), and presents an overview of the completed IRM activities and proposed upgrades to the hydroelectric station.

1.4.1 Site Description

The School Street Hydroelectric Station is located on School Street in Cohoes, New York. A site location map is presented on Figure 1. The generating station is located along the south bank of the Mohawk River, which flows southeasterly through the City of Cohoes.

An approximately 1,280-foot-long feeder dam extends across the Mohawk River approximately 0.9 miles north of the generating station. The dam diverts flow in the river through the approximately 0.9-mile-long power canal that leads to the generating station. The water level in the canal is controlled by two gatehouses, including an upper gatehouse adjacent to the western abutment of the feeder dam and a lower gatehouse at the downstream end of the power canal. A 375-foot-long concrete ice fender north of the upper gatehouse prevents winter ice flow in the river from entering the power canal. The locations of the ice fender, the upper and lower gatehouses, the feeder dam, and the power canal are shown on Figure 2.

Intakes and a pump house for the City of Cohoes public drinking water supply are located at the downstream end of the power canal, approximately 4,500 feet downstream from the upper gatehouse (approximately 200 feet upstream from the lower gatehouse). Water drawn from the power canal for public water supply is treated at the City of Cohoes Water Treatment Plant.

An area approximately 150 feet northwest of the ice fender and feeder dam (situated along the southern bank of the Mohawk River in the Town of Colonie) was formerly utilized by Niagara Mohawk for fire training activities. Fire training activities were conducted within an area approximately 115 feet long by 35 feet wide that is bordered to the north by a vacant field, to the south by an access road to the feeder dam, to the east by the Mohawk River, and to the west by Crescent Road (which becomes North Mohawk Street farther to the south). The location of the former fire training area is shown on Figure 2. Access to the former fire training area is limited by a chain-link fence that runs parallel to Crescent Road and locked gates that block the access road to the north and south of the former fire training area.

1.4.2 Ownership History

The School Street Hydroelectric Station was constructed in approximately 1915. The station was originally owned and operated by several predecessor companies to Niagara Mohawk. In 1999, Niagara Mohawk sold the hydroelectric station to Erie Boulevard Hydropower, operating as Orion Power Holdings, Inc. (Orion). In early 2002, Orion/Erie Boulevard Hydropower was acquired by Reliant Energy. Most recently (at the end of September 2004), Brascan Power New York completed an acquisition of the School Street Hydroelectric Station from Reliant Energy and became the new site owner and operator.

1.4.3 Site History

Fire training activities were conducted at the site during the period from approximately 1968 to 1980. Employees of Niagara Mohawk's eastern operating region took part in the training activities, which were conducted intermittently throughout the summer and fall of each year of operation. Fire training activities conducted at the site consisted of igniting oil (including transformer oil) that was piped to or poured over training props. The fires were then extinguished using a combination of dry chemical fire extinguishers and water pumped from the river. Water was also utilized to cool the props after the fires had been extinguished. Props utilized in the fire training area reportedly included a bank of three oil-filled circuit breakers, a metal pan, and a pole-mounted transformer that was suspended approximately 6 feet above ground level. Oil burned at the site was reportedly stored in a tank located within or adjacent to the fire training area. Oil from the tank may have been pumped to the props via underground piping. The tank and the training props were removed after the fire training activities at the site were discontinued. The approximate layout of the former fire training area is shown on Figure 3.

Based on conversations with former Niagara Mohawk personnel familiar with site operations, Niagara Mohawk apparently removed sediment from the Mohawk River in the immediate vicinity of the ice fender as part of a project to rehabilitate the ice fender during the early 1980s. The sediment spoils generated from the project (and an unknown volume of sediment removed from the vicinity of an ice fender at the Green Island Hydroelectric Station) were placed in a low elevation area north of the former fire training area. Former Niagara Mohawk personnel also indicated that sediment removed from the Mohawk River on either side of the feeder dam during the summer of 1998 (as part of a spillway rehabilitation project) was placed/graded in the area immediately south of the former fire training area, which is shown on Figure 3. Based on the results of previous sampling and analysis activities, PCBs were not detected in either of the spoil areas at concentrations greater than 1 part per million (ppm).

In preparation for the anticipated divestiture of the School Street Hydroelectric Station, Niagara Mohawk retained the Chazen Companies to conduct a Phase I Environmental Site Assessment (ESA) of the property in April 1998. Following completion of the Phase I ESA, Niagara Mohawk retained Fluor Daniel GTI to conduct a Phase II ESA to evaluate potential environmental concerns identified by the Phase I ESA. The Phase II ESA consisted of a soil investigation, which was completed in August 1998. The Phase II ESA identified the presence of PCBs in subsurface soil within the former fire training area at concentrations exceeding the 10 ppm NYSDEC-recommended subsurface soil cleanup objective presented in the NYSDEC TAGM #4046 titled, *Determination of Soil Cleanup Objectives and Cleanup Levels*" HWR-94-4046, dated January 24, 1994 (NYSDEC, 1994b). Surface soil was not characterized as part of the Phase II ESA.

Based on the Phase II ESA results, Niagara Mohawk retained BBL to conduct a Preliminary Site Assessment (PSA) to further evaluate site conditions. The PSA was implemented between March and November 1999 and included soil, groundwater, and sediment investigation activities. During the PSA, PCBs were detected in surface and subsurface soil samples at concentrations greater than the NYSDEC-recommended soil cleanup objectives presented in TAGM #4046, and the 50 ppm disposal criterion for a TSCA-regulated PCB waste and a New York State hazardous waste (Waste Code B007). The PSA also identified areas of visibly oil-stained soil and soil containing semi-volatile organic compounds (SVOCs) at concentrations exceeding NYSDEC-recommended soil cleanup objectives presented in TAGM #4046. The results of the PSA are summarized in the *Remedial Investigation/Feasibility Study Work Plan* (BBL, 2000).

Based on the PSA results, the former fire training area was listed in the New York State Registry of Inactive Hazardous Waste Disposal Sites (Site No. 401044), and Niagara Mohawk entered into the Consent Order with the NYSDEC, which required Niagara Mohawk to develop and implement a remedial program for the site. In accordance with the Consent Order, Niagara Mohawk retained BBL to prepare the *Remedial Investigation/ Feasibility Study Work Plan* (BBL, 2000). NYSDEC approval of the work plan was provided in a September 27, 2000 letter to Niagara Mohawk. The RI field activities were subsequently completed between October 2000 and February 2001. The results of the RI are detailed in the *Remedial Investigation Report* (BBL, 2001a).

Based on the results of the RI, Niagara Mohawk and Brascan elected to conduct an IRM to remove impacted soil in the vicinity of the former fire training area. An *Interim Remedial Measures Work Plan* (BBL, 2001b) was submitted to the NYSDEC and approved in a January 9, 2002 letter to Niagara Mohawk. Brascan and Niagara Mohawk retained SLC Environmental Services, Inc. (SLC) of Rochester, New York to implement the IRM activities. The IRM activities were completed by SLC between July and October 2002, and observed by an onsite Engineer from BBL. The NYSDEC periodically conducted site visits during implementation of the IRM activities. A detailed summary of the IRM activities is presented in the NYSDEC-approved *Interim Remedial Measure Summary Report* (BBL, 2003).

1.4.4 Topography and Drainage

Surface topography in the vicinity of the former fire training area before implementation of the IRM activities is shown on Figure 3. As shown on Figure 3, surface topography within the former fire training area sloped gently toward the southeast to the top of the riverbank. Pre-IRM ground surface elevations in the former fire training area ranged from approximately 165 to 185 feet above mean sea level (MSL). The slope of the adjacent riverbank ranged from relatively flat (less than 10 degrees southeast of the former fire training area) to steep (greater than 45 degrees directly east of the former fire training area). At its maximum elevation, the top of the riverbank was roughly 23 feet above the water level of the Mohawk River, which is maintained by the upstream New York Power Authority (NYPA) Crescent Hydroelectric Station and the School Street Hydroelectric Station, to the extent possible, at a target elevation of approximately 155 to 156 feet above MSL.

The topography in the vicinity of the former fire training area was modified by the IRM activities. Following the excavation activities, the former fire training area was backfilled and graded with a slightly steeper slope toward the riverbank than prior to the IRM. The elevations along the top of the riverbank east and southeast of the former fire training area were lowered by approximately 2 to 3 feet, leaving an approximately 20-foot high riverbank. Storm water runoff in the vicinity of the former fire training area continues to drain to the Mohawk River via overland flow.

The Mohawk River and the power canal are the primary surface-water features in the vicinity of the former fire training area. The feeder dam southeast of the former fire training area diverts water from the Mohawk River through the power canal to the School Street Hydroelectric Station. Approximately 1 mile upstream from the former fire training area, the Mohawk River is dammed by the NYPA Crescent Hydroelectric Station.

1.4.5 Surface Water Quality

The power canal and portion of the Mohawk River adjacent to the former fire training area are designated as Class A water bodies. The NYSDEC defines Class A surface water as a source of water for drinking, primary and secondary contact recreation, and fishing. Class A surface waters are suitable for fish propagation and survival.

As previously mentioned, the intakes for the City of Cohoes public drinking water supply are located at the downstream end of the power canal. Previous monthly and semi-annual water monitoring conducted by the City of Cohoes and quarterly water monitoring conducted by Niagara Mohawk indicate that PCBs have not been detected in the source of drinking water to the City of Cohoes Water Treatment Plant. The monitoring has been conducted during low-flow conditions associated with seasonal dry-weather and during high-flow conditions associated with rainfall/snowmelt. PCBs have not been detected at concentrations exceeding laboratory detection limits in any of the monthly/semi-annual water samples collected by the City of Cohoes or the quarterly water samples collected by Niagara Mohawk. Laboratory detection limits have generally been approximately 0.05 ppb for each monitoring event, except for one monthly monitoring event by the City (June 2001) in which the laboratory detection limit was 0.1 ppb. The higher detection limit for the June 2001 monitoring event was attributed to the analysis being performed by a different laboratory and did not indicate the potential presence of PCBs in the water. Results for water monitoring conducted by the City of Cohoes are summarized in a November 8, 2001 letter from Niagara Mohawk to the NYSDEC, which describes the approach for quarterly monitoring activities. Results for quarterly water monitoring conducted by Niagara Mohawk are summarized in letters to the NYSDEC dated May 28, 2002; September 12, 2002; November 7, 2002; January 13, 2003; and July 25, 2003.

The fish community within the river in the vicinity of the site is dominated by game species, including bass and walleye (McBride, 1985). Currently, there is no fish consumption advisory on the stretch of the Mohawk River adjacent to the site (NYSDOH, 1999). Based on an October 31, 2000 letter from the NYSDEC Division of Fish, Wildlife and Marine Resources (included in the *Remedial Investigation Report* [BBL, 2001a]), no fish kill incidents have been reported for the Mohawk River in the vicinity of the former fire training area.

1.4.6 Geologic/Hydrogeologic Setting

Regional surface geology in the area is generally characterized as lacustrine silt and clay deposits. The lacustrine silt and clay deposits are typically laminated and up to 100 meters thick. Based on the subsurface soil characteristics observed at the site during the investigation activities and the IRM, the overburden material across the majority of the former fire training area appeared to be brown silt with some clay, sand, and/or gravel (typically shale fragments) to depths generally ranging from 0 to 4 feet below ground surface (bgs). The overburden in the southeastern portion of the former fire training area (near monitoring well cluster MW-2, as shown on Figure 3) appeared to be primarily brown-orange sand and silt to a depth of approximately 8 feet bgs. The overburden material south of the former fire training area (toward the lower gatehouse) generally consisted of brown sand/gravel overlying silt and sand to depths of 3.5 to 5 feet bgs. The areas excavated during the IRM were restored primarily with varying thicknesses of run-of-bank gravel (approximately 0 to 4.5 feet) and up to 4 inches of topsoil.

Bedrock encountered beneath the overburden at the site consists of approximately 1 to 2 feet of weathered shale overlying more competent shale. The bedrock geology in the area is mapped as the Austin Glen Formation, which consists of shale and greywacke from the mid- to late-Ordovician Period.

Based on the previous investigation activities, groundwater is encountered in overburden (immediately above the bedrock) at downgradient monitoring well cluster MW-2. Groundwater is encountered in the bedrock at monitoring well locations MW-1, MW-3, and MW-4 (shown on Figure 3). Groundwater was encountered just above bedrock during IRM excavation activities at the base of the riverbank east of the former fire training area. Groundwater was not encountered during IRM excavation activities west of the riverbank. No reported or known uses of groundwater occur hydraulically downgradient from the site.

1.5 Previous Sediment Investigations

PSA sediment investigation activities were conducted to evaluate the potential presence and extent of PCBs in sediment within the Mohawk River adjacent to the former fire training area. In accordance with the NYSDEC-approved *Remedial Investigation/Feasibility Study Work Plan* (BBL, 2000), RI sediment investigation activities were conducted to further delineate the extent of PCBs in the Mohawk River adjacent to the former fire training area, and to evaluate the potential presence and extent of PCBs in sediment within the power canal. The sediment investigation activities are summarized below, followed by a discussion of the results.

1.5.1 Sediment Investigation Activities

The PSA and RI sediment investigation activities included:

- probing activities to determine the depth of accumulated sediment in the section of the Mohawk River adjacent to the former fire training area and within the power canal; and

- collecting surface sediment and sediment core samples from the Mohawk River and power canal for visual characterization and laboratory analysis.

The PSA sediment investigation activities, conducted in November 1999, included sediment probing and sediment sampling in an approximately 300-foot long by 100-foot wide section of the Mohawk River adjacent to the former fire training area. The RI sediment investigation activities, conducted in October 2000, included additional sediment sampling in the Mohawk River to delineate the extent of PCBs in sediment east of the former fire training area, and sediment probing/sampling activities in the power canal (while the canal was dewatered for maintenance activities) to evaluate the extent of PCBs in sediment in the canal. Additional sediment investigation activities were conducted during December 2000 to evaluate an area where a sheen was observed during the October 2000 sediment investigation activities, and during September 2002 to further evaluate nearshore sediment east of the former fire training area where visibly oil-impacted material was encountered during IRM soil removal activities.

A description of the sediment probing and sampling activities conducted as part of the PSA and RI is presented below. Sediment sampling activities conducted during the IRM are described in Subsection 1.8 below.

1.5.1.1 Sediment Probing Activities

Sediment probing was conducted at six transects in the Mohawk River east of the former fire training area (Transects T1 through T6), along one transect located in the forebay to the upper gatehouse (Transect T7, midway between the ice fender and the upper gatehouse), and at the five transects located in the power canal (Transects T8 through T12), which are shown on Figures 4A and 4B. The thickness of sediment and the depth of the water column over the sediment (where applicable) were measured at each probing location using a graduated 0.5-inch hollow steel rod fitted with an end cap. The sediment probing locations in the river were surveyed, and sediment probing locations in the power canal were documented with tie-distances measured from the shoreline and permanent structures along the shoreline, such as transmission tower footings.

1.5.1.2 Sediment Sampling Activities

As part of the sediment investigation activities, surface sediment and sediment core samples were collected from the following locations (shown on Figures 4A and 4B):

- twelve locations within the Mohawk River east of the former fire training area, including six locations approximately 10 feet from the shoreline (sampling locations SD-1 through SD-6) and six locations approximately 60 feet from the shoreline (sampling locations SD-7 through SD-12);

- one location in the Mohawk River between the ice fender and the upper gatehouse (sampling location SD-13); and

- six locations in the power canal, including one location approximately 1,000 feet downstream from the upper gatehouse (sampling location SD-14) and three locations toward the downstream end of the power canal opposite the intakes for the City of Cohoes public drinking water supply (sampling locations SD-15 through SD-17), and two locations approximately 3,750 feet downstream from the upper gatehouse (sampling locations SD-18 and SD-24).

Each surface sediment and sediment core sample was collected using 2-inch diameter Lexan® tubing, which was advanced to the depth of refusal. Sediment recovered at each location (except SD-15) was sectioned into the following intervals:

- 0.5-foot depth intervals (beginning with 0 to 0.5 feet) to a depth of 2 feet; and

- 1-foot depth intervals (beginning with 2 to 3 feet) through the remaining depth of the sediment column.

Alternate sampling intervals were selected for location SD-15, where approximately 3 feet of zebra muscle shells intermixed with fine sand were encountered overlying approximately 2 feet of accumulated fine sand. Each sediment sample was visually characterized for color, texture, and staining. In addition, each surface sediment sample (19 samples total) and sediment core sample (48 samples total) was submitted for laboratory analysis for PCBs using USEPA SW-846 Method 8082. Selected surface sediment and sediment core samples were submitted for laboratory analysis for total organic carbon (TOC) using the Lloyd Kahn method. An analytical sample summary for the sediment samples collected as part of the PSA and RI is included as Table 1.

Surface sediment samples collected from two sampling locations during December 2000 to further characterize an apparent sheen seeping from the west bank of the power canal (locations SD-18 and SD-24) were also analyzed for volatile organic compounds (VOCs), SVOCs, TOC, and total petroleum hydrocarbons (TPH). The results of the December 2000 sediment investigation activities were summarized in a January 10, 2001 letter from Niagara Mohawk to the NYSDEC. Based on the investigation results, the sheen appeared to be associated with a petroleum discharge not related to past or present operations at the site.

1.5.2 Sediment Investigation Results

Based on sediment probing, sediment depths ranged from 0.2 to 7.4 feet in the Mohawk River east of the former fire training area and 0 to 2.4 feet throughout the power canal, except at the downstream end of the canal where up to 5 feet of sediment was encountered where the canal bends eastward toward the lower gatehouse. The water depth measured at the sediment probing locations ranged from 0 feet (in portions of the dewatered power canal) to 10.5 feet (at a probing location approximately 110 feet east of the Mohawk River shoreline opposite the former fire training area). The water and sediment depths at each sediment probing location are presented in Table 2.

Visual characterization of the recovered sediment samples indicates that sediment in the Mohawk River and the power canal generally consists of a grayish-brown colored sand, intermixed with zebra muscle shells near the surface. Visual characterization information for each sediment sample is presented in Table 3. Analytical results obtained from the laboratory analysis of the PSA and RI sediment samples for PCBs and TOC are presented in Table 4. Analytical results for the sediment samples collected from the Mohawk River east of the former fire training area are shown on Figure 4A, while the analytical results for the sediment samples collected from the power canal are shown on Figure 4B. The PSA and RI sediment analytical results are summarized below.

- PCBs were detected in 16 of the 19 surface sediment samples, with concentrations ranging from 0.015 ppm to 7.3 ppm, and with an arithmetic average of 0.78 ppm.

- PCBs were detected in 19 of the 48 sediment core samples, with concentrations ranging from 0.013 ppm to 1.9 ppm, and with an arithmetic average of 0.13 ppm.

The highest PCB concentration identified in the PSA and RI sediment samples (7.3 ppm) was detected at location SD-3, approximately 10 feet from the shoreline and adjacent to the area where the highest PCB concentrations were identified in the upland soil. The PCB concentrations detected in the nearshore river sediment diminish quickly with distance from the upland former fire training area and also diminish quickly with depth, as indicated below.

- The highest PCB concentration detected along the line of sediment samples approximately 60 feet east of the shoreline is 0.085 ppm (in surface sediment at location SD-8).

- PCBs were not detected in any sediment core samples collected at depths of greater than 2 feet below the sediment surface in the Mohawk River east of the former fire training area, or at depths of greater than 1.5 feet below the sediment surface in the power canal (except for the downstream end of the canal, where PCBs were identified at low concentrations between 4.5 and 5.0 feet at SD-15).

The detection of Aroclor 1248 in several sediment samples, which was not identified in the PSA/RI soil or groundwater samples from the former fire training area, and the distribution of the PCB Aroclors in sediment within the river and power canal, suggest that the site-related presence of PCBs in sediment is limited to sampling locations nearest to/immediately downstream from the former fire training area. The remaining PCBs identified in the sediment may be attributable with offsite sources, other than the former fire training area. A detailed review of PCB Aroclor data for soil, groundwater, and sediment samples collected as part of previous investigation activities, which supports the conclusions above, is summarized in a June 20, 2002 memorandum from BBL to Niagara Mohawk (included in Appendix A).

For the purpose of evaluating the sediment sampling results, the results were compared to sample-specific sediment criteria calculated using the three ecological, risk-based levels of protection presented in the NYSDEC document titled, *Technical Guidance for Screening Contaminated Sediments*, dated January 1999, and the concentration of TOC (where available) detected in the individual sediment samples. Sediment criteria were calculated for the protection of benthic aquatic life from acute and chronic toxicity, and for the protection of wildlife from bioaccumulation. The sediment criterion for the protection of wildlife from bioaccumulation (1.4 micrograms PCBs per gram organic carbon) was the lowest of the ecological, risk-based sediment criteria. The three criteria were compared with analytical results obtained for the surface sediment samples (0 to 0.5 feet) because surface sediment contains the highest level of biological activity and potential for exposure. The results of this comparison are conservative because the highest PCB concentrations were identified primarily in the surface sediment. Comparison of the surface sediment sample results to the sediment criteria indicates the following:

- the PCB concentration detected in each PSA and RI surface sediment sample does not exceed the sample-specific PCB criterion for the protection of benthic aquatic life from acute toxicity; and

- the PCB concentrations detected in four surface sediment samples exceed the sample-specific PCB criteria for the protection of benthic aquatic life from chronic toxicity, and the PCB concentrations detected in 14 surface sediment samples exceed the PCB sediment criteria for the protection of wildlife from bioaccumulation.

The calculated sample-specific sediment criteria are presented in Table 4. In accordance with the NYSDEC document titled, *Technical Guidance for Screening Contaminated Sediments*, dated January 1999, sediment with constituent concentrations exceeding calculated sample-specific sediment criteria are considered impacted, but the criteria do not necessarily represent a final concentration to be achieved by remediation.

1.6 Human Exposure Evaluation

A qualitative human health exposure evaluation was conducted as part of the RI to evaluate current and reasonably foreseeable human exposure pathways. Based on the evaluation, the only potentially significant exposure pathway identified was potential human exposure to PCBs in soil in the vicinity of the former fire training area. Possible receptors included onsite workers and trespassers, and the most significant exposure route was direct-contact (via dermal contact and incidental ingestion). This exposure pathway has been eliminated by the IRM soil removal activities completed in October 2002.

The potential for onsite workers and trespassers to contact PCBs in sediment within the Mohawk River and power canal was considered in the human exposure evaluation, but found to be insignificant. First, PCBs were detected in roughly one-half of the sediment samples, and most of the detected concentrations were relatively low. In addition, the highest PCB concentrations in sediment were associated with a relatively small area immediately adjacent to the former fire training area. The physical characteristics of the west bank of the Mohawk River and the power canal also minimize potential human exposure to sediment. The riverbank in the vicinity of the former fire training area is relatively steep, and the sediment is under approximately 5 to 10 feet of water, on average. The banks on either side of the canal are also steep. There is little to no sediment accumulation on much of the bedrock canal bottom. Swimming is not allowed in the river near the ice fender or feeder dam, nor in the power canal. A chain-link fence around the former fire training area and power canal limits access to these areas. Although PCBs are known to bioaccumulate in fish, given the small size of the affected area and the relatively low concentrations detected in sediment, it is unlikely that PCBs in sediment in the vicinity of the site would have a significant effect on PCB concentrations in resident fish. Therefore, potential exposure via bioaccumulation in fish tissue is not expected to be significant.

Potential worker exposure to PCBs in sediment within the power canal, while dewatered for future maintenance activities (and planned construction activities, as discussed in Subsection 1.9 below), is expected to be relatively low because, again, there is little to no sediment accumulation on much of the bedrock canal bottom, and in areas where sediment has been encountered, PCBs were either non-detect or identified at low concentrations.

Because the intakes for the City of Cohoes public drinking water supply are located at the downstream end of the power canal, the drinking water ingestion exposure pathway was also considered in the human exposure evaluation. However, PCBs have not been detected in water samples collected from the power canal near the intakes. In addition, water pumped from the power canal is treated at the City of Cohoes Water Treatment Plant prior to distribution to the public. Therefore, the potential for exposure via ingestion of PCBs in drinking water is considered to be insignificant.

There may be a potential future human exposure to PCBs associated with possible future hydroelectric station maintenance activities that could disturb nearshore sediment containing low concentrations of PCBs (e.g., repairs to concrete piers supporting the ice fender), although such activities are not currently planned. This hypothetical future human exposure pathway is addressed by this FFS Report.

1.7 Fish and Wildlife Impact Analysis

An FWIA was completed as part of the RI to evaluate the sensitivity of ecological resources in the vicinity of the site, identify complete exposure pathways for these resources to PCBs in environmental media, and compare the detected PCB concentrations to media-specific standards and criteria. The FWIA consisted of Steps IA through IIB as outlined in the NYSDEC guidance document titled, *Fish and Wildlife Impact Analysis for Inactive Hazardous Waste Sites* (NYSDEC, 1994a).

PCBs were identified in a small area of sediment in the Mohawk River adjacent to the site and in the power canal at concentrations exceeding the NYSDEC sediment criteria for chronic benthic exposures and for wildlife bioaccumulation. However, the extent of PCB-containing sediment adjacent to the site is small in relation to the large area of the Mohawk River near the site. The availability of such a large area for aquatic organisms limits the duration of exposures actually occurring in the vicinity of the site and reduces the significance of these exposures.

PCBs have been detected in fish and sediment at locations upstream from the site. A fish advisory exists for an upstream portion of the Mohawk River due to the presence of PCBs. The relatively low PCB concentrations detected in the sediment in a section of the Mohawk River adjacent to the former fire training area and in the power canal are not expected to contribute significantly to PCB exposures to aquatic biota of the Mohawk River.

1.8 Interim Remedial Measure

Based on the results of the RI, Brascan and Niagara Mohawk elected to implement an IRM to remove surface and subsurface soil at and in the vicinity of the former fire training area that contained PCBs at concentrations exceeding the NYSDEC-recommended cleanup objectives of 1 ppm for surface soil and 10 ppm for subsurface soil. The IRM also addressed soil that was visibly oil-stained, soil that contained SVOCs at concentrations exceeding NYSDEC-recommended soil cleanup objectives, and nearshore sediment in a small area of the Mohawk River east of the former fire training area that contained low concentrations of PCBs. The IRM activities were implemented by SLC between July 2002 and October 2002 and observed by an onsite engineer from BBL. The NYSDEC periodically conducted site visits during implementation of the IRM activities.

Approximately 3,925 cubic yards (CY) of impacted soil in the vicinity of the former fire training area and approximately 25 CY of impacted sediment along the riverbank east of the former fire training area were excavated as part of the IRM. The horizontal limits of the IRM excavation activities are shown on Figure 5. The excavated materials were transported for offsite disposal in accordance with applicable rules and regulations based on waste characterization sampling activities conducted before and during the IRM activities. Verification soil samples were collected and analyzed following the soil excavation activities to confirm that remaining soil at the excavation limits did not contain PCBs at concentrations exceeding NYSDEC-recommended soil cleanup objectives.

During the IRM excavation activities, visibly oil-stained soil was encountered along the base of the riverbank east of the former fire training area, opposite PSA and RI soil sampling locations where the highest PCB concentrations had previously been identified. As part of the effort to delineate the eastern extent of the oil-stained material, a series of nearshore sediment samples were collected approximately 3 feet and 8 feet east of the shoreline (at locations SD-101 through SD-108, as shown on Figure 5). Visibly oil-stained material was not encountered at any of these sediment sampling locations. One sediment sample obtained from the 0.5-foot depth interval just above refusal at each sampling location was analyzed for PCBs and TOC. The validated PCB and TOC sediment analytical results are presented in Table 4 and shown on Figure 5. The results are summarized below.

- PCBs were detected at five of the eight sediment sampling locations at concentrations ranging from 0.18 ppm to 14 ppm. The 14 ppm result, obtained for sediment sample SD-103 collected approximately 3 feet east of the shoreline, was higher than any of the previous PSA and RI sediment analytical results. The remaining PCB concentrations (6.1 ppm and less) were generally consistent with the previous PSA and RI sediment analytical results.

- PCB concentrations identified in the nearshore sediment generally diminished with distance from the shoreline, which is consistent with the findings from the PSA and RI sediment investigation activities.

Sediment within an approximately 120-foot section of the shoreline was subsequently removed in connection with the excavation of visibly oil-stained soil along the base of the riverbank. The eastern edge of the excavation extended just beyond sediment sampling location SD-103, where the highest PCB sediment concentration was found. Prior to the removal activities, the water level in the impoundment east of the former fire training area was lowered to the maximum extent possible, which was approximately 2 to 4 feet below the crest of the feeder dam. The drawdown was achieved mainly due to seasonal low-flow conditions in the Mohawk River and dry weather preceding the excavation activities. Additional sediment removal to the east was attempted after reaching the limits of visibly oil-stained material, but was discontinued when a significant amount of river water began to seep through the eastern sidewall.

As previously mentioned, the IRM activities mitigated the potential future migration of PCBs to groundwater beneath the site and sediment within the Mohawk River adjacent to the site. The activities also mitigated potential human and wildlife exposure to PCBs in soil in the vicinity of the site and nearshore sediment east of the site. Based on the IRM verification soil sampling results and results obtained for previous soil samples collected outside the excavation limits, no further investigation or remedial activities are proposed for soil in the former fire training area. A detailed summary of the IRM activities is presented in the NYSDEC-approved *Interim Remedial Measure Summary Report* (BBL, 2003).

1.9 Facility Upgrades

Brascan is currently developing plans for upgrades to the School Street Hydroelectric Station primarily intended to increase the generating capacity of the station. Existing plans also include measures to assist the downstream passage of native species of fish and non-native blueback herring and striped bass. Construction is anticipated to begin during 2006 and take at least 6 to 12 months to complete. The existing generating station will be completely shut down during the construction period. The upgrades are currently anticipated to involve:

- modifying the ice fender to serve as a temporary cofferdam to eliminate flow to the power canal and facilitate other proposed construction work;

- replacing the existing vertical-lift gates and tainter gates in the upper gatehouse;

- ripping, blasting, and removing approximately 65,000 CY of material from the bottom of the power canal, which includes any existing sediment, to increase flow conveyed to the generating station and offset anticipated head-loss from the proposed measures to assist the downstream passage of native fish species. Approximately 4 to 5 feet of material is expected to be removed over the full length of the power canal;

- potentially installing a new generating unit at the downstream end of the power canal; and

- constructing a temporary water line to convey water to be pumped from the Mohawk River (downstream from the existing generating station) to an existing pump house owned by the City of Cohoes and located along North Mohawk Street. From the pump house, water will be conveyed through existing piping to the City of Cohoes Water Treatment Plant.

Based on existing sediment analytical data which indicate PCB concentrations within the location of the planned upgrades were low (between an estimated 0.013 ppm to 0.143 ppm) or not-detected, special handling will not be required for the material removed from the power canal. The excavated material will be:

- used onsite or offsite as hard fill under a permit as described in 6 NYCRR Part 360-1.2(a)(4)(ix); and/or

- transported offsite for disposal as a solid waste in accordance with 6 NYCRR Part 360.

2. Standards, Criteria, and Guidance

2.1 General

This section of the FFS Report discusses potential SCGs as set forth in NYSDEC TAGM #4025 titled, *Guidelines for Remedial Investigations/Feasibility Studies* (NYSDEC, 1989), NYSDEC TAGM #4030 titled, *Selection of Remedial Actions at Inactive Hazardous Waste Sites* (NYSDEC, 1990), and applicable provisions of the New York State ECL and the NCP. The potential SCGs are used in the identification of RAOs and evaluation of potential remedial alternatives but do not dictate a particular alternative and do not set remedial cleanup levels.

2.1.1 Definition of SCGs

Definitions of the SCGs are presented below.

- Standards and Criteria – are cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under federal or state law that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstances.

- Guidelines – are non-promulgated criteria that are not legal requirements. However, remedial programs should be designed with consideration given to guidelines that, based on professional judgment, are determined to be applicable to the site [6 NYCRR Part 375-1.10(c)(1)(ii)].

The NYSDEC has also identified certain guidance as “to-be-considered” (TBC) criteria. TBC criteria are non-promulgated advisories or guidance issued by federal or state governments that are not legally binding and do not have the status of potential SCGs. For example, the sediment criteria presented in the NYSDEC document titled, *Technical Guidance for Screening Contaminated Sediments*, (NYSDEC, 1999), are TBC criteria. The TBC criteria are considered, as appropriate, with SCGs to develop remedial cleanup levels that are protective of human health and the environment.

2.1.2 Types of SCGs

The NYSDEC has provided guidance on the application of the SCGs concept into the RI/FS process. The potential SCGs considered for the potential remedial alternatives identified in this FFS were categorized into the following NYSDEC-recommended classifications:

- Chemical-Specific SCGs – These SCGs are usually health- or risk-based numerical values or methodologies that, when applied to site-specific conditions, result in the establishment of numerical values for each constituent of concern. These values establish the acceptable amount or concentration of constituents that may be found in, or discharged to, the ambient environment.

- Action-Specific SCGs – These SCGs are usually technology- or activity-based requirements or limitations on actions taken with respect to hazardous waste management and site cleanup.

- Location-Specific SCGs – These SCGs are restrictions placed on the concentration of hazardous substances or the conduct of activities solely because they occur in specific locations.

The SCGs identified for the site are summarized below.

2.2 SCGs

The identification of federal and state SCGs for the evaluation of remedial alternatives at the site was a multi-step process that included a review of conditions identified by the RI, including results from the human exposure evaluation and FWIA and a cultural resources investigation [summarized in the NYSDEC-approved *Remedial Investigation Report* (BBL, August 2001)]. The SCGs that have been identified for this FFS Report are presented in Table 5 and summarized below.

2.2.1 Chemical-Specific SCGs

One set of chemical-specific SCGs that apply to the nearshore sediment are the PCB regulations in 40 CFR Part 761 related to the handling, storage, and disposal of materials containing PCBs. As indicated in 40 CFR Part 761(b)(3), material with PCB concentrations less than 50 ppm that has been dredged or excavated from waters of the United States may be managed or disposed of in accordance with a permit issued:

- under Section 404 of the Clean Water Act, or the equivalent of such a permit as provided for in regulations of the U.S. Army Corps of Engineers (USACE) at 33 CFR Part 320; or

- by the USACE under Section 103 of the Marine Protection, Research, and Sanctuaries Act, or the equivalent of such a permit as provided for in regulations of the USACE at 33 CFR Part 320.

As indicated in 40 CFR 761(a)(5)(iii), remediation wastes (such as excavated sediment) containing PCBs with concentrations at or exceeding 50 ppm must be disposed of in a hazardous waste landfill permitted by the USEPA under Section 3004 of the Resource Conservation and Recovery Act (RCRA), a State authorized under Section 3005 of RCRA, or other approved PCB disposal facility. As discussed in Section 1 of this FFS Report, the highest concentration of PCBs identified in the remaining nearshore sediment is 7.3 ppm.

Another set of chemical-specific SCGS that may potentially be applicable to the nearshore sediment are the federal and New York State regulations regarding identification of hazardous wastes, as outlined in 40 CFR Part 261 and 6 NYCRR Part 371, respectively. These regulations provide criteria at which a solid waste is considered a hazardous waste by the characteristics of toxicity, ignitability, corrosivity, and reactivity. The toxicity characteristic is evaluated by comparing concentrations detected in sample extract generated using the Toxicity Characteristic Leaching Procedure (TCLP) to RCRA-regulated levels. Based on existing analytical data, any excavated nearshore sediment would likely be characterized as a nonhazardous waste.

Ambient water quality criteria set forth in the USEPA document titled, *Quality Criteria for Water – 1986* (USEPA, 1986) may be potentially applicable chemical-specific SCGs for assessing water quality in the Mohawk River and power canal in connection with the remedial activities. In addition, the surface waters of the power canal and Mohawk River near the site are designated as a Class A water bodies. Therefore, the Class A ambient water quality standards and guidance values for surface waters provided in the NYSDEC Division of Water, Technical and Operational Guidance Series (TOGS 1.1.1) document titled, *Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations*, (NYSDEC, 2000) may also be a potentially applicable chemical-specific SCG. Other potentially applicable SCGs for nearshore sediment are presented in Table 5.

2.2.2 Action-Specific SCGs

The general health and safety requirements established by the Occupational Safety and Health Administration (OSHA) for general industry under 29 CFR Part 1910, and for construction under 29 CFR Part 1926, are action-specific SCGs that may be potentially applicable to the remedial alternatives evaluated in this FFS Report. Other potentially applicable action-specific SCGs pertain to handling of solid wastes and protecting water quality, as indicated below.

The New York State regulations contained in 6 NYCRR Part 364 for the collection, transportation, and delivery of regulated waste within New York State are potentially applicable action-specific SCGs. The National Pollution Discharge Elimination System (NPDES) and the New York State Pollution Discharge Elimination System (SPDES) regulations contained in 40 CFR Part 122 and 6 NYCRR Parts 750-758, respectively, which detail specific permit requirements for the discharge of chemical constituents to United States and New York State waters, are also potentially applicable action-specific SCGs.

Another potential action-specific SCG is the Rivers and Harbors Act (33 CFR Parts 320-330), which contains requirements for obstructions or alterations of navigable waters in the United States. Section 401 of the Clean Water Act, which requires a federal license or permit for activities including, but not limited to, the construction or operation of facilities that may result in any discharge into waters of the United States (such as construction of temporary dams or dredging of sediment), has also been identified as a potentially applicable action-specific SCG. However, as authorized in 6 NYCRR Part 375, a permit would not be required for remedial alternatives at the site that include the construction of a temporary dam or dredging of sediment, provided the activities are conducted in compliance with the substantive permitting requirements.

2.2.3 Location-Specific SCGs

Examples of potential location-specific SCGs include regulations pertaining to floodplain management, wetlands protection, preservation of historic areas, maintenance of navigable waterways, and protection of endangered/threatened or rare species. Location-specific SCGs also include local requirements such as local building permit conditions for permanent or semi-permanent facilities constructed during the remedial activities (if any), and influent requirements of publicly owned treatment works (POTW) if water is treated at the site and discharged to a POTW.

A review of Federal Emergency Management Agency (FEMA) Flood Insurance Rate mapping for the Town of Colonie (Panel No. 360007-0015C, dated September 1979) and City of Cohoes (Panel No. 360006-0005B, dated December 1979) indicates negligible impacts in the vicinity of the site in connection with a 100-year or 500-year flood. Based on a review of New York State Freshwater Wetlands Maps, one NYSDEC-regulated wetland was identified within a 2-mile radius of the former fire training area, but at a location hydraulically upgradient (west) of the former fire training area. No state-regulated wetlands were identified downgradient from the site to the Hudson River. However, several small National Wetland Inventory (NWI) mapped wetlands have been identified in the Mohawk River channel downstream from the feeder dam. Based on site reconnaissance activities completed as part of the RI, federal jurisdictional wetland areas appear to be consistent with the mapped state-regulated wetland and NWI wetlands.

In support of the FWIA completed as part of the RI, information regarding the presence of threatened or endangered plant and animal species in the vicinity of the site was requested and received from the NYSDEC Natural Heritage Program and the United States Fish and Wildlife Service (USFWS). Responses indicate that no threatened or endangered plant species are known to exist in the vicinity of the site.

Based on research conducted in support of a Stage 1A Archaeological Survey (cultural resources investigation), the upper gatehouse and feeder dam at the School Street Hydroelectric Station are eligible for listing on the National Register of Historic Places (National Register) and included on the State Register. Background information reviewed as part of the survey indicated that the site is situated in a zone of high prehistoric sensitivity and moderate historic sensitivity. However, no historic foundations or artifact scatters were observed in the area.

Potentially applicable location-specific SCGs are presented in Table 5.

3. Remedial Action Objectives

3.1 General

This section of the FFS Report presents RAOs to address sediment in the "nearshore area" of the Mohawk River located opposite the former fire training area and within approximately 50 feet of the shoreline. This subject nearshore area encompasses approximately 14,500 square feet and includes sediment sampling locations SD-3 through SD-6 and SD-104 through SD-108, where PCBs have been identified in the upper 1 foot of sediment at concentrations ranging from 1.6 ppm to 7.3 ppm. Outside the nearshore area, PCBs have been identified at concentrations on the order of 0.010 ppm to 0.20 ppm, except for sampling location SD-13, where PCBs were detected at a concentration of 0.45 ppm. For the purposes of the discussions/evaluations below, the term "nearshore sediment," when mentioned hereinafter, will refer to sediment within the "nearshore area" of the Mohawk River as defined above.

The USEPA defines RAOs as media-specific goals for protecting human health and the environment. These objectives are, in general, developed by considering the results of risk assessments and/or SCGs. RAOs for the nearshore sediment are presented below, followed by the remedial alternatives that have been identified to attain the RAOs.

3.2 Remedial Action Objectives

Based on the results of the previous investigation activities, the human exposure evaluation, and FWIA (as discussed in Section 1.0 of this FFS Report), PCBs are the constituent of concern in sediment within the subject nearshore area. The overall goal of the remedial alternatives will be to mitigate potential future human exposure to PCBs associated with the nearshore sediment of the Mohawk River adjacent to the former fire training area.

3.3 Remedial Alternatives

The following seven remedial alternatives have been identified to address the presence of PCBs in nearshore sediment of the Mohawk River east of the former fire training area.

1. *No Further Action* – Beyond the work completed to date (investigation and IRM activities), no further investigation or remedial activities would be conducted to address the nearshore sediment.

2. *Institutional Controls* – The existing water quality certification for the School Street Hydroelectric Station, which is submitted to the NYSDEC pursuant to Section 401 of the Clean Water Act and in accordance with 6 NYCRR Part 608 (hereinafter referred to as the "401 Water Quality Certification"), would be amended to identify the presence of PCBs in the nearshore sediment. A special condition added to the certification would require surface water monitoring for PCBs in connection with future maintenance removal (if any) of nearshore sediment. Maintenance activities by Brascan in the nearshore area are typically limited to occasional removal of organic materials (tree limbs/branches, wood debris) that accumulate on the water surface in front of the ice fender, but could potentially include future repairs to concrete piers that support the ice fender. The maintenance activities are not related to the planned facility upgrades described in Subsection 1.9.

3. *Monitored Natural Attenuation* – Monitoring would be conducted to evaluate natural attenuation processes (i.e., sedimentation) in the subject nearshore area.

4. *Sediment Capping* – A physical barrier would be installed over nearshore sediment within the subject area.

5. *Sediment Removal in the "Wet"* – Sediment within the subject nearshore area would be dredged, transferred to an onsite staging area for dewatering, and transported for offsite disposal at a facility permitted to accept the material.

6. *Sediment Removal in the "Dry"* – A cofferdam would be installed around the subject nearshore area, water would be pumped from the area, and sediment would be excavated using a crane and/or excavator. The excavated sediment would be transferred to an onsite staging area for dewatering prior to offsite transportation and disposal.

7. *Focused Sediment Removal* – This alternative was identified in response to the NYSDEC's and NYSDOH's comments on the initial FFS Report submitted in July 2003. Under this alternative, sediment extending along the shoreline from sampling location SD-3 to location SD-6 and extending outward from the shoreline for a distance of approximately 4 feet past the sampling locations will be removed. The removed sediment will be transferred to an onsite staging area for dewatering prior to offsite transportation and disposal.

4. Detailed Analysis of Remedial Alternatives

4.1 General

This section presents a detailed description and analysis of remedial alternatives developed to address PCBs in the nearshore sediment of the Mohawk River east of the former fire training area. The evaluation criteria used for analysis of the remedial alternatives are based on criteria specified in NYSDEC TAGM #4025, which incorporates the NCP by reference, and the USEPA guidance document titled, *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA* (USEPA, 1988). These criteria encompass statutory requirements and include other gauges of overall feasibility and acceptability of remedial options.

The detailed evaluation of each remedial alternative presented in this section consists of an assessment of the following seven criteria:

- Compliance with SCGs;
- Overall Protection of Human Health and the Environment;
- Short-Term Effectiveness;
- Long-Term Effectiveness and Permanence;
- Reduction of Toxicity, Mobility, or Volume through Treatment;
- Implementability; and
- Cost.

According to 6 NYCRR Part 375-1.109(c), another criterion to be considered when determining appropriate remedial alternatives is community acceptance. The community acceptance assessment will be completed by the NYSDEC after community comments on the PRAP are received. The results of the evaluation are typically considered when the NYSDEC selects a preferred remedial alternative and are typically presented in a Responsiveness Summary completed by the NYSDEC. The Responsiveness Summary is part of the ROD for the project and responds to all comments and questions raised during a public meeting associated with the PRAP, as well as comments received during the associated public comment period.

In addition to assessing each potential remedial alternative against the seven criteria presented above, the detailed analysis of the remedial alternatives presented in this section also includes a detailed technical description of each remedial alternative. In addition, unique engineering aspects (if any) of the physical components of the remedial alternative are discussed.

4.2 Description of Evaluation Criteria

A description of each of evaluation criterion used in this FFS Report is presented below.

4.2.1 Compliance with SCGs

This criterion evaluates the compliance of the remedial alternative with the SCGs. The evaluation will be based on compliance with:

- chemical-specific SCGs;

- action-specific SCGs; and
- location-specific SCGs.

This evaluation criterion also addresses whether or not the remedial alternative would be in compliance with other appropriate federal and state criteria, advisories, and guidance (TBCs).

4.2.2 Overall Protection of Human Health and the Environment

This criterion evaluates whether the remedial alternative provides adequate protection of human health and the environment. This evaluation relies on the assessment of other evaluation criteria, including long-term and short-term effectiveness and compliance with SCGs.

4.2.3 Short-Term Effectiveness

The short-term effectiveness of the remedial alternative is evaluated relative to its effect on human health and the environment during implementation of the alternative. The evaluation of each remedial alternative with respect to its short-term effectiveness will consider the following:

- short-term impacts to which the community may be exposed during implementation of the alternative;

- potential impacts to workers during implementation of the remedial alternative, and the effectiveness and reliability of protective measures;

- potential environmental impacts of the remedial alternative and the effectiveness of mitigative measures to be used during implementation; and

- amount of time until environmental concerns are mitigated.

4.2.4 Long-Term Effectiveness and Permanence

The evaluation of each remedial alternative relative to its long-term effectiveness and permanence is made by considering the risks that may remain following completion of the remedial alternative. The following factors will be assessed in the evaluation of the alternative's long-term effectiveness and permanence:

- potential environmental impacts from untreated waste or treatment residuals remaining at the completion of the remedial alternative;

- the adequacy and reliability of controls (if any) that will be used to manage treatment residuals or untreated waste remaining after the completion of the remedial alternative; and

- the ability of the remedial alternative to meet RAOs established for the site.

4.2.5 Reduction of Toxicity, Mobility, or Volume through Treatment

This criterion evaluates the degree to which remedial actions will permanently and significantly reduce the toxicity, mobility, or volume of the constituents present in the site media. The evaluation will be based on the:

- treatment process and the volume of materials to be treated;
- anticipated ability of the treatment process to reduce the toxicity, mobility, or volume of chemical constituents of interest;
- nature and quantity of treatment residuals that will remain after treatment;
- relative amount of hazardous substances and/or chemical constituents that will be destroyed, treated, or recycled; and
- degree to which the treatment is irreversible.

4.2.6 Implementability

This criterion evaluates the technical and administrative feasibility of implementing the remedial alternative, including the availability of the various services and materials required for implementation. The evaluation of implementability will be based on two factors, as described below.

- Technical Feasibility – This refers to the relative ease of implementing the remedial alternative based on site-specific constraints. In addition, the ease of construction, operational reliability, and ability to monitor the effectiveness of the remedial alternative are considered.
- Administrative Feasibility – This refers to the feasibility/time required to obtain necessary permits and approvals to implement the remedial alternative.

4.2.7 Cost

This criterion evaluates the estimated total cost to implement the remedial alternative. The total cost of each alternative represents the sum of the direct capital costs (materials, equipment, and labor), indirect capital costs (engineering, licenses/permits, and contingency allowances), and operation and maintenance (O&M) costs. O&M costs may include operating labor, energy, chemicals, and sampling and analysis. These costs will be estimated with an anticipated accuracy between -30% to +50% in accordance with the USEPA document titled *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA* (USEPA, 1988). A 25% contingency factor is included to cover unforeseen costs incurred during implementation of the remedial alternative. Present-worth costs are calculated for alternatives expected to last more than 2 years. In accordance with USEPA guidance presented in OSWER Directive 9355.3-20 as superseded by OSWER 9355.0-75, a 7% discount rate (before taxes and after inflation) is used to determine the present-worth factor.

4.3 Detailed Description and Analysis of Sediment Remedial Alternatives

This Subsection presents the detailed description and analysis of each sediment remedial alternative identified in Subsection 3.3 against the seven NCP criteria described above in Subsection 4.2. The remedial alternatives to be evaluated include:

- Alternative 1: No Further Action;
- Alternative 2: Institutional Controls;
- Alternative 3:Monitored Natural Attenuation;
- Alternative 4: Sediment Capping;
- Alternative 5: Sediment Removal in the “Wet;”
- Alternative 6: Sediment Removal in the “Dry;” and
- Alternative 7:Focused Sediment Removal.

The results of the detailed evaluation of remedial alternatives against the NCP criteria will be used to aid in the recommendation of the appropriate alternative for implementation at the site.

4.3.1 Alternative 1 – No Further Action

Technical Description

The no-further-action alternative serves as a baseline for comparison of the overall effectiveness of the other remedial alternatives. The no-further-action alternative would not involve the implementation of any remedial activities to remove, treat, or contain the nearshore sediment of the Mohawk River east of the former fire training area, beyond the IRM activities already completed. The sediment would be allowed to remain in its current condition, and no activities would be undertaken to change the current conditions.

Compliance with SCGs

Chemical-Specific SCGs

The Class A ambient water quality standards and guidance values for surface waters presented in the NYSDEC TOGS 1.1.1 document titled, *Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations* (NYSDEC 2000) are applicable chemical-specific SCGs for this alternative. Based on existing surface water monitoring results, which indicate that PCBs have not been detected in water samples collected at the City of Cohoes intakes for the public drinking water supply, the no-further-action alternative would comply with this chemical-specific SCG.

Chemical-specific guidelines that are to be considered under this alternative are the sediment screening levels established in the NYSDEC document titled, *Technical Guidance for Screening Contaminated Sediments* (NYSDEC, 1999). As stated in that NYSDEC document, sediment with concentrations of constituents of interest which exceed the listed criteria is considered impacted, but the listed criteria do not necessarily represent a final concentration that must be achieved through remediation.

The no-further-action alternative does not include the handling of any materials containing PCBs. Therefore, chemical-specific SCGs that regulate the subsequent management and disposal of these materials (and related residuals) are not applicable.

Action-Specific SCGs

Action-specific SCGs are not applicable because this alternative does not include any remedial actions.

Location-Specific SCGs

Location-specific SCGs are not applicable because this alternative does not include any remedial actions.

<u>Overall Protection of Human Health and the Environment</u>

Based on the RI results, the nearshore sediment poses no current significant risks to human health or the environment. In addition, existing surface water monitoring results indicate that PCBs have not been detected in the surface water supplied to the City of Cohoes Water Treatment Plant. Based on these results, there would be no adverse impact to human health or the environment associated with the no-further-action alternative. However, possible future maintenance activities associated with the hydroelectric station (i.e., sediment removal in the vicinity of the ice fender, if any) could result in a potential future human exposure to PCBs without precautions.

<u>Short-Term Effectiveness</u>

No remedial action would be implemented for the nearshore sediment. Therefore, there would be no short-term environmental impacts or risks posed to the community associated with implementation of this alternative.

<u>Long-Term Effectiveness and Permanence</u>

Under the no-further-action alternative, there would be no mechanism in place to address possible future maintenance activities in the vicinity of the hydroelectric station that could potentially disturb the nearshore sediment. Therefore, the no-further-action alternative may not achieve the RAO of mitigating potential future human exposure associated with nearshore sediment containing PCBs.

<u>Reduction of Toxicity, Mobility, and Volume Through Treatment</u>

Under the no-further-action alternative, the nearshore sediment would not be removed. Therefore, the existing low concentrations of PCBs in the nearshore sediment would not be treated, recycled, or destroyed.

<u>Implementability</u>

The no-further-action alternative does not involve any active remedial response and poses no technical or administrative implementability concerns.

<u>Cost</u>

There are no capital or O&M costs associated with implementation of the no-further-action alternative.

4.3.2 Alternative 2 – Institutional Controls

Technical Description

This alternative would not involve the implementation of remedial activities to remove, treat, or contain the nearshore sediment east of the former fire training area. The sediment would be allowed to remain in its current condition. However, to address possible future maintenance activities relative to the hydroelectric station that could potentially disturb the nearshore sediment (although none are currently scheduled or planned), the existing 401 Water Quality Certification would be amended. The amended certification would include new language in the "special conditions" section to:

- identify the presence of PCBs in sediment within the "nearshore area" of the Mohawk River as defined in Subsection 3.1;
- require surface water monitoring for PCBs in connection with future maintenance removal (if any) of the nearshore sediment containing PCBs; and
- maintain fencing around the former fire training area to limit access to the nearshore sediment.

The 401 Water Quality Certification for the School Street Hydroelectric Station is effective for the lifetime of the operating license issued by FERC for the hydroelectric station. The amended certification would be a mechanism to notify future station operators of the low concentrations of PCBs in the nearshore sediment and requirements relative to maintenance removal of the sediment. Amendments to the certification would be made in connection with a future Settlement Agreement with FERC relative to the planned facility upgrades. Alternatively, if the upgrades are not constructed, the amendments would be made through a separate request for a permit modification.

Compliance with SCGs

Chemical-Specific SCGs

The same chemical-specific SCGs that apply to the no-further-action alternative also apply to the institutional controls alternative. In addition to these SCGs, chemical-specific SCGs regulating the management and disposal of sediment (if any) removed as part of future maintenance dredging activities would be applicable. Like the no-further-action alternative, the institutional controls alternative would also comply with the chemical-specific SCGs.

Action-Specific SCGs

Surface water monitoring would be performed in accordance with the 401 Water Quality Certification in connection with future maintenance removal (if any) of the nearshore sediment containing PCBs. The monitoring would be performed to demonstrate that maintenance activities would not adversely impact surface water quality.

Location-Specific SCGs

Location-specific SCGs are not applicable to the institutional controls alternative.

Overall Protection of Human Health and the Environment

As previously mentioned, the RI results indicate that the nearshore sediment poses no current significant risks to human health or the environment. In addition, existing surface water monitoring results indicate that PCBs have not been detected in the surface water supplied to the City of Cohoes Water Treatment Plant. In accordance with existing conditions of the 401 Water Quality Certification, measures would be provided to control sediment resuspension/migration during any future maintenance removal of nearshore sediment. In addition, pursuant to new special conditions in the amended 401 Water Quality Certification, surface water monitoring would be performed to demonstrate that the maintenance activities do not adversely impact the quality of the surface water withdrawn from the power canal for the City of Cohoes public drinking water supply.

Implementation of the institutional control measures described above would provide a mechanism to protect human health in connection with future limited maintenance removal activities, if any.

Short-Term Effectiveness

There would be no short-term environmental impacts or risks posed to the community associated with implementation of the institutional controls alternative.

Long-Term Effectiveness and Permanence

Unlike the no-further-action alternative, this alternative includes a mechanism to address possible future maintenance activities relative to the hydroelectric station that could potentially disturb the nearshore sediment. The institutional controls alternative would mitigate potential future human exposure associated with the nearshore sediment containing PCBs.

Reduction of Toxicity, Mobility, and Volume Through Treatment

Under the institutional controls alternative, the nearshore sediment would not be removed (except in connection with possible limited future maintenance dredging activities, which are not currently planned). Therefore, the existing low concentrations of PCBs in the nearshore sediment would not likely be treated, recycled, or destroyed.

Implementability

Amendments to the 401 Water Quality Certification could easily be made, perhaps in connection with a future Settlement Agreement with FERC relative to the planned facility upgrades. The maintenance and monitoring activities required by the amendments could also be easily implemented, where needed.

Cost

The estimated cost to establish the institutional controls is approximately $30,000. A detailed breakdown of the estimated cost for this alternative is presented in Table 6.

4.3.3 Alternative 3 – Monitored Natural Attenuation

Technical Description

Similar to the two previous alternatives discussed above, this alternative would not involve the implementation of any remedial activities to remove, treat, or contain the nearshore sediment east of the former fire training area. The sediment would be allowed to remain in its current condition. Monitoring would be performed to evaluate natural sedimentation processes that could reduce the already low potential for human exposure to PCBs in the nearshore sediment of the Mohawk River adjacent to the former fire training area.

The monitoring would involve sediment probing and sampling at several locations in the nearshore area of the Mohawk River (potentially along transects previously established for the PSA and RI) to evaluate potential changes in sediment depths and PCB concentrations over time. Monitoring would likely be conducted at a frequency of once every 5 years over an assumed 20-year period. The frequency of monitoring could be adjusted, as appropriate, based on results obtained for the initial monitoring events.

Compliance with SCGs

Chemical-Specific SCGs

The same chemical-specific SCGs that apply to the no-further-action and institutional controls alternatives also apply to the monitored natural attenuation alternative. Compliance with the chemical-specific SCGs under the monitored natural attenuation alternative would be the same as under the no-further-action alternative.

Action-Specific SCGs

Action-specific SCGs are not applicable because this alternative does not include any remedial actions.

Location-Specific SCGs

Location-specific SCGs are not applicable because this alternative does not include any remedial actions.

Overall Protection of Human Health and the Environment

As previously mentioned, the RI results indicate that the nearshore sediment poses no current significant risks to human health or the environment. In addition, existing surface water monitoring results indicate that PCBs have not been detected in the surface water supplied to the City of Cohoes Water Treatment Plant. Based on these results, there would be no adverse impact to human health or the environment associated with the monitored natural attenuation alternative. However, possible future maintenance activities associated with the hydroelectric station (i.e., limited sediment removal in the vicinity of the ice fender, if any) could result in a potential future human exposure to PCBs without precautions.

Short-Term Effectiveness

No remedial action would be implemented for the nearshore sediment. Therefore, there would be no short-term environmental impacts or risks posed to the community associated with implementation of this alternative.

Long-Term Effectiveness and Permanence

Unless coupled with the institutional controls alternative, the monitored natural attenuation alternative would not include a mechanism to address possible future maintenance activities in the vicinity of the hydroelectric station that could potentially disturb the nearshore sediment. Therefore, the monitored natural attenuation alternative, alone, may not achieve the RAO of mitigating future human exposure associated with nearshore sediment containing PCBs.

Reduction of Toxicity, Mobility, and Volume Through Treatment

Under the monitored natural attenuation alternative, the nearshore sediment would not be removed. Therefore, the existing low concentrations of PCBs in the nearshore sediment would not be treated, recycled, or destroyed. Based on the relatively long length of time that has passed since fire training activities permanently ended (23 years) and the current distribution of PCBs remaining in the nearshore sediment (the highest PCB concentrations are near the sediment surface and concentrations generally diminish with depth at each sampling location), there appears to be little evidence of ongoing sedimentation processes that could potentially reduce future PCB concentrations in the nearshore surface sediment.

Implementability

The sediment probing and sampling activities included under this alternative could be implemented relatively easily.

Cost

The estimated cost for the monitored natural attenuation alternative is approximately $220,000. A detailed breakdown of the estimated cost for this alternative is presented in Table 7.

4.3.4 Alternative 4 – Sediment Capping

Technical Description

This alternative involves the installation of an engineered cap over the nearshore sediment of the Mohawk River east of the former fire training area. The cap would be installed to physically isolate the sediment and reduce potential future human exposure to PCBs. In conjunction with this alternative, signs would be posted along the shoreline and a special condition would be added to the existing 401 Water Quality Certification to restrict actions that may jeopardize the integrity of the cap.

The engineered cap would cover an approximately 14,500 square foot area (shown on Figure 6), which encompasses approximately 320 feet of shoreline and extends 45 feet, on average, from the shoreline. The limits of the capping were developed assuming the cap would cover the entire “nearshore area” as defined in Subsection 3.1.

The actual cap configuration would be determined during remedial design. However, for cost estimating purposes for this FFS Report, it is assumed that the engineered cap would consist of two layers. The bottom layer would consist of 6 inches of coarse-grained sand, and the top layer would consist of at least 12 inches of washed stone with a 6-inch or larger median diameter. A geotextile would be installed over the entire capping area to support the sand layer and to minimize mixing and/or displacement that could occur during placement of the cap materials. The geotextile would also provide a bioturbation barrier, stabilize the cap, prevent mixing of cap materials with underlying sediments, promote uniform consolidation, and reduce erosion of the cap.

Although proposed equipment, materials, and processes utilized during implementation may be modified during remedial design, this alternative would generally consist of the following steps:

- completing a predesign investigation to facilitate an appropriate cap design. The investigation would include, for example, a bathymetric survey of the cap area to provide information regarding the river bottom (including slope, presence of debris, low-lying or mounded areas, etc.) and an evaluation of sediment geotechnical properties to evaluate potential cap materials/thicknesses. The investigation would also include measurements to evaluate river conditions, including flow, groundwater discharge, etc. Data generated by the investigation would be used to evaluate erosion forces associated with various cap thicknesses (including under the ice fender, where the highest flow velocity would be expected due to the limited clearance/flow depth). The resulting data would also be used to evaluate head-loss to the generating station associated with the various cap thicknesses;

- complying with permit requirements associated with this alternative. Permits may include, but are not limited to, USACE permits for work affecting navigable waters and discharge of dredged or fill material, and a New York State dredge and fill permit and water quality certification;

- mobilizing equipment, materials, and personnel and constructing support areas. Portions of the former fire training area adjacent to the river would be used for staging equipment and materials. A temporary dock capable of mooring work boats would be constructed along the shoreline, if needed. It is assumed that watercraft used in the capping activities would be launched from a ramp constructed along the shoreline upstream from the ice fender;

- installing a silt curtain(s) prior to initiating activities that may disturb nearshore sediment containing PCBs. The purpose of the silt curtain would be to mitigate, to the extent practical, the potential for downstream transport of materials that potentially may become suspended into the water column during the capping activities. For cost estimating purposes, it is assumed that a silt curtain would be installed around the boundaries of the capping area, except the upstream boundary;

- deploying geotextile by anchoring the material to shore and unrolling the fabric from a work boat. The geotextile would be submerged by placing sand on top of the fabric. Sufficient overlap would be maintained between geotextile sheets to minimize migration of sediments, to the extent practical; and

- using a crane or excavator located on the shoreline to place capping materials stockpiled in the former fire training area (i.e., sand and stone) over the geotextile.

It is assumed that cap installation could be completed within a 2-month period. Daily water column monitoring for turbidity would be performed downstream of the capping area during construction activities to monitor the effectiveness of the silt curtain. Based on the monitoring results, capping activities would be slowed or halted until acceptable turbidity levels (to be determined during the remedial design and approved by the NYSDEC) are achieved. Monitoring would also consist of probing to evaluate the installed cap thickness.

Following completion of the cap installation, a long-term cap monitoring and maintenance program would be implemented. For cost estimating purposes, it has been assumed that this program would involve annual inspection of the cap for 30 years following cap installation. Inspection may consist of an underwater reconnaissance by divers and/or visual assessment from a boat to identify faults in the cap integrity (e.g., erosion or washout). Inspection of the cap may also be conducted subsequent to events that may potentially damage the integrity of the cap (e.g., high flow events and ice movement). Any faults or failures observed during cap inspections would be repaired appropriately to maintain the long-term effectiveness and reliability of the cap. In addition, the cap would be restored appropriately following possible future hydroelectric station maintenance activities that disturb the capped area (if any), such as repairs to concrete piers supporting the ice fender.

Compliance with SCGs

Chemical-Specific SCGs

The Class A ambient water quality standards and guidance values for surface waters presented in the NYSDEC TOGS 1.1.1 document titled, *Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations* (NYSDEC, 2000) are applicable chemical-specific SCGs for this alternative. Silt curtain would be installed around the capping area in an effort to minimize suspended solids concentrations during placement of cap materials. Based on existing surface water monitoring results, which indicate that PCBs have not been detected in water samples collected at the City of Cohoes intakes for the public drinking water supply, the capping alternative would presumably comply with the TOGS 1.1.1 criterion for PCBs.

Chemical-specific guidelines that are to be considered under this alternative are the sediment screening levels established in the NYSDEC document titled, *Technical Guidance for Screening Contaminated Sediments* (NYSDEC, 1999). As previously mentioned, that document states that sediment with concentrations of constituents of interest exceeding listed criteria are considered impacted, but the listed criteria do not necessarily represent a final concentration that must be achieved through remediation.

The sediment capping alternative does not include the handling of any materials containing PCBs. Therefore, chemical-specific SCGs that regulate the subsequent management and disposal of these materials (and related residuals) are not applicable.

Action-Specific SCGs

Action-specific SCGs that apply to this alternative are associated with monitoring requirements and OSHA health and safety requirements. Worker and worker activities that occur during implementation of this alternative must comply with OSHA requirements for training, safety equipment and procedures, monitoring, recordkeeping, and reporting as identified in 29 CFR Parts 1904, 1920, and 1926. Compliance with these SCGs would be accomplished by following a NYSDEC-approved design and site-specific Health and Safety Plan (HASP).

Capping activities under this alternative would need to be conducted in accordance with the requirements of the Rivers and Harbors Act (33 CFR Parts 320-330) and Section 401 of the Clean Water Act pertaining to alterations of navigable waterways, including placement of fill material.

Location-Specific SCGs

Location-specific SCGs that apply to this alternative are associated with discharge of dredge or fill materials, modifications of waterways, and obstruction/alteration of navigable waters. Compliance with these SCGs would be achieved by complying with permitting requirements and implementing designs that would minimize disturbance and/or alteration of the Mohawk River. A Joint Application for Permit covering stream disturbance would be completed and submitted to the NYSDEC and USACE for approval. Sediment removal activities would be conducted under USACE Nationwide Permit 38 (NWP38).

Overall Protection of Human Health and the Environment

Sediment cap installation would meet the RAO of mitigating potential future human exposure to nearshore sediment containing PCBs, by physically isolating the sediment. Capping would also mitigate potential resuspension and transport of sediment containing PCBs, although existing surface water monitoring data suggests that this is not occurring. Following installation of the cap, maintenance activities would be conducted on a long-term basis. Installation and maintenance of the cap in conjunction with an amendment to the 401 Water Quality Certification and posting of signs would effectively mitigate the potential for human exposure to the nearshore sediment over the long term.

Short-Term Effectiveness

The short-term effects of capping would include some disruption/destruction of areas to construct access points, alteration of the existing benthic community, and potential releases of particulates to the surface water during implementation of the capping activities. Reasonable and appropriate controls would be undertaken/ implemented to mitigate particulate release to the surface water during implementation activities (e.g., silt curtains, modification of production rates or placement techniques based on results of daily turbidity monitoring), but these controls may not be entirely effective.

In general, during capping operations, remediation workers would not be exposed to unacceptable health risks provided that appropriate health and safety practices (OSHA 29 CFR Part 1910.129) are followed through implementation of a site-specific HASP.

Long-Term Effectiveness and Permanence

Installing an engineered cap would effectively isolate nearshore sediment east of the former fire training area over the long term. The cap would also provide a barrier to minimize potential resuspension and transport of sediment containing PCBs, although existing surface water monitoring data suggests that this is not occurring. Potential disturbances from ice movement (if any) would likely be limited to the immediate vicinity of the shoreline (where sediment removal was previously completed as part of the IRM) and would not significantly impact the capped area. An amendment to the existing 401 Water Quality Certification and posting of signs would restrict actions in the river that may jeopardize the integrity of the cap. A cap maintenance program would be implemented following installation of the cap to verify the reliability and effectiveness of the alternative in the long-term.

Reduction of Toxicity, Mobility, and Volume Through Treatment

The capping alternative will not reduce the volume of nearshore sediment containing PCBs or the concentration of PCBs in the sediment. However, the nearshore sediment would be physically isolated and the potential mobility of PCBs in the sediment would be reduced. Isolation of the sediment would mitigate potential future human exposure to the low concentrations of PCBs in the sediment.

Implementability

Capping is a proven remedial technology for sediments containing chemical constituents and has been implemented at numerous sites. Construction of an engineered cap is technically feasible and could be completed within an approximately 2-month period. The equipment and materials necessary to construct the cap are available, as are capable remediation contractors. With respect to administrative feasibility, permitting requirements would be followed for modification and alternation of the waterway. Difficulties associated with the remedial construction activities would be related to work within a close distance around the ice fender.

Cost

The total estimated 30-year present-worth cost associated with implementation of the capping alternative is $690,000. A detailed breakdown of the estimated costs associated with this alternative is presented in Table 8.

4.3.5 Alternative 5 – Sediment Removal in the "Wet"

Technical Description

Under this remedial alternative, nearshore sediment containing PCBs would be mechanically dredged without dewatering the removal area (in the "wet"). The sediment removal area, shown on Figure 6, would encompass approximately 320 feet of shoreline and extend 45 feet, on average, from the shoreline. The horizontal sediment removal limits include the entire "nearshore area" as defined in Subsection 3.1. Based on an average sediment removal depth of 1 foot, approximately 550 CY of sediment would be removed under this alternative.

The mechanical dredging approach would involve the use of a crane (e.g., 150 ton) equipped with a sealed clamshell to remove the submerged nearshore sediment. The crane would be operated from the top of the riverbank and would have sufficient reach for sediment removal and transfer directly to a dewatering pad constructed in the former fire training area. Mechanical dredging would be recommended over hydraulic dredging, which involves the use of centrifugal pumps to capture and transport sediment in a liquid slurry form. The major disadvantage of hydraulic dredging is the comparatively large volume of water to be managed due to a low solids concentration in the liquid slurry. Under both the mechanical dredging and hydraulic dredging approaches, resuspension of sediments within the water column would occur and must be addressed. The resuspension issue is significant considering the location of the intakes for the City of Cohoes public drinking water supply in the power canal downstream from the sediment removal area and the duration of dredging activities. It is anticipated that the City of Cohoes could not temporarily stop withdrawing the water from the power canal for a period of more than approximately three or four days. Measures to control resuspension include the installation of silt curtains to section off the removal area from the remainder of the river and, as needed, to divide the sediment removal area into smaller working cells.

Following dewatering/stabilization, the sediment would be characterized and transported for offsite disposal at a facility permitted to accept the material. Water collected in the dewatering pad would drain to a lined sump, and would be pumped to an onsite wastewater storage tank for temporary storage. The water would be characterized and subsequently transported for offsite treatment/disposal at a facility permitted to accept the water. Temporary onsite water treatment facilities would not be provided as the volume of water to be generated is assumed to be on the order of approximately 50,000 gallons.

Verification sediment sampling would be conducted following completion of the removal activities to evaluate the potential presence of PCBs in remaining nearshore sediment. Following receipt of acceptable verification sampling results, the dredged sediment area would be restored with materials similar in physical characteristics to the native material removed from the area (i.e., medium to coarse sand) to provide habitat for benthic invertebrate colonization.

Although proposed equipment, materials, and processes utilized during implementation may be modified during remedial design, this alternative would generally consist of the following steps:

- completing predesign investigation activities, complying with permitting requirements, mobilizing equipment and materials, constructing support areas, and installing silt curtain in accordance with the approach described above for the sediment capping alternative;

- constructing a lined sediment dewatering pad for gravity dewatering and stabilizing of the excavated sediment. It is assumed that the dewatering pad would be approximately 100-foot long by 100-foot wide and would consist of a 4-inch thick granular fill base layer (i.e., interlocking stone), a 40-mil high density polyethylene (HDPE) liner over the base layer, and a sacrificial 12-inch thick stone layer over the liner. The HDPE liner would extend over approximately 18-inch-high bermed sidewalls. The pad would slope toward a lined collection sump that would be used for collecting water that drains from the sediment. The actual dewatering/stabilization system would be determined during the remedial design/remedial action process;

- dredging sediment from the removal area using the crane equipped with a sealed clamshell. It is assumed that the dredging production rate would be on the order of 100 CY per day, assuming efficient operating conditions. It is further assumed that daily water column sampling for turbidity and PCBs would be performed downstream of the dredging area during construction activities to monitor the effectiveness of the silt curtains. Based on sampling results, dredging activities may be modified (e.g., slowed or halted) or additional measures implemented (e.g., placement of additional silt curtain) until acceptable turbidity levels, to be determined during the remedial design and approved by the NYSDEC, are achieved. Dredging would also be halted if PCBs were detected in water column samples at concentrations exceeding laboratory detection limits (around 0.05 ppb). It is anticipated that actual removal activities would be completed within an approximately two-week period, provided water column monitoring results during the removal process are acceptable;

- dewatering/stabilizing the dredged sediment material, to the extent necessary, prior to transporting the material offsite to a facility permitted to accept the material. Based on existing sediment analytical results, it is assumed that the dredged sediment would be characterized as nonhazardous waste and would be disposed of at a Subtitle D landfill. It is also assumed that wastewater generated by gravity dewatering would be characterized as nonhazardous and transported to a POTW or commercial wastewater treatment facility for treatment/discharge; and

- placing clean sand/gravel material within the dredged sediment area to the approximate original lines and grades following receipt of acceptable verification sediment sampling results. It is assumed that backfilling would require approximately 2 weeks to complete. Silt curtain would be maintained to control sediment suspension/transport during backfilling.

Activities to be performed in connection with the sediment removal in the "wet" alternative would likely require a minimum of approximately 3 months to complete, assuming 1 week for mobilization, 1 week for construction of the dewatering pad, 2 weeks for dredging, 2 weeks for backfilling, 2 weeks for gravity-dewatering/stabilization of dredged sediment material, 2 weeks for waste transportation and offsite treatment/disposal, and 1 week for demobilization. Additional dredging could be required based on analytical results for the initial verification samples, which would extend the schedule for completing the alternative.

Compliance with SCGs

Chemical-Specific SCGs

The Class A ambient water quality standards and guidance values for surface waters presented in the NYSDEC TOGS 1.1.1 document titled, *Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations* (NYSDEC 2000) are applicable chemical-specific SCGs for this alternative. Silt curtain would be installed around the removal area in an effort to minimize the migration of suspended solids and to prevent detectable levels of PCBs from entering the water column outside the removal area. Although the concentration of PCBs detected in the sediment is relatively low (with a maximum of 7.3 ppm), it is possible that PCBs could become suspended in the water column and exceed the 0.09 ppb New York State ambient water quality standard for the protection of sources of drinking water. Therefore, this sediment removal alternative may not comply with the TOGS 1.1.1 criteria.

Chemical-specific guidelines that are to be considered under this alternative are the sediment screening levels established in the NYSDEC document titled, *Technical Guidance for Screening Contaminated Sediments* (NYSDEC, 1999). As previously mentioned, that document states that sediment with concentrations of constituents of interest exceeding listed criteria are considered impacted, but the listed criteria do not necessarily represent a final concentration that must be achieved through remediation.

Because this alternative includes handling of materials containing PCBs, the PCB regulations in 40 CFR Part 761 related to the handling, storage, and disposal of materials containing PCBs would apply. As indicated in 40 CFR Part 761(b)(3), material with PCB concentrations less than 50 ppm that has been dredged or excavated from waters of the United States may be managed or disposed of in accordance with a permit issued:

- under Section 404 of the Clean Water Act, or the equivalent of such a permit as provided for in regulations of the USACE at 33 CFR Part 320; or

- by the USACE under Section 103 of the Marine Protection, Research, and Sanctuaries Act, or the equivalent of such a permit as provided for in regulations of the USACE at 33 CFR Part 320.

Because the highest concentration of PCBs identified in the nearshore sediment is 7.3 ppm, disposal of dredged sediment as a TSCA-regulated PCB waste/New York State hazardous waste (Waste Code B007) would not be required.

Another set of applicable chemical-specific SCGS applicable to this alternative are the federal and New York State regulations regarding identification of hazardous wastes, as outlined in 40 CFR Part 261 and 6 NYCRR Part 371, respectively. However, based on existing analytical data, excavated nearshore sediment is expected to be characterized as nonhazardous waste.

Action-Specific SCGs

Action-specific SCGs that may apply to this alternative are associated with the dredging and offsite treatment/disposal of the nearshore sediment, removal and treatment of water (from the dredging and dewatering activities), monitoring requirements, and OSHA health and safety requirements.

Workers and worker activities that occur during implementation of this alternative must comply with OSHA requirements for training, safety equipment and procedures, monitoring, recordkeeping, and reporting, as identified in 29 CFR Parts 1904, 1910, and 1926. Compliance with these SCGs would be accomplished by following a NYSDEC-approved design and project-specific HASP.

Dredging activities under this alternative would need to be conducted in accordance with the requirements of the Rivers and Harbors Act (33 CFR Parts 320-330) and Section 401 of the Clean Water Act pertaining to alterations of navigable waterways, which includes dredging of sediment.

U.S. Department of Transportation (USDOT) and disposal facility requirements for packaging, labeling, transporting, and disposing of regulated materials would also be applicable to this alternative. Compliance with these SCGs would be achieved by utilizing licensed and properly permitted waste transporters and treatment/disposal facilities.

Location-Specific SCGs

Location-specific SCGs that apply to this alternative are associated with discharge of dredge or fill materials, modifications of waterways, and obstruction/alteration of navigable waters. Compliance with these SCGs would be achieved by complying with permitting requirements and implementing designs that would minimize disturbance and/or alteration of the Mohawk River. A Joint Application for Permit covering stream disturbance would be completed and submitted to the NYSDEC and USACE for approval. Sediment removal activities would be conducted under USACE NWP38.

Overall Protection of Human Health and the Environment

The sediment removal in the "wet" alternative may meet the RAO of mitigating potential future human exposure to nearshore sediment containing PCBs, by removing the sediment. However, sediment suspension into the water column during dredging could result in a potential human exposure to PCBs that does not currently exist. As previously mentioned, existing surface water monitoring data indicates that PCBs have not been detected in water samples collected at the City of Cohoes public drinking water supply intakes located in the power canal downstream from the sediment removal area.

Short-Term Effectiveness

The short-term effects of dredging and backfilling would include disruption/destruction of some areas to construct access points, alteration of the benthic community, and (of most significance) the potential for suspension of PCB-containing sediment in surface water during dredging. Reasonable and appropriate controls would be undertaken/implemented to mitigate the potential suspension of PCBs in surface water during dredging, including the installation of silt curtains around the removal area. In addition, daily monitoring for turbidity and PCBs would be conducted downstream from the area. Based on monitoring results, production rates or dredging techniques may be modified and additional silt curtain may be placed. However, these control measures may not be entirely effective.

In general, during dredging operations, remediation workers would not be exposed to constituent levels that present unacceptable health risks provided that appropriate health and safety practices (OSHA 29 CFR Part 1910.129) are followed through implementation of a site-specific HASP.

Long-Term Effectiveness and Permanence

This alternative would result in the permanent removal of nearshore sediment containing PCBs. However, due to dredging technology limitations, it may not be possible to remove all nearshore sediment within the target removal area. Sand/gravel backfill used to restore the removal area would isolate PCBs potentially present in the remaining sediment. In the long-term, potential future human exposure to nearshore sediment containing PCBs would be mitigated by this alternative.

Reduction of Toxicity, Mobility and Volume Through Treatment

The sediment removal in the "wet" alternative would reduce the mobility and volume of nearshore sediment containing PCBs. Following dewatering, the dredged sediment would be transported for offsite disposal at a Subtitle D landfill. Backfill material placed following the dredging activities would reduce the mobility of PCBs potentially remaining in sediment at the removal limits.

Implementability

Sediment dredging is a technology that has been implemented at other sites to address sediment containing PCBs. Dredging of the nearshore sediment is technically feasible and could be completed within a construction season. The equipment and materials necessary to implement this alternative are available, as are capable remedial contractors. Compliance with permitting requirements would be required for the dredging and backfilling. As discussed above, measures would be implemented to address potential resuspension of sediment containing PCBs. However, the measures may not be completely effective, and PCBs could become suspended in the water column and potentially migrate toward the intakes for the City of Cohoes public drinking water supply.

Cost

The estimated cost associated with implementation of the sediment removal in the "wet" alternative is $850,000. A detailed breakdown of the estimated costs associated with this alternative is presented in Table 9.

4.3.6 Alternative 6 – Sediment Removal in the "Dry"

Technical Description

This alternative would involve the construction of a temporary cellular-type, gravity cofferdam around the proposed removal area, dewatering of the area inside the cofferdam, and sediment removal (in the "dry") after the area is dewatered. The sediment removal area, shown on Figure 6, would encompass approximately 320 feet of shoreline and extend 45 feet, on average, from the shoreline. The horizontal sediment removal limits include the entire "nearshore area" as defined in Subsection 3.1. Based on an average sediment removal depth of 1 foot, approximately 550 CY of sediment would be removed under this alternative. A cellular-type, gravity cofferdam would be provided for sediment removal in the "dry" because other potential alternatives do not appear to be appropriate, as indicated below.

- The water level in the impoundment east of the former fire training area can only be drawn down to a level of approximately 2 to 4 feet below the crest of the feeder dam under optimal conditions (i.e., seasonal low-flow conditions in August/September preceded by dry-weather), which would not expose any more sediment than was exposed during the IRM sediment removal activities.

- Sediment probing conducted as part of the PSA and RI indicates that sediment depths in the nearshore area are relatively shallow (maximum of approximately 7.5 feet) and would not provide sufficient embedment for a sheetpile-wall cofferdam.

- Construction of an earthen cofferdam would be impractical given the water depths along the perimeter of the removal area (more than 10 feet in places) and the required length of dam (more than 400 feet). Assuming the crest of the cofferdam dam would be at least 10 feet wide and a minimum of 2 to 3 feet above the feeder dam crest (to provide freeboard needed for high flow conditions), more than 4,500 CY of material would be required.

- Commercially-available portable dams, such as those manufactured by Portadam or Aquabarrier, are not sufficiently high and require a smooth bottom surface (which is not anticipated) to limit seepage.

The temporary cellular-type, gravity cofferdam would consist of two rows of sheetpile spaced approximately 10 feet apart (embedded and braced as needed) with a granular fill material placed/compacted between the sheetpiles. A crane operated west of the shoreline would be used to drive the sheetpile and, as needed, place the granular fill. Prior to fill placement, water trapped inside the two rows of sheetpiles would be pumped to the Mohawk River using a trash pump. Following completion of the cofferdam construction, water retained by the cofferdam within the sediment removal area would also be pumped to the river using the trash pump. The inlet of the hose connected to the trash pump would be maintained a minimum distance (e.g., at least 12 inches) above the sediment surface in an effort to prevent sediment from being drawn into the pump and discharged to the river. The final 12 inches of water ponded in the deepest part of the sediment removal area and any subsequent water that seeps into the area would be pumped to onsite wastewater storage tanks for temporary storage and handling (as discussed below). For purposes of this FFS Report, it is assumed that approximately 75,000 gallons of water would be generated by dewatering of the sediment removal area. However, it is possible that this volume could increase depending on the amount of water that seeps beneath the cofferdam.

Sediment removal in the dewatered area would be accomplished using a small excavator operating from the shoreline and within the area, as needed. It is assumed that the sediment removal would proceed at a rate of approximately 100 CY per day and would take less than 2 weeks to complete. Sediment removed by the small excavator would be transferred to a dewatering pad using a second excavator (i.e., long-reach) or a loader. The dewatering pad would be constructed using the same approach described above for Alternative 5 - Sediment Removal in the "Wet." Sediment placed in the dewatering pad would undergo gravity dewatering and stabilization, as necessary, in preparation for offsite transportation and disposal. Water collected in the dewatering pad would drain to a lined sump, and from there would be pumped to the onsite wastewater storage tanks for temporary storage. For purposes of this FFS Report, it is assumed that approximately 25,000 gallons of water would be collected in the dewatering pad. Based on the anticipated total volume of water to be generated under this alternative (25,000 gallons from dewatering excavated sediment and 75,000 gallons from dewatering the sediment removal area), temporary onsite water treatment facilities are not included under this alternative. The potential need for onsite water treatment facilities would be further evaluated during design.

Waste characterization samples would be collected to evaluate disposal requirements for the excavated sediment and wastewater generated by the dewatering activities. Based on existing sediment analytical results, it is assumed that the excavated sediment would be characterized as nonhazardous and transported to a Subtitle D landfill for offsite disposal. It is assumed that the wastewater would also be characterized as nonhazardous, but transported to a POTW or commercial wastewater treatment facility for treatment prior to discharge.

Verification sediment sampling would be conducted following completion of the removal activities to evaluate the potential presence of PCBs in remaining nearshore sediment. Following receipt of acceptable verification sampling results, the sediment excavation area would be backfilled with materials similar in physical characteristics to the native material removed from the area (i.e., medium to coarse sand) to provide habitat for benthic invertebrate colonization. The backfill material would be placed to the approximate original lines and grades. After backfilling is complete, all temporary cofferdam materials would be removed.

This alternative, like Alternative 5 - Sediment Removal in the "Wet," would also require the completion of predesign investigation activities prior to implementation and compliance with permitting requirements during implementation. Activities in connection with the sediment removal in the "dry" alternative would likely require a minimum of approximately 4 to 5 months to complete, allowing 1 week for mobilization, 4 weeks for construction of the temporary cofferdam and dewatering pad, 2 weeks for sediment removal, 1 week for backfill, 2 weeks for gravity-dewatering/stabilization of dredged sediment material, 2 weeks for waste transportation and offsite treatment/disposal, 3 weeks for cofferdam removal, and 1 week for demobilization. Additional removal may be required based on analytical results for the initial verification samples, which would extend the schedule for completing the alternative.

Compliance with SCGs

Chemical-Specific SCGs

The Class A ambient water quality standards and guidance values for surface waters presented in the NYSDEC TOGS 1.1.1 document titled, *Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations* (NYSDEC 2000) are applicable chemical-specific SCGs for this alternative. The inlet to the hose connected to the trash pump used for dewatering the sediment removal area would be maintained a minimum distance above the sediment surface in an effort to minimize the amount of sediment from being drawn into the pump and discharged to the river.

The additional chemical-specific guidelines discussed under the sediment removal in the "wet" alternative also apply to this alternative.

Action-Specific SCGs

The same action-specific SCGs that apply to the sediment removal in the "wet" alternative also apply to this alternative.

Location-Specific SCGs

The same action-specific SCGs that apply to the sediment removal in the "wet" alternative also apply to this alternative.

Overall Protection of Human Health and the Environment

The sediment removal in the "dry" alternative would meet the RAO of mitigating potential future human exposure to nearshore sediment containing PCBs, by permanently removing the sediment.

Short-Term Effectiveness

The short-term effects of this alternative include disruption/destruction of some areas to construct access points and the temporary cofferdam, alteration of the benthic community, and the potential suspension of PCB-containing sediment in surface water during dewatering of the sediment removal area. Daily monitoring for turbidity and PCBs could be conducted downstream from the area during dewatering. Based on monitoring results, the dewatering approach could be adjusted, if needed.

In general, during removal operations, remediation workers would not be exposed to constituent levels that present unacceptable health risks provided that appropriate health and safety practices (OSHA 29 CFR Part 1910.129) are followed through implementation of a site-specific HASP.

Long-Term Effectiveness and Permanence

This alternative would result in the permanent removal of nearshore sediment containing PCBs. Verification sediment sampling would be conducted to evaluate the potential presence of PCBs remaining at the excavation limits. While there would be short-term exposures by remedial construction workers, potential future human exposure to nearshore sediment containing PCBs would be mitigated by this alternative.

Reduction of Toxicity, Mobility and Volume Through Treatment

The sediment removal in the "dry" alternative would reduce the mobility and volume of nearshore sediment containing PCBs. Following dewatering, the dredged sediment would be transported for offsite disposal at a Subtitle D landfill. Backfill material placed following the dredging activities would reduce the mobility of PCBs (if detectable levels remain) within sediment at the removal limits.

Implementability

Sediment removal in the "dry" is a technology that has been implemented at other sites to address sediment containing PCBs. Removal of the nearshore sediment is technically feasible and could be completed within a construction season. The equipment and materials necessary to implement this alternative are available, as are capable remedial contractors. Compliance with permitting requirements would be required for the cofferdam construction, dewatering, sediment removal, backfilling, etc.

As discussed above, measures would be implemented to address the potential resuspension of sediment containing PCBs during excavation dewatering. However, the measures may not be completely effective, and PCBs could become suspended in the water column and potentially migrate toward the intakes for the City of Cohoes public drinking water supply.

Cost

The estimated cost associated with implementation of the sediment removal in the "dry" alternative is $1,400,000. A detailed breakdown of the estimated costs associated with this alternative is presented in Table 10.

4.3.7 Alternative 7 – Focused Sediment Removal

Technical Description

Under this remedial alternative, sediments located in the nearshore area containing the highest concentrations of PCBs would be mechanically dredged without dewatering the removal area. The anticipated sediment removal area, shown on Figure 7, would extend along the shoreline from sediment sampling location SD-3 to location SD-6, and would extend outward from the shoreline a distance of approximately 4 feet past the sampling locations. Based on an average sediment removal depth of 1 foot, approximately 100 CY of sediment would be removed under this alternative. The average PCB concentration in the sediment to be removed is 2.7 ppm (the range is 0.32 ppm to 7.3 ppm). The average PCB concentration in nearshore sediment to remain is 0.07 ppm (the range is an estimated 0.013 ppm to 1.5 ppm). The sediment to remain that exhibits PCBs at a concentration of 1.5 ppm was identified at a depth of 1 foot below the sediment surface and would be covered by clean sand/gravel material used to restore the sediment removal area.

The mechanical dredging approach for this alternative would be essentially the same as for Alternative 5, except that it may be possible to complete sediment removal under this alternative using an excavator instead of a crane. Use of an excavator versus a crane will be further evaluated during remedial design. For the purpose of estimating costs, it is assumed that a crane will be used to remove the submerged nearshore sediment. The crane or excavator would be operated from the shoreline. Sediments removed using a crane would be transferred directly from the excavation area to a dewatering pad constructed in the former fire training area. If an excavator was used to remove the sediment, a second excavator or loader would be used to transfer the dredged sediment to the dewatering pad. Measures to control sediment migration include the installation of silt curtains to section off the removal area from the remainder of the river. It is anticipated that Brascan would close the gates to the power canal prior to the start of actual sediment removal. The gates would be kept closed during the anticipated two-day sediment removal period. In turn, it is anticipated that the City of Cohoes would temporarily stop withdrawing water from the canal during this period. It is also anticipated that the sediment removal activities would be conducted during the months with the lowest baseflow for the Mohawk River (September and October). Surface water monitoring would also be performed during and following completion of the removal activities to document the effectiveness of the controls.

Following dewatering/stabilization, the sediment would be characterized and transported for offsite disposal at a facility permitted to accept the material. Water collected in the dewatering pad would drain to a lined sump, and would be pumped to an onsite wastewater storage tank for temporary storage. The water would be characterized and subsequently transported for offsite treatment/disposal at a facility permitted to accept the water. Temporary onsite water treatment facilities would not be provided as the volume of water to be generated is assumed to be on the order of approximately 20,000 gallons.

Based on the results of previous sediment sampling activities, verification sediment sampling would not be conducted following completion of the removal activities. After sediment removal within the defined limits has been completed, the dredged sediment area would be restored with materials similar in physical characteristics to the native material removed from the area (i.e., medium to coarse sand) to provide habitat for benthic invertebrate colonization.

Although proposed equipment, materials, and processes utilized during implementation may be modified during remedial design, this alternative would generally consist of the following steps:

- complying with permitting requirements, mobilizing equipment and materials, constructing support areas, and installing silt curtain in accordance with the approach described above for the sediment capping alternative;

- constructing a lined sediment dewatering pad for gravity dewatering and stabilizing of the excavated sediment. It is assumed that the dewatering pad would be approximately 50-foot long by 50-foot wide and would consist of a 4-inch thick granular fill base layer (i.e., interlocking stone), a 40-mil HDPE liner over the base layer, and a sacrificial 4-inch thick stone layer over the liner. The HDPE liner would extend over approximately 18-inch-high bermed sidewalls. The pad would slope toward a lined collection sump that would be used for collecting water that drains from the sediment. The actual dewatering/stabilization system would be determined during the remedial design/remedial action process;

- dredging sediment from the removal area using the crane equipped with a sealed clamshell or an excavator operated from the shoreline. It is assumed that the dredging production rate would be on the order of 50 CY per day, assuming efficient operating conditions. It is further assumed that daily water column sampling for turbidity and PCBs would be performed downstream of the dredging area during construction activities to monitor the effectiveness of the silt curtains. Based on sampling results, dredging activities may be modified (e.g., slowed or halted) or additional measures implemented (e.g., placement of additional silt curtain) until acceptable turbidity levels, to be determined during the remedial design and approved by the NYSDEC, are achieved. Dredging would also be halted if PCBs were detected in water column samples at concentrations exceeding laboratory detection limits (around 0.05 ppb). It is anticipated that actual removal activities would be completed within an approximately two-day period, provided water column monitoring results during the removal process are acceptable;

- dewatering/stabilizing the dredged sediment material, to the extent necessary, prior to transporting the material offsite to a facility permitted to accept the material. Based on existing sediment analytical results, it is assumed that the dredged sediment would be characterized as nonhazardous waste and would be disposed of at a Subtitle D landfill. It is also assumed that wastewater generated by gravity dewatering would be characterized as nonhazardous and transported to a POTW or commercial wastewater treatment facility for treatment/discharge; and

- placing clean sand/gravel material within the dredged sediment area to the approximate original lines and grades following the removal activities. It is assumed that backfilling would require approximately 2 days to complete. Silt curtain would be maintained to control sediment suspension/transport during backfilling.

Activities to be performed in connection with the focused sediment removal alternative would likely require a minimum of approximately 3 weeks to complete, assuming 1 week for mobilization and construction of the dewatering pad; 2 days for dredging; 2 days for backfilling; and 1 week for gravity-dewatering/stabilization of dredged sediment material, waste transportation and offsite treatment/disposal, and demobilization.

Compliance with SCGs

Chemical-Specific SCGs

The Class A ambient water quality standards and guidance values for surface waters presented in the NYSDEC TOGS 1.1.1 document titled, *Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations* (NYSDEC 2000) are applicable chemical-specific SCGs for this alternative. Silt curtain would be installed around the removal area to minimize the migration of suspended solids and PCBs from entering the water column outside the removal area. Although the concentration of PCBs detected in the sediment is relatively low (with a maximum of 7.3 ppm), it is possible that PCBs could become suspended in the water column for a short period of time and, within the specific area of turbid water, possibly exceed the 0.09 ppb New York State ambient water quality standard for the protection of sources of drinking water. Therefore, this sediment removal alternative may not comply with the TOGS 1.1.1 criteria within the nearshore area for a short period of time during implementation of the alternative. Impacts, if any, would be temporary. Given the short period of time needed for the sediment removal, it is anticipated that the City of Cohoes would be able to close the intakes located at the downstream end of the power canal, which would further mitigate potential water quality impacts.

Chemical-specific guidelines that are to be considered under this alternative are the sediment screening levels established in the NYSDEC document titled, *Technical Guidance for Screening Contaminated Sediments* (NYSDEC, 1999). As previously mentioned, that document states that sediment with concentrations of constituents of interest exceeding listed criteria are considered impacted, but the listed criteria do not necessarily represent a final concentration that must be achieved through remediation.

Because this alternative includes handling of materials containing PCBs, the PCB regulations in 40 CFR Part 761 related to the handling, storage, and disposal of materials containing PCBs would apply. As indicated in 40 CFR Part 761(b)(3), material with PCB concentrations less than 50 ppm that has been dredged or excavated from waters of the United States may be managed or disposed of in accordance with a permit issued:

- Under Section 404 of the Clean Water Act, or the equivalent of such a permit as provided for in regulations of the USACE at 33 CFR Part 320; or

- By the USACE under Section 103 of the Marine Protection, Research, and Sanctuaries Act, or the equivalent of such a permit as provided for in regulations of the USACE at 33 CFR Part 320.

Because the highest concentration of PCBs identified in the nearshore sediment is 7.3 ppm (at sampling location SD-3, approximately 10 feet from the shoreline), disposal of dredged sediment as a TSCA-regulated PCB waste/New York State hazardous waste (Waste Code B007) would not be required.

Another set of applicable chemical-specific SCGS applicable to this alternative are the federal and New York State regulations regarding identification of hazardous wastes, as outlined in 40 CFR Part 261 and 6 NYCRR Part 371, respectively. However, based on existing analytical data, excavated nearshore sediment is expected to be characterized as nonhazardous waste.

Action-Specific SCGs

Action-specific SCGs that may apply to this alternative are associated with the dredging and offsite treatment/disposal of the nearshore sediment, removal and treatment of water (from the dredging and dewatering activities), monitoring requirements, and OSHA health and safety requirements.

Workers and worker activities that occur during implementation of this alternative must comply with OSHA requirements for training, safety equipment and procedures, monitoring, recordkeeping, and reporting, as identified in 29 CFR Parts 1904, 1910, and 1926. Compliance with these SCGs would be accomplished by following a NYSDEC-approved design and project-specific HASP.

Dredging activities under this alternative and future maintenance removal (if any) activities would need to be conducted in accordance with the requirements of the Rivers and Harbors Act (33 CFR Parts 320-330) and Section 401 of the Clean Water Act pertaining to alterations of navigable waterways, which includes dredging of sediment.

U.S. Department of Transportation (USDOT) and disposal facility requirements for packaging, labeling, transporting, and disposing of regulated materials would also be applicable to this alternative. Compliance with these SCGs would be achieved by utilizing licensed and properly permitted waste transporters and treatment/disposal facilities.

Location-Specific SCGs

Location-specific SCGs that apply to this alternative are associated with discharge of dredge or fill materials, modifications of waterways, and obstruction/alteration of navigable waters. Compliance with these SCGs would be achieved by complying with permitting requirements and implementing designs that would minimize disturbance and/or alteration of the Mohawk River. A Joint Application for Permit covering stream disturbance would be completed and submitted to the NYSDEC and USACE for approval. Sediment removal activities would be conducted under USACE NWP38.

Overall Protection of Human Health and the Environment

The focused sediment removal alternative would meet the RAO of mitigating potential future human exposure to nearshore sediment containing PCBs, by permanently removing sediment and backfilling the removal area.

Short-Term Effectiveness

The short-term effects of dredging and backfilling would include disruption/destruction of some areas to construct access points, alteration of the benthic community, and the potential for suspension of PCB-containing sediment in surface water during dredging. Reasonable and appropriate controls would be undertaken/ implemented to mitigate the potential suspension of PCBs in surface water during dredging, including the installation of silt curtains around the removal area. In addition, routine water column monitoring for turbidity and PCBs would be conducted upstream and downstream from the area. Based on monitoring results, production rates or dredging techniques may be modified and additional silt curtain may be placed. As previously discussed, the actual dredging activities will be conducted in a small area over a period of two days which minimizes the disruption of the area. Because the dredging will occur over a short period of time, it is anticipated that the water intake for the City of Cohoes would be temporarily stopped during the dredging activities.

In general, during dredging operations, remediation workers would not be exposed to constituent levels that present unacceptable health risks provided that appropriate health and safety practices (OSHA 29 CFR Part 1910.129) are followed through implementation of a site-specific HASP.

Long-Term Effectiveness and Permanence

This alternative would result in the permanent removal of nearshore sediment containing PCBs. Sand/gravel backfill used to restore the removal area would isolate PCBs potentially present in the remaining sediment. In the long-term, potential future human exposure to nearshore sediment containing PCBs would be mitigated by this alternative. However, due to dredging technology limitations, it may not be possible to remove all nearshore sediment within the target removal area.

Reduction of Toxicity, Mobility and Volume Through Treatment

The focused sediment removal alternative would significantly reduce the mobility and volume of nearshore sediment containing PCBs. Following dewatering, the dredged sediment would be transported for offsite disposal at a Subtitle D landfill. Backfill material placed following the dredging activities would provide a protective layer between any residual PCBs and the river surface water, thus reducing the potential for scour-induced movement of PCBs.

Implementability

Dredging is a technology that has been implemented at other sites to address sediment containing PCBs. Dredging of the nearshore sediment is technically feasible and could be completed within a few weeks time. The equipment and materials necessary to implement this alternative are available, as are capable remedial contractors. Compliance with permitting requirements would be required for the dredging and backfilling. As discussed above, measures would be implemented to address potential resuspension of sediment containing PCBs.

Cost

The estimated cost associated with implementation of the focused sediment removal alternative is $210,000. A detailed breakdown of the estimated costs associated with this alternative is presented in Table 11.

5. Comparative Analysis of Alternatives

5.1 General

This section presents a detailed assessment of the alternatives to address the nearshore sediment of the Mohawk River adjacent to the former fire training area based on the seven NCP evaluation criteria identified in Section 4. This comparative analysis identifies the advantages and disadvantages of each alternative relative to each other and with respect to the seven NCP criteria. The results of the comparative analysis will be used as a basis for recommending a remedial alternative to address the nearshore sediment. A comparative analysis of remedial alternatives is presented below.

5.1.1 Compliance with SCGs

Chemical-Specific SCGs

The Class A ambient water quality standards and guidance values presented in the NYSDEC TOGS 1.1.1 document titled, *Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations* (NYSDEC 2000) are applicable chemical-specific SCGs for each alternative. Based on existing surface water monitoring results, which indicate that PCBs have not been detected in water samples collected at the City of Cohoes intakes for the public drinking water supply, Alternatives 1 (No Further Action), 2 (Institutional Controls), 3 (Monitored Natural Attenuation), and 4 (Sediment Capping) would comply with this SCG. Under Alternative 5 (Sediment Removal in the “Wet”) and Alternative 7 (Focused Sediment Removal), silt curtains would be installed around the sediment removal area to minimize migration of suspended solids and PCBs from entering the water column outside the removal area. Although the concentration of PCBs detected in the nearshore sediment is relatively low (with a maximum of 7.3 ppm), it is possible that PCBs could become suspended in the water column and exceed the 0.09 ppb New York State ambient water quality standard for the protection of sources of drinking water. Therefore, Alternative 5 may not comply with TOGS 1.1.1 criteria.

The sediment removal area under Alternative 7 (Focused Sediment Removal) is smaller than the area envisioned under Alternatives 5 and 6. Because less sediment would be disturbed under Alternative 7, the amount of sediment suspension within the immediate water column would be inherently less than under Alternatives 5 and 6. It is anticipated that the focused sediment removal proposed under Alternative 7 would be completed in two days. Due to the relatively short time period of sediment removal under Alternative 7, it is anticipated that Reliant would close the gates to the power canal (thereby diverting flow around the canal) and the City of Cohoes would, in turn, temporarily stop withdrawing water from the canal for the duration of the removal.

Under Alternative 6 (Sediment Removal in the “Dry”), dewatering of the sediment removal area would be conducted in a manner to minimize the potential for sediment containing PCBs from being drawn into the pump and discharged to the river.

For each alternative, chemical-specific SCGs that are to be considered are the sediment screening levels established in the NYSDEC document titled, *Technical Guidance for Screening Contaminated Sediments*, (NYSDEC, 1999). As previously mentioned, that document states that sediment with concentrations of constituents of interest exceeding listed criteria are considered impacted, but the listed criteria do not necessarily represent a final concentration that must be achieved through remediation.

Alternatives 1 through 4 do not involve the handling of any materials containing PCBs. Therefore chemical-specific SCGs that regulate the subsequent management and disposal of these materials are not applicable. Because Alternatives 5, 6, and 7 involve the handling of materials containing PCBs, the PCB regulations in 40 CFR Part 761 related to the handling, storage, and disposal of materials containing PCBs would apply. In addition, the Federal and New York State regulations regarding the identification of hazardous wastes, as outlined in 40 CFR Part 261 and 6 NYCRR Part 371, respectively, would apply to Alternatives 5, 6, and 7. However, based on existing analytical data, sediment excavated under Alternatives 5, 6, and 7 would presumably be characterized as nonhazardous and would be transported for offsite disposal at a Subtitle D landfill.

Action-Specific SCGs

Action-specific SCGs are not applicable under Alternatives 1 or 3. Under Alternative 2, surface water monitoring would be performed in accordance with the 401 Water Quality Certification in connection with future maintenance removal (if any) of nearshore sediment containing PCBs to demonstrate that maintenance activities would not adversely impact surface water quality. Alternatives 4, 5, 6, and 7 would require compliance with action-specific SCGs related to monitoring and OSHA health and safety requirements for construction activities. Alternatives 4, 5, 6, and 7 would also require compliance with action-specific SCGs related to alterations of navigable waterways, including dredging and filling operations. In addition, Alternatives 5, 6, and 7 would require compliance with USDOT and disposal facility requirements for packaging, labeling, transporting, and disposing of regulated materials.

Location-Specific SCGs

Location-specific SCGs are not applicable under Alternatives 1 through 3. Location-specific SCGs related to the discharge of dredge or fill materials, modifications to waterways, and obstruction/alternation of navigable waters would be applicable under Alternatives 4 through 7. Compliance with these SCGs would be achieved by following permitting requirements and implementing designs that would minimize disturbance and/or alteration of the Mohawk River.

5.1.2 Overall Protection of Human Health and the Environment

As previously mentioned, the RI results indicate that the nearshore sediment poses no current significant risk to human health or the environment. In addition, surface water monitoring results indicate that PCBs have not been detected in surface water supplied to the City of Cohoes Water Treatment Plant. However, possible future maintenance activities associated with the hydroelectric station (i.e., focused sediment removal in the vicinity of the ice fender, if any) could result in a potential future human exposure to PCBs under Alternatives 1 (No Further Action) and 3 (Monitored Natural Attenuation). In addition, sediment resuspension into the water column during removal of sediment in the “wet” under Alternative 5 (Sediment Removal in the “Wet”) and Alternative 7 (Focused Sediment Removal) could potentially result in a temporary human exposure to PCBs that does not currently exist. This exposure pathway would be addressed by the installation and maintenance of silt curtain during dredging operations. Additionally, under Alternative 7 sediment removal would be performed in a smaller area than Alternative 5, which would result in less sediment resuspension during the removal activities.

Alternatives 2 (Institutional Controls), 4 (Sediment Capping), and 6 (Sediment Removal in the "Dry") would meet the RAO of mitigating potential future human exposure to nearshore sediment containing PCBs. Alternative 3 (Monitored Natural Attenuation), if coupled with Alternative 2 (Institutional Controls), could also meet the RAO established for the nearshore sediment. Although the implementation of Alternatives 4 and 6 would possibly result in a minor long-term incremental reduction of risk relative to Alternative 2, the increase in protectiveness of human health would be marginal and may be outweighed by the short-term potential for particulates to become suspended into the water column during implementation of the sediment capping or removal in the "dry" alternative. Nearshore sediment dredging may potentially be needed for future maintenance purposes. By removing sediments in advance that contain the highest concentrations of PCBs (Alternative 7), the possibility of potential future human exposure to nearshore sediment containing PCBs is reduced. The dredging proposed in Alternative 7 also affects a smaller area than would be affected by Alternative 5 and 6. Based on this smaller removal area and control measures that would be provided (including installing a silt curtain, performing surface water monitoring), sediment resuspension during the focused sediment removal activities would be minor in comparison to full-scale remedial activities (Alternatives 5 and 6).

5.1.3 Short-Term Effectiveness

There would be no short-term environmental impacts or risks posed to the community associated with implementation of Alternatives 1 (No Further Action), 2 (Institutional Controls), and 3 (Monitored Natural Attenuation). There would be some disruption/destruction of areas to construct access points, alteration of the existing benthic community, and potential release of particulates and/or suspension of PCB-containing sediment in surface water during implementation of Alternative 4 (Sediment Capping), 5 (Sediment Removal in the "Wet"), 6 (Sediment Removal in the "Dry"), or Alternative 7 (Focused Sediment Removal). Reasonable and appropriate controls would be undertaken/implemented to mitigate potential human and ecological exposures associated with possible suspension of PCB-containing sediment in surface water during implementation of Alternatives 4, 5, 6, and 7 (e.g., installation of silt curtains, modification of production rates, modification of removal or placement techniques, etc.). As an added measure, under Alternative 7, it is assumed that the City of Cohoes could temporarily stop withdrawing water from the power canal for the short duration of the removal activities, thereby further addressing potential future human exposure.

Remediation workers would not be exposed to unacceptable health risks under Alternatives 4, 5, 6, and 7 provided that appropriate health and safety practices are followed through implementation of a site-specific HASP.

5.1.4 Long-Term Effectiveness and Permanence

A mechanism would not be in-place under Alternative 1 (No Further Action) to address possible future maintenance activities in the vicinity of the hydroelectric station that could potentially disturb nearshore sediment containing PCBs. Therefore, Alternative 1 may not achieve the RAO of mitigating future human exposure associated with nearshore sediment containing PCBs. However, the water quality certification amendments under Alternative 2 (Institutional Controls) could effectively and permanently mitigate potential future human exposure associated with the nearshore sediment containing PCBs. Unless coupled with institutional controls, Alternative 3 (Monitored Natural Attenuation) may not be effective at mitigating potential future human exposure to nearshore sediment containing PCBs. Alternatives 4 (Sediment Capping), 5 (Sediment Removal in the "Wet"), 6 (Sediment Removal in the "Dry"), and 7 (Focused Sediment Removal) would each be considered permanent and effective over the long-term. However, a cap maintenance program would be required under Alternative 4 to verify the reliability and effectiveness of the alternative in the long term.

5.1.5 Reduction of Toxicity, Mobility, or Volume through Treatment

Under each potential remedial alternative, the existing low concentrations of PCBs in the nearshore sediment would not be treated, recycled, or destroyed. Based on the relatively long (23-year) length of time that has passed since fire training activities permanently ended and the current distribution of PCBs remaining in the nearshore sediment (the highest PCB concentrations are near the sediment surface and concentrations generally diminish with depth at each sampling location), there appears to be little evidence of ongoing sedimentation processes that could potentially reduce future PCB concentrations in the nearshore surface sediment under Alternatives 1 (No Further Action), 2 (Institutional Controls), and 3 (Monitored Natural Attenuation).

Under Alternative 4 (Sediment Capping), the mobility of PCBs in sediment beneath the cap would be reduced. Both the mobility and volume of PCBs in nearshore sediment would be reduced under Alternatives 5 (Sediment Removal in the “Wet”), 6 (Sediment Removal in the “Dry”), and 7 (Focused Sediment Removal).

5.1.6 Implementability

Alternative 1 (No Further Action) does not include any active remedial component and consequently poses no technical or administrative implementability concerns. The remaining alternatives are technically feasible and could be implemented at the site. The technologies and/or controls proposed for these alternatives are proven, and the necessary materials and services are available. There would be minor potential difficulties under Alternatives 4 (Sediment Capping), 5 (Sediment Removal in the “Wet”), 6 (Sediment Removal in the “Dry”), and 7 (Focused Sediment Removal) related to construction activities in close proximity to the ice fender. In addition, although measures would be implemented to control sediment resuspension/transport under Alternatives 5, 6, and 7, the measures may not be entirely effective and PCBs could become suspended in the water column. Under Alternative 7, it is assumed that Brascan would close the gates to the power canal and the City of Cohoes could temporarily stop withdrawing water from the power canal for the short duration of the removal activities.

5.1.7 Cost

The seven remedial alternatives under consideration for the nearshore sediment of the Mohawk River cover a wide range of capital and O&M costs. No capital or O&M costs are associated with the implementation of Alternative 1. The costs associated with Alternatives 2 and 7 are relatively low compared to the total present-worth cost to implement either Alternative 3, 4, 5, or 6. The total costs to implement Alternatives 1 through 7 are presented in the table below.

Remedial Alternative		Estimated Capital Costs	Estimated O&M Costs	Total Costs (Rounded)
Alternative 1 –	No Further Action	$0	$0	$0
Alternative 2 –	Institutional Controls	$6,800	$18,620	$30,000

Remedial Alternative		Estimated Capital Costs	Estimated O&M Costs	Total Costs (Rounded)
Alternative 3 –	Monitored Natural Attenuation	$81,000	$129,600	$220,000
Alternative 4 –	Sediment Capping	$439,800	$248,200	$690,000
Alternative 5 –	Sediment Removal in the “Wet”	$842,400	$0	$850,000
Alternative 6 –	Sediment Removal in the “Dry”	$1,397,600	$0	$1,400,000
Alternative 7 –	Focused Sediment Removal	$210,000	$0	$210,000

5.2 Recommended Remedial Alternative

Based on the results of the comparative analysis presented above, the recommended remedial alternative to satisfy the RAO for the nearshore sediment of the Mohawk River east of the former fire training area is Alternative 7 (Focused Sediment Removal). The focused sediment removal alternative is compliant with the SCGs, would provide overall protection of human health and the environment, would be effective in the short term and long term, and could be easily implemented. Implementation of the focused sediment removal alternative would provide an additional level of protection for human health above the current, already acceptable level.

Alternative 2 would allow PCBs to remain in the sediment in concentrations ranging from less than 0.04 ppm to 7.3 ppm (with an average of 2.7 ppm), which could possibly become resuspended during future maintenance activities. Under Alternative 2, there is no removal of PCB containing sediments or long-term monitoring of surface water or sediments to verify that remaining PCBs in sediment will not present an exposure concern to users of the public water supply. Under Alternative 7, sediments containing PCBs ranging from 0.32 to 7.3 ppm would be removed to provide an additional level of protection for human health. The concentration of PCBs in the remaining sediments would range from an estimated 0.013 ppm to 1.5 ppm (with an average of 0.07 ppm), which is significantly lower than current levels. The sediment to remain that exhibits PCBs at a concentration of 1.5 ppm was identified at a depth of 1 foot below the sediment surface and would be covered by clean sand/ gravel material used to restore the sediment removal area.

As previously discussed, upland sources of PCBs to the nearshore sediment of the Mohawk River east of the former fire training area were removed by the IRM activities completed during 2002. The IRM also included the removal of a small area of nearshore sediment containing PCBs. With the IRM completed, the site-related concentration of PCBs in the remaining nearshore sediment is expected to remain consistent. There appears to be little evidence of ongoing sedimentation processes in this area so that monitoring of future sedimentation processes under Alternative 3 (Monitored Natural Attenuation) is considered unnecessary because potential future human exposure to PCBs would be mitigated by the removal activities performed under Alternative 7.

The additional efforts and short-term adverse impacts associated with Alternatives 4 (Sediment Capping), 5 (Sediment Removal in the “Wet”), or 6 (Sediment Removal in the “Dry”) when compared to Alternative 7 and weighed against potential long-term benefits do not appear to warrant the implementation of Alternatives 4, 5, or 6. Although a small additional amount of PCBs would be isolated under Alternative 4 and permanently removed (to the extent practical) under Alternatives 5 and 6 in the long term, implementation of each of these alternatives increases the potential of resuspension of sediments. The focused removal of sediments proposed under Alternative 7 would result in a reduction of PCBs in the nearshore sediments. Alternative 7 proposes a smaller removal area and shorter excavation duration that would reduce the potential of resuspension of sediment. In addition, it is anticipated that the City of Cohoes water intake in the power canal could be closed for the duration of the focused sediment removal activities.

As set forth in the NCP [40 CFR Part 300.430(f)(1)(D)], remedial costs should be proportional to the overall effectiveness of the remedial efforts. The detailed analysis for Alternative 7 indicates that this alternative, alone, would effectively mitigate potential future human exposure to nearshore sediment containing PCBs. Therefore, as compared to Alternative 7, the higher costs associated with Alternatives 3 through 6, for the potential small increase in long-term benefits, do not appear to be justified.

6. References

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Tables

BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Table 1

Brascan Power New York
(Former Reliant Energy/Niagara Mohawk, a National Grid Company)
School Street Hydroelectric Station
Cohoes, New York

Focused Feasibility Study
Sediment Analytical Sample Summary

Sample ID	Sample Interval	Date Sampled	SDG#	Analyses: PCBs	Analyses: TOC
Preliminary Site Assessment (PSA)					
SD-1	(0-0.5')	11/23/99	L56009	X	X
	(0.5-1')			X	X
	(1-1.5')			X	X
	(1.5-2')		L56012	X	
	(2-3')			X	
	(3-4')			X	
	(4-5')			X	
	(5-6')			X	
SD-2	(0-0.5')	11/23/99	L56009	X	X
	(0.5-1')			X	X
	(1-1.5')			X	X
	(1.5-2')		L56012	X	
	(2-3')			X	
	(3-4')			X	
	(4-5')			X	
SD-3	(0-0.5')	11/23/99	L56009	X	X
	(0.5-1')			X	X
	(1-1.5')			X	X
	(1.5-2')		L56012	X	
SD-4	(0-0.5')	11/23/99	L56009	X	X
	(0.5-1')			X	X
SD-D1 (SD-4)	(0.5-1')	11/23/99	L56009	X	X
SD-5	(0-0.5')	11/23/99	L56009	X	X
	(0.5-1')			X	X
	(1-1.5')			X	X
SD-6	(0-0.7')	11/23/99	L56009	X	X
SD-7	(0-0.5')	11/23/99	L56012	X	
	(0.5-1')			X	
	(1-1.5')			X	
	(1.5-2')			X	
	(2-3')			X	
SD-8	(0-0.5')	10/24/00	L64896/GAL144	X	
					X
	(0.5-1')			X	
					X
	(1-1.5')		L64901/GAL145	X	
					X
SD-9	(0-0.5')	10/24/00	L64896/GAL144	X	
					X
	(0.5-1')			X	
					X
	(1-1.5')			X	
					X

See Notes on Page 3.

Table 1

Brascan Power New York
(Former Reliant Energy/Niagara Mohawk, a National Grid Company)
School Street Hydroelectric Station
Cohoes, New York

Focused Feasibility Study
Sediment Analytical Sample Summary

Sample ID	Sample Interval	Date Sampled	SDG#	Analyses	
				PCBs	TOC
Remedial Investigation (RI)					
SD-10	(0-0.5')	10/24/00	L64896/GAL144	X	
					X
	(0.5-1')			X	
					X
	(1-1.5')			X	
					X
	(1-1.5') DUP				X
	(1.5-2')		L65310/GAL144	X	
					X
	(2-2.6')			X	
					X
SD-DUP-1 (SD-10)	(0.5-1')	10/24/00	L64901/GAL144	X	
					X
SD-11	(0-0.5')	10/24/00	L64896/GAL144	X	
					X
	(0.5-1')			X	
					X
	(1-1.5')			X	
					X
	(1.5-2')		L65310/GAL144	X	
					X
	(2-3')			X	
					X
SD-12	(0-0.5')	10/24/00	L64896/GAL144	X	
					X
	(0.5-1')			X	
					X
SD-13	(0-0.5')	10/25/00	L64901/GAL144	X	
					X
	(0.5-1')			X	
					X
	(1-1.5')			X	
					X
	(1.5-2')		L65310/GAL144	X	
					X
SD-14	(0-0.5')	10/25/00	L64901/GAL145	X	
					X
	(0.5-1')			X	
					X
SD-15	(0-1.5')	10/25/00	L64901/GAL145	X	
					X
	(1.5-3')			X	
					X
	(3-3.5')			X	
					X
	(3.5-4')			X	
					X
	(4-4.5')			X	
					X
	DUP (4-4.5')				X
	(4.5-5')			X	

See Notes on Page 3.

Table 1

Brascan Power New York
(Former Reliant Energy/Niagara Mohawk, a National Grid Company)
School Street Hydroelectric Station
Cohoes, New York

Focused Feasibility Study
Sediment Analytical Sample Summary

Sample ID	Sample Interval	Date Sampled	SDG#	Analyses	
				PCBs	**TOC**
Remedial Investigation (Cont'd)					
SD-DUP-2 (SD-15)	(3.5-4')	10/25/00	L64901/GAL145	X	
					X
SD-16	(0-0.5')	10/25/00	L64901/GAL145	X	
					X
	(0.5-1')			X	
					X
	(1-1.5')			X	
					X
SD-17	(0-0.5')	10/25/00	L64901/GAL145	X	
					X
	(0.5-1')			X	
					X
SD-18	(0-0.5')	12/8/00	L66595	X	
SD-18 DUP	(0-0.5')	12/8/00	L66595	X	X
SD-24	(0-0.5')	12/8/00	L66595	X	
Interim Remedial Measure					
SD-101	(1.5-2')	9/11/02	R2213672	X	X
SD-102	(0.5-1')	9/11/02	R2213672	X	X
SD-103	(0-0.5')	9/11/02	R2213672	X	X
SD-104	(0.5-1')	9/11/02	R2213672	X	X
SD-105	(2.2-2.7')	9/11/02	R2213672	X	X
SD-106	(1.2-1.7')	9/11/02	R2213672	X	X
DUP-SD-1 (SD-106)	(1.2-1.7')	9/11/02	R2213672	X	X
SD-107	(0-0.5')	9/11/02	R2213672	X	X
SD-108	(0.5-1')	9/11/02	R2213672	X	X

Notes:

1. SDG = Sample delivery group.
2. Samples collected by Blasland, Bouck & Lee, Inc. (BBL) on the dates indicated.
3. Sample designations indicate the following:
   - SD = Sediment sample; and
   - DUP = Blind duplicate sample.
4. Samples were analyzed using the following methods as referenced in the NYSDEC 2000 Analytical Services Protocol (ASP):
   - PCBs = Polychlorinated biphenyls using USEPA SW-846 Method 8082; and
   - TOC = Total organic carbon using the Lloyd Kahn method.
5. Laboratory analysis of the PSA and RI sediment samples for PCBs constituents was performed by Galson Laboratories, Inc. of East Syracuse, New York.
6. Laboratory analysis of the PSA and RI sediment samples for TOC was performed by H2M Laboratories, Inc. of Melville, New York.
7. Laboratory analysis of the IRM sediment samples for PCBs and TOC was performed by Columbia Analytical Services, Inc. of Rochester, New York.
8. Analytical results have been validated.

Table 2

Brascan Power New York
(Former Reliant Energy/Niagara Mohawk, a National Grid Company)
School Street Hydroelectric Station
Cohoes, New York

Focused Feasibility Study
Sediment Probing Results (feet)

Transect/Location	**Water Depth* (feet)**	**Sediment Depth (feet)**
Preliminary Site Assessment		
Transect T1		
T1-1	3.8	0.7
T1-2	8.7	1.5
T1-3	9.0	0.5
Transect T2		
T2-1	4.9	1.5
T2-2	7.4	3.5
T2-3	8.3	7.4
Transect T3		
T3-1	1.9	0.2
T3-2	10.2	4.0
T3-3	10.5	3.5
Transect T4		
T4-1	1.5	2.5
T4-2	8.3	2.0
T4-3	9.3	5.0
Transect T5		
T5-1	1.2	5.0
T5-2	7.8	1.2
T5-3	8.0	2.5
Transect T6		
T6-1	0.9	6.0
T6-2	8.0	1.5
T6-3	8.1	1.5
Remedial Investigation		
Transect T7		
T7-1	9.2	0.8
T7-2	9.4	2.4
T7-3	6.4	0.6
Transect T8		
T8-1	0.8	1.2
T8-2	0.7	0.3
Transect T9		
T9-1	0.3	0.2
T9-2	0.7	0.5
Transect T10		
T10-1	5.1	0.0
T10-2	4.8	0.0
Transect T11		
T11-1	0.4	0.4
T11-2	1.0	2.3
T11-3	0.0	2.0

See Notes on Page 2.

Table 2

Brascan Power New York
(Former Reliant Energy/Niagara Mohawk, a National Grid Company)
School Street Hydroelectric Station
Cohoes, New York

Focused Feasibility Study
Sediment Probing Results (feet)

Transect/Location	Water Depth* (feet)	Sediment Depth (feet)
Remedial Investigation		
Transect T12		
T12-1	0.0	1.0
T12-2	0.0	1.5
T12-3	0.0	5.0

Notes:
1. Preliminary Site Assessment (PSA) sediment probing was conducted by Blasland, Bouck & Lee, Inc. (BBL) during November 1999 from a small aluminum boat equipped with an outboard motor.
2. Remedial Investigation (RI) sediment probing was conducted by BBL during October 2000 while the water level in the power canal was drawn down for maintenance activities.
3. RI sediment probing locations were accessed by boat or wading (or directly for locations that were not submerged).
4. Sediment probing was conducted using a 0.5-inch diameter hollow steel rod equipped with an end cap.
5. PSA sediment probing locations were surveyed by BBL.
6. Distances from shoreline to RI sediment probing locations were measured by field personnel.
7. * = Water depths obtained during the RI were measured while the canal was dewatered.

Table 3

Brascan Power New York
(Former Reliant Energy/Niagara Mohawk, a National Grid Company)
School Street Hydroelectric Station
Cohoes, New York

Focused Feasibility Study
Sediment Sample Visual Characterization Results

Sample ID/ Depth Interval	Description
Preliminary Site Assessment	
SD-1	
0.0-0.5'	Gray-brown fine-to-very fine sand w/ some silt
0.5-1.0'	Gray-brown fine sand w/ some silt and white shells
1.0-1.5'	Gray-brown fine-to-very fine sand w/ some silt
1.5-2.0'	
2.0-3.0'	
3.0-4.0'	
4.0-5.0'	
5.0-6.0'	
SD-2	
0.0-0.5'	Gray-brown fine-to-very fine sand w/ silt
0.5-1.0'	
1.0-1.5'	
1.5-2.0'	Gray-brown fine-to-very fine sand
2.0-3.0'	
3.0-4.0'	Gray-brown fine-to-very fine sand w/ some silt
4.0-5.0'	
SD-3	
0.0-0.5'	Dark gray-brown fine sand w/ some silt & organic matter
0.5-1.0'	Gray-brown fine-to-very fine sand w/ some silt
1.0-1.5'	
1.5-2.0'	Gray-brown fine-to-very fine sand w/ silt
SD-4	
0.0-0.5'	Gray-brown coarse-to-fine sand & gravel
0.5-1.0'	
SD-5	
0.0-0.5'	Brown coarse-to-fine sand w/ some silt
0.5-1.0'	Brown coarse-to-fine sand w/ some silt & gravel
1.0-1.5'	Gray-brown coarse-to-fine sand & gravel
SD-6	
0.0-0.7'	Dark gray-brown silt w/ medium-to-fine sand & some organic matter
SD-7	
0.0-0.5'	Gray-brown coarse-to-medium sand w/ fine sand & some silt
0.5-1.0'	
1.0-1.5'	
1.5-2.0'	Gray-brown coarse-to-medium sand w/ fine sand, small white shells, & some silt
2.0-3.0'	Gray-brown medium-to-fine sand

See Notes on Page 3.

Table 3

Brascan Power New York
(Former Reliant Energy/Niagara Mohawk, a National Grid Company)
School Street Hydroelectric Station
Cohoes, New York

Focused Feasibility Study
Sediment Sample Visual Characterization Results

Sample ID/ Depth Interval	Description
Remedial Investigation	
SD-8	
0.0-0.7'	Brown silt, some fine to coarse sand with some shells
0.7-1.0'	Dark gray fine to coarse sand
1.0-1.5'	
SD-9	
0.0-0.5'	Brown silt with medium to coarse sand and shells
0.5-1.0'	Dark gray fine to coarse sand
1.0-1.5'	
SD-10	
0.0-0.5'	Dark gray silt and medium to coarse sand
0.5-1.0'	Dark gray fine to coarse sand
1.0-1.5'	
1.5-2.0'	Gray brown fine sand
2.0-2.6	
SD-11	
0.0-0.5'	Brown fine to coarse sand with shells
0.5-1.5'	Dark gray fine to coarse sand
1.0-1.5'	
1.5-2.0'	Gray brown fine to coarse sand
2.0-2.3'	
2.3-3.0'	Gray to silty clay
SD-12	
0.0-0.5'	Gray, brown medium to coarse sand with shells
0.5-1.0'	
SD-13	
0.0-0.5'	Brown fine sand, some shells
0.5-1.0'	Gray-brown fine to coarse sand with some shells
1.0-1.5'	
1.5-2.0'	Gray-brown fine sand and shells
SD-14	
0.0-0.5'	Gray-brown coarse-to-medium sand w/ fine sand & some silt
0.5-1.0'	Gray-brown fine sand some silt some clay
SD-15	
0.0-0.5'	Zebra muscle shells with some fine sand
0.5-1.0'	
1.0-1.5'	
1.5-2.0'	
2.0-2.5'	
2.5-3.0'	

See Notes on Page 3.

Table 3

Brascan Power New York
(Former Reliant Energy/Niagara Mohawk, a National Grid Company)
School Street Hydroelectric Station
Cohoes, New York

Focused Feasibility Study
Sediment Sample Visual Characterization Results

Sample ID/ Depth Interval	Description
Remedial Investigation	
SD-15 (Cont'd)	
3.0-3.5'	Gray-brown fine sand and zebra muscle shells
3.5-4.0'	Gray-brown fine to coarse sand with shells
4.0-4.5'	
4.5-5.0'	
SD-18	
0.0-0.5'	Brown and dark brown silt
0.5-1.0'	Light brown fine sand, some dark brown silt
1.0-1.5'	
SD-24	
0.0-0.5'	Brown and dark brown silt
0.5-1.0'	Dark brown silt, some fine sand, some gravel
1.0-1.5'	Gray-brown fine sand, some silt
Interim Remedial Measure	
SD-101	
0.0-0.5'	Brown weathered shale with some fine sand
0.5-1.5'	Grey-brown tight fine sand, some clay, some organic matter
SD-102	
0.0-0.5'	Grey brown fine to coarse sand, some silt
0.5-1.0'	Grey brown silt with weathered shale
SD-103	
0.0-0.5'	Grey brown fine to coarse sand with gravel, some silty clay
SD-104	
0.0-0.5'	Grey brown fine to medium sand
0.5-0.8'	Grey brown fine to medium sand
0.8-1.0'	Grey brown silty clay
SD-105	
0.0-2.2'	Grey brown, tight fine sand with some clay
2.2-2.7'	Grey brown, tight fine sand, some clay
SD-106	
0.0-0.3'	Silt
0.3-1.2'	Grey brown, tight fine sand, some gravel
1.2-1.7'	Grey brown, tight fine sand, some gravel
1.7-2.3'	Weathered shale
SD-107	
0.0-0.5'	Grey brown fine to coarse sand with gravel, some silty clay
SD-108	
0.0-0.8'	Grey-brown fine to medium sand
0.8-1.0'	Grey-brown silty clay

Notes:

1. Preliminary Site Assessment (PSA) sediment samples were collected by Blasland, Bouck & Lee, Inc. (BBL) during November 1999.
2. Remedial Investigation (RI) sediment samples were collected by BBL during October 2000 and December 2000.
3. Interim Remedial Measure (IRM) sediment samples were collected by BBL during September 2002.

Table 4

Brascan Power New York
(Former Reliant Energy/Niagara Mohawk, a National Grid Company)
School Street Hydroelectric Station
Cohoes, New York

Focused Feasibility Study
Sediment Analytical Results for PCBs and TOC (ppm)

Sample ID	TOC (ppm)	NYSDEC Sediment Criteria (ppm)			PCB Concentration (ppm)			
		Benthic Aquatic Life Acute Toxicity	Benthic Aquatic Life Chronic Toxicity	Wildlife Bioaccumulation	Aroclor 1248	Aroclor 1254	Aroclor 1260	Total PCBs
Preliminary Site Assessment								
SD-1 (0-0.5')	12,800 J	35.3	0.25	0.018	0.069	< 0.024	0.058	0.13
SD-1 (0.5-1')	15,300 J	42.2	0.30	0.021	<0.023	< 0.023	<0.023	<0.023
SD-1 (1-1.5')	14,600 J	40.3	0.28	0.020	<0.022	< 0.022	0.013 J	0.013 J
SD-1 (1.5-2')*	NA	NA	NA	NA	0.013 J	< 0.022	<0.022	0.013 J
SD-1 (2-3')*	NA	NA	NA	NA	<0.022	< 0.022	<0.022	<0.022
SD-1 (3-4')*	NA	NA	NA	NA	<0.022	< 0.022	<0.022	<0.022
SD-1 (4-5')*	NA	NA	NA	NA	<0.022	< 0.022	<0.022	<0.022
SD-1 (5-6')*	NA	NA	NA	NA	<0.017	< 0.017	<0.017	<0.017
SD-2 (0-0.5')	21,300 J	58.8	0.41	0.030	<0.023	< 0.023	0.24	0.24
SD-2 (0.5-1')	17,800 J	49.1	0.34	0.025	<0.024	< 0.024	0.085	0.085
SD-2 (1-1.5')	6,740 J	18.6	0.13	0.009	<0.023	< 0.023	<0.023	<0.023
SD-2 (1.5-2')*	NA	NA	NA	NA	<0.021	< 0.021	<0.021	<0.021
SD-2 (2-3')*	NA	NA	NA	NA	<0.022	< 0.022	<0.022	<0.022
SD-2 (3-4')*	NA	NA	NA	NA	<0.021	< 0.021	<0.021	<0.021
SD-2 (4-5')*	NA	NA	NA	NA	<0.023	< 0.023	<0.023	<0.023
SD-3 (0-0.5')	30,700 J	84.8	0.59	0.043	< 0.46	< 0.46	7.3	7.3
SD-3 (0.5-1')	10,800 J	29.8	0.21	0.015	<0.022	< 0.022	0.32	0.32
SD-3 (1-1.5')	8,430 J	23.3	0.16	0.012	<0.021	< 0.021	<0.021	<0.021
SD-3 (1.5-2')*	NA	NA	NA	NA	<0.024	< 0.024	<0.024	<0.024
SD-4 (0-0.5')*	6,980 J	19.3	0.13	0.010	< 0.22	< 0.22	3.0	3.0
SD-4 (0.5-1')*	14,800 J	40.9	0.29	0.021	<0.20	< 0.20	1.9	1.9
SD-D1 [SD-4 (0.5-1')]	14,900 J	41.1	0.29	0.021	<0.21	< 0.21	2.6	2.6
SD-5 (0-0.5')	17,400 J	48.0	0.34	0.024	<0.12	< 0.12	1.9	1.9
SD-5 (0.5-1')	6,250 J	17.3	0.12	0.009	<0.10	< 0.10	1.0	1.0
SD-5 (1-1.5')	13,400 J	37.0	0.26	0.019	<0.10	< 0.10	1.5	1.5
SD-6 (0-0.7')	19,200 J	53.0	0.37	0.027	<0.12	< 0.12	1.6	1.6

See Notes on Page 4.

Table 4

Brascan Power New York
(Former Reliant Energy/Niagara Mohawk, a National Grid Company)
School Street Hydroelectric Station
Cohoes, New York

Focused Feasibility Study
Sediment Analytical Results for PCBs and TOC (ppm)

Sample ID	TOC (ppm)	NYSDEC Sediment Criteria (ppm)			PCB Concentration (ppm)			
		Benthic Aquatic Life Acute Toxicity	Benthic Aquatic Life Chronic Toxicity	Wildlife Bioaccumulation	Aroclor 1248	Aroclor 1254	Aroclor 1260	Total PCBs
Preliminary Site Assessment								
SD-7 (0-0.5')*	NA	NA	NA	NA	0.025	< 0.021	0.020 J	0.045 J
SD-7 (0.5-1')*	NA	NA	NA	NA	0.021	< 0.019	<0.019	0.021
SD-7 (1-1.5')*	NA	NA	NA	NA	<0.020	< 0.020	<0.020	<0.020
SD-7 (1.5-2')*	NA	NA	NA	NA	<0.019	< 0.019	<0.019	<0.019
SD-7 (2-3')*	NA	NA	NA	NA	<0.020	< 0.020	<0.020	<0.020
Remedial Investigation								
SD-8 (0-0.5')	24,800	68.5	0.48	0.035	0.036	0.049	< 0.034	0.085
SD-8 (0.5-1')	26,000	71.8	0.50	0.036	< 0.028	0.046	< 0.028	0.046
SD-8 (1-1.5')	14,600	40.3	0.28	0.020	< 0.021	0.019 J	< 0.021	0.019 J
SD-9 (0-0.5')	11,300	31.2	0.22	0.016	0.029	0.044	< 0.026	0.073
SD-9 (0.5-1')	11,100	30.6	0.21	0.016	< 0.021	< 0.021	< 0.021	< 0.021
SD-9 (1-1.5')	8,080	22.3	0.16	0.011	< 0.020	< 0.020	< 0.020	< 0.020
SD-10 (0-0.5')	14,200	39.2	0.27	0.020	< 0.024	0.030	< 0.024	0.030
SD-10 (0.5-1')	5,230	14.4	0.10	0.007	< 0.019	< 0.019	< 0.019	< 0.019
SD-DUP-1 <SD-10 (0.5-1')>	5,440	15.0	0.10	0.008	< 0.020	< 0.020	< 0.020	< 0.020
SD-10 (1-1.5')	8,690	24.0	0.17	0.012	< 0.019	< 0.019	< 0.019	< 0.019
SD-10 (1-1.5') DUP	8,230	22.7	0.16	0.012	NA	NA	NA	NA
SD-10 (1.5-2')*	2,210	6.1	0.04	0.003	<0.019	<0.019	<0.019	<0.019
SD-10 (2-2.6')*	1,600	4.4	0.03	0.002	<0.019	<0.019	<0.019	<0.019
SD-11 (0-0.5')	4,460	12.3	0.09	0.006	< 0.019	< 0.019	< 0.019	< 0.019
SD-11 (0.5-1')	4,400	12.1	0.08	0.006	< 0.019	< 0.019	< 0.019	< 0.019
SD-11 (1-1.5')	1,700	4.7	0.03	0.002	0.025	0.025	< 0.020	0.050
SD-11 (1.5-2')*	3,850	10.6	0.07	0.005	<0.018	0.025 J	<0.018	0.025 J
SD-11 (2-3')*	8,230	22.7	0.16	0.012	<0.019	<0.019	<0.019	<0.019
SD-12 (0-0.5')	6,930	19.1	0.13	0.010	< 0.019	< 0.019	< 0.019	< 0.019
SD-12 (0.5-1')	17,400	48.0	0.34	0.024	< 0.021	< 0.021	< 0.021	< 0.021

See Notes on Page 4.

Table 4

Brascan Power New York
(Former Reliant Energy/Niagara Mohawk, a National Grid Company)
School Street Hydroelectric Station
Cohoes, New York

Focused Feasibility Study
Sediment Analytical Results for PCBs and TOC (ppm)

Sample ID	TOC (ppm)	NYSDEC Sediment Criteria (ppm)			PCB Concentration (ppm)			
		Benthic Aquatic Life Acute Toxicity	**Benthic Aquatic Life Chronic Toxicity**	**Wildlife Bioaccumulation**	**Aroclor 1248**	**Aroclor 1254**	**Aroclor 1260**	**Total PCBs**
Remedial Investigation (cont'd)								
SD-13 (0-0.5')	5,530	15.3	0.11	0.008	< 0.022	< 0.022	0.015 J	0.015 J
SD-13 (0.5-1')	17,500	48.3	0.34	0.025	< 0.039	< 0.039	0.45	0.45
SD-13 (1-1.5')	3,930	10.8	0.08	0.006	< 0.020	< 0.020	0.025	0.025
SD-13 (1.5-2')*	7,860	21.7	0.15	0.011	<0.021	0.014 J	<0.021	<0.021
SD-14 (0-0.5')	5,380	14.9	0.10	0.008	< 0.021	< 0.021	0.048	0.048
SD-14 (0.5-1')	12,600	34.8	0.24	0.018	< 0.020	< 0.020	< 0.020	< 0.020
SD-15 (0-1.5')	3,680	10.2	0.07	0.005	< 0.020	< 0.020	0.016 J	0.016 J
SD-15 (1.5-3')	115,000	317.5	2.22	0.161	< 0.022	< 0.022	< 0.022	< 0.022
SD-15 (3-3.5')	83,100	229.4	1.60	0.116	< 0.021	0.013 J	< 0.021	0.013 J
SD-15 (3.5-4')	10,800	29.8	0.21	0.015	< 0.021	0.015 J	< 0.021	0.015 J
SD-DUP-2 <SD-15 (3.5-4')>	13,500	37.3	0.26	0.019	< 0.020	0.025	0.023	0.048
SD-15 (4-4.5')	11,300	31.2	0.22	0.016	< 0.021	< 0.021	0.040	0.040
SD-15 (4-4.5') DUP	11,900	32.9	0.23	0.017	NA	NA	NA	NA
SD-15 (4.5-5')	NA	NA	NA	NA	0.032	< 0.020	0.015 J	0.047 J
SD-16 (0-0.5')	10,200	28.2	0.20	0.014	< 0.020	< 0.020	< 0.020	< 0.020
SD-16 (0.5-1')	2,550	7.0	0.05	0.004	< 0.020	< 0.020	< 0.020	< 0.020
SD-16 (1-1.5')	3,460	9.6	0.07	0.005	< 0.021	< 0.021	< 0.021	< 0.021
SD-17 (0-0.5')	38,700	106.8	0.75	0.054	0.059	0.084	< 0.028	0.143
SD-17 (0.5-1')	7,380	20.4	1.00	0.010	0.027	0.049	< 0.025	0.076
SD-18 (0-0.5')	NA	66.3	0.46	0.034	0.048	0.078	<0.027	0.126
SD-18 (0-0.5') DUP	24,000	66.3	0.46	0.034	0.040	0.065	<0.026	0.105
SD-24 (0-0.5')	NA	NA	NA	NA	0.035	0.057	<0.026	0.092
Interim Remedial Measure								
SD-101 (1.5-2')	11,800	32.6	0.23	0.017	< 0.042	< 0.042	< 0.042	< 0.042
SD-102 (0.5-1')	7,730	21.3	0.15	0.011	< 0.039	< 0.039	0.180	0.180
SD-103 (0-0.5')	5,550	15.3	0.11	0.008	< 0.040	< 0.040	14.0	14.0
SD-104 (0.5-1')	10,200	28.2	0.20	0.014	< 0.044	< 0.044	1.6	1.6
SD-105 (2.2-2.7')	4,820	13.3	0.09	0.007	< 0.042	< 0.042	< 0.042	< 0.042
SD-106 (1.2-1.7')	5,440	15.0	0.10	0.008	< 0.040	< 0.040	< 0.040	< 0.040
DUP-SD-1 [SD-106 (1.2-1.7')]	12,500	34.5	0.24	0.018	< 0.040	< 0.040	< 0.040	< 0.040
SD-107 (0-0.5')	8,640	23.9	0.17	0.012	< 0.042	< 0.042	6.1	6.1
SD-108 (0.5-1')	7,860	21.7	0.15	0.011	< 0.041	< 0.041	2.0	2.0

See Notes on Page 4.

Table 4

Brascan Power New York
(Former Reliant Energy/Niagara Mohawk, a National Grid Company)
School Street Hydroelectric Station
Cohoes, New York

Focused Feasibility Study
Sediment Analytical Results for PCBs and TOC (ppm)

Notes:

1. Preliminary Site Assessment (PSA) sediment samples were collected by Blasland, Bouck & Lee, Inc. (BBL) during November 1999.
2. Remedial Investigation (RI) sediment samples were collected by BBL during October and December 2000.
3. Interim Remedial Measure (IRM) sediment samples were collected by BBL during September 2002.
4. TOC = Total organic carbon.
5. Samples were analyzed using the following methods as referenced in the NYSDEC 2000 Analytical Service Protocol (ASP):
   - PCBs = Polychlorinated biphenyls using USEPA SW-846 Method 8082; and
   - TOC = Total organic carbon using the Lloyd Kahn method.
6. Laboratory analysis of PSA and RI sediment samples for PCBs was performed by Galson Laboratories, Inc. (Galson).
7. Laboratory analysis of PSA and RI sediment samples for TOC was performed by H2M Laboratories, Inc. (H2M).
8. Laboratory analysis of IRM sediment samples for PCBs and TOC was performed by Columbia Analytical Services, Inc.
9. Concentrations reported on a dry-weight basis in parts per million (ppm) or milligrams per kilogram (mg/kg).
10. Sample designations indicate the following:
    - SD = Sediment sample
    - D, DUP = Duplicate sample
11. J = Indicates an estimated value.
12. * = Indicates that the sample was initially archived. Laboratory analysis of the sample was subsequently performed based on the results of sediment samples collected from the overlying depth intervals.
13. Analysis of the archived sediment samples was performed outside the 7-day allowable holding time under the NYSDEC 1995 ASP, but within the 14-day allowable holding time under USEPA SW-846 Method 8082.
14. < = Not detected exceeding the indicated laboratory detection limit.
15. D = Concentration is based on a diluted sample analysis.
16. NA = Not analyzed.
17. NYSDEC sediment criteria were calculated using the ecological, risk-based levels of protection presented in the NYSDEC Division of Fish, Wildlife, and Marine Resources document titled, Technical Guidance for Screening Contaminated Sediments, dated January 1999, and the concentration of TOC detected in the individual sediment samples.
18. Analytical results have been validated.

Table 5

Brascan Power New York
(Former Reliant Energy/Niagara Mohawk, a National Grid Company)
School Street Hydroelectric Station
Cohoes, New York

Focused Feasibility Study
Potential Chemical, Action, and Location-Specific SCGs and TBCs

Potential Federal/ State Requirements and Guidance	Citation/Reference	Potential Status	Summary of Requirements/Guidance	Considerations in Remedial Process/Action for Attainment
Chemical-Specific SCGs				
Identification and Listing of Hazardous Wastes	40 CFR Part 261 6 NYCRR Part 371	Applicable	Establishes procedures for identifying solid wastes that are subject to regulation as hazardous wastes under 40 CFR Parts 260-266 and 6 NYCRR Parts 371-376.	These regulations do not set cleanup standards, but are considered when developing remedial alternatives. Material excavated/removed from the site would be handled in accordance with RCRA and New York State hazardous waste regulations, if appropriate.
Universal Treatment Standards/Land Disposal Restrictions (UTS/LDRs)	40 CFR Part 268	Applicable	Identifies hazardous wastes for which land disposal is restricted and provides a set of numerical constituents concentration criteria at which hazardous waste is restricted from land disposal.	Applicable to use if waste determined to be hazardous. These regulations will be used for remedial alternatives utilizing offsite land disposal.
Clean Water Act (CWA) – Ambient Water Quality Criteria	40 CFR Part 131 EPA 4405/5-86/001 "Quality Criteria for Water – 1986"	Applicable	Criteria for protection of aquatic life and/or human health depending on designated water use.	Criteria may be applicable for assessing water quality in the Mohawk River and power canal during potential remedial activities.
NYSDEC Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations	Division of Water Technical and Operational Guidance Series (TOGS 1.1.1, June 1998, revised April 2000)	Applicable	Provides a compilation of ambient water quality standards and guidance values for toxic and non-conventional pollutants for use in the NYSDEC programs.	These standards are applicable in evaluating surface water quality.
NYSDEC Technical Guidance for Screening Contaminated Sediments	Division of Fish and Wildlife, Division of Marine Resources (January 1999)	To Be Considered	Describes methodology for establishing sediment criteria for the purpose of identifying sediment that potentially may impact marine and aquatic ecosystems.	These criteria are to be considered in evaluating sediment quality.

Table 5
(cont'd)
Brascan Power New York
(Former Reliant Energy/Niagara Mohawk, a National Grid Company)
School Street Hydroelectric Station
Cohoes, New York

Focused Feasibility Study
Potential Chemical, Action, and Location-Specific SCGs and TBCs

Potential Federal/ State Requirements and Guidance	Citation/Reference	Potential Status	Summary of Requirements/Guidance	Considerations in Remedial Process/Action for Attainment
Action-Specific SCGs				
OSHA – General Industry Standards	29 CFR Part 1910	Applicable	These regulations specify the 8-hour time-weighted average concentration for worker exposure to various organic compounds. Training requirements for workers at hazardous waste operations are specified in 29 CFR 1910.120.	Proper respiratory equipment will be worn if it is not possible to maintain the work atmosphere below these concentrations.
OSHA – Safety and Health Standards	29 CFR Part 1926	Applicable	These regulations specify the type of safety equipment and procedures to be followed during site remediation.	Appropriate safety equipment will be onsite and appropriate procedures will be followed during any remedial activities.
OSHA – Recordkeeping, Reporting, and Related Regulations	29 CFR Part 1904	Applicable	These regulations outline recordkeeping and reporting requirements for an employer under OSHA.	These regulations apply to the company(s) contracted to install, operate, and maintain remedial actions at hazardous waste sites.
RCRA – General Standards	40 CFR 264	Relevant and Appropriate	General performance standards requiring minimization of need for further maintenance and control; minimization or elimination of post-closure escape of hazardous waste, hazardous constituents, leachate, contaminated runoff, or hazardous waste decomposition products. Also requires decontamination or disposal of contaminated equipment, structures, and soils.	Proper design considerations will be implemented to minimize the need for future maintenance. Decontamination actions and facilities will be included.
RCRA – Regulated Levels for Toxic Characteristics Leaching Procedure (TCLP) Constituents	40 CFR Part 261	Applicable	These regulations specify the TCLP constituent levels for identification of hazardous waste that exhibit the characteristic of toxicity.	Excavated soil may be sampled and analyzed for TCLP constituents prior to disposal to determine if the materials are hazardous based on the characteristic of toxicity.
RCRA – Preparedness and Prevention	40 CFR Part 264 Subpart C	Relevant and Appropriate	These regulations outline requirements for safety equipment and spill control.	Safety and communication equipment will be installed at the site as necessary. Local authorities will be familiarized with the site.

Table 5
(cont'd)
Brascan Power New York
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School Street Hydroelectric Station
Cohoes, New York

Focused Feasibility Study
Potential Chemical, Action, and Location-Specific SCGs and TBCs

Potential Federal/ State Requirements and Guidance	Citation/Reference	Potential Status	Summary of Requirements/Guidance	Considerations in Remedial Process/Action for Attainment
Action-Specific SCGs (cont'd)				
RCRA – Contingency Plan and Emergency Procedures	40 CFR Part 264 Subpart D	Relevant and Appropriate	Provides requirements for outlining emergency procedures to be used following explosions, fires, etc.	Plans will be developed and implemented during remedial design, as appropriate. If necessary to develop, copies of the plan will be kept onsite.
Standards Applicable to Transporters of Applicable Hazardous Waste – RCRA Section 3003	40 CFR Parts 262 and 263 40 CFR Parts 170-179	Applicable	Establishes the responsibility of offsite transporters of hazardous waste in the handling, transportation, and management of the waste. Requires manifesting, recordkeeping, and immediate action in the event of a discharge.	These requirements would be applicable to any company(s) contracted to transport hazardous material from the site.
USEPA – Administered Permit Program: The Hazardous Waste Permit Program	40 CFR Part 270 RCRA Section 3005	Applicable	Covers the basic permitting, application, monitoring, and reporting requirements for offsite hazardous waste management facilities.	Any offsite facility accepting hazardous waste from the site would be properly permitted. Implementation of the site remedy would include consideration of these requirements.
USDOT Rules for Transportation of Hazardous Materials	49 CFR Parts 107, 171.1 – 172.558	Applicable	Outlines procedures for the packaging, labeling, manifesting, and transportation of hazardous materials.	Any company contracted to transport hazardous waste from the site will be required to follow these regulations.
Clean Water Act (CWA) - Discharge to Waters of the U.S. National Pollution Discharge Elimination System (NPDES)	40 CFR Part 122, 125, 403, 230, and 402 33 USC 446 Section 404	To be considered	Establishes site-specific pollutant limitations and performance standards that are designed to protect surface water quality. Types of discharges regulated under CWA include discharge to surface water, indirect discharge to POTW, and discharges of dredged or fill material into U.S. waters.	May be relevant and appropriate for remedial alternatives that include discharging treated water back to the Mohawk River/power canal or POTW.
Clean Air Act (CAA)- – Ambient Air Quality Standards (NAAQS)	40 CFR Part 1 - 99	To be considered	Establishes ambient air quality standards for protection of public health.	Remedial operations would be performed in a manner that minimizes the production of particulate matter.

Table 5
(cont'd)
Brascan Power New York
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School Street Hydroelectric Station
Cohoes, New York

Focused Feasibility Study
Potential Chemical, Action, and Location-Specific SCGs and TBCs

Potential Federal/ State Requirements and Guidance	Citation/Reference	Potential Status	Summary of Requirements/Guidance	Considerations in Remedial Process/Action for Attainment
Action-Specific SCGs (cont'd)				
Discharge of Dredge or Fill Material into Waters of the United States	40 CFR Part 230	To be considered	Requirements for discharge of fill material or dredge material into waters of the United States.	Activities resulting in the discharge of fill material or dredge material to Mohawk River or power canal must be done under a permit from the United States Army Corps of Engineers.
Rivers and Harbors Act	33 CFR Parts 320-330	To be considered	Prohibits unauthorized obstruction or alteration of any navigable water in the U.S. (Dredging, fill, cofferdam, piers, etc.) requirements for permits affecting "navigable waters of the U.S."	Remedial activities may include dredging, damming, and/or armoring. If dredging and/or armoring are performed, a permit may be required for work in "navigable waters of the U.S."
Clean Waters Act (CWA) Section 404	40 CFR Part 320 30 CFR parts 230 - 330	To be considered	Relevant and appropriate for remedial actions that involve dredging, filling, and other construction activities in waterways.	May be relevant and appropriate for remedial alternatives that would include dewatering of soil/sediment followed by discharge of treated water to the Mohawk River/power canal.
Fish and Wildlife Coordination Act Modifications to Waterways that Affect Fish or Wildlife	16 USC 661 *et seq.* 40 CFR 6.302	Applicable	Requires protection of fish or wildlife that may be affected during when diversion, channeling, or other activities associated with modifying a stream or river.	Relevant and appropriate for remedial activities that includes hydraulic modifications to the Mohawk River.
New York State Pollution Discharge Elimination System (SPDES)	6 NYCRR Parts 750-758	Applicable	These regulations detail the specific permit requirements for the discharge of pollutants to the waters of New York State.	Any water discharged from the site would be treated and discharged in accordance with NYSDEC SPDES permit requirements.
New York Hazardous Waste Management System – General	6 NYCRR Part 370	Relevant and Appropriate	Provides definitions of terms and general instructions for the Part 370 series of hazardous waste management.	Hazardous waste is to be managed according to this regulation.

Table 5
(cont'd)
Brascan Power New York
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School Street Hydroelectric Station
Cohoes, New York

Focused Feasibility Study
Potential Chemical, Action, and Location-Specific SCGs and TBCs

Potential Federal/ State Requirements and Guidance	Citation/Reference	Potential Status	Summary of Requirements/Guidance	Considerations in Remedial Process/Action for Attainment
Action-Specific SCGs (cont'd)				
New York State - Identification and Listing of Hazardous Wastes	6 NYCRR Part 371	Applicable	Establishes procedures for identifying solid wastes that are subject to regulation as hazardous waste.	Materials excavated/removed from the site will be handled in accordance with RCRA and New York State hazardous waste regulations, if appropriate.
New York State - Hazardous Waste Manifest System and Related Standards for Generators, Transporters, and Facilities	6 NYCRR Part 372	Applicable	Provides requirements relating to the use of the manifest system and its recordkeeping requirements. Also establishes requirements for proper storage of hazardous waste. Applies to hazardous waste generators, transporters, and facilities in New York State.	This regulation will be applicable to the onsite storage of generated hazardous waste (if any) and to any company(s) contracted to do treatment work or to transport hazardous materials from the site.
New York State - Waste Transporter Permits	6 NYCRR Part 364	Applicable	Governs the collection, transport, and delivery of regulated waste within New York State.	Properly permitted haulers will be used if any waste materials are transported offsite.
NYSDEC Technical and Administrative Guidance Memorandums (TAGM)	NYSDEC TAGMs	To be considered	TAGMs are NYSDEC guidance that are to be considered during the remedial process.	Appropriate TAGMs will be considered during the remedial process.
Location-Specific SCGs				
Floodplains Management	40 CFR Appendix A to Part 6	Applicable	Procedures on floodplain management and wetlands protection.	Activities taking place within floodplains must be done to avoid advance impacts and preserve beneficial values in floodplains.
National Historic Preservation Act	36 CFR Part 800	Applicable	Requirements for preservation of historic properties.	Activities taking place on a site on or under consideration for placement of the National Register of Historic Places must be planned to preserve the historic property and minimize harm.

Table 5
(cont'd)
Brascan Power New York
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School Street Hydroelectric Station
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Focused Feasibility Study
Potential Chemical, Action, and Location-Specific SCGs and TBCs

Potential Federal/ State Requirements and Guidance	Citation/Reference	Potential Status	Summary of Requirements/Guidance	Considerations in Remedial Process/Action for Attainment
Location-Specific SCGs (cont'd)				
Preservation of Area Containing Artifacts	36 CFR Part 65	Applicable	Requirements for preservation of historical/archeological artifacts.	Activities must be done to identify, preserve, and recover artifacts if the site has been identified as containing significant historical artifacts.
New York Preservation of Historic Structures or Artifacts	Section 14.09	Applicable	Requirements for preservation of historical/archeological artifacts.	Activities must be done to identify, preserve, and recover artifacts if the site has been identified as containing significant historical artifacts.

Table 6

Brascan Power New York
(Former Reliant Energy/Niagara Mohawk, a National Grid Company)
School Street Hydroelectric Station
Cohoes, New York

Focused Feasibility Study
Cost Estimate for Alternative 2 - Institutional Controls

Item #	Description	Estimated Quantity	Unit	Unit Price	Estimated Amount
CAPITAL COSTS					
1	Amend 401 Water Quality Certification	1	LS	$5,000	$5,000
				Subtotal Capital Cost	$5,000
				Engineering and Administration (10%)	$500
				Contingency (25%)	$1,250
				Total Estimated Capital Cost	$6,750
OPERATION AND MAINTENANCE (O&M) COSTS					
1	Annual Fence Maintenance	1	LS	$1,500	$1,500
				Present Worth Factor (30 yrs., 7%)	12.41
				Total Present Worth O&M Cost	$18,615
				TOTAL ESTIMATED COST:	
				Total Estimated Cost	$25,365
				Rounded To	**$30,000**

Notes:

1. Amend 401 Water Quality Certification cost estimate includes costs to amend the existing certification to identify the presence of PCBs in the nearshore area of the Mohawk River east of the former fire training area, require surface water monitoring for PCBs in connection with future maintenance removal (if any) of the nearshore sediment, and require that fencing be maintained around the former fire training area to limit access to the nearshore sediment.
2. Annual fence maintenance includes costs for annual repairs to the fencing around the former fire training area.
3. Cost estimate based on 2003 dollars.
4. Cost estimate based on BBL's past experience.

Table 7

Brascan Power New York
(Former Reliant Energy/Niagara Mohawk, a National Grid Company)
School Street Hydroelectric Station
Cohoes, New York

Focused Feasibility Study
<u>Cost Estimate for Alternative 3 - Monitored Natural Attenuation</u>

Item #	Description	Estimated Quantity	Unit	Unit Price	Estimated Amount
CAPITAL COSTS					
1	Initial Monitoring Event	1	LS	60,000	$60,000
				Subtotal Capital Cost	$60,000
				Engineering and Administration (10%)	$6,000
				Contingency (25%)	$15,000
				Total Estimated Capital Cost	$81,000
OPERATION AND MAINTENANCE (O&M) COSTS					
1	Semi-Annual Monitoring (One Event Every 5 Years over a 30-Year Period)	1	LS	$60,000	$60,000
				Present Worth Factor (5, 10, 15, 20, 25, & 30 years @ 7%)	2.16
				Total Present Worth O&M Cost	$129,600
				TOTAL ESTIMATED COST:	
				Total Estimated Cost	$210,600
				Rounded To	**$220,000**

<u>Notes</u>:

1. Monitored natural attenuation cost estimate includes an initial monitoring event and additional monitoring events every 5 years over a period of 30 years.
2. Each monitoring event would consist of sediment probing and sampling along seven transects in the nearshore area of the Mohawk River east of the former fire training area, with three probing/sampling locations per transect. Cost estimate assumes up to 60 sediment samples per monitoring event would be analyzed for PCBs and TOC.
3. Surveying would be conducted to document probing/sampling locations.
4. A report would be prepared to summarize results obtained for each monitoring event.
5. Cost estimate based on 2003 dollars.
6. Cost estimate based on BBL's past experience.

Table 8

Brascan Power New York
(Former Reliant Energy/Niagara Mohawk, a National Grid Company)
School Street Hydroelectric Station
Cohoes, New York

Focused Feasibility Study
Cost Estimate for Alternative 4 - Sediment Capping

Item #	Description	Estimated Quantity	Unit	Unit Price	Estimated Amount
CAPITAL COSTS					
1	Institutional Controls	1	LS	$5,000	$5,000
2	Pre-Design Investigation	1	LS	$75,000	$75,000
3	Mobilization/Demobilization	1	LS	$50,000	$50,000
4	Staging/Access Area Development & Restoration	1	LS	$30,000	$30,000
5	Onsite Engineering Support	300	hours	$100	$30,000
6	Silt Curtain - Materials & Installation	500	LF	$100	$50,000
7	Geotextile Layer	1,600	SY	$3	$4,800
8	Sand Subbase (0.5 feet)	270	CY	$60	$16,200
9	Washed Stone Armor Layer (1.0 feet)	540	CY	$70	$37,800
10	Laboratory Analysis of Proposed Capping Materials	2	samples	$1,000	$2,000
11	Surface Water Monitoring	1	LS	$15,000	$15,000
12	Health and Safety Monitoring	1	LS	$10,000	$10,000
13	Miscellaneous Waste Disposal	1	LS	$5,000	$5,000
				Subtotal Capital Cost	$325,800
				Engineering and Administration (10%)	$32,580
				Contingency (25%)	$81,450
				Total Estimated Capital Cost	$439,830
OPERATION AND MAINTENANCE (O&M) COSTS					
1	Annual Cap Monitoring and Maintenance	1	LS	$20,000	$20,000
				Present Worth Factor (30 yrs., 7%)	12.41
				Total Present Worth O&M Cost	$248,200
				TOTAL ESTIMATED COST:	
				Total Estimated Cost	$688,030
				Rounded To	**$690,000**

General Comments:

1. All costs include labor, equipment, and materials, unless otherwise noted.
2. Costs do not include legal fees, permitting, negotiations, or NYSDEC oversight.
3. Unit costs are in 2003 dollars and are estimated from standard estimating guides, vendors, and professional judgment and experience from other projects.
4. Costs based on current site information and project understanding.
5. A 10% allowance is made for engineering fees and administration.
6. A 25% contingency allowance is included to provide for unforeseen circumstances or variability in estimated areas, volumes, and labor and material costs.

Notes and Assumptions:

1. Institutional controls cost estimate includes administrative costs associated with posting signs and amending the existing 401 Water Quality Certification to mitigate potential exposure and actions that may disturb the integrity of the cap. The specific scope and requirements for the institutional controls would be determined during the remedial design/remedial action process.
2. Pre-design investigation cost estimate includes costs for conducting activities to gather information required for the remedial design for this alternative. Pre-design investigation activities may include a bathymetric survey of the cap area to provide information regarding the river bottom, and evaluation of hydrodynamic conditions, an evaluation of hydrogeologic conditions,

Table 8

Brascan Power New York
(Former Reliant Energy/Niagara Mohawk, a National Grid Company)
School Street Hydroelectric Station
Cohoes, New York

Focused Feasibility Study
Cost Estimate for Alternative 4 - Sediment Capping

and an evaluation of sediment geotechnical properties to facilitate an appropriate cap design.

3. Mobilization/demobilization cost estimate includes mobilization and demobilization of labor, equipment, and materials necessary to place an engineered cap over approximately 14,500 square feet of nearshore sediment east of the former fire training area.
4. Staging/access area development cost estimate includes clearing and preparation of equipment and material staging/handling areas, installation of an office trailer, and construction of a shoreline mooring area for loading/unloading barge and watercraft. Restoration includes the removal and disposal of gravel and fill replacemet, where necessary, followed by topsoil placement and hydroseeding.
5. Onsite engineering support cost estimate includes an onsite engineer and technical support staff during remedial construction activities. Cost is based on 12 labor-hours per day at a cost of $100/hour for oversight during an approximately 25-day field construction period.
6. Silt curtain materials/installation cost estimate includes installing a silt curtain around the capping area. For the purposes of this cost estimate, it is assumed that the silt curtain would be anchored to the shore, hung to the river bottom, and would extend approximately 500 feet around the capping area.
7. Geotextile layer cost estimate includes costs to install a non-woven geotextile (possibly 8- or 10-ounce) over the capping area.
8. Sand subbase cost estimate includes costs to install a 0.5-foot thick sand layer on top of the geotextile.
9. Washed stone armor layer cost estimate includes costs to install a 1.0-foot thick stone layer with an assumed minimum 6-inch diameter particle size over the sand subbase.
10. Laboratory analysis of proposed capping materials cost estimate includes costs to analyze samples of proposed capping materials to confirm that the materials are acceptable for use at the site.
11. Surface water monitoring cost estimate includes costs to monitor surface water quality immediately downstream of the work area, at the intakes for the City of Cohoes public drinking water supply, and at locations in the City of Cohoes Water Treatment Plant for PCBs, turbidity, and total suspended solids on a daily basis during placement of capping materials.
12. Health and safety monitoring cost estimate includes miscellaneous monitoring for worker health and safety.
13. Miscellaneous waste disposal cost estimate is based on disposal of miscellaneous materials (e.g., used silt curtain, water generated during decontamination activities, personal protective equipment, and disposable equipment at a facility permitted to accept the wastes).
14. Cap monitoring and maintenance costs are for labor, equipment, and materials necessary to inspect (diver-assisted operation) and maintain the engineered cap, when needed.

Table 9

Brascan Power New York
(Former Reliant Energy/Niagara Mohawk, a National Grid Company)
School Street Hydroelectric Station
Cohoes, New York

Focused Feasibility Study
Cost Estimate for Alternative 5 - Sediment Removal in the "Wet"

Item #	Description	Estimated Quantity	Unit	Unit Price	Estimated Amount
CAPITAL COSTS					
1	Pre-Design Investigation	1	LS	$75,000	$75,000
2	Mobilization/Demobilization	1	LS	$75,000	$75,000
3	Access Area Development & Restoration	1	LS	$15,000	$15,000
4	Sediment Dewatering Area Construction	1	LS	$35,000	$35,000
5	Onsite Engineering Support	600	hours	$100	$60,000
6	Silt Curtain Materials/Installation	500	LF	$100	$50,000
7	Oil Booms and Absorbents	15	days	$500	$7,500
8	Sediment Removal	550	CY	$150	$82,500
9	Sediment Stabilization	1	LS	$10,000	$10,000
10	Surface Water Monitoring	1	LS	$15,000	$15,000
11	Waste Characterization Sample Analyses	4	Each	$1,000	$4,000
12	Backfill Sample Analysis	2	Each	$1,000	$2,000
13	Placement of Sand/Gravel Backfill	550	CY	$60	$33,000
14	Offsite Transportation and Disposal of Stabilized Sediment	1,000	Tons	$80	$80,000
15	Offsite Transportation and Treatment/Disposal of Wastewater	50,000	Gallons	$0.50	$25,000
16	Verification Sediment Sampling	1	LS	$25,000	$25,000
17	Health and Safety Monitoring	1	LS	$10,000	$10,000
18	Miscellaneous Waste Disposal	1	LS	$20,000	$20,000
				Subtotal Capital Cost	$624,000
				Engineering and Administration (10%)	$62,400
				Contingency (25%)	$156,000
				Total Estimated Capital Cost	$842,400
OPERATION AND MAINTENANCE (O&M) COSTS					
1	Annual Operation/Maintenance	0	LS	$0	$0
				Present Worth Factor (30 yrs., 7%)	12.41
				Total Present Worth O&M Cost	$0
				TOTAL ESTIMATED COST:	
				Total Estimated Cost	$842,400
				Rounded To	**$850,000**

General Comments:

1. All costs include labor, equipment, and materials, unless otherwise noted.
2. Costs do not include legal fees, permitting, negotiations, or NYSDEC oversight.
3. Unit costs are in 2003 dollars and are estimated from standard estimating guides, vendors, and professional judgment and experience from other projects.
4. Costs based on current site information and project understanding.
5. A 10% allowance is made for engineering fees and administration.
6. A 25% contingency allowance is included to provide for unforeseen circumstances or variability in estimated areas, volumes, and labor and material costs.

Notes and Assumptions:

1. Pre-design investigation cost estimate includes costs for conducting activities to gather information required for the remedial design for this alternative. Pre-design investigation activities may include a bathymetric survey of the removal area to provide information regarding the river bottom, an evaluation of hydrodynamic conditions, an evaluation of hydrogeologic conditions, and an evaluation of sediment geotechnical properties to facilitate an appropriate sediment dewatering/stabilization approach.

Table 9

Brascan Power New York
(Former Reliant Energy/Niagara Mohawk, a National Grid Company)
School Street Hydroelectric Station
Cohoes, New York

Focused Feasibility Study
Cost Estimate for Alternative 5 - Sediment Removal in the "Wet"

2. Mobilization/demobilization cost estimate includes mobilization and demobilization of labor, equipment, and materials necessary to dredge the targeted area to a depth of approximately 1 foot and backfill the dredged area.
3. Access area development and restoration cost estimate includes costs to regrade the area along the top of the riverbank (as needed) for crane access, construction of haul road for offsite transportation of dredged sediment, removal and disposal of gravel and fill, placement of topsoil, and hydroseeding.
4. Sediment dewatering area construction cost estimate includes costs to construct a lined sediment dewatering pad for gravity dewatering and stabilization of the dredged sediment. It is assumed that the dewatering pad would be approximately 100 feet long by 100 feet wide and would consist of a 4-inch thick granular fill base layer (interlocking stone), a 40-mil HDPE liner over the base layer, and a 4-inch thick sacrificial sand layer over the liner.
5. Onsite engineering support cost estimate includes an onsite engineer and technical support staff during remedial construction activities. Cost is based on 12 labor-hours per day at a cost of $100/hour for oversight during the approximately 50-day field construction period.
6. Silt curtain materials/installation cost estimate includes costs to install a silt curtain around the sediment removal area. For the purposes of this cost estimate, it is assumed that the silt curtain would be anchored to the shore, hung to the river bottom, and would extend approximately 500 feet around the removal area.
7. Oil booms and absorbents cost estimate includes costs to provide oil booms and absorbent pads as a precaution during the actual removal of sediment.
8. Sediment removal cost estimate includes costs to mechanically dredge sediment using an approximately 150-ton crane equipped with a sealed clamshell. The crane would be operated from the top of the riverbank and would transfer the sediment to the sediment dewatering pad. Cost estimate assumes a production rate of approximately 100 CY per day.
9. Sediment stabilization cost estimate includes costs to stabilize sediment by adding/mixing a stabilizing agent following gravity dewatering. It is assumed that 20% stabilizing agent by weight would be added and that the wet density of in-situ sediment is approximately 1.1 tons/CY.
10. Surface water monitoring cost estimate includes costs to monitor surface water quality immediately downstream of the work area, at the intakes for the City of Cohoes public drinking water supply, and at locations in the City of Cohoes Water Treatment Plant for PCBs, turbidity, and total suspended solids on a daily basis when sediment removal occurs.
11. Waste characterization sample analyses cost estimate includes costs for the laboratory analysis of two samples collected to characterize the dredged sediment and two samples to characterize wastewater generated by sediment dewatering for offsite treatment/disposal.
12. Backfill sample analysis cost estimate includes costs for the laboratory analysis of proposed backfill materials to provide data to confirm that the materials are acceptable for use at the site.
13. Placement of sand/gravel backfill material cost estimate includes costs to place a clean sand/gravel backfill material in the removal area to provide habitat for benthic invertebrate colonization.
14. Offsite transportation and disposal of stabilized sediment cost estimate includes costs for loading, transporting, and disposing of stabilized sediment. It is assumed that the sediment is nonhazardous and would be transported to a Subtitle D landfill for offsite disposal. The estimated disposal weight is based on 550 CY of sediment at 1.1 tons/CY (605 tons) plus stabilizing agent at 20% by weight (121 tons). Cost estimate also includes costs for disposal of approximately 200 tons of sand used as a sacrificial layer in the sediment dewatering pad.
15. Offsite transportation and treatment/disposal of wastewater cost estimate includes costs for loading and transporting an estimated 50,000 gallons of wastewater generated by sediment dewatering and equipment decontamination activities to a wastewater treatment facility for offsite treatment/discharge. It is assumed that the wastewater would be characterized as nonhazardous.
16. Verification sediment sampling cost estimate includes costs to collect verification sediment samples from the limits of the sediment removal area for laboratory analysis for PCBs and TOC.
17. Health and safety monitoring cost estimate includes miscellaneous monitoring for worker health and safety.
18. Miscellaneous waste disposal cost estimate is based on disposal of miscellaneous materials (e.g., used silt curtain, water generated during decontamination activities, personal protective equipment, and disposable equipment at a facility permitted to accept the wastes).

Table 10

Brascan Power New York
(Former Reliant Energy/Niagara Mohawk, a National Grid Company)
School Street Hydroelectric Station
Cohoes, New York

Focused Feasibility Study
Cost Estimate for Alternative 6 - Sediment Removal in the "Dry"

Item #	Description	Estimated Quantity	Unit	Unit Price	Estimated Amount
CAPITAL COSTS					
1	Pre-Design Investigation	1	LS	$75,000	$75,000
2	Mobilization/Demobilization	1	LS	$75,000	$75,000
3	Access Area Development & Restoration	1	LS	$20,000	$20,000
4	Sediment Dewatering Area Construction	1	LS	$35,000	$35,000
5	Onsite Engineering Support	720	hours	$100	$72,000
6	Cofferdam Construction/Removal	20,000	SF	$23	$460,000
7	Dewatering of Sediment Removal Area	1	LS	$10,000	$10,000
8	Silt Curtain Materials/Installation	500	LF	$100	$50,000
9	Oil Booms and Absorbents	15	days	$500	$7,500
10	Sediment Removal	550	CY	$20	$11,000
11	Sediment Stabilization	1	LS	$10,000	$10,000
12	Surface Water Monitoring	1	LS	$15,000	$15,000
13	Waste Characterization Sample Analyses	7	Each	$1,000	$7,000
14	Backfill Sample Analysis	2	Each	$1,000	$2,000
15	Placement of Sand/Gravel Backfill	550	CY	$25	$13,750
16	Offsite Transportation and Disposal of Stabilized Sediment	1,000	Tons	$80	$80,000
17	Offsite Transportation and Treatment/Disposal of Wastewater	100,000	Gallons	$0.50	$50,000
18	Verification Sediment Sampling	1	LS	$12,000	$12,000
19	Health and Safety Monitoring	1	LS	$10,000	$10,000
20	Miscellaneous Waste Disposal	1	LS	$20,000	$20,000
				Subtotal Capital Cost	$1,035,250
				Engineering and Administration (10%)	$103,525
				Contingency (25%)	$258,813
				Total Estimated Capital Cost	$1,397,588
OPERATION AND MAINTENANCE (O&M) COSTS					
1	Annual Operation/Maintenance	0	LS	$0	$0
				Present Worth Factor (30 yrs., 7%)	12.41
				Total Present Worth O&M Cost	$0
				TOTAL ESTIMATED COST:	
				Total Estimated Cost	$1,397,588
				Rounded To	**$1,400,000**

General Comments:

1. All costs include labor, equipment, and materials, unless otherwise noted.
2. Costs do not include legal fees, permitting, negotiations, or NYSDEC oversight.
3. Unit costs are in 2003 dollars and are estimated from standard estimating guides, vendors, and professional judgment and experience from other projects.
4. Costs based on current site information and project understanding.
5. A 10% allowance is made for engineering fees and administration.
6. A 25% contingency allowance is included to provide for unforeseen circumstances or variability in estimated areas, volumes, and labor and material costs.

Notes and Assumptions:

1. Pre-design investigation cost estimate includes costs for conducting activities to gather information required for the remedial design for this alternative. Pre-design investigation activities may include a bathymetric survey of the removal area to provide information regarding the river bottom, an evaluation of hydrodynamic conditions, an evaluation of hydrogeologic conditions,

and an evaluation of sediment geotechnical properties to facilitate an appropriate sediment dewatering/stabilization approach.

2. Mobilization/demobilization cost estimate includes mobilization and demobilization of labor, equipment, and materials necessary to construct a temporary cofferdam and remove sediment from the targeted area to a depth of approximately 1 foot.
3. Access area development and restoration cost estimate includes costs to regrade the area along the top of the riverbank (as needed) for crane access, construct a haul road from the shoreline to a sediment dewatering pad, remove the haul road after the sediment removal activities are completed, rebuild the existing access road into the former fire training area, and place topsoil and hydroseed areas that were covered with grass/vegetation prior to the sediment removal activities.
4. Sediment dewatering area construction cost estimate includes costs to construct a lined sediment dewatering pad for gravity dewatering and stabilization of the dredged sediment. It is assumed that the dewatering pad would be approximately 100 feet long by 100 feet wide and would consist of a 4-inch thick granular fill base layer (interlocking stone), a 40-mil HDPE liner over the base layer, and a 4-inch thick sacrificial sand layer over the liner.
5. Onsite engineering support cost estimate includes an onsite engineer and technical support staff during key phases of the cofferdam construction and during the entire sediment removal/backfill period. Cost is based on 12 labor-hours per day at a cost of $100/hour for oversight over an estimated total of 60 days.
6. Cofferdam construction/removal cost estimate includes costs to install an approximately 500 foot long termporary cellular-type gravity cofferdam outside the sediment removal limits. The cofferdam would consist of two rows of sheetpile spaced approximately 10 feet apart, embedded and braced as needed, with a granular fill material placed/compacted between the sheetpiles. A crane operated along the shoreline would be used to install the shoreline would be used to drive the sheetpile and, as needed, place the granular fill. Cost estimate assumes that individual sheetpiles within each row would be approximately 20 feet long and embedded approximately 5 to 6 feet.
7. Dewatering of sediment removal area cost estimate includes costs to dewater the approximately 14,500 square foot sediment removal area inside the cofferdam. The majority of water within the sediment removal area would be pumped to the Mohawk River. The final 12-inches of water in the deepest part of the sediment removal area would be pumped to onsite storage tanks for temporary staging and characterization prior to offsite treatment/discharge.
8. Silt curtain materials/installation cost estimate includes costs to install a silt curtain around the proposed outside wall of the temporary cofferdam. For purposes of this cost estimate, it is assumed that the silt curtain would be anchored to the shore, hung to the river bottom, and would extend approximately 500 feet around the cofferdam.
9. Oil booms and absorbents cost estimate includes costs to provide oil booms and absorbent pads as a precaution during the construction of the temporary cofferdam.
10. Sediment removal cost estimate includes costs to excavate sediment from the dewatered nearshore area using a small excavator operating from the shoreline and within the removal area, as needed. Sediment removed by the small excavator would be transferred to the dewatering pad using a second excavator (i.e., long-reach) or a loader. Cost estimate assumes a production rate of approximately 100 CY per day.
11. Sediment stabilization cost estimate includes costs to stabilize sediment by adding/mixing a stabilizing agent following gravity dewatering. It is assumed that 20% stabilizing agent by weight would be added and that the wet density of in-situ sediment is approximately 1.1 tons/CY.
12. Surface water monitoring cost estimate includes costs to monitor surface water quality immediately downstream of the work area, at the intakes for the City of Cohoes public drinking water supply, and at locations in the City of Cohoes Water Treatment Plant for PCBs, turbidity, and total suspended solids on a daily basis during cofferdam construction/removal and during dewatering of the sediment removal area.
13. Waste characterization sample analyses cost estimate includes costs for the laboratory analysis of two samples collected to characterize the excavated sediment and five samples to characterize wastewater generated by sediment dewatering for offsite treatment/disposal.
14. Backfill sample analysis cost estimate includes costs for the laboratory analysis of proposed backfill materials to provide data to confirm that the materials are acceptable for use at the site.
15. Placement of sand/gravel backfill material cost estimate includes costs to place a clean sand/gravel backfill material in the removal area to provide habitat for benthic invertebrate colonization.
16. Offsite transportation and disposal of stabilized sediment cost estimate includes costs for loading, transporting, and disposing of stabilized sediment. It is assumed that the sediment is nonhazardous and would be transported to a Subtitle D landfill for offsite disposal. The estimated disposal weight is based on 550 CY of sediment at 1.1 tons/CY (605 tons) plus stabilizing agent at 20% by weight (121 tons). Cost estimate also includes costs for disposal of approximately 200 tons of sand used as a sacrificial

layer in the sediment dewatering pad.

17. Offsite transportation and treatment/disposal of wastewater cost estimate includes costs for loading and transporting an estimated 100,000 gallons of wastewater generated by dewatering of the sediment removal area, dewatering of excavated sediment, and decontamination of equipment to a wastewater treatment facility for offsite treatment/discharge. It is assumed that the wastewater would be characterized as nonhazardous.
18. Verification sediment sampling cost estimate includes costs to collect verification sediment samples from the limits of the sediment removal area for laboratory analysis for PCBs and TOC.
19. Health and safety monitoring cost estimate includes miscellaneous monitoring for worker health and safety.
20. Miscellaneous waste disposal cost estimate is based on disposal of miscellaneous materials (e.g., used silt curtain, water generated during decontamination activities, personal protective equipment, and disposable equipment at a facility permitted to accept the wastes).

Table 11

Brascan Power New York
(Former Reliant Energy/Niagara Mohawk, a National Grid Company)
School Street Hydroelectric Station
Cohoes, New York

Focused Feasibility Study
Cost Estimate for Alternative 7 - Focused Sediment Removal

Item #	Description	Estimated Quantity	Unit	Unit Price	Estimated Amount
CAPITAL COSTS					
1	Engineering Design	1	LS	$25,000	$25,000
2	Mobilization/Demobilization	1	LS	$15,000	$15,000
3	Access Area Development & Restoration	1	LS	$7,500	$7,500
4	Sediment Dewatering Area Construction	1	LS	$10,000	$10,000
5	Onsite Engineering Support	150	hours	$100	$15,000
6	Silt Curtain Materials/Installation	600	LF	$100	$60,000
7	Oil Booms and Absorbents	5	days	$500	$2,500
8	Sediment Removal	100	CY	$150	$15,000
9	Sediment Stabilization	100	CY	$20	$2,000
10	Surface Water Monitoring	1	LS	$10,000	$10,000
11	Waste Characterization Sample Analyses	2	Each	$1,000	$2,000
12	Backfill Sample Analysis	1	Each	$1,000	$1,000
13	Placement of Sand/Gravel Backfill	100	CY	$50	$5,000
14	Offsite Transportation and Disposal of Stabilized Sediment	200	Tons	$80	$16,000
15	Offsite Transportation and Treatment/Disposal of Wastewater	20,000	Gallons	$0.50	$10,000
16	Health and Safety Monitoring	1	LS	$7,000	$7,000
17	Miscellaneous Waste Disposal	1	LS	$5,000	$5,000
				Subtotal Capital Cost	$183,000
				Engineering and Administration (10%)	$18,300
				Contingency (25%)	$45,750
				Total Estimated Capital Cost	$247,050
OPERATION AND MAINTENANCE (O&M) COSTS					
1	Annual Operation/Maintenance	0	LS	$0	$0
				Present Worth Factor (30 yrs., 7%)	12.41
				Total Present Worth O&M Cost	$0
				TOTAL ESTIMATED COST:	
				Total Estimated Cost	$247,050
				Rounded To	**$250,000**

General Comments:

1. ***Assumes predesign investigation will not be performed.***
2. All costs include labor, equipment, and materials, unless otherwise noted.
3. Costs do not include legal fees, permitting, negotiations, or NYSDEC oversight.
4. Unit costs are in 2004 dollars and are estimated from standard estimating guides, vendors, and professional judgment and experience from other projects.
5. Costs based on current site information and project understanding.
6. A 10% allowance is made for engineering fees and administration.
7. A 25% contingency allowance is included to provide for unforeseen circumstances or variability in estimated areas, volumes, and labor and material costs.

Notes and Assumptions:

1. Engineering design cost estimate includes costs to prepare contract drawings/specifications.
2. Mobilization/demobilization cost estimate includes mobilization and demobilization of labor, equipment, and materials necessary to dredge the targeted area to a depth of approximately 1 foot and backfill the dredged area.

Table 11

Brascan Power New York
(Former Reliant Energy/Niagara Mohawk, a National Grid Company)
School Street Hydroelectric Station
Cohoes, New York

Focused Feasibility Study
<u>Cost Estimate for Alternative 7 - Focused Sediment Removal</u>

3. Access area development and restoration cost estimate includes costs to regrade the area along the top of the riverbank (as needed) for crane access, construct a haul road from the shoreline to a sediment dewatering pad, remove the haul road after the sediment removal activities are completed, rebuild the existing access road into the former fire training area, and place topsoil and hydroseed areas that were covered with grass/vegetation prior to the sediment removal activities.
4. Sediment dewatering area construction cost estimate includes costs to construct a lined sediment dewatering pad for gravity dewatering and stabilization of the dredged sediment. It is assumed that the dewatering pad would be approximately 50 feet long by 50 feet wide and would consist of a 4-inch thick granular fill base layer (interlocking stone), a 40-mil HDPE liner over the base layer, and a 4-inch thick sacrificial sand layer over the liner.
5. Onsite engineering support cost estimate includes an onsite engineer and technical support staff during remedial construction activities. Cost is based on 10 labor-hours per day at a cost of $100/hour for oversight during the approximately 15-day field construction period.
6. Silt curtain materials/installation cost estimate includes costs to install a silt curtain around the sediment removal area. For the purposes of this cost estimate, it is assumed that the silt curtain would be anchored to the shore, hung to the river bottom, and would extend approximately 300 feet around the removal area.
7. Oil booms and absorbents cost estimate includes costs to provide oil booms and absorbent pads as a precaution during the actual removal of sediment.
8. Sediment removal cost estimate includes costs to mechanically dredge sediment using an approximately 150-ton crane equipped with a sealed clamshell. The crane would be operated from the top of the riverbank and would transfer the sediment to the sediment dewatering pad. Cost estimate assumes a production rate up to approximately 50 CY per day.
9. Sediment stabilization cost estimate includes costs to stabilize sediment by adding/mixing a stabilizing agent following gravity dewatering. It is assumed that 20% stabilizing agent by weight would be added and that the wet density of in-situ sediment is approximately 1.1 tons/CY.
10. Surface water monitoring cost estimate includes costs to monitor surface water quality immediately downstream of the work area, at the intakes for the City of Cohoes public drinking water supply, and at locations in the City of Cohoes Water Treatment Plant for PCBs, turbidity, and total suspended solids on a daily basis when sediment removal occurs.
11. Waste characterization sample analyses cost estimate includes costs for the laboratory analysis of one sample collected to characterize the dredged sediment and one sample to characterize wastewater generated by sediment dewatering for offsite treatment/disposal.
12. Backfill sample analysis cost estimate includes costs for the laboratory analysis of proposed backfill materials to provide data to confirm that the materials are acceptable for use at the site.
13. Placement of sand/gravel backfill material cost estimate includes costs to place a clean sand/gravel backfill material in the removal area to provide habitat for benthic invertebrate colonization.
14. Offsite transportation and disposal of stabilized sediment cost estimate includes costs for loading, transporting, and disposing of stabilized sediment. It is assumed that the sediment is nonhazardous and would be transported to a Subtitle D landfill for offsite disposal. The estimated disposal weight is based on 100 CY of sediment at 1.1 tons/CY (110 tons) plus stabilizing agent at 20% by weight (22 tons). Cost estimate also includes costs for disposal of approximately 50 tons of sand used as a sacrificial layer in the sediment dewatering pad.
15. Offsite transportation and treatment/disposal of wastewater cost estimate includes costs for loading and transporting an estimated 20,000 gallons of wastewater generated by sediment dewatering and equipment decontamination activities to a wastewater treatment facility for offsite treatment/discharge. It is assumed that the wastewater would be characterized as nonhazardous.
16. Health and safety monitoring cost estimate includes miscellaneous monitoring for worker health and safety.
17. Miscellaneous waste disposal cost estimate is based on disposal of miscellaneous materials (e.g., used silt curtain, water generated during decontamination activities, personal protective equipment, and disposable equipment at a facility permitted to accept the wastes).

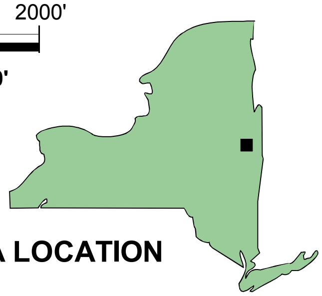
Figures

BLASLAND, BOUCK & LEE, INC.
engineers & scientists

REFERENCE: BASE MAP USGS 7.5 MIN. QUAD., TROY NORTH, NY, 1954, PHOTOREVISED 1980.

2000'   0   2000'

Approximate Scale: 1" = 2000'



AREA LOCATION

05/07/02 SYR-D85-DJH
36458001/36458n01.cdr

RELIANT ENERGY
FORMER NIAGARA MOHAWK, A NATIONAL GRID COMPANY
SCHOOL ST. HYDROELECTRIC STATION - COHOES, NY
FOCUSED FEASIBILITY STUDY REPORT

SITE LOCATION MAP

BBL®
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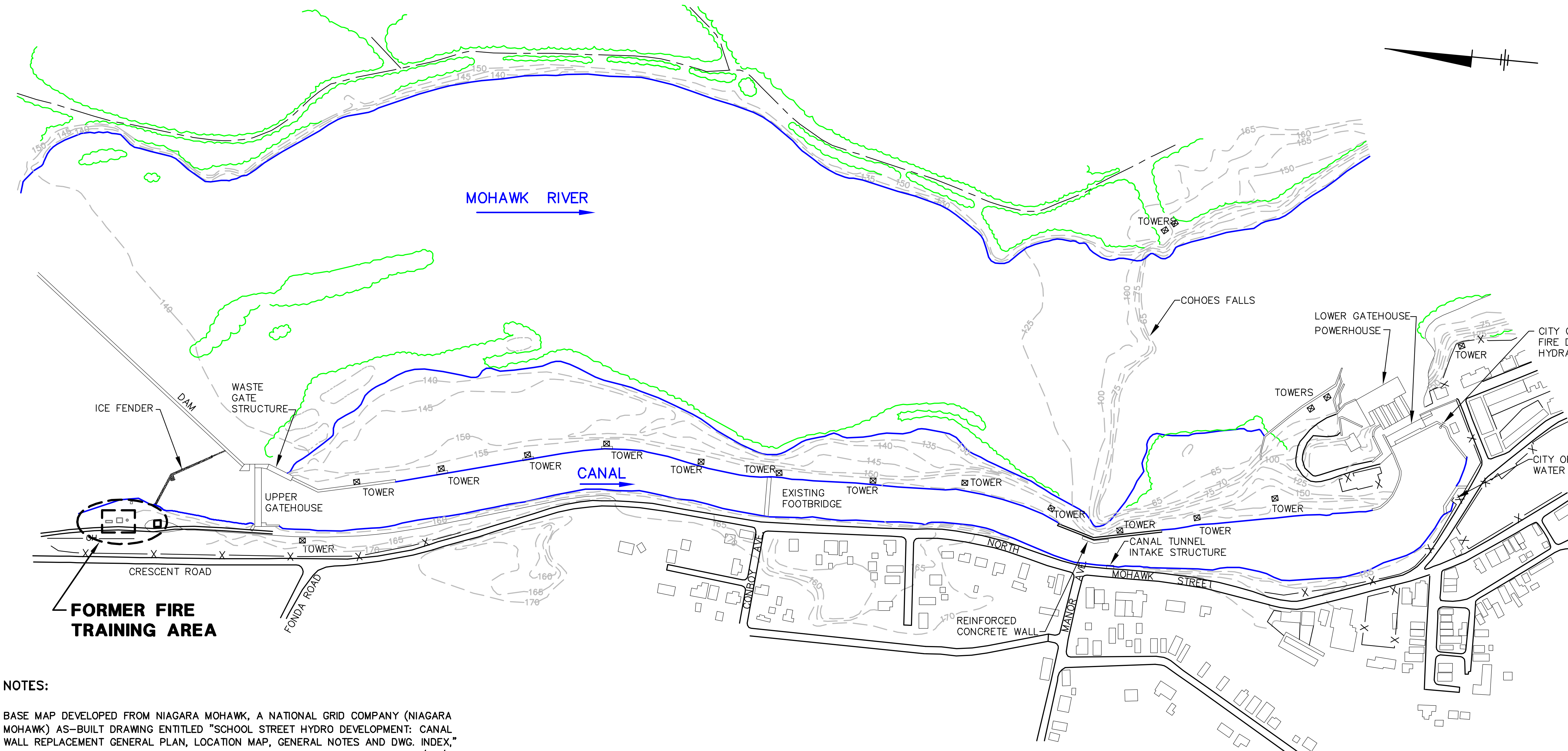
FIGURE
1



NOTES:

1. BASE MAP DEVELOPED FROM NIAGARA MOHAWK, A NATIONAL GRID COMPANY (NIAGARA MOHAWK) AS-BUILT DRAWING ENTITLED "SCHOOL STREET HYDRO DEVELOPMENT: CANAL WALL REPLACEMENT GENERAL PLAN, LOCATION MAP, GENERAL NOTES AND DWG. INDEX," FILE INDEX NO. 2.0-S12-H4, DRAWING NO. D-30664-E, ORIGINAL ISSUE DATE 6/30/94, AS-BUILT 9/95, AT A SCALE OF 1"=200'.

2. BASE MAP ALSO DEVELOPED FROM SITE SURVEY COMPLETED BY NIAGARA MOHAWK (AS PRESENTED ON THE NIAGARA MOHAWK DRAWING ENTITLED "SCHOOL STREET DEVELOPMENT SAMPLING LOCATIONS, INDEX NO. 2.0-S12-M5, DRAWING NO. B-33591-E, DATED APRIL 1999, LATEST REVISION MARCH 2001, AT A SCALE OF 1"=60'). LOCATION OF ICE FENDER IS FROM SURVEY ACTIVITIES COMPLETED BY BLASLAND, BOUCK & LEE, INC. (BBL) DURING NOVEMBER 1999.

0 400' 800'

GRAPHIC SCALE

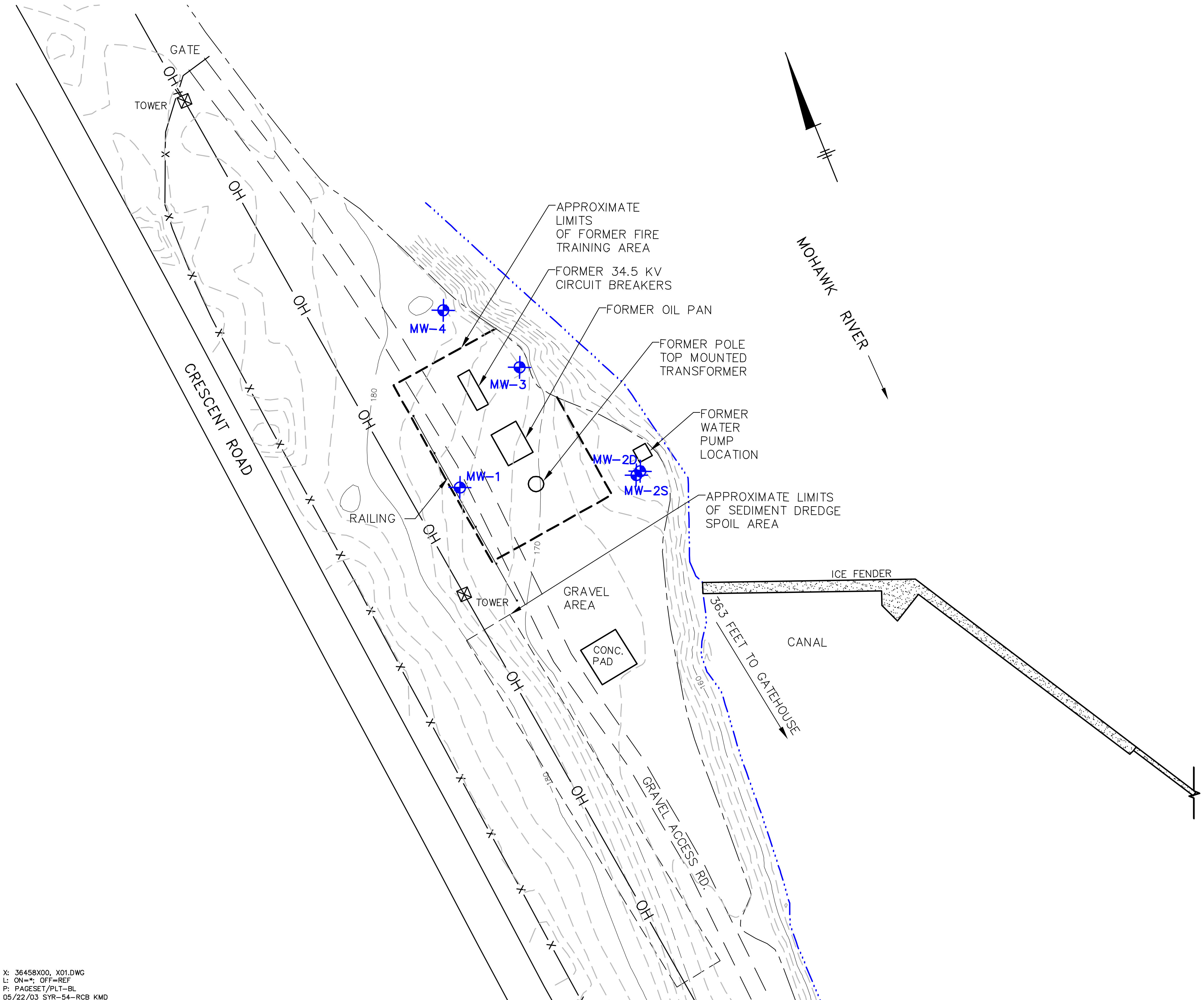
RELIANT ENERGY
FORMER NIAGARA MOHAWK, A NATIONAL GRID COMPANY
SCHOOL ST. HYDROELECTRIC STATION – COHOES, NY
FOCUSED FEASIBILITY STUDY REPORT

SITE PLAN

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

FIGURE
2

X: 36458X00.DWG
L: ON=*, OFF=REF*
P: PAGESET/PLT-BL
05/05/03 SYR-54-PGL KMD
36458008/FFSR/36458B01.DWG



LEGEND:

- SHORELINE
- TOP OF BANK
- X FENCE
- OH OVERHEAD HIGH VOLTAGE ELECTRIC LINE
- 170 GROUND SURFACE CONTOUR LINE (ELEVATION IN FEET ABOVE MEAN SEA LEVEL)

NOTES:

1. BASE MAP DEVELOPED FROM SITE SURVEY COMPLETED BY NIAGARA MOHAWK, A NATIONAL GRID COMPANY (NIAGARA MOHAWK) (AS PRESENTED ON THE NMPC DRAWING ENTITLED "SCHOOL STREET DEVELOPMENT SAMPLING LOCATIONS, INDEX NO. 2.0-S12-M5, DRAWING NO. B-33591-E, DATED APRIL 1999, LATEST REVISION MARCH 2001, AT A SCALE OF 1"=60'). LOCATION OF ICE FENDER, TOP OF BANK, AND HIGH VOLTAGE LINE ARE FROM SURVEY ACTIVITIES COMPLETED BY BLASLAND, BOUCK & LEE, INC. (BBL) DURING NOVEMBER 1999.
2. GROUND SURFACE CONTOUR LINES INDICATE TOPOGRAPHY OF SITE PRIOR TO IMPLEMENTATION OF INTERIM REMEDIAL MEASURES (WHICH WAS COMPLETED DURING 2002)
3. MONITORING WELL LOCATIONS MW-1 THROUGH MW-3 WERE SURVEYED BY NIAGARA MOHAWK.
4. MONITORING WELL MW-4 WAS SURVEYED BY BBL.
5. MONITORING WELL LOCATION MW-2S IS AN OVERBURDEN MONITORING WELL WHILE MONITORING WELL MW-2D IS A BEDROCK WELL.

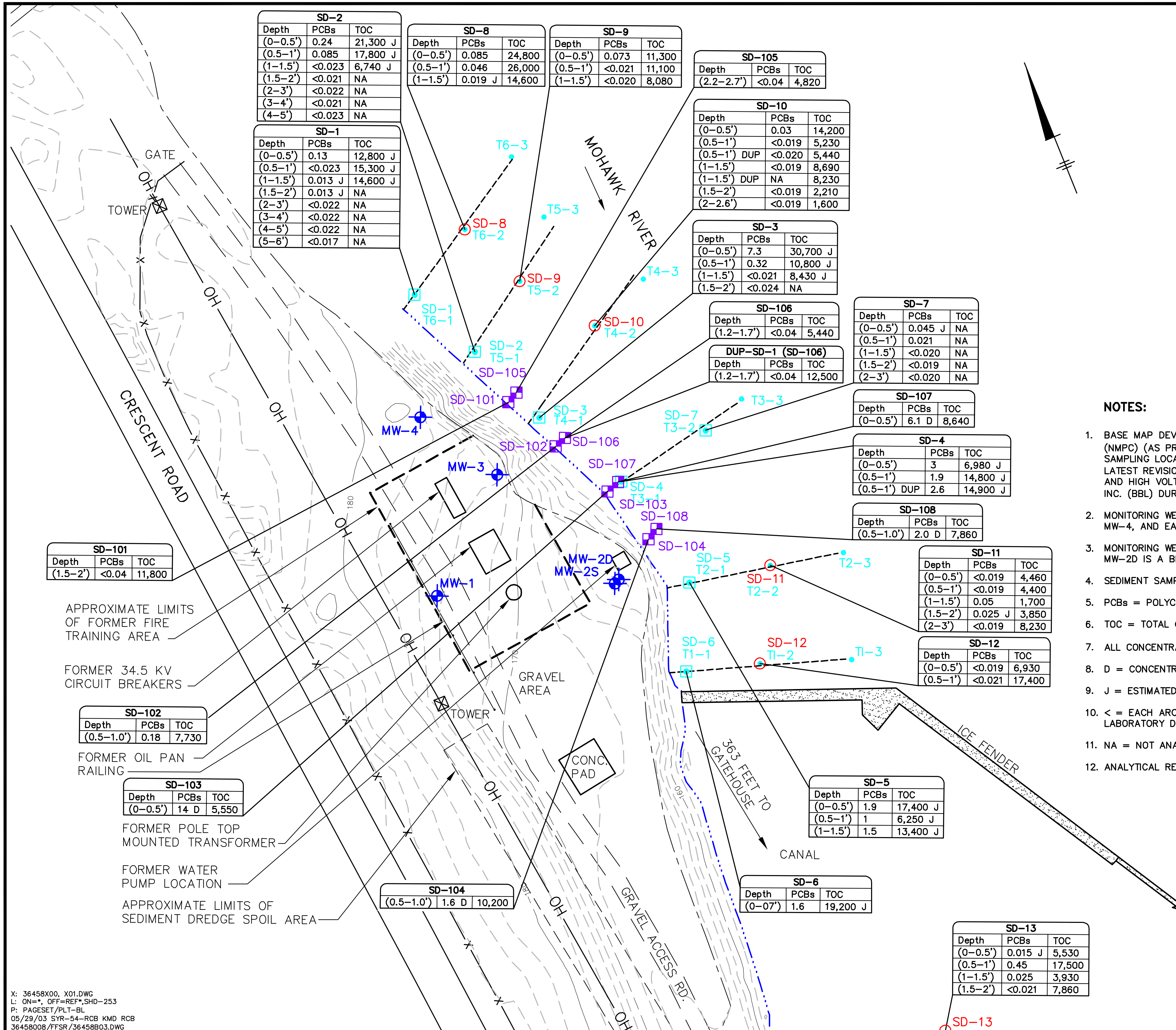
X: 36458X00, X01.DWG
L: ON=*; OFF=REF
P: PAGESET/PLT-BL
05/22/03 SYR-54-RCB KMD
36458008/FFSR/36458B02.DWG

RELIANT ENERGY
FORMER NIAGARA MOHAWK, A NATIONAL GRID COMPANY
SCHOOL ST. HYDROELECTRIC STATION – COHOES, NY
FOCUSED FEASIBILITY STUDY REPORT

FORMER FIRE TRAINING AREA FEATURES

BBL® BLASLAND, BOUCK & LEE, INC. engineers & scientists

FIGURE 3



SD-2

Depth	PCBs	TOC
(0–0.5')	0.24	21,300 J
(0.5–1')	0.085	17,800 J
(1–1.5')	<0.023	6,740 J
(1.5–2')	<0.021	NA
(2–3')	<0.022	NA
(3–4')	<0.021	NA
(4–5')	<0.023	NA

SD-8

Depth	PCBs	TOC
(0–0.5')	0.085	24,800
(0.5–1')	0.046	26,000
(1–1.5')	0.019 J	14,600

SD-9

Depth	PCBs	TOC
(0–0.5')	0.073	11,300
(0.5–1')	<0.021	11,100
(1–1.5')	<0.020	8,080

SD-105

Depth	PCBs	TOC
(2.2–2.7')	<0.04	4,820

SD-10

Depth	PCBs	TOC
(0–0.5')	0.03	14,200
(0.5–1')	<0.019	5,230
(0.5–1') DUP	<0.020	5,440
(1–1.5')	<0.019	8,690
(1–1.5') DUP	NA	8,230
(1.5–2')	<0.019	2,210
(2–2.6')	<0.019	1,600

SD-1

Depth	PCBs	TOC
(0–0.5')	0.13	12,800 J
(0.5–1')	<0.023	15,300 J
(1–1.5')	0.013 J	14,600 J
(1.5–2')	0.013 J	NA
(2–3')	<0.022	NA
(3–4')	<0.022	NA
(4–5')	<0.022	NA
(5–6')	<0.017	NA

SD-3

Depth	PCBs	TOC
(0–0.5')	7.3	30,700 J
(0.5–1')	0.32	10,800 J
(1–1.5')	<0.021	8,430 J
(1.5–2')	<0.024	NA

SD-106

Depth	PCBs	TOC
(1.2–1.7')	<0.04	5,440

DUP-SD-1 (SD-106)

Depth	PCBs	TOC
(1.2–1.7')	<0.04	12,500

SD-7

Depth	PCBs	TOC
(0–0.5')	0.045 J	NA
(0.5–1')	0.021	NA
(1–1.5')	<0.020	NA
(1.5–2')	<0.019	NA
(2–3')	<0.020	NA

SD-107

Depth	PCBs	TOC
(0–0.5')	6.1 D	8,640

SD-4

Depth	PCBs	TOC
(0–0.5')	3	6,980 J
(0.5–1')	1.9	14,800 J
(0.5–1') DUP	2.6	14,900 J

SD-108

Depth	PCBs	TOC
(0.5–1.0')	2.0 D	7,860

SD-11

Depth	PCBs	TOC
(0–0.5')	<0.019	4,460
(0.5–1')	<0.019	4,400
(1–1.5')	0.05	1,700
(1.5–2')	0.025 J	3,850
(2–3')	<0.019	8,230

SD-12

Depth	PCBs	TOC
(0–0.5')	<0.019	6,930
(0.5–1')	<0.021	17,400

SD-101

Depth	PCBs	TOC
(1.5–2')	<0.04	11,800

SD-102

Depth	PCBs	TOC
(0.5–1.0')	0.18	7,730

SD-103

Depth	PCBs	TOC
(0–0.5')	14 D	5,550

SD-104

(0.5–1.0')	1.6 D	10,200

SD-5

Depth	PCBs	TOC
(0–0.5')	1.9	17,400 J
(0.5–1')	1	6,250 J
(1–1.5')	1.5	13,400 J

SD-6

Depth	PCBs	TOC
(0–07')	1.6	19,200 J

SD-13

Depth	PCBs	TOC
(0–0.5')	0.015 J	5,530
(0.5–1')	0.45	17,500
(1–1.5')	0.025	3,930
(1.5–2')	<0.021	7,860

LEGEND:

- SD-105 — IRM SEDIMENT SAMPLING LOCATION (9/02)
- SD-10 — RI/FS SURFACE SEDIMENT & SEDIMENT CORE SAMPLING LOCATION (10/00 & 12/00)
- T2-3 — SEDIMENT PROBING LOCATION (11/99)
- SD-6 — PSA SURFACE SEDIMENT & SEDIMENT CORE SAMPLING LOCATION (11/99)
- MW-3 — MONITORING WELL LOCATION
- SHORELINE
- TOP OF BANK
- X — FENCE
- APPROXIMATE DITCH LOCATION
- OH — OVERHEAD HIGH VOLTAGE ELECTRIC LINE
- SEDIMENT TRANSECT LINE

NOTES:

1. BASE MAP DEVELOPED FROM SITE SURVEY COMPLETED BY NIAGARA MOHAWK POWER CORPORATION (NMPC) (AS PRESENTED ON THE NMPC DRAWING ENTITLED "SCHOOL STREET DEVELOPMENT SAMPLING LOCATIONS, INDEX NO. 2.0-S12-M5, DRAWING NO. B-33591-E, DATED APRIL 1999, LATEST REVISION MARCH 2001, AT A SCALE OF 1"=60'). LOCATION OF ICE FENDER, TOP OF BANK, AND HIGH VOLTAGE LINE ARE FROM SURVEY ACTIVITIES COMPLETED BY BLASLAND, BOUCK & LEE, INC. (BBL) DURING NOVEMBER 1999.
2. MONITORING WELL LOCATIONS MW-1 THROUGH MW-3 WERE SURVEYED BY NMPC. MONITORING WELL MW-4, AND EACH OF THE SEDIMENT PROBING LOCATIONS WERE SURVEYED BY BBL.
3. MONITORING WELL LOCATION MW-2S IS AN OVERBURDEN MONITORING WELL WHILE MONITORING WELL MW-2D IS A BEDROCK WELL.
4. SEDIMENT SAMPLING LOCATIONS ARE BASED ON FIELD MEASUREMENTS AND ARE APPROXIMATE.
5. PCBs = POLYCHLORINATED BIPHENYLS.
6. TOC = TOTAL ORGANIC CARBON.
7. ALL CONCENTRATIONS ARE REPORTED IN PARTS PER MILLION (PPM).
8. D = CONCENTRATION IS BASED ON A DILUTED SAMPLE ANALYSIS.
9. J = ESTIMATED CONCENTRATION.
10. < = EACH AROCLOR WAS NOT DETECTED AT A CONCENTRATION ABOVE THE REPORTED LABORATORY DETECTION LIMIT.
11. NA = NOT ANALYZED.
12. ANALYTICAL RESULTS HAVE BEEN VALIDATED.

0 60' 120'
GRAPHIC SCALE

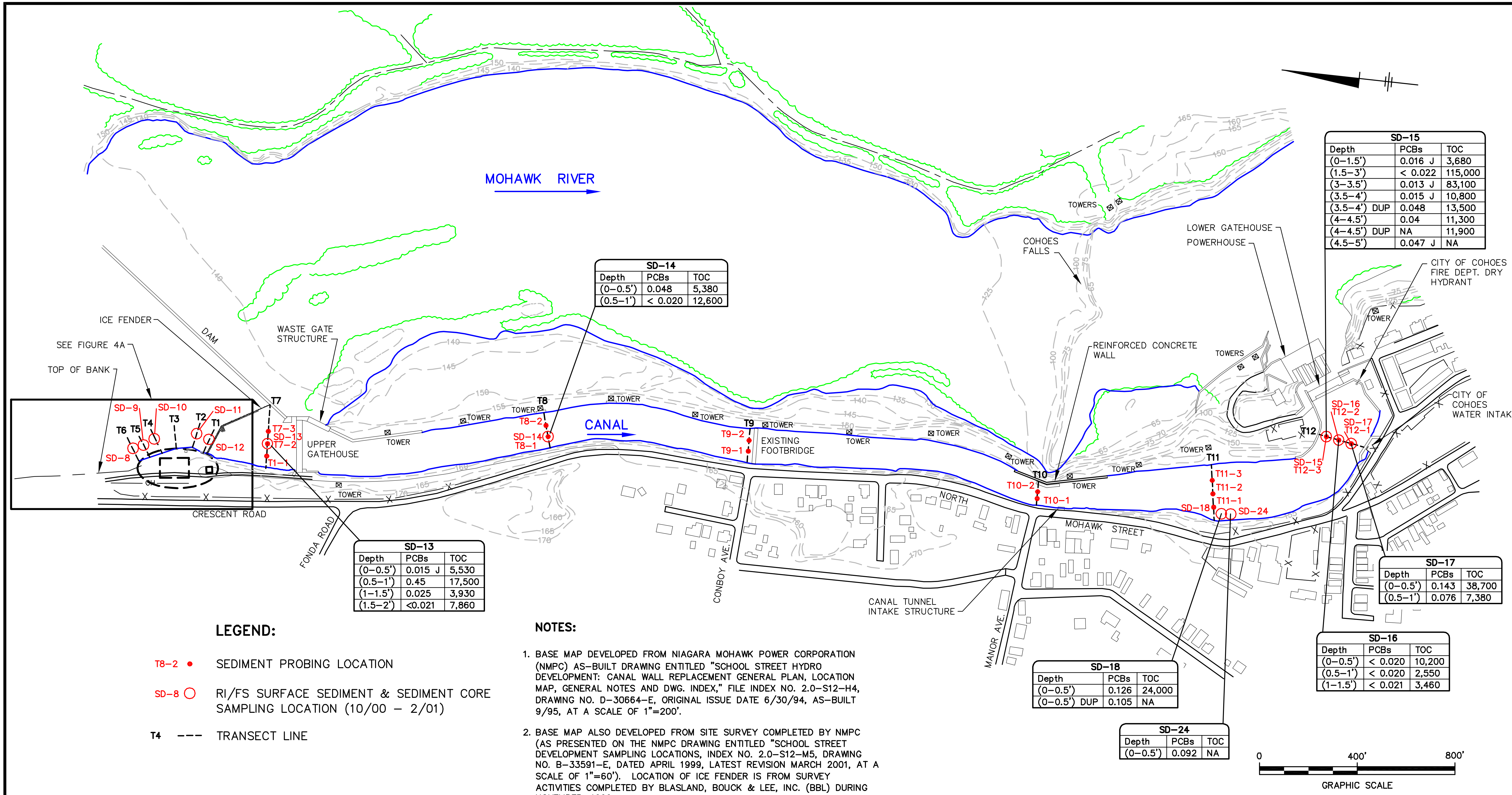
RELIANT ENERGY
FORMER NIAGARA MOHAWK, A NATIONAL GRID COMPANY
SCHOOL ST. HYDROELECTRIC STATION – COHOES, NY
FOCUSED FEASIBILITY STUDY REPORT

SEDIMENT SAMPLING LOCATIONS AND ANALYTICAL RESULTS FOR TOTAL PCBs & TOC (ppm)

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

FIGURE
4A

X: 36458X00, X01.DWG
L: ON=*, OFF=REF*,SHD-253
P: PAGESET/PLT-BL
05/29/03 SYR-54-RCB KMD RCB
36458008/FFSR/36458B03.DWG



SD-15

Depth	PCBs	TOC
(0-1.5')	0.016 J	3,680
(1.5-3')	< 0.022	115,000
(3-3.5')	0.013 J	83,100
(3.5-4')	0.015 J	10,800
(3.5-4') DUP	0.048	13,500
(4-4.5')	0.04	11,300
(4-4.5') DUP	NA	11,900
(4.5-5')	0.047 J	NA

SD-14

Depth	PCBs	TOC
(0-0.5')	0.048	5,380
(0.5-1')	< 0.020	12,600

SD-13

Depth	PCBs	TOC
(0-0.5')	0.015 J	5,530
(0.5-1')	0.45	17,500
(1-1.5')	0.025	3,930
(1.5-2')	<0.021	7,860

SD-17

Depth	PCBs	TOC
(0-0.5')	0.143	38,700
(0.5-1')	0.076	7,380

SD-16

Depth	PCBs	TOC
(0-0.5')	< 0.020	10,200
(0.5-1')	< 0.020	2,550
(1-1.5')	< 0.021	3,460

SD-18

Depth	PCBs	TOC
(0-0.5')	0.126	24,000
(0-0.5') DUP	0.105	NA

SD-24

Depth	PCBs	TOC
(0-0.5')	0.092	NA

LEGEND:

- T8-2 ● SEDIMENT PROBING LOCATION
- SD-8 ○ RI/FS SURFACE SEDIMENT & SEDIMENT CORE SAMPLING LOCATION (10/00 – 2/01)
- T4 – – – TRANSECT LINE

NOTES:

1. BASE MAP DEVELOPED FROM NIAGARA MOHAWK POWER CORPORATION (NMPC) AS-BUILT DRAWING ENTITLED "SCHOOL STREET HYDRO DEVELOPMENT: CANAL WALL REPLACEMENT GENERAL PLAN, LOCATION MAP, GENERAL NOTES AND DWG. INDEX," FILE INDEX NO. 2.0-S12-H4, DRAWING NO. D-30664-E, ORIGINAL ISSUE DATE 6/30/94, AS-BUILT 9/95, AT A SCALE OF 1"=200'.
2. BASE MAP ALSO DEVELOPED FROM SITE SURVEY COMPLETED BY NMPC (AS PRESENTED ON THE NMPC DRAWING ENTITLED "SCHOOL STREET DEVELOPMENT SAMPLING LOCATIONS, INDEX NO. 2.0-S12-M5, DRAWING NO. B-33591-E, DATED APRIL 1999, LATEST REVISION MARCH 2001, AT A SCALE OF 1"=60'). LOCATION OF ICE FENDER IS FROM SURVEY ACTIVITIES COMPLETED BY BLASLAND, BOUCK & LEE, INC. (BBL) DURING NOVEMBER, 1999.
3. TRANSECT LOCATIONS T1 THROUGH T7 WERE SURVEYED BY BBL. TRANSECT LOCATIONS T8 THROUGH T12 WERE POSITIONED RELATIVE TO EXISTING SITE FEATURES, AS SHOWN.
4. PCBs = POLYCHLORINATED BIPHENYLS.
5. TOC = TOTAL ORGANIC CARBON.
6. ALL CONCENTRATIONS ARE REPORTED IN PARTS PER MILLION (ppm).
7. < = EACH AROCLOR WAS NOT DETECTED AT A CONCENTRATION ABOVE THE REPORTED LABORATORY DETECTION LIMIT.
8. NA = NOT ANALYZED.
9. J = ESTIMATED CONCENTRATION.

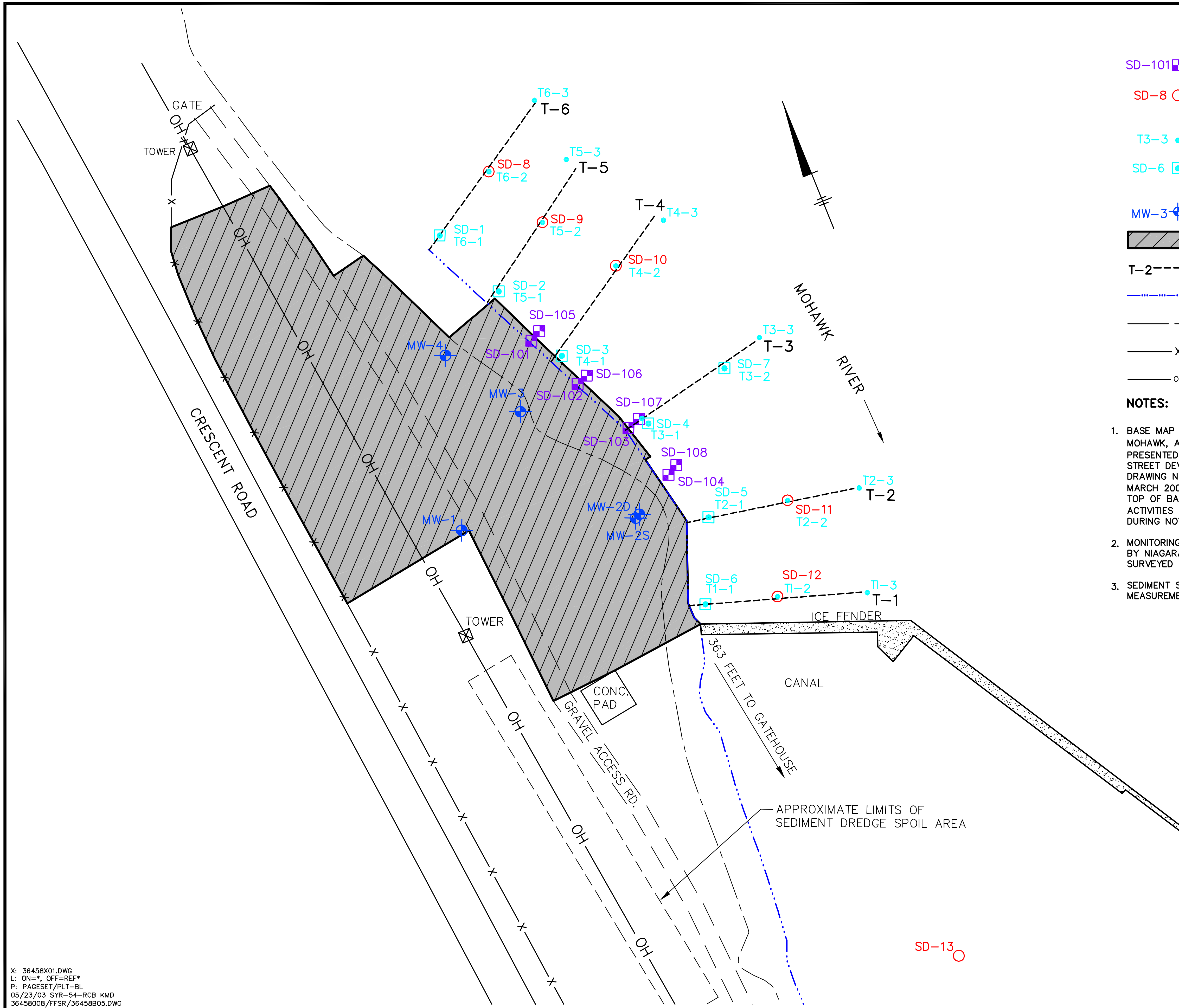
X: 36458X00.DWG
P: PAGESET/PLT-BL
05/22/03 SYR-54-PGL KMD
36458008/FFSR/36458B04.DWG

RELIANT ENERGY
FORMER NIAGARA MOHAWK, A NATIONAL GRID COMPANY
SCHOOL ST. HYDROELECTRIC STATION – COHOES, NY
FOCUSED FEASIBILITY STUDY REPORT

SEDIMENT SAMPLING LOCATIONS AND ANALYTICAL RESULTS FOR TOTAL PCBs & TOC (ppm)

BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

FIGURE **4B**



LEGEND:

- SD-101 — IRM SEDIMENT SAMPLING LOCATION (9/02)
- SD-8 — RI/FS SURFACE SEDIMENT AND SEDIMENT CORE SAMPLING LOCATION (10/00 & 12/00)
- T3-3 — SEDIMENT PROBING LOCATION (11/99)
- SD-6 — PSA SURFACE SEDIMENT AND SEDIMENT CORE SAMPLING LOCATION (11/99)
- MW-3 — MONITORING WELL LOCATION
- APPROXIMATE LIMITS OF IRM EXCAVATION AREA
- T-2 — SEDIMENT TRANSECT LINE
- SHORELINE
- TOP OF BANK
- X — FENCE
- OH — OVERHEAD HIGH VOLTAGE ELECTRIC LINE

NOTES:

1. BASE MAP DEVELOPED FROM SITE SURVEY COMPLETED BY NIAGARA MOHAWK, A NATIONAL GRID COMPANY (NIAGARA MOHAWK) (AS PRESENTED ON THE NIAGARA MOHAWK DRAWING ENTITLED "SCHOOL STREET DEVELOPMENT SAMPLING LOCATIONS, INDEX NO. 2.0-S12-M5, DRAWING NO. B-33591-E, DATED APRIL 1999, LATEST REVISION MARCH 2001, AT A SCALE OF 1"=60'). LOCATION OF ICE FENDER, TOP OF BANK, AND HIGH VOLTAGE LINE ARE FROM SURVEY ACTIVITIES COMPLETED BY BLASLAND, BOUCK & LEE, INC. (BBL) DURING NOVEMBER 1999.
2. MONITORING WELL LOCATIONS MW-1 THROUGH MW-3 WERE SURVEYED BY NIAGARA MOHAWK. MONITORING WELL LOCATION MW-4, WAS SURVEYED BY BBL.
3. SEDIMENT SAMPLING LOCATIONS ARE BASED ON FIELD MEASUREMENTS AND ARE APPROXIMATE.

0 60' 120'
GRAPHIC SCALE

RELIANT ENERGY
FORMER NIAGARA MOHAWK, A NATIONAL GRID COMPANY
SCHOOL ST. HYDROELECTRIC STATION – COHOES, NY
FOCUSED FEASIBILITY STUDY REPORT

APPROXIMATE IRM SOIL/SEDIMENT EXCAVATION LIMITS

BBL
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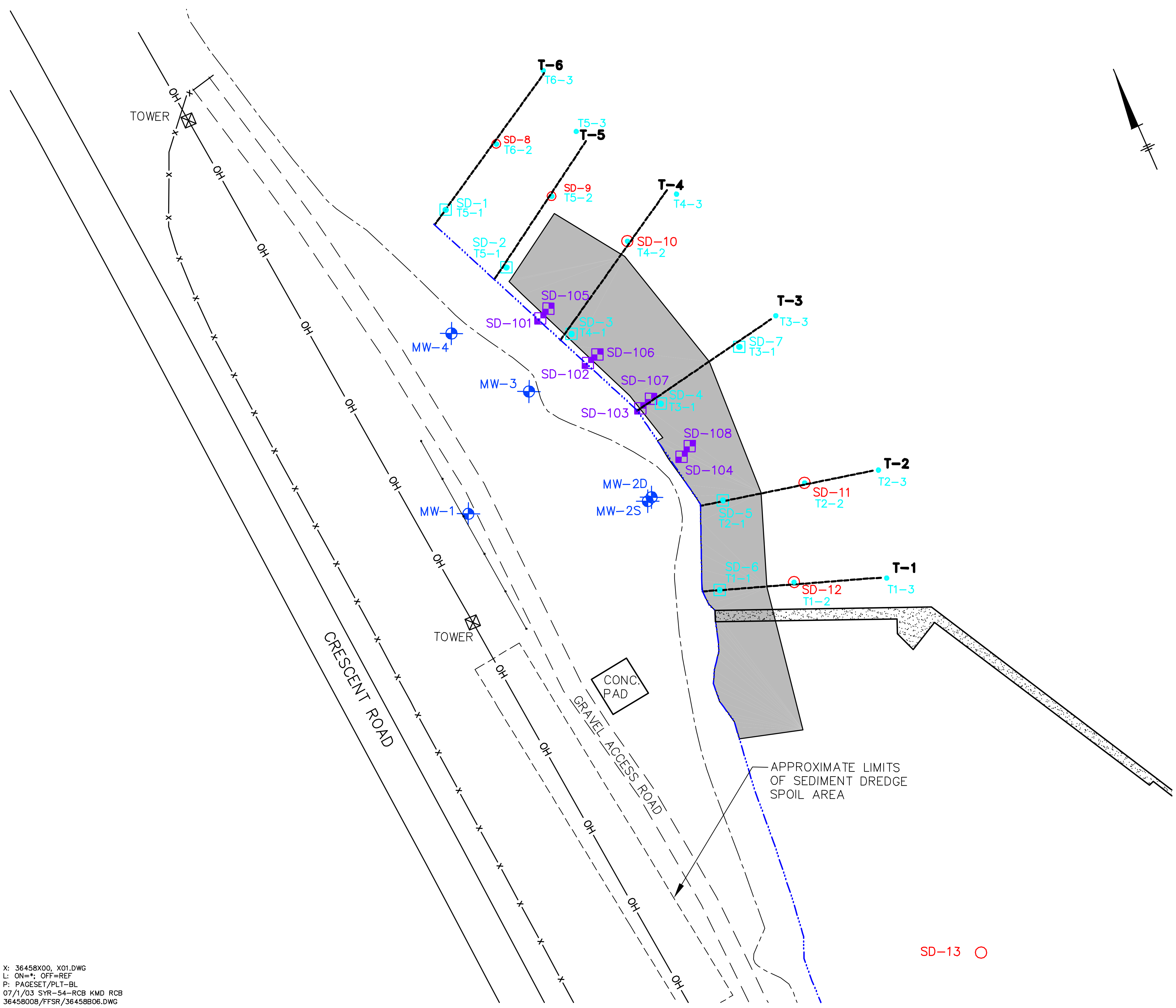
engineers & scientists

FIGURE **5**

X: 36458X01.DWG
L: ON=*, OFF=REF*
P: PAGESET/PLT-BL
05/23/03 SYR-54-RCB KMD
36458008/FFSR/36458B05.DWG



LEGEND:

- SD-101 — IRM SEDIMENT SAMPLING LOCATION (9/02)
- SD-8 — RI/FS SURFACE SEDIMENT AND SEDIMENT CORE SAMPLING LOCATION (10/00 & 12/00)
- SD-6 — PSA SURFACE SEDIMENT AND SEDIMENT CORE SAMPLING LOCATION (11/99)
- MW-3 — MONITORING WELL LOCATION
- EXTENT OF SEDIMENT ADDRESSED BY SEDIMENT CAPPING AND REMOVAL ALTERNATIVES
- T-2 — SEDIMENT TRANSECT LINE
- SHORELINE
- TOP OF BANK
- FENCE
- OHE — OVERHEAD HIGH VOLTAGE ELECTRIC LINE

NOTES:

1. BASE MAP DEVELOPED FROM SITE SURVEY COMPLETED BY NIAGARA MOHAWK, A NATIONAL GRID COMPANY (NIAGARA MOHAWK) (AS PRESENTED ON THE NIAGARA MOHAWK DRAWING ENTITLED "SCHOOL STREET DEVELOPMENT SAMPLING LOCATIONS, INDEX NO. 2.0-S12-M5, DRAWING NO. B-33591-E, DATED APRIL 1999, LATEST REVISION MARCH 2001, AT A SCALE OF 1"=60'). LOCATION OF ICE FENDER, TOP OF BANK, AND HIGH VOLTAGE LINE ARE FROM SURVEY ACTIVITIES COMPLETED BY BLASLAND, BOUCK & LEE, INC. (BBL) DURING NOVEMBER 1999.
2. MONITORING WELL LOCATIONS MW-1 THROUGH MW-3 WERE SURVEYED BY NIAGARA MOHAWK. MONITORING WELL LOCATION MW-4, WAS SURVEYED BY BBL.
3. SEDIMENT SAMPLING LOCATIONS ARE BASED ON FIELD MESUREMENTS AND ARE APPROXIMATE.
4. LIMITS OF SEDIMENT ADDRESSED BY SEDIMENT CAPPING AND REMOVAL ALTERNATIVES ARE BASED ON LINEAR INTERPOLATION BETWEEN ADJACENT SAMPLING LOCATIONS TO A PCB SEDIMENT CONCENTRATION OF 1 PART PER MILLION.

0 60' 120'

GRAPHIC SCALE

RELIANT ENERGY
FORMER NIAGARA MOHAWK, A NATIONAL GRID COMPANY
SCHOOL ST. HYDROELECTRIC STATION – COHOES, NY
FOCUSED FEASIBILITY STUDY REPORT

SEDIMENT CAPPING AND REMOVAL ALTERNATIVES - PROPOSED LIMITS

BBL
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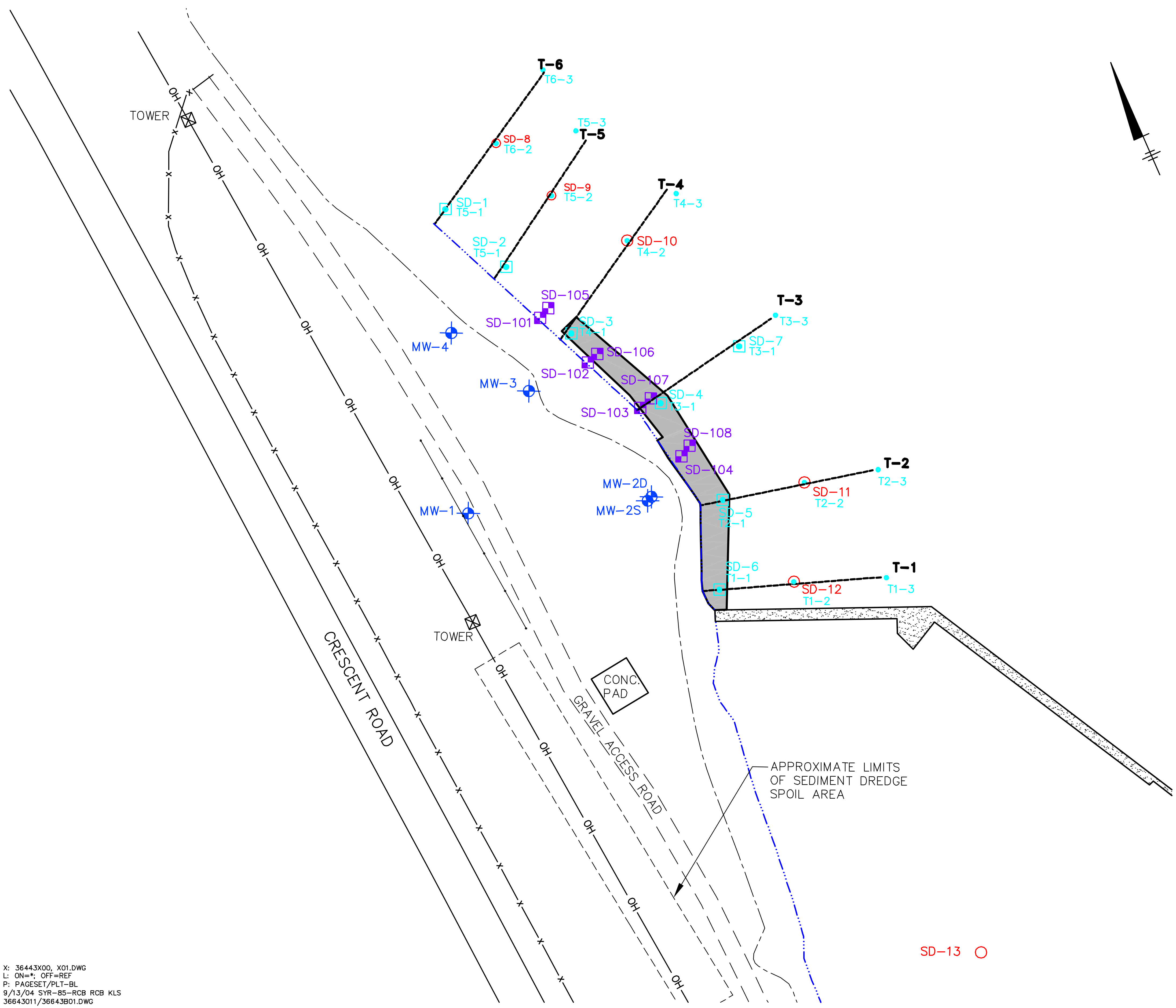
engineers & scientists

FIGURE
6

X: 36458X00, X01.DWG
L: ON=*; OFF=REF
P: PAGESET/PLT-BL
07/1/03 SYR-54-RCB KMD RCB
36458008/FFSR/36458B06.DWG



LEGEND:

SD-101	IRM SEDIMENT SAMPLING LOCATION (9/02)
SD-8	RI/FS SURFACE SEDIMENT AND SEDIMENT CORE SAMPLING LOCATION (10/00 & 12/00)
SD-6	PSA SURFACE SEDIMENT AND SEDIMENT CORE SAMPLING LOCATION (11/99)
MW-3	MONITORING WELL LOCATION
	POTENTIAL EXTENT OF SEDIMENT REMOVAL TO A DEPTH OF 1 FOOT.
T-2	SEDIMENT TRANSECT LINE
	SHORELINE
	TOP OF BANK
x	FENCE
OHE	OVERHEAD HIGH VOLTAGE ELECTRIC LINE

NOTES:

1. BASE MAP DEVELOPED FROM SITE SURVEY COMPLETED BY NIAGARA MOHAWK, A NATIONAL GRID COMPANY (NIAGARA MOHAWK) (AS PRESENTED ON THE NIAGARA MOHAWK DRAWING ENTITLED "SCHOOL STREET DEVELOPMENT SAMPLING LOCATIONS, INDEX NO. 2.0-S12-M5, DRAWING NO. B-33591-E, DATED APRIL 1999, LATEST REVISION MARCH 2001, AT A SCALE OF 1"=60'). LOCATION OF ICE FENDER, TOP OF BANK, AND HIGH VOLTAGE LINE ARE FROM SURVEY ACTIVITIES COMPLETED BY BLASLAND, BOUCK & LEE, INC. (BBL) DURING NOVEMBER 1999.
2. MONITORING WELL LOCATIONS MW-1 THROUGH MW-3 WERE SURVEYED BY NIAGARA MOHAWK. MONITORING WELL LOCATION MW-4, WAS SURVEYED BY BBL.
3. SEDIMENT SAMPLING LOCATIONS ARE BASED ON FIELD MESUREMENTS AND ARE APPROXIMATE.

0 60' 120'
GRAPHIC SCALE

X: 36443X00, X01.DWG
L: ON=*; OFF=REF
P: PAGESET/PLT-BL
9/13/04 SYR-85-RCB RCB KLS
36643011/36643B01.DWG

RELIANT ENERGY
FORMER NIAGARA MOHAWK, A NATIONAL GRID COMPANY
SCHOOL ST. HYDROELECTRIC STATION – COHOES, NY
FOCUSED FEASIBILITY STUDY REPORT

FOCUSED SEDIMENT REMOVAL ALTERNATIVE - PROPOSED LIMITS

BBL
BLASLAND, BOUCK & LEE, INC.
engineers, scientists, economists

FIGURE
7

Appendix A

Memorandum Evaluating PCB Aroclor Data Trends for Sediment

BLASLAND, BOUCK & LEE, INC.
engineers & scientists

MEMORANDUM

BBL®
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

To:	James F. Morgan, Niagara Mohawk, a National Grid Company	**Date:**	6/20/02
From:	John C. Brussel, P.E. Blasland, Bouck & Lee, Inc.	**cc:**	William J. Holzhauer, Niagara Mohawk Jeffery M. Auser, P.E., Reliant Energy Joseph L. Viau, P.E., Reliant Energy Andrew Oliver, Reliant Energy Richard R. Capozza, Esq., Hiscock & Barclay Michael C. Jones, Blasland, Bouck & Lee, Inc.
Re:	Reliant Energy (Former Niagara Mohawk, a National Grid Company) School Street Hydroelectric Substation Review of Sediment Aroclor Data		

This memorandum summarizes a review of polychlorinated biphenyl (PCB) Aroclor data for soil, sediment, and groundwater samples collected as part of the Phase II Environmental Site Assessment (ESA), Preliminary Site Assessment (PSA), and Remedial Investigation (RI) of the former fire training area at the Reliant Energy (former Niagara Mohawk, a National Grid Company [Niagara Mohawk]) School Street Hydroelectric Station. The data review was completed in response to discussions during a February 6, 2002 telephone conference call with representatives from the New York State Department of Environmental Conservation (NYSDEC), the New York State Department of Health (NYSDOH), the Albany County Health Department (ACDH), Reliant Energy, Niagara Mohawk, and Blasland, Bouck & Lee, Inc. (BBL). The purpose of the data review was to evaluate the potential significance of non-site related sources of PCBs in sediment within the Mohawk River east of the former fire training area and the power canal upstream from the hydroelectric station.

The location of the former fire training area is shown on Figure 1. Sampling locations selected for the Phase II ESA, the PSA, and RI are shown on Figures 2 and 3. The PCB Aroclor data obtained from the laboratory analysis of the soil, groundwater, and sediment samples collected as part of the Phase II ESA, PSA, and RI are summarized below, followed by conclusions drawn from a review of the data.

I. SUMMARY OF PCB ANALYTICAL DATA

Analytical results obtained from the laboratory analysis of the soil, groundwater, and sediment samples collected as part of the PSA and RI were validated by BBL (the Phase II ESA analytical results were not validated). The Phase II ESA, PSA, and RI soil sampling results for individual PCB Aroclors are summarized below, followed by the groundwater and sediment sampling results for individual PCB Aroclors.

Soil Analytical Results

A total of 95 soil samples (including 64 surface and 31 subsurface soil samples) collected in the vicinity of the former fire training area have been analyzed for PCBs. Laboratory analytical results indicate that PCBs were detected in 62 of the surface soil samples and 27 of the subsurface soil samples. The validated PCB analytical results for the surface soil and subsurface soil samples (including the individual Aroclors that were detected) are presented in Tables 1 and 2, respectively. A breakdown of the PCB soil sampling results, including the Aroclors detected, numbers/percentages of samples with specific Aroclors detected, range of concentrations detected, and average concentrations, is presented below.

Matrix	Aroclors Detected	No. of Samples with PCBs Detected	% of Samples with PCBs Detected	Range of Concentrations Detected (ppm)	Average Concentration Detected (ppm)
Surface Soil	Total PCBs	62	97%	0.029 J - 130	5.9
	1260	54	84%	0.029 J - 130	6.3
	1254	17	27%	0.030 - 4.8	1.7
Subsurface Soil	Total PCBs	27	87%	0.006 J - 66 J	10.9
	1260	27	87%	0.006 J - 66 J	10.4
	1254	3	10%	3.8 - 5.0	4.2

Notes:
1. ppm = Parts per million.
2. J = Estimated concentration.
3. ND = Not detected.

As indicated in the table above, PCBs detected in surface soil consist primarily of Aroclor 1260 (with some 1254). The surface soil sampling locations where Aroclor 1254 was identified appear to be limited to one section west of the former fire training area, between the gravel access road and the western fenceline. Aroclor 1254 was not detected in any of the surface soil samples collected east of the gravel access road. The surface soil sampling locations where Aroclor 1260 was identified are spread across the former fire training area. PCBs detected in subsurface soil within the former fire training area consist only of Aroclor 1260, except at Phase II ESA sampling locations Sch-SB6, Sch-TP1, and Sch-TP2 where both Aroclors 1254 and 1260 were detected.

Groundwater Analytical Results

Over the course of five separate sampling events, groundwater samples were collected from four bedrock monitoring wells (three installed as part of the PSA and one installed as part of the RI) within the former fire training area. During two of the groundwater sampling events, PCBs (consisting only of Aroclor 1260) were detected in one monitoring well (i.e., MW-3 at concentrations of 0.98 and 0.13 parts per billion [ppb]). The detection of PCBs in groundwater at monitoring well MW-3 was attributed to the sample turbidity. Monitoring well MW-3 is hydraulically downgradient from the area where the highest PCB concentrations were detected in soil at the site. PCBs were not detected in any of the other groundwater samples collected as part of the site investigation activities. The validated PCB analytical results for the PSA and RI groundwater samples are presented in Table 3.

Sediment Analytical Results

A total of 67 sediment samples (19 surface sediment samples and 48 sediment core samples) were collected and analyzed for PCBs as part of the PSA and RI. The distribution of the PSA and RI sediment sampling locations is summarized below.

- Surface sediment samples were collected from 13 locations in the Mohawk River and 6 locations in the power canal (downstream from the lower gatehouse).

- Sediment core samples were collected from 12 locations in the Mohawk River (39 samples) and 4 locations in the power canal (9 samples).

PCBs were detected in 11 of the 13 surface sediment samples collected from the Mohawk River and 5 of the 6 surface sediment samples collected from the power canal. PCBs were detected in 14 of the 39 sediment core samples collected from the Mohawk River and 5 of the 9 sediment core samples collected from the power canal. The validated PCB analytical results for the surface sediment and sediment core samples (including the individual Aroclors that were detected) are presented in Table 4. A breakdown of the PCB sediment sampling results, including the Aroclors detected, numbers/ percentages of samples with specific Aroclors detected, range of concentrations detected, and average concentrations, is presented below.

Sampling Location/Sample Matrix	Aroclors Detected	No. of Samples with PCBs Detected	% of Samples with PCBs Detected	Range of Concentrations Detected (ppm)	Average Concentration Detected (ppm)
Mohawk River					
Surface Sediment	Total PCBs	11	85%	0.015 J - 7.3	1.3
	1260	8	62%	0.015 J - 7.3	1.8
	1254	3	23%	0.030 - 0.049	0.041
	1248	4	31%	0.025 - 0.069	0.040
Sediment Cores	Total PCBs	14	36%	0.013 J - 1.9	0.39
	1260	8	21%	0.013 J - 1.9	0.66
	1254	5	13%	0.014 J - 0.046	0.026
	1248	3	8%	0.013 J - 0.025	0.020
Power Canal					
Surface Sediment	Total PCBs	5	83%	0.016 J - 0.143	0.085
	1260	2	33%	0.016 J - 0.048	0.032
	1254	3	50%	0.057 - 0.084	0.073
	1248	3	50%	0.035 - 0.059	0.047
Sediment Cores	Total PCBs	5	56%	0.013 J - 0.076	0.038
	1260	2	22%	0.015 J - 0.040	0.028
	1254	3	33%	0.013 J - 0.049	0.026
	1248	2	22%	0.027 - 0.032	0.030
Note: J = Estimated concentration.					

As indicated above, three Aroclors (1248, 1254, and 1260) were detected in the surface sediment and sediment core samples collected as part of the PSA and RI. Aroclor 1260 was the most frequently detected Aroclor in the sediment samples collected from the Mohawk River (found in 62% of the surface sediment samples and 21% of the sediment core samples collected from the river). Aroclor 1254 was the most frequently detected Aroclor in the sediment samples collected from the power canal (found in 50% of the surface sediment samples and 33% of the sediment core samples collected from the power canal).

The highest PCB concentrations in sediment (i.e., PCB concentrations greater than 1 ppm) were found at sampling locations SD-3 through SD-6. These four sediment sampling locations are approximately 10 feet from the shoreline and immediately downslope from the sampling locations where the highest PCB concentrations were identified in soil within the former fire training area. PCBs in sediment at locations SD-3 through SD-6 consist entirely of Aroclor 1260 (the same Aroclor detected in the soil samples that exhibited the highest PCB concentrations). The concentration of Aroclor 1260 detected in sediment appears to diminish (from a maximum of 7.3 ppm) with distance away from the shoreline and upstream/downstream from the former fire training area (to a minimum, estimated at 0.013 ppm).

Aroclors 1248 and 1254 were also detected in sediment samples collected from the Mohawk River east of the former fire training area, although at much lower concentrations than Aroclor 1260. Unlike the Aroclor 1260 concentrations which appear to diminish with distance from the former fire training area, the Aroclor 1248 and 1254 concentrations (where detected) do not vary significantly from the river to the power canal. The Aroclor 1248 concentrations range from an estimated 0.013 ppm to 0.069 ppm, and the Aroclor 1254 concentrations range from an estimated 0.013 ppm to 0.084 ppm.

It is possible that the Aroclor 1254 found in the river sediment was transported via runoff from the former fire training area. However, this is questionable given the absence of Aroclor 1254 in each of the surface soil samples collected east of the gravel access road and all but three of the subsurface soil samples. It is also possible that the Aroclors 1254 and 1248 found in sediment resulted from the natural degradation of Aroclors 1260 and 1254, respectively. Degradation of more chlorinated Aroclors into less chlorinated Aroclors can occur through anaerobic dechlorination (and possibly aerobic biodegradation) by indigenous micro-organisms. However, studies conducted by the United States Environmental Protection Agency (USEPA) and the NYSDOH have shown that the dechlorination of PCB Aroclors is dependent on PCB concentration and does not typically occur at concentrations below 35 to 40 ppm.

For further evaluation of potential sources of PCBs in the river/power canal sediment, the contribution of the individual Aroclors detected (on a mass basis) to the total mass of PCBs detected in the Mohawk River east of the former fire training area and the power canal is summarized below.

Aroclor Detected	Aroclor Percentage of Total PCB Mass		
	Mohawk River Sampling Locations		Power Canal Sampling Locations
	Nearest to/Immediately Downstream from the Former Fire Training Area	Upstream/Furthest from the Former Fire Training Area	
1248	0.0%	40%	33%
1254	0.1%	43%	48%
1260	99.9%	17%	19%

Based on a review of analytical results for the PSA and RI sediment samples collected from the sampling locations in the Mohawk River that are nearest to/immediately downstream from the former fire training area (sampling locations SD-2 through SD-6 and SD-13), Aroclor 1260 represents 99.9% of the total mass of PCBs. A review of the analytical results for the sediment samples collected from the sampling locations in the Mohawk River that are upstream/further from the former fire training area (sampling locations SD-1 and SD-7 through SD-12) reveals a different distribution of Aroclor data. At these upstream/further sampling locations, Aroclors 1248 and 1254 represent approximately 40% and 43% of the total PCB mass, while Aroclor 1260 represents approximately 17%. The Aroclor percentages for the sediment samples collected upstream/further from the former fire training area are similar to the percentages for sediment samples collected in the power canal, where Aroclors 1248, 1254, and 1260 represent approximately 33%, 48%, and 19% (respectively) of the total PCB mass.

II. CONCLUSIONS

These findings suggest that the site-related distribution of PCBs in sediment is limited to the sampling locations nearest to/immediately downstream from the former fire training area. The remaining PCBs identified in sediment may be primarily associated with off-site sources, other than the former fire training area.

JCB/kah

6723 Towpath Road, P.O. Box 66 • Syracuse, NY 13214-0066 • Telephone (315) 446-9120 • Fax (315) 449-4111

Tables

BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Table 1

Reliant Energy
(Former Orion/Niagara Mohawk, a National Grid Company)
School Street Hydroelectric Station
Cohoes, New York

Site Investigation
Surface Soil Analytical Results for PCBs (ppm)

Sample ID	PCB Concentration			
	Aroclor 1248	**Aroclor 1254**	**Aroclor 1260**	**Total PCBs**
Preliminary Site Assessment				
S-1	<0.17	<0.17	2.4	2.4
S-2	<0.37	<0.37	2.7	2.7
S-3	<0.18	<0.18	1.7	1.7
S-4	<0.18	<0.18	1.9	1.9
S-5	<0.018	<0.018	0.078	0.078
S-6	<7.4	<7.4	130	130
S-6D	<7.5	<7.5	120	120
S-7	<0.74	<0.74	7.8	7.8
S-8	<0.76	<0.76	11	11
S-9	<0.74	<0.74	8.1	8.1
S-15	<0.095	<0.095	0.67	0.67
S-16	<0.075	<0.075	0.64	0.64
S-17	<1.9	<1.9	16	16
S-18	<0.94	<0.94	8.6	8.6
S-19	<0.70 D	<0.70 D	74 D	74 D
S-20	<0.019	<0.019	0.10	0.10
S-21	<0.88 D	<0.88 D	4.7 D	4.7 D
S-22	<0.076 D	<0.076 D	0.54 D	0.54 D
S-23	<0.018	<0.018	0.043	0.043
S-24	<0.18 D	<0.18 D	2.6 D	2.6 D
S-25	<0.94 D	<0.94 D	8.0 D	8.0 D
DUP-1 (S-25)	<0.90 D	<0.90 D	7.0 D	7.0 D
S-26	<0.37	<0.27	4.1	4.1
S-27	<0.92 D	<0.92 D	5.7 D	5.7 D
S-28	<0.93 D	<0.93 D	9.3 D	9.3 D
Remedial Investigation				
S-29	<0.021	<0.021	0.12	0.12
S-30	<0.18	<0.18	1.8	1.8
S-31	<0.80	4.8	<0.80	4.8
S-32	<0.38	4.3	<0.38	4.3
S-33	<0.23	2.4	1.3 J	3.7 J
S-34	<0.018	<0.018	0.057	0.057
S-35	<0.091	<0.091	0.69	0.69
S-36	<0.17	<0.17	3.1 J	3.1 J
S-37	<0.037	<0.037	0.40	0.40
S-38	<0.096	<0.096	1.3	1.3
S-39	<0.037	<0.037	0.40	0.40
S-40	<0.95	<0.95	7.2	7.2
S-41	<1.1	<1.1	8.1	8.1
S-42	<0.37	<0.37	3.4	3.4

See Notes on Page 3.

Table 1

Reliant Energy
(Former Orion/Niagara Mohawk, a National Grid Company)
School Street Hydroelectric Station
Cohoes, New York

Site Investigation
Surface Soil Analytical Results for PCBs (ppm)

Sample ID	PCB Concentration			
	Aroclor 1248	**Aroclor 1254**	**Aroclor 1260**	**Total PCBs**
S-43	<0.20	<0.20	1.6	1.6
S-44	<0.040	<0.040	0.43 J	0.43 J
S-45	<0.21	<0.21	1.9	1.9
S-46	<0.021	<0.021	0.074	0.074
S-47	<0.073	0.33	0.22 J	0.55 J
S-48	<0.018	<0.018	0.27 J	0.27 J
S-50	<0.017	<0.017	0.029 J	0.029 J
S-51	<0.017	<0.017	0.23 J	0.23 J
S-54	<0.041	<0.041	0.44 J	0.44 J
S-55	<0.43	<0.43	3.8 J	3.8 J
S-56	<0.020	<0.020	0.054 J	0.054 J
S-57	<0.019	<0.019	0.16 J	0.16 J
S-58	<0.019	<0.019	< 0.019	< 0.019
S-59	<0.43	2.6	<0.43 J	2.6
S-60	<0.48	3.4	<0.48 J	3.4
DUP-3 <S-60>	<0.46	1.9	<0.46 J	1.9
S-61	<0.50	0.85	<0.50 J	0.85
S-62	<0.50	4.1	<0.50 J	4.1
S-63	<0.45	2.5	<0.45 J	2.5
S-64	<0.14	0.98	<0.14 J	0.98
S-65	<0.13	0.83	0.74	1.6
S-66	<0.060	0.66	0.51	1.2
S-67	<0.025	0.030	0.036	0.066
S-68	<0.030	0.14	0.062	0.20
S-69	<0.026	0.058	0.033	0.091
DUP-4 <S-69>	<0.026	0.062	0.021 J	0.083 J
S-70	<0.028	0.035	0.030	0.065
S-71	<0.026	<0.026	<0.026	< 0.026
S-72	<0.022	0.079	0.054	0.13

See Notes on Page 3.

Table 1

Reliant Energy
(Former Orion/Niagara Mohawk, a National Grid Company)
School Street Hydroelectric Station
Cohoes, New York

Site Investigation
Surface Soil Analytical Results for PCBs (ppm)

Notes:

1. Preliminary Site Assessment (PSA) samples collected by Blasland, Bouck & Lee, Inc. (BBL) during March and November 1999.
2. Remedial Investigation (RI) samples collected by BBL during October 2000, January 2001, and February 2001.
3. Samples analyzed by Galson Laboratories, Inc. (Galson) using USEPA SW-846 Method 8082 as referenced in NYSDEC 1995 ASP.
4. Concentrations reported in parts per million (ppm) or milligrams per kilogram (mg/kg).
5. Aroclors 1254 and 1260 were the only Aroclors detected in the surface soil samples.
6. Sample designations indicate the following:
   S = Soil sample; and
   DUP= Blind duplicate sample.
7. < = Not detected at a concentration exceeding the presented laboratory detection limit.
8. D = Concentration is based on a diluted sample analysis.
9. J = Estimated concentration.
10. Shaded values indicate a total PCB concentration exceeding the 1 ppm recommended surface soil cleanup objective presented in the NYSDEC document entitled, "Technical and Administrative Guidance Memorandum (TAGM): Determination of Soil Cleanup Objectives and Cleanup Levels", HWR-94-4046 (TAGM 4046) dated January 24, 1994.
11. Analytical results have been validated.

Table 2

Reliant Energy
(Former Orion/Niagara Mohawk, a National Grid Company)
School Street Hydroelectric Station
Cohoes, New York

Site Investigation
Subsurface Soil Analytical Results for PCBs (ppm)

Sample ID	Sample Depth	PCB Concentration			
		Aroclor 1248	Aroclor 1254	Aroclor 1260	Total PCBs
Phase II - Environmental Site Assessment					
Sch-SB4	0-4'	<0.6	<0.6	<0.6	< 0.6
Sch-SB5	0-4'	<0.5	<0.5	<0.5	< 0.5
Sch-SB6	3'	<0.5	5.0	37.0	42.0
Sch-SB9	4-8'	<0.5	<0.5	<0.5	< 0.5
Sch-TP1	3'	<0.5	3.9	25.0	28.9
Sch-TP2	1.8'	<0.5	3.8	29.0	32.8
Preliminary Site Assessment					
S-1	1-2'	<0.33	<0.33	4.8 J	4.8 J
S-2	0.5-1.5'	<0.38	<0.38	2.8 J	2.8 J
S-3	2-3'	<1.9	<1.9	22 J	22 J
S-4	0.5-1.5'	<0.018	<0.018	0.17 J	0.17 J
S-5	0.5-1.5'	<0.018	<0.018	< 0.018 J	< 0.018 J
S-6	0.5-1.5'	<1.8	<1.8	14 J	14 J
S-7	0.5-1.5'	<0.19	<0.19	2.0 J	2.0 J
S-8	0.5-1.5'	<0.74	<0.74	8.6 J	8.6 J
S-9	0.5-1.5'	<1.5	<1.5	16 J	16 J
S-10	0.5-1.5'	<0.019	<0.019	0.006 J	0.006 J
S-11	0.5-1.0'	<0.094	<0.094	0.56 J	0.56 J
S-12	0.5-1.5'	<0.020	<0.020	0.13 J	0.13 J
S-15	0.5-1.5'	<0.076	<0.076	0.46 J	0.46 J
S-16	0.5-1.5'	<0.041	<0.041	0.34 J	0.34 J
S-17	0.5-1.5'	<7.9	<7.9	66 J	66 J
S-18	1-2'	<0.022	<0.022	0.098 J	0.098 J
DUP-2 (S-18)	1-2'	<0.021	<0.021	0.085 J	0.085 J
S-21	0.5-1.5'	<0.090 D	<0.090 D	0.96 D	0.96 D
S-26	0.5-1.5'	<1.9	<1.9	23 J	23 J
Remedial Investigation					
S-36	0.5-1.5'	<0.018	<0.018	0.046 J	0.046 J
S-37	0.5-1.5'	<0.018	<0.018	0.16	0.16
DUP-1 (S-37)	0.5-1.5'	<0.018	<0.018	0.14	0.14
S-38	0.5-1.5'	<0.018	<0.018	0.036	0.036
S-40	0.5-1.5'	<0.95	<0.95	9.3	9.3
S-41	0.5-1.5'	<1.8	<1.8	18	18
S-48	1.5-2.5'	<0.018	<0.018	0.095 J	0.095 J
DUP-2 (S-48)	1.5-2.5'	<0.076	<0.076	0.49 J	0.49 J
S-53	1-2'	<0.071	<0.071	0.34 J	0.34 J

See Notes on Page 2.

Table 2

Reliant Energy
(Former Orion/Niagara Mohawk, a National Grid Company)
School Street Hydroelectric Station
Cohoes, New York

Site Investigation
Subsurface Soil Analytical Results for PCBs (ppm)

Notes:

1. Phase II Environmental Site Assessment (ESA) samples collected by Fluor Daniel GTI during August 1998.
2. Preliminary Site Assessment (PSA) samples collected by Blasland, Bouck & Lee, Inc. (BBL) during March & November 1999.
3. Remedial Investigation (RI) samples collected by BBL during October 2000.
4. Phase II ESA samples analyzed by Scilab Albany, Inc. (Scilab) using USEPA SW-846 Method 8080.
5. PSA and RI samples analyzed by Galson Laboratories, Inc. (Galson) using USEPA SW-846 Method 8082 as referenced in NYSDEC 1995 ASP.
6. Concentrations reported in parts per million (ppm) or milligrams per kilogram (mg/kg).
7. Aroclor 1260 was the only Aroclor detected in the subsurface soil samples.
8. Sample designations indicate the following:
   - SB = Soil boring;
   - TP = Test pit;
   - S = Soil sample; and
   - DUP = Blind duplicate sample.
9. < = Not detected at a concentration exceeding the presented laboratory detection limit.
10. J = Estimated concentration.
11. D = Concentration is based on a diluted sample analysis.
12. Shaded value indicates a total PCB concentration exceeding the 10 ppm recommended subsurface soil cleanup objective as presented in the NYSDEC document entitled, "Technical and Administrative Guidance Memorandum (TAGM): Determination of Soil Cleanup Objectives and Cleanup Levels", HWR-94-4046 (TAGM 4046), dated January 24, 1994.
13. Analytical results have been validated.

Table 3

Reliant Energy
(Former Orion/Niagara Mohawk, a National Grid Company)
School Street Hydroelectric Station
School Street, New York

Site Investigation
Groundwater Analytical Results for PCBs (ppb)

Sample ID	PCB Concentration			
	Aroclor 1248	**Aroclor 1254**	**Aroclor 1260**	**Total PCBs**
Preliminary Site Assessment				
April 9, 1999				
MW-1	<0.5	<0.5	<0.5	< 0.5
MW-2D	<0.5	<0.5	<0.5	< 0.5
Blind Duplicate (MW-2D)	<0.5	<0.5	<0.5	<0.5
MW-3	<0.5	<0.5	0.98	0.98
June 4, 1999				
MW-3	<0.5	<0.5	<0.5	< 0.5
DUP-1 (MW-3)	<0.5	<0.5	<0.5	< 0.5
MW-3F	<0.5	<0.5	<0.5	< 0.5
November 22-23, 1999				
MW-1	<0.05	<0.05	<0.05	<0.05
MW-2D	<0.05	<0.05	<0.05	<0.05
MW-3	<0.05	<0.05	<0.05	<0.05
DUP-1 (MW-3)	<0.05	<0.05	<0.05	<0.05
Remedial Investigation				
November 8, 2000				
MW-2D	<0.05	<0.05	<0.05	<0.05
MW-3	<0.05	<0.05	0.13	0.13
DUP-1 (MW-3)	<0.05	<0.05	0.12	0.12
December 7, 2000				
MW-1	<0.05	<0.05	<0.05	<0.05
DUP-1 (MW-1)	<0.05	<0.05	<0.05	<0.05
MW-4	<0.05	<0.05	<0.05	<0.05

Notes:

1. Samples collected by Blasland, Bouck & Lee, Inc. (BBL) on the dates indicated.
2. Samples analyzed by Galson Laboratories, Inc. (Galson) using USEPA SW-846 Method 8082 as referenced in NYSDEC 1995 ASP.
3. Concentrations reported in parts per billion (ppb) or micrograms per liter (ug/L).
4. Sample designations indicate the following:
   MW = Groundwater sample;
   D = Deep well; and
   DUP = Blind duplicate sample.
5. < = No individual Aroclors were detected exceeding the presented concentration.
6. Groundwater sample MW-2D was collected from the bedrock well completed at monitoring well location MW-2.
7. Analytical results have been validated.

Table 4

Reliant Energy
(Former Orion/Niagara Mohawk, a National Grid Company)
School Street Hydroelectric Station
Cohoes, New York

Site Investigation
Sediment Analytical Results for PCBs and TOC (ppm)

Sample ID	TOC (ppm)	NYSDEC Sediment Criteria (ppm)			PCB Concentration (ppm)			
		Benthic Aquatic Life Acute Toxicity	Benthic Aquatic Life Chronic Toxicity	Wildlife Bioaccumulation	Aroclor 1248	Aroclor 1254	Aroclor 1260	Total PCBs
Preliminary Site Assessment - Sampling Locations in the Mohawk River								
SD-1 (0-0.5')	12,800 J	35.3	0.25	0.018	0.069	< 0.024	0.058	0.13
SD-1 (0.5-1')	15,300 J	42.2	0.30	0.021	<0.023	< 0.023	<0.023	<0.023
SD-1 (1-1.5')	14,600 J	40.3	0.28	0.020	<0.022	< 0.022	0.013 J	0.013 J
SD-1 (1.5-2')*	NA	NA	NA	NA	0.013 J	< 0.022	<0.022	0.013 J
SD-1 (2-3')*	NA	NA	NA	NA	<0.022	< 0.022	<0.022	<0.022
SD-1 (3-4')*	NA	NA	NA	NA	<0.022	< 0.022	<0.022	<0.022
SD-1 (4-5')*	NA	NA	NA	NA	<0.022	< 0.022	<0.022	<0.022
SD-1 (5-6')*	NA	NA	NA	NA	<0.017	< 0.017	<0.017	<0.017
SD-2 (0-0.5')	21,300 J	58.8	0.41	0.030	<0.023	< 0.023	0.24	0.24
SD-2 (0.5-1')	17,800 J	49.1	0.34	0.025	<0.024	< 0.024	0.085	0.085
SD-2 (1-1.5')	6,740 J	18.6	0.13	0.009	<0.023	< 0.023	<0.023	<0.023
SD-2 (1.5-2')*	NA	NA	NA	NA	<0.021	< 0.021	<0.021	<0.021
SD-2 (2-3')*	NA	NA	NA	NA	<0.022	< 0.022	<0.022	<0.022
SD-2 (3-4')*	NA	NA	NA	NA	<0.021	< 0.021	<0.021	<0.021
SD-2 (4-5')*	NA	NA	NA	NA	<0.023	< 0.023	<0.023	<0.023
SD-3 (0-0.5')	30,700 J	84.8	0.59	0.043	< 0.46	< 0.46	7.3	7.3
SD-3 (0.5-1')	10,800 J	29.8	0.21	0.015	<0.022	< 0.022	0.32	0.32
SD-3 (1-1.5')	8,430 J	23.3	0.16	0.012	<0.021	< 0.021	<0.021	<0.021
SD-3 (1.5-2')*	NA	NA	NA	NA	<0.024	< 0.024	<0.024	<0.024
SD-4 (0-0.5')*	6,980 J	19.3	0.13	0.010	< 0.22	< 0.22	3.0	3.0
SD-4 (0.5-1')*	14,800 J	40.9	0.29	0.021	<0.20	< 0.20	1.9	1.9
SD-D1 [SD-4 (0.5-1')]	14,900 J	41.1	0.29	0.021	<0.21	< 0.21	2.6	2.6
SD-5 (0-0.5')	17,400 J	48.0	0.34	0.024	<0.12	< 0.12	1.9	1.9
SD-5 (0.5-1')	6,250 J	17.3	0.12	0.009	<0.10	< 0.10	1.0	1.0
SD-5 (1-1.5')	13,400 J	37.0	0.26	0.019	<0.10	< 0.10	1.5	1.5
SD-6 (0-0.7')	19,200 J	53.0	0.37	0.027	<0.12	< 0.12	1.6	1.6

See Notes on Page 4.

Table 4

Reliant Energy
(Former Orion/Niagara Mohawk, a National Grid Company)
School Street Hydroelectric Station
Cohoes, New York

Site Investigation
Sediment Analytical Results for PCBs and TOC (ppm)

Sample ID	TOC (ppm)	NYSDEC Sediment Criteria (ppm)			PCB Concentration (ppm)			
		Benthic Aquatic Life Acute Toxicity	Benthic Aquatic Life Chronic Toxicity	Wildlife Bioaccumulation	Aroclor 1248	Aroclor 1254	Aroclor 1260	Total PCBs
Preliminary Site Assessment - Sampling Locations in the Mohawk River								
SD-7 (0-0.5')*	NA	NA	NA	NA	0.025	< 0.021	0.020 J	0.045 J
SD-7 (0.5-1')*	NA	NA	NA	NA	0.021	< 0.019	<0.019	0.021
SD-7 (1-1.5')*	NA	NA	NA	NA	<0.020	< 0.020	<0.020	<0.020
SD-7 (1.5-2')*	NA	NA	NA	NA	<0.019	< 0.019	<0.019	<0.019
SD-7 (2-3')*	NA	NA	NA	NA	<0.020	< 0.020	<0.020	<0.020
Remedial Investigation - Sampling Locations in the Mohawk River								
SD-8 (0-0.5')	24,800	68.5	0.48	0.035	0.036	0.049	< 0.034	0.085
SD-8 (0.5-1')	26,000	71.8	0.50	0.036	< 0.028	0.046	< 0.028	0.046
SD-8 (1-1.5')	14,600	40.3	0.28	0.020	< 0.021	0.019 J	< 0.021	0.019 J
SD-9 (0-0.5')	11,300	31.2	0.22	0.016	0.029	0.044	< 0.026	0.073
SD-9 (0.5-1')	11,100	30.6	0.21	0.016	< 0.021	< 0.021	< 0.021	< 0.021
SD-9 (1-1.5')	8,080	22.3	0.16	0.011	< 0.020	< 0.020	< 0.020	< 0.020
SD-10 (0-0.5')	14,200	39.2	0.27	0.020	< 0.024	0.030	< 0.024	0.030
SD-10 (0.5-1')	5,230	14.4	0.10	0.007	< 0.019	< 0.019	< 0.019	< 0.019
SD-DUP-1 <SD-10 (0.5-1')>	5,440	15.0	0.10	0.008	< 0.020	< 0.020	< 0.020	< 0.020
SD-10 (1-1.5')	8,690	24.0	0.17	0.012	< 0.019	< 0.019	< 0.019	< 0.019
SD-10 (1-1.5') DUP	8,230	22.7	0.16	0.012	NA	NA	NA	NA
SD-10 (1.5-2')*	2,210	6.1	0.04	0.003	<0.019	<0.019	<0.019	<0.019
SD-10 (2-2.6')*	1,600	4.4	0.03	0.002	<0.019	<0.019	<0.019	<0.019
SD-11 (0-0.5')	4,460	12.3	0.09	0.006	< 0.019	< 0.019	< 0.019	< 0.019
SD-11 (0.5-1')	4,400	12.1	0.08	0.006	< 0.019	< 0.019	< 0.019	< 0.019
SD-11 (1-1.5')	1,700	4.7	0.03	0.002	0.025	0.025	< 0.020	0.050
SD-11 (1.5-2')*	3,850	10.6	0.07	0.005	<0.018	0.025 J	<0.018	0.025 J
SD-11 (2-3')*	8,230	22.7	0.16	0.012	<0.019	<0.019	<0.019	<0.019
SD-12 (0-0.5')	6,930	19.1	0.13	0.010	< 0.019	< 0.019	< 0.019	< 0.019
SD-12 (0.5-1')	17,400	48.0	0.34	0.024	< 0.021	< 0.021	< 0.021	< 0.021
SD-13 (0-0.5')	5,530	15.3	0.11	0.008	< 0.022	< 0.022	0.015 J	0.015 J
SD-13 (0.5-1')	17,500	48.3	0.34	0.025	< 0.039	< 0.039	0.45	0.45
SD-13 (1-1.5')	3,930	10.8	0.08	0.006	< 0.020	< 0.020	0.025	0.025
SD-13 (1.5-2')*	7,860	21.7	0.15	0.011	<0.021	0.014 J	<0.021	0.014 J

See Notes on Page 4.

Table 4

Reliant Energy
(Former Orion/Niagara Mohawk, a National Grid Company)
School Street Hydroelectric Station
Cohoes, New York

Site Investigation
Sediment Analytical Results for PCBs and TOC (ppm)

Sample ID	TOC (ppm)	NYSDEC Sediment Criteria (ppm)			PCB Concentration (ppm)			
		Benthic Aquatic Life Acute Toxicity	Benthic Aquatic Life Chronic Toxicity	Wildlife Bioaccumulation	Aroclor 1248	Aroclor 1254	Aroclor 1260	Total PCBs
Remedial Investigation - Sampling Locations in the Power Canal								
SD-14 (0-0.5')	5,380	14.9	0.10	0.008	< 0.021	< 0.021	0.048	0.048
SD-14 (0.5-1')	12,600	34.8	0.24	0.018	< 0.020	< 0.020	< 0.020	< 0.020
SD-15 (0-1.5')	3,680	10.2	0.07	0.005	< 0.020	< 0.020	0.016 J	0.016 J
SD-15 (1.5-3')	115,000	317.5	2.22	0.161	< 0.022	< 0.022	< 0.022	< 0.022
SD-15 (3-3.5')	83,100	229.4	1.60	0.116	< 0.021	0.013 J	< 0.021	0.013 J
SD-15 (3.5-4')	10,800	29.8	0.21	0.015	< 0.021	0.015 J	< 0.021	0.015 J
SD-DUP-2 <SD-15 (3.5-4')>	13,500	37.3	0.26	0.019	< 0.020	0.025	0.023	0.048
SD-15 (4-4.5')	11,300	31.2	0.22	0.016	< 0.021	< 0.021	0.040	0.040
SD-15 (4-4.5') DUP	11,900	32.9	0.23	0.017	NA	NA	NA	NA
SD-15 (4.5-5')	NA	NA	NA	NA	0.032	< 0.020	0.015 J	0.047 J
SD-16 (0-0.5')	10,200	28.2	0.20	0.014	< 0.020	< 0.020	< 0.020	< 0.020
SD-16 (0.5-1')	2,550	7.0	0.05	0.004	< 0.020	< 0.020	< 0.020	< 0.020
SD-16 (1-1.5')	3,460	9.6	0.07	0.005	< 0.021	< 0.021	< 0.021	< 0.021
SD-17 (0-0.5')	38,700	106.8	0.75	0.054	0.059	0.084	< 0.028	0.143
SD-17 (0.5-1')	7,380	20.4	1.00	0.010	0.027	0.049	< 0.025	0.076
SD-18 (0-0.5')	NA	66.3	0.46	0.034	0.048	0.078	<0.027	0.126
SD-18 (0-0.5') DUP	24,000	66.3	0.46	0.034	0.040	0.065	<0.026	0.105
SD-24 (0-0.5')	NA	NA	NA	NA	0.035	0.057	<0.026	0.092

See Notes on Page 4.

Table 4

Reliant Energy
(Former Orion/Niagara Mohawk, a National Grid Company)
School Street Hydroelectric Station
Cohoes, New York

Site Investigation
Sediment Analytical Results for PCBs and TOC (ppm)

Notes:

1. Preliminary Site Assessment (PSA) sediment samples were collected by Blasland, Bouck & Lee, Inc. (BBL) during November 1999.
2. Remedial Investigation (RI) sediment samples were collected by BBL during October and December 2000.
3. TOC = Total organic carbon.
4. Samples analyzed for PCBs by Galson Laboratories, Inc. (Galson) using USEPA SW-846 Method 8082 as referenced in the New York State Department of Environmental Conservation (NYSDEC) 1995 Analytical Services Protocol (ASP).
5. Samples analyzed for TOC by H2M Laboratories, Inc. (H2M) using the Lloyd Kahn method.
6. Concentrations reported on a dry-weight basis in parts per million (ppm) or milligrams per kilogram (mg/kg).
7. Sample designations indicate the following:
   SD = Sediment sample
   D, DUP = Duplicate sample
8. J = Indicates an estimated value.
9. * = Indicates that the sample was initially archived. Laboratory analysis of the sample was subsequently performed based on the results of sediment samples collected from the overlying depth intervals.
10. Analysis of the archived sediment samples was performed outside the 7-day allowable holding time under the NYSDEC 1995 ASP, but within the 14-day allowable holding time under USEPA SW-846 Method 8082.
11. < = Not detected at a concentration exceeding the indicated laboratory detection limit.
12. D = Concentration is based on a diluted sample analysis.
13. NA = Not analyzed.
14. NYSDEC sediment criteria were calculated using the ecological, risk-based levels of protection presented in the NYSDEC Division of Fish, Wildlife, and Marine Resources document entitled, "Technical Guidance for Screening Contaminated Sediments,"dated January 1999, and the concentration of TOC detected in the individual sediment samples.
15. Analytical results have been validated.

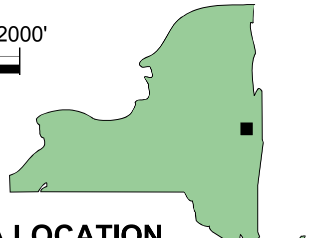
Figures

BLASLAND, BOUCK & LEE, INC.
engineers & scientists

REFERENCE: BASE MAP USGS 7.5 MIN. QUAD., TROY NORTH, NY, 1954, PHOTOREVISED 1980.

2000' 0 2000'

Approximate Scale: 1" = 2000'



AREA LOCATION

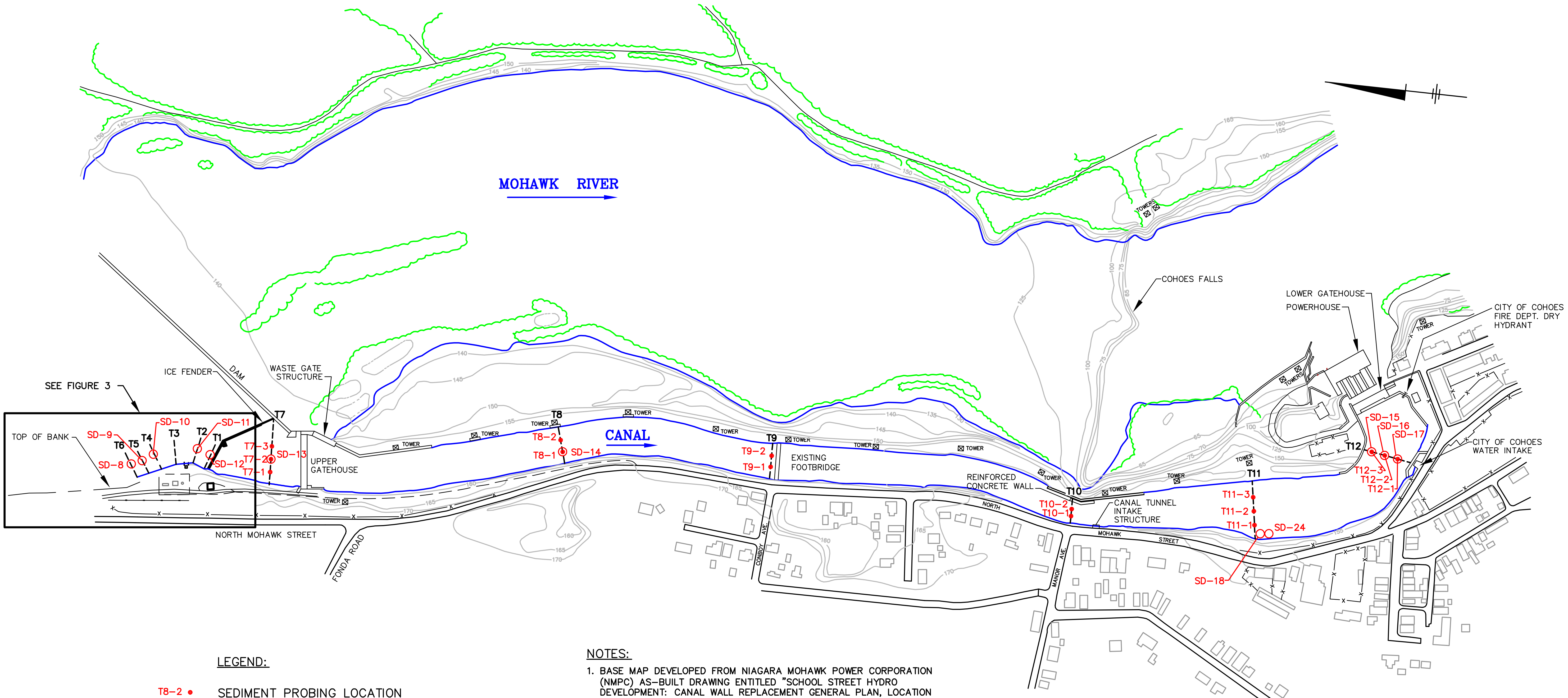
RELIANT ENERGY
(FORMER ORION/NIAGARA MOHAWK, A NATIONAL GRID COMPANY)
SCHOOL STREET HYDROELECTRIC STATION
COHOES, NY

SITE LOCATION MAP

BBL®
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

FIGURE
1

03/10/02 SYR-D54-LBR
36458006/36458n02.cdr



LEGEND:

T8-2 • SEDIMENT PROBING LOCATION

SD-8 ○ RI/FS SURFACE SEDIMENT & SEDIMENT CORE SAMPLING LOCATION

---T4 TRANSECT LINE

NOTES:

1. BASE MAP DEVELOPED FROM NIAGARA MOHAWK POWER CORPORATION (NMPC) AS-BUILT DRAWING ENTITLED "SCHOOL STREET HYDRO DEVELOPMENT: CANAL WALL REPLACEMENT GENERAL PLAN, LOCATION MAP, GENERAL NOTES AND DWG. INDEX," FILE INDEX NO. 2.0-S12-H4, DRAWING NO. D-30664-E, ORIGINAL ISSUE DATE 6/30/94, AS-BUILT 9/95, AT A SCALE OF 1"=200'.

2. BASE MAP ALSO DEVELOPED FROM SITE SURVEY COMPLETED BY NMPC (AS PRESENTED ON THE NMPC DRAWING ENTITLED "SCHOOL STREET DEVELOPMENT SAMPLING LOCATIONS, INDEX NO. 2.0-S12-M5, DRAWING NO. B-33591-E, DATED APRIL 1999, LATEST REVISION MARCH 2001, AT A SCALE OF 1"=60'). LOCATION OF ICE FENDER IS FROM SURVEY ACTIVITIES COMPLETED BY BLASLAND, BOUCK & LEE, INC. (BBL) DURING NOVEMBER, 1999.

3. TRANSECT LOCATIONS T1 THROUGH T7 WERE SURVEYED BY BBL. TRANSECT LOCATIONS T8 THROUGH T12 WERE POSITIONED RELATIVE TO EXISTING SITE FEATURES, AS SHOWN.

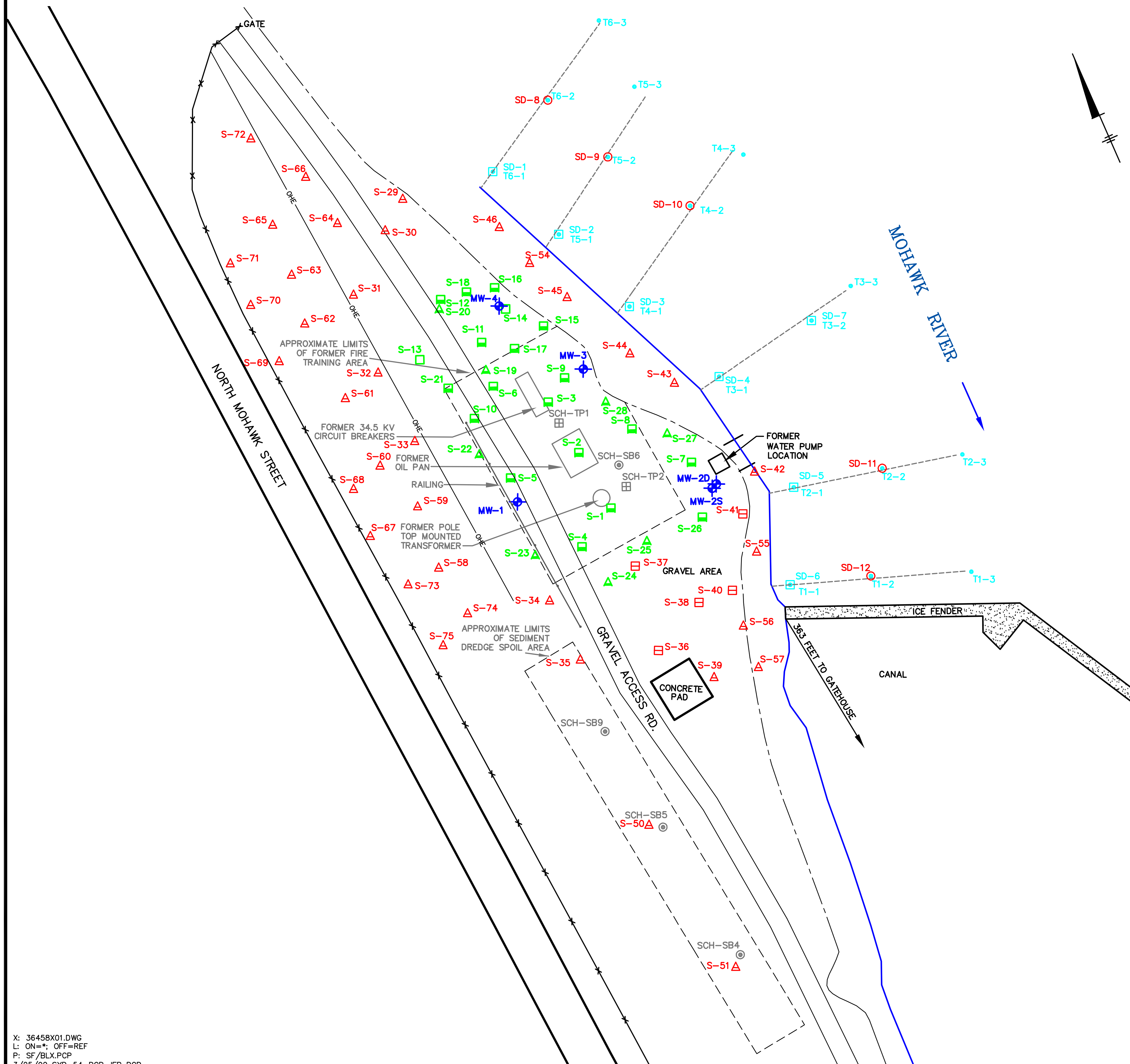
L: (LAYER)
P: SF/BLX.PCP
3/25/02 SYR-54-PGL RCB
36458004/36458B01.DWG

RELIANT ENERGY
(FORMER ORION/NIAGARA MOHAWK, A NATIONAL GRID COMPANY)
SCHOOL ST. HYDROELECTRIC STATION
COHOES, NY

SAMPLING LOCATIONS

BBL BLASLAND, BOUCK & LEE, INC. *engineers & scientists*

FIGURE 2



LEGEND:

- S-47 △ RI/FS SURFACE SOIL SAMPLING LOCATION (10/00 – 02/01)
- S-48 ⊟ RI/FS SURFACE & SUBSURFACE SOIL SAMPLING LOCATION (10/00)
- SD-8 ○ RI/FS SURFACE SEDIMENT & SEDIMENT CORE SAMPLING LOCATION (10/00 & 12/00)
- S-3 PSA SURFACE & SUBSURFACE SOIL SAMPLING LOCATION (3/99 & 11/99)
- S-27 △ PSA SURFACE SOIL SAMPLING LOCATION (3/99 & 11/99)
- S-13 □ PSA OBSERVATION TEST PIT LOCATION (3/99)
- MW-3 MONITORING WELL LOCATION
- T2-3 • SEDIMENT PROBING LOCATION (11/99)
- SD-6 PSA SURFACE SEDIMENT & SEDIMENT CORE SAMPLING LOCATION (11/99)
- SCH-TP2 ⊞ PHASE II ESA TEST PIT LOCATION (8/98)
- SCH-SB4 ◎ PHASE II ESA SOIL BORING LOCATION (8/98)
- SHORELINE
- TOP OF BANK
- FENCE
- OHE OVERHEAD HIGH VOLTAGE ELECTRIC LINE
- SEDIMENT TRANSECT LINE

NOTES:

1. BASE MAP DEVELOPED FROM SITE SURVEY COMPLETED BY NIAGARA MOHAWK POWER CORPORATION (NMPC) (AS PRESENTED ON THE NMPC DRAWING ENTITLED "SCHOOL STREET DEVELOPMENT SAMPLING LOCATIONS, INDEX NO. 2.0-S12-M5, DRAWING NO. B-33591-E, DATED APRIL 1999, LATEST REVISION MARCH 2001, AT A SCALE OF 1"=60'). LOCATION OF ICE FENDER, TOP OF BANK, AND HIGH VOLTAGE LINE ARE FROM SURVEY ACTIVITIES COMPLETED BY BLASLAND, BOUCK & LEE, INC. (BBL) DURING NOVEMBER 1999.
2. SOIL SAMPLING LOCATIONS S-1 THROUGH S-14, S-54 THROUGH S-72, AND MONITORING WELL LOCATIONS MW-1 THROUGH MW-3 WERE SURVEYED BY NMPC. SOIL SAMPLING LOCATIONS S-15 THROUGH S-51, MONITORING WELL MW-4, AND EACH OF THE SEDIMENT PROBING LOCATIONS WERE SURVEYED BY BBL. PHASE II ESA TEST PIT AND SOIL BORING LOCATIONS ARE APPROXIMATE.
3. MONITORING WELL LOCATION MW-2S IS AN OVERBURDEN MONITORING WELL WHILE MONITORING WELL MW-2D IS A BEDROCK WELL.

0 60' 120'

GRAPHIC SCALE

RELIANT ENERGY
(FORMER ORION/NIAGARA MOHAWK, A NATIONAL GRID COMPANY)
SCHOOL ST. HYDROELECTRIC STATION
COHOES, NY

SAMPLING LOCATIONS

BBL BLASLAND, BOUCK & LEE, INC. *engineers & scientists*

FIGURE 3

X: 36458X01.DWG
L: ON=*; OFF=REF
P: SF/BLX.PCP
3/25/02 SYR-54-RCB JER RCB
36458004/36458B02.DWG