FINAL Site Management Plan for the Niagara Transformer Corporation Site

Town of Cheektowaga Erie County, New York NYSDEC Site No. 9-15-146

March 2012

Prepared for:

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION Division of Environmental Remediation

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Revision	Date Submitted	Summary of Revisions	NYSDEC Approval Date

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ist of Abbreviations and Acronyms

CSX Consolidated Rail Corporation

EC engineering control

EEEPC Ecology and Environment Engineering, P.C.

ELAP Environmental Laboratory Accreditation Program

EPA United States Environmental Protection Agency

FS feasibility study

GHASP Generic Health and Safety Plan

HASP Health and Safety Plan

IC institutional control

IDW investigation-derived waste

IRM interim remedial measure

MSDS material safety data sheet

NTC Niagara Transformer Corporation

NYS PE New York State Professional Engineer

NYSDEC New York State Department of Environmental Conservation

O&M operation and maintenance

OM&M operation, maintenance, and monitoring

OSHA Occupational Safety and Health Administration

List of Abbreviations and Acronyms (cont.)

PCB polychlorinated biphenyl

PPE personal protective equipment

QA quality assurance

QC quality control

RA remedial action

RI remedial investigation

ROD Record of Decision

SCGs standards, criteria, and guidance values

SCOs soil cleanup objectives

SHASP Site-Specific Health and Safety Plan

SMP Site Management Plan

TAGM Technical and Administrative Guidance Memorandum

1

Administrative Setting and Site Background

1.1 Introduction and Basis for the Site Management Plan

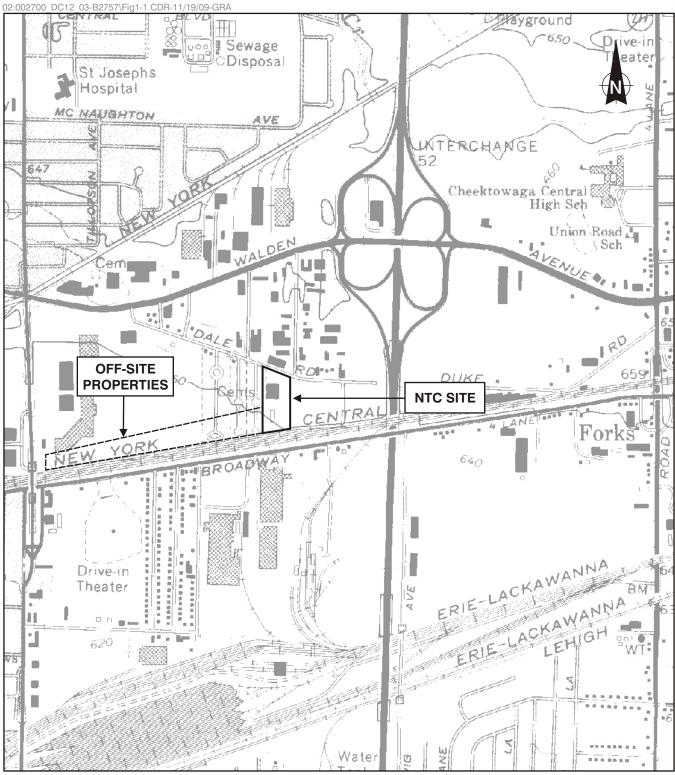
This report presents the Site Management Plan (SMP) for the long-term operation, maintenance, and monitoring (OM&M) of the Niagara Transformer Corporation (NTC) Site (New York State Department of Environmental Conservation [NYSDEC] Site No. 9-15-146). The site is located at 1747 Dale Road in the town of Cheektowaga, Erie County, New York (see Figure 1-1).

This SMP identifies and describes the institutional controls (ICs) and engineering controls (ECs) required to implement the remedy identified in the Record of Decision (ROD) issued for the Niagara Transformer site. These ICs and ECs are mandated by three legal documents: the Order on Consent, the Record of Decision (ROD) (Appendix A) and Explanation of Significant Differences (Appendix B), and the Consent Decree signed in 1996 (Appendix C). Currently, the Consent Decree serves as the institutional control for the site in lieu of a Declaration of Covenants and Restrictions, as described below.

- 1. **The Order on Consent**, signed on March 21, 1991, committed NYSDEC and NTC to investigate the nature and extent of contamination and identify the means for cleaning up the site. The product of this Order was the ROD, which followed two years later.
- 2. **The ROD** (included as Attachment A) was signed by NTC and NYSDEC on December 30, 1993, and the **Explanation of Significant Differences** (included as Attachment B) was signed by NTC and NYSDEC in November 1995. NYSDEC selected off-site land disposal of excavated soil and sediment as the final remedy. The ROD states, "The DEC will discuss with Niagara Transformer the need for invoking institutional controls, such as deed notices, to restrict the future use of the Niagara Transformer property." The ROD also stipulates that, "a post-remediation monitoring program, to include periodic sampling of the groundwater (both the "perched" and deep aquifer), along with surface water and sediments shall be implemented."

In summary, the ROD specifies the following:

1. Excavation and off-site disposal of soil



SOURCE: USGS 7.5 Minute Series (Topographic) Quadrangle: Buffalo NE, NY, 1965.

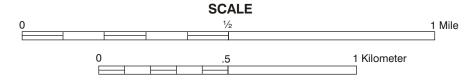


Figure 1-1 General Location Map, NTC Site



- 2. The need to put in place suitable institutional controls
- 3. A long-term monitoring program

The Explanation of Significant Differences was issued by NYSDEC after it was determined that the excavation and removal of contaminated soil around the building foundations to the depth specified in the ROD (i.e., 20 feet) was not feasible, as it could compromise the substructure of the existing manufacturing building. The design difference limited the excavation and removal of contaminated soil to a depth of 4 feet.

3. The Final Consent Decree (Attachment C) was signed by NTC and NYSDEC on March 22, 1996. The Consent Decree references a prior access agreement that allows NYSDEC to conduct continuing groundwater monitoring and surface water and sediment sampling. With respect to institutional controls, the Consent Decree states the following:

"Within thirty (30) days after the effective date of this decree, NTC shall file a Declaration of Covenants and Restrictions with the Erie County Clerk to give all persons who may acquire any interest in its property at the Site notice of this decree. This Declaration is and shall be deemed to be a covenant to be running with the land, binding NTC, its successors and assigns and any lessee of NTC in perpetuity or until such time that the DEC determines that the covenant is no longer necessary for the protection of human health and the environment"

At the time of this writing, the Declaration of Covenants and Restrictions had not been filed with Erie County.

The Consent Decree also states that, unless prior written approval is obtained from NYSDEC and the New York State Department of Health (NYSDOH), there shall be no construction or use of NTC's property at the site that:

- Results in the disturbance or excavation of waste materials therein
- Threatens the integrity of the cap, soil cover materials, or wells
- Results in unacceptable human exposure to contaminated soils or groundwater

With respect to construction, unless prior written approval is obtained from NYSDEC and the NYSDOH, there shall be no change in the use of NTC's property at the site in a manner that would significantly interfere with the long-term operation and maintenance of the remedial actions of the SMP.

If NTC proposes to convey the whole or any part of its property interest at the site, NTC shall, not fewer than 60 days before the date of such conveyance, notify NYSDEC in writing of the identity of the transferee and of the nature and pro-



posed date of the conveyance, and NTC shall notify the transferee in writing, with a copy to NYSDEC, of the applicability of this decree.

This SMP was prepared by Ecology and Environment Engineering, P.C., on behalf of NYSDEC, in accordance with the requirements in *Technical Guidance for Site Investigation and Remediation* (NYSDEC 2002) and other guidelines provided by NYSDEC.

1.2 Administrative Setting

NTC entered into a Consent Decree with NYSDEC in 1996 (Appendix C), which settled cost-recovery issues for the NTC site. The Consent Decree requires NTC to make 18 annual payments of \$300,000 to NYSDEC, for a total of \$5,400,000.

In 1993 NTC entered into a Consent Order with NYSDEC to remediate the property. After completion of the remedial work and subsequent OM&M programs, some contamination was left in the subsurface at the site (hereinafter referred to as "residual contamination"). This SMP was prepared to manage the residual contamination at the site in accordance with Environmental Conservation Law (ECL), Article 71, Title 36. All reports associated with the site can be reviewed by contacting NYSDEC or its successor agency managing environmental issues in New York State.

1.3 Declaration of Covenants and Restrictions

A Declaration of Covenants and Restrictions will be prepared by NYSDEC and executed with NTC and then filed and recorded with the Erie County Clerk so that future owners of the site will be informed of development restrictions due to environmental concerns. An example of a Declaration of Covenants and Restrictions is provided in Appendix D.

A Declaration of Covenants and Restrictions is required for remedial projects in New York State that rely upon one or more ICs and/or ECs after remediation has been completed and where residual contamination remains to be monitored and controlled. A Declaration of Covenants and Restrictions is a recordable instrument executed by the governmental body with immediate jurisdiction in the area where the property is located, the property title owner, and NYSDEC. The Declaration of Covenants and Restrictions remains with the land, binding the owner and the owner's successors and assigns in favor of the state, subject to the provisions of ECL Article 71, Title 36.

An environmental easement contains the use restriction(s) and/or any prohibition(s) on the use of land in a manner consistent with the ECs deemed necessary to control the residual contamination at the NTC site. The emplacement of an environmental easement provides an effective and enforceable means of encouraging the reuse and redevelopment of a controlled property in a manner that has been determined to be safe for a specific use, while ensuring the performance of the operation, maintenance, and/or monitoring requirements deemed necessary to control the residual contamination on the property.



1.4 Site Management Plan

This SMP specifies the methods and provides a detailed description of the obligations for the future remedial management and monitoring requirements at the NTC Site. The execution of the requirements presented in this SMP or latest revision are necessary to ensure compliance with the Declaration of Covenants and Restrictions to address residual contamination at the site. The ICs were established to place restrictions on the site use and mandate reporting measures for all ECs in the SMP. The ECs that have been incorporated into this SMP were established to control potential exposure of site personnel and the environment to the residual contamination during current and future use of the NTC Site. This SMP may be revised only with the approval of NYSDEC.

This SMP describes the future remedial actions to be performed at the NTC Site, including:

- Implementation and management of all ICs and ECs;
- Media monitoring;
- Operation and maintenance of all treatment, collection, containment, and recovery systems;
- Performance of periodic inspections, certification of results, and submittal of Periodic Review Reports (PRRs); and
- Defining the criteria for the termination of any treatment equipment.

To address these needs, this SMP includes the following plans:

- A plan for implementing and managing ICs and ECs.
- Plans for implementing site monitoring, including:
 - a Groundwater Monitoring Well Plan;
 - a Storm Water and Surface Water Monitoring Plan; and
 - a Soils Management Plan.
- An Operations and Maintenance Plan for remedial collection, containment, treatment, and recovery systems.

This SMP also includes a description of PRRs, which will be used to periodically submit data, information, recommendations, and certifications to NYSDEC.



It is important to note the following:

- This SMP details the specific implementation procedures that are required by the Declaration of Covenants and Restrictions. Failure to properly implement the SMP is a violation of the Declaration of Covenants and Restrictions.
- Failure to comply with this SMP is also a violation of ECL 6NYCRR Part 375 and the Consent Order for the site and is subject to applicable penalties.

Revisions to this SMP may be proposed in writing to NYSDEC's project manager for the NTC Site. In accordance with the Declaration of Covenants and Restrictions for the site, NYSDEC will provide a notice of any approved changes to the SMP and append those notices to the SMP that is retained in its files.

1.5 Summary of Remedial Goals

The two main remedial goals selected for the NTC Site, as identified in the ROD (see Appendix A) and the Explanation of Significant Differences (see Appendix B), are the following:

- Reducing or controlling the risks to human health by preventing the incidental ingestion or inhalation of or direct contact with polychlorinated biphenyl (PCB)-contaminated soils, sediments, and water; and
- Protecting the environment by preventing the migration of PCB-contaminated sediments and surface water from the drainage ditch and the continued migration of contaminated groundwater from the site.

From 1993 to 2008, during the remediation phases of the ROD, material at the NTC Site was excavated and disposed of, surface water and roof runoff were rerouted and treated prior to discharge, and other miscellaneous work was completed. In 2008, the surface water and roof runoff water treatment facility was decommissioned. All treatment equipment was removed from the site and disposed of in 2009.

Henceforth, the remedial program will consist of monitoring the designated onsite and off-site locations with respect to the remaining residual contamination. The monitoring program will consist of the following:

- Long-term monitoring of the groundwater well network;
- Analysis of storm water and surface water runoff samples collected during selected rain events; and
- Monitoring and review of the management of on-site soils.



1.6 General Site Background and History 1.6.1 Background

The 3.6-acre NTC Site is located at 1747 Dale Road in the town of Cheektowaga, Erie County, New York. An active manufacturing/office facility is located on the site. A metal storage building and aboveground oil storage tanks are also located on the property, to the south of the manufacturing/office facility (see Figure 1-2).

The CSX property, including six sets of railroad tracks, is located immediately south of the NTC Site; St. Adalbert's cemetery is located west of the site; and light industry and commercial businesses are located north of the site. The residence nearest to the NTC property is located approximately 1,500 feet to the southwest.

1.6.2 Site History

There is no record of industrial activity on the site prior to NTC's purchase of the site and construction of the manufacturing facility in 1958. Until 1980, oils containing PCBs were stored on site or used as an insulating fluid in the manufacture of liquid-filled transformers. NTC no longer uses oils containing PCBs.

On April 10, 1990, Town of Cheektowaga Highway Department employees reported to NYSDEC that oil was seeping into the drainage ditch between the railroad yard and the NTC property. A sample of the oily leachate was analyzed and found to contain PCBs at a concentration of approximately 57,000 parts per million (ppm).

In the early 1990s a remedial investigation/feasibility study (RI/FS) was conducted by NTC under a Consent Order. The RI/FS was finalized for NTC in September 1993 by Woodward-Clyde Consultants (Woodward-Clyde 1993). The ROD was signed on December 30, 1993 (see Appendix A).

The ROD identified excavation and off-site disposal of soil and sediment as the site remedy. During the design of the selected site remedy, soil contamination in one area of the site, the south paved area, was found to extended much deeper than expected (greater than 20 feet). It was determined that removing all of the deep soil was not feasible because it would compromise the substructure of the existing manufacturing building. The design therefore limited the removal depth to 4 feet. The reasons for this decision are documented in the Explanation of Significant Differences issued by NYSDEC in November 1995 (see Appendix B).

The remedial design (RD) contract documents were then developed by Ecology and Environment Engineering P.C. (EEEPC) for NYSDEC for public bidding in 1995 (NYSDEC 1995). Bids were received in October 1995.

A Consent Decree was imposed on NTC by NYSDEC in March 1996 (NYSDEC 1996) (see Appendix C), which settled cost-recovery issues for the NTC Site. As part of the decree, NTC has assumed financial responsibility for the long-term monitoring of the site.



Remediation began in April 1996 and was completed in September 1997 at a cost of \$5.5 million. During remediation, the following actions were performed:

- Contaminated soil and debris material were excavated from the NTC property, adjacent cemeteries, and the downgradient drainage ditches, sewer, and retention pond;
- The tank farm that was used to store PCB-containing dielectric fluids at NTC was demolished;
- The south NTC parking lot and a portion of the driveway were removed; and
- 24,000 tons of hazardous waste (i.e., having PCB concentrations greater than 50 ppm), 21,000 tons of nonhazardous waste, and 18 tons of decontaminated scrap steel were removed from the site and disposed of.

Following remediation, the affected areas were restored by the placing of backfill, where necessary; installation of a new storm drain system and associated piping/structures; installation of asphalt pavement; installation of a new tank farm; and topsoiling, seeding, and mulching or sodding (in cemetery areas only). The *Final Remediation Report for the Niagara Transformer Site* (EEEPC 1997) provides additional details about the remediation of this site.

In 1997 it was discovered that the roof of the main building was contaminated with PCBs. Before any flushing operations were performed on the roof, an emergency water treatment system (EWTS) was installed in late 1997 at the head of the site drainage ditches, which had already been remediated, to prevent their recontamination by contaminated roof runoff. However, analysis of sediment samples collected in 1998 from the downstream ditches indicated that portions of the ditches near the site had already become re-contaminated with PCBs by the contaminated roof runoff. Sampling of the roof and drainage piping was performed again in 1998 to determine the effectiveness of the roof replacement work. The sample results indicated continuing low-level releases of PCBs. Additional work was completed by NYSDEC in 1999 to flush and reroute the drain lines.

In 1999 additional field investigations were initiated to determine the source(s) of the continuing releases of PCBs to surface water and the extent of recontamination of the drainage ditches. The data generated indicated that the on-site storm sewers were acting as a pathway for the migration of residual contamination at the site (mainly from under the active main building) (NYSDEC 2000). Because it would not be feasible to directly remove additional contamination from under the building without closing the building and demolishing the structure, an Interim Remedial Measure (IRM) was implemented in 2003 to treat storm water flow and address areas of recontamination in the drainage ditches. Contract Documents for this work were prepared by EEEPC and issued for bidding in March 2003 (EEEPC 2003).

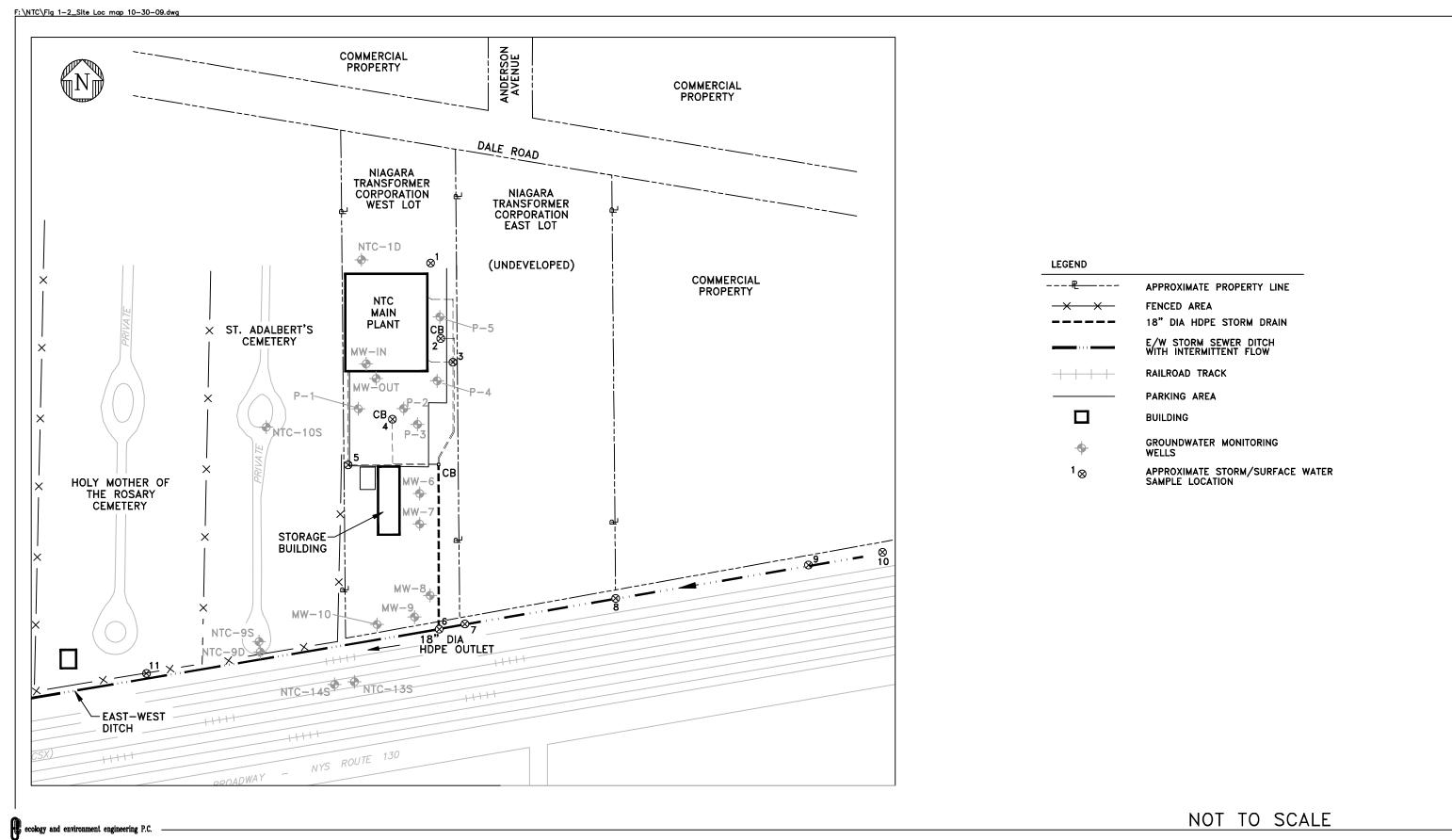


Figure 1-2 NTC SITE LAYOUT MAP

1 Administrative Setting and Site Background

To prevent contaminated groundwater from migrating off the site, a low-permeability slurry wall was installed around the yard area. The slurry wall confines the groundwater beneath the pavement in the yard area, and the pavement prevents surface water from seeping into the groundwater. This work was completed in 2004.

In 2008, as part of the storm water investigation program, samples were collected from under the fume hood and exhaust fan discharges on the east side of the main manufacturing building. The analytical results indicated the presence of PCBs, and another remedial cleanup project was performed to address this contamination. NTC's outside consultant, Benchmark Environmental Engineering & Science, PLLC, of Buffalo, New York, prepared a work plan for this remedial work, which was accepted by NYSDEC. The work proposed in the work plan included the removal and cleaning of ductwork and fans on the east side of the manufacturing facility, cleanup of the outside pavement under the ductwork, and the removal of sediments from a nearby catch basin. The remedial cleanup was performed by Demcon LLC, of Webster, New York, under subcontract to Benchmark. The closeout report prepared at the completion of the cleanup indicated that the contamination had been effectively removed (Benchmark 2008).

Also in 2008, NYSDEC determined that further treatment of surface water and roof runoff was unnecessary. Therefore, operation of the EWTS at the head of the site drainage ditches was discontinued. The treatment system was subsequently decommissioned and removed in 2009.

1.7 Future Site Zoning

The site is currently zoned for general manufacturing by the Town of Cheektowaga. There are no plans to modify or change the present zoning in a manner that would allow or encourage increased human contact with the site. The Environmental Easement and the additional requirements imposed by the ICs and ECs in the SMP as described in Section 2 will also limit the potential for human exposure, even if the zoning of the general area is modified.

2

Institutional and Engineering Controls

2.1 Introduction

ICs and ECs are needed to protect human health and the environment from the residual contamination present in soil and groundwater beneath the site. This section describes the procedures for managing all ICs and ECs at the site. The ICs ECs are components of the SMP, and revisions to the Plan are subject to approval by NYSDEC.

NYSDEC's *Technical Guidance for Site Investigation and Remediation* outlines the requirements for all phases of the remediation process (NYSDEC 2002). Among these requirements are the ICs and ECs that must be followed for this phase of the SMP. The site drawings presented in Appendix E identify the locations of the major ECs for the site.

2.2 Institutional Controls

The ICs that are necessary to ensure the effectiveness of this phase of site management of the remedial action include a Declaration of Covenants and Restrictions that shall be implemented to prevent existing or future property owners from destroying the south paved area asphalt or the slurry wall and concrete cutoff wall surrounding the pavement.

The following or similar language should be added to the filed Declaration of Covenants and Restrictions: All requirements of the SMP and all referenced plans, latest revision, on file at the offices of NYSDEC Region 9 must be adhered to. This applies to all existing and future property owners.

The ICs required by the Declaration of Covenants and Restrictions refer to non-physical mechanisms designed to:

- Restrict the use or development of the site,
- Limit human exposure to site contaminants,
- Prevent any action that would threaten the effectiveness or operation and maintenance of a remedy at or pertaining to the site; and



- Implement, maintain, and monitor engineering control systems. In addition to the ICs identified above, the Declaration of Covenants and Restrictions also stipulates the following:
- No construction activity shall be allowed beneath the main building's floor slab(s) or in the paved area south of the main building and north of the existing tank farm without written approval from NYSDEC. Detailed drawings prepared by a NYS Professional Engineer (NYS PE) showing the proposed activities and specifications fully describing the work, the construction or restoration effort, and the hazardous material handling and disposal procedures will be required prior to obtaining approval.
- No construction activity shall be allowed in the vicinity of the slurry wall around the perimeter of the paved area south of the main building and north of the existing tank farm without written approval from NYSDEC. Detailed drawings prepared by a NYS PE showing the proposed activities and specifications will be required prior to obtaining approval. The drawings shall clearly show the location of the slurry wall, and the specifications shall describe excavation warnings and slurry wall repair or replacement requirements.
- All excavated material and all debris removed as part of the maintenance of the storm sewers in the south paved area shall be treated as hazardous material unless shown to be otherwise by analytical testing.

2.3 Engineering Controls

2.3.1 Engineering Control Systems To provent exposure to the remaining control of the control o

To prevent exposure to the remaining contamination in soil and sediments at the site, cover systems have been placed over the southern portion of the site and the parking lot immediately south of the manufacturing building. The soil cover on the southern portion of the site is comprised of a minimum of 12 inches of clean soil and vegetative cover. The south parking lot is covered with asphalt to prevent surface water infiltration, and concrete cutoff walls and subsurface barriers (slurry walls) have been installed to prevent the off-site migration of PCB-contaminated groundwater.

In addition to the soil cover, the ECs also include a system of groundwater monitoring wells and surface water sampling locations. The analytical results of samples collected from these locations will be used to evaluate the natural attenuation of contaminants from the site.

2.3.1.1 Cover Systems

The Soils Management Plan presented in Appendix F outlines the procedures that must be implemented in the event the soils are disturbed or the asphalt cover is breached, penetrated, or temporarily removed and any underlying remaining contamination is disturbed.



The asphalt cover system is a permanent control, and the quality and integrity of the cover must be inspected at defined, regular intervals in perpetuity. Procedures for the inspection and maintenance of the asphalt cover are summarized below.

Institutional and Engineering Controls

- Perform a semi-annual inspection of the asphalt-surfaced area located south of the main building and enclosed by the low-permeability slurry wall and concrete cutoff wall. This area is used for storage and to facilitate truck movement. The asphalt surface should be inspected for cracks, open joints between concrete and other non-asphalt materials, developing pot holes, excessive flexing in unstable or soft areas, and other signs of surface and sub-surface distress. The inspections should occur in April and October. Observations regarding cracks and comments regarding repairs of cracks should be recorded on inspection Form 1 (see Figure 2-1). Inspection Form 2 (see Figure 2-2) should be used to record observations regarding pavement distress and comments regarding repairs of distressed areas.
- If it is determined that an excessive amount of water is accumulating beneath the asphalt area, possibly leading to frost heave damage to the pavement, it may be necessary to install a sump along the southern edge of the asphalt area and pump the water into a storage tank for disposal at an approved facility until repairs can be made to the slurry wall or asphalt surface. Use inspection Form 3 (see Figure 2-3) to record observations regarding this type of problem and comments regarding repairs.
- When the asphalt nears the end of its useful life and needs to be replaced, all asphalt material shall be removed and replaced in-kind with minimal construction time to prevent accumulation of water in the base and sub-base regions. The slurry wall and concrete cutoff wall shall be protected during the removal of existing asphalt and placement of the new asphalt. NYSDEC approval is required prior to disturbing the existing asphalt surface. Use Inspection Form 2 (see Figure 2-2) to record observations regarding this type of problem and comments regarding asphalt pavement replacement.
- Any pavement distress or construction activity involving excavation in the vicinity of the slurry wall and concrete cutoff wall will reduce the effectiveness of the slurry wall in preventing the off-site migration of groundwater. The slurry wall and concrete cutoff wall around the perimeter of the south paved area shall be inspected annually, preferably in late spring, to verify that it is not damaged. Damage to either of these walls will require immediate repair. The type and extent of damage sustained will need to be evaluated at the time of inspection to determine the repair that will be required. Use Inspection Form 3 (see Figure 2-3) to record observations/issues regarding the slurry wall and concrete cutoff wall and comments regarding repairs.

Date	Asphalt Cracks (Y/N)	If Yes, Location	Repairs Made (Date) ¹	Repaired With	Comments
Notes:					

Figure 2-1 South Paved Area Inspection Record for Asphalt Cracks and Open Joints between Asphalt and Concrete

Date	Asphalt Distress (Y/N)	Describe Distress	Repairs Made (Date) ¹	Repair Description and Comments
Notes:	1	dia 1 mand - C' - C'	Т	pairs made necessary because of winter month repairs must be repaired final by May 15.

Figure 2-2 South Paved Area Inspection Record for Asphalt Pavement Distressed Areas

Date	Slurry Wall Distressed (Y/N)	Describe Distress ¹	Repairs Made (Date) ²	Repair Description and Comments
Notes:				

Figure 2-3 Slurry Wall Inspection Record

Slurry Wall distress can be evaluated by inspecting the south paved area perimeter to determine whether any excavation was performed in this area.

Repairs must be made within 1 month of inspection. Temporary repairs made necessary because of winter month repairs must be repaired final by May 15.



2.3.1.2 Monitored Natural Attenuation

Groundwater, surface water, and sediment monitoring activities to assess natural attenuation of contamination will continue until NYSDEC has determined that residual levels of contaminants in groundwater, surface water, and sediments are consistently below NYSDEC standards or have become asymptotic at an acceptable level over an extended period. Monitoring will continue until permission to discontinue is granted in writing by NYSDEC. If groundwater, surface water, or sediment contaminant levels become asymptotic at levels that are not acceptable to NYSDEC, additional source removal, treatment, and/or control measures will be evaluated. The groundwater, surface water, and sediment sampling locations will be inspected as follows:

- The on- and off-site groundwater monitoring wells should be inspected semiannually to ensure their integrity. If (1) the wells are damaged or determined to be otherwise unusable for obtaining samples, (2) the wells need to be abandoned and replaced, or (3) an additional monitoring well is required, then:
 - The well(s) shall be decommissioned as described in NYSDEC's
 Groundwater Monitoring Well Decommissioning Procedures (NYSDEC
 2009) and agreed to by NTC; or
 - Replacement or new well(s) shall be installed as described in Section 3.3.4 of this SMP; or
 - If it is determined that a monitoring well needs to be decommissioned and replaced or an additional monitoring well is required, refer to Section 3.3.3 of this SMP.
- The on- and off-site surface water and sediment sampling locations should be inspected semi-annually to ensure their suitability for sample collection (e.g., have sufficient flow and sediment buildup).

2.3.2 Criteria for Completion of Remediation

Generally, remedial processes are considered completed when the effectiveness of the monitoring program indicates that the remedy has achieved the remedial action objectives identified by the ROD or other post-remedial decision documents. The framework for determining when remedial processes are complete is provided in Section 6.6 of NYSDEC's *Technical Guidance for Site Investigation and Remediation* (NYSDEC 2002).

2.4 Certification of Institutional and Engineering Controls

To verify that the ICs and ECs are being monitored and enforced, this SMP and a long-term OM&M program must be instituted and coordinated by NTC. The major tasks will include the following:

- Maintaining and enforcing ICs.
- Completing all work required in the ECs.



- Repairing, maintaining, replacing, etc., roof drains, catch basins, the underground roof drain and south paved area piping, and the discharge pipe to ensure that samples can be obtained;
- Patching, sealing cracks, and providing general maintenance of the asphalt cover in the south paved area;
- Verifying that no construction or other similar activities occur that would damage the slurry wall;
- Repairing, maintaining, replacing, etc., groundwater monitoring wells as required;
- Obtaining access permits from St. Adalbert's cemetery, CSX, the Town of Cheektowaga, and others as necessary to allow for reasonable access to the groundwater monitoring wells for the purposes of repairing, maintaining, and/or replacing the wells and to obtain required samples;
- Sampling and analysis of surface water and groundwater by an independent, NYSDEC-approved laboratory on an approved schedule and frequency; and
- Preparing reports regarding the water analyses based on NYSDEC-provided parameters and format and sealed by a NYS PE.

2.4.1 Certification of Institutional Controls

The ICs described by the Declaration of Covenants and Restrictions must be prepared by NYSDEC and attached to an amended deed filed with the Erie County Clerk and other appropriate offices. NTC shall annually submit an affidavit (via the PRR) to NYSDEC that there have been no changes to the executed Declaration of Covenants and Restrictions or any other ICs that have been put in place as a result of this SMP.

2.4.2 Certification of Engineering Controls

The ECs described herein must be installed under the direct supervision of a NYS PE, and the ECs must be reviewed and certified by the PE on an annual basis. A separate inspection and repair summary for each inspection and any necessary repair shall be prepared by the supervising NYS PE, who shall sign and certify the summary. The President of NTC shall also sign and certify that all ECs are being enforced.

The affidavit for ICs and ECs included as part of the PRRs should state the following:

"NTC hereby certifies that all ICs and ECs described in this SMP have been followed by NTC. NTC further certifies that all requirements of all other Plans attached to the Site Management Plan have been followed and all data generated by these actions have been forwarded, or will be forwarded, to NYSDEC. In addi-



2 Institutional and Engineering Controls

tion, all prospective buyers of the NTC property shall be informed of the environmental status of the site and be given access to the SMP for review and consideration."

This affidavit shall be dated and signed by the President of NTC.

3

Site Monitoring Plan Summary

3.1 Introduction

The overall goals of this remediation effort were provided in Section 1 of this SMP. As part of the remediation effort, the monitoring of groundwater, surface water, storm water runoff, and sediment, including sampling and analysis, shall be performed in a manner acceptable to NYSDEC. This section provides a summary and a description of the Site Monitoring Plan for groundwater, surface water runoff, and sediment. These monitoring activities must continue indefinitely or until NYSDEC has determined that the site is no longer capable of discharging contamination off-site or affecting human health.

3.1.1 General

This Site Monitoring Plan describes the measures for evaluating the performance and effectiveness of the remedy to reduce or mitigate contamination at the site, the cover systems, and all affected site media. Monitoring of the ECs is described in the Soil, Storm Water, and Groundwater Monitoring Plans presented in appendices F, G, and H, respectively. These plans may be revised only with the approval of NYSDEC. The SMP and the latest revisions to the SMP shall be filed with NYSDEC.

3.1.2 Purpose and Frequency

NTC shall retain the services of a qualified professional firm to inspect and maintain all monitoring wells, replace wells as required, and obtain and analyze groundwater, surface water runoff, and sediment samples.

The site monitoring plan describes the methods to be used for the following:

- Sampling and analysis of all appropriate media (i.e., groundwater, surface waters, stormwater, sediments, and soils);
- Assessing compliance with applicable NYSDEC standards, criteria, and guidance (SCGs), particularly ambient groundwater/surface water standards and Part 375 Soil Cleanup Objectives for soil;
- Assessing achievement of the remedial performance criteria;
- Periodically evaluating site information to confirm that the remedy continues to be effective in protecting public health and the environment; and



■ Preparing the necessary reports for the various monitoring activities.

To adequately address these issues, the Site Monitoring Plan provides information on:

- Sampling locations, protocol, and frequency;
- Information on all designed monitoring systems (e.g., well logs);
- Analytical sampling program requirements, including independent validation of analytical data;
- Reporting requirements;
- Quality Assurance/Quality Control (QA/QC) requirements;
- Inspection and maintenance requirements for monitoring wells;
- Monitoring well decommissioning procedures; and
- Annual inspection and periodic review certification.

All groundwater, surface water and storm water runoff, and sediment sampling shall be completed as described in the Surface Water/Stormwater Sampling Plan (see Appendix G). Samples shall be analyzed for PCBs, semi-volatile organic compounds, and other listed contaminants. Table 3-1 presents the sampling program for the NTC Site.

Table 3-1 NTC Sampling Schedule and Analytical Methodologies

Monitoring Program	Reporting Frequency ¹	Matrix	Analysis ²
Groundwater and	Semi-annually	Water and Soils	Analytical Method 8082 and
Sediment			8270D
Surface Water and	Semi-annually ³	Water and Soils	Analytical Methods 8082,
Stormwater	-		1664A, 2540C, and 2540D
On-site Soils and	As needed ⁴	Soils	Analytical Method 8082 ⁵
Imported Soils			-

Notes:

- ¹ The sampling frequency will be as indicated unless otherwise specified by NYSDEC.
- All Method 8082 analyses must be performed and reported to detection limits <0.065 micrograms per liter.
- ³ Surface water sampling will be performed at the same time as groundwater and sediment sampling; stormwater sampling will be performed only during a qualifying storm event or "first-flush."
- When excavation of any on-site subsurface areas is required.
- Additional analytical parameters may be required under TAGM 4046 to ensure compliance with the site cleanup objectives.



3.1.3 Access

Access to properties not owned by NTC is required to complete the tasks and services described in this SMP. NTC will be responsible for obtaining and executing any permits or legal instruments required to obtain access to these properties.

NTC must obtain an Access Agreement with St. Adalbert's Cemetery (Roman Catholic Church Society of Buffalo) to access the groundwater monitoring wells. NYSDEC has an Access Agreement in effect for sampling on the cemetery grounds; however, NYSDEC will not be responsible or liable for any activity required by this SMP. Therefore, NTC must obtain its own Access Agreement. A copy of NYSDEC's existing Access Agreement will be made available to NTC for the purposes of planning and for obtaining the services of consultants and contractors.

If NTC assumes responsibility for management of the site, it must obtain an Access Agreement with CSX. NYSDEC has an Access Agreement in effect for sampling on railroad property; however, NYSDEC will not be responsible or liable for any activity required by this SMP that would be performed within the CSX right-of-way. Therefore, NTC must obtain its own Access Agreement. A copy of the existing Access Agreement is included as Appendix I and is available to NTC for the purposes of planning and for obtaining the services of consultants and contractors.

In addition, if NTC assumes responsibility for management of the site, it also must obtain an Access Agreement with the Town of Cheektowaga to access the retention pond for sampling. However, if NYSDEC assumes responsibility for management of the site, it also must obtain this Access Agreement with the Town of Cheektowaga.

If NTC refuses to perform the duties required by the site management plan then NYSDEC will perform the requirements of the SMP and recover those costs required to perform the duties in the SMP.

3.2 Soil Cover and Cap System Monitoring

Note that soil cover and cap monitoring is covered separately from the other engineering controls in this section. Monitoring of these active engineering controls is included in Section 2.3, Engineering Controls.

3.3 Media Monitoring Program

3.3.1 Groundwater Monitoring Wells

Groundwater monitoring will be performed on a periodic basis to assess the performance of the remedy. Thirteen groundwater monitoring wells were installed both upgradient and downgradient of the NTC property to allow observation of the local groundwater contaminant trends. Available information logs of the groundwater monitoring wells are provided in Appendix J.



Ten groundwater monitoring wells must be sampled semi-annually. Five of these ten wells are located on NTC property, two wells are located in the railroad track area south of the NTC property, and three wells are located in St. Adalbert's east cemetery. The locations of these wells are shown on Figure 2 of the Groundwater Sampling Plan (see Appendix H). Monitoring well NTC-1D is the only upgradient monitoring well, while the two monitoring wells located in the railroad track area (NTC-13S and NTC-14S) are considered the most downgradient monitoring wells

Semi-annual groundwater sampling is required from the following monitoring wells: NTC-1D, NTC-10S, NTC-9S, NTC-9D, NTC-13S, NTC-14S, MW-9, MW-10, MW-IN, and MW-OUT. The remaining three groundwater monitoring wells do not require sampling at this time. If sampling is required at these remaining wells in the future, NYSDEC will notify NTC of this requirement. NTC shall maintain these groundwater monitoring wells as if they were part of the Sampling Plan.

3.3.2 Groundwater Monitoring Well Inspection

All on-site and off-site monitoring wells shall be inspected semi-annually to determine their physical condition and to identify necessary maintenance required to allow the monitoring wells to remain operational. Minor problems with the physical condition of the existing monitoring wells (problems that will not prevent or interfere with sampling) should be identified during each inspection. Repairs or equipment replacement shall be completed within 10 days after inspection. Inspections of the monitoring wells should be conducted prior to scheduled sampling times to allow scheduled sampling to proceed as planned. Some minor problems that may be encountered and typical solutions include the following:

- Inspection of well identification markings re-label as necessary;
- Inspection of the protective casing repair as necessary;
- Cracked anti-percolation pad replace with new pad;
- Rusty lock or broken cap replace;
- Casings that have peeling paint or are rusty remove loose paint and rust and repaint;
- Bent casings repair if possible (if the casing cannot be repaired to allow for sampling, then the monitoring well may have to be decommissioned and replaced if determined necessary by NYSDEC); and
- Leaking seals or cap replace with watertight items.

The results of the inspections must be documented on monitoring well inspection checklists. An example of this form is provided in Appendix H as Form 1.



3.3.3 Groundwater Monitoring Well Decommissioning

If a monitoring well is determined to be unusable for obtaining samples because of damage or otherwise, the well will be decommissioned as described in NYSDEC's *Groundwater Monitoring Well Decommissioning Procedures* (NYSDEC 2003) and agreed to by NTC.

3.3.4 Installation of New or Replacement Groundwater Monitoring Wells

If it is determined that a new or replacement monitoring well needs to be installed, the well(s) shall be installed as described in NYSDEC's *Groundwater Monitoring Well Decommissioning Procedures* (NYSDEC 2003) and agreed to by NTC. If the new monitoring well is intended to replace an existing monitoring well, the new monitoring well shall be installed approximately 5 feet from the existing monitoring well and to the same depth of the monitoring well it is replacing. If the new monitoring well is for a new location, the well location and depth will be determined by NYSDEC.

A typical flush-mount groundwater monitoring well is shown on Figure 3-1. A typical "stick up" groundwater monitoring well is shown on Figure 3-2.

If biofouling or silt accumulation occurs in the on-site and/or off-site monitoring wells, the wells should be physically agitated, surged, and then redeveloped. In addition, monitoring wells will be properly decommissioned and replaced (as per the Site Monitoring Plan) if the redevelopment event renders the wells unusable.

3.3.5 Monitoring Well Repairs

Each permanent groundwater monitoring well must be inspected to determine and document its physical condition and to identify the necessary maintenance required to ensure that each monitoring point remains operational. Routine inspections of each of the long-term monitoring points are to be performed for the duration of the groundwater monitoring program. Repair and/or replacement of each well in the monitoring well network will be performed based on the assessment of its structural integrity and overall performance. A copy of the monitoring well inspection form is presented as Form 1 in Appendix H.

NYSDEC will be notified prior to the performance any repair work on a monitoring well or the decommissioning of a monitoring well. All such work will be documented in the subsequent PRR. Well decommissioning without replacement will be performed only with the prior approval of NYSDEC. Well abandonment will be performed in accordance with NYSDEC's latest version of the *Groundwater Monitoring Well Decommissioning Procedures* (NYSDEC 2003). Monitoring wells that are decommissioned because they have become unusable will be reinstalled in the nearest available location approved by NYSDEC.

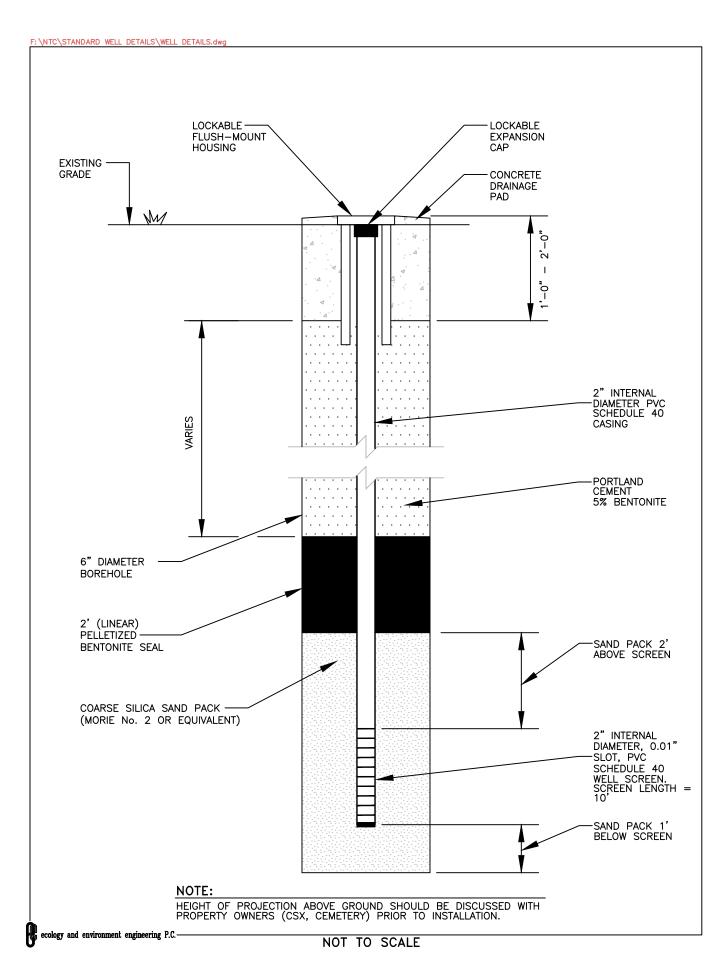


Figure 3-1
TYPICAL FLUSH MOUNT MONITORING WELL CONSTRUCTION
NIAGARA TRANSFORMER CORP. SITE
SITE No. 9-15-146
CHEEKTOWAGA, N.Y.

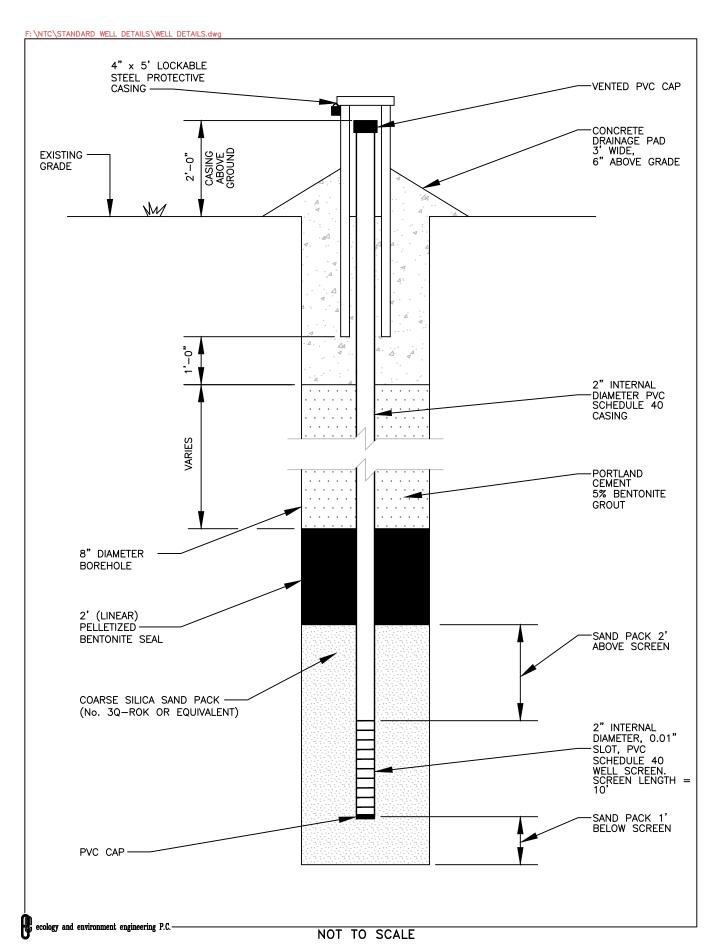


Figure 3-2
TYPICAL STICKUP MONITORING WELL CONSTRUCTION
NIAGARA TRANSFORMER CORP. SITE
SITE No. 9-15-146
CHEEKTOWAGA, N.Y.



3.4 Media Sampling Program

3.4.1 Groundwater Sampling

All monitoring well sampling activities shall be recorded in a dedicated site field log book and a groundwater sampling log.

Groundwater samples shall be collected semi-annually from the monitoring wells, and the groundwater levels in the wells shall be recorded when the sampling is performed. The samples shall be analyzed for PCBs and other contaminants by an Environmental Laboratory Accreditation Program (ELAP) -certified laboratory in accordance with the analytical procedures listed in Table 3-1. Sampling personnel should have spill prevention and spill response equipment on hand in the event of an accidental spill. Standard groundwater well sampling procedures for the NTC site are provided in Appendix H. The groundwater well purge and sample record form is provided as Form 2 in Appendix H.

3.4.2 Stormwater Sampling

Sampling of stormwater, including roof runoff water, shall be performed semi-annually at 14 locations. The samples shall be analyzed for PCBs and other contaminants at an Environmental Laboratory Accreditation Program (ELAP) - certified laboratory in accordance with the analytical procedures listed in Table 3-1. Information on qualifying storm events and sampling procedures is provided in Appendix G. Figure 1 of Appendix G identifies the sampling locations.

One sampling event should occur during a precipitation event, preferably in late summer, and one other time as agreed to by NYSDEC. Precipitation runoff must be sufficient to result in a measurable discharge, and the sampling should occur at "first flush." The samples will be analyzed at an ELAP-certified laboratory.

3.4.3 Soil/Sediment Sampling

Soil and sediment sampling is required whenever soil is excavated from any area south of the main building. Soil/sediment samples will be collected semi-annually from the following locations:

- At the 18-inch-diameter high-density polyethylene (HDPE) outlet or at the nearest practical point downstream of this outlet,
- At the inlet surface water at the Retention Pond, and
- At the surface water outlet of the Retention Pond.

Soil/sediment sampling procedures for the NTC site are presented in the Groundwater Sampling Plan (see Appendix H).

3.4.4 Surface Water Sampling

Surface water sampling should be performed, at a minimum, at the NTC outfall and the inlet of the retention pond. Surface water sampling should be performed semi-annually at the same time as the groundwater and sediment sampling.



The samples shall be analyzed for PCBs and other contaminants at an Environmental Laboratory Accreditation Program (ELAP) - certified laboratory in accordance with the analytical procedures listed in Table 3-1. Standard surface water sampling procedures for the NTC site are provided in Appendix G.

3.5 Sampling Equipment Decontamination ProceduresStandard equipment decontamination procedures for each of the sampling elements are presented in each sampling plan.

3.6 Sample Packaging and Shipping Procedures

Sample packaging and shipping procedures are presented in each sampling plan.

3.7 Storage and Disposal of Investigation-Derived Wastes (IDW) and Personal Protective Equipment

3.7.1 Typical Wastes

Typical site-related wastes that must be disposed of include the following:

- Liquid and solid investigation-derived waste (IDW) from sampling activities, including water and sediments;
- Excavated soil, asphalt materials, and other objects (such as catch basins and similar) from any construction activities that occur in the south paved area;
- Accumulated debris or sediment removed from the surface water runoff collection system during maintenance or other operations; and
- Personal protective equipment (PPE).

NYSDEC will determine, on a case-by-case basis, what other wastes will require disposal.

3.7.2 Temporary Storage

All IDW and excavated materials must be stored in approved containers, roll-offs, or drums. The contents and origin of the material must be clearly described on the exterior of the container and managed in accordance with the requirements of NYSDEC TAGM 4046 (NYSDEC 1994). No wastes shall be stored on site for more than 90 days after the accumulation of the waste without written permission from NYSDEC.

No materials shall be stored on or in non-approved storage areas. All waste containers must be stored in a NYSDEC-approved area until an approved waste handling contractor removes them for proper disposal. The storage area must be a watertight area that will contain all spills and precipitation runoff. Immediately prior to the discharge of any collected runoff, NTC supervisory personnel will



visually inspect the accumulated runoff for an oily sheen. The supervisor shall then sign a checklist that he has visually inspected the liquid for the presence of an oily sheen. (If an oily sheen is detected, then sampling and corrective actions must be performed.) The checklist shall contain, at a minimum, the date of the inspection, the supervisory personnel's full name (typed or printed), the approximate amount of accumulated runoff discharged, the end point of the discharge (e.g., town storm sewer, 18-inch HDPE discharge pipe, etc.) and a space for a signature.

3.7.3 Backfill of Excavated Areas

Excavated materials from the south paved area shall not be reinstalled or used for backfill. Clean backfill shall be obtained from a NYSDEC-approved source, be similar to the soil it is replacing, and be suitable for the final in-place use. The soil must be verified clean in accordance with the analytical criteria in NYSDEC TAGM 4046 (NYSDEC 1994). The backfill shall be placed and compacted as necessary.

If soil excavated from areas other than the south paved area does not contain contaminants in excess of established criteria, the excavated soil may be used for backfill. Soil that contains contaminants in excess of established limits shall be disposed of.

3.7.4 Responsibility

NTC shall be responsible for the proper handling of all IDW. Written documentation and approved manifests describing the disposal destination and handler shall be obtained and stored by NTC. Copies of the documentation and manifests shall be submitted annually to NYSDEC along with the PRR for the NTC Site.

3.8 Monitoring Analytical Program

The analytical program outlines provided in Appendices F, G, and H present the policies, organization, objectives, functional activities, and specific quality assurance (QA) and quality control (QC) measures that must be implemented by the laboratory selected for this project. The program is designed to ensure that all technical data generated by the laboratory are accurate and representative and will (if needed) withstand judicial scrutiny. The analytical program outline provides details regarding analytical schedules, QA/QC, reports, and deliverables of analytical data. NTC shall prepare an Analytical Program Work Plan that addresses all requirements and considers all information presented in the analytical program (see Appendix K).

3.8.1 Quality Assurance/Quality Control

All sampling and analyses shall be performed in accordance with the requirements of the generic Quality Assurance Project Plan (QAPP) prepared for the site (see Appendix K). The main components of the QAPP include the following:

QA/QC Objectives for Data Measurement;



■ Sampling Program;

- Sample containers will be properly washed, decontaminated, and appropriate preservative will be added (if applicable) prior to their use by the analytical laboratory. Containers with preservative will be tagged as such.
- Sample holding times will be in accordance with the NYSDEC Analytical Service Protocol requirements.
- Field QC samples (e.g., trip blanks, coded field duplicates, and matrix spike/matrix spike duplicates) will be collected as necessary.
- Sample Tracking and Custody;
- Calibration Procedures;
 - All field analytical equipment will be calibrated immediately prior to each day's use. Calibration procedures will conform to manufacturer's standard instructions.
 - The laboratory will follow all calibration procedures and schedules as specified in U.S. Environmental Protection Agency (EPA) SW-846 (EPA 1995) and subsequent updates that apply to the instruments used for the analytical methods.
- Analytical Procedures;
- Preparation of a Data Usability Summary Report (DUSR), which will present the results of data validation, including a summary assessment of laboratory data packages, sample preservation and chain-of-custody procedures, and a summary assessment of precision, accuracy, representativeness, comparability, and completeness for each analytical method.
- Internal QC and Checks;
- QA Performance and System Audits;
- Preventative Maintenance Procedures and Schedules; and
- Corrective Action Measures.

3.8.2 Reporting Requirements

Forms and any other information generated during regular monitoring events and inspections shall be kept on file at the site. All forms and other relevant reporting formats used during the monitoring/inspection events will be subject to approval by NYSDEC and submitted at the time of the PRR, as specified below.

All monitoring results must be reported to NYSDEC on a periodic basis in the PRR. A report will also be prepared, if required by NYSDEC, subsequent to each sampling event. The report (or letter) shall include, at a minimum:

■ The date of the event;



- The names of the personnel who conducted the sampling;
- A description of the activities performed;
- The type of samples collected (e.g., sub-slab vapor, indoor air, outdoor air);
- Copies of all field forms completed (e.g., well sampling logs, chain-of-custody documentation);
- Sample results in comparison to appropriate standards/criteria;
- A figure illustrating sample type and sampling locations;
- Copies of all laboratory data sheets and the required laboratory data deliverables required for all points sampled (to be submitted electronically in the NYSDEC-identified format);
- Any relevant observations, conclusions, or recommendations; and
- A determination as to whether groundwater conditions have changed since the last reporting event.

Deliverables shall be submitted in either hard copy or digital format as required by NYSDEC. A summary of the monitoring program deliverables is provided in Table 3-1.

4

Operation and Maintenance Plan

The site remedy does not rely on any operational remedial mechanical systems, such as sub-slab depressurization systems or air sparge/soil-vapor extraction systems to protect public health and the environment. Therefore, the operation and maintenance of such components are not included in this SMP.

5

Inspections, Reporting, and Certifications

5.1 Site Inspections

5.1.1 Sitewide Inspection

Sitewide inspections shall be performed at least once a year and after all severe weather conditions that may affect ECs or monitoring devices. Based on the results of these inspections, a report shall be compiled that provides sufficient information to assess the following:

- Compliance with all ICs, including changes in site use;
- The condition and effectiveness of all ECs;
- General site conditions at the time of the inspection;
- The site management activities being conducted, including, where appropriate, confirmation sampling and health and safety inspections performed as part of the sitewide inspection;
- Compliance with the permits and schedules included in this Site Management Plan; and
- Whether site records are up-to-date.

Sitewide inspections will be performed as scheduled, and interim inspections will be performed as needed. Inspection reports (scheduled and interim) will be submitted to NYSDEC in a timely manner. All inspection reports will be included as part of the annual PRR.

5.1.2 Inspection Frequency

All inspections will be conducted at the frequency specified in the schedules provided in Section 3 (Site Monitoring Plan) of this SMP. At a minimum, a sitewide inspection will be conducted annually (see Section 5.1.1).



All inspection and monitoring reports will be sent to:

Mr. Will Welling NYSDEC Remedial Bureau D, Section B 625 Broadway, 12th Floor Albany, New York 12233-7013

Mr. Martin Doster Regional Hazardous Waste Engineer NYSDEC Region 9 Office 270 Michigan Avenue Buffalo, New York 14203

Mr. Cameron O'Connor NYSDOH 584 Delaware Avenue Buffalo, New York 14202

The monitoring and analytical report shall be submitted within 45 days after receipt of the samples by the laboratory.

5.1.3 Inspection Forms, Sampling Data, and Maintenance Reports Information obtained during all inspections and monitoring events will be recorded on the appropriate forms for each respective environmental monitoring plan (see Appendices F, G, and H).

5.1.4 Evaluation of Records and Reporting

The inspection and site monitoring data will be evaluated to determine whether:

- The ICs and ECs are in place, are performing properly, and remain effective;
- The Monitoring Plan is being implemented;
- Operation and maintenance activities are being conducted properly; and, based on the above items,
- The site remedy continues to be protective of public health and the environment and is performing as designed.

5.2 Periodic Review Report

A PRR will be submitted to the Department every [leave blank for annual or insert second, third, fifth, etc., as appropriate] year, beginning 18 months after the Certificate of Completion or equivalent document (e.g., Satisfactory Completion Letter, No Further Action Letter, etc.) is issued. In the event that the site is subdivided into separate parcels with multiple ownership, a single PRR will be prepared in accordance with NYSDEC's *Technical Guidance for Site Investigation*



and Remediation (NYSDEC 2002) and submitted within 45 days of the end of each certification period. The PRR will include the following:

- Identification, assessment, and certification of all ICs and ECs required by the remedy for the site;
- Results of the required annual site inspections and severe condition inspections, if applicable;
- All applicable inspection forms and other records generated for the site during the reporting period in electronic format;
- A summary of any discharge monitoring data and/or information generated during the reporting period, including comments and conclusions;
- Data summary tables that include a listing of all compounds analyzed, along with the applicable standards, with all exceedances highlighted. These will include a presentation of past data as part of an evaluation of contaminant concentration trends;
- Graphical representations of the distributions of contaminants of concern, by media (groundwater, soil vapor);
- The results of all analyses, copies of all laboratory data sheets, and the required laboratory data deliverables for all samples collected during the reporting period will be submitted electronically in a NYSDEC-approved format;
- A site evaluation that includes the following:
 - The compliance of the remedy with the requirements of the site-specific Remedial Action Work Plan and ROD;
 - The effectiveness of all treatment units, etc., including identification of any needed repairs or modifications;
 - Any new conclusions or observations regarding site contamination based on inspections or data generated by the Monitoring Plan for each media being monitored;
 - Recommendations regarding any necessary changes to the remedy and/or Monitoring Plan; and
 - The overall performance and effectiveness of the remedy.

The PRR will be submitted in hard-copy format to the NYSDEC Central Office and the Region 9 Office (the region in which the site is located), and in electronic format to the NYSDEC Central and regional offices and the NYSDOH, Bureau of Environmental Exposure Investigation.



5.2.1 Certification of Institutional and Engineering Controls

After the last inspection of the reporting period, a qualified environmental professional or NYS PE (depending on the need to evaluate engineering systems) will prepare the following certifications.

For ICs, include the following:

"For each institutional control identified for the site, I certify that all of the following statements are true:

- The institutional controls employed at this site are unchanged from the date the control was put in place, or last approved by the Department;
- Nothing has occurred that would impair the ability of the Institutional Controls to protect the public health and environment;
- Nothing has occurred that would constitute a violation or failure to comply with any site-specific requirements of the Site Management Plan;
- Access to the site will continue to be provided to the Department to evaluate the remedy, including access to evaluate the continued maintenance of the Institutional Controls;
- If a financial assurance mechanism is required under the oversight document for the site, the mechanism remains valid and sufficient for the intended purpose under the document;
- Use of the site is in compliance with the Declaration of Covenants and Restrictions.
- The information presented in this report is accurate and complete.
- I certify that all information and statements in this certification form are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law. I, [name], of [business address], am certifying as [Owner or Owner's Designated Site Representative] (and if the site consists of multiple properties): [and I have been authorized and designated by all site owners to sign this certification] for the site."

For ECs, include the following:

"For each engineering control identified for the site, I certify that all of the following statements are true:

■ Inspection of the site to confirm the effectiveness of each engineering control required by the remedial program was performed under my direction;



- Each engineering control employed at this site is unchanged from the date the control was put in place, or last approved by the Department;
- Nothing has occurred that would impair the ability of the Engineering Controls to protect public health and the environment;
- Nothing has occurred that would constitute a violation or failure to comply with any site-specific requirements of the Site Management Plan.
- Access to the site will continue to be provided to the Department to evaluate the remedy, including access to evaluate the continued maintenance of the engineering controls;
- If a financial assurance mechanism is required under the oversight document for the site, the mechanism remains valid and sufficient for the intended purpose under the document;
- Use of the site is in compliance with the Declaration of Covenants and Restrictions;
- Each engineering control is performing as designed and is effective;
- To the best of my knowledge and belief, the work and conclusions described in this certification are in accordance with the requirements of the site remedial program and generally accepted engineering practices; and
- The information presented in this report is accurate and complete.
- I certify that all information and statements in this certification form are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law. I, [name], of [business address], am certifying as [Owner or Owner's Designated Site Representative] (and if the site consists of multiple properties): [I have been authorized and designated by all site owners to sign this certification] for the site."

The signed certifications will be included in the PRR described below.

If for any reason one or more of the above statements cannot be certified, the certification cannot be completed and a corrective measures plan must be submitted to NYSDEC (see Section 5.4).

For projects in the Brownfields Cleanup Program that the Department has determined do not represent a significant threat to public health or the environment, but where contaminants in groundwater exceed drinking water standards, the following should also be included for the IC and EC statements listed above:



- No new information has come to my attention, including groundwater monitoring data from wells located at the site boundary, if any, to indicate that the assumptions made in the qualitative exposure assessment of off-site contamination are no longer valid; and
- Every five years the following certification will be added:
- The assumptions made in the qualitative exposure assessment remain valid.

The signed certification will be included in the PRR.

5.3 Reporting Exceedances of Standards, Criteria, and Guidance Values

If PCBs or other contaminants are detected at concentrations exceeding the standards, criteria, and guidance values (SCGs) defined by NYSDEC for surface waters, groundwater, sediments, or excavated soils, the exceedance must be reported to NYSDEC as soon as the information becomes available. The interim analytical results will then be evaluated by NYSDEC to determine whether further analytical testing or interim remedial actions are needed. NYSDEC Technical and Administrative Guidance Memorandum (TAGM) 4046 (NYSDEC 1994 or latest version) should be reviewed to determine the site-specific soil cleanup objectives, and the ROD (see Appendix A) should be reviewed to identify established cleanup levels.

The established site cleanup levels for PCBs at the NTC site are:

Soils and Sediments

Surface: 1 part per million (ppm)

Subsurface (1 foot below ground surface [BGS]): 10 ppm

Groundwater, Surface Water, and Stormwater

Not to exceed 0.065 micrograms per liter (µg/L)

Tables 5-1 and 5-2 list the SCG values defined by NYSDEC for groundwater, surface water, and sediment.

Table 5-1 Recommended SCG Values for Soil and Sediment at the NTC Site

Contaminant	Soil Cleanup Objectives to Protect Groundwater Quality (mg/kg)	Recommend Soil Cleanup Levels (mg/kg)
PCBs		1.0 (surface) 10.0 (subsurface)

Source: NYSDEC TAGM 4046, revised January 1994.

Key:

mg/kg = Milligrams per kilogram. PCBs = Polychlorinated biphenyls.



Table 5-2 Recommended SCG Values for Groundwater and Surface Water at the NTC Site

Contaminant	Groundwater Standards/Criteria (μg/L)	Surface Water and Stormwater Standards/ Criteria (µg/L)					
Volatile Organic Compounds							
1,2-Dichlorobenzene	3	3					
1,3-Dichlorobenzene	3	3					
1,4-Dichlorobenzene	3	3					
1,2,4-Trichlorobenzene	5	5					
Organic Pesticides/Herbicides and PCBs							
PCBs	0.09	0.09					

Source: New York State Ambient Water Quality Standards and Guidance Values, Technical Operational Guidance Series 1.1.1, June 1998.

Key:

μg/L = Micrograms per liter. PCBs = Polychlorinated biphenyls.

5.4 Corrective Measures Plan

If any component of the remedy is found to have failed, or if the periodic certification cannot be provided due to the failure of an IC or EC, a corrective measures plan will be submitted to NYSDEC for approval. This plan will explain the failure and provide the details and schedule for performing work necessary to correct the failure. Unless an emergency condition exists, no work will be performed pursuant to the corrective measures plan until it has been approved by NYSDEC.

All records and information regarding maintenance shall be included as a part of the site inspection report. If maintenance is projected for the future or cannot be completed as a result of winter weather or other difficulties, it shall be noted in the site inspection report. Records of all completed maintenance efforts, including any transportation and disposal of waste, shall also be included in the site inspection report.

In order to comply with the above submittal times, it may be necessary to prepare and submit interim reports to NYSDEC to supplement the semi-annual reports.

6

Health and Safety Plan

A Site-specific Health and Safety Plan (sHASP) must be developed for the work assignments to be conducted. As required by NYSDEC's *Draft Technical Guidance for Site Investigation and Remediation* (NYSDEC 2002), the Generic HASP (GHASP) included in this SMP can be used as a guide when producing an sHASP for the activities, or separately for each activity, as required. A copy of the GHASP is provided in Appendix L.

All staff should be aware of Occupational Safety and Health Administration (OSHA) hazardous communication requirements. Personnel should review all required Material Safety Data Sheets (MSDSs) and instructions pertaining to all anticipated chemicals prior to the initiation of any work. MSDSs of contaminants known or suspected to be present on the NTC Site are provided in Appendix M.

6.1 Preparation of a Site-Specific Health and Safety Plan In accordance with the requirements of 20 CEP 1010 120, on SHASP must be

In accordance with the requirements of 29 CFR 1910.120, an sHASP must be prepared prior to initiating field activities at the site. The sHASP should include the following:

- The names of key personnel responsible for site health and safety, including an appointed site Health and Safety Officer;
- A safety and health-risk analysis for each site task and operation;
- Employee training requirements;
- Specification of PPE to be used by employees for each of the site tasks and operations being conducted;
- Medical surveillance requirements;
- Frequency and types of air monitoring, personnel monitoring, and environmental sampling techniques and instrumentation to be used;
- Site control measures;
- Decontamination procedures;



- Site standard operating procedures; and
- A contingency plan for responses to emergencies.

6.2 Training

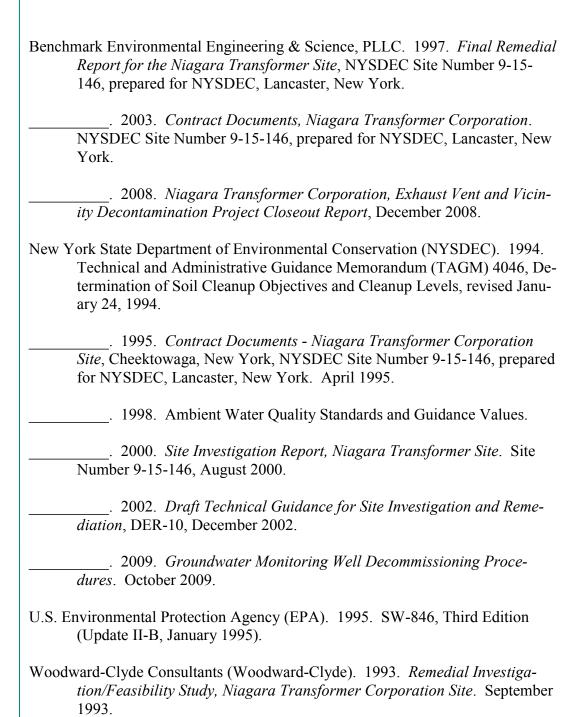
All personnel performing monitoring, inspection, or remediation activities at the NTC Site must complete OSHA's 40-hour health and safety training course for work at hazardous waste sites. This includes 8-hour refresher training, first aid/cardiopulmonary resuscitation (CPR) training, and annual physical examinations.

6.3 Emergency Telephone Numbers

NYSDEC – Region 9	716/851-7220
NYSDEC – Albany O&M Section	518/457-0927
NYSDOH – Buffalo	716/847-4385

7

References





A Record of Decision



Division of Hazardous Waste Remediation

Record of Decision

Niagara Transformer Site

I.D. Number 9-15-146

December 1993

New York State Department of Environmental Conservation MARIO M. CUOMO, *Governor* THOMAS C. JORLING, *Commissioner*

DECLARATION STATEMENT - RECORD OF DECISION

Niagara Transformer Corporation Site Cheektowaga, New York Site No. 9-15-146

Statement of Purpose and Basis

This Record of Decision (ROD) presents the selected accelerated remedial action for the Niagara Transformer Corporation inactive hazardous waste disposal site which was chosen in accordance with the New York State Environmental Conservation Law (ECL). The remedial program selected is not inconsistent with the National Oil and Hazardous Substances Pollution contingency Plan of March 8, 1990 (40 CFR 300).

This decision is based upon the Administrative Record of the New York State Department of Environmental Conservation (NYSDEC) for the Niagara Transformer Corporation Inactive Hazardous Waste Site and upon public input to the Proposed Remedial Action Plan (PRAP) presented by the NYSDEC. A bibliography of the documents included as a part of the Administrative Record is included in Appendix A of this Document.

Assessment of the Site

The actual or threatened release of hazardous waste constituents from this site, if not addressed by implementing the response action selected in this Record of Decision, may present a current or potential threat to public health and the environment.

Description of Selected Remedy

Based upon the Remedial Investigation/Feasibility Study (RI/FS) for the Niagara Transformer Corporation Site and the criteria identified for the evaluation of alternatives, the NYSDEC has selected a remedy to excavate and remove from the site contaminated soils and sediments.

The major elements of the selected remedy include:

- Excavation of contaminated soils and sediments (above clean-up goals) from the site and the drainage ditches and retention pond downstream of the site;
- Disposal of the excavated material at an appropriate off-site landfill; and
- o Implementation of a long-term groundwater, surface water, and sediment

•

monitoring program to gauge the effectiveness of the remedial program after the excavations have been completed.

New York State Department of Health Acceptance

The New York State Department of Health concurs with the remedial action selected for this site as being protective of human health.

Declaration

The selected remedy is protective of human health and the environment, complies with State and Federal requirements that are legally applicable or relevant and appropriate to the remedial action to the extent practicable, and is cost effective. This remedy utilizes permanent solutions and alternative treatment or resource recovery technologies, to the maximum extent practicable, and satisfies the statutory preference for remedies that employ treatment that reduces toxicity, mobility, or volume as a principal element.

been her 30, 1993 Date

Ann Hill DeBarbieri

Deputy Commissioner

Office of Environmental Remediation New York State Department of Environment Conservation

NIAGARA TRANSFORMER CORPORATION SITE Site #915146

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Responsiveness Summary

RECORD OF DECISION NIAGARA TRANSFORMER CORPORATION SITE SITE NO. 915146

Section 1. Site Location and Description

The 3.6 acre site is owned by Niagara Transformer Corporation (NTC), a local manufacturer of electrical transformers. The site is located at 1747 Dale Road, between Harlem Road and Interstate 90, in the Erie County Town of Cheektowaga (Figure 1). On site, there is a large, active manufacturing/office facility with a smaller storage building and above-ground oil storage tanks to the south. An abandoned rail spur from a Conrail railyard to the south crosses an open field and paved parking lot to a loading bay in the southwest corner of the manufacturing facility (Figure 2).

The topography of the site is characterized by a gentle slope to the south. Along the east perimeter of the site, there is a drainage ditch which directs runoff from the parking lot south, to another ditch which flows to the west, between the site's southern perimeter and the Conrail railyard. To the west of the site is a cemetery and to the east, an undeveloped parcel, purchased by Niagara Transformer in 1983. The properties north of the site, along Dale Road, are occupied primarily by light industries. While there are a few homes northwest of the site on Dale Road, the nearest residential area is located approximately 1000 feet to the southwest (Figure 3).

The soils on site consist of a surface layer of fill material; as much as three and one-half feet of asphalt and gravel subgrade, miscellaneous shotrock and silty clay. Beneath this surface is a forty to fifty foot thick layer of silty clay till and clay which separates two groundwater aquifers, one "perched" above the clay and the other beneath, in a two to three foot layer of gravel and sand overlying bedrock. The depth of the "perched" groundwater varies from six inches to three feet below ground surface. Both aquifers flow southward. There were no private water wells identified within a one mile radius of the site. Residences and commercial properties in the area are supplied with water by a municipal system.

Section II. Site History

Niagara Transformer purchased the property on Dale Road in 1958 and built its manufacturing facility. There is no record of industrial activity at the site prior to this. Until 1980, oils containing polychlorinated biphenyls (PCBs) were stored or used on-site as an insulating fluid in the manufacture of some liquid filled transformers. Currently, Niagara Transformer uses only non-PCB mineral oils.

On April 10, 1990, Town of Cheektowaga Highway Department employees reported to the New York State Department of Environmental Conservation (NYSDEC) that oil was found seeping into the drainage ditch between the Conrail railyard and the Niagara Transformer property (Figure 2). Samples of this oily leachate contained approximately 57,000 parts per million (ppm) of PCBs. In New York State, waste material containing more than 50 ppm PCBs is regulated as a hazardous waste. Sediments from locations in the ditch near the seep area, west to a receiving

culvert beneath the railyard, contained PCBs in concentrations ranging from 44 to 3700 ppm. The discharge of the culvert was an open ditch located approximately 1800 feet to the south, near an industrial warehouse.

This so-called lower ditch continues south and westward, passing near several light industrial properties and immediately south of the residential neighborhood. Here the ditch sediments were found to contain levels of PCBs ranging from less than 1 to approximately 32 ppm of PCBs. Later investigations were to find two isolated locations in the lower ditch where the sediments contained as much as 613 ppm PCBs. A concentration of 1 ppm in residential soils has been determined by the New York State Department of Health (NYSDOH) to be considered an acceptable level. This lower ditch joins a subsurface storm sewer at Harlem Road, which in turn discharges to the Buffalo River, approximately three miles to the southwest.

Niagara Transformer complied with DEC instructions to fence and post warning signs along the drainage ditch north of the railyard. Dams were also constructed in this upper ditch as an interim remedial measure, to mitigate the continued release of PCB oil/sediment.

Section III. Current Status

A. Remedial Investigation

The Remedial Investigation (RI) and preliminary studies included the sampling of sediments, soils and surface water as well as the installation and sampling of groundwater wells.

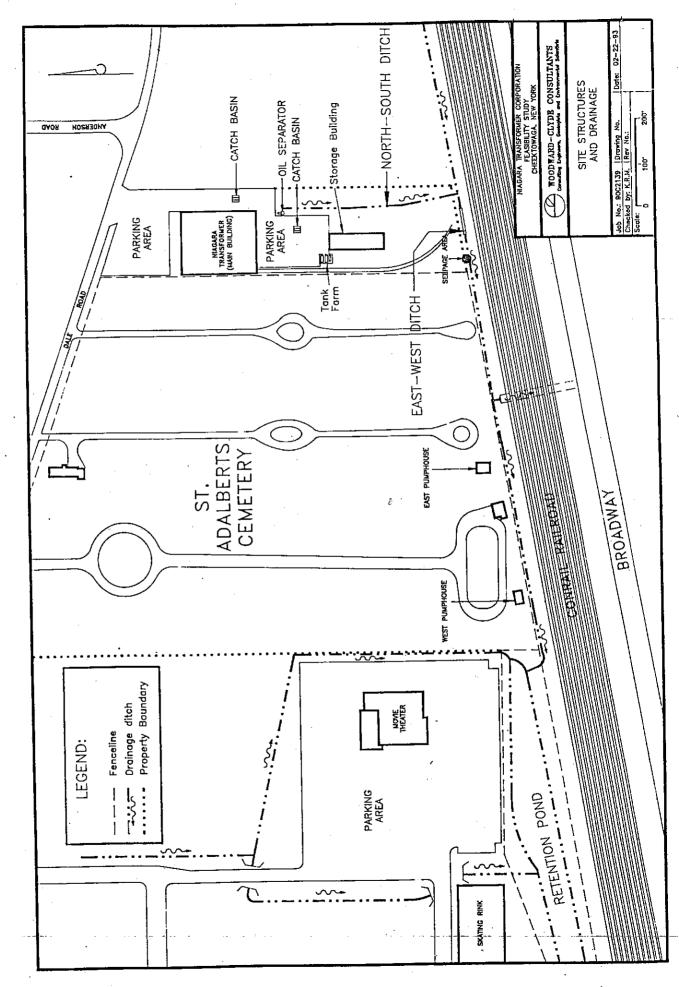
The RI found PCBs to be the contaminant of prominent concern because of their prevalence across the site and the concentrations found. Volatile organic compounds were also detected; dichloro- and trichlorobenzene compounds were found in the groundwater at concentrations as high as 335 micrograms per liter (ug/L), well above the maximum level of 5 ug/L set by New York State Groundwater Quality Standards. Chlorobenzenes, therefore, have to be considered in any groundwater remediation.

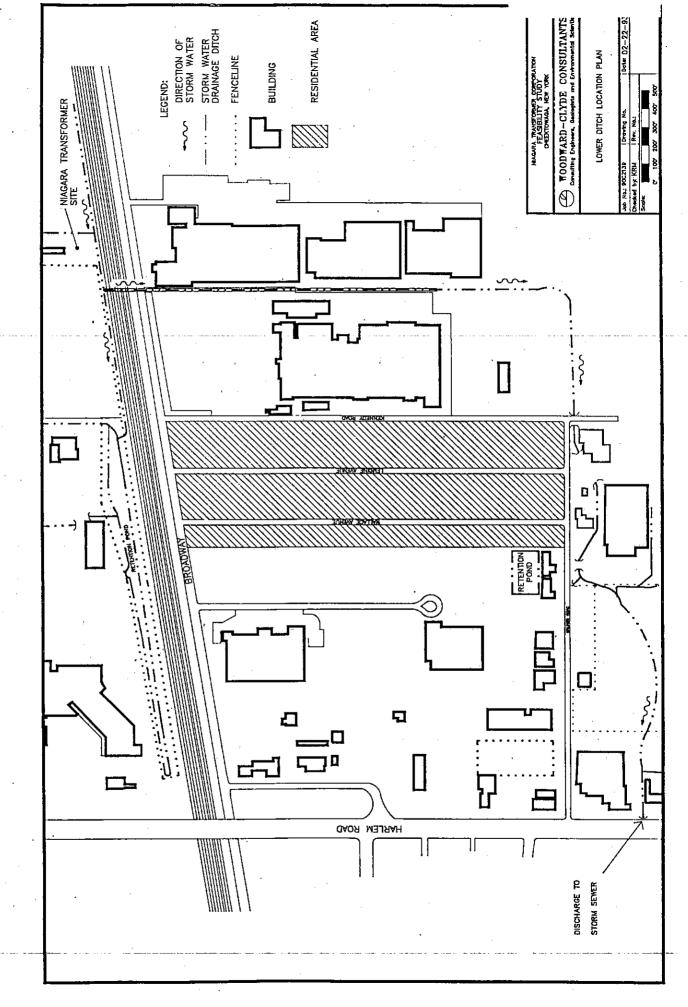
PCB contamination was found in sediments, soils, surface water and groundwater throughout the site. PCB contamination was also found in the soils of the adjacent St. Adalbert's Cemetery, within an area ten feet from the Niagara Transformer property line.

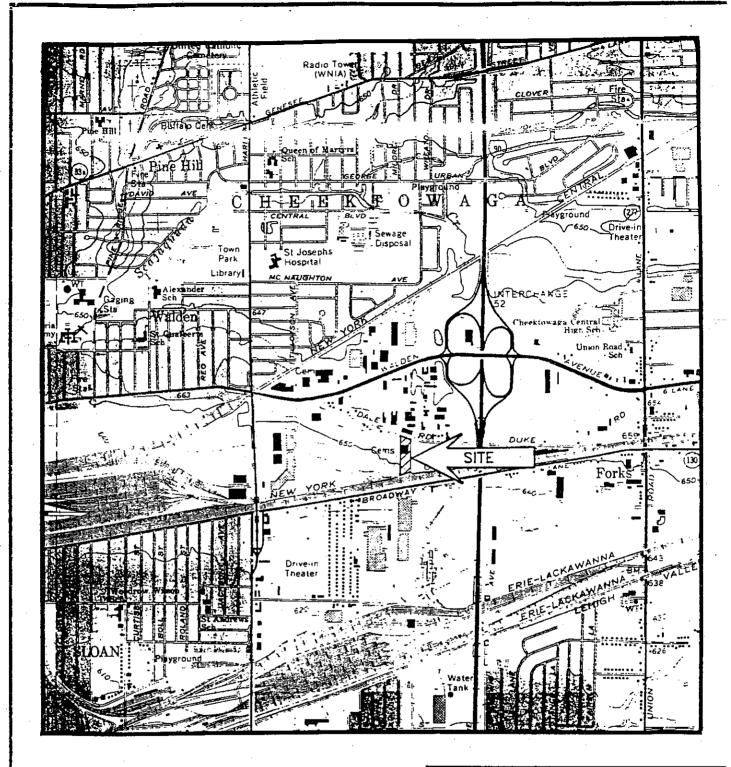
The extent of contamination, described in the RI report, is summarized below:

Surficial Soils: The highest concentrations of PCBs were found along the cemetery fence and on either side of the storage building. In the area between the main plant building and cemetery fence, concentrations of 10,000 to 280,000 ppm PCBs were found in the soil. Across the site, PCB concentrations rapidly decreased to the south, in the southeast corner of the Niagara Transformer property, concentrations were less than 10 ppm.

Subsurface Soil: During the installation of groundwater monitoring wells and at two soil boring locations, samples of the subsurface soils were collected for PCB analyses. Except for the parking lot area south of the main building, PCB contamination was limited primarily to the top 4







NIAGARA TRANSFORMER CHEEKTOWAGA, NEW YORK

WOODWARD-CLYDE CONSULTANTS
Consulting Engineers, Geologists and Environmental Scientis:

SITE LOCATION MAP

Job No.: 90C2139 Drawing No. Date:
Checked by: Rev. No.:
Scale:

feet of soil. In the parking lot, at location NTC-2S, high levels of PCBs were found over the entire depth of the boring (10 feet) with PCB levels exceeding 1000 ppm in the upper 8 feet. Elsewhere in the parking lot, PCBs were not detected at depths below 12 feet.

The evidence of PCB contamination coincides with reports of waste disposal on site. Interviews conducted with Niagara Transformer employees during the course of the RI found that until the early 1970s, waste PCB oil was used to control dust in the formerly unpaved parking lot and driveway. Waste oil was also used to kill weeds along the cemetery fence.

Ditch Sediments: PCB levels in excess of 500 ppm were found in the upper ditch area closest to the site, between the site and a culvert passing beneath the railyard, and at two isolated sample locations in the upstream section of the lower ditch. Downstream of this section, PCB results for the lower ditch were as high as 32 ppm, but most samples contained less than 10 ppm PCBs. PCBs were also found, at concentrations ranging from 12 to 3200 ppm, in the upper ditch beyond (i.e. west of) the culvert passing beneath the railyard, and in a stormwater retention pond near a shopping mall parking lot west of the site. While stormwater currently flows from the site to the culvert and south to the lower ditch, it is suspected that stormwaters may have, on occasion, been diverted past the culvert to the retention pond. In the upper ditch, PCB contamination was generally found throughout the top foot of sediment, while in the lower ditch PCB contamination was primarily limited to the top 6 inches. In the retention pond, total PCB concentrations ranged from 1.1 to 31 ppm, primarily in the top 4 inches of sediment.

Surface Water: Surface water samples were collected in the upper ditch immediately downstream of the dams on a monthly basis from May 1992 through September 1992 (except for June when there was no flow). The concentration of PCBs ranged from 1.3 to 4.7 ug/L. Chlorobenzenes were either not detected or reported as estimated concentrations at levels below the detection limits. In the lower ditch, east of Kennedy Road, the surface water contained 1.6 ug/L PCBs. The most southerly sample, collected near Harlem Road, contained 1.2 ug/L. For comparison purposes, it is noted the water quality standards for streams of this nature is 0.001 ug/L PCBs.

Off-site Soil: Samples were collected from soils adjacent to the upper and lower ditches, in areas prone to flooding. In the cemetery, near the upper ditch the PCB concentrations ranged from 1 to 160 ppm. The higher levels found might be attributed to previous dredgings being piled along the ditch banks. Adjacent to the lower ditch, soil levels of PCBs remained lower (2.78 to 11.8 ppm).

Public concerns prompted the collection of soil samples from the residential area, between the lower ditch and Niagara Transformer site. PCBs were not detected (ND) in eleven of fourteen samples collected from fourteen residential lots (Figure 4). In only one of the three remaining samples was the PCB concentration high enough to accurately quantify; at 0.38 ppm this concentration was below Federal and New York State cleanup guidelines for residential soils.

Groundwater: Sixteen groundwater monitoring wells were installed and sampled for PCBs. PCBs were not detected in the in the wells installed in the cemetery or in the upgradient well north of the main building. PCB concentrations were in the 1 to 10 ug/L range for many of

the samples from the groundwater "perched" above the clay layer underlying the site. New York State Groundwater Quality Standards set a limit of 0.1 ug/L PCBs in groundwater. In the samples from monitoring wells NTC-2S and NTC-11S, the PCB concentrations were 5,050 and 22,000 ug/L respectively, far in excess of the PCB water solubility limit. This is probably due to entrainment of non-aqueous phase liquid (NAPL) in the sample. The presence of NAPL on site is further discussed below.

PCBs were also detected in the groundwater beneath the layer of clay underlying the site. Concentrations of 2.0 and 6.7 ug/L PCBs were detected in this deeper aquifer.

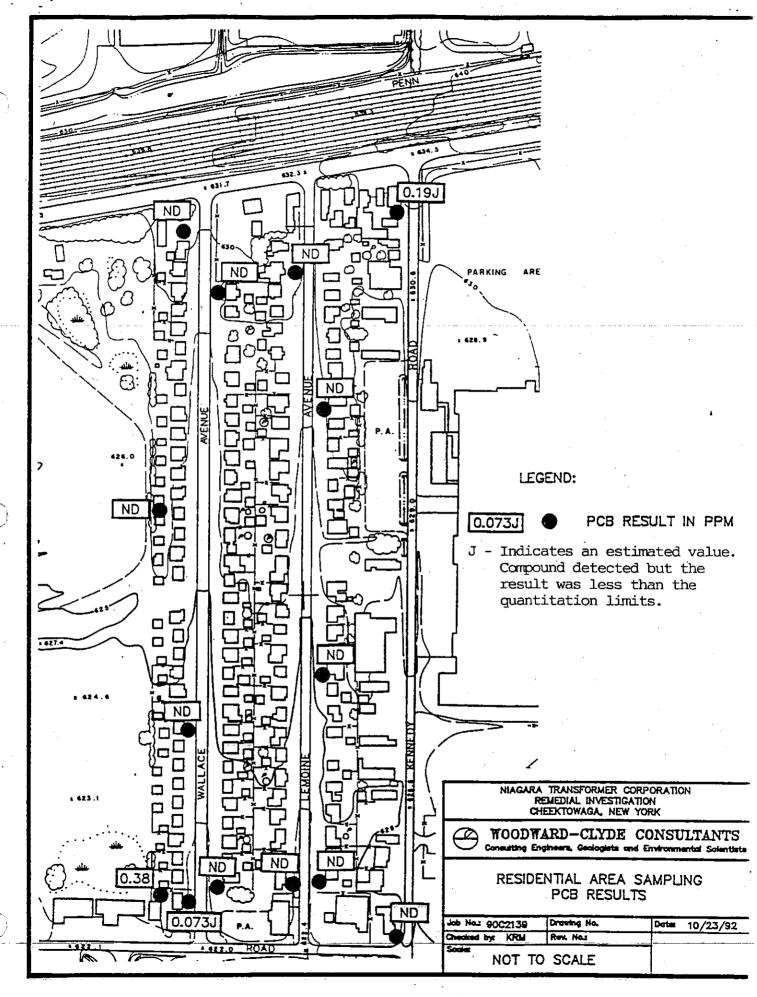
The groundwater sampled from monitoring well NTC-7S was also analyzed for the U.S. Environmental Protection Agency's Target Compound List (TCL) of environmental contaminants. In addition to PCBs, five chemicals were measured above detection limits, including dichloro and trichlorobenzenes at concentrations of 17 to 335 ug/L, and bis (2-ethylhexyl) phthalate at 11.9 ug/L. Chlorinated benzene compounds are commonly present in PCB mixtures. Bis (2-ethylhexyl) phthalate is commonly found in plastics and may be an artifact of the sampling equipment used.

Non-Aqueous Phase Liquid (NAPL): NAPL was observed in water at the following locations: monitoring wells NTC-2S and NTC-11S, in the ditch seep area at the southwest corner of the site; and in two test pits excavated on-site adjacent to the seep. NAPL was not observed as a discrete fluid phase in any of the soil samples obtained during the investigation. No NAPL was observed in the groundwater of the deeper aquifer.

At monitoring well NTC-2S, located in the parking lot south of the main building, a sheen was observed on the surface of the water samples obtained from the top of the water column. This suggests that a NAPL with a lighter density than water (LNAPL) may be present in groundwater at this location. The LNAPL was observed only as surface film and did not have an appreciable thickness. This LNAPL is probably residual mineral oil which was applied or spilled at the site. There are reports that a mineral oil storage tank was ruptured in 1971, releasing 2000 to 4000 gallons of the non-PCB transformer fluid to the parking lot area.

During a purging of monitoring well NTC-2S, approximately 0.25 liters of a denser-than-water NAPL (DNAPL) was evacuated from the well. The DNAPL probably consists primarily of the type of transformer fluid which contains a high percentage of PCBs. Similar conditions were observed during purging of monitoring well NTC-11S, located in the Conrail railyard opposite the seep area.

NAPL was observed during the RI at seeps into the ditch near the southwest corner of the site. As in wells NTC-2S and NTC-11S, both LNAPL and DNAPL were observed. LNAPL in seepage was observed at two locations spaced several feet apart. Containment structures were built and maintained around the seeps as part of the Interim Remedial Measures program (IRM). A sample of seepage water containing some LNAPL was analyzed for PCBs and total petroleum hydrocarbons (TPH) and was found to contain 230,000 ug/L PCBs. The TPH concentration in the sample was 7,200,000 ug/L.



DNAPL was found to accumulate in the bottom of the upper ditch. The first observation of this material was in March 1991. The DNAPL appeared to have a very high surface tension, tending to form beads on the sediment. After the first observation, Niagara Transformer undertook a program of regular DNAPL removal from the ditch. When found, it was present between the groundwater seep area and the nearest dam downstream. A sample of the DNAPL was collected for PCB analysis. Analytical results showed it contained 140,000 ppm or 14 percent PCB.

The RI report concluded that NAPL was unlikely to have migrated from the probable source areas to the seepage points (a distance of more than 250 feet) through the low-permeability soils encountered and characterized during the subsurface investigation. This suggested that a preferential pathway existed between the source and the seepage points. Three test pits and two soil borings were advanced adjacent to the seeps and within the rail bedding traversing the site to investigate the preferential migration of NAPL.

No evidence of NAPL was found in the railroad bedding. The other two test pits were excavated on site, adjacent to the seep areas. Subsurface tile drains containing NAPL, were found in each of the test pits, 2 to 3 feet below ground surface. These drains were directed from the north and had likely caused the preferential migration of NAPL south to the seep areas.

B. Baseline Risk Assessment

As part of the Feasibility Study report submitted for the Niagara Transformer site, a baseline risk assessment was conducted to evaluate the potential human health risks associated with existing conditions (i.e. baseline conditions). Health risks associated with anticipated, future human activities were also evaluated.

The baseline risk assessment found that the greatest risks of cancer posed by the Niagara Transformer site is from direct contact and/or accidental ingestion of PCB contaminated soil, sediment and surface water. Sensitive populations include workers maintaining the drainage ditches, trespassers or children playing in the lower ditches and cemetery personnel working in contaminated areas adjacent to the site. Based on conservative estimates of PCB concentrations and exposure, cancer risks were found to be above levels accepted by the U.S. Environmental Protection Agency for construction workers on site, cemetery workers and ditch maintenance personnel. Hence, remediation of soils on site and in the cemetery, and the sediments in the upper and lower ditches is warranted. The baseline risk assessment did not identify any significant non-cancer risks.

The RI determined there were limited ecological resources on site or in areas potentially impacted by the site. The protection of human health is considered to be the primary remedial action objective.

Section IV. Enforcement Status

The New York State Department of Environmental Conservation (NYSDEC) negotiated an Order on Consent (Index #B9-0334-90-05) with the Niagara Transformer Corporation

pursuant to Article 27 of the Environmental Conservation Law. The Order was signed by NYSDEC Deputy Commissioner Edward O. Sullivan on March 2l, 1991. The Order on Consent is a legal obligation between NYSDEC and Niagara Transformer which committed Niagara Transformer to investigate the extent of contamination and identify the means for cleaning up the site. Completion of the remedy selection process, which culminates in this Departmental Record of Decision (ROD), will complete Niagara Transformer's obligation under this Order. A new Order will be required to implement the remedy set out in the ROD.

Section V. Goals for the Remedial Action

Remedial Action is proposed for the purpose of 1) reducing or controlling the risks to human health by preventing the incidental ingestion, inhalation or direct contact with contaminated soils, sediments and water, 2) protecting the environment by preventing the transport of contaminated sediments and surface water in the drainage ditches and the continued migration of contaminated groundwater from the site, and 3) accomplishing these objectives while satisfying the requirements of applicable laws and regulations that apply to contaminants associated with this site. These objectives are best achieved by removing the contaminated media from areas of potentialhuman exposure for disposal or treatment, and eliminating the source of contamination to the groundwater and surface water.

To mitigate the human exposure to PCBs by direct contact, incidental ingestion or inhalation of contaminated soil or sediment and to protect downstream water resources, such material found in off-site locations containing more than 1 ppm PCBs will be excavated for disposal and/or treatment. Soils found on the Niagara Transformer property exceeding 10 ppm PCBs will also be treated and/or disposed. Excavation of contaminated soil and treatment of the water it contains is expected to protect surface waters and groundwater in both the "perched" and deep aquifer at the site.

For surface water, the New York State surface water quality standard for PCB is set at 0.01 ug/L for the protection of human health, and 0.001 ug/L for the protection of aquatic life. A goal of remediation will be to achieve a level of 0.001 ug/L PCBs in the water within the drainage ditches and retention pond. The remedial action objective for groundwater is 0.1 ug/L PCB.

To meet these objectives, several areas will require remediation:

- Area l The Niagara Transformer property, between the main building and the Conrail property opposite the leachate seep areas.
- Area 2- The drainage ditches north of Broadway and the Conrail yard, including those areas adjacent to the ditches prone to flooding.
- Area 3- The stormwater retention pond south of the Thruway Mall
- Area 4- The section of "lower" drainage ditch (south of Broadway) located east of Kennedy Road.

- Area 5- The section of "lower" drainage ditch located between Kennedy and Harlem Roads.
- Area 6- The stormwater culvert connecting the "upper" drainage ditch (north of Broadway) with the "lower" drainage ditch, passing beneath the Conrail yard, Broadway and the Kennedy Industrial Park.
- Area 7- A portion of the St. Adalbert cemetery, immediately adjacent to the Niagara Transformer site.

It has been estimated (Table 1) that a total of 21,565 cubic yards or approximately 32,000 tons of soil and sediment will require remediation in these areas.

Section VI. Summary and Evaluation of Alternatives

The October 1992 Preliminary Feasibility Study report identified several cleanup technologies, focusing on those which were both effective in remediating PCB contamination and capable of being implemented at this site. Effectiveness was measured by the technology's ability to 1) reduce the toxicity, mobility or volume of contamination through treatment, 2) minimize long-term risk and afford long-term protection, 3) comply with the applicable or relevant and appropriate requirements of law, and 4) minimize short-term impacts and quickly achieve protection of the public health and environment. Implementability considers the availability of the necessary equipment, specialists and/or treatment facilities, and the ability of the technology to achieve the remedial action objectives described.

The October 1992 Preliminary Feasibility Study evaluated three general categories of remedial technologies: removal, containment and treatment.

The various technologies were then combined and assembled into several alternatives for remediating the site. The 1993 Feasibility Study report provides a detailed description of each alternative. The DEC identified a preferred alternative based on an evaluation of all the alternatives in terms of the following criteria.

- OVERALL PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT-

Under this criterion an alternative is assessed as to whether it can adequately protect the environment and human health, in both the short- and long-term, from unacceptable risks posed by hazardous substances present on the site by eliminating, reducing or controlling exposures to those substances.

- COMPLIANCE WITH APPLICABLE OR RELEVANT AND APPROPRIATE NY STATE STANDARDS, CRITERIA AND GUIDANCE VALUES (SCGs) - $\,$

The alternatives were evaluated as to their ability to achieve the desired clean-up levels and meet all applicable standards. This criterion would also address whether or not a waiver from any such requirements is justified.

SCGs are divided into the categories of chemical-specific (e.g. groundwater standards), action-specific (e.g. design of a landfill) and location-specific (e.g. protection of wetlands). The primary requirements for alternatives addressing PCBs derive from the Federal Toxic Substances Control Act (TSCA).

- LONG-TERM EFFECTIVENESS AND PERMANENCE -

This criterion evaluates the degree of certainty that the remedial alternative will protect human health and the environment, and continue to protect after remedial action objectives have been initially met. The primary focus is on the extent, effectiveness and reliability of the controls (e.g. property deed restrictions, and containment systems such as landfill caps and leachate collection systems) that may be required to manage the risk posed by untreated wastes or treatment residuals that remain on site after the remedy has been implemented.

- REDUCTION OF MOBILITY, TOXICITY OR VOLUME OF CONTAMINANTS THROUGH TREATMENT -

This criterion evaluates the statutory preference for selecting remedial actions that employ treatment technologies that permanently and significantly reduce the mobility, toxicity or volume of hazardous substances as their principal element. The assessment focuses on the remedial process employed; the amount of hazardous substances destroyed, treated, contained or recycled; degree of expected reduction; degree to which the alternative is irreversible; the characteristics of any treatment residuals; and the degree to which the inherent hazards at the site are reduced.

- SHORT-TERM EFFECTIVENESS -

This criterion evaluates risks to the environment and the health of the community and remedial workers that may result from implementation of the remedy, considering the effectiveness and reliability of protective measures taken during implementation, and the time required to achieve the clean up goals.

- IMPLEMENTABILITY -

This criterion evaluates the ease or difficulty in carrying out an alternative, focusing on: the technical difficulties and unknowns associated with the construction and operation of a particular technology and its reliability; the ability to monitor the effectiveness of the remedy and the risks posed if monitoring is insufficient to detect system failure; the ease of undertaking additional remedial action if necessary; the ability and time required to obtain the necessary government approvals and permits; the adequacy of off-site treatment and storage capacities and the availability of disposal services, necessary equipment and specialists.

- COST -

An estimate was made of the costs for each alternative based on such items as: construction; labor, materials and equipment; engineering, financial, and legal services; and power, utilities, and monitoring requirements for operating and maintaining the remedy. The total cost

TABLE 1

ESTIMATED SOIL AND SEDIMENT VOLUMES EXCEEDING ACTION LEVELS NIAGARA TRANSFORMER CORPORATION FEASIBILITY STUDY

Area	Description	Exceed 10 PPM	Sdil Volum Exceed 25 PPH	es in Cubic Yai 50 PPM or more	rds NAPL Contaminated
Area 1	NTC property ⁽¹⁾	15,100	12,420	9,500	375
		Exceed: 1 PPH	Exceed 10 PPM	50 PPM or more	NAPL Contaminated
Area 2	* Upper ditch and flood-prone soils	2,145		950	
Area 3	Retention pand	2,500	200	0	
Area 4	Lower ditch east	650	350	25	
Area 5	Lower ditch west	830	370	0	
Area 6	Stormwater pipe	80.	80	0 .	
Area 7	East cemetery soils	260	80	. 40	
	Totals	21,565	15,190	10,515	375

⁽¹⁾ Includes adjacent soils near the seepage areas and monitoring well NTC-11S, located adjacent to the southeast corner of the NTC property.

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for each alternative is expressed in terms of the net present worth, a single cost representing an amount that if invested at today's interest and inflation rates and disbursed as needed, would be sufficient to cover all the costs of a remedy over its lifetime.

- COMMUNITY ACCEPTANCE -

Components of the alternatives which interested persons in the community support, have reservations about, or oppose, are evaluated. This assessment could not be completed until comments on Proposed Remedial Action Plan and the RI/FS reports were received. Based on public comment or new information, the preferred alternative may be modified or another remedial action selected.

Remedial alternatives must be protective of human health and the environment and comply with SCGs in order to be eligible for selection. These are the threshold criteria.

The detailed analysis of alternatives, found in the FS report, identified and compared the alternatives with respect to long-term effectiveness and permanence; reduction of toxicity, mobility or volume through treatment; short-term effectiveness; implementability; and cost criteria. This initial comparison focuses attention on the extent to which permanent treatment alternatives can be practicably utilized in a cost effective manner. The preferred alternative is the one which is protective of human health and the environment, compliant with SCGs and affords the best combination of attributes. Community acceptance is factored into the final balance, assessing which of the alternatives interested individuals express support, have reservation about, or oppose.

A detailed analysis of each alternative was provided in the Feasibility Study report. Based on its evaluation of the health risks posed by the contaminated soils and sediments, Niagara Transformer proposed alternative remedial action levels: 10 ppm PCBs for off-site soil and 25 ppm PCBs for on-site soils. Remedial Alternatives employing these action levels were described in the FS report with the letter suffix "a". The DEC determined that the more conservative action levels of 1 ppm PCB for off-site soils and 10 ppm PCB for on-site soils should be employed for site remediation; these alternatives are described by the letter suffix "b". For comparative purposes, Niagara Transformer described a third subset of alternatives based on the DEC's stated action levels except for the retention pond, where the action level would be 10 ppm PCBs. These alternatives are described by the letter suffix "c".

A description of each alternative was provided in the FS report and have been summarized here.

Alternative I: Incineration and Off-Site Land Disposal

Under this alternative, soils and sediments within the project area which contain PCBs in excess of the action levels would be excavated. Excavated soils and sediments containing more than 50 ppm PCBs would be sent off site to a TSCA permitted incinerator for destruction. The remainder of the excavated material would be sent off site to an approved landfill for disposal.

Excavation activities under this and other alternatives would be completed using proven earth moving methods and equipment. Measures would be taken to reduce the potential for fugitive dust emissions during the excavation and transport of soil and sediment. Some areas would have to be dewatered during excavation activities. The water collected would be filtered and treated with granulated activated carbon prior to disposal. It is expected that groundwater and surface water quality standards would be attained through removal of the contaminated soil and dewatering of the perched aquifer during excavation. Post remediation monitoring of the sediment, surface water and groundwater, over an extended period, would be required to confirm this. A water quality monitoring program would be developed using relevant and appropriate provisions of New York State regulations as guidance.

Incineration would permanently and irreversibly destroy PCBs and other contaminants; disposing excavated material in a landfill would not actually treat the contaminants but it would significantly mitigate the mobility of the PCBs, for the design lifetime of the landfill. While this remedy would be protective of the public health and the environment, it could be difficult to implement. Because of the limited number of permitted incinerators available, a lengthy waiting period could be expected. This alternative is also by far the most expensive; a similar degree of protection may be afforded by another alternative at a lower cost. The total present worth costs for the alternatives la, lb and lc were estimated to be \$48.3, \$49.5 and \$49.0 million respectively.

Alternative 2: Off-site Land Disposal

Under this alternative, all of the excavated material would be sent off site to an approved landfill for disposal. Wet soils and sediments would have to be stabilized with the addition of cement, fly ash or equivalent prior to off-site land disposal. If any free flowing NAPL is found, containing more than 500 ppm PCB, it would be collected and sent to an off-site facility for incineration. Post remediation monitoring of the groundwater, surface water and ditch sediments over an extended period would be conducted to assess the effectiveness of the cleanup.

Land disposal is a reliable, fully demonstrated technology for containing contamination. The remedy would not actually treat the contaminants, but would mitigate the potential for PCBs to migrate in the environment. The remedy would be permanent in the sense that soils contaminated at levels above cleanup goals would be removed from the Niagara Transformer site. Several approved landfills are available, and the remedy could be readily implemented. The total present worth costs of alternatives 2a, 2b and 2c were estimated to be \$7.49, \$8.65 and \$8.23 million respectively.

Alternative 3: On-site Thermal Desorption

Under this alternative, excavated soils and sediments would be treated in a thermal reactor, to be built on Niagara Transformer property. In the reactor, contaminated soils would be heated to temperatures of approximately ll00 to 1500 degrees Fahrenheit, removing PCBs and other contaminants by volatilization (vaporization). The vapor would then be condensed into an oily residue and sent off site to an incinerator for destruction. Treated soil would be used as backfill on site. Surface water and groundwater remediation would be attained through excavation and treatment of the contaminated soil and sediment, and dewatering during

excavations. Post remediation monitoring of the groundwater surface water and sediments would be conducted to assess the effectiveness of the clean-up.

Soils treated by thermal desorption may lose their structure and load-bearing capabilities. The treated material may have to be stabilized with the addition of cement prior to use as backfill or be disposed off site in a landfill. Thermal desorption can achieve the irreversible removal of PCBs from soil, such that residual PCBs in the treated soil are at or below actions levels. While thermal desorption has been demonstrated full scale and its reliability established, the availability of equipment is limited. Implementing the remedy could be delayed. The present worth cost were estimated assuming that treated soils could be used as backfill on site; for alternatives 3a, 3b, 3c those estimates were \$13.4, \$17.3 and \$15.9 million respectively.

Alternative 4: Off-site Land Disposal and Bioremediation

With the exception of the Thruway Mall stormwater retention pond, this alternative is identical to alternative 2. Remediation of contaminated sediments in the retention pond would rely on the natural process of biodegradation. The native microorganisms would be allowed to consume and break the PCBs and other contaminants down into simpler, less toxic hydrocarbons. Initially, the remedy would entail the annual collection and analysis of sediment samples from the pond over a three year period. If, after three years of monitoring, it appears that degradation is occurring too slowly to achieve the remedial action objectives, plans would be prepared and implemented for enhancing the biodegradation rate through the addition of nutrients or other microorganisms.

Natural biodegradation is a slow process, the half-life for the degradation of PCBs could be several years long. In fact, biodegradation has not yet been proven to effectively reduce the concentration of the highly chlorinated type of PCBs present here. The total present worth costs for alternatives 4a and 4b were estimated to be \$7.62 and \$8.62 million respectively.

Alternative 5: On-site Containment and Bioremediation

By this alternative, most of the contaminated soil on Niagara Transformer property would be left in place. NAPL-contaminated soils would be excavated and transported off site for landfill disposal. Free flowing NAPL, containing more than 500 ppm PCB, would be collected and sent to an off-site facility for incineration. The soil remaining on site would be contained within a subsurface barrier, a slurry wall built of impermeable clay intersecting the top of the natural clay layer beneath the site. Sediments in the Thruway Mall stormwater retention pond would be left undisturbed, allowing the natural process of biodegradation to reduce the levels of PCBs. Off-site soil and sediments from the drainage ditches and cemetery, which contain levels of PCBs in excess of the action levels, would be excavated. The excavated material containing more than 50 ppm PCBs would be characterized a hazardous waste in New York State and disposed in an approved off-site landfill. The excavated material containing less than 50 ppm would be disposed on Niagara Transformer property, within the containment area, and covered with a composite cap of synthetic geomembrane material and clean soil. Within the containment area, a trench drain would be installed to collect the groundwater "perched" above the natural clay layer. Long-term treatment of the collected groundwater would be provided by a facility built on site, using

granulated activated carbon. Deed restrictions would be placed on the Niagara Transformer property to preclude future development which might disturb the containment area.

Containment is a fully demonstrated and generally reliable technology for isolating contaminated materials from the environment. This alternative would not, however, irreversibly treat or destroy the PCBs and other contaminants. Protection to the environment and public health would be provided for the design lifetime of the containment structures, future improvements or repairs to those structures could, however, be readily implemented. While the groundwater collection system should produce dewatered conditions within the containment area, there is evidence that the natural clay layer beneath the site may not be an effective barrier; PCBs were found in the groundwater beneath this layer. Total present worth cost estimates for alternatives 5a and 5b were \$5.29 and \$5.65 million respectively.

Alternative 6: On-site Containment and Off-site Land Disposal

This alternative is nearly identical to Alternative 5. Soils and sediments in the off-site areas which contain PCBs in excess of the remedial action levels would be excavated, including the sediments within the Thruway Mall stormwater retention pond. The excavated material containing less than 50 ppm PCBs would be disposed on Niagara Transformer property, contained within a slurry wall, groundwater recovery trench and composite cover. Excavated material containing more than 50 ppm PCBs would be disposed off site in an approved landfill along with the NAPL-contaminated soils excavated from the Niagara Transformer site. Total present worth cost estimates for alternatives 6a, 6b and 6c were \$5.18, \$5.34 and \$5.24 million respectively.

Alternative 7: Stabilization/Solidification

Under this alternative, contaminated soils and sediments would be mixed with a cement-like binder and other additives, immobilizing the contaminants in a solidified mass. On-site soils would either be treated in-place or excavated, treated and backfilled. Contaminated soils and sediments excavated from the off-site ditches, cemetery and stormwater retention pond would be combined with the on-site soils, solidified and stored on site. NAPL-contaminated soils would be handled separately and solidified, before being sent off site to an approved landfill for disposal. If free flowing NAPL is found, containing more than 500 ppm PCBs, it would be collected and incinerated in an off-site facility. Groundwater and surface water, collected as part of the dewatering operation during excavation activities, would be carbon treated prior to disposal. Post remediation sampling of the surface water and groundwater would be conducted to assess the effectiveness of the remedy.

Stabilization/Solidification may reduce the mobility of PCBs and other contaminants but its effectiveness has not been fully demonstrated on waste material containing the level of organic contaminants found at this site. As the solidified mass ages, there is the potential for the significant level of contaminants found at the site to be released. Without any controls to isolate the solidified mass from the existing "perched" groundwater on site, this alternative may not be reliable in providing long-term protection to the environment or public health. Total present worth cost estimates for alternatives 7a, 7b and 7c were \$5.78, \$7.2 and \$6.65 million

respectively.

Alternative 8: No Further Action:

Although not included in the FS report, NY State and Federal guidelines require that the analysis of remedial alternatives include the "no action" alternative. For the Niagara Transformer site "no action" was interpreted as no further action; barriers had already been placed in the upper ditch to mitigate the release of PCB contaminated oil and the ditch surrounded by a fence. Under this alternative, long-term maintenance of the barriers and fence would be undertaken.

In the absence of further action, the baseline risk assessment found that the contamination found both on site and off site posed unacceptable risks to human health. The RI found that the groundwater beneath the site and surface water flowing from the site violated NYS water quality standards. The NYS DEC concluded that without further remedial action, the environment would likely continue to be adversely impacted.

The "no further action" alternative failed to satisfy the alternative selection threshold criteria. This alternative would not provide adequate protection to the public health or the environment, nor would it comply with NYS SCGs. While this alternative could not be selected as a remedy, it was used as a baseline in the comparative analysis of alternatives to follow.

Section VII: Summary of the Government's Position

A. Comparative Analysis of the Alternatives

Each alternative was evaluated by the remedy criteria and in turn the alternatives were compared to one another by the NYSDEC, balancing the trade offs with respect to those criteria.

Overall Protection of Human Health and the Environment

Alternative 2 would reduce the risk of human exposure to PCB contaminated soils and sediments through all routes of exposure, by removing the impacted soils and sediments and confining them within an off-site landfill. Removal of the soils and sediments is expected to remove the source of groundwater and surface water contamination evident on site. The mobility of the PCBs and other contaminants would be greatly reduced by the barriers and control features of the off-site, TSCA approved landfill facility, assuring protection of the environment.

Incineration or thermal desorption (Alternatives 1 and 3) offer perhaps a greater degree of protection in the long term, the risks to human health and the environment posed by the PCB contaminated soils and sediments would not merely be reduced but eliminated, the contaminants would be irreversibly destroyed. Bioremediation (Alternatives 4 and 5) might also eventually achieve the destruction of the PCBs, but the process is slow and the short-term risks to water resources downstream was considered unacceptable. In the short term, alternatives 6 and 7 (on-site consolidation and on-site stabilization/solidification) would offer levels of protection similar to that of the preferred alternative. However, the presence of "perched" groundwater so near the ground-surface and the potential for the aging-solidified mass-to-leach contamination makes these

alternatives less desirable in the long term. Sampling of the groundwater beneath the native clay layer lying below the site suggests that this layer may not be an effective barrier to contaminant migration.

As noted earlier, the baseline risk assessment demonstrated that the "no further action" alternative would not be protective of human health or the environment.

Compliance with Applicable or Relevant and Appropriate New York State SCGs

The on-site action level of 10 ppm PCBs for soils was adopted by the NYSDEC through methods which estimate the potential for PCBs in the soil to leach into the groundwater at levels which would contravene groundwater standards. Thus, all the "b" alternatives described in the FS report are expected to attain the New York State Water Quality Standards for PCBs and other contaminants through the removal and/or containment of impacted soils. The "no further action" alternative would fail to comply with this SCG.

The off-site action level of l ppm PCBs for soils is consistent with Federal guidelines and based on a generic assessment of the risk to public health. The risk assessment conducted as part of this investigation indicated that this action level will be adequate to ensure protection of human health.

All of the alternatives considered are expected to comply with the action-specific SCGs. In every case where there is not strict compliance, there is adequate basis for a waiver.

Long-Term Effectiveness and Permanence

Alternatives 2, 6 and 7 which limit the mobility of PCBs through containment and treatment, afford less long-term effectiveness and permanence than Alternatives 1 and 3 which permanently destroy the contaminant. Biodegradation (combined with off-site land disposal and on-site containment in alternatives 4 and 5 respectively) was another method of destroying PCBs.

Alternative 2 is preferred over the on-site containment alternatives (5 and 6) because of the higher degree of certainty that the off-site containment barriers would be reliable. On site there is groundwater perched on top of a layer of clay, just a few feet below ground surface. This "perched" aquifer might compromise the integrity of the vertical slurry wall barriers to be constructed around the waste disposal area as part of Alternatives 5 and 6. There was also evidence of PCBs in the groundwater beneath the clay layer, which suggested that this clay layer may not be as effective in containing the contamination as the engineered, bottom liner of an off-site landfill.

Alternative 7 included no such barrier to separate the solidified mass from the perched groundwater. There is some uncertainty that the solidification/stabilization technology would effectively immobilize the high concentration of PCB found on site, and whether the treatment would chemically bind the PCBs to the solid mass or just encapsulate the contaminant. Contaminants might be expected to leach or be released more readily from encapsulation than if

they were chemically bonded to the mass. Considering the potential for contaminants to leach from the aging solidified mass, Alternative 7 was determined to be little more effective and permanent than the on-site containment alternatives.

The barriers that had been installed in the upper ditch to mitigate the flow of PCB contaminated oil would not contain PCB dissolved in water or adsorbed to suspended particles of sediment. The "no further action" alternative would not be effective in the long term.

Reduction of Mobility, Toxicity or Volume of ContaminantsThrough Treatment

Alternatives 2 and 6 would reduce the mobility of the PCBs and other contaminants present by containing the contaminated material in a landfill, however, containment does not constitute treatment. Therefore, Alternatives 2, 6 and the "no further action" alternative, as well as the off-site land disposal and on-site containment portions of Alternatives 1, 4,& 5 could not be evaluated under this criterion. Instead, this reduction in mobility was assessed under the criterion of Overall Protection of Human Health and the Environment.

The toxicity of PCBs would be reduced, irreversibly under Alternative 1 which includes the incineration of contaminated material. Alternative 3 would first reduce the volume of PCB contaminated material by vaporizing the contaminant from the excavated soils and sediments, and then reduce the toxicity of the collected PCB by incinerating this concentrated residue.

Under Alternative 7, the mobility of PCBs might be significantly reduced through the chemical bonding of the contaminant to the solidified mass.

Short-Term Effectiveness

During excavation activities there is the potential for contaminated dust to be generated. However, all the alternatives considered include reliable methods for suppressing dust and the evaluation of potential dust emissions to confirm that no unacceptable off-site exposures would occur. Development of a health and safety plan specifying the proper decontamination procedures and protective equipment to be used by remediation workers, was also part of each alternative. Excavation within the drainage ditches would require the temporary diversion of the surface water. Work on the ditches would be completed in sections, starting at the Niagara Transformer property and proceeding downstream, so as to minimize the disturbance and transport of contaminated sediments.

With several approved landfills available, off-site land disposal could be completed sooner than Alternative 6 which would require the construction of a containment facility on site. Alternative 7 would require extensive study, to determine if solidification/stabilization is, in fact, feasible for treating the high concentrations of PCBs in the soil at this site. Bioremediation, a principal element in Alternatives 4 and 5 would also require additional study, three years of monitoring, to determine if the process would actually work. Waiting periods for the few available thermal desorption treatment units (Alternative 3) and off-site incinerators (Alternative 1) is expected to be lengthy.

The "no further action" alternative would only be partially effective in remediating the site and then only in the short term, as PCBs dissolved in water and adsorbed to floating sediments continue to pass through the ditch barriers.

Implementability

Land disposal is a fully demonstrated remedial technology. Alternative 2 would employ conventional earth moving equipment and methods, and permitted transporters to transfer the contaminated material off site to one of several TSCA approved landfills. Such landfills include reliable monitoring systems, adequate for monitoring the effectiveness of the containment.

Alternatives I and 3, which employ incineration and thermal desorption technologies might be difficult to implement, there are relatively few permitted incinerators and full scale thermal treatment units available; waiting periods could be lengthy.

Alternatives 4 and 5 include the remediation of sediments in the stormwater retention pond by the process of biodegradation. Biodegradation has not yet been proven to effectively reduce the concentration of the highly chlorinated type of PCBs present at this site. Even if it is successful in destroying PCBs, biodegradation is a slow process; the half-life of PCBs could be years long.

The reliability of on-site containment was considered less certain than the preferred off-site remedy. Unlike an off-site facility with its an engineered bottom liner, Alternative 6 would rely on the existing native clay layer beneath the site. There is some evidence that this layer of clay may not be an effective barrier; PCBs were found in the groundwater beneath this layer.

Alternative 7 might be effective in immobilizing PCBs and other contaminants but there is some concern about its long-term reliability; as it ages, there is the possibility that contaminants may leach or be released from the solidified mass.

The "no further action" alternative is in effect currently being implemented. Materials for maintaining the barriers and fences are readily available.

Cost

Alternative 2 provides overall protection to the public health and environment proportionate to its present worth cost of \$8.65 million. Alternative I would afford a greater degree of protection through the destruction of the PCBs, but at a cost which was considered prohibitive (\$49.5 million). Alternative 3 would also offer a greater degree of protection, but the cost (\$17.3 million) is significantly more than Alternative 2.

Bioremediation of the stormwater retention pond would realize a savings as compared to Alternatives 1 and 3, but Alternative 4 (\$8.62 million) was considered deficient in providing protection in the short-term. Alternatives 5, 6, 7 and the "no further action" alternative were also less expensive than the preferred remedy, but also less protective and reliable in the long-term.

Community Acceptance

A public meeting was held on August 26, 1993 to discuss the proposed remedial action plan and address the public's concerns. The public was encouraged to offer comments during the period extending from August 20 to September 29,1993. Comments received were addressed in a Responsiveness Summary, Appendix B of this document.

Clarifications of the proposed remedial action plan and elaboration of the RI/FS findings comprised most of the comments received. On September 7, 1993, the Cheektowaga Town Board adopted a resolution supporting the proposed remedial action plan. Based on these comments, it was concluded that the selected remedy is acceptable to the community.

B. Description of the Selected Remedy

Based on its evaluation of the alternatives presented in the Feasibility Study report, the DEC has selected alternative 2, the off-site land disposal of excavated soil and sediment, as the remedy for the Niagara Transformer site. Specifically, alternative 2b was so identified, employing action levels for off-site and on-site soils of 1 and 10 ppm PCBs respectively. Key elements of that alternative include:

- The DEC will discuss with Niagara Transformer the need for invoking institutional controls, such as deed notices, to restrict the future use of the Niagara Transformer property.
- Clearing vegetation from the site, drainage ditches and retention pond, removing and disposing of the asphalt pavement from the Niagara Transformer parking lot and driveway.
- Excavating on-site soils which contain more than 10 ppm PCBs for off-site disposal at an approved landfill. All excavations will be completed using conventional earth moving equipment and methods.
- Excavating off-site soils and sediments from the drainage ditches and retention pond which contain more than l ppm PCBs, for off-site disposal at an approved landfill. Wet soils will be stabilized with fly ash, cement or equivalent.
- Evaluation and control of potential fugitive dust emissions during soil and sediment excavations.
- Dewatering of the ditches and retention pond, accomplished with diversion structures, temporary piping and pumps. The ditch excavation will begin near the site and proceed downstream in sections.
- Hydraulic cleaning of the railroad culvert, which connects the upper and lower ditches. The culvert will have to be broken at several points along its length, to flush contaminated sediments and collect the material for off-site disposal.

- Treating contaminated water collected during excavated activities. A temporary water treatment facility will be built on site consisting of a filtration unit to remove solids and granulated activated carbon to remove the PCBs and other contaminants.
- Testing in the excavated areas to confirm that the remaining soil and sediment does not exceed the remedial action levels for PCBs.
 - Transporting the excavated material to an approved landfill.
- Backfilling the excavated areas with clean fill, reseeding and planting shrubbery where needed.
- Establishing and implementing a post remediation monitoring program, to include periodic sampling of the groundwater (both the "perched" and deep aquifer), surface water and sediments.

To assure that the public health and environment have been adequately protected, the remedial action will be evaluated after implementation. This review will rely on the data gathered during the post remediation monitoring program. If this review indicates further action is required, the public and all interested parties will be afforded an opportunity to comment on the decision of the DEC before it takes or requires such action be taken.

APPENDIX A

Administrative Record Niagara Transformer Corporation Site #915146

- 1. Interim Remedial Measure Work Plan, Woodward-Clyde Consultants, (WCC), November 1990.
- 2. Remedial Investigation Work Plan, WCC, February 1991.
- 3. Letter February 25, 1991, WCC to New York State Department of Environmental Conservation (NYSDEC) addendum to Remedial Investigation Work Plan.
- 4. Remedial Investigation, draft report, WCC, October 1991.
- Letter March 22, 1991, WCC to NYSDEC Work Plan for Soil Sampling in Residential Area.
- 6. Remedial Investigation Report, WCC, October 1992.
- 7. Preliminary Feasibility Study Report, WCC, October 1992.
- 8. Letter December 9, 1992, NYSDEC to Niagara Transformer Comments on October 1992 Remedial Investigation and Preliminary Feasibility Study Reports.
- 9. Remedial Investigation Report, NCC, August 1993.
- 10. Feasibility Study Report, WCC, September 1993.
- ll. Proposed Remedial Action Plan, NYSDEC, August 1993.

APPENDIX B Responsiveness Summary

NIAGARA TRANSFORMER CORPORATION Site Number 915146

The following is a summary of responses to comments expressed by the public during a meeting held August 26, 1993 at the Cheektowaga Town Hall relative to the Proposed Remedial Action Plan (PRAP) for the Niagara Transformer site. One comment letter was received during the public comment period, which ran from August 20 to September 29, 1993.

Remedial Investigations of the site found contamination in soil, sediment, groundwater and surface water; the contaminant of primary concern being polychlorinated biphenyls (PCBs). Based on the results of these investigations, a Feasibility Study (FS) was prepared. Various clean-up technologies were combined to form several alternatives for remediating the site. These alternatives were then evaluated against eight criteria: overall protection of human health and the environment; compliance with NYS Standards, Criteria and Guidance (SCGs); reduction of toxicity, mobility or volume; short-term effectiveness; long-term effectiveness and permanence; implementability; cost; and community acceptance.

Based on the evaluation of the alternatives, a remedial action plan was selected consisting of: excavation of on-site soils and off-site sediments from the drainage system, disposal of the excavated material in an off-site landfill and long-term monitoring of groundwater, surface water and sediments once excavation has been completed.

- Q.1 It was requested that the Town of Cheektowaga Conservation Advisory Council be copied on all future correspondence and documents regarding remediation of the Niagara Transformer site.
- A.1 The chairman of the Conservation Advisory Council will be provided with the available records.
- Q.2 Is there any risk of inhaling PCBs or PCB contaminated dust?
- A.2 PCBs are relatively non-volatile, meaning they do not vaporize easily. The PCB contaminated sediments in off-site ditches are either submerged or moist throughout most of the year, and the contaminated soils on-site are either covered with pavement or dense vegetation; dust is negligible. The risk of inhaling PCBs is minimal. During the remediation, air monitoring will be performed and measures taken to ensure that dust is not created.
- Q.3 Approximately 32,000 tons of soil and sediment is to be removed from the drainage ditches and the Niagara Transformer site. Will the same amount of backfill be used to return these areas to original grade?

- A.3 Yes, the site and drainage ditches will be returned to their original grade or elevations. Imported backfill material will be tested prior to placement, to ensure that it is clean.
- Q.4 Is permission needed from owners of property through which the ditches pass, the ditch itself or off-site areas such as the cemeteries, to excavate the contaminated material?
- A.4 Property owners will be notified and access to these properties requested. However, the New York State Environmental Conservation Law authorizes the NYS Department of Environmental Conservation, or the Niagara Transformer Corporation, acting under the State's authority, to enter any areas near the site for the purpose of remediation.
- Q.5 Is there any thought to treatment of the soil and sediment that remains after excavation has been completed?
- A.5 As soil and sediment is removed, excavated areas will be sampled to confirm that cleanup goals have been met. The cleanup levels are designed to be protective of human health and the environment, so that after the excavation is complete, no further treatment should be necessary. However, long term monitoring of the site will be conducted to ensure the effectiveness of the remediation. If monitoring indicates that the cleanup goals are not being met, further remedial measures will be evaluated and implemented if need be.
- Q.6 What type of precautions should Town of Cheektowaga employees take while maintaining the contaminated drainage ditches?
- A.6 Currently, Niagara Transformer has assumed responsibility for routine maintenance of the ditches. Should the Town elect to resume these maintenance operations, the New York State
 - Department of Health advises that direct contact with contaminated sediments be limited through the use of gloves, boots, protective coveralls and splash-protective face shields. Normal personal hygiene practices should be adhered to.
- Q.7 Are there documents or records of any continuing health concerns of Town employees who historically had maintained the drainage ditches?
- A.7 Several Town employees had complained of health problems. They were advised to have their physicians contact the New York State Department of Health to determine if these health problems may be attributed to exposure from PCBs. The results of any medical exams or testing are, however, strictly confidential; any disclosures made by these individuals to the New York State Department of Health are also held confidential.
- Q.8 In what manner will residents by kept advised of the hazards associated with accessible portions of the contaminated drainage ditches, prior to and during remediation?
- A.8 The upper drainage ditches near the Niagara Transfomer site have been fenced and warning signs posted. In the lower ditches, the level of contamination is considerably less.

Only two locations were found in a remote part of the lower ditch where the level of contamination was elevated. Since the contamination was confined primarily to the ditch, the levels of contamination are generally low and the incidence of human exposure infrequent, the lower ditch has not been fenced. Through fact sheets and public meetings, residents have been advised to avoid walking in the ditches. Notices will be mailed to residents and Town employees reminding them to avoid these areas. If individuals should accidently come in contact with contaminated sediments, the New York State Department of Health continues to advise that washing with soap and water should be adequate. When the ditches are to be excavated, temporary fences will be erected to prevent public access to the work area and hazards inherent with any construction site employing heavy equipment.

- Q.9 The drainage ditches receive a considerable amount of water during heavy rains. What happens to the PCBs in those ditches?
- A.9 Shortly after PCB-contaminated oil was found seeping into the drainage ditch behind the Niagara Transformer site, barriers were constructed in this upper ditch to contain the seepage. The PCB oil, however, had already contaminated the ditch sediments, here and further downstream in the lower ditch. While the barriers halted the release of PCB oil, it is likely that stormwaters will continue to carry PCBs downstream, dissolved in the water and adsorbed to floating or suspended particles of sediment. Therefore, remediation of the drainage ditches, i.e. removal of the contaminated sediments, is required to protect the public health and the environment.
- Q.10 Are there any risks to cemetery workers excavating along the southern part of the Dale Road cemeteries, near the contaminated ditches?
- A.10 The levels of PCBs found in the cemetery soils near the ditch were considerably lower than what was found in the sediments within the ditch. The New York State Department of Health (NYS DOH) has advised that routine maintenance of the cemetery (e.g. mowing the grass) should not pose an undue risk to workers, nor will cemetery visitors be at risk. While it would appear that this part of the cemetery is full, and future burials considered unlikely, the NYS DOH will advise on what precautions workers should take when burials occur.
- Q.ll What are the health hazards posed by PCBs? (One individual, familiar with the electrical transformer manufacturing industry, commented that he saw no evidence of workers, exposed to levels of PCBs typically higher than what has been found on site, ever contracting cancer).
- A.ll The Toxicological Profile for Selected PCBs (Aroclor 1260, 1254, 1248, 1242, 1232, 1221 and 1016) prepared by the U.S. Department of Health and Human Services (October 1991) indicates the following in regard to PCBs.

As with all chemical exposure, the nature and extent of health effects are related to the amount of chemical exposure. Information on effects is obtained from studies with

animals and investigations of people who have been exposed to high levels in the workplace.

Human effects reported after exposures to high PCB levels in the workplace include skin, eye and respiratory tract irritation and sometimes headache, digestive disturbances and liver problems. There may be a link between a mother's increased exposure to PCBs and slight effects on her child's birthweight and behavior. Some PCBs caused cancer in laboratory animals exposed to high levels over their livetime. Whether PCBs cause cancer in humans is unknown. PCBs have also caused skin, liver, nervous system, immune system and reproductive disorders in animals.

- Q.12 How did the PCBs get into the soils in that part of the cemetery opposite the Niagara Transformer plant?
- A.12 The question was raised by a former Niagara Transformer employee who suggests that the contamination was the result of PCB vapors being discharged through Niagara Transformer roof vents from ovens used to dry oil soaked transformer cores. Earlier reports to the NYSDEC indicated that PCB waste oil was used to kill weeds along the fence separating the cemetery and Niagara Transformer property. It was assumed that the PCBs found in the cemetary, within several feet of the fence was inadvertently sprayed. The reported operation of drying ovens will be investigated further. Remediation of the cemetery soils will occur regardless of the results of that investigation.



BExplanation of Significant Differences

NOV 20 1595



Explanation of Significant Differences Niagara Transformer Site (ID No. 9-15-146) Town of Cheektowaga, Erie County

Overview

The New York State Department of Environmental Conservation (NYSDEC) is announcing significant differences in the scope of the remedy selected to clean up the Niagara Transformer Site (the "Site"). The difference in the remedy consists of limiting the depth of the excavations, to be performed during the removal of PCB contaminated soils, to a maximum of four feet below the ground surface. This modification to the remedy affects Niagara Transformer's rear parking lot and a small area below the railyard immediately south of the site. The remaining components of the remedy, including the removal of PCB contaminated soils in drainage ways and basins away from the site, are unaffected with the exception of the following clarification. The Record of Decision (ROD) states that off-site soils and sediments containing more than 1 ppm PCBs will be excavated. Due to an oversight, the ROD did not specify a difference between surface and subsurface cleanup goals for off-site soils and sediments. The wording for the off-site cleanup goal has been slightly modified to indicate that all off-site soils and sediments containing more than 1 ppm PCBs will be excavated to a depth of 10 inches. Below 10 inches the cleanup goal is 10 ppm PCBs. The cleanup goal of 10 ppm PCBs at depth is still protective because of the decreased potential for exposure. These numbers are consistent with guidance and with cleanup goals established at other sites across the State.

Summary

When the cleanup method for on-site subsurface soils for this site was selected in December 1993, the approach taken was to remove PCB contaminated soils down to a concentration goal (i.e., 10 parts per million, ppm). Based on information gathered after the ROD was issued, removal of all material to achieve the original cleanup goals would involve excavations of up to 20 feet or more and would take months to complete. Some of the soils were found to be near the building foundations. Removal of these soils could jeopardize the stability of the foundation. The difficulties and costs of removing deeper soils were compared with the anticipated benefits of the removal. As discussed below, it was determined that the marginal benefits achieved by removing soils located below four feet would not justify the increased costs and risks. Also, since Niagara Transformer Corporation (NTC) would be unable to operate during the remediation of the rear parking lot, the potential impacts would be significant (i.e., if NTC went out of business there would be a loss of jobs and local tax base as well as the loss of NTC's re-payment of cleanup costs to the State). This modification to the remedy is cost effective and provides protection to human health and the environment while still minimizing the impacts associated with performing the cleanup.

Summary of Site History, Contamination, and Selected Remedy

The Niagara Transformer Corporation property occupies 3.6 acres and is located at 1747 Dale Road in the Town of Cheektowaga, Erie County. Niagara Transformer is a local manufacturer of electrical transformers. On site, there is a large, active manufacturing/office facility with a smaller storage building and aboveground storage tanks to the south. As a result of past releases, PCB contamination is present in on-site surface and subsurface soils, in surface soils at the cemetery immediately west of the site, subsurface soils below the railyard (just south of the Site) as well as sediments in a retention pond and drainage ditch as far as one mile downstream.

Information gathered in the Remedial Investigation (RI) was used in the Feasibility Study (FS) to develop a list of possible alternatives to clean up the Site which would be protective of public health and the environment. The RI and FS Reports were completed by September of 1993. The NYSDEC and NYS Department of Health (NYSDOH) proposed a remedial action plan and solicited public comment in September 1993. The selected remedy was then finalized in a Record of Decision (ROD), a document that outlines the chosen remedy and responds to concerns raised during the public comment period. The ROD was signed on December 30, 1993 and calls for the excavation of subsurface soil with PCB concentrations above 10 mg/kg (ppm) and off-site surface soil with PCB concentrations above one ppm.

As a part of pre-design activities, additional on-site subsurface soils samples were collected to fill in data gaps needed to prepare the design specifications. The data gathered during the pre-design field activities indicated PCB concentrations above the 10 ppm cleanup goal at depths of 20 feet or more (one sample taken at 18-19 feet had a PCB concentration of 96 ppm). There is a "corridor", up to 60 feet wide and 175 feet long, extending from the southwest corner of the main building to the tank farm area in which elevated PCB concentrations extend much deeper than in other sections of the rear parking lot (see attached figure). Also, during the RI soil borings in the railyard revealed high concentrations of PCBs (up to 6,300 ppm) in two locations from 6 feet below ground surface down to 14 feet below ground surface (deepest sample still indicated high concentrations). However, those same soil borings indicated PCB concentrations well below I ppm from the surface down to 6 feet. Several other borings nearby were essentially "clean" (both surface and subsurface). The subsurface soil contamination does not appear to be migrating to any significant degree and would be very difficult to excavate due to its location below an active railyard. As a result this remedial program will not address the area.

Potential Short Term Impacts of 10 ppm Cleanup Goal

As the pre-design data collection progressed, it became apparent that PCB concentrations above 10 ppm (the cleanup goal for subsurface soils) extended to much greater depths than originally anticipated. Removal below approximately four feet would require dewatering and shoring in order to facilitate excavation. The "best-case" time estimate for removal of all PCB contaminated soils in the rear parking lot, (to a concentration of 10 ppm) is 90 12-hour workdays. Niagara Transformer Corporation's (NTC) operations require access to a loading dock located in the back corner of the rear parking lot. A three month remediation of the rear parking lot would not only result in increased costs of remediation, it could jeopardize the viability of the business. In the railyard, the subsurface contamination is located below an active railroad track. Removal of this material would result in interruption of rail service on this line.

Protection of Human Health and the Environment

Aqueous phase (dissolved in water) PCB contamination has been found in on-site groundwater samples up to concentrations of approximately 10 parts per billion (ppb). The groundwater standard for PCB is 0.1 ppb. Samples taken in downgradient monitoring wells have shown results of non-detect (detection limit of 0.5 ppb). Since the extent of groundwater contamination is limited and groundwater in the area is not used, there are no human health risks associated with exposure to aqueous phase PCB contamination.

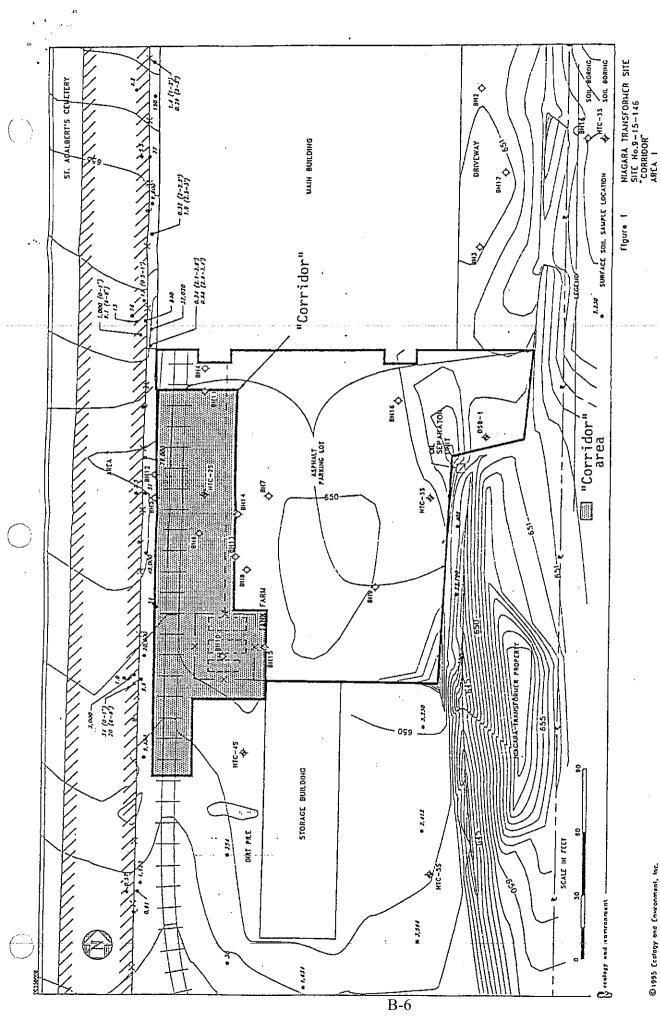
There will be no increased potential for exposure due to direct contact since all of the soil to a depth of four feet will still be removed to achieve the original cleanup goals. There is no potential for exposure to the subsurface contamination that will remain behind. In addition, deed restrictions will be pursued with Niagara Transformer to prevent current or future site owners from undertaking deep excavations without proper precautions.

As a part of the initial construction activities, a perimeter exploratory trench will be dug on-site to ensure that there are no subsurface features which may act as a preferential pathway for contaminant migration (e.g. a tile drain) to the drainage ditch along the southern edge of the site. Excavation of contaminated soil to a depth of four feet, combined with removal of any potential preferential pathway for migration, will ensure that the ditch will not become re-contaminated. Also, after the completion of the remedial program, a long-term monitoring plan will be in place to monitor the effectiveness of the remediation.

With the change of limiting the excavation depth to a maximum of 4 feet, the selected remedy remains protective of human health and the environment, complies with federal and state requirements that are applicable, or relevant and appropriate to this remedial action, and is cost effective.

Information in support of the limiting the excavation depth to 4 feet is available in the Administrative Record which documents the decisions made regarding the cleanup of the Site. These documents available area for public inspection at the Reinstein Branch Library, 2580 Harlem Road, Cheektowaga, New York 14225, Ms. Elaine Mahoney, Library Director and the NYS Department of Environmental Conservation, 270 Michigan Avenue, Buffalo, New York 14203-2999, by appointment only, contact: Mr. Michael Podd, Citizen Participation Specialist, (716) 851-7220.

For more information on this project please contact: Mr. James Moras, Project Manager, NYSDEC, 50 Wolf Road, Albany, New York 12233-7010, (518) 457-0315, or call NYSDEC's toll free number, 1-800-342-9296, and leave a short message.



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Consent Decree

UNITED STATES DISTRICT COURT WESTERN DISTRICT OF NEW YORK

STATE OF NEW YORK,

Plaintiff

VS.

NIAGARA TRANSFORMER CORPORATION

FILED

W.B. DISTRICT GOURT

OF THE SECOND STATE

Civil Action No. 12 PH 1: 52

OF THE SECOND STATE

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RECEIVE Defendant

DEC 1 5 1995

CLERK, USDC WDNY

CONSENT DECREE

WHEREAS, the State of New York ("State"), on behalf of the New York State

Department of Environmental Conservation ("Department"), has filed a complaint against

Niagara Transformer Corporation ("NTC"), pursuant to Section 107(a) of the

Comprehensive Environmental Response, Compensation and Liability Act of 1980, as

amended by the Superfund Amendments and Reauthorization Act of 1986, Pub. L. No.

99-499, 42 U.S.C. § 9607(a) ("CERCLA"), and New York common law of public

nuisance, seeking recovery of response costs incurred and to be incurred in responding to

the release or threat of release of hazardous substances at or in connection with NTC

plant site at 1747 Dale Road, Cheektowaga, Erie County, New York (the "Site") and

other related relief; and

WHEREAS, NTC is a corporation organized and existing under the laws of the State of New York and is doing business in the State of New York in that it owns and operates a transformer manufacturing facility at the Site; and

WHEREAS, pursuant to an April 1, 1991 Administrative Order on Consent with the Department, Index No. B9-0334-90-05, NTC developed and implemented a Remedial Investigation and Feasibility Study ("RI/FS") for the Site to the satisfaction of the Department, and the Department has issued a Record of Decision ("ROD") describing the selected remedial program deemed most appropriate for the Site based upon the approved reports submitted pursuant to the aforesaid Administrative Order, and a copy of ROD is attached hereto as Appendix A; and

WHEREAS, the Site is an inactive hazardous waste disposal site, as that term is defined in New York ECL 27-1301.2, and the Department has determined that the Site presents a significant threat to public health and the environment, and the Site has been listed in the Registry of Inactive Hazardous Disposal Sites as No. 9-15-146 as a classification "2" Site pursuant to ECL 27-1305.4.b; and

WHEREAS, pursuant to ECL 27-1313.f, the Department is required to make every effort to secure appropriate relief from the owner or operator of such a site, including payment of the costs of developing and implementing the selected remedial programs; and

WHEREAS, the remedial program selected in the ROD for the Site is estimated to cost \$7-8 million, and, based upon an extensive investigation and examination of the

sufficient financial resources to develop and implement the remedial program selected for the Site, and, therefore, the Department has proceeded to develop and is implementing the selected remedial program for the Site using funds from the New York Hazardous Waste Remedial Fund established pursuant to Section 97-b of the New York State Finance Law; and

WHEREAS, the State and NTC agree that the Department will implement the remedial program for the Site as selected in the ROD and that NTC will reimburse the Department for its costs and expenses incurred for that purpose to the extent, on the schedule and in the manner set forth herein; and

WHEREAS, the State and the Department have determined, based upon an extensive investigation of NTC's financial condition, including NTC's status as a defendant in a CERCLA cost recovery claim brought by the United States Environmental Protection Agency and the State of New York with regard to the Wide Beach Superfund Site in Brant, New York, which claim is being settled concurrently herewith, that the scheduled payments provided for herein will maximize the recovery of the State's costs and expenses incurred for the remedial program at the Site; and

WHEREAS, the State and NTC agree that settlement of this case and the concurrent settlement of the Wide Beach case, also on an ability to pay basis, without further litigation and without the admission or adjudication of any issue of fact or law is the most appropriate means of resolving this action.

NOW, THEREFORE, it is Ordered, Adjudged and Decreed as follows:

JURISDICTION

1. This Court has jurisdiction over the subject matter and the parties to this action. The parties agree to be bound by the terms of this Consent Decree and agree not to contest its validity in any subsequent proceeding to implement or enforce its terms.

DEFINITIONS

- 2. Unless otherwise expressly provided herein, terms used in this Consent

 Decree which are defined in CERCLA or in regulations promulgated pursuant to

 CERCLA or which are defined in Article 27, Title 13 of the New York Environmental

 Conservation Law or in regulations promulgated pursuant thereto shall have the meaning

 assigned to them in such statutes or such regulations. Whenever the terms set forth below

 are used in this Consent Decree, the following definitions shall apply:
- a. "CERCLA" means the Comprehensive Environmental Response,
 Compensation and Liability Act of 1980, as amended by the Superfund Amendments and
 Reauthorization Act of 1986, Pub. L. No. 99-499, 42 U.S.C. § § 9601, et seq.
- b. "Department" means the New York State Department of Environmental Conservation.
- c. "Parties" means the State of New York on behalf of the Department and Niagara Transformer Corporation.

- d. "State" means the State of New York.
- e. "NTC" means Niagara Transformer Corporation.
- f. "Site" means the NTC plant site located at 1747 Dale Road, Cheektowaga, Erie County, New York.
- g. "ROD" means the record of decision issued by the Department for the Site.
- h. "RI/FS," means the remedial investigation and feasibility study prepared for the Site.
- i. "Remedial Program" means the remedial design and remedial construction of the remedy selected in the ROD, including any long term, post construction monitoring, sampling, analysis and maintenance, except routine landscape, fence and sign maintenance which will be performed by NTC.
 - j. "ECL" means the New York Environmental Conservation Law.

PARTIES BOUND

3. This Consent Decree shall apply to and be binding upon the State, the Department and NTC, its successors and assigns. Each signatory to this Consent Decree represents that he or she is fully authorized to enter into the terms and conditions of this Consent Decree and to bind legally the party represented by him or her. Any change in ownership or corporate status of NTC including, but not limited to, any transfer of assets

or real or personal property shall in no way alter NTC's responsibilities under this Consent Decree.

NO ADMISSION OR ACKNOWLEDGMENT

4. Neither this Consent Decree, nor the terms hereof, nor the entry into this Consent Decree, nor the performance of the terms hereunder, by any of the parties shall constitute or be construed as an admission or acknowledgment by any of the parties of the factual or legal assertions contained in this Consent Decree and the parties retain the right to controvert in any subsequent proceedings, other than proceedings for the purpose of implementing or enforcing this Consent Decree, the validity of the facts or determinations contained in this Consent Decree. Neither this Consent Decree, nor the terms hereof, nor the entry into this Consent Decree, nor the performance of the terms hereunder, by NTC shall constitute or be construed as an admission or acknowledgment by NTC of any liability, or an admission of violation of any law by NTC or by its officers, directors, employees, agents, successors or assigns; however, the court, in enforcing this Consent Decree shall look to the terms hereof.

PAYMENT

5a. Beginning on April 1, 1998, NTC shall make annual payments in the amount of \$300,000.00 each to the Department to be compared and set off against the amounts expended by the Department in overseeing the RI/FS and in developing and

implementing the Remedial Program. Each such payment shall be by cashiers check payable to the "Department of Environmental Conservation" and shall be sent by mail to the Bureau of Program Management, Division of Hazardous Waste Remediation, Department of Environmental Conservation, 50 Wolf Road, Albany, New York 12233-7010. NTC shall continue to make such annual payments to the Department until the total sum of accumulated payments equals the total sum of expenses incurred by the Department for oversight of the RI/FS and implementation of the Remedial Program plus administrative and interest expenses or the amounts specified in subparagraph b. below have been paid, whichever occurs first.

- b. Beginning April 1, 1998, NTC shall make annual payments in an amount up to \$300,000.00 for eighteen consecutive years. In the event the provisions of paragraph 6.b. hereof result in the deferral of any amount in any given year and such amount(s) plus accrued interest at the rate of 6% per annum are not fully paid by the eighteenth payment, NTC shall continue to make annual payments in the amount of \$300,000.00 until the amount of all payment deferrals plus accumulated interest has been paid in full.
- 6. The annual payments specified in paragraph 5 of this Consent Decree are subject to the following conditions:
- a. The parties expect that the tax treatment applicable to the payments made under this Consent Decree shall be at least as favorable to NTC as the deductibility specified by the Internal Revenue Service in Revenue Ruling 94-38. In the event there is a change in the tax laws or subsequent revenue rulings resulting in an adverse change in

the tax treatment applicable to the payments to be made under this Consent Decree, NTC shall notify the Department in writing with an explanation of the change, the impact of the change on NTC's financial condition, and a proposed change in the schedule of payments to be made hereunder. Within sixty (60) days of receipt of any such notice, the Department shall respond in writing indicating its agreement to the requested change to the payment schedule or its disagreement and the basis therefore. If the parties are unable to resolve any differences through further informal discussion, NTC may apply to the Court for appropriate relief in the form of a change in the payment schedule. In granting any such relief, the aggregate amount of the payments to be made hereunder shall not exceed \$5.4 million plus interest in the event the procedures in paragraphs 5.b. and 6.b. would be applicable. Unless or until the payment schedule is changed by agreement of the parties or Order of Court, the schedule set forth in paragraph 5 of this Consent Decree shall apply.

b. The parties expect that the annual payments to be made hereunder will be payable out of NTC's current income for the year in question prior to payment of any dividends or bonuses to shareholders of NTC. In the event that NTC is unable to pay the full amount of any \$300,000.00 annual payment due to a lack of net income for that year, the unpaid portion, without penalty but with interest at the rate of 6% per annum, shall be added to the amount due the next year. For the purposes of this provision, NTC's net income shall be determined in accordance with generally accepted accounting principals by NTC's independent outside accountants prior to the deduction of the annual

payment to DEC. NTC shall not be entitled to defer payment of any portion of the \$300,000.00 payment in any year when its net income, as defined above, equals or exceeds \$400,000.00. In the event NTC's net income is less than \$400,000.00 and NTC determines it is not able to pay the entire \$300,000.00 payment, NTC, subject to the terms of paragraph 5.b. above, shall provide DEC with a copy of its annual income statement along with its partial payment for that year.

- c. In any year, NTC shall have the right to prepay all or any part of a deferred payment due from the prior year, all or any part of that year's payment and/or to prepay part or all of any subsequent year's payment. In any such event, the payment(s) shall be applied against the next amount due under the schedule of payments without accelerating the schedule for any subsequent payments.
- d. NTC may elect at any time to pay in full any outstanding balance calculated in accordance with paragraph 5.a. or 5.b. above. In that event, NTC will have fully discharged its payment obligations under this Decree.
- 7. Upon final acknowledgment by the Department that the remedy has been completed, the Department shall prepare an accounting of its expenses and the payments received from NTC through the date thereof, showing the outstanding balance and shall send a copy of such accounting statement to NTC. Thereafter, NTC shall be entitled to request and obtain from the Department an annual accounting and balance statement.
- 8. Upon completion of the remedial construction work and the final acceptance thereof by the Department indicating that the remedial construction work has

been satisfactorily completed, the Department shall notify NTC in writing, and thereafter, NTC shall be responsible for maintaining the site landscaping, permanent fencing and any permanent signage. At the same time, the Department may request NTC to retain a qualified contractor to conduct the post-construction monitoring, sampling, analysis and related maintenance. If NTC agrees to undertake such work, the full annual cost thereof, including administrative overhead, shall be deducted from the respective annual payments due under paragraph 5 supra.

9. No payment made pursuant to paragraph 5 of this Consent Decree shall be construed as a fine, penalty or sanction. For the purpose of this Consent Decree, the payments made by NTC shall be deemed ordinary and necessary expenses for the continued operation of NTC at its facility.

SITE ACCESS

- 10. NTC, by separate written access agreement, has granted the Department the right to use property owned by NTC adjacent to the Site for purposes related to implementation of the remedy. NTC shall continue that access agreement as long as necessary for the Department to complete implementation of the remedial program.
- 11. NTC shall provide the Department and its duly designated employees, agents, consultants and contractors with access to the Site and suitable operating space for the construction and implementation of the on-site elements of the Remedial Program.

 NTC shall assume responsibility for reasonable adjustments or modifications to its

facility use and operations which may be necessary for implementation of the Remedial Program.

CIVIL PENALTIES

12. In addition to any other remedies or sanctions available to the State, if NTC fails or refuses to comply with any term or condition of this Consent Decree, it shall be subject to a civil penalty up to \$25,000.00 per day of such failure or refusal pursuant to Section 122(1) of CERCLA, 42 U.S.C. § 9622(1), or ECL 71-2705.1.

RESERVATION OF RIGHTS

- 13. The State agrees that NTC has satisfactorily complied with all obligations undertaken in connection with the 1991 Administrator Order concerning the conduct of the RI/FS for the Site.
- 14. Except as expressly provided elsewhere in this Decree, nothing contained in the Decree shall be construed as barring, diminishing, adjudicating, or in any way affecting any of the State's rights, including the following:
- a. The State's right to bring any action or proceeding against anyone other than NTC, or its directors, officers, employees, servants, agents affiliates, successors and assigns.

- b. The State's right to enforce the provisions of this Decree against NTC and/or NTC's successors and assigns in the event NTC fails to satisfy any of the terms of this Decree.
- c. The State's right to bring any criminal action against NTC, its directors, officers, employees, servants, agents, and assigns rising out of its future conduct with respect to the Site.
- d. The State's right to gather information and enter and inspect property and premises in accordance with applicable law and the terms of this Decree.

Similarly, nothing contained in this Decree shall be construed as barring, diminishing, adjudicating or any way affecting NTC's rights or the rights of its officers, directors, agents, servants, employees, successors or assigns to take issue with or contest the State's entitlement to any of the foregoing.

15. Subject to paragraph 17 hereof, nothing in this Decree shall prohibit the Department Commissioner, or his duly authorized representative, or the Attorney General from executing any summary abatement or public nuisance abatement powers.

RELEASE OF LIABILITY AND COVENANT NOT TO SUE

16. Nothing in this Decree shall be deemed to release NTC from liability for hazardous substance conditions at the Site or the State's response costs arising therefrom except as provided in this section:

- a. In consideration of, and contingent upon, NTC's compliance with the provisions of this Decree, and until the release provided for in paragraph b of this section, takes effect, the State covenants not to sue, execute judgment or take any civil, judicial or administrative action under Federal or State law (other than enforcement of this Decree) against NTC, its past, present, or future officers, directors, employees, agents, successors and assigns, arising out of or relating to the performance of the Remedial Program.
- b. Upon payment of the last amount due in accordance with paragraphs 5 and 6 of this Decree, the State shall provide a release from liability to NTC, its past, present and future officers, directors, employees, agents, successors and assigns for all claims, demands, remedies or actions whatsoever under common law or any State or Federal statute arising out of or related to the past release and migration of hazardous substances or chemicals or chemical wastes as those terms are used in CERCLA, the ECL and the State's complaint in this action that have been contained, removed and/or treated through implementation of the Remedial Program as described in the Remedial Program records.
- c. Nothing in this Decree shall in any way constitute or be construed as a release of claims by the State against any person not a party to this Decree.
- d. Nothing in this Decree shall in any way constitute or be construed as a release of claims by NTC against any person not a party to this Decree.

PROTECTION FROM FURTHER CONTRIBUTION

17. Upon entry of this Decree, and subject to its compliance with the material terms of this Decree, NTC, its past, present and future officers, directors, agents, employees, successors and assigns, shall be deemed to have resolved their liability to the State for purposes of contribution protection provided by CERCLA Section 113(f)(2). Specifically, if the obligations set forth in this Decree are met, NTC shall not be liable for any claim for contribution regarding matters addressed in the 1991 Administrative Order, the RI/FS, the ROD, the final engineering report for the Remedial Program, or this Decree. The provisions of this section shall not apply to any action which is brought by the State to enforce this Decree.

PUBLIC NOTICE

18. Within thirty (30) days after the effective date of this Decree, NTC shall file a Declaration of Covenants and Restrictions with the Erie County Clerk to give all persons who may acquire any interest in its property at the Site notice of this Decree. This Declaration is and shall be deemed to be a covenant to be running with the land, binding NTC, its successors and assigns and any lessee of NTC in perpetuity or until such time that the Department determines that the covenant is no longer necessary for the protection of human health and the environment.

- 19. Unless prior written approval by the Department and the Department of Health is first obtained, which approval shall not be unreasonably withheld, there shall be no construction or use of NTC's property at the Site which results in the disturbance or excavation of waste materials therein, which threatens the integrity of the cap or soil cover materials or wells, or which results in unacceptable human exposure to contaminated soils or groundwater.
- 20. Unless prior written approval by the Department and the Department of Health is obtained, which approval shall not be unreasonably withheld, there shall be no change in the use of NTC's property at the Site in a way that would significantly interfere with the long term operation and maintenance of the Remedial Program.
- 21. If NTC proposes to convey the whole or any part of its property interest at the Site, NTC shall, not fewer than sixty (60) days before the date of such conveyance, notify the State in writing of the identity of the transferee and of the nature and proposed date of the conveyance, and NTC shall notify the transferee in writing, with a copy to the State, of the applicability of this Decree.

COMMUNICATIONS

22. All written notices or communications required by this Decree shall be transmitted by United States Postal Service, by private courier service, telefax, or hand delivery as follows:

- a. Communications from NTC to the State shall be sent as follows:
- (i) Andrew English, P.E., New York State Department of Environmental Conservation, Division of Hazardous Waste Remediation, 50 Wolf Road, Albany, New York 12233-7010.
- (ii) Director, Bureau of Environmental Exposure Investigation,
 New York State Department of Health, Two University Place, Albany, New York 12203
- (iii) Martin Doster, P.E., New York State Department of
 Environmental Conservation, Division of Hazardous Waste Remediation, 270 Michigan
 Avenue, Buffalo, New York 14203-2999
- (iv) Glen R. Bailey, New York State Department of Environmental Conservation, Division of Environmental Enforcement, 270 Michigan Avenue, Buffalo, New York 14203-2999.
- (v) David A. Munro, Esq., New York State Department of Law, The Capitol, Albany, NY 12224
 - b. Communications from the State to NTC shall be sent as follows:
- (i) One copy to Niagara Transformer Corporation, Attention Mr. Fred Darby, President, 1747 Dale Road, Buffalo, New York 14225; and
- (ii) One copy to Buchanan Ingersoll Professional Corporation,
 One Oxford Centre, 301 Grant Street, 20th Floor, Pittsburgh, Pennsylvania 15219,
 Attention: Daniel M. Darragh, Esquire.

The State and NTC reserve the right to designate additional or different addressees for communications on written notice to the other.

INDEMNITY AND INSURANCE

- 23. NTC shall indemnify and hold the Department, the State of New York, and their representatives and employees harmless from all claims, suits, actions, damages, and costs of every name and description arising out of or resulting from the performance or attempted performance of the Remedial Program by the Department and/or any other state agency, its officers, employees or agents, unless such claims, suits, actions, damages, and costs are assessed as a result of a determination or finding of negligent, unlawful, willful, or malicious acts or omissions or other culpable conduct on the part of the state, state agencies, or their officers, employees, agents, contractors or subcontractors.
- 24. Any contractor retained by the Department and/or any other state agency to implement any part of the Remedial Program shall be required to provide comprehensive general liability insurance applicable to its work on the Remedial Program in an amount not less than \$1 million per occurrence, \$2 million annual aggregate, and any such insurance shall name NTC as an additional insured. In addition, any such contractor shall be required to provide and maintain worker's compensation insurance as required by the laws of the State of New York.

25. In the event of a claim for indemnity under paragraph 23 hereof, NTC's obligations under said paragraph shall arise only after the limits of any applicable insurance under paragraph 24 hereof have been exhausted.

MISCELLANEOUS

- 26. This Decree shall be lodged with the Court by the State after it has been executed by the parties. If for any reason the Court should decline to approve this Decree, in the form presented, this agreement is voidable at the sole discretion of any party hereto and the terms of the agreement may not be used as evidence in any litigation between the parties.
- 27. The terms of this Decree shall constitute the complete and entire agreement between NTC and the State concerning the Site. No term, condition, understanding, or agreement purporting to modify or vary any term of this Decree shall be binding unless made in writing and subscribed by the parties to be bound. No informal advice, guidance, suggestion or comment by the State regarding any proposal, schedule or any other submittal shall be construed as relieving NTC of its obligation to obtain such formal approvals as may be required by this Decree.
- 28. If NTC desires that any provision of this Decree be changed, NTC shall make timely written application to the State setting forth reasonable grounds for the relief sought. Copies of such written applications shall be delivered or mailed to:

- a. Andrew English, P.E., New York State Department of
 Environmental Conservation, Division of Hazardous Waste Remediation, 50 Wolfe Road,
 Albany, New York 12233-7010.
- b. Glen R. Bailey, New York State Department of Environmental Conservation, Division of Environmental Enforcement, 270 Michigan Avenue, Buffalo, New York 14203-2999.
- c. David A. Munro, Esq., New York State Department of Law, The Capitol, Albany, NY 12224
- 29. The effective date of this Decree shall be the date it is entered by the Clerk of the Court.
- 30. The Court shall retain jurisdiction to modify or enforce the terms of this

 Decree and to resolve such disputes arising hereunder as may be presented to the Court.

TERMINATION OF DECREE

31. The provisions of this Consent Decree shall remain in effect until completion of all payments required by this Decree. NTC shall notify the State in writing at the time it believes all such payments have been made. Within thirty (30) days of such notice, the State shall advise NTC in writing of its determination that all payments required by the Consent Decree were made or that further payments are necessary to fulfill the obligations of this Decree. Except for the provisions of paragraphs 4, 13, 14, 15, 16, 17, 18, 19, 20 and 21, which shall survive termination, the provisions of this

Decree shall terminate on the date that the State advises NTC that all of the requirements have been completed. Upon receipt of the State's acknowledgment that all required payments have been made or the failure of the State to respond within the thirty (30) day period, NTC may file a statement with the Clerk of the Court indicating that the requirements of this Decree have been fully satisfied.

Dated: Dec 13, 1995

Dennis C. Vacco

Attorney General of the State of New

York

David A. Munro

Assistant Attorney General

Attorney for the State of New York

Buchanan Ingersoll

Professional Corporation

Daniel M. Darragh

Attorney for Niagara Transformer Corporation

SO ORDERED?

United States District Judge

march 22,1996



Declaration of Covenants and Restrictions

ERIE COUNTYDECLARATION OF COVENANTS AND RESTRICTIONS

THIS DECLARATION is made the ______ day of July, 2011, by Niagara Transformer Corp., a Corporation organized and existing under the laws of the State of New York, and having an office for the transaction of business at 1747 Dale Road, Cheektowaga, New York 14225, ("Declarant").

WHEREAS, Declarant is the owner in fee of a certain parcel of real property ("Property") located at 1747 Dale Road in the Town of Cheektowaga, New York in the County of Erie, pursuant to a deed on file in the Erie County Clerk's Office in Deed Book 06314 at Deed Page 00169, which parcel is assigned tax identification number S-B-L 102.03-3-5 and as hereinafter more fully described in the attached Appendix "A" and made a part hereof, and hereinafter referred to as the "Property", and

WHEREAS, the Property is subject to the provisions of a Federal Judicial Consent Decree entered on March 22, 1996 and Administrative Order on Consent # B90334-90-05 dated April 1, 1991 with the New York State Department of Environmental Conservation ("Department").

WHEREAS, pursuant to the aforementioned Consent Decree and a 1993 Record of Decision, the Department required that certain restrictions be placed on the Property owing to the past disposal of hazardous waste on the Property and its listing, on the New York State Registry of Inactive Hazardous Waste Disposal Sites, as a Class 2 Site (Site ID # 9-15-146) ("Site") pursuant to New York Environmental Conservation Law § 27-1305.2.b.

NOW, THEREFORE, Declarant, for itself and its successors and assigns and any of Declarant's lessees, covenants as follows:

First, the Property subject to this Declaration of Covenants and Restrictions is as shown on a map attached to this declaration as Appendix B and made a part hereof.

Second, unless prior written approval by the Department or, if the Department shall no longer exist, any New York State agency or agencies subsequently created to protect the environment of the State and the health of the State's citizens, hereinafter referred to as "the Relevant Agency," is first obtained, where contamination remains at the Property, there shall be no construction, use or occupancy of the Property that results in the disturbance or excavation of the Property which threatens the integrity of the engineering controls or which results in unacceptable human exposure to contaminated soils or groundwater.

Third, the owner of the Property shall not disturb, remove, or otherwise interfere with the installation, use, operation, and maintenance of engineering controls for the Property, unless in each instance they first obtain a written waiver of such prohibition from the Department or Relevant Agency.

Fourth, use of the Property for any purpose other than for industrial use without the express written waiver of such prohibition by the Relevant Agency is prohibited.

Fifth, the use of groundwater beneath the Property as a source of potable without first implementing necessary water quality treatment, as determined by the New York State Department of Health ("NYSDOH"), and after giving prior notice to and receiving the prior written approval of the Department or other Relevant Agency or as a source of process water without giving prior notice to the Department or other Relevant Agency is prohibited.

Sixth, the owner of the Property shall perform site landscape, permanent fence and permanent sign maintenance and continue such maintenance, unless the owner first obtains permission to discontinue such maintenance from the Department or Relevant Agency.

Seventh, consent to entry upon the Property by any duly designated officer or employee of the Department or any Relevant Agency and by any agent, consultant, contractor, or other person so authorized by the Commissioner and its contractors to assure compliance with the above restrictions and to implement any remedial program deemed necessary by the Department shall not be unreasonably withheld by the Site owner or other party having control of the Site.

Eighth, Declarant, on behalf of itself and its successors and assigns, hereby consents to the enforcement by the Relevant Agency of these restrictions, and hereby covenants not to contest lawful enforcement.

Ninth, this Declaration is and shall be deemed a covenant that shall run with the land and shall be binding upon all future owners of the Property, and shall provide that the owner and its successors and assigns consent to enforcement by the Department or Relevant Agency of the above prohibitions and restrictions and hereby covenant not to contest the authority of the Department or Relevant Agency to seek their enforcement.

Tenth, any deed of conveyance of the Property or any portion thereof shall recite that said conveyance is subject to this Declaration of Covenants and Restrictions, unless the Department or Relevant Agency has provided express written consent to the termination of said covenants and restrictions.

On the <u>Adnd</u> day of July in the year 2011 before me, the undersigned, a notary public in and for said State, personally appeared John Darby personally known to me or proved to me on the basis of satisfactory evidence to be the individual whose name is subscribed to the within instrument and acknowledged to me that he executed the same in his capacity, and that by his signature on the instrument, the individual or the person upon behalf of which the individual acted, executed this instrument.

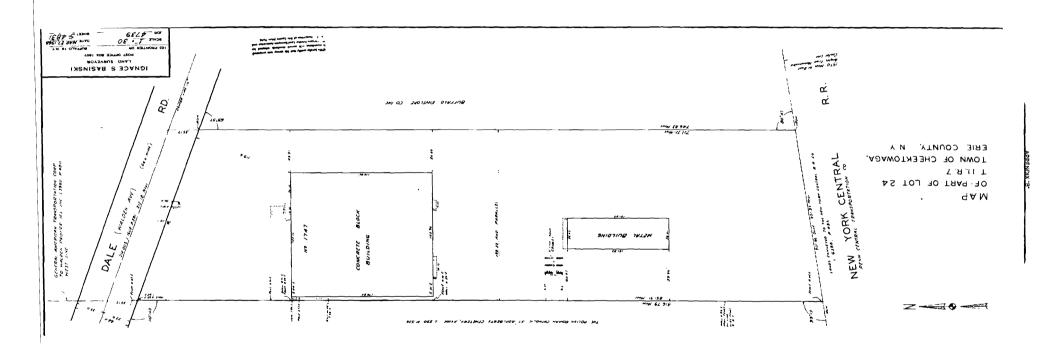
Paula Of Walter Notary Public

PALLA R. WALTER
Notary Public, State of New York
Qualified in Erie County
My Commission Expires June 27, 2014

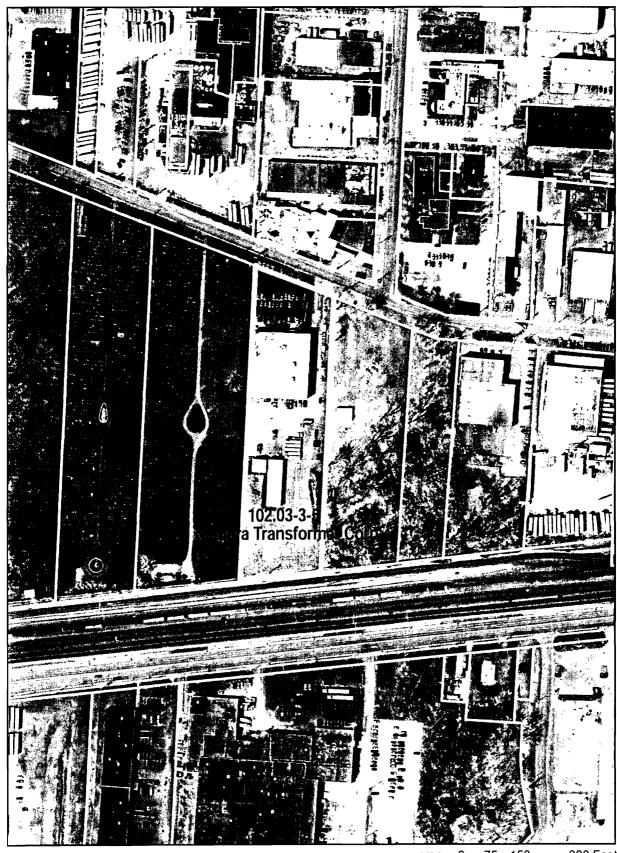
APPENDIX "A"

All that tract or parcel of land situate in the Town of Cheektowaga, County of Erie and State of New York, being part of Lot No. 24, Township 11, Range 7 of the Holland Land Company's Survey, described as follows:

Beginning at the intersection of the south line of Dale Road (formerly Walden Avenue) with the east line of land conveyed to George Kroth by a deed recorded in Erie County Clerk's Office in liber in Book 542 of Deeds at page 612; thence southerly along the east line of lands so conveyed to George Kroth approximately 713.80 feet to the north line of land conveyed to the New York Central Railroad Company by a deed recorded in the said Clerk's Office in Book 5983 of Deeds at page 176; thence easterly along the north line of land so conveyed to the New York Central Railroad Company a distance of 199.79 feet to the west line of land conveyed to 1800 Dale Road, Inc. by a deed recorded in the said Clerk's Office in Book 8542 of Deeds at page 13 on August 8, 1977; thence northerly along the west line of said corp. line approximately 601.52 feet to a point in the south line of Dale Road; thence westerly along the south line of Dale Road 235.4 feet to the point or place of beginning







Niagara Transformer, Site ID No. 915146. Cheektowaga, NY 0 75 150 300 Feet



E Site Drawings

INTERIM REMEDIAL MEASURES AT NIAGARA TRANSFORMER CORPORATION SITE

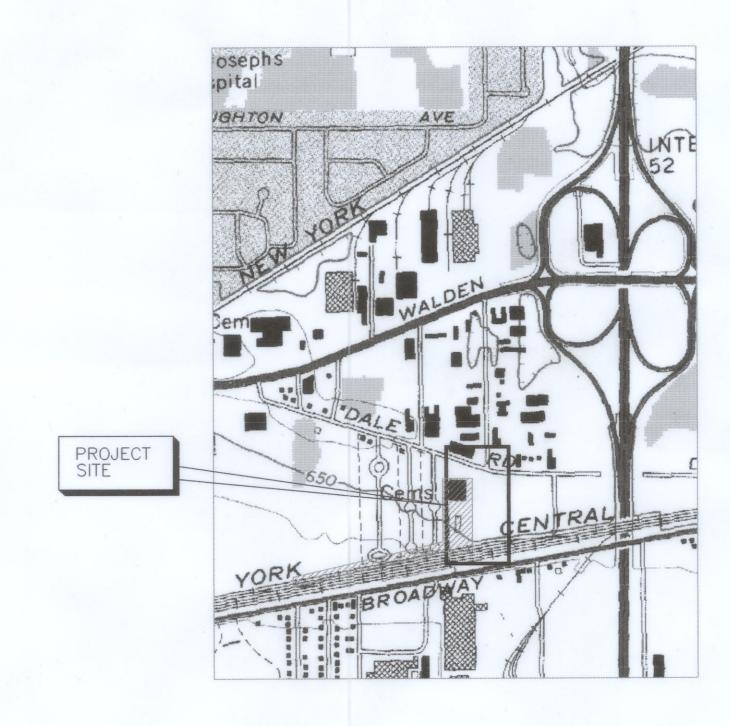
NYSDEC SITE No. 9-15-146 CONTRACT No. D003493-28 TOWN OF CHEEKTOWAGA ERIE COUNTY, NEW YORK

Prepared For:

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION



DIVISION OF ENVIRONMENTAL REMEDIATION



SITE LOCATION MAP

CHEEKTOWAGA



DWG. NO.	REV.	TITLE
NTC-01	В	TITLE SHEET, VICINITY MAP, SITE LOCATION MAP, AND LIST OF DRAWINGS
NTC-02	В	OVERALL SITE PLAN AND WORK LIMITS
NTC-03	В	ENLARGED SITE PLAN-NTC BUILDING AND VICINITY
NTC-04	В	NORTH/SOUTH DITCH PLAN, PROFILE AND SECTIONS
NTC-05	В	EAST/WEST DITCH SECTIONS AND DETAILS
NTC-06	В	SECTIONS AND DETAILS 1
NTC-07	В	SECTIONS AND DETAILS 2

						ecology and environment engineering, p.c.					
						DESIGNED BY	CHECKED BY				
В	3/28/02	JJK	DJM	ISSUED FOR BIDDING PUR	RPOSES ONLY	W. KAWAR WK	S. BLAIR P.E. D. Alber PE				
Α	1/15/02	KMK	DJM	ISSUED FOR 90% DESIGN	REVIEW						
10.	DATE	DWN	APP'D		DESCRIPTION	DRAWN BY MMIC	APPROVED BY				
REVISIONS				REVISIONS		JØ KOHLER/K. KRAJEWSKI	DJ MILLER P.E.				

IT IS A VIOLATION OF NEW YORK STATE EDUCATION LAW TO ALTER THIS DOCUMENT BY MEANS INCONSISTENT WITH SECTION 7209 OF SAID LAW.

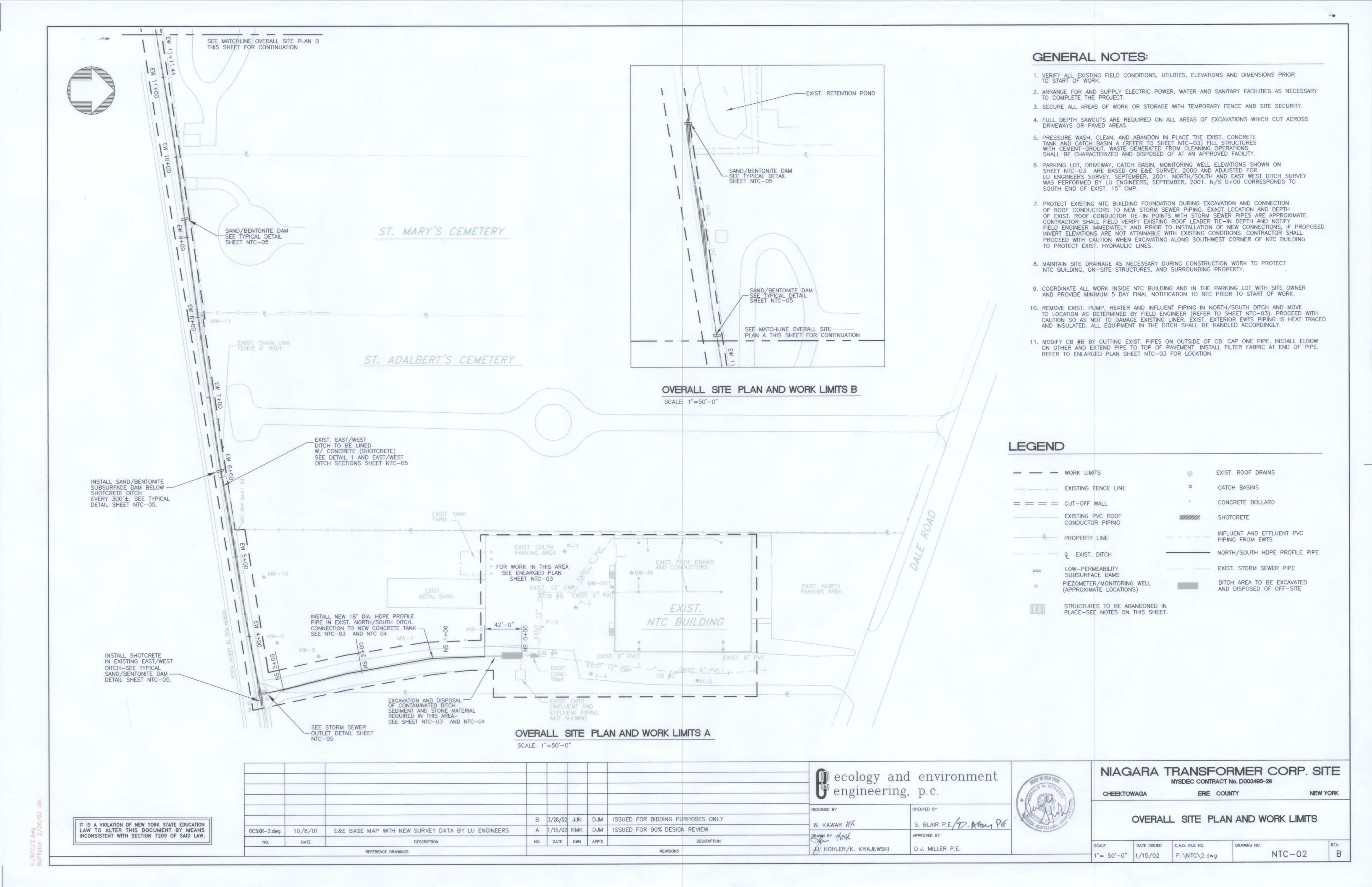
NEW YORK

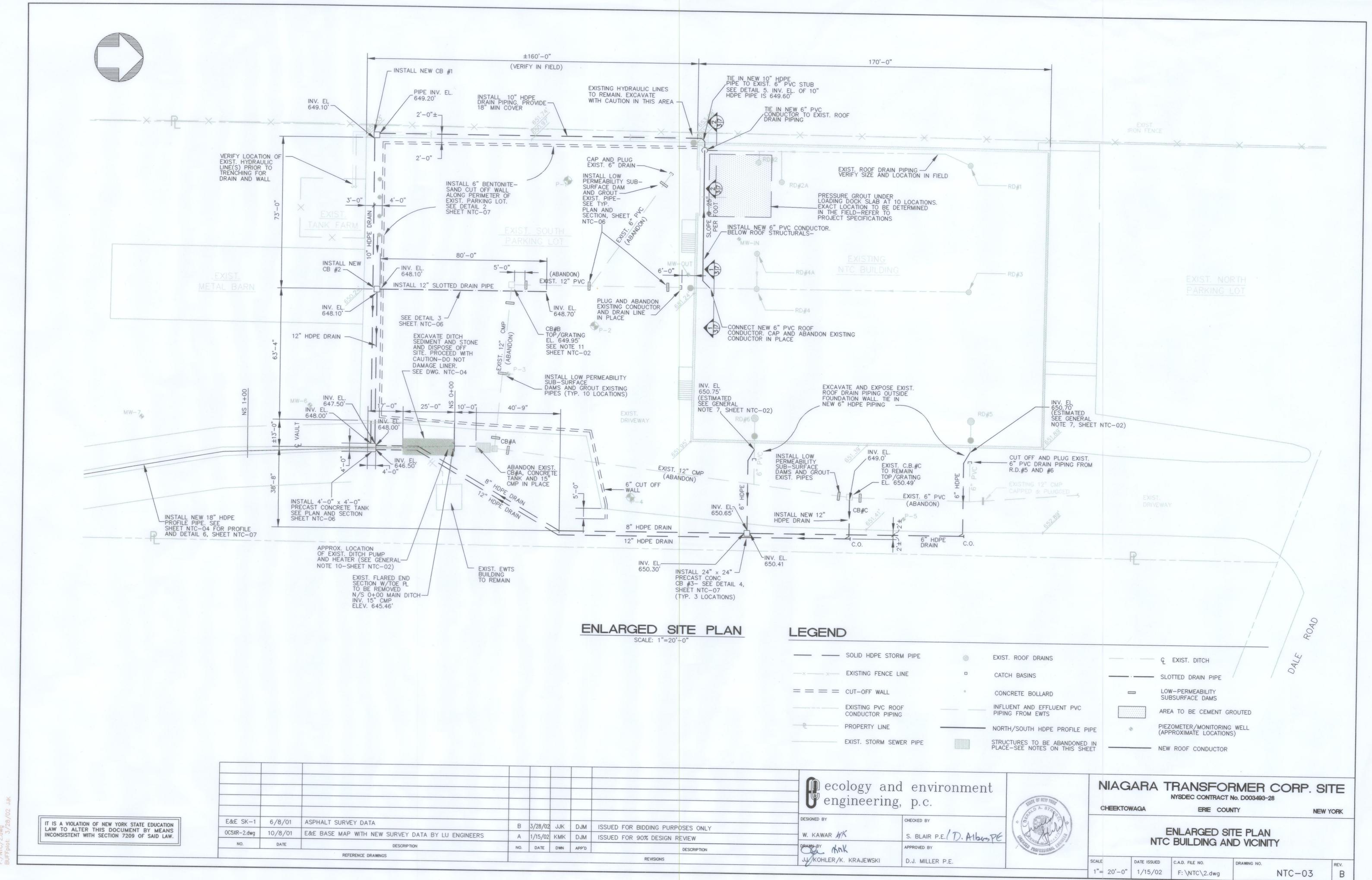
NTC-01

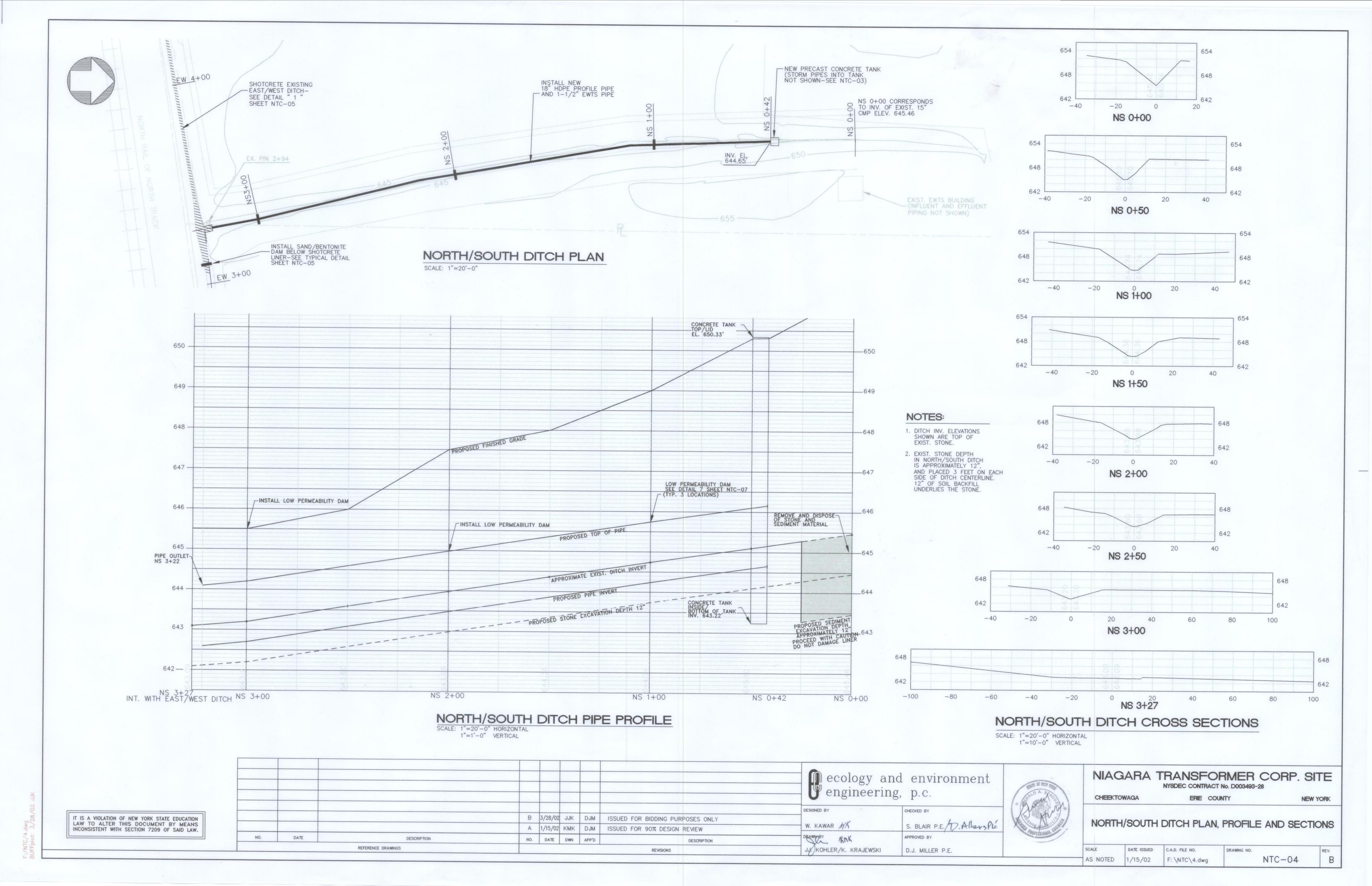
NIAGARA TRANSFORMER CORP. SITE
NYSDEC CONTRACT No. D003493-28

ERIE COUNTY

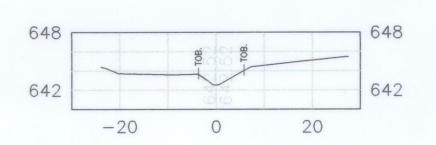
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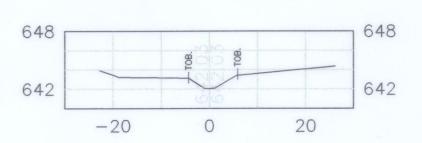




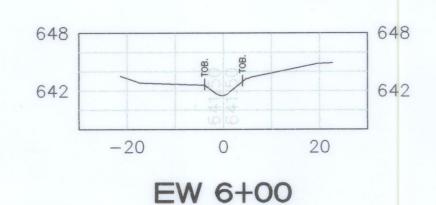






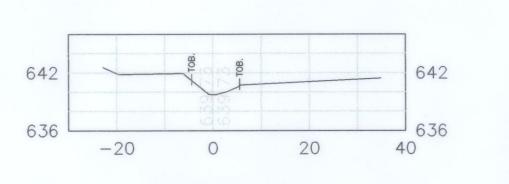


EW 5+00





EW 4+00



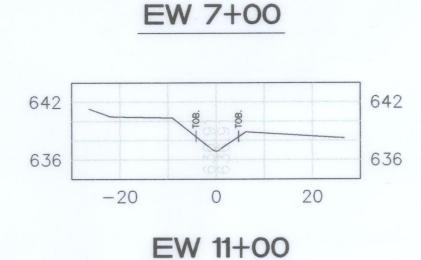
EW 8+00

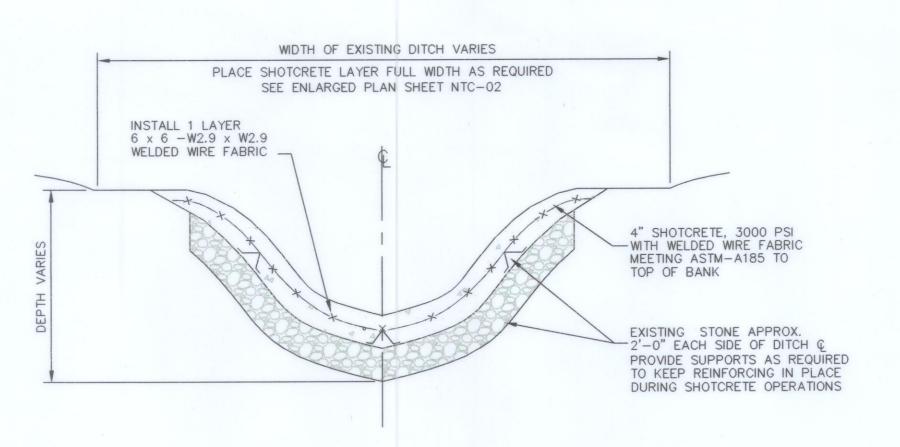


EW 9+00



EW 10+00



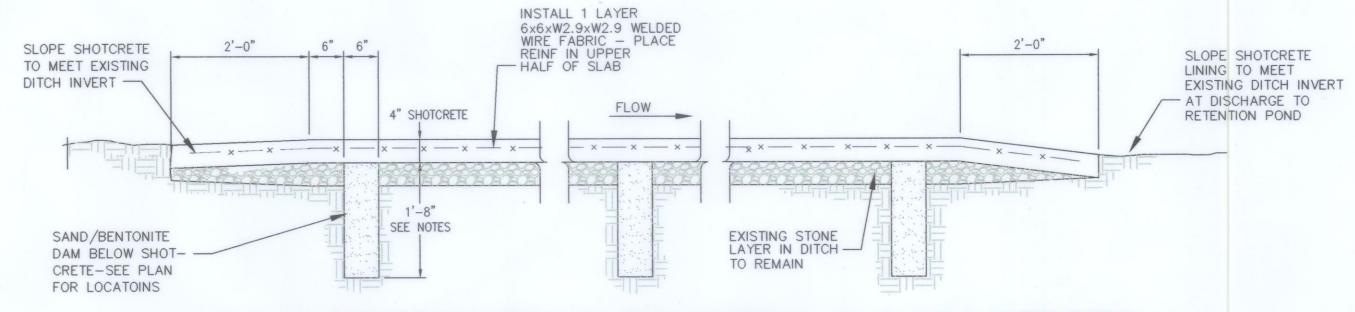


EAST/WEST DITCH CROSS SECTIONS

SCALE: 1"=20'-0" HORIZONTAL; 1"=10'-0" VERTICAL

- 1. DITCH ELEVATIONS SHOWN ARE TOP OF EXISTING STONE.
- 2. VERIFY ALL EXIST. CONDITIONS PRIOR TO START OF WORK.

3. TOP OF BANK (TOB.) INDICATES EXTENT OF SHOTCRETE ON DITCH BANKS. INSTALL 1 LAYER

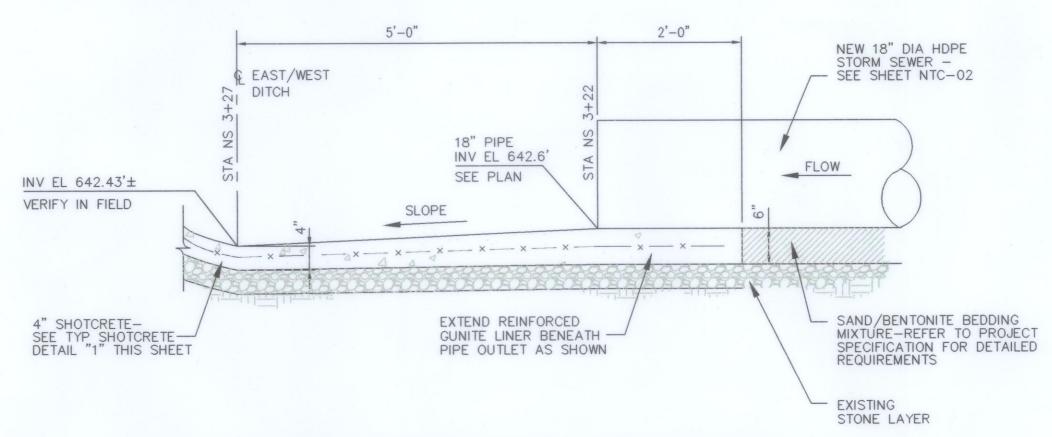


TYPICAL SAND/ BENTONITE DAM DETAIL IN EAST WEST DITCH

SCALE: 3/4" = 1'-0"

NOTE:

1. VERIFY DEPTH OF EXISTING STONE LAYER IN DITCH PRIOR TO START OF WORK. STONE DEPTH IS ASSUMED TO BE 6" TO 8". 2. EXTEND SAND/ BENTONITE DAM THROUGH ENTIRE DEPTH OF STONE AND 12" INTO NATURAL UNDISTURBED MATERIAL.

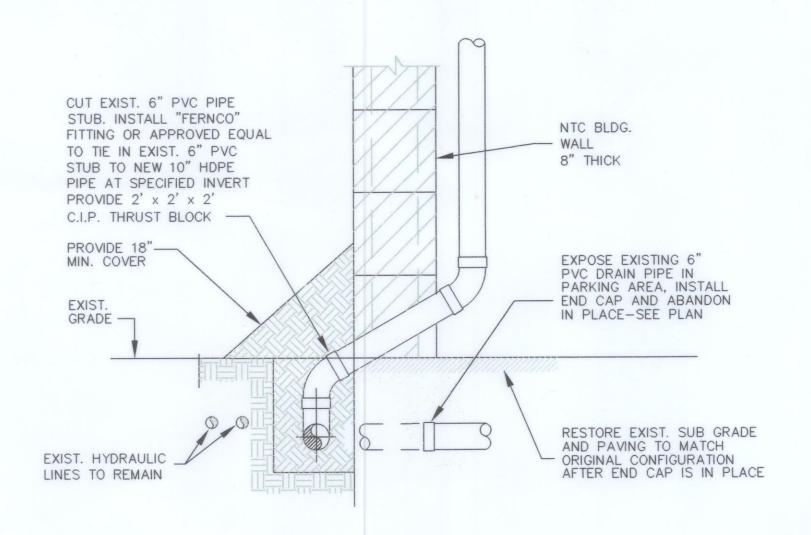


SHOTCRETE DETAIL "1"

SCALE: 1"=1'-0"

NOTE:

1. ENSURE COMPLETE ENCASEMENT OF WIRE FABRIC WITH SHOTCRETE.



AREA OF ROOF DRAIN CONNECTION DETAIL "5"

NOTE:

1. DEPTH OF EXIST. ROOF DRAIN CONNECTION IS UNKNOWN. EXCAVATE AND EXPOSE PIPE STUB, DETERMINE ELEV RELATIVE TO NEW CATCH BASIN AND NOTIFY ENGINEER. PROCEED WITH CAUTION DURING EXCAVATION IN THIS AREA.

NORTH/ SOUTH STORM SEWER OUTLET DETAIL SCALE: 3/4" = 1'-0"

ecology and environment engineering, p.c. DESIGNED BY B 3/28/02 JJK DJM ISSUED FOR BIDDING PURPOSES ONLY S. BLAIR P.E. / D.P.A. Buspe W. KAWAR WK A 1/15/02 KMK DJM ISSUED FOR 90% DESIGN REVIEW APPROVED BY NO. DATE DWN APP'D DESCRIPTION DESCRIPTION DATE NO. D.J. MILLER P.E. KOHLER/K. KRAJEWSKI REVISIONS REFERENCE DRAWINGS



NIAGARA TRANSFORMER CORP. SITE NYSDEC CONTRACT No. D003493-28

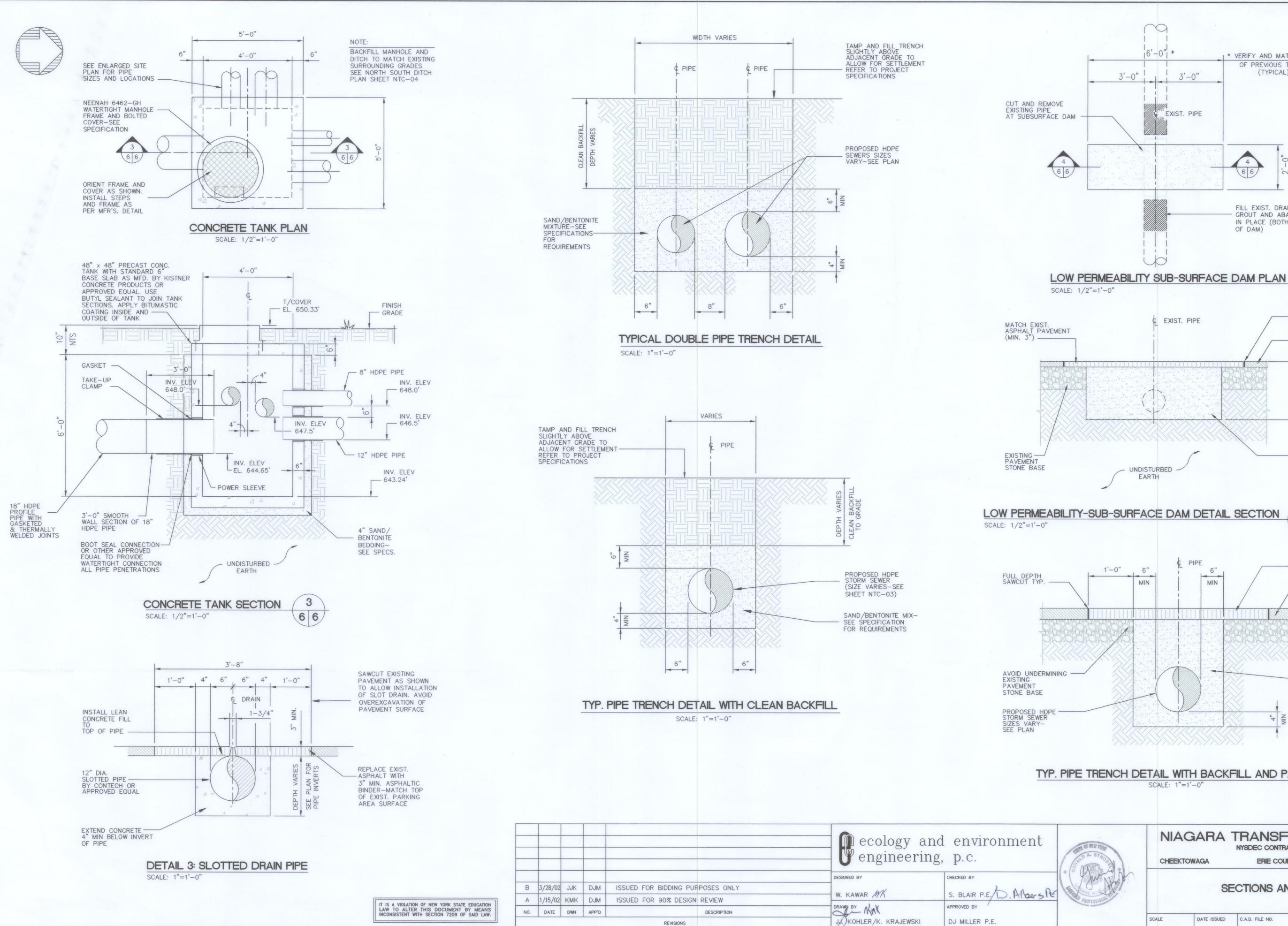
ERIE COUNTY CHEEKTOWAGA

NEW YORK

EAST/WEST DITCH SECTIONS AND DETAILS

DATE ISSUED C.A.D. FILE NO. DRAWING NO. NTC-05 1/15/02 F: \NTC\4.dwg

LAW TO ALTER THIS DOCUMENT BY MEANS INCONSISTENT WITH SECTION 7209 OF SAID LAW.



REVISIONS

TYP. PIPE TRENCH DETAIL WITH BACKFILL AND PAVING NIAGARA TRANSFORMER CORP. SITE NYSDEC CONTRACT No. D003493-28 **ERIE COUNTY NEW YORK SECTIONS AND DETAILS 1** C.A.D. FILE NO. DRAWING NO. DATE ISSUED SCALE NTC-06 NOTED 1/15/02 F: \NTC\DETAILS1

DJ MILLER P.E.

* VERIFY AND MATCH LIMIT

OF PREVIOUS TRENCH

(TYPICAL)

FILL EXIST. DRAIN WITH

GROUT AND ABANDON

OF DAM)

IN PLACE (BOTH SIDES

FULL DEPTH -SAWCUT TYP.

EXIST. 3"

-ASPHALT PAVEMENT

SAND/BENTONITE MIXTURE-PLACE BELOW EXISTING PIPE INVERT

EXCAVATION/BEDDING

MATERIAL OR BOTTOM OF STONE WHICHEVER IS GREATER

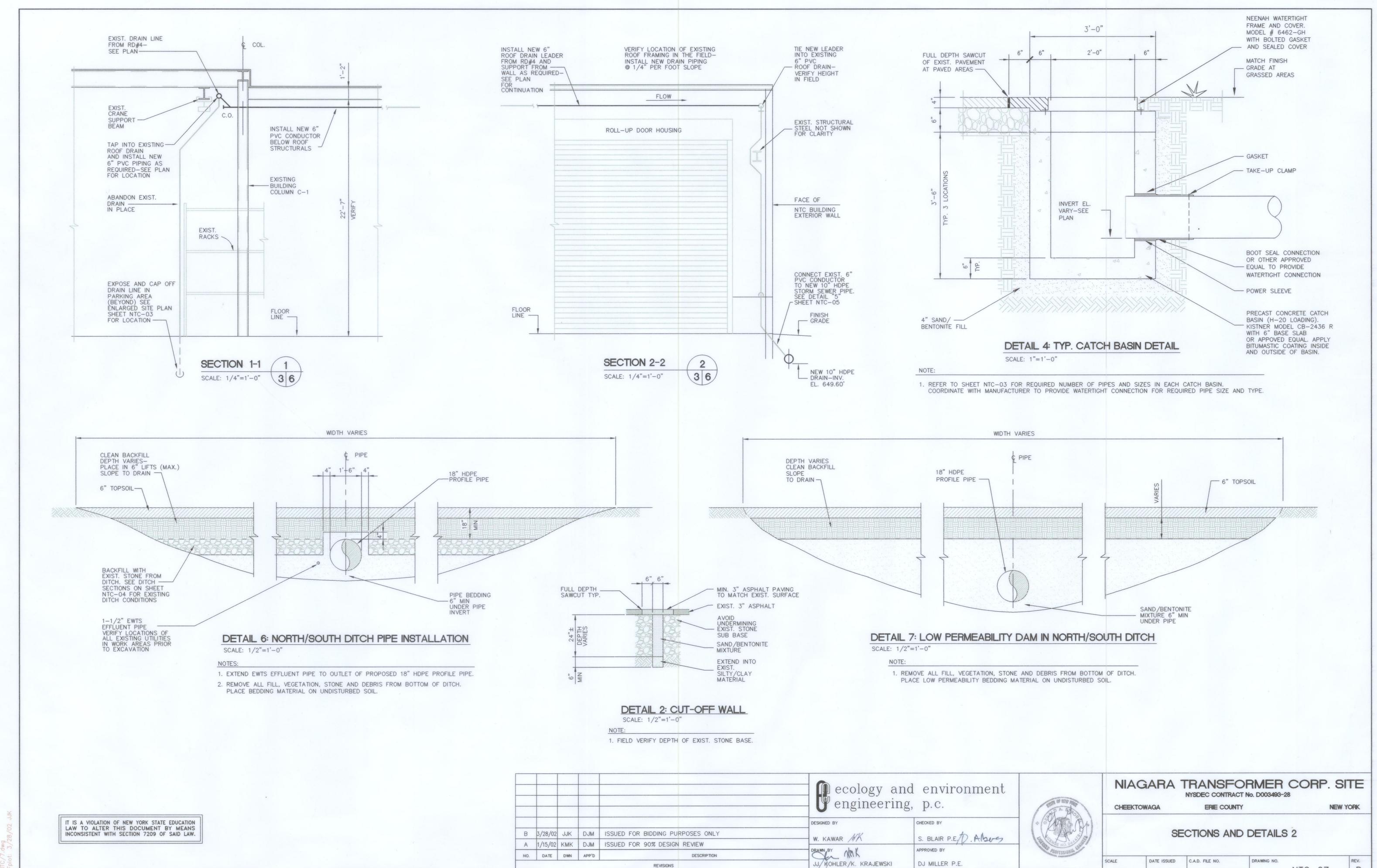
MATCH EXIST. ASPHALT PAVEMENT

- ASPHALT PAVEMENT

BACKFILL PIPE AND EXCAVATION WITH SAND/BENTONITE MIXTURE

EXIST. 3"

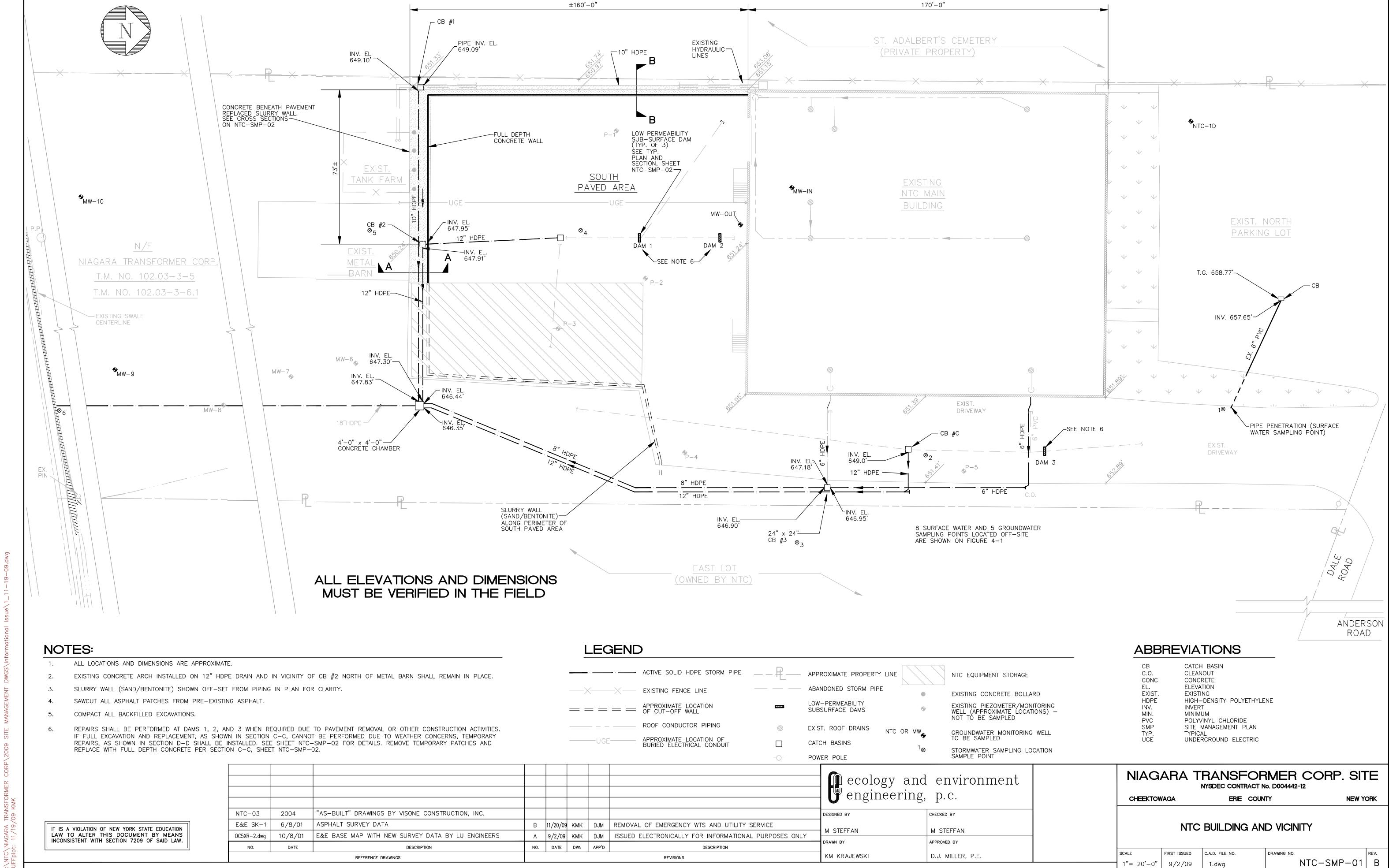
- MATCHING LIMIT OF PREVIOUS

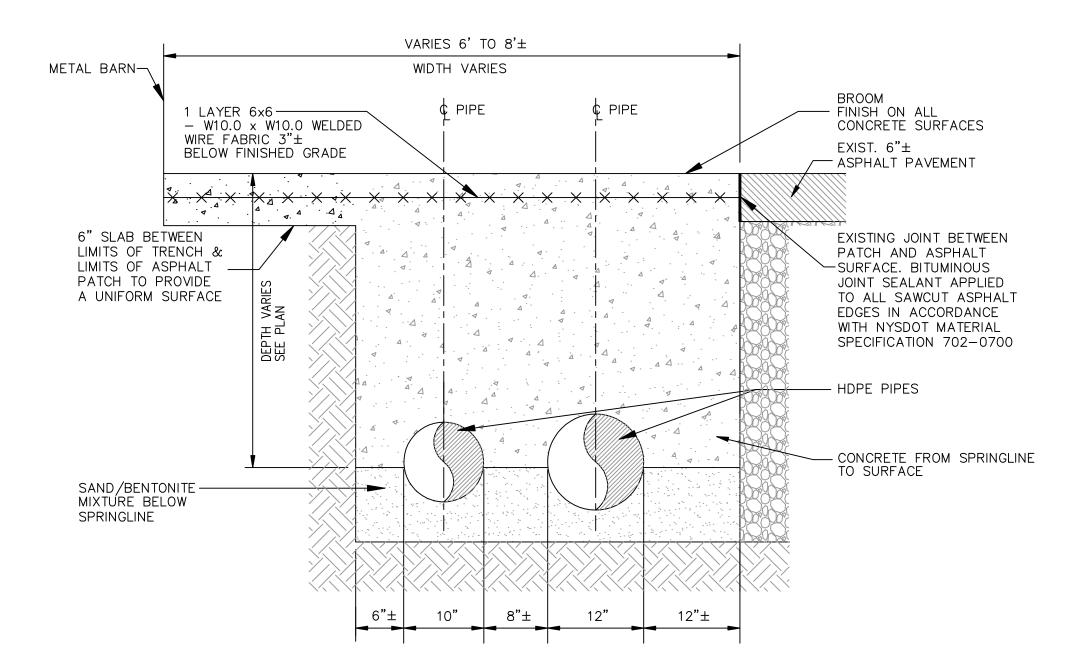


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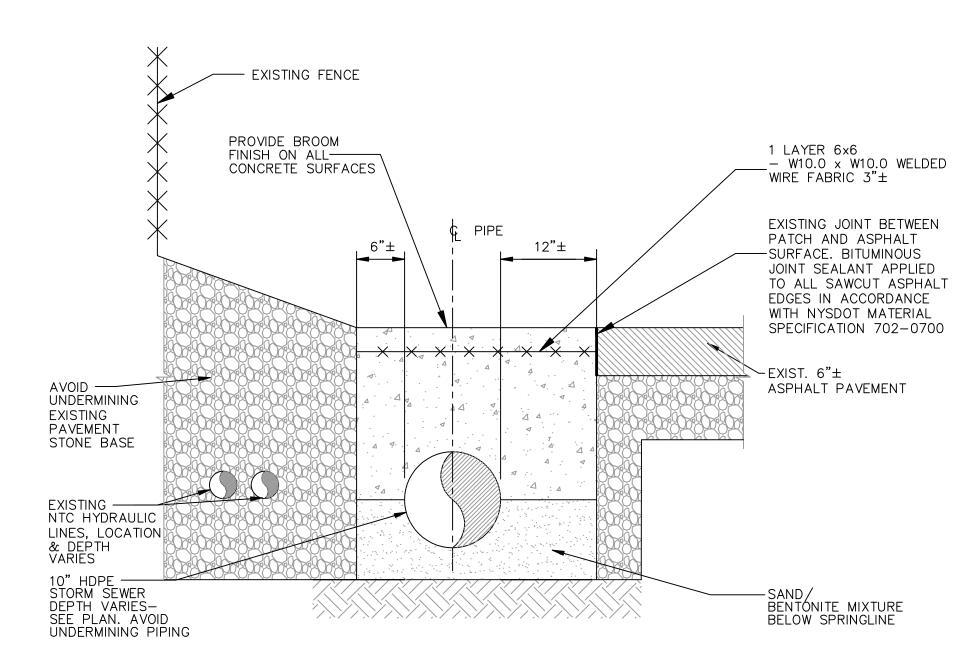
NOTED





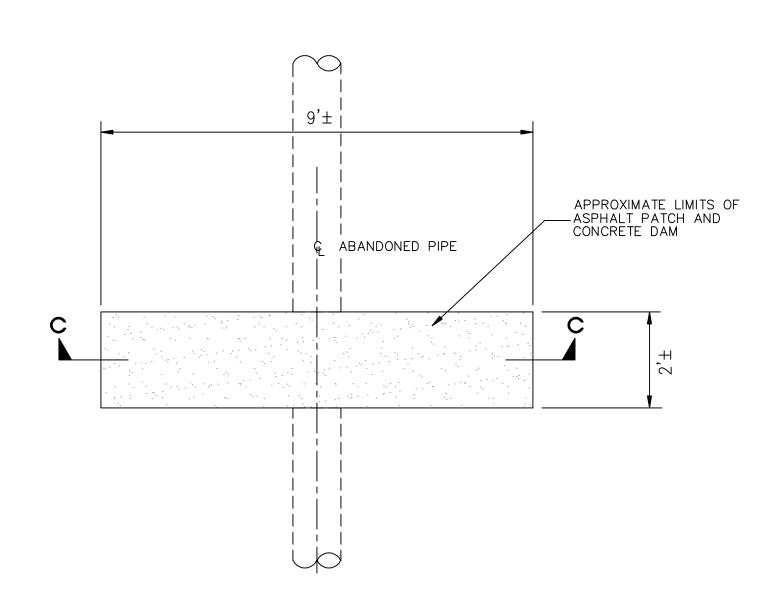
DOUBLE PIPE TRENCH DETAIL SECTION A-A

SCALE: 1"=1'-0"



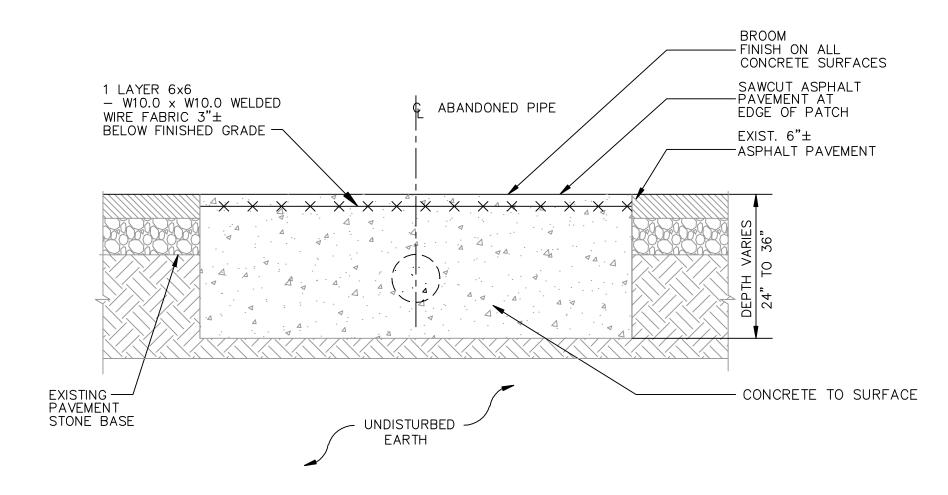
SINGLE PIPE TRENCH DETAIL SECTION B-B

SCALE: 1"=1'-0"



LOW PERMEABILITY SUB-SURFACE DAM PLAN

SCALE: 1/2"=1'-0"



LOW PERMEABILITY-SUB-SURFACE DAM SECTION C-C

SCALE: 1/2"=1'-0"

NOTE:

1. AS-BUILT CONDITIONS **MUST** BE VERIFIED PRIOR TO ANY REPAIR WORK

GENERAL NOTE:

- 1. SAND/BENTONITE MIXTURE IS REFERRED TO AS SLURRY WALL.
- 2. IF PAVEMENT REPAIRS CANNOT BE COMPLETED DUE TO WEATHER, INSTALL TEMPORARY REPAIRS UNTIL WEATHER PERMITS PERMANENT REPAIRS.

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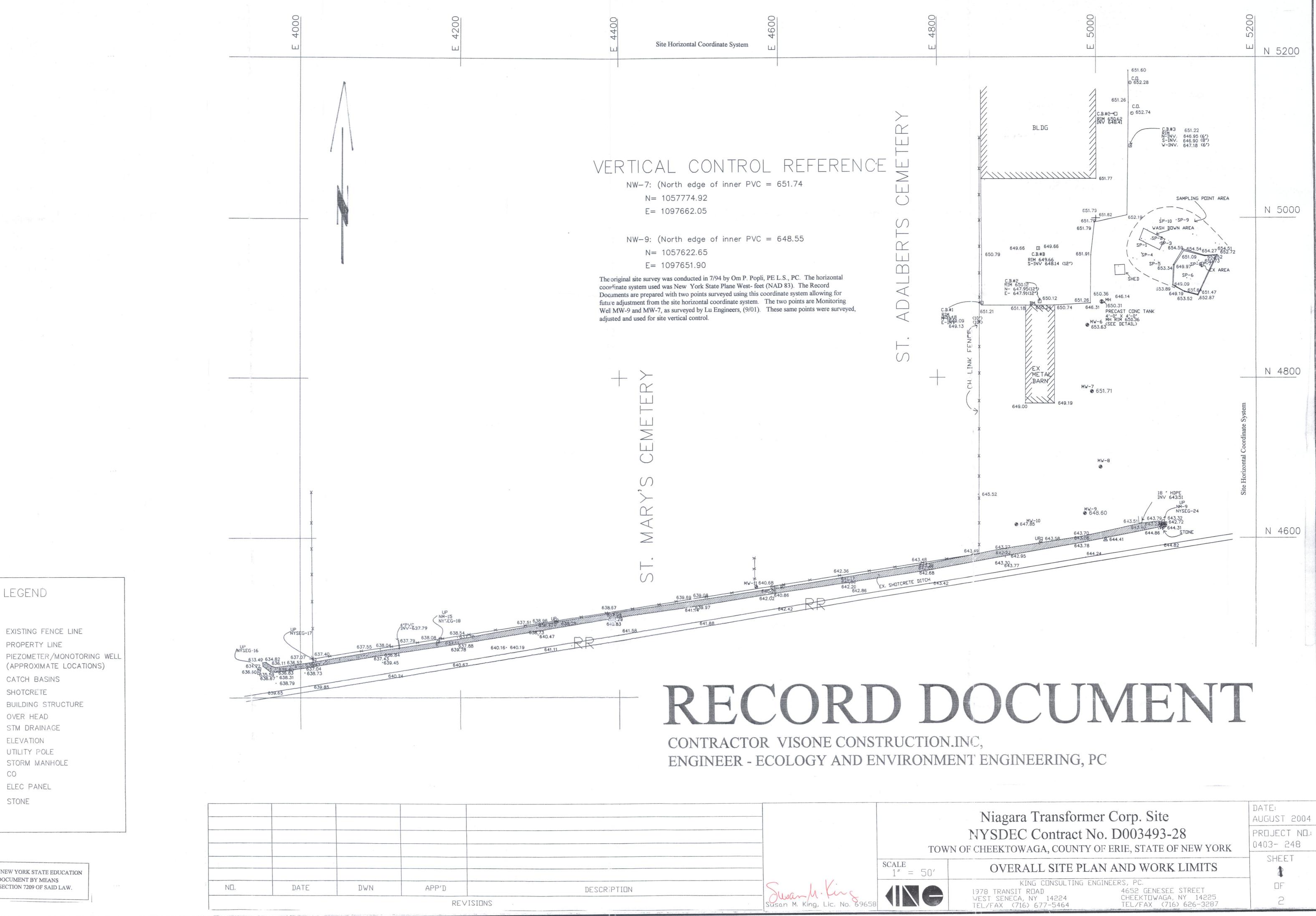
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B 11/20/09 KMK MGS ISSUED ELECTRONICALLY FOR INFORMATIONAL PURPOSES ONLY	
A 9/2/09 KMK DJM ISSUED ELECTRONICALLY FOR INFORMATIONAL PURPOSES ONLY	
NO. DATE DWN APP'D DESCRIPTION DRAWN BY APPROVED BY	
REVISIONS KM KRAJEWSKI DJ MILLER, P.E.	

NIAGARA TRANSFORMER CORP. SITE
NYSDEC CONTRACT No. D004442-12

CHEEKTOWAGA ERIE COUNTY NEW YORK

DESIGN SECTIONS AND DETAILS

SCALE FIRST ISSUED C.A.D. FILE NO. DRAWING NO. NTC-SMP-02 B

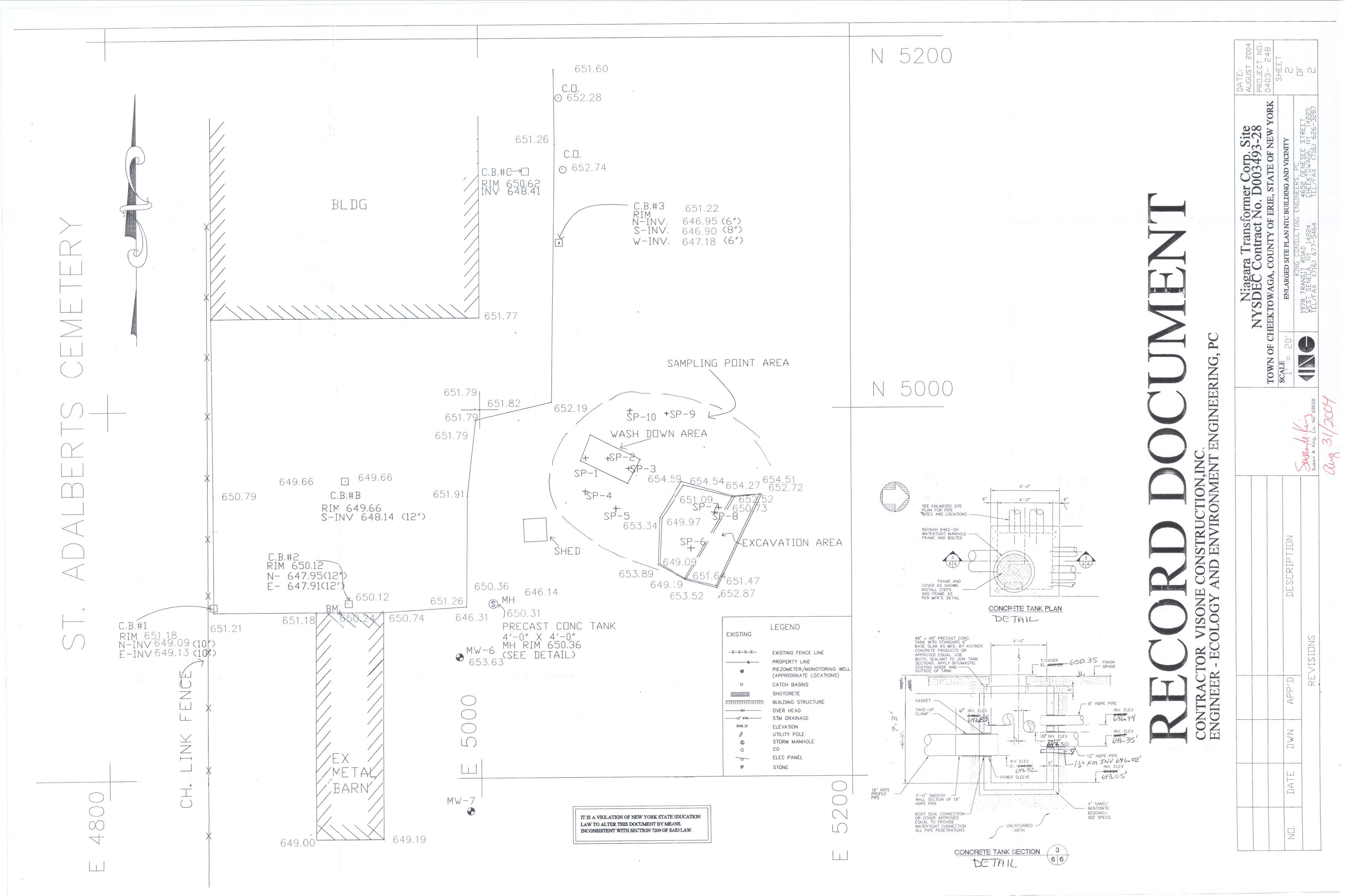


EXISTING

-X-X-X-X-

ELEVATION

STONE





Soils Management Plan

NIAGARA TRANSFORMER CORPORATION GENERIC SOILS MANAGEMENT PLAN

1. Introduction

This Generic Soil Management Plan (G-Soil MP) has been prepared for use in conjunction with the Niagara Transformer Corporation (NTC) Site Management Plan (SMP). The purpose of this G-Soil MP is to provide guidance for the proper handling and final disposition of polychlorinated biphenyl (PCB) -contaminated sediments and materials excavated in and around the site. Any proposed maintenance of drainage structures, including asphalt pavements; excavation of existing soils, including sub-base materials and sub-floor slab materials; and decommissioning of monitoring wells/piezometers and other subsurface utilities must be evaluated for the potential to expose PCBs or other contaminants to the environment. These activities must be performed in accordance with this G-Soil MP and the established and approved Institutional Controls and Engineering Controls (IC/EC) presented in the NTC SMP. A Site-Specific Soil MP (Soil MP) must be prepared using, as a minimum, the requirements of this G-Soil MP. The NTC east property is included in the G-Soil MP based on information submitted by NTC and obtained from NYSDEC indicating the presence of PCB contamination.

When excavation or maintenance activities are planned in the areas of the NTC Site where sediments or soils may be contaminated with PCBs, adequate personal protective equipment must be used to prevent exposure to potentially contaminated soil. A work plan must be prepared that addresses the methods of excavation or maintenance, precipitation runoff and groundwater control, handling and storing of the contaminated sediment or excavated materials on site, and the proper transportation and disposal of the sediment or excavated material. The testing and analytical requirements must be described in detail as part of the work plan. In addition, a Health and Safety Plan (HASP) and specifications and drawings must be prepared and submitted to the New York State Department of Environmental Conservation (NYSDEC) for their comment and approval prior to performing any maintenance activities or excavations within these potentially contaminated areas.

2. Sediment

Sediments at the NTC Site are associated with catch basins, storm sewers, other surface drainage structures, and roof runoff structures (e.g., downspouts, gutters).

3. Excavated Material

Soils and materials excavated from certain areas of the NTC Site are considered to be contaminated with PCBs, while materials from other areas either have not been exposed

to PCBs or consist of clean soil used to backfill areas where contaminated material was excavated. Excavated soils and other materials at the NTC Site are classified as follows:

- a. **Probably contaminated:** Any materials from future excavations within the limits of the south paved area and the slurry wall and the interior of the main building. These materials include asphalt pavement material, the pavement base materials, sub-grade materials, materials generated by the decommissioning of monitoring wells and piezometers, soils on the NTC east property lot, concrete slabs and structures, clay dams, the bentonite/sand mixture wall installed around the perimeter of the south paved area and other soil materials located within the boundaries of the south paved area, and all materials beneath the main building concrete floor slab regardless of the depth of excavation.
- b. **Probably not contaminated:** All materials from other proposed excavations located outside the perimeter of the south paved area, including the paved parking area north of the main building, the driveway leading to the south paved area, and the area between the south paved area and the railroad property.

4. Sediment and Excavated Material Handling

This section describes the minimum requirements that must be followed when handling PCB-contaminated sediments and excavated materials at the NTC Site, including the east property. Additional requirements may be added as necessary for the Site-specific Soil MP.

- a. All maintenance activities and excavations should be completed during non-precipitation events unless these activities must be performed immediately. A water-handling and treatment plan must be developed for inclusion into the Soils MP as a contingency in the event that emergency maintenance or excavation activities must be performed during a precipitation event.
- b. Prior to performing any maintenance or excavation activity, samples of the affected sediments and excavated materials (either new or from an existing stockpile) must be submitted to a laboratory for analysis (a) to determine the appropriate disposal method and (b) for waste characterization and profiling for disposal. The analysis must be performed by a laboratory certified by the National Voluntary Laboratory Accredited Program (NVLAP). If, in the opinion of NYSDEC, the materials are considered free of contamination, then the materials may be handled by standard construction means and methods and in conformance with the erosion and sediment control plan (E&SCP) or Storm Water Pollution Prevention Plan (SWPPP) prepared by NTC and approved by NYSDEC.
- c. Transport of sediments and excavated materials must be performed using approved watertight containers. Dump trucks may be used as the container if their beds are lined with 40-mil polyethylene or an approved equivalent.

- d. Waterproof containers such as roll-offs and drums should be used to store sediments and excavated materials. However, as an option for small quantities of materials, sediments and excavated materials may be stored on a 40-mil polyethylene base sheet and covered with a waterproof cover when not being added to or removed.
- e. Non-contaminated drainage from the waterproof cover must be directed away from the stockpiled soils suspected of being contaminated with PCBs and collected in a water-tight sump for observation or analysis prior to being manually discharged to an on-site ditch or drainageway.
- f. Uncontaminated soil must not come into contact with sediments and excavated materials. If the uncontaminated soil comes into contact with the stored sediments and excavated materials, these soils also must be considered contaminated
- g. Contaminated materials should be stored on site for as short a period as possible prior to disposal. In no event should the materials be stored for longer than 90 days.
- h. Transport of PCB-contaminated sediments and excavated materials shall be provided by a certified transportation company that can ship either hazardous waste or solid wastes.
- Disposal of contaminated sediments and excavated materials shall be at an approved disposal facility. Sampling and analysis shall be performed as described in the NTC SMP. Additional requirements of the company receiving the waste shall also be followed.

5. Backfill Materials

All backfill materials shall be obtained from an approved source, free of all contaminants per NYSDEC TAGM 4046 criteria, and suitable for the intended purpose. Analytical results are to be provided to demonstrate acceptability of the materials.

a. Backfill material used within the south paved area (the paved area within the slurry wall boundaries), the driveway, and other paved areas must be well-graded crushed stone and placed and compacted to fully support the frequent truck traffic. As part of the Engineering Controls described in the NTC SMP, the pavement in these paved areas must remain sealed to prevent the accumulation of water beneath the pavement surface, which would result in frost heave conditions and early pavement failure. This situation could allow the migration of PCBs off the site.

- b. Backfill material used around sewers and other below-grade features in the south paved area shall be placed and compacted such that no voids will result and full support will be provided to the below-grade feature and the pavement structure in the vicinity of the below-grade feature.
- c. Backfill material used under the main building's floor slab must be well-graded crushed stone and placed and compacted to support the anticipated loadings within the building.
- d. Backfill used in other areas, such as the undeveloped NTC east property, shall be material appropriate for that area's use.

If the slurry wall needs to be replaced or rehabilitated, the slurry shall consist of a sand/bentonite mixture consisting of the following design mix: 10% bentonite, 90% sand or when hydrated. The permeability of the mixture after mixing and setting up shall equal 1×10^{-9} cm/s.

6. Backfill Placement

- a. Backfill used beneath pavements shall be placed on a prepared subgrade in 6-inch lifts and compacted to 95% of the maximum dry density per ASTM D1557 for modified Proctor. The combined thickness of the lifts shall be at least the same as the thickness of the existing fill.
- b. Backfill used in unpaved areas must be compacted as necessary and be suitable for the intended end use of the area being backfilled.

Surface Water/Stormwater Sampling Plan

Surface Water/Stormwater Sampling Program Niagara Transformer Corporation (NTC) Site NYSDEC Site No. 9-15-146

Cheektowaga, New York Project: 002700.DC12 - Task 4

Prepared by: Mahesh Kunapuli, Ecology and Environment Engineering, P.C.

Reviewed by: Mike Steffan, EEEPC Work Assignment Project Manager - NTC

Accepted for Use:

Revisions:

Dated:	Revisions:	By:

1.0 Objective

This sampling plan was designed to identify the source(s) of polychlorinated biphenyl (PCB) contamination in surface water/stormwater (referred to herein as precipitation/storm-water runoff) collected at the Niagara Transformer Corporation (NTC) site, located 1747 Dale Road, Cheektowaga, New York 14225.

The field effort includes sampling for the following:

- PCBs
- Oil and grease (hexane extractable materials, or HEM)
- Total suspended solids (TSS)
- Total dissolved solids (TDS)

Data obtained from the sampling effort will be analyzed to determine whether there is a spatial correlation between the distribution of PCBs, suspended solids, and the sampling locations.

The New York State Department of Environmental Conservation (NYSDEC) may compare the data obtained from this surface water study to the remedial goals set forth in the Record of Decision (ROD) for the NTC Site to identify potential future modifications of the ROD. In addition, the data may be used to justify any future Intermediate Remedial Measure (IRM) or other remedial actions at the site, if deemed necessary by the NYSDEC.

2.0 Approach

2.1 Stormwater Program

Specific criteria for stormwater have been established by the United States Environmental Protection Agency (EPA) to ensure a build-up of pollutants during the dry weather intervals, that

adequate flow would dislodge and discharge the build-up of pollutants, and to ensure that the runoff would be "representative" (i.e., typical for the area in terms of intensity, depth and duration). The criteria for the type of precipitation runoff event that can be sampled are:

- The amount of precipitation must be greater than 0.41 inch over a 4- to 6-hour period; and
- The precipitation event must be preceded by at least 72 hours of dry weather.

Precipitation runoff from the site flows into the East/West (E/W) ditch along the southern boundary of the Niagara Transformer site and ultimately enters the retention pond located south of the former Thruway Plaza (Harlem Road and Walden Avenue) and north of the CSX rail lines.

The storm water sampling program will comprise semi-annual events, with sampling at 14 locations (plus collection of quality assurance/quality control [QA/QC] samples) during each sampling event. Efforts will be made to collect surface water samples from the NTC site during the "first-flush" (i.e., within the first hour of the storm event after a dry period). Off-site samples will be collected during or shortly after the storm event. The samples will be analyzed for PCBs, TSS, TDS, and oil and grease (i.e., hexane extractable materials [HEM]). The collection of samples from additional locations and media (i.e., wipe samples, soils, and/or sediments) may be required by NYSDEC based on the analytical data obtained during the specific Stormwater Program.

In addition to the collection of storm water samples, the consultant will collect field measurements (weir width, and depth of flow and velocity in pipes and ditches) to estimate the flow rate of storm water from each of the three study reaches in the E/W ditch and the retention basin outlet weir. The E/W ditch channel cross section can be best described as parabolic, and open-channel flow equations for a parabolic profile will be used to calculate the flow rate. The velocity head rod method will be used to estimate velocities in the three study reaches of the E/W ditch. However, the velocity head rod method is applicable only for velocities between 1.5 feet per second (ft/sec) and 10 ft/sec; for velocities above and below that range, the float method will be used to estimate the velocities of water in the E/W ditch. The measured velocity will then be multiplied by the cross-sectional area of the ditch to calculate the flow rate. To estimate the flow rate over the weir, depth and width measurements of the flow over the weir will be measured in the field. The measured flow rate and PCB concentrations will be used to determine mass loadings of PCBs (see estimated flow calculations in Attachment A). Additional reference guidance documents for measuring stream velocity and flow calculations include the following:

- U. S. Department of the Interior (U.S.DOI). 1980. Construction and Use of A Head Velocity Rod for Measuring Stream Velocity and Flow. Bureau of Land Management Technical Report 5. June 1980.
- U. S. Department of the Interior (U.S. DOI). 1981. *Water Measurement Manual*, 2nd Edition. Bureau of Reclamation.
- West Virginia Department of Environmental Protection. 2009. *Manual on Velocity Head Rod Method for Measuring Stream Flow*. Division of Water and Waste Management, Save Our Stream Program.
- ISCO, Inc. 1997. *ISCO Open Channel Flow Measurement Handbook*, 5th Edition, Lincoln, Nebraska...

■ U.S. Environmental Protection Agency (EPA). 1992. *NPDES Storm Water Sampling Guidance Document*. Office of Water. EPA Document 833-8-92-001. July 1992.

Sampling Locations

The sampling locations for the storm water study (see Figure 1) were identified in the Work Plan for this site (EEEPC 2006). Samples will be collected as follows:

- One sample from the PVC outfall at the east driveway, where surface water is collected from the NTC front parking lot (storm water sampling location 1);
- One sample from each of the four upstream catch basins on the NTC site (locations 2, 3, 4, and 5);
- One sample from the 18-inch outfall from the NTC site to the E/W ditch (location 6);
- One sample from the upstream edge of the shotcreted swale at the outfall of the E/W ditch (location 7);
- One sample from the E/W ditch at the upstream edge of NTC's eastern wooded lot (location 8);
- One sample from the "head" of the E/W ditch, near the railroad access drive/moving company lot east of the NTC site (location 9);
- One sample from the electrical substation drainage located to the east of the NTC site (location 10);
- One sample from each of two known "point" drainage discharges (as opposed to overland flow to ditch) from adjacent cemetery upstream of the retention pond to assess potential impact from point sources (locations 11 and 12);
- One sample from the Thruway Plaza retention basin inlet (location 13); and
- One sample from the Thruway Plaza retention basin outlet at weir (location 14).

2.2 Surface Water Program

The sampling locations for the surface water are identified in Figure 1 in the Work Plan for this site (EEEPC 2006). Samples at a minimum will be collected from the follows locations at the same time groundwater and sediment samples are taken:

- One sample from the 18-inch outfall from the NTC site to the E/W ditch (location 6); and
- One sample from the Thruway Plaza retention basin inlet (location 13).

Where surface waters are flowing during the sampling event additional locations as selected by the NYSDEC representative may be performed. Locations similar to the Stormwater samples locations should be used as guidance.

3.0 Methodology

The consultant's field personnel shall sign in at the NTC reception area in the NTC main building (see Figure 1) before accessing the site, and they shall sign out before leaving the site for the day. Adequate protective clothing (e.g., gloves, rain boots, rain suits, safety goggles, reflective vests, etc.) will be used during the sampling events in accordance with the site-specific Health and Safety Plan (see Appendix L of the Site Management Plan).

The surface water and stormwater sampling will be conducted in accordance with the EPA's *NPDES Storm Water Sampling Guidance Document* (EPA 1992). Unfiltered samples will be collected from under the water, with the sample bottles/collecting devices facing upstream. Sample bottles/collection devices will be positioned upstream of the collector, and disturbance of the substrate will be avoided.

Two 1-liter (L) amber sample bottles for PCBs, one 1-L amber sample bottle for HEM, and two 500-milliliter (mL) poly bottle for TSS/TDS will be filled at each sampling location, either directly or by using a dedicated sample collection device. When the depth of flow and the shape of the bottle do not prevent it, samples for HEM will be taken with the sample bottle itself and not the sample collection device as per the *NPDES Storm Water Sampling Guidance Document*. This surface water and stormwater sampling effort will include the collection of one field duplicate sample (FDUP) for quality control, one matrix spike (MS), and one matrix spike duplicate (MSD)(only for PCBs). Selection of a location for these FDUP, MS, and MSD samples will be determined by the field personnel during sampling. Collection of a rinsate sample is not required since the sampling bottles will be filled either directly or by the use of a dedicated sample collection device for each sampling location.

Sample nomenclature will be as printed on the chain-of-custody form (see Attachment B), e.g., MMYY-NTC-SW-Location Number, and with a suffix of FDUP, MS, or MSD for the QA/QC samples. The samples will be submitted to a laboratory for the following analyses:

- Low-level detection limits of PCBs by EPA method 8082, reporting limit less than 0.065 parts per billion (ppb);
- TSS by SM2540 D;
- TDS by SM2540 C; and
- Oil and Grease (HEM) by EPA method 1664A.

Precautions should be taken to prevent cross-contamination during the sampling program, including the labeling of all containers and the use of new gloves at each sampling location. To prevent cross-contamination of samples, surface water and stormwater sampling will proceed in general from the location of the lowest historical concentration to the location of the highest concentration, as established by the results of previous storm water sampling events. As described earlier, efforts will first be made to collect samples on-site, but in order based on historical concentration. The historic PCB concentrations (in $\mu g/L$) at each sample location, from NTCSW 1 through NTCSW 14, are provided in Table 1.

Historical Stormwater / Surface Water Analytical Results Niagara Transformer Corporation Site (μg/L)

Niagara Transformer Corporation Site (μg/L) Sampling Periods											
Compling Locations	October 2007 ¹	Sampling Periods	A mail 2000								
Sampling Locations	October 2007	April 2008 ¹	April 2009 ¹								
NTCSW – 1	0.051011	3.7	0.000111								
Aroclor - 1248	0.0510U	No sample	0.062UJ								
Aroclor -1260	0.202		0.36J								
NTCSW – 2											
Aroclor - 1248	0.303	0.050U	0.12UJ								
Aroclor -1260	0.430	1.7	1.9J								
NTCSW – 3											
Aroclor - 1248	0.0500U	0.50U	0.12U								
Aroclor -1260	0.155	5.6	4.1								
NTCSW – 4											
Aroclor - 1248	0.223	0.10U	0.063UJ								
Aroclor -1260	1.83	2.0	1.0J								
NTCSW - 5											
Aroclor - 1248	0.0500U	0.053U	0.063U								
Aroclor - 1248 Aroclor - 1260	0.171	0.053U	0.0030								
NTCSW – 6	V.1 / 1	0.0330	0.10								
Aroclor - 1248	0.0721	0.051U	0.13UJ								
Aroclor -1260	0.371	0.051U	3.7J								
NTCSW – 6D	37 1 1		0.1277								
Aroclor - 1248	No sampled	No sampled	0.13U								
Aroclor -1260			2.0J								
NTCSW – 7											
Aroclor - 1248	0.0549U	0.055U	0.063U								
Aroclor -1260	0.0561	0.055U	0.44								
NTCSW – 8											
Aroclor - 1248	0.0510U	0.056U	0.063U								
Aroclor -1260	0.0510U	0.056U	0.063U								
NTCSW – 9											
Aroclor - 1248	0.0549U	0.052U	0.065UJ								
Aroclor -1260	0.0712	0.052U	0.065UJ								
NTCSW - 10	0.0712	0.0320	0.002.00								
Aroclor - 1248	0.155	0.050U	0.066U								
Aroclor - 1240	0.0585	0.050U	0.047J								
NTCSW – 11	0.0303	0.0300	U.U+/J								
	0.0532U	0.055U	0.063U								
Aroclor - 1248											
Aroclor -1260	0.165	0.34	0.18								
NTCSW – 12	0.052611	0.05111	0.06511								
Aroclor - 1248	0.0526U	0.051U	0.065U								
Aroclor -1260	0.173	0.26	0.12								
NTCSW – 13											
Aroclor -1248	0.0532U	0.051U	0.062U								
Aroclor -1260	0.164	0.39	0.14								
NTCSW – 13D											
Aroclor - 1248	No sampled	0.051U	No sampled								
Aroclor -1260	•	0.38	1								
NTCSW – 14											
Aroclor - 1248	0.0526U	0.11U	0.062U								
Aroclor -1260	0.0526	0.11U	0.062UJ								
11100101 1200	0.0520	0.110	0.00203								

Key: J = Estimated value. U = Not detected at the reported value.

Note:

1 Analytical results provided by EEEPC.

Field personnel should review the previous sample documentation from the chain-of-custody forms before submitting the samples to the laboratory. Previous chain-of-custody forms are provided in Attachment B. Turbidity measurements will be collected for the field samples before the samples are submitted to the analytical laboratory, but these measurements do not have to be included on the chain-of-custody forms. Field information from the sampling event will be logged into the project log book by the Field Team Leader.

The prescribed method to calculate the velocity and flow rate in the three reaches in the E/W ditch is described below.

3.1 Velocity Head Rod Method

- 1. Place the ruler in the water with the sharp edge positioned upstream.
- 2. Record the depth of the water (normal depth).
- 3. Place the ruler sideways in the water, which will cause some turbulence and the water level to rise. Record the level again (turbulent depth).
- 4. Subtract the normal depth from the turbulent depth and this will be the "jump height."
- 5. Find the velocity corresponding to the "jump height" from Table 2.
- 6. Multiply the velocity by the cross-sectional area of the ditch to get the flow rate (cfs).

Table 2 Conversion Chart for Velocity Head Rod Measurements (from inches to ft/sec)

Jump (inches)	1/4	1/2	3/4	1	11/4	1½	13/4	2	21/4	21/2	23/4	3	4	5	6
Velocity (ft/sec)	1.2	1.6	2.0	2.3	2.6	2.8	3.1	3.3	3.5	3.7	3.8	4.0	4.6	5.2	5.7

If the velocity in the E/W ditch is less than 2.0 ft/sec, the float method, discussed below, shall be used to estimate the velocity.

3.2 Float Method (U.S. DOI 1981)

- 1. Choose a 100-foot section of ditch that is fairly uniform in depth and width.
- 2. Mark the zero point and the 100-foot point with a flag or stick. The 100-foot mark should be downstream from the zero point.
- 3. Take a float and place it a few feet up stream from the zero point, in the center of ditch.
- 4. Mark the time when the float hits the zero point, and mark the time when the float passes the 100-foot point.
- 5. Repeat the above process five to ten times and average the recorded times.

- 6. Divide the length of the ditch (100 feet) by the time (in seconds) to get the approximate surface water velocity.
- 7. Multiply the velocity by the cross-sectional area of the ditch to get the approximate flow rate (cfs).

4.0 Quality Assurance

There are no specific QA activities that apply to the implementation of this sampling procedure. However, the following general QA procedures apply:

- All data must be documented on field data sheets or within field or site logbooks;
- All instrumentation must be operated in accordance with operating instructions as supplied by the manufacturer unless otherwise specified in the work plan;
- Equipment checkout and calibration activities must occur prior to sampling or operation and must be documented; and
- All deliverables will receive independent data validation and consultant peer review prior to release

5.0 Project Logbook and Photo Documentation

The consultant will document the details of each site visit in a daily report. When photos of the site and/or sampling location conditions are taken they will be included in the daily and final reports. A logbook will be maintained to record any on-site activities. Data from each surface water sampling event will be forwarded to NYSDEC and summarized in a letter report. Copies of previously completed chain-of-custody forms are provided as Attachment B for the convenience of the field sampling team.

6.0 Sample Shipping

All collected samples will be shipped to the current laboratory under contract to perform these services. The laboratory currently (2010) approved for these analytical services is:

Mitkem Laboratories, Inc. 175 Metro Center Boulevard Warwick, Rhode Island 02886-755

Phone: (401) 732-3400

Project Manager: Shirley Ng

7.0 Sample Shipping Requirements

The requirements for shipping samples containing PCBs, TSS/TDS, and oil and grease (HEM) to labs outside the local area are provided in Attachment C. However, air shipment of samples containing detectable levels of PCBs is very expensive and highly regulated. Therefore, the sampling team leader should check with the analytical laboratory to determine whether land courier service can be used instead of packaging the samples per the DOT regulations in Attachment C and then shipping by FedEx. If possible, set up the analytical services with a local laboratory to reduce the high costs of packaging and shipping. If the only alternative is to ship

the samples, the samplers should obtain all packaging materials in advance of the sampling event.

Sampling events are performed with limited notice of a storm event. The sampling team should review and track potential rain events on either the Weather Channel Web site or local weather band channels. The Weather Channel link for Cheektowaga, New York, is: <a href="http://www.weather.com/outlook/travel/vacationplanner/local/USNY1642?lswe=cheektowaga%20ny&from=cheektowag

The sampling team should be prepared to mobilize with manpower and equipment, including sample containers, wet weather gear, and personal protective equipment, at least 24 hours in advance of a potential sampling effort.

8.0 Generic Site-Specific Health and Safety Plan

A generic site-specific health and safety plan (sHASP) has been prepared for long-term groundwater monitoring and reporting, operations & maintenance (O&M), and surface water/stormwater study. A copy of the generic sHASP is provided as Appendix L of the Site Management Plan. As conditions of the work assignment change over the time, the sHASP will be evaluated and amended by the consultant's work assignment project manager.

9.0 Report

The consultant will provide a summary report that outlines the methodology used for measuring and calculating flows, laboratory results and plots of sampling results, and comparisons of the results to earlier sampling events performed by a previous consultant. A laboratory analytical report, a local climate report, the chain-of-custody forms, a data usability summary report or independent data validation report, photo-documentation, and a sample location diagram will be included as appendices to the report.

10.0 Schedule

10.1 Stormwater

Stormwater samples will be collected on a semi-annual basis—two during consecutive spring storm events, and two during consecutive fall storm events. The collected samples will be shipped to the laboratory being utilized for this specific task. Independent analytical data validation review will be performed by the consultant upon receipt of the analytical results from the laboratory. The data usability summary report will be available for use in the reports.

10.2 Surface water

Surface water samples will be collected at the same time as the groundwater and sediment sampling events. In the event the outfall culvert and retention pond inlet are dry, then sampling during or after a storm event can be performed. The sampling should be performed as close as possible to the groundwater/sediment sampling event.

11.0 References

Ecology and Environment Engineering, P.C. (EEEPC). 2006. Work Plan for Operations and Maintenance Services – Niagara Transformer Corporation Site.

- ISCO, Inc. 1997. *ISCO Open Channel Flow Measurement Handbook*, 5th Edition. Lincoln, Nebraska.
- U.S. Department of the Interior (U.S. DOI). 1980. *Construction and Use of A Head Velocity Rod for Measuring Stream Velocity and Flow*. Bureau of Land Management Technical Report 5. June 1980.
- ______. 1981. Water Measurement Manual, 2nd Edition. Bureau of Reclamation.
- U.S. Environmental Protection Agency (EPA). 1992. *NPDES Storm Water Sampling Guidance Document*. Office of Water. EPA Document 833-8-92-001.
- West Virginia Department of Environmental Protection. 2009. *Manual on Velocity Head Rod Method for Measuring Stream Flow*. Division of Water and Waste Management, Save Our Stream Program.

Figure 1 SAMPLE LOCATION MAP
NIAGARA TRANSFORMER CORP. SITE
SITE No. 9-15-146
CHEEKTOWAGA, N.Y.

Attachment A

Estimated Flow Calculations

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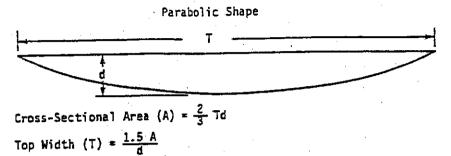
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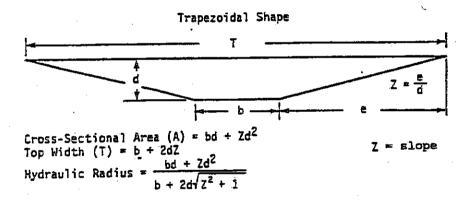
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Exhibit 2

Channel Geometry



Hydraulic Radius =
$$\frac{T^2d}{1.5T^2 + 4d^2}$$



Adapted from:

U.S. Department of Agriculture, Soil Conservation Service, Storrs, Connecticut.

Attachment B

Historical (October 2009) Chain-of-Custody Form

Chain of Custody Record



Client Information	Sampler: Rachael Moxle Max Marh	()	Lab PM: Tony Bogolin		Carrier Tracking No(s):	COC No: _1
Client Contact: Mike Steffan	Phone: (716) 624-80		E-Mail: tony bogolin@te	estamericainc.com		Page: 1
Company:	t vies do-1 oc		ion, sogom (g).	Analysis Reg	wastad	Job #:
Ecology & Environment, Inc Lancaster, NY Address:	Due Date Requested:			Allalysis Red	uesteu	Preservation Codes:
368 Pleasant View Drive City:	TAT Requested (days):					A - HCL M - Hexane B - NaOH N - None
Lancaster	28 (CD				C - Zn Acetate O - AsNaO2 D - Nitric Acid P - Na2O4S
State, Zip: NY, 14086						E - NaHSO4 Q - Na2SO3 F - MeOH R - Na2S2SO3
Phone: (716) 684-8060	PO#:		g			G - Amchlor S - H2SO4 H - Ascorbic Acid T - TSP Dodecahydrate
Email: msteffan@ene.com	W0#: RSI0734		5 3			i - ice U - Acetone J - Di Water V - MCAA
Project Name:	Project#: Niagara Transformer Site	002700 DC12 04	딕칠횗		all	K - EDTA W - ph 4-5 L - EDA Z - other (specify)
Niagara Transformer Site - 002700.DC12.04 Site:	SSOW#:	- 002100.DC12.04				Other:
Ecology and Environment NYSDEC Standby - NY5A9393.		Sample Matr			per	
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Chain of Custody Record



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Attachment C

FedEx Packaging and Shipping Requirements for Polychlorinated Biphenyls (PCBs) for Laboratories Outside the Western New York Area

Sample Shipping Polychlorinated biphenyls (PCBS) FedEx Variation

INFORMATION FOR SHIPPING PAPERS, PACKAGING and LABELING:

Proper Shipping Name Polychlorinated biphenyls

Class/Division

Identification Number UN2315

Packing Group

Subsidiary Risk None

Special Provisions/Authorizations FedEx Approval #0038

Reportable Quantity

Emergency Response Guide ERG 171

Primary Hazard Label MISCELLANEOUS

Subsidiary Hazard Label None

Handling Labels Orientation ("UP" (liquid only) Yellow "PCB" label (only if ≥ 50 ppm)

IATA Packing Instruction 907 – liquids (passenger) 911 – solids (passenger)

Max Net Qty/Inner Packaging
1 Liter – liquids

1 Liter – liquid 1 kg - solids

Max Net Qty/Package
1 Liter – liquids (passenger)
1 kg – solids (passenger)

UN Specification Packaging Code 4G/y

Applicable State Variations USG-04 & 13

Applicable Carrier Variations
None

Packing Requirements

DHL/Airborne will not accept Polychlorinated biphenyl (PCB) shipments. Shipments that are known or expected to contain measurable levels (ppm) of PCBs will be made via FedEx using IATA regulations.

This is a combination package consisting of a UN 4G fibreboard box marked with a DOT exemption (DOT-E-9168) as an outer container with a IP3 metal can as an inner container. FedEx limits the contents of the package to 1 liter for liquids or 1 kg for solids. They also require that the "DOT-E-9168" marking be covered.

Note: FedEx will accept ONLY the ALL PAK exemption combination package - they will NOT accept any other brand of 4G combination package.

A copy of the FedEx authorization letter 0038 must accompany the FedEx airbill.

If you have more than 1 pound of PCBs in the package, you must include "RQ" with the proper shipping name on the package and the declaration.

Compatibility

None

FEDERAL EXPRESS AIRBILL POLYCHLORINATED BIPHENYLS 4 G EXEMPTION PACKAGING

			TUBALL	11 1101112	CICAGING	٦ - '		
Passenger and Cargo Aircraft	Cargo Aircraft Only		Airport	of Departure	2		7	
Airport of Destinatio	n				····	Non- Radioactive Radioactive		
Nature and Quantity	of Dangerous Goods					T		1
	Dangerous Goo	ds Identific	ation		 			
Proper Sh	ipping Name	Class or Division	UN or ID No	Packing Group	Subsidiary Risk	Quantity and type of packing	Packing Inst	Authorization
If less than one pound Polychlorinated biph	d net: enyls – [liquid] [solid]	9	UN2315	II	,	L net* IP3 metal can in 4G	907**	FedEx Auth Letter 0038 (Attached) USG-04 & 13
f one pound or more RQ Polychlorinated l solid]			N.		-			
Additional Handling	Information		1					
2000 ERG #171			í					
	e Number (Required for	US origin o	r Destinatio	n Shipment	s			

^{*}L net for liquids, kg net for solids. **907 for liquids, 911 for solids

Polychlorinated Biphenyls 4G Exemption Packaging

	*
	Labels
Shipper/Consignee Addresses:	
Hazard Label:	Class 9 (Use the Class 9 label to cover the "DOT-E- 9168" marking)
Subsidiary Hazard Label:	None
Handling Labels:	Orientation ("UP") Yellow "PCB" label if ≥50 ppm concentration
	Markings
If less than one pound of PCBs net:	
POLYCHLORINATED BIPHENYLS	6 - [liquid] [solid] UN2315
If one pound or more of PCBs net:	
RQ POLYCHLORINATED BIPHEN	YLS - [liquid] [solid] UN2315

Cosporate Safety Tekeph 3670 Harky Cross Road Fax 90 Building C, 2rd Floor Manageria TN 38125-1500

Tekshidae 90| 434.9556 Fax 901 434.9769



INTEROFFICE MEMORANDUM

Date: April 29, 2004

TO:

From: Dangerous Good Administration

RE: Approval #0038

FedEx Express requires "ANY" concentration of "PCB" to be shipped as regulated. The above mentioned company is authorized to ship or receive shipments in accordance with the following conditions:

Proper Shipping Name and UN# - Polychlorinated biphenyls Solid, UN 2315, Polychlorinated biphenyls Liquid, UN 2315 (see exception below)

Hazard Class - Class 9

Packing Group - II

Label(s) Required - Class 9 & (2) Package Orientation Labels

Marking Required - "Polychlorinated biphenyls Solid, UN 2315" or "Polychlorinated biphenyls Liquid, UN 2315"

Maximum Quantity and Packing Instructions - 1kg, 911 for Solids or 1L, 907 for liquids

Outer Packaging Required - ALL PAK UN 4G, (DOT E 9168 covered)

Expiration Date - NONE

Destinations Authorized - Domestic U. S.

Approved by - Carole Scione, 901-434-9557

Dangerous Goods Administration

Any questions should be referred to the Dangerous Goods Administration at 901-434-9543.

Exception – Also covered under this approval are materials classed as 3, 6.1, 8, etc., when they contain "polychlorinated biphenyls". In this scenario, "polychlorinated biphenyl" must appear below whatever proper shipping name used on the DG declaration and on the outside of the package. The package marking and labeling will be per IATA 4.2. The DG declaration's "Packaging Instructions" and "Packing Group" will also be according to Section 4.2 in IATA. However, the only packaging authorized is identified above.

Note: A copy of this approval <u>must</u> be stached to each shipper's declaration and accompany all Dangerous Goods shipments offered in accordance with the provisions of this approval.



Groundwater Sampling Plan

Groundwater Monitoring Well and Sediment Sampling Procedures Work Plan for the Niagara Transformer Corporation Site Cheektowaga, New York

1.0 Introduction

1.1 Site Location and Description

The 3.6-acre NTC Site is located at 1747 Dale Road in the town of Cheektowaga, Erie County, New York. An active manufacturing/office facility is located on the site, and a metal storage building and aboveground oil storage tanks are also located on the property, to the south of the manufacturing/office facility (see Figure 1).

Conrail property, including six sets of railroad tracks, is located immediately south of the NTC property, St. Adalbert's cemetery is to the west, and light industry and commercial businesses are located to the north

1.2 Site History

There is no record of industrial activity prior to NTC's purchase of the site and construction of the manufacturing facility in 1958. Until 1980, oils containing PCBs were stored or used on site as an insulating fluid in the manufacture of liquid-filled transformers. Currently, NTC uses only non-PCB mineral oils.

On April 10, 1990, town of Cheektowaga Highway Department employees reported to NYSDEC that oil was seeping into the drainage ditch between the railroad yard and the NTC property. A sample of this oily leachate was analyzed and found to contain approximately 57,000 parts per million (ppm) PCBs.

A remedial investigation/feasibility study (RI/FS) of the property was conducted by NTC under a Consent Order. The RI/FS was finalized for NTC in September 1993 by Woodward-Clyde Consultants. The Record of Decision (ROD) was signed on December 30, 1993.

1.3 Purpose of This Work Plan

Ecology and Environment, Engineering P.C. (EEEPC), has been contracted by NYSDEC under a work assignment- D004442-12 to evaluate the condition of the existing groundwater monitoring wells, sample existing active wells, and recommend decommissioning where wells no longer provide useful information. EEEPC has also been tasked with sampling soils/sediments at three locations: the outfall on the south side of the property, the inlet of the retention pond, and the outlet of the retention pond. This site-specific work plan details the procedures to be used to complete these tasks.

2.0 Site Access and Coordination

2.1 Access to NTC Property

Prior to a sampling event, the sampling team and/or the work assignment Project Manager will call at least a week in advance to notify the owner of the NTC facility of when a groundwater monitoring well sampling event will take place. Upon arrival at the facility, at the beginning of each work day, the sampling team will sign in at the NTC front office to let the property owners know that the sampling team is on the site. Upon completion of the sampling, the team will sign out at the NTC front office. The contacts at NTC for site access (Bob Fishlock and John Darby)

can be reached at 716-896-6500. Access is provided for the purpose of sampling the four monitoring wells on site and the soil/sediment at the south outfall.

2.2 CSX Right-of-Way

Prior to sampling the two groundwater monitoring wells located within the CSX right-of-way (NTC-13S and NTC-14S), CSX should be contacted and provided with the following information: milepost location, the number of personnel that will be on the right-of-way, and the approximate time and date the personnel will be on the right of way. An agreement previously signed between CSX and NYSDEC provides access to the CSX right-of-way. A copy of the CSX agreement is provided as Appendix I of the Site Management Plan.

At least a month prior to the sampling event, the EEEPC project manager will submit the CSX "Outside Party Number Request Form" (see Attachment A), a processing fee of \$150 on the Pre-Authorized Credit Card Acceptance Form (see Attachment B), and a copy of the proof of insurance from EEEPC naming CSX as an additionally insured party (see Attachment C). The completed forms should be submitted by e-mail to OP Request@csx.com. For additional information from CSX regarding the completion of these forms, contact Rachael Clemons at 904-633-1513 (contact good as of 10/5/09).

2.3 St. Adalbert's Cemetery Access

Three of the sampling program's active groundwater monitoring wells (NTC-9S, NTC-9D, and NTC-10S) are located in St. Adalbert's Cemetery (see Figure 2). Prior to sampling these wells, the cemetery must be contacted to gain access to the property. The contact for the cemetery is Terry Gladkowski at 716-681-3090.

2.4 Town of Cheektowaga – Retention Pond Access

Soil/sediment samples are taken at the inlet and outlet of the retention pond south of the Thruway plaza and north of the CSX right-of-way. Access to the pond is provided under a formal access agreement with the Town of Cheektowaga. It is not necessary to contact the Town of Cheektowaga for the limited access time needed to collect the two soil/sediment samples.

2.5 NYSDEC Coordination

The NYDEC Project Manager (Will Welling) and the Region 9 office (Dave Szymanski) should be informed of all sampling events at the NTC site. Mr. Welling can be contacted at NYSDEC's central office in Albany at 518-402-9638, and Mr. Szymanski can be contacted at NYSDEC's Buffalo office at 716-851-7220.

3.0 Site Monitoring Wells

3.1 Monitoring Well Evaluation

During the sampling of each monitoring well, a brief inspection of the well's condition will be made. Minor well repairs, including well labeling and replacing missing well flush-mount cover bolts, will be made as needed. The need for more extensive repairs will be noted, if necessary. More extensive well repairs will be noted on the Monitoring Well Inspection Checklist (see Attachment D).

4.0 Monitoring Well Development Procedure

All newly installed wells will be developed using a submersible pump. Well development will be performed using the equipment and procedures described below.

4.1 Equipment and Supplies

- Water level indicator;
- Submersible pump with dedicated tubing;
- pH/temperature/conductivity meter; and
- Turbidity meter.

4.2 Well Development Procedures

Prior to well development, static water level and well depth will be measured. During development, temperature, pH, conductivity, and turbidity will be monitored, at a minimum, initially, after each well volume, and at the end of development. The wells will initially be surged with either a surge block or the pump in order to draw fine sediments out of the sand pack and into the well for removal. Well development will be performed until pH, specific conductance, and temperature have stabilized and turbidity of the discharge is 50 nephelometric turbidity units (NTUs) or less. If substantial improvement has been noted through the development process but the proposed goal of 50 NTUs has not been met, well development will be considered complete after two hours of purging. A minimum of three well volumes and three times the amount of any water added during drilling will be purged during well development unless the well is pumped dry during development. If the well is pumped dry during development, the well will be allowed to recharge for approximately 15 minutes. If the recharge rate is less than one gallon in 15 minutes, the well will be pumped dry a second time and development will be considered complete. Development water from the wells will be handled according to the methodology described in Section 10.

Monitoring well purge and sampling information will be reported on the form provided in Attachment E.

5.0 Sampling

5.1 Groundwater Sampling

Groundwater from a maximum of eight of the groundwater monitoring wells identified on Figure 2 will be sampled and analyzed for polychlorinated biphenyls (PCBs) and chlorobenzenes using the following methods:

- SW8082 PCBs (low detection limits, 0.065 ppb); and
- SW8270D SVOCs (chlorobenzenes only).

Groundwater sampling will be performed using the equipment and procedures described in Sections 5.2 and 5.3, respectively.

5.2 Equipment and Supplies

- Water level indicator:
- Disposable polyethylene bailers and new polypropylene or nylon line;
- pH/temperature/conductivity meter;
- Turbidity meter;
- Sample bottles, labels, chain-of-custody forms; and
- Cooler with ice.

5.3 Monitoring Well Groundwater Sampling Procedures

- All wells will be purged prior to sampling. Prior to purging, record the static water level and total well depth to within ± 0.01 foot in each well.
- Purge each well of three to five times the volume of water standing in the well. Purged water will be handled as described in Section 10. Temperature, pH, specific conductance, and turbidity will be measured and recorded, at a minimum, initially, after each well volume, and just prior to sampling. Purging will be performed until pH, specific conductance, and temperature have stabilized and turbidity is 50 NTUs or less. If specific conductance and temperature have stabilized, but a turbidity reading of 50 NTUs cannot be obtained, purging will not continue for no more than a total of two hours. If the well becomes dry during purging, sampling will occur when sufficient recharge has occurred and within 24-hours from the time of purging.
- Using polyethylene bailers on new polypropylene or nylon line at each well, fill bottles, leaving minimum headspace. Label sample bottles as specified in Section 6. Upon collection, immediately place the samples in a cooler maintained with ice at 4°C. Prepare chain-of-custody documents, package samples, and store the samples under the chain-of-custody until the laboratory courier retrieves them in accordance with the procedures specified in Section 6.

5.4 Soil/Sediment

Three soil/sediment samples will be collected at the same time that the groundwater samples are collected. The soil/sediment samples will be collected at the following locations: south outfall pipe on the NTC property, the inlet to the retention pond, and the outlet of the retention pond (see Figure 3).

5.5 Surface Water

Surface water samples will be collected at the same time that the groundwater and soil/sediment samples are collected. See Appendix G (Surface Water/Stormwater Sampling Plan) of the Site Management Plan regarding the procedures and locations to be sampled.

6.0 Field Quality Control Samples

Field QC samples help determine whether project data quality objectives are being met. Analyzed in the laboratory as ordinary field samples, they are used to assess sampling and transport procedures as possible sources of sample contamination and to document overall sampling and analytical precision. One duplicate sample will be collected per 20 samples per sampling round and analyzed for all parameters. Additional volume will be collected for matrix spike/matrix spike duplicate (MS/MSD) analyses at the rate of one MS/MSD sample set per 20 samples during each sampling round. Rinsate blank samples will be collected only on days that non-dedicated sampling equipment is used. Rinsate blanks will be collected with non-dedicated equipment at the rate of one per 10 field samples collected (or one per day in the event that less than 10 samples are collected in a single day).

7.0 Sample Containers, Labeling, Packaging and Shipping, and Custody

The volumes and containers for aqueous samples, as well as sample preservation are presented in Table 1. Sample containers pre-washed and prepared in accordance with U.S. Environmental Protection Agency (EPA) bottle washing procedures will be provided by the Mitkem Corporation (Mitkem). During the holding period prior to delivery to the Mitkem Corporation lab in Warwick, Rhode Island, or another selected laboratory, the samples will be chilled using ice to a minimum of 4°Celsius.

7.1 Sample Labeling

All samples will be assigned a unique sample identifier. Labels for each sample container will contain the sample identifier, date of sample collection, analytical parameters, and type of preservation used. Any change in the label information prepared prior to the sample collection will be initialed by the sampler.

An example of the sample identifier is NTC-10S-10-3-09-W or NTC-10-3-09-S-1, where:

NTC = Niagara Transformer Corporation site 10S = groundwater monitoring well number 10-3-09 = date of sample collection W = water (matrix) S = soil (matrix)

7.2 Sample Packaging and Shipping

Sample containers will be placed inside sealed plastic bags as a precaution against cross-contamination caused by leakage or breakage. The bags will be placed in coolers in such a manner as to eliminate the chance of breakage during shipment. Ice in plastic bags will be placed in the coolers to keep the samples at a minimum of 4°C throughout shipment.

Sample shipment will be performed in strict accordance with all applicable U.S. Department of Transportation (DOT) regulations. The samples to be shipped to Mitkem will picked up by courier and delivered to the Mitkem Corporation lab in Warwick, Rhode Island. Additional contact information is:

Mitkem Laboratories
175 Metro Center Boulevard
Warwick, Rhode Island 02886-1755
(401)-732-3400 - business
(401)-732-3499 - fax
Project Contact - Shirley Ng - sng@mitkem.com
www.mitkem.com

7.3 Sample Custody

A sample is considered to be in custody under the following situations:

- The sample is directly in your possession;
- The sample is clearly in your view;
- The sample is placed in a locked location; or
- The sample is in a designated secure area.

In order to demonstrate that the samples and coolers have not been tampered with during shipment, adhesive custody seals will be used. The custody seals will be placed either around the cap of each sample container or across the cooler lids in such a manner that they will be visibly disturbed upon opening of the sample container or cooler. The seals will be signed or initialed and dated by field personnel when affixed to the container and cooler.

Documentation of sample chain-of-custody is necessary to demonstrate that the integrity of the samples has not been compromised between collection and delivery to the laboratory. Each sample cooler will be accompanied by a chain-of-custody record to document the transfer of custody from the field to the laboratory. All information requested in the chain-of-custody record will be completed. A standard turnaround time will be used for sample analysis. One copy of the chain-of-custody form will be retained by the samplers and placed in the project records file. The original will be sealed in a plastic bag and placed inside the cooler. Upon receipt at the laboratory, the chain-of-custody documents will be completed. It is the responsibility of the laboratory to document the condition of custody seals and sample integrity upon receipt. A copy of the May 2009 chain-of-custody form is provided for information in preparing future chains-of-custody (see Attachment F).

Table 1 - NTC Sample Bottles ¹ , Volumes, and Preservatives											
Analytical Parameter per Matrix	Bottles Type	Sample Volume Needed	Preservative s								
PCBs - water	1 liter amber	2 liters	None								
SVOCs (chlorobenzenes) - water	1 liter amber	2 liters	None								
PCBs - soil	glass jar	One, 4 ounces	None								

Note:

7.4 Turnaround Time for Analysis

All groundwater and soil samples will be analyzed at Mitkem's laboratory within a standard turnaround time of 21 days following receipt of the samples.

¹ Certified pre-cleaned bottles and containers.

8.0 Health and Safety

Health and safety procedures will be as described in the project Health and Safety Plan and its amendment for these drilling and groundwater sampling tasks. When opening any well, the headspace will be screened with a photo-ionization detector (PID) or flame-ionization detector (FID). All work is expected to be completed in Level D personal protection. While on the CSX right-of-way, a high visibility safety vest and hard hat must be worn due to the active rails in the rail yard.

The Generic Health and Safety Plan for this work plan is provided as Appendix L of the Site Management Plan. The safety rules and regulations to be followed while on the CSX right-of-way are provided as Attachment G.

9.0 Decontamination Procedures

9.1 Sampling Equipment Decontamination

All decontamination will be performed in accordance with NYSDEC-approved procedures. Sampling methods and equipment have been chosen to minimize decontamination requirements and prevent the possibility of cross-contamination. Any non-dedicated miscellaneous development or sampling equipment will be decontaminated using the procedure above or by the following procedure:

- Initially remove all foreign matter;
- Scrub with brushes in alconox solution;
- Rinse with deionized water; and
- Allow to air dry.

Fluids generated during decontamination will be handled according to the procedures outlined in Section 10.

10.0 Investigation-Derived Waste

At least two waste stream types of IDW will be generated: groundwater from development and purging and personal protective equipment (PPE). Waste streams will be segregated and not mixed. Low-level purge and decontamination waters will be disposed of by discharging onto the ground or, if available, into a storm drain.

All expendable materials generated during the investigation (including, but not limited to, Tyvek clothing, gloves, and plastic sheeting from the decontamination pad) will be double-bagged and placed in an industrial dumpster.

11.0 Report

A brief report summarizing all field activities and providing a summary of the analytical results will be provided to the EEEPC project manager upon receipt of the analytical report from the laboratory.

12.0 Schedule

Monitoring well evaluation and sampling, including soil/sediment sampling, is expected to be performed on a semi-annual basis. Sampling is typically performed in approximately April and October of each year.

ecology and environment engineering P.C.

Figure 1 NTC

NOT TO SCALE

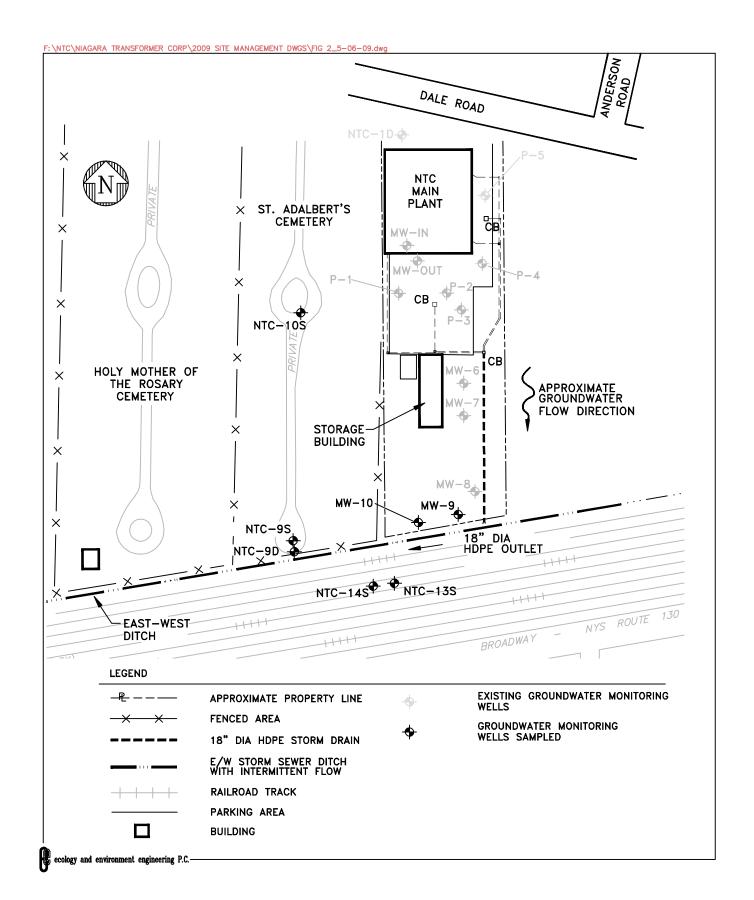


Figure 2
SITE MAP SHOWING GROUNDWATER SAMPLE LOCATIONS
NIAGARA TRANSFORMER CORP. SITE
SITE No. 9-15-146
CHEEKTOWAGA, N.Y.

NOT TO SCALE

FIGURE 3 SEDIMENT SAMPLE LOCATION MAP
NIAGARA TRANSFORMER CORP. SITE
SITE No. 9-15-146
CHEEKTOWAGA, NEW YORK

Attachment A

CSX Outside Party Number Request Form

To be Completed by Customer



Form # OP



OUTSIDE PARTY NUMBER REQUEST FORM Ø

- » All information must be TYPED or CLEARLY PRINTED
- » Proof of insurance as required by CSX and/or indicated in your agreement
- » Note: If flagging protection is required, the average cost is \$800.00/day. This is not an invoice. A separate invoice for actual costs of flagging services will be sent to Licensee or Project Owner upon completion of the project.
- » Please provide a check for \$150.00 for processing of the Request form.
- » Please submit this form in one of the following manners:

Mail: Property Services

Section 1: Project Information

Fax: 904.245.3692 Email: OP Request@csx.com

Agreement Information

CSXT Agreement No.: NYC046252

c/o Flagging Projects 500 Water Street, J180 Jacksonville, FL 32202

City: Cheektowaga

Location//Project Description.

		_	
County:	Erie	CSXT Agreement Date:	
State:	New York	Agreement Holder:	NYSDEC
Requested Start Date:	October 7, 2009	Railroad Milepost:	QC433.68
Duration in Days:	1 day	Installation:	Maintenance Only
	since 2004. Monitoring well location	ng program has been perfo	rmed on these wells on a semi-annual basis nce.
Section 2: Project Contact	Information		To be Completed by Customer
Billing Information for	Agreement Holder/Project Owners	Project Con	itact (if different from Billing).
Contact Name:	Mr. Will Welling	Contact Name:	Mr. Michael Steffan
Company Name:	NYSDEC	Company Name:	Ecology & Environment Engineering, P.G.
Company Billing Address:	65 Broadway	Company Billing Address:	368 Pleasant View Drive
Address (2):		Address (2):	
City:	Albany	City:	Lancaster
State & Zip:	New York 12233	State & Zip:	New York 14086
Phone:	518-402-9638	Phone:	716-684-8060
Fax:	518-402-9819	Fax:	716-684-0844
Email:	wbwelling@gw.dec.state.ny.us	Email:	msteffan@ene.com
CSXT Use Only			
	Roadmaster		Signal Manager (***)
Name:		Name:	
Division:			
		Project:	
Outside Party (OP) Number:	Valid Thru:		Inspection:
Actual Start Date:			
	· · · · · · · · · · · · · · · · · · ·	H_10	· ·

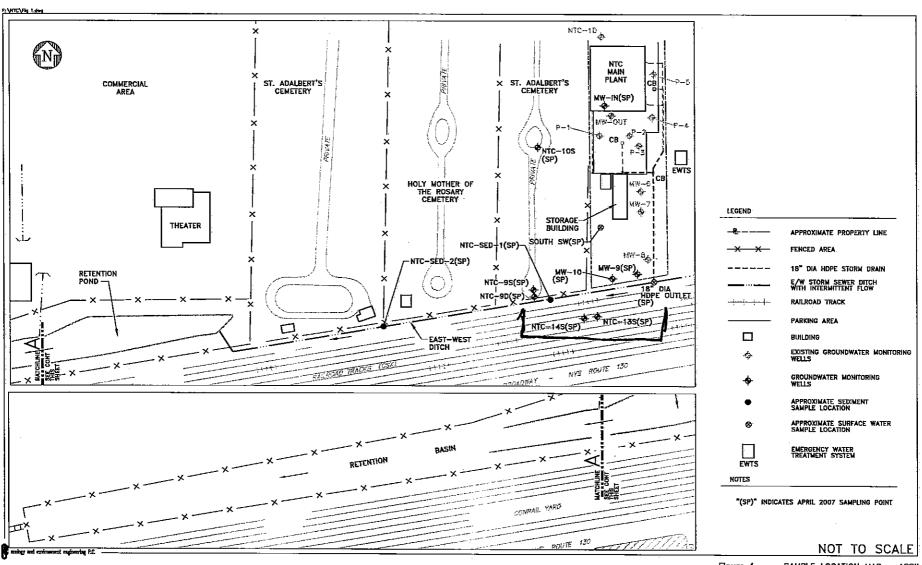


Figure 1 SAMPLE LOCATION MAP — APRIL 2007 NIAGARA TRANSFORMER CORP. SITE SITE No. 9-15-146 CHEEKTOWAGA, N.Y.

Attachment B

CSX Pre-Authorization Credit Card Acceptance Form



PRE-AUTHORIZED CREDIT CARD ACCEPTANCE FORM

Please forward the completed form to CSX Transportation (CSXT) via email at CustomerRel@csx.com or a secured facsimile at 904.245.2985. Questions? Call 904.633.1534

*Agreement Holde	r Name:	NEW Y	ORK STAT	E DEI		· · · · · · · · · · · · · · · · · · ·	NVIR	DMENIA	l Couservation
*Address (1):		625	Broadwa	7	12th Flo	OR	quantum uman il um	The state of the s	and the second s
Address (2):									
*City/State/Zip:		ALBAN	Υ	NEW	YORK	19	333		
*Contact Name:		MR. W	ILL WELL	146		*Phone	No.:	518-	402-9638
Contact Title:		PROSE	CTMANI	AGE	2	Cell No		518-	791-9603
Contact Email:		wbwel	lingeg	w.de	c.state.ny	Fax No	.:	518-	402-9819
*SECTION 2: PA									
One-Time	Payme	nt	The fact that the second		Re	curring	Payr	nent	
Bill Number	Am	ount*	Contra Numbe		Amount	*	Frec	uency	Period (MM//YY to MM/YY)
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									stics of the United States a amount indicated above

*Cardholder Name: MICHAEL G. STEFFAN *Cardholder Billing Address: *Visa/MasterCard Account Number: *Expiration Date: (MM/YY) SEPTEMBER 2010

SECTION 4: AUTHORIZATION

I hereby authorize CSXT to keep my signature on file and to charge the above account in the amount indicated. I understand this authorization will be in effect until CSXT is notified of change by prepaid registered mail or certified mail to the following address:

*Cardholder Signature: *Michael H. Steffan-

CSX Transportation Property Services Dept 500 Water St, J180 Jacksonville, FL 32202

*Date:

October 2, 2009

* MICHAEL G. STEFFON IS AN EMPLOYEE OF ECOLOGY AND ENVIRONMENT ENGINEERING, P.C., UNDER CONTRACT WITH NYSDEC.

* COPY OF THE CERTIFICATE OF INSURONCE IS OTTOCHING INCLUDING CSX AS ADDITIONALLY INSURED.

Page 1 of 1

Attachment C

Certificate of Liability Insurance Naming CSX as an Additionally Insured Party

ACORD CERTIFICATE OF LIABILITY INSURANCE							DATE (MM/DD/YYYY) 07/31/09										
PRODUCER THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW.																	
				INSURERS A	AFFORDING COVI	ERAGE	NAIC #										
INSURED					INSURER A:												
					_												
				INSURER C:													
				INSURER E:	INSURER E:												
COVERAGES																	
THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. AGGREGATE LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.																	
INSA	ADD'L INSRE	TYPE OF INSURANCE	POLICY NUMBER	POLICY EFFECTIVE DATE (MM/DD/YY)	POLICY EXPIRATION DATE (MM/DD/YY)	шмп	S										
Α		GENERAL LIABILITY	•	08/01/09	08/01/10	EACH OCCURRENCE	\$3,000,000										
:		X COMMERCIAL GENERAL LIABILITY				DAMAGE TO RENTED PREMISES (Ea occurrence)	\$500,000										
		CLAIMS MADE X OCCUR				MED EXP (Any one person)	\$50,000										
						PERSONAL & ADV INJURY	\$3,000,000										
						GENERAL AGGREGATE	\$3,000,000										
		GEN'L AGGREGATE LIMIT APPLIES PER:	•			PRODUCTS - COMP/OP AGG	\$3,000,000										
A		POLICY X JECT X LOC AUTOMOBILE LIABILITY X ANY AUTO		08/01/09 08/01/09	08/01/10 08/01/10	COMBINED SINGLE LIMIT (Ea accident)	\$2,000,000										
		ALL OWNED AUTOS SCHEDULED AUTOS				BODILY INJURY (Per person)	s										
		X HIRED AUTOS X NON-OWNED AUTOS				BODILY INJURY (Per acoldent)	\$										
						PROPERTY DAMAGE (Per accident)	\$										
		GARAGE LIABILITY	•			AUTO ONLY - EA ACCIDENT	\$										
	,	ANY AUTO				OTHER THAN EA ACC	\$										
						AUTO ONLY: AGG	\$										
A	1 t	EXCESS/UMBRELLA LIABILITY		08/01/09	08/01/10	EACH OCCURRENCE	\$15,000,000										
		X OCCUR CLAIMS MADE				AGGREGATE	\$15,000,000										
							\$										
		DEDUCTIBLE					\$										
<u> </u>	<u> </u>	X RETENTION \$ 10000		00/04/00	00/04/40	X WC STATU- OTH-	\$										
A	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY			08/01/09	08/01/10	l · · · · · · · · · · · · · · · · · · ·	\$1,000,000										
1	ANY	PROPRIETOR/PARTNER/EXECUTIVE				E.L. DISEASE - EA EMPLOYEE											
1	OFFICER/MEMBER EXCLUDED?			,	E.L. DISEASE - POLICY LIMIT												
-	-	R Professional		08/01/09	08/01/10	\$1,000,000 Each Claim											
Α	1	ollution Legal	,	00/01/03	00/01/10	\$1,000,000 Aggrega											
l		pility				\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \											
DES	CRIPTI	ON OF OPERATIONS / LOCATIONS / VEHIC	LES / EXCLUSIONS ADDED BY ENDOR	SEMENT / SPECIAL PRO	VISIONS	<u> </u>											
RE- NYSDEC, the State of New York, Niagara																	
Transformer Corporation and CSX Transportation, Inc. are named as an additional insured on all certified policies as required by contract																	
								workers compensation and professional liability excepted.									
CERTIFICATE HOLDER CANCELLATION																	
						THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION											
том					DATE THEREOF, THE ISSUING INSURER WILL ENDEAVOR TO MAIL30_ DAYS WRITTEN NOTICE TO THE CERTIFICATE HOLDER NAMED TO THE LEFT, BUT FAILURE TO DO SO SHALL MPOSE NO OBLIGATION OR LIABILITY OF ANY KIND UPON THE INSURER, IT'S AGENTS OR												
														REPRESENTATIVES.			
													AUTHORIZED RE	PRESENTATIVE			
1				1/suttl	Wanty of												

IMPORTANT

If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

DISCLAIMER

The Certificate of Insurance on the reverse side of this form does not constitute a contract between the issuing insurer(s), authorized representative or producer, and the certificate holder, nor does it affirmatively or negatively amend, extend or alter the coverage afforded by the policies listed thereon.

2 of 2

Attachment D

Monitoring Well Inspection Checklist

Monitoring Well Inspection Checklist Niagara Transformer Corp. -- Cheektowaga, NY

NYSDEC Site No 9-15-157

Current Well Casing Protective Inner Well Equipment in Obstruction in We														
		Current	Well			Casing	Protective	Inner Well	Equipment in	Obstruction in	water in	Concrete		
	Water Level	Depth (feet TOIC)	Completion	Well Paint	Well Label	Lock	Cover (G/F/P)	Сар	Well	Well	Annulus	Pad	Inspection	
Well Number	(feet TOIC)	(feet TOIC)	(A/F)	(G/F/P)	(G/F/P)	(G/F/P)	(G/F/P)	(G/F/P)	(B/U/H)	(Y/N)	(Y/N)	(G/F/P)	Date	Comments/Needs
<u> </u>														
<u> </u>		<u> </u>			<u> </u>									
							_							
		 												

Key:

A = Above-grade completion. H = PDB Harness. Y = Yes.

B = Bailer. N = No. C = Curb box (flush-mount) completion. <math>P = Poor.

F = Fair.

G = Good.

TOIC = Top of inner casing.

U = Bladder Pump.

Attachment E

Monitoring Well Purge and Sampling Record

WELL PURGE & SAMPLE RECORD

Site Name/Loc	cation:					Well ID:		
	ct No.:							
	Water:				5	Start Time:		
	Depth:	_						
	Pump:	_						
Initial Pump	Rate:	_Lpm / gpm			P	ump Type:		
adjus	sted to:	_ at _		_minutes	Well	Diameter:		inches
adjus	sted to:	_ at _		_minutes	1x We	ell Volume:		gallons
Time	Purge Volume (gallons/liters)	pH (s.u.)	Temp. (°C/°F)	ORP (mV)	Conductivity (µS/cm mS/cm)	DO (mg/L)	Turbidity (NTU)	Water Level (feet)
Final S	Sample Data:							
Sample ID:		_		Duplicate?		Samp ID:		
Sample Time	:			MS/MSD?	Ш			
Analyses:	Methods:	Comments:						
□ VOCs	□ CLP							
□ SVOCs	□ SW846							
□ PCBs	☐ Drink. Wtr.							
☐ Metals								
		Sampler(s):						

Attachment F

Example Chain-of-Custody Form



CHAIN OF CUSTODY RECORD

Page _ l _ of _ l

Specia	al H	andli	ng:
1		101	

☐ Standard TAT - 7 to 10 business days

☐ Rush TAT - Date Needed:

· All TATs subject to laboratory approval. Min. 24-hour notification needed for rushes.

· Samples disposed of after 60 days unless otherwise instructed.

Report To:	MIKE STEF	Invoic	e To:		_5,	AN	LE.				_	Project No.: 4+00. DC12. 82							
	4 + ENVIR		Inc										Site Name: <u>N</u>	IASAR	a Ti	CANSTON	men Co	MID	
	LIERS ANTVI											_	Location:C	1 (/.			State: NY	•	
	Acten No	4 14086	<u> </u>		460							_	Sampler(s):			/ L	arah Ca		
Project Mgr.: _	MIKE	STEFFAN	P.O. N	10.: <i>A</i>	400.	DC12	<u>.07</u>	RQ	N:		contemporary and		Sampler(s).	Jane	> /~	<u> </u>		σ	
	=HCl 3=H ₂ SO ₄ 4 = NaHSO ₄ 9=		OH 6=Ascorb 10=	ic Ac	id 			Co	ntain	ers:			Analy	ses:		A COMMENT OF THE PARTY OF THE P	oorting Notes ck if needed)		
	Water GW=Grou Surface Water SO X2=		dge A=Air		7	ive	Vials	r Glass	of Clear Glass	၁	8082	(१०५१८)				☐ Provide CT QA/QC	DEP MCP CAM DEP RCP Repor Reporting Leve	rt el	
	G=Grab C=G	Composite		_		rvat	OA	mbe	lear	lasti	8	م ا				Stand	lard 🔲 No Q	C.	
Lab Id:	Sample Id:	Date:	Time:	Type	Matrix	Preservative	# of VOA	# of Amber	# of C	# of Plastic	१६८३ १३	Suoc					c reporting stand	اards: محک	
46803-d	NTC 105	5/6/09	1450		GW	NoN	>	12	-		6	6				Ms	MSD		
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															1				
					\rightarrow	Reli	 nauis	shed l	bv:				Receive	d by:		Date:	Tim	e:	
Fax results	when available to (716) 684	0844		1		۸ ۸						0 ,,			; 1			
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{					2	-A4	20	ala	ms	7			Lun Jan	tre		5-8-0	9 102	7	
Condition upon	receipt: Iced D	Ambient K °C	0,0		Ter	n'	1	võ	tus			6	agner de	inthe		518/09	15:22		
	175 M	etro Center Bo	و ulevard • Warv	⊃℃ vick,	RI 02	2886-	/ 1755	5 • 40	01-73	32-3	400 •	• Fax	<i>U</i> x 401-732-3499	• www.mi	tkem.	com			

200



CHAIN OF CUSTODY RECORD

Page __l__of__l

Special	Handling:
---------	-----------

☐ Standard TAT - 7 to 10 business days

☐ Rush TAT - Date Needed:

· All TATs subject to laboratory approval. Min. 24-hour notification needed for rushes.

· Samples disposed of after 60 days unless otherwise instructed.

Report To:	MIKE STEF	FAN	Invoic	e To:		S	A	NE	<u> </u>											.02		
Ecolog	4 + ENU, U DUSASANTY	non mental	[nc.]			-					•	_	Site 1	Vame	: _/\/	IAC	AR	A 7	RAN	S Form	nen	Conp
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CHAIN OF CUSTODY RECORD

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All TATs subject to laboratory approval. Min. 24-hour notification needed for rushes.

· Samples disposed of after 60 days unless otherwise instructed.

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CHAIN OF CUSTODY

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☐ Standard TAT - 7 to 10 business days

☐ Rush TAT - Date Needed:

· All TATs subject to laboratory approval. Min. 24-hour notification needed for rushes.

· Samples disposed of after 60 days unless otherwise instructed.

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CHAIN-OF-CUSTODY RECORD

Page _ 1 of _ 1

REPORT TO		INVOICE TO	
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MITKEM LABORATORIES Sample Condition Form

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Attachment G CSX Safety Rules and Regulation

SAFETY PROCEDURES

Effective January 1, 1996, "The CSX Safe Way," a manual containing CSX Transportation's (Railroad) General Safety Rules, mandatory Departmental Safety Rules, recommended Work Practices, and CSX Policies and Programs was revised. The following Rules, Practices, and Policies are excerpted for your guidance. While on Railroad property, all consultants, contractors and visitors must comply with these requirements.

GENERAL SAFETY RULES

- 1. Consultant/Contractor must ensure that:
 - a. "job briefings are conducted prior to work activity and subsequently when activity changes."
 - c. "co-workers are warned of unsafe acts and hazards."
 - e. "safety rules and all company policies that relate to our job tasks are complied with."
 - f. "our work place is drug and alcohol free."
 - g. "the behavior in our work place is civil and courteous."
 - h. "local, state and federal laws and regulations that relate to our job tasks are observed."
 - i. "oral and written report of accidents and injuries are made as soon as possible to the supervisor or employee in charge."
- 3. "Do not attempt to mount, dismount, or cross over moving locomotives or cars."
- 6. Consultant/Contractor "must be familiar with and wear approved personal protective equipment and clothing as required" and comply with applicable OSHA requirements.
- 8. "Do not wear finger rings outside an office environment."
- 16. "When working on or about tracks:
 - a. be alert for the movement of cars, locomotives, or equipment at any time, in either direction, on any track;
 - b. do not cross within 25 feet of the end of standing cars, equipment, or locomotives, except when proper protection is provided."

Note: Proper Protection: Always ensure that a Railroad Flagman is present or the track is taken out of service by the proper Railroad authority, prior to starting any work on or about our tracks!

- 17. "Do not cross over coupled, moving freight cars."
- 18. "Do not take refuge under any car, equipment or locomotive."

- 20. "Do not go under any equipment unless proper protection is provided."
- 25. "Do not attempt to mount, dismount, or cross over moving equipment."
- 26. "Seat belts must be worn while operating or riding in motor vehicles that are equipped with them."
- 27. "Ensure that your work area and environment are clean and orderly, and protected from controllable hazards.

ENGINEERING AND MECHANICAL - DEPARTMENTAL SAFETY RULES AND RECOMMENDED SAFE WORK PRACTICES

E/M-10 Hi-Rail Vehicles:

- a. "Occupy track only with proper authority."
- b. "Stop on-track equipment when the operator's attention cannot be directed exclusively to controlling the movement."
- * "Be aware of the effects of the weather on starting and stopping hi-rail equipment."

E/M-12 Lifting and Carrying:

- a. "Use provided material handling and lifting devices when lifting heavy objects."
- b. "Ensure walkways are free of slipping or tripping hazards before lifting or carrying material."
 - * "Wear back support belts whenever you lift."
 - * "Designate one person to call signals when two or more people are lifting."

E/M-14 Motor Vehicles:

- b. "If two or more people are occupying the motor vehicle, designate one person to guide backing movements from the ground."
- c. "Apply the parking brake to a stationary vehicle if the engine must be left running in order to accomplish its intended task."
- * "Whenever possible back into parking spaces."

E/M-16 Personal Protective Equipment:

a. "Wear head protection provided by the company at all times while on duty, except when working in an office, when riding in a highway motor vehicle, or while in a designated lunch break area. Non-hardhat areas may be designated by local management."

- b. "Wear approved safety glasses with sideshields at all times while on duty, except when working in an office, while in a lunch area, or while in a locker room."
- c. "When working in areas where hearing protection may be required, have approved hearing protection devices available on your person, and wear them where required by posted notice or special instructions."
- d. "Wear hi-top (6-inch or more) safety-toe shoes with laces, oil-resistant soles, and a distinct separation between heel and sole when working outside of an office environment . . ."

ENGINEERING - DEPARTMENTAL SAFETY RULES AND RECOMMENDED SAFE WORK PRACTICES

E-2 Excavations, Pits, and Manholes

- a. "Shore vertical excavations of four feet deep or more."
- b. "Call utility locators before you dig."
- c. "Protect all open holes and trenches with adequate barricades."

E-10 On or Around and Crossing Tracks

- b. "When observing passing trains or equipment, always look in the direction from which the train or equipment is coming."
- * "Use caution when working on or around and crossing tracks."
- * "Look in both directions when approaching or crossing tracks."
- * "Be alert for dragging bands, shifting loads, etc."

Please ensure that your employees (and all subcontractors), who are or will be working on or about CSX Transportation property, comply with these revised standards of safety conduct. If you have any questions, or need further clarification of anything listed above, please contact your project manager. If there's ever any doubt, the safe course must always be taken!

Remember: No job is so important, no service so urgent that we cannot take time to perform all work safely.

Railroad Environmental Department

*Recommended Safe Work Practice

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CSX Access Agreement

SURFACE WATER DRAINAGE FACILITY AGREEMENT

THIS AGREEMENT, made as of Agril 26, 2004, by and among CSX TRANSPORTATION, INC., a Virginia corporation, whose address is 500 Water Street, Jacksonville, Florida 32202, as Operator for New York Central Lines LLC, a Delaware limited liability company, a wholly-owned subsidiary of Consolidated Rail Corporation, a Pennsylvania Corporation (hereinafter jointly called "Licensor") and New York State Department of Environmental Conservation, an agency of the State of New York, under the laws of the State of New York, whose mailing address is 625 Broadway, 12th Floor, Albany, New York 12233-7013, (hereinafter called "Licensee") WITNESSETH:

WHEREAS, Licensee desires to revise and construct certain facilities including installation of a concrete lining (i.e., shotcrete) over the existing drainage ditch and sand/bentonite dams, as described in the Work Description, (Attachment A), attached hereto and made a part hereof, for the purpose of minimizing any potential exposure pathway to contaminated sediments and reducing the potential migration pathway of contaminated waters along the existing stone bedding in the ditch (hereinafter called the "Drainage Facility") as identified in the Licensee's application for environmental right of entry, dated February 27, 2003 attached hereto as Attachment B, along the rail corridor, right-of-way and property (the "Property") owned or controlled by Licensor adjacent to the Niagara Transformer Corporation Site (Site #9-15-146), located at 1747 Dale Road, Cheektowaga, Erie County, State of New York, approximately 1600 feet west of Milepost QC433.68, (hereinafter called the "Occupancy");

WHEREAS, the Licensor will conduct routine maintenance of the Drainage Facility as further detailed in the long term Operations and Maintenance Manual to be developed as part of this work;

NOW, THEREFORE, in consideration of the mutual covenants, conditions, terms and agreements herein contained, the parties hereto agree and covenant as follows:

1. LICENSE:

- 1.1 Licensor, insofar as it has the legal right, power and authority to do so, and its present title permits, and SUBJECT TO:
- (A) Licensor's present and future right to occupy, possess and use its property within the area of the Occupancy for any and all purposes;
- (B) All encumbrances, conditions, covenants and easements applicable to Licensor's title to or rights in the Property; and

- (C) Compliance by Licensee with the terms and conditions herein contained; does hereby license and permit Licensee to construct, maintain, or repair the Drainage Facility, including necessary slope(s) or shoulder(s), in the Occupancy above for the term herein stated, and to remove the Drainage Facility upon termination of this Agreement.
- 1.2 No additional drainage facility, pipeline or wireline, or other facilities shall be placed, allowed or maintained by Licensee in, upon or along the Occupancy except upon separate prior written consent of Licensor.
- 1.3 Licensor reserves the rights to: (a) drain water from Licensor's own facilities or right-of-way into and along the Drainage Facility; and (b) connect its own drainage or stormwater outfall(s) to the Drainage Facility, at any time in the future.

2. LICENSE FEE, TERM:

- 2.1 Licensee shall pay directly, or reimburse Licensor for, any additional taxes, assessments or charges levied against Licensor or Licensor's property solely on account of the Drainage Facility or the Occupancy.
- 2.2 The effective date of this Agreement shall be the date and year first written above (the "Effective Date").
- 2.3 This Agreement shall remain in effect from the Effective Date, unless revoked by Licensor for cause (breach or default), but shall also terminate upon: (a) Licensee's cessation of use of the Drainage Facility for the purpose above; (b) removal of the Drainage Facility; or (c) by subsequent mutual written consent of the parties.
- 2.4 As consideration for the license or right herein granted, Licensee hereby agrees that Licensor shall not, be charged or assessed, directly or indirectly, with any part of the cost of the installation of the Drainage Facility on Licensor's property, or for any public works project for which the Drainage Facility is a part, or for any added value thereof to Licensor's property, or for any maintenance thereof.

3. CONSTRUCTION, MAINTENANCE AND REPAIR:

3.1 Licensee, at its sole cost and expense, covenants to construct, repair and maintain and/or remove the Drainage Facility, in a prudent, workmanlike manner, using quality materials and complying with: any applicable standard(s) or regulation(s) of Licensor (A.R.E.A. Specifications), Licensee's particular industry, or any governmental or regulatory body having jurisdiction over the Occupancy or the Drainage Facility.

- 3.2 Location and construction of the Drainage Facility shall be made substantially in accordance with design(s) and specification(s) furnished to and approved by Licensor and of material(s) and size(s) appropriate for the purpose(s) above. Licensee shall provide as-built drawings to Licensor upon completion of the Drainage Facility.
- 3.3 All Licensee's work and exercise of rights hereunder shall be undertaken at time(s) satisfactory to Licensor and in a manner so as to eliminate any impact on or interference with the safe use and operation of Licensor's track(s) and appurtenances thereto.
- 3.4 In the installation or maintenance of the Drainage Facility, Licensee shall not use explosives of any type or perform or cause any blasting without the prior separate express written consent of Licensor. As a condition to such consent, a representative will be assigned by Licensor to monitor any blasting and Licensee shall reimburse Licensor for the entire cost or expense of furnishing such a representative.
- 3.5 Any excavated, cleared or dredged materials shall be properly disposed of by Licensee, in accordance with all applicable permits or state or local laws or regulations. Such materials may be cast, wasted or spread upon adjacent portions of the right-of-way only in such manner as permitted and as satisfactory to Railroad's Chief Engineer.
- 3.6 Any repairs or maintenance to the Drainage Facility, whether resulting from acts of Licensee or natural or weather events, which are necessary to protect or facilitate Licensor's use of its property within or adjacent to the Occupancy, shall be made promptly by Licensee, but in no event later than fifteen (15) days after Licensee has notice as to the need for such repairs or maintenance.
- 3.7 In order to protect or safeguard its right-of-way, property, rail operations (including track changes), equipment or employees from damage or injury, Licensor may request immediate repair of the Drainage Facility by Licensee, and if such immediate repairs are not performed, Licensor may make (or contract to be made) such repairs, at the sole risk, reasonable cost and reasonable expense of Licensee.
- 3.8 Licensee hereby agrees to reimburse Licensor any reasonable loss, cost or expense (including losses resulting from train delays or inability to meet train schedules) arising from any failure of Licensee to make, or from improper or incomplete, repairs or maintenance to the Drainage Facility.
- 3.9 All persons entering the Property pursuant to this Agreement shall wear safety glasses with side shields hard hats and steel-toed safety shoes, and shall abide by Licensor's Safety Rules and Procedures (Attachment C) and any safety instructions given by Licensor.

4. PERMITS, LICENSES:

- 4.1 Before any work hereunder is performed, or before use by Licensee of the Occupancy for the contracted purpose(s), Licensee, at its sole cost and expense, shall obtain all necessary permit(s) (including but not limited to zoning, building, construction, health, safety, or environmental matters), certificate(s) or letter(s) of approval from any federal, state or local public authorities having jurisdiction over the Occupancy or the Drainage Facility. Licensee expressly covenants to conform and limit its activities to the terms of such permit(s), letter(s) or certificate(s), and shall thereafter observe and comply with all applicable laws, regulations and requirements of such public authorities.
- 4.2 Licensee assumes sole responsibility for failure to obtain such permit(s), license(s), or approval(s), for any violations thereof, or for any costs or expenses of compliance or remediation resulting therefrom.

5. MARKING AND SUPPORT:

- 5.1 With respect to any subsurface installation of pipes, ducts, etc., upon Licensor's property, Licensee, at its sole cost and expense, shall:
- (A) Support track(s) and roadbed of Licensor, in a manner satisfactory to Licensor;
- (B) Backfill with satisfactory material and thoroughly tamp all trenches to prevent settling of surface of land and roadbed of Licensor; and
- (C) Either remove any surplus earth or material from Licensor's property or cause said surplus earth or material to be placed and distributed at permitted location(s) and in such manner as Licensor may direct.
 - 5.2 After construction of the Drainage Facility, Licensee shall:
- (A) Restore track(s), roadbed and other disturbed property of Licensor, and leave the same in a condition satisfactory to Licensor; and
- (B) Erect, maintain and periodically verify the accuracy of aboveground markers, indicating the location, depth and ownership of the Drainage Facility or other facilities, in Licensee's standard form or in a form approved by Licensor; and
- (C) Remain responsible for any subsidence or settlement of the track(s) or roadbed of Licensor for a period of one (1) year subsequent to completion of installation of the Drainage Facility.

6. TRACK CHANGES:

- 6.1 Licensor reserves the paramount right to fill over the top of any pipe(s), or to encase any ditch in pipe, and to cross the same by rail.
- 6.2 In the event that Licensor's future operating needs or track maintenance program(s) result in any changes in grade of alignment of or additions to Licensor's tracks or other facilities (including raising, lowering or relocating thereof) any changes in grade or alignment of or additions to, which necessitate any change of location, height or depth of the Drainage Facility or the Occupancy, Licensee, at its sole cost and expense and within one-hundred and twenty (120) days after notice in writing from Licensor, shall make such changes in the Drainage Facility or the Occupancy to accommodate Licensor's tracks or operations. If Licensee fails to do so, Licensor may make such changes, at Licensee's reasonable cost.
- 6.3 Licensee agrees to periodically monitor and verify the depth or height of the Drainage Facility in relation to Licensor's track(s) and facilities, and to relocate the Drainage Facility, at Licensee's sole cost and expense, should such relocation be necessary to comply with Section 8 of this Agreement.
- 6.4 In the event Licensee's construction (or reconstruction, repair, replacement or removal) requires the relocation or replacement of any track(s), signal pole(s), or other facility(ies) of Licensor, or any traffic diversion or rerouting of Licensor's trains, Licensee shall prepay or reimburse Licensor, at Licensor's sole option, reasonable costs and expenses for the same.

7. DRAINAGE FACILITY CHANGES:

- 7.1 If Licensee undertakes to revise, renew, relocate or change all or any part of the Drainage Facility (including any change in circumference, diameter or radius of any pipe, change in pipe operating pressure, or change in materials transmitted in and through any pipe, ditch, culvert, swale or drain), or is required by any public agency or court order to do so, plans herefore shall be submitted to Licensor for approval <u>before</u> any such change is made. After approval, the terms and conditions of this Agreement shall apply thereto.
- 7.2 Any additional costs or expenses incurred by Licensor to accommodate changes in the Drainage Facility by Licensee shall be paid by Licensee.

8. INTERFERENCE WITH RAIL FACILITIES:

- 8.1 Although the Drainage Facility herein permitted may not presently interfere with Licensor's railroad operations or facilities, in the event that any use, operation or maintenance of the Drainage Facility, at any time in the sole judgment of Licensor, causes: (a) interference with Licensor's communication, signal or other wires, train control system or facilities; or (b) interference in any manner with the operation, maintenance or use by Licensor of its right-of-way, track(s), structures, pole lines, devices, other property, or any appurtenances thereto; then, and in either event, Licensee, upon receipt of written notice from Licensor of any such interference, and at Licensee's sole risk, cost and expense, shall promptly take such remedial action or make such changes to the Drainage Facility as required to eliminate all such interference.
- 8.2 Upon Licensee's failure to promptly take the remedial action or make the required changes, Licensor may do so (or contract to do so), at Licensee's sole risk, cost, and expense.
- 8.3 Without assuming any duty hereunder to inspect the Drainage Facility, Licensor hereby reserves the right to inspect the Drainage Facility and to require Licensee to undertake any repairs or maintenance to the Drainage Facility that Licensee reasonably requests which repairs or maintenance Licensee hereby agrees to promptly make, at Licensee's sole risk, cost and expense. In consideration of the fact that a drainage ditch currently exists in the area of the Drainage Facility and maintenance of flows in the ditch is currently the responsibility of Licensor or others, Licensee and Licensor agree that certain repairs are limited to those detailed in the long term Operations and Maintenance Manual to be developed as part of this work or those which affect potential exposure to human health or the environment. The determination that any condition impacts human health and requires repair will be made solely by the New York State Department of Health. The determination that any condition impacts the environment and requires repair will be made solely by the New York State Department of Environmental Conservation=s Division of Fish and Wildlife. Licensor's Environmental Department, shall be given a reasonable time and opportunity to review and comment on the Operations and Maintenance Manual before it is finalized to determine if actions it calls for would impede or negatively impact railroad operations or railroad structures.

9. RISK, LIABILITY, INDEMNITY:

With respect to the liabilities of the parties, to the extent it is permitted by New York State law, it is hereby agreed that:

- 9.1 To the extent attributable to Licensee=s negligence or actionable conduct, Licensee hereby assumes all risk of loss, injury or damage to: (a) all property, employees, agents or invitees of Licensee or on the Occupancy, arising out of the installation, presence, operation, use, maintenance, repair, or removal of the Drainage Facility, its appurtenances, or any part thereof; (b) property or employees of Licensor in or on the Occupancy, arising in whole or in part from negligent acts or omissions of Licensee or their agents or employees.
- 9.2 Licensor hereby assumes all risk of loss, injury or damage to property, employees, agents or invitees of Licensor or Licensee in or on the Occupancy, resulting from negligent acts or omissions of Licensor, its employees or agents.
- 9.3 In consideration for Licensor granting its permission to revise and construct the Drainage Facility on the Occupancy, Licensee hereby agrees to accept responsibility for and pay as necessary, in accordance with New York State laws and consistently with the Court of Claims Act, all claims, demands, payments, suits, actions, recoveries and judgments of every nature and description brought or recovered against Licensee by reason of the negligent (tortuous act or omission) act of Licensee or its employees which are caused by or arise from the work on the Occupancy, provided that such claim or loss is directly attributable to such work, or directly attributable to Licensee's presence at the Occupancy or from the presence of any physical facility installed, used, maintained or removed as part of the work including the Drainage Facility; and provided further that Licensee shall not be responsible for any claims, losses or damages arising from the willful negligence or gross misconduct of Licensor or its employees, agents or contractors.
- 9.4 Licensee further expressly assumes all responsibility for (a) monitoring the Occupancy area and the Drainage Facility for pollution; (b) all claims, costs and expenses (including reasonable attorneys' fees) arising from the pollution of air, water, land or groundwater, resulting solely from the escape or release of any hazardous material transported through the Drainage Facility by Licensee; and (c) any claim or liability arising under federal or state law dealing with the pollution of air, water, land or groundwater in the Occupancy because of such escape or release. Nothing in this Agreement shall be deemed to abrogate liability protection afforded Licensee by NYS Environmental Conservation Law Section 27-1313.
- 9.5 Obligations of Licensee hereunder with respect to responsibility for all claims, demands, payments, suits, actions, recoveries and judgments to shall also extend to officers, agents and employees of Licensor, and to companies and other legal entities that control or are controlled by or subsidiaries of or are affiliated with Licensor, and their respective officers, agents and employees.

10. INSURANCE:

- 10.1 Prior to commencement of surveys, installation of the Drainage Facility or occupation of the Occupancy, Licensee shall cause its contractor in charge of the work to procure, at the sole cost and expense of Licensee, a policy of Commercial General Liability Insurance (CGL), naming Licensee (and its contractor as the case may be) as insured and Licensor as additional insured, covering Licensee's direct and assumed contractual (i.e., indemnification) liability under this Agreement, with a coverage limit of not less than THREE MILLION DOLLARS (\$3,000,000) Combined Single Limit per occurrence for bodily injury liability and property damage liability.
- 10.2 If the CGL policy does not automatically cover contractual liability of Licensee during periods of survey, installation and maintenance, a specific endorsement adding such coverage shall be purchased or caused to be purchased by Licensee, and indicated on the Certificate of Insurance. If the CGL policy is written on a "claims made" basis instead of a "per occurrence" basis, Licensee shall arrange for adequate time for reporting losses. Failure to do so shall be at the Licensee's sole risk.
- 10.3 Securing the CGL insurance shall not limit the liability of Licensee's contractor under this Agreement, but shall be additional security herefore.
- 10.4 Licensor may at any time prior to or during construction, reconstruction, maintenance, repair, replacement or removal request evidence of CGL insurance purchased by Licensee in compliance with this Agreement, and may demand that Licensee purchase insurance deemed adequate by Licensor. Failure of Licensee to comply with Licensor's demand shall be considered a default by Licensee.
- 10.5 Notwithstanding Sections 10.1 through 10.4, specifically to cover construction or demolition activities within fifty (50) feet of any railroad track(s) or affecting any railroad bridge, trestle, tunnel, track(s), roadbed, overpass or underpass, Licensee shall pay to Licensor the sum of Three Thousand U.S. DOLLARS (\$3,000) to cover the cost of adding the Drainage Facility to Licensor's Railroad Protective Liability Policy (RPL) for the period of actual construction.

11. GRADE CROSSINGS; FLAGGING:

11.1 Nothing herein contained shall be construed to permit Licensee or Licensee's contractor(s) to move any vehicles or equipment over track(s) of Licensor, except at public road crossing(s), without the separate written consent of Licensor.

- 11.2 If Licensor deems it advisable, during any construction, maintenance, repair, renewal, alteration, change or removal of the Drainage Facility or other work within fifty (50) feet of the track, to place watchmen, flagmen, inspectors or supervisors, for protection of property or operations of Licensor or others, on the Occupancy, and to keep persons, equipment and materials away from Licensor's track(s), Licensor shall have the right to do so at the sole risk, cost and expense of Licensee, but Licensor shall not be liable for failure to do so. Notwithstanding the foregoing, Licensor has determined that a flagman will be required for all work adjacent to Licensor's operating tracks.
- 11.3 Subject to Licensor's prior written consent and to Licensor's Railroad Operating Rules and existing labor agreements, Licensee may provide such flagmen, watchmen, inspectors or supervisors, during all times of construction, at Licensee's sole risk, cost and expense; and in such event, Licensor shall not be liable for the failure or neglect of such watchmen, flagmen, inspectors or supervisors.

12. LICENSOR'S COSTS:

- 12.1 Licensor shall have the right to reimbursement for reasonable expenses incurred by Licensor as a result of this Agreement. Such reimbursable expenses shall include but not be limited to the cost of railroad labor and supervision, including necessary overtime, plus current applicable overhead percentages, or other materials provided or work performed by Licensor at the request of Licensee.
- 12.2 Timeliness of payments and any interest to be paid to Licensor for late payment shall be governed by Article 11-A of the State Finance Law to the extent required by law.

13. DEFAULT, BREACH, WAIVER:

- 13.1 The proper and complete performance of each covenant of this Agreement shall be deemed of the essence hereof. In the event Licensee fails or refuses to fully and completely perform any of such covenants or to remedy any breach, within thirty (30) days after receiving a written notice from Licensor to do so (or within forty-eight (48) hours in the event of notice of a railroad emergency), Licensor shall have the right to make necessary repairs or improvements to the Drainage Facility at the sole risk, cost and expense of Licensee.
- 13.2 No waiver by Licensor of its rights as to any breach of covenant or condition herein contained shall be construed as a permanent waiver of such covenant or condition, or any subsequent breach thereof, unless such covenant or breach is permanently waived in writing by Licensor.

14. TERMINATION, REMOVAL:

- 14.1 All rights which Licensee may have hereunder shall cease upon: (a) Licensee's breach, (b) Licensee's removal of the Drainage Facility from the Occupancy, or (c) subsequent termination of this Agreement by mutual written consent. Such revocation or breach shall not be effective until after thirty (30) days written notice to cure is delivered to Licensee and Licensee has failed to cure or failed to demonstrate a good faith effort to do so. However, neither revocation (upon Licensee's breach) nor termination shall affect any claims and liabilities which may have arisen or accrued hereunder, and which at the time of such termination or revocation have not been satisfied.
- 14.2 Within thirty (30) days after revocation or termination, Licensee, at its sole risk, cost and expense, shall: (a) remove the Drainage Facility from the Occupancy, (b) restore property of Licensor in a manner satisfactory to Licensor (unless the parties hereto agree otherwise), and (c) reimburse Licensor any loss, cost or expense resulting from such removal or restoration.

15. NOTICE:

15.1 Licensee shall give Licensor's Division Engineer, Mr. David J. Evers, One Bell Crossing Road, Selkirk, NY 12158, Phone: (518) 767-6557, Fax: (518) 767-6359, at least five (5) days' written notice before doing any work on the Property, except that in cases of emergency shorter notice may be given by telephone or facsimile (confirmed in writing). Additionally, Licensee shall provide Licensor's Environmental Department, Larry Dixon, 500 Water Street, J275, Jacksonville, Florida 32202, 904-359-1462, or its designee with forty-eight (48) hours notice by telephone and facsimile of the actual commencement of the work so that the Environmental Department may arrange for the Licensor's own consultants to be present during the work.

Licensor shall give Licensee's Remedial Section D's Section Chief, Mr. Robert Knizek, P.E., 625 Broadway, 12th floor, Albany, N.Y., 12233-7013, Phone (518) 402-9813, Fax (518) 402-9020, at least fifteen (15) days written notice before doing any work that would modify or interrupt the drainage way (i.e., potentially affects its protectiveness of human health or the environment); such notice is not required for emergency or routine work performed by Licensor on its right of way.

15.2 All other notices and communications concerning this Agreement shall be addressed to Licensee at 625 Broadway, 12th Floor, Albany, New York 12233, to Licensor at CSXT Contract Administration J180, 500 Water Street, Jacksonville, Florida 32202; or at such other address as the parties designate in writing to each other.

15.3 Unless otherwise expressly stated herein, <u>all</u> notices shall be in writing and sent via certified or registered mail, return receipt requested, or by courier, and shall be effective upon: (a) actual receipt, or (b) date of refusal of delivery by addressee.

16. ASSIGNMENT:

- 16.1 The rights herein conferred are the privilege of Licensee only, and Licensee shall obtain Licensor's prior written consent to any sale, transfer, assignment or sublease of Licensee's interest herein. Consent of Licensor shall be presumed to such assignment, etc., if no rejection notice is given by Licensor within sixty (60) days of request. Licensor acknowledges that, once the construction of the Drainage Facility is completed, the State of New York, or one of its agencies, may perform routine maintenance activities on the Drainage Facility and Occupancy. Nothing in this provision shall be deemed to limit the liability of Licensee for maintenance and repairs of the Drainage Facility.
- 16.2 Subject to Section 16.1, this Agreement shall be binding upon and inure to the benefit of the parties hereto and their respective successors or assigns (or heirs, legal representatives and assigns, as the case may be).
- 16.3 Licensee shall give Licensor notice of any legal succession (by merger, consolidation, reorganization, etc.) or other change of legal existence or status of Licensee, with a copy of documents attesting to such change or legal succession, within thirty (30) days thereof.
- 16.4 In the event of any unauthorized sale, transfer, assignment, sublease or encumbrance of this Agreement, or any of the rights and privileges hereunder, Licensor, at its option, may terminate this Agreement at any time within six (6) months after such sale, transfer, etc., by giving Licensee or any such assignee written notice of such termination, and Licensor may thereupon enter and retake possession of the premises and Licensee shall reimburse Licensor for any loss, cost or expense Licensor may incur as a result of Licensee's failure to obtain Licensor's prior written consent.

17. TITLE:

17.1 Licensee shall not at any time own or claim any right, title or interest in or to Licensor's property occupied by the Drainage Facility, nor shall the exercise of this Agreement for any length of time give rise to any right, title or interest in Licensee to said property other than the license herein created.

18. GENERAL PROVISIONS:

18.1 This Agreement, and any attached specifications, contains the entire understanding between the parties hereto.

- 18.2 Neither this Agreement, any provision hereof, nor any agreement or provision included herein by reference, shall operate or be construed as being for the benefit of any third person.
- 18.3 Neither the form nor any language of this Agreement shall be interpreted or construed in favor of or against either party hereto as the sole drafter thereof.
- 18.4 This Agreement is executed under current interpretation of applicable federal, state, county, municipal or other local statutes, ordinances or laws. Each separate division (paragraph, clause, item, term, condition, covenant or agreement) hereof shall have independent and severable status for the determination of legality, so that if any separate division is determined to be void, invalid or unenforceable for any reason, such determination shall have no effect upon the validity or enforceability of each other separate division, or any combination thereof.
- 18.5 This Agreement shall be construed and governed by the laws of the state in which the Drainage Facility is located.
- 18.6 Neither the failure of Licensor to object to any work done, material used, or method of construction or maintenance of said Occupancy, nor any approval given or supervision exercised by Licensor, shall be construed as an admission of liability or responsibility by Licensor, or as a waiver by Licensor of any of the obligations, liability and/or responsibility of Licensee under this Agreement.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement in duplicate (each of which may constitute an original but both of which shall be but one agreement), as of the date and year first above written.

Witness(es) for Licensor:	CSX TRANSPORTATION, INC.				
Mul 5 del	By: Spren E Milk				
	Print Name: Karen E. Mohler				
Marcy TJ. Rey olds	Director - RE Engineering				
	Print Title:				
	a E 9				
Witness(es) for Licensee:	NEW YORK STATE DEPARTMENT OF				
	ENVIRONMENTAL CONSERVATION				
Mill Ja	By: Janey Where				
,	Print Name: NANey W. Lussier				
	Print Title: Normo or Manage				

ATTACHMENT A

DESCRIPTION OF WORK

Installation of concrete lining in the east west drainage ditch which runs parallel to the existing track of Licensor located on the Property (the "E/W Ditch"). Concrete lining of the E/W Ditch will extend from the confluence of the north south ditch and E/W Ditch to the existing stormwater retention pond approximately 1,140 linear feet as shown on Figures 1 and 2 of Licensee's application for right of entry attached to the Agreement as Attachment B.

Concrete lining of the ditch will include minimum grading of the E/W Ditch, and the placement of four (4) inch thick concrete with welded wire fabric to cover the full width of the E/W Ditch as shown on Figure 3 of Licensee's application for right of entry attached to the as Attachment B.

In addition, five subsurface dams consisting of sand/bentonite mix will be installed along the E/W Ditch to minimize any water flow through the stone layer underlying the concrete lining as shown on Figure 4 of Licensee's application for right of entry attached to the Agreement as Attachment B. Minimal excavation work is anticipated with the consideration of these subsurface dams.

The Licensee's workers, personnel or equipment will not cross any track. Access route to the work area is shown on Figure 5 of Licensee's application for right of entry attached to the Agreement as Attachment B.

The work is adjacent to Licensor's rail yard and will therefore require flagging complete the project. Licensor's flagman will be required for the commencement and performance of all work adjacent to any track. Licensee shall not commence or perform any such work without the presence of Licensor's flagman. Licensee shall be responsible for the cost and expense of such flagman.

Licensee is required to locate any underground utilities prior to commencement of any work.

Licensee shall follow all reasonable safety instructions given to Licensee in the performance of any work by Licensor's Engineering Department, Roadmaster, flagman or other representative.

ATTACHMENT B

RIGHT-OF-ENTRY APPLICATION

Application for Environmental Right-of-Entry

-	
Pr	oject Owner Information: X Check here if agreement should be mailed to this address
1. 2.	Complete Legal Name of applicant: New York State Department of Environmental Conservation Company Contact Name: Michael J. Cruden Title: Environmental Engineer
3.	Telephone: (518) 402-9812 Fax: (518) 402-9819
4.	Telephone: (_518
5.	Type of business: Corporation, (State of incorporation:), Partnership, (type and
	state of Partnership),Individual, Developer, _X _XXXXXXXXXXXXXXX
	State Government
En	gineer/Consultant Information:
	Check here if agreement should be mailed to this address
6.	Company Name: Ecology and Environment, P.C.
1 %	Company Contact Name: Wadie Kawar Title: Senior Engineer Telephone: 716) 684-8060 Fax:(716) 684-0844
0.	Address: 369 Places t Wise Pai
9.	Address: 368 Pleasant View Drive City: Lancaster State: NY Zip: 14086
Pr	pject Information: Application Date: February 27, 2003
-	
11.	10. Your Reference No.: <u>Site No. 9-15-146</u> Location: <u>Niagara Transformer</u> 1747 Dale Road
	City: Cheektowaga County: Erie State: New York
12.	Field Measurement (REQUIRED):16000 feet West_ (direction) from Railroad Milepost_0C433.68
ŀ	OR feet (direction) from Rd Xing: Rd Name DOT/AAR#
	Latitude: Longitude:
13.	Project Description: Concrete lining of East/West ditch running parallel railroad
	tracks
14.	How close will the project be to the nearest track? 20 feet
	Does work on CSXT right-of-way include:
, -,	soil borings? No monitoring wells? No remediation/construction? Yes
16.	What sampling/work will be done on CSXT right-of-way? None
47	Mary All the second sec
17.	What is the source of contamination? Historic spill and leak of polychlorinated biphenyls (PCBs)
18.	Is this request related to investigation of a State or Federal "Superfund" site? No Yes X_
	If Yes, State or Federal Ref. No.: 9-15-146
	If No, Explain reason for the work
19.	How did you verify that property and/or trackage is CSXTs? from consultant
20.	Expected length of project (on CSXT R/W): begin date: June 2003 completion date: July 2003
	Requested Expiration date of contract: September 2003 (allow for follow-up monitoring/work)
Rai	road Use Only 21. Env. Project No.: 031109
00	22. Region: ALBANY Subdivision: BUFFALO
	M.P. QC433.68 V.S Val. Map No.:
24	Agmt. Term: Tenant-at-will (can be cancelled on 30 days' notice) X OR Specify Exp. date
	File Review date: 5/3/03 Fees attached? Y V N Explain:
26.	Comments: PLEASE NOTE SPECIAL CONDITIONS
27 -	Additional distribution:
	Approved? Yes No By: SD Duton
	Dy

EXHIBIT B
PAGE 1 OF 6

SAFETY PROCEDURES

Effective January 1, 1996, "The CSX Safe Way," a manual containing CSX Transportation's (Railroad) General Safety Rules, mandatory Departmental Safety Rules, recommended Work Practices, and CSX Policies and Programs was revised. The following Rules, Practices, and Policies are excerpted for your guidance. While on Railroad property, all consultants, contractors and visitors must comply with these requirements.

GENERAL SAFETY RULES

- 1. Consultant/Contractor must ensure that:
 - a. "job briefings are conducted prior to work activity and subsequently when activity changes."
 - c. "co-workers are warned of unsafe acts and hazards."
 - e. "safety rules and all company policies that relate to our job tasks are complied with."
 - f. "our work place is drug and alcohol free."
 - g. "the behavior in our work place is civil and courteous."
 - h. "local, state and federal laws and regulations that relate to our job tasks are observed."
 - i. "oral and written report of accidents and injuries are made as soon as possible to the supervisor or employee in charge."
- 3. "Do not attempt to mount, dismount, or cross over moving locomotives or cars."
- 6. Consultant/Contractor "must be familiar with and wear approved personal protective equipment and clothing as required" and comply with applicable OSHA requirements.
- 8. "Do not wear finger rings outside an office environment."
- 16. "When working on or about tracks:
 - a. be alert for the movement of cars, locomotives, or equipment at any time, in either direction, on any track;
 - b. do not cross within 25 feet of the end of standing cars, equipment, or locomotives, except when proper protection is provided."

Note: Proper Protection: Always ensure that a Railroad Flagman is present or the track is taken out of service by the proper Railroad authority, prior to starting any work on or about our tracks!

- 17. "Do not cross over coupled, moving freight cars."
- 18. "Do not take refuge under any car, equipment or locomotive."

- 20. "Do not go under any equipment unless proper protection is provided."
- 25. "Do not attempt to mount, dismount, or cross over moving equipment."
- 26. "Seat belts must be worn while operating or riding in motor vehicles that are equipped with them."
- 27. "Ensure that your work area and environment are clean and orderly, and protected from controllable hazards.

ENGINEERING AND MECHANICAL - DEPARTMENTAL SAFETY RULES AND RECOMMENDED SAFE WORK PRACTICES

E/M-10 Hi-Rail Vehicles:

- a. "Occupy track only with proper authority."
- b. "Stop on-track equipment when the operator's attention cannot be directed exclusively to controlling the movement."
- * "Be aware of the effects of the weather on starting and stopping hi-rail equipment."

E/M-12 Lifting and Carrying:

- a. "Use provided material handling and lifting devices when lifting heavy objects."
- b. "Ensure walkways are free of slipping or tripping hazards before lifting or carrying material."
 - * "Wear back support belts whenever you lift."
 - * "Designate one person to call signals when two or more people are lifting."

E/M-14 Motor Vehicles:

- b. "If two or more people are occupying the motor vehicle, designate one person to guide backing movements from the ground."
- c. "Apply the parking brake to a stationary vehicle if the engine must be left running in order to accomplish its intended task."
- * "Whenever possible back into parking spaces."

E/M-16 Personal Protective Equipment:

a. "Wear head protection provided by the company at all times while on duty, except when working in an office, when riding in a highway motor vehicle, or while in a designated lunch break area. Non-hardhat areas may be designated by local management."

- b. "Wear approved safety glasses with sideshields at all times while on duty, except when working in an office, while in a lunch area, or while in a locker room."
- c. "When working in areas where hearing protection may be required, have approved hearing protection devices available on your person, and wear them where required by posted notice or special instructions."
- d. "Wear hi-top (6-inch or more) safety-toe shoes with laces, oil-resistant soles, and a distinct separation between heel and sole when working outside of an office environment . . ."

ENGINEERING - DEPARTMENTAL SAFETY RULES AND RECOMMENDED SAFE WORK PRACTICES

E-2 Excavations, Pits, and Manholes

- a. "Shore vertical excavations of four feet deep or more."
- b. "Call utility locators before you dig."
- c. "Protect all open holes and trenches with adequate barricades."

E-10 On or Around and Crossing Tracks

- b. "When observing passing trains or equipment, always look in the direction from which the train or equipment is coming."
- * "Use caution when working on or around and crossing tracks."
- * "Look in both directions when approaching or crossing tracks."
- * "Be alert for dragging bands, shifting loads, etc."

Please ensure that your employees (and all subcontractors), who are or will be working on or about CSX Transportation property, comply with these revised standards of safety conduct. If you have any questions, or need further clarification of anything listed above, please contact your project manager. If there's ever any doubt, the safe course must always be taken!

Remember: No job is so important, no service so urgent that we cannot take time to perform all work safely.

Railroad Environmental Department

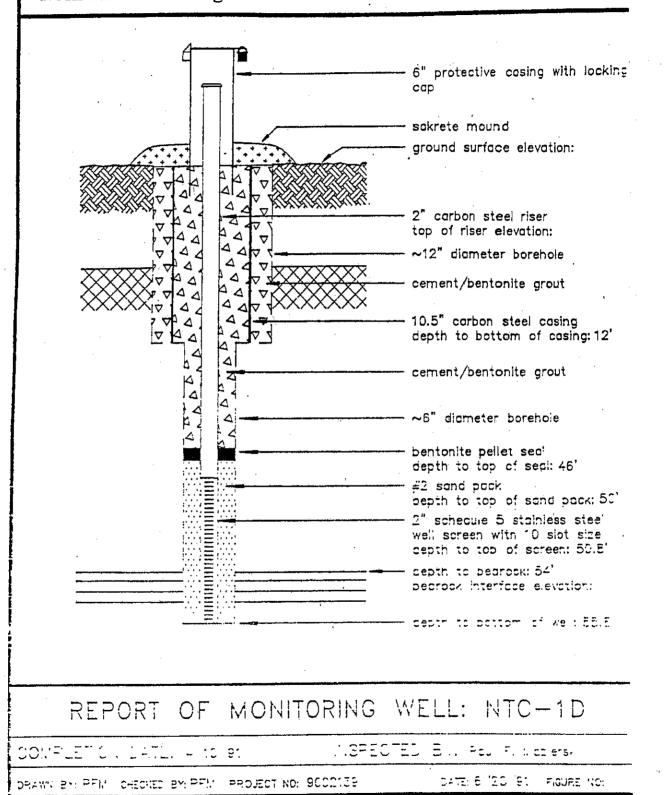
*Recommended Safe Work Practice

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J Information Logs

NIAGARA TRANSFORMER Remedial Investigation





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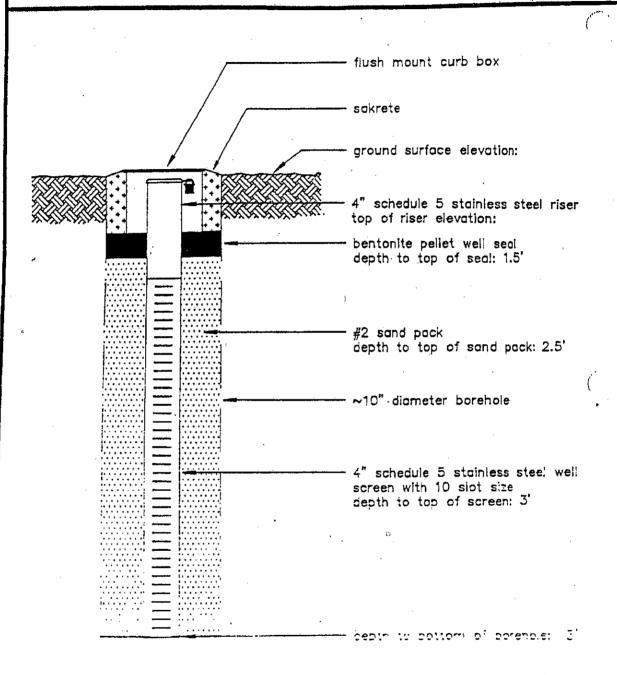
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оертн, гт.	SAMPLING RESISTANCE	SAMPLE TYPE	DESCRIPTION	STRATUM ELEVATION	POCKET PENETROMETER	UATER CONTENT, X	LIGUID LIMIT, %	PLASTIC LIHIT, X	OTHER TESTS
40-	39 . 46	SS	Brown-red clay some to little silt, trace to little sand, dry, hard, compact, occasional small rock clasts and thin moist layers of higher silt and		:				ND
-	~~		sand content						
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Drilling 3	dethes _		Hollow-Stem Auger			11. 4	river _		List

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NIAGARA TRANSFORMER Remedial Investigation



WOODWARD-CLYDE CONSULTANTS
Consulting Engineers, Geologists and Environmental Scientists



REPORT OF MONITORING WELL: NTC-95

COMPLETION DATE: 4,15, 81

1.SPECTED Bit Poul F. McDersk

DRAWN BY: PFM ICHECKED BY: PFM : PROJECT NO: 9002139

DATE: 6/20 '91 | FIGURE NO:

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ecology and environment

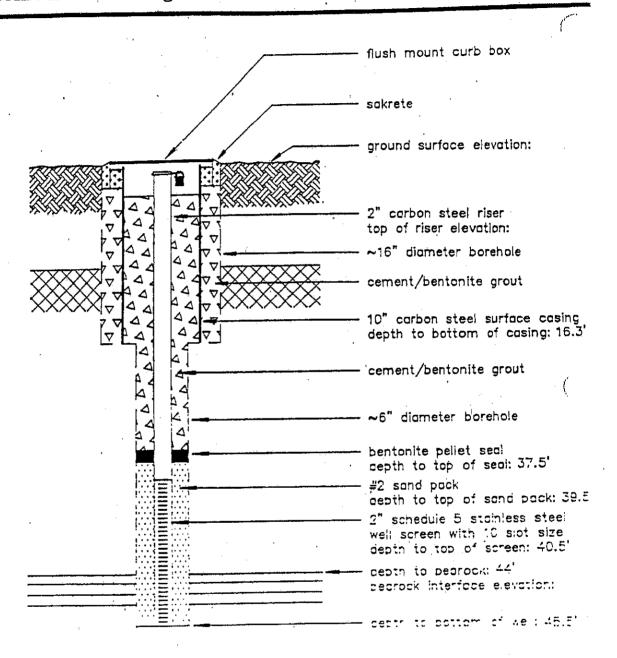
	 -		LOG of BORING No. NTC-9S			S	heet	1	of 1
DATE _	4/	5/91	SURFACE ELEVATION LOCATION	N	<u> </u>				
DEPTH, ft.	SAMPLING RESISTANCE	SAMPLE TYPE	DESCRIPTION	STRATUH ELEVATION	POCKET PENETROMETEP	WATER CONTENT, X	LIQUID LIMIT, X	PLASTIC LIMIT, %	OTHER TESTS
0-	19	SS	Bituminous asphalt and coarse subgrade						ND
	6	SS	Brown silty clay, trace to little sand with black rock clasts, wet Tan-light brown silt and sand, little clay, wet, no	<u> </u>					< 0.2
	29	55	Lmottling	·					ND
5—	2.3		Brown-tan fine to medium sand, trace silt and clay, saturated					ļ	ND
	44	SS							עא
	40	SS							ND
10-	53	SS	3						ND
	70	SS	Brown-red-tan silty clay, dry, very firm with fine gravel sized angular to subangular sized rock clasts						
15-		,							
20-			NOTES: (1) See monitoring well report for well completion retails (2) Values under "OTHER TESTS" are Aroclor-1260 concentration in ppm	•					
- 25—							•		ļ
-				•				; .	
,- -			•						, i
20									,
30 									
•									
-									
35-									•
-								12122	
i :ms.et.:	n Lest.		Name 2	. 17	•••				'
Francis	,			· -			Aller. After.		5.5. 1.5.
Fragect N.			Nagará Transformer RI	-			Airer. Aire		1.Fv
Traing M	e'r'' -		Hollow-Stem Auger					—	

— Woodward-Clyde Consultants.

NIAGARA TRANSFORMER Remedial Investigation



WOODWARD-CLYDE CONSULTANTS
Consulting Engineers, Geologists and Environmental Scientists



REPORT OF MONITORING WELL: NTC-9D

COMPLETION DATE: 4,46 F

SPECTED Downson Functioners.

DRAWN BY: PFN' CHECKED BY: PFN' PROJECT NO: 9002139

SATE: 6 '20, 9' FIGURE NO:

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			LOG of BORING No. NTC-9D	-		S	heet	1	of 2
DATE_	4/	15/9	1 SURFACE ELEVATION LOCATIO	ис					
DEPTH, rt.	SAMPLING RESISTANCE	SAMPLE TYPE	DESCRIPTION	STRATUM ELEUATION	POCKET PENETROHETEP	UNTER CONTENT, X	LIGUID LIMIT, %	PLASTIC LIMIT, X	отнея тезтз
0-]			SEE BORING LOG FOR NTC-9S					j	
 			- surface casing set to 17 feet			4			
10-									,
	46	SS	Alternating brown-tan fine to medium sand and silty sands, occasional rock clasts, saturated AND brown-tan silt and clay, little sand, moist to dry, harder, dryer in clay dominated portions;					i	
20-	45	SS	saturated in sand dominated lenses		!!!				
Í	77	ss			;		:		ND
25—	87	SS	, 1		-				
	34	ISS	Brown-tan silty clay with suprounded to rounded rock clasts, trace sand, hard to firm, moist to dry		-				
1	33	. 55							ND
30-1	26	SS							
30 55	25	35 "	Brown-red mottled ciax, soit to very soit conesive, occasional areas with little sand, trace	gang Pajan pamban (199 17	•				
35	18	SS	rock clasts, 'gumbo clay"						NI.
	12	'25	CONTINUED ON SHEET 2 OF 2						······································
Completion	r Derir		46.0 (1) Winst 1	··· . —	 .		· -		;;
Project No			uC313n	-					
Project Na	me		Niagara Transformer Rl						: ##
Drilling Mi	ethoi _		Hallow-Stem Auger Clude Consultants			. :/	liter _		- ***

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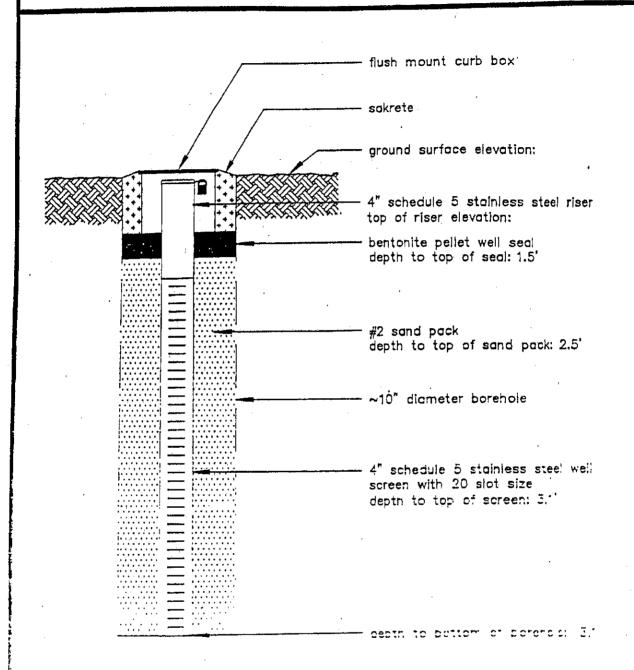
1	NTC-9D			
DATE 4/15/91 SURFACE ELEVATION	LOCATION		, ,	
SAMPLES SAMPLING RESISTANCE SAMPLE TYPE AND SAMPLE TYPE	STRATUM	POCKET PENETROMETER UATER CONTENT, X	LIMIT, % PLASIIC	OTHE/ STS
5 SS SAME AS ABOVE				
40—23 SS - occasional gray sand layers				ND
Gray sand and silt with abundant fine sized gravel clasts, saturated, "regolith"	to medium			, < 0.:
NOTES: (1) Bedrock auger refusal at 44 feet (2) Drilled 2 feet into rock with 5.9" Troller bit. (3) See monitoring well report for well completion details (4) Values under "OTHER TESTS" are Aroclor-1260 concentration in ppm	ri-cone			
65			•	
			,	
1 mm. et. : Deptr. 46.0 F.	* #12*	.:	7dist 🚐 🖫	
Project Name Ningara Transformer R1	-		مر میں۔ مراجع	—— —— ***
Project Name Ningara Transformer R1				

⊕ Woodward-Clyde Consultants F-10

NIAGARA TRANSFORMER Remedial Investigation



WOODWARD-CLYDE CONSULTANTS
Consulting Engineers, Geologists and Environmental Scientists



REPORT OF MONITORING WELL: NTC-11S

COMPLETION DATE: 6:6 92

(SPECTED Bit Fou F. McDerski

DRAYIN BY: PFM CHECKED BY: FRG PROJECT HC 9002139

DATE: 9/28,/90 FIGURE 1/1

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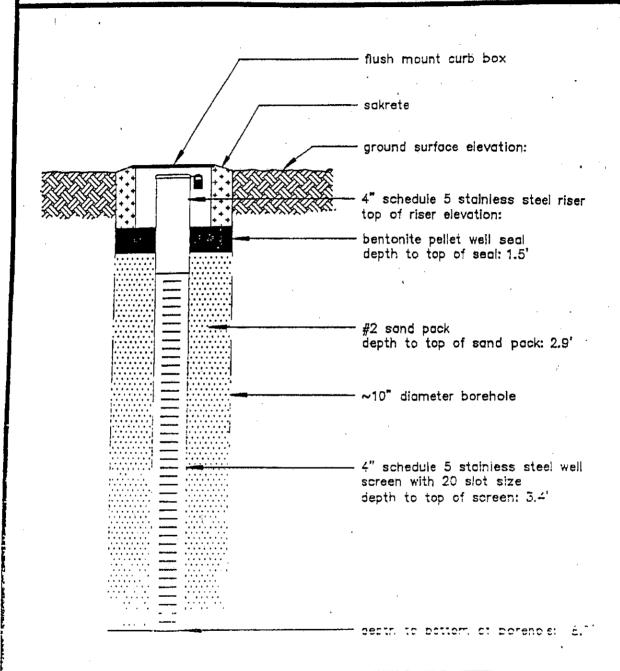
ecology and environment

1			LOG of BORING No. NTC-11S			Sheet 7	loiI
DATE_	6	/8/92	SURFACE ELEVATIONLOCATION				
DEPTH, ft.	SAMPLING RESISTANCE	SAMPLE TYPE	DESCRIPTION		STROTUM	HNu HEAD SPACE (ppm)	SPAC YEAD
0-7	87	SS	Shot rock fill and angular stone with brown sand, little silt.	-			
	35	SS	Mottled brown-tan clay, some to little silt, little small rock clasts dry, firm to very firm.				•
5	38	SS	Brown clay, little silt, trace sand, little to trace small rock clasts (decreasing with depth).				1
	50	SS	Sandier seams wet, with odor.				ł
	55	SS					.
10-	49	ss	Odor stronger, slight sheen apparent			, }	
	26	SS	Some sandier, thin lenses. Brown-gray silt and clay, little to some sand, very wet,	/			
1 . 1			odoriferous.				1
15-							l
20-							
							\
		<i>!</i>					(
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-	-		\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \				
-							
-							
Completion S			13.5 Ft Water Depth:			r <u>29</u> : <u>50</u>	
Project N Project N		71	Niagara Transformer		i Ane		
Drilling N		_	8.25" H.S.A.		i Afte		hrs.
			" Mandagerd Clyde Concultante				

NIAGARA TRANSFORMER Remedial Investigation



WOODWARD-CLYDE CONSULTANTS
Consulting Engineers, Geologists and Environmental Scientists



REPORT OF MONITORING, WELL: NTC-12S

COMPLETION DATE: 974 92

SPECTED Bit Frank R. Gorpe

DRAWN BY PFW - CHECKET BY FRG PROJECT NO. 9002139

DATE 9/28./92 FIGURE NO:

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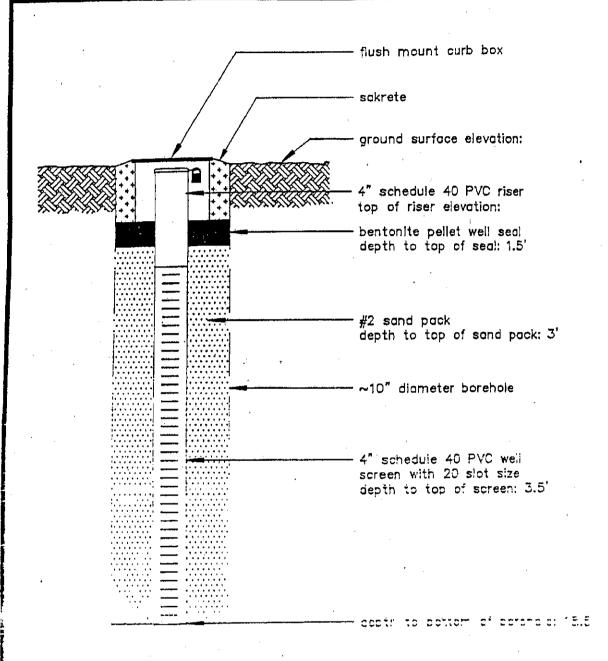
1			LOG of BORING No. NTC-12S		Queet 1 of 1
DATE	9	/14/9	2 SURFACE ELEVATION LOCATION		
	SAMPLES SAMPLING RESISTANCE	SAMPLE TYPE	DESCRIPTION	STRATUM	SPACE (ppm) OVP—EAD SPAC ppm)
0-	70	SS	Shot rock		1.0-5.0
1 :	30	ss.	No recovery	 	
5-	19	SS	Brown silty clay, trace sand, moist with infrequent thin lenses of tan-brown fine to medium sand, trace silt.		0-0.4
	7,6	SS	tan-prown time to medium said, trace sin.		0-2.0
] :	69	SS.	No recovery		
10-	39	SS	Brown to yellow-brown silty clay, moist, stiff, with little sand and fine gravel/subrounded rock clasts.		0-0.2
-	<i>5</i> 3	SS	THE BLAYCH SHOTOLIHOOD LOOK CHAIS.		0-3.0
15-	41 45	SS SS			0-0.2 0-0.2
20-			Note: Values under "OVA Head Space" are OVA readings off of freshly broken surfaces in split spoon samples and represent peak readings, not sustained readings.		
25— -					
30-				,	
- 20					
±0.— - - -		,			
Comple	tion Dep	th:	18.7 Ft. Water Depth:	ii., Alu	er <u>185</u> .hrs.
Project	No.;	G U	<u></u>	Li Ain	. 1
Project			Niagara Transformer	⊶tt Atti	4
Drilling	Method	: <u> </u>	8.25" H.S.A.	_ft., Afte	rhrs.

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NIAGARA TRANSFORMER Remedial Investigation



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REPORT OF MONITORING WELL: NTC-13S

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DRAWN BY: PFM CHECKED BY: FRG PROJECT NO: 9000139

DATE: 9/25,192 FIGURE : 10:

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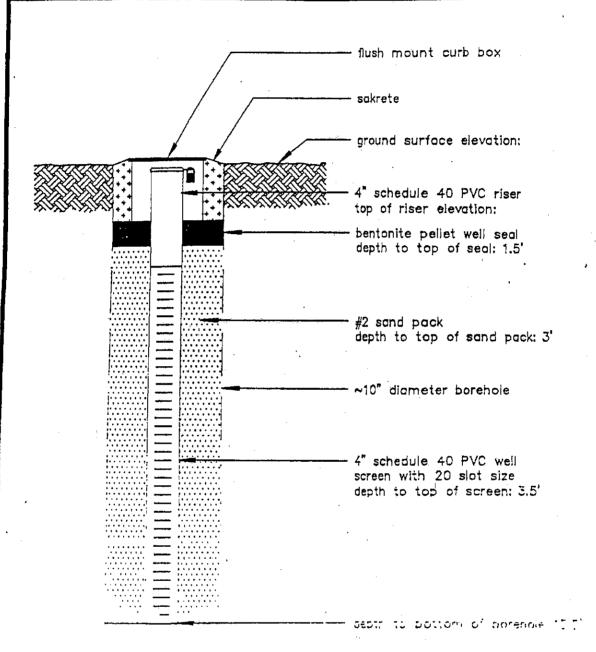
!			LOG of BORING No. NTC-13S		Sneet 1 of 1
DATE .	9/	16/9	2 SURFACE ELEVATION LOCATION		,
SAMPLES	SAMPLING RESISTANCE	SAMPLE TYPE	DESCRIPTION	STRATUM	HN4 HEAD SPACE (PPm) OVA HEAD SPAF PPm)
		.55.	Railroad bed shot rock-no sample taken		
	33	SS	Black-brown silty sand and gravel (FiLL), little black coal flakes.		2-35
5	20	SS	Brown clay, stiff, with trace silt and subrounded fine gravel.		0,4-1.5
	41	SS	Brown-black silty clay with some fine gravel.		0-4.0
-	82	SS	Tan-brown sandy clay	,	3.0-7.0
10-	67	SS	Dark red-brown silty clay, stiff, moist with occassional thin silty sand lenses, wet.	' .	0.2-0.6
	80	SS	Sand ictises, wet.		0-0.6
15	32	SS			0-0.4
13	65	SS			0-0.2
20-			Note: Values under "OVA Head Space Reading" are OVA readings off of freshly broken surfaces in split spoon samples and represent peak readings, not sustained readings.		
: ئــ . ئــ		ļ ;		<u> </u>	
30-	·	•		, •	
35-					,
- - - -		5			
• . • .					
Complet			18.5 Ft. Water Deptl:: 1.0		
urnjeet! Project!			Niagara Transformer		,
Project 1 Drilling			8.25' H.S.A	1t Aft	

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NIAGARA TRANSFORMER Remedial Investigation



WOODWARD-CLYDE CONSULTANTS
Consulting Engineers, Geologists and Environmental Scientists



REPORT OF MONITORING WELL: NTC-14S

COMPLET ON DATE: 9,10,95

MISPECTED, BN: Frank R. Garbe

DRAWN BY: PFN I CHECKED BY: FRG | PROJECT NO: 9002139

DATE: 9/28/92 . FIGURE NO:

'-...; T 1356'

erology and environment

1			LOG of BORING No. NTC-14S		Sheet 1	of I
DATE _	9,	/16/9	2 SURFACE ELEVATION LOCATION		,	
DEPTH, FT.	SAMPLING RESISTANCE	SAMPLE TYPE	DESCRIPTION	STRATUM	HNu HEAD SPACE (ppm)	OVA HEAD SPACE OPM)
[[No samples taken from 0° to 10°			
5—	•			ż		
10-	88	SS	Red-brown silty clay, stiff, with occassional thin, yellow-tan sandy silt lenses.			0-0.2
1	96	SS	Gray silty sand, moist to wet, with trace clay.	1		0
15-		SS.	No sample taken 14' to 16'.			
· #	6 0	SS	Gray silty sand, moist to wel, with trace clay.			0
20-			Note: Values under "OVA Head Space Reading" are OVA readings off of freshly broken surfaces in split spoon samples and represent peak readings, not sustained readings.			
25	 - - - -					
30-				· :		
35—						
- -	•					•
- - -						•
÷						
Completio	n Dept	h:	18.0 Ft. Water Depth:5	i 4!1	185	inrs.
Project No	•		C2130	<u></u>		_hr.{
Project Na			Niagara Transformer	_ft., Aite	er	_nrs.` _i
Drilling M	ethod:		8.25" H.S.A.	_ft., Alto		hrv.

Woodward-Clyde Consultants
Consultants

NIAGARA TRANSFORMER WOODWARD-CLYDE CONSULTANTS Consulting Engineers, Geologists and Environmental Scientists Remedial Investigation flush mount curb box sakrete . ground surface elevation: 4" diameter schedule 40 PVC riser top of riser elevation: bentonite pellet well seal depth to top of seal: 1.7 Ft. #2 sand pack depth to top of sand pack: 3.5 Ft. ~10" diameter borehole 4" diameter schedule 40 PVC we." screen with .020" slot size depth to top of screen: 4.5 Ft. depth to bottom of borehole: 19.5 Ft. REPORT OF MONITORING WELL: MSPECTED BY: Frank R. Garbo 'COMPLETION: DATE: 03-01-93 DATE: 3-5-93 FIGURE NO: DRAWN BY FRS CHECKED BY KRIM, PROJECT NO. 9002:39

restored baret

ecology and environment

ſ			LOG of Boring No. NTC-15S	Z	ideci 1	. U) 1
DATE	3	/1/9:	3 SURFACE ELEVATION LOCATION			
DEPTH, ft.	SAMPUNG	SAMPLE TYPE	DESCRIPTION	STRATUM	RECOVERY (FEET)	OVA HEAD SPACE (ppm)
0-		1	Augered through top one foot of shot rock and brown sand.			
•	100/6"	SS	Shorrock fill and fine brown sand. Frozen.		.4'	
_	2 9	SS	Black/dark brown fine sand, some shotrock fill and silt.		1.7'	,
	2.5		Tan/brown clay, little small, rounded rock clasts, trace sand and			
5-	32	SS	silt. Brown clay, trace silt, no rock clasts. Clay stiff, somewhat moist.		2.0'	
-	60	SS	Dark to light brown clay, trace to little silt, trace small, rounded rock clasts. Clay is stiff, somewhat moist to moist lower in spoon. Auger cuttings have slight odor.		1.9'	
10	48	ss	Brown clay, trace to little silt, trace small, rounded rock clasts. Clay is stiff and moist. NAPL/mineral oil throughout spoon, primarily in small voids surrounding rock clasts. Strong odor		1.7'	
į	82	ss	shroughout spoon. Same as above with increase in silt and moisture.		1.4'	
	61	SS			1.4'	
15	56	ss	Light brown to grey fine sand. Uniform, wet. No visible NAPL/mineral oil or apparent odor throughout spoon.		1.5	
National Design	45	SS	Light brown clay, some fine sand, little silt and small, rounded rock clasts.		1.1	
20—	24	zs ;	Light brown to grey, fine sand, little to some clay. Grey, fine to medium coarse sand, trace silt. Uniform, wet.	· · · · · · · · · · · · · · · · · · ·	1.21	
		-	Grey to prown clay and fine to medium coarse sand, trace silt. Moist.			
1	ı					
amn	ı v. Dan		21.0 Ft. Water Depti.:	_i.,After		_hrs.
zoject : Zoniect :	70∙: Journe	<u> </u>		⊒iAfter		hrs.(
roject !	Name:		Niagara Transformer	ــــft After	-	hrs.
	Method.		6 1/4" ID.H.S.A.	⊥l.,Alter		ins.

Woodward-Clyde Consultants - and environment

NIAGARA TRANSFORMER WOODWARD-CLYDE CONSULTANTS Consulting Engineers, Geologists and Environmental Scientists Remedial Investigation flush mount curb box sakrete ground surface elevation: 4" diameter schedule 40 PVC riser top of riser elevation: bentonite pellet well seal depth to top of seal: 2.5 Ft. #2 sand pack depth to top of sand pack: 4.0 Ft. ~10" diameter borehole 4" digmeter schedule 40 PVC weil screen with .020" slot size depth to top of screen: 5.0 Ft. depth to pottom of porenole: 20.0 Ft. REPORT OF MONITORING "ISPECTED BY: FRANK R. GARBE COMPLETION DATE: 03-02-93 DATE: 3-5-93 | FIGURE NO: DRAWN BY: FRG CHECKED BY: KRM - PROJECT NO: 9002139

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[LOG of Boring No. NTC-16S		P.11444 .	
DATE _	3	/2/93	SURFACE ELEVATION LOCATION			
DEPTH, ft. SAMPLES	SAMPLING	SAMPLE TYPE	DESCRIPTION	STRATUM	RECOVERY (FEET)	OVA HEAD SPA (ppm)
0-		.0)	Augered through top one foot of shot rock and fine brown sand.			
, -	N.A.	SS	Shot rock fill and brown sand, some silt and clay. Clay stift, dry.	İ	.9'	
-	.16	SS	Dark brown clay, some silt, trace small, rounded rock clasts. Clay stiff, dry to slightly moist in last .2' of spoon. Very slight odor throughout spoon.		.6'	
5-	27	SS	Grey clay, some sand. Moist, soft. Odor stronger,		1.7'	
	57	SS	Reddish brown clay, trace silt and small, rounded rock clasts. Clay is stiff and dryer. No apparent odor. Reddish brown clay, occasionally mottled green and dark red in last 1/2 foot of spoon, some to little medium coarse sand (in seams), trace small, rounded rock clasts.		1.4'	
10-	45	SS	Same as above but wet with less sand.		1.8'	
	76	SS.	No recovery in spoon due to basket failure.		0.0	
	33	SS	Grey brown clay, trace silt and small, rounded rock clasts. Clay is firm and moist.		1.81	
15	35	ss.	No recovery in spoon due to basket failure.		0.0	•
	8.5	ss	Brown to grey-brown clay, trace silt and small, rounded rock clasts. Clay is firm and moist.		7 1.9	
20-						
-						
-						
<u>-</u>	·					·
Complet						hrs.
Project !			<u>0C2139</u>		ti	—'(
Project :			Niagara Transformer	itAii ltAii		••
Drilling	Method	j:	6.1'4' ID H.S.5.			

Woodward-Clyde Consultants
F-22

DATE
STARTED: 8-18-97



SUBSURFACE LOG

BORING NO.: INSIDE SURF, ELEV.: ±

PROJE	CT:	<u>N</u>	iaga	ira T	rans	forn	ner	, 	LOCATION: Dale Road	
LIENT	:	<u> 1</u>	<u>vss</u>						Cheektowage	, New York
SAMPLES	SAMPLE NO	0 8	SA	DWS MPL 12/ 18	ER	N	RECOVERY	SYMBOL	SOIL OR ROCK CLASSIFICATION	NOTES
P	1	-	1	1	4		10		CONCRETE SUBBASE Brown SILT Little Clay Little f-c Sand tr.	BG = 0.8
	}_					\dashv			gravel (Fill)	
Ź	2	5	6	6	6	1	BG .		tr, sand	,
	}					_				İ
	3	4	5	12	11	+	ВG			,
5 -				•		\dashv		 	Brown SILT, some f. Sand (moist)	•
	4	16	15	22	25	\dashv	BG	Ų.	Red Brown CLAY and Silt, little tr. I-c sand (moist)	
V					\dashv	_			N. Committee of the Com	
	5.	2	8	20	31	$\frac{1}{1}$	ВG		Contains tr. gravel	
1						-	1			
0 1	6	3	9	16	23		BG		Contains tr. sand	
						1				
									Boring completed at 12.0'	
1					_	_			. WELL DETAILS	
5 -						-			2" S/S Screen (10-slot) 5.0' 2" S/S Riser 6.0'	
+									Grade #1 Silica Sand from 11.0' to 6.0' #0 Silica Sand to 5.5'	
		-				-	 .		Bentinite to 3.5' Grout to Surface	
4		 				-				
1						1				
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RILLER	: <u>F</u>	₹. Br					·		DRILL RIG: CME 45	

DEC 08 197 16:45

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BORING NOUTSIDE DATE SUBSURFACE SURF. ELEV.; _______ STARTED: _8-15-97 LOG FINISHED: 8-15-97 SHEET 1 OF 1 6001-6-00111 Niagara Transformer LOCATION: Dale Road PROJECT: Cheeklowaga, New York CLIENT: <u>IWSŞ</u> 문 SAMPLES DEPTH-FT. RECOVERY BLOWS ON SOIL OR ROCK. SAMPLER NOTES CLASSIFICATION ASPHALT SUBBASE BG = 0.419 12 10 1.1 Brown f-c SAND, some f-c Gravel, little Silt 3.0 Poor recovery on 6 4 6 10 #2 Red Brown CLAY, some Silt, tr. sand 8 11 12 18 2.0 (moist) Contains tr. gravel 3,0 18 23 23 21 Boring completed at 8.0' 10 WELL DETAILS 5' S/S Screen (10-slot) 2.5' S/S Riser Grade #1 Silica Sand from 6.0' to 2.0' #0 Sand from 2.0' - 1.5' Bentonite to .5" Grout to Surface

DRILLER: R. Brown	DAILL RIG: CME 45
METHOD OF INVESTIGATION: AS	TM D-1586 USING HOLLOW STEMA UGERS (4 1/4 ID)
WEATHER:	CLASSIFIED BY: S. Bochenek

TOTAL P.03



Quality Assurance Project Plan

Generic Quality Assurance
Project Plan (GQAPP)
for the
Niagara Transformer
Corporation Site
NYSDEC Site No. 9-15-157

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Prepared for:

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

625 Broadway Albany, New York 12233

Program QA Officer	Date	9

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AAS atomic absorption spectroscopy

ASP Analytical Services Protocol

ASTM American Society for Testing and Materials

CERCLA Comprehensive Environmental Response, Compensation and Liability

Act of 1980

CLP Contract Laboratory Program

CM construction management

COC chain-of-custody

CPR cardiopulmonary resuscitation

DOT United States Department of Transportation

DUSR Data Usability Summary Report

ECL Environmental Conservation Law

EDD electronic data deliverable

ELAP Environmental Laboratory Accreditation Program

EPA United States Environmental Protection Agency

FS Feasibility Study

FSP field sampling plan

GC/MS gas chromatography/mass spectrometry

IATA International Air Transport Association

ICP inductively coupled plasma

ICS interference check sample

List of Acronyms (Cont.)

IDW investigation-derived waste

IIWA immediate investigation work assignment

IRM interim remedial measure

LCS laboratory control sample

MDL method detection limit

MEDD multimedia electronic data deliverable

mL/min milliliters per minute

MS/MSD matrix spike/matrix spike duplicate

MSB matrix spike blank

NELAP National Environmental Laboratory Accreditation Program

NYSDEC New York State Department of Environmental Conservation

NYSDOH New York State Department of Health

OVA organic vapor analyzer

PARCC precision, accuracy, representativeness, completeness, and comparability

PE performance evaluation

PID photoionization detector

PPE personal protection equipment

PSA preliminary site assessment

QA/QC quality assurance/quality control

QAM Quality Assurance Manual

QAPP Quality Assurance Project Plan

QMP Quality Management Plan

RA remedial action

RD remedial design

RI Remedial Investigation

List of Acronyms (Cont.)

RPD relative percent difference

SARA Superfund Amendments and Reauthorization Act of 1986

SDG sample delivery group

SI site inspection

SOP Standard Operating Procedure

SOW scope of work

SVOC semi-volatile organic compound

TCLP toxicity characteristic leaching procedure

TRPH total recoverable petroleum hydrocarbon

VOA volatile organic analysis

VOC volatile organic compound

VTSR verified time of sample receipt

Distribution List

Party	Affiliation and Title	Revision	Date Sent
QAPP Original Distribution			
	QA Director		
	Project Manager(s)		
	NYSDEC Contracts		
	NYSDEC QA Officer		

Revision List

Revision	Modifications	Distributed

Laboratory Distribution and Approval

All site specific contract or subcontract laboratories working on project must perform analytical services and work in compliance with this QAPP.

Party		Affiliation and Title	Revision	Date Sent
QAPP Original	Distribution			

This page must be completed and returned to NYSDEC with each revision of the QAPP.

Laboratory certifies that it will conduct analytical services in compliance with QAPP unless modified by any project-specific requirements listed in the site-specific QAPP or approved laboratories exceptions or clarifications.

Executed this	day of	, 20	
			Contractor or Subcontractor Laboratory
		<u> </u>	Signature
			Name
		_	
			Title

1

Project Management

This generic Quality Assurance Project Plan (GQAPP) has been prepared in support of projects performed for the New York State Department of Environmental Conservation (NYSDEC).

The GQAPP is applicable to the Niagara Transform Corporation project and needs to be implemented by site monitoring personnel and is subject to regulatory oversight by NYSDEC or that must be conducted in accordance with NYSDEC regulations.

This GQAPP has been prepared in accordance with "United States Environmental Protection Agency (EPA) Requirements for Quality Assurance Project Plans," final, EPA QA/R-5 (March 2001) and incorporates NYSDEC requirements. This GQAPP presents the policies, organization, objectives, functional activities, and specific quality assurance/quality control (QA/QC) procedures that will be employed by site monitoring personnel to ensure that all technical data generated are accurate, representative, and ultimately capable of withstanding judicial scrutiny. These activities will be implemented under the requirements of site monitoring personnel's comprehensive QA program as documented in the corporate Quality Management Plan (QMP).

The GQAPP is formatted to address the four major sections listed in the EPA QAPP guidance document: Project Management, Data Generation and Acquisition, Assessment and Oversight, and Data Validation and Usability.

1.1 Project Organization

The organizational chart for the site specific environmental investigation, design, or construction project work in New York is presented as Figure 1-1. The owner and project team members are primarily responsible for implementation of the QA program on NYSDEC related projects. All project communications are directed through the site specific project manager. The site specific project manager is the primary point of contact for the NYSDEC Project Manager and technical staff. The QA Officer for the site specific work provides independent review functions to verify that the projects are implemented in accordance with applicable QA documents. The site specific project manager is responsible for independent over-



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sight of projects involving engineering services for design and construction. The roles and specific QA responsibilities of key project personnel are described below.

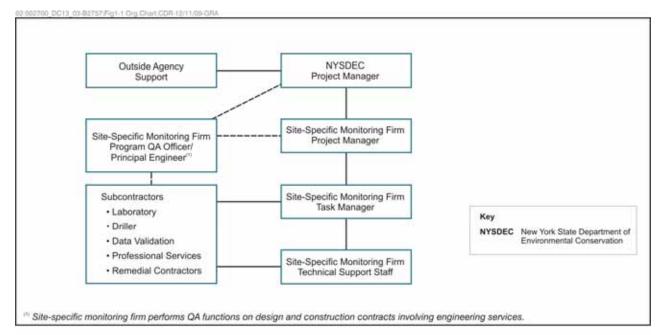


Figure 1-1 Organizational Chart

Project Manager

The site specific Project Manager is responsible for QA/QC functions for all task-specific operations on NYSDEC projects, and will coordinate with the owner on issues that impact the overall quality of performance on the site specific work.

The Project Manager will also be responsible for the overall quality of work performed under project activities as it relates to the following specific roles:

- Overseeing day-to-day performance including all technical and administrative operations;
- Interfacing frequently with the NYSDEC Project Manager and technical staff;
- Tracking schedules and budgets and managing of mobilization and contract closeout activities;
- Selecting and monitoring field staff;
- Managing the development of detailed work plans; and
- Reviewing and approving all final reports and other work products.



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Corporate or Program QA Officer

The site specific monitoring firm's Corporate QA Director is responsible for ensuring compliance with the site specific QA program. The Program QA Officer is responsible for oversight of all QA/QC activities for NYSDEC projects. The QA Officer will remain independent of day-to-day, direct project involvement but will have the responsibility for ensuring that all project and task-specific QA/QC requirements are met. The QA Officer will have direct access to corporate executive staff, as necessary, to resolve any QA/QC problems, disputes, or deficiencies. The QA Officer's specific duties include:

- Reviewing and approving the QAPP;
- Conducting field and laboratory audits in conjunction and keeping written records of the audits;
- Coordinating with the NYSDEC technical staff, Project Manager, Task Managers, and laboratory management to ensure that QA objectives appropriate to the project are set and that laboratory and field personnel are aware of these objectives; and
- Recommending, implementing, and/or reviewing actions taken in the event of QA/QC failures in the laboratory or field.

Project Chemist

The Project Chemist is responsible for data validation and verification, generation of Data Usability Summary Reports (DUSRs), and independent assessment of the hard copy and electronic analytical data. The Project Chemist will report nonconformance with QC criteria (including an assessment of the impact on data quality objectives) to the appropriate managers.

Technical Support Staff

The technical support staff for this program will be drawn from the site specific pool of resources. The technical support staff will implement project and site tasks, analyze data, and prepare reports/support materials. All support personnel assigned will be experienced professionals who possess the degree of specialization and technical competence necessary to perform the required work effectively and efficiently.

Laboratories

Laboratories providing analytical services will be chosen as appropriate for the project requirements. All laboratories will be certified by the New York State Department of Health (NYSDOH) Environmental Laboratory Accreditation Program (ELAP) for the methods that they are contracted to perform. Laboratories



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performing for Superfund sites with full data packages must be certified by NYSDOH for Contract Laboratory Program (CLP) analysis.

The laboratory QA programs are reviewed and approved by the QA Officer or the Project Chemist, and will be submitted to NYSDEC for approval. Copies of the laboratory QA manuals are available on request. The laboratory must provide an experienced Project Manager and a QA Officer that is independent of the day-to-day operations of the laboratory. The specific duties of the laboratory Project Manager and QA Officer for NYSDEC activities include:

- Reviewing the GQAPP to verify that analytical operations will meet project requirements;
- Documenting review and approval of GQAPP on distribution page;
- Reviewing receipt of all sample shipments and notifying the Project Manager and Project Chemist of any discrepancies within one day of receipt;
- Rapidly notifying the site specific Project Manager and Project Chemist regarding laboratory nonconformance with the GQAPP or analytical QA/QC problems affecting project samples; and
- Coordinating with the site specific Project Manager and Project Chemist, and laboratory management to implement corrective actions approved by NYSDEC or others as applicable.

1.2 Problem Definition/Background

All work is to be carried out consistent with NYSDEC and EPA requirements, protocols, and guidance.

1.3 Project Description

The work covered by this QAPP is defined under the site specific Site Management Plan (SMP). If necessary, site-specific QAPP information will be provided as an appendix to the field sampling plan (FSP).

1.4 Quality Objectives and Criteria

Quality objectives are qualitative or quantitative statements derived from the systematic planning process. Quality objectives are used to clarify the goals of the project and define the appropriate type of data to collect to support project decisions. General quality objectives for NYSDEC projects are summarized in Table 1-1.

Table 1-1 General Data Quality Objectives, NYSDEC Projects

Data Collection	leral Data Quality Objectives, NYSDEC		<u></u>		Acceptability/
Activity	Quality Objectives		Standards ^a		Performance Criteria ^b
Sampling and Analysis	To have samples and analytical results that accurately represents the nature and extent of contamination at the site. Data must be of sufficient quality to meet all regulatory requirements and allow assessment of impacts on human health by comparison to New York State criteria or background values. Data also may be used for long-term monitoring or to meet regulatory permit requirements. In these cases, data must meet the requirements of the permit.	•	NYSDEC Ambient Water Quality Standards NYSDOH Soil Vapor Intru- sion Guidance Values NYSDEC Remedial Program Soil Cleanup Objectives	•	Data must be collected under an approved FSP using approved SOPs. Data must meet the acceptance and performance criteria documented in Section 2 of this QAPP. Reporting limits should be below risk-based screening values for 90% of target analytes and 100% of critical analytes of concern. Data must be compared to standards.
Field Screening Analysis	To have samples and analytical results that effectively indicate the nature and extent of contamination at the site. Technical personnel use data to determine the best locations to collect samples for laboratory analysis.		None	-	Data must be collected under an approved FSP using approved SOPs. Data must meet the acceptance and performance criteria for the screening method. Reporting limits should be below anticipated concentrations of critical analytes of concern.
Subsurface Logging	To provide a description of the subsurface soils that is consistent and accurate, and to record drilling and sampling procedures and well construction details.		Site Specific SOPs (including Geologic Logging and Moni- toring Well Installation)		Accurate, consistent, signed, and legible documentation as described in SOPs. Unconsolidated materials described according to the Unified Soil Classification System. Rock/soil material described using standard geologic nomenclature.
Surveying	To relate project work locations (including sample, monitoring well, and test pit locations) to existing local benchmarks.	=	Surveying subcontract Differential correction for GPS data	= =	Relation of all survey points to existing/known benchmarks. Accurate horizontal coordinates (±0.5 foot for wells; ±3 feet for GPS locations). Accurate vertical elevations (±0.01 foot) for permanent monitoring well locations.
Field Records	To document all field activities and to allow accurate representation field events in the final report. Records must be capable of withstanding legal scrutiny.	=	Section 2 of the QAPP Site Specific SOPs (Field Activities Logbooks)	-	Consistency between field and laboratory data. Clear and legible documentation for sample collection and equipment decontamination for final report.

Table 1-1 General Data Quality Objectives, NYSDEC Projects

Data Collection			Acceptability/
Activity	Quality Objectives	Standards ^a	Performance Criteria ^b
	To use the most current reference values, reports, or data from outside sources in data assessments and recommendations for the site.	None	 All versions of data or standards must be the most current values available. Data or standards must be accurately incorporated into the final report.
and Assessment	To review and verify data are generated according to the QAPP, and assign data qualifiers as necessary to indicate limitations on data usability.	 NYSDEC DUSR Guidance EPA Region 2 Data Validation SOPs EPA National Functional Guidelines 	 Data must be reviewed by Project Chemist meeting minimum NYSDEC qualifications. Data qualifiers or changes to data must be documented in a DUSR.

Notes:

- a Major standards.
- Major or noteworthy acceptability criteria. All performance criteria must be verified using procedures listed in the QAPP.

Key:

GPS = Global Positioning System.

NYSDEC = New York State Department of Environmental Conservation.

NYSDOH = New York State Department of Health.

QAPP = Quality Assurance Project Plan.

SOP = Standard Operating Procedure.





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Acceptance and performance criteria establish the quality and quantity of data needed to meet the project quality objectives. General acceptance or performance criteria for the collection, evaluation, or use of environmental data for NYSDEC projects are outlined in Section 2.5, Analytical Methods. Quality objectives or acceptance and performance criteria applicable to a project are specified in the site-specific QAPP or work plan.

1.4.1 Data Assessment Definitions

Acceptance and performance criteria are often specified in terms of precision, accuracy, representativeness, completeness, and comparability (PARCC) parameters. Numerical acceptance criteria cannot be assigned to all PARCC parameters, but general performance goals are established for most data collection activities. Numerical goals for analytical methods are presented in Section 2.4. Data assessment procedures throughout the QAPP clearly outline the steps to be taken, responsible individuals, and implications if QA objectives are not met. PARCC parameters are briefly defined below.

Precision

Precision measures the reproducibility of measurements under a given set of conditions. Specifically, it is a quantitative measure of the variability of a group of measurements compared to their average value, usually stated in terms of standard deviation or coefficient of variation. It also may be measured as the relative percent difference (RPD) between two values. Precision includes the interrelated concepts of instrument or method detection limits and multiple field sample variance. Sources of this variance are sample heterogeneity, sampling error, and analytical error.

Accuracy

Accuracy measures the bias of the measurement system. Sources of this error are the sampling process, field contamination, preservation, handling, sample matrix, sample preparation, and analysis. Data interpretation and reporting may also be significant sources of error. Typically, analytical accuracy is assessed through the analysis of spiked samples and may be stated in terms of percent recovery or the average (arithmetic mean) of the percent recovery. Blank samples are also analyzed to assess sampling and analytical bias (i.e., sample contamination). Background measurements similarly assess measurement bias.

Representativeness

Representativeness expresses the degree to which data represent a characteristic of a population, a parameter variation at a sampling point, or an environmental condition. Representativeness is a qualitative parameter, which is most concerned with proper design of the measurement program. Sample/measurement locations may be biased (judgmental) or unbiased (random or systematic). For unbiased schemes, sampling must be designed not only to collect samples that represent



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conditions at a sample location, but also to select sample locations, which represent the total area to be sampled.

Completeness

cology and environment engineering, p.c.

Completeness is defined as the percentage of measurements performed that are judged to be valid. Although a quantitative goal must be specified, the completeness goal is the same for all data uses—that a sufficient amount of *valid* data be generated. It is important that critical samples are identified and plans are made to ensure that valid data are collected for them

Comparability

Comparability is a qualitative parameter expressing the confidence with which one dataset may be compared to another. Sample data should be comparable with other measurement data for similar samples and sample conditions. This goal is achieved through the use of standard techniques to collect and analyze samples.

1.5 Special Training/Certification

The site specific monitoring firm is committed to providing vigorous training in health and safety procedures, the proper use of protective equipment, and overall policy objectives. General training requirements for NYSDEC activities are as follows:

- Site monitoring employees that participate in on-site activities must have completed the 40-hour health and safety training program and the cardiopulmonary resuscitation (CPR)/first aid certification course. To continue such participation, each employee must successfully complete a minimum of eight hours of refresher training, annually; and
- All personnel shipping samples must complete the United States Department of Transportation (DOT) hazardous materials transportation training and certification, including training in specific International Air Transport Association (IATA) regulations (air shipments).

1.6 Documentation and Records

The site monitoring firm's QA Officer will approve the site specific QAPP and maintain the most current approved version of the document. The site specific Project Manager is responsible for providing the most current copy of the site specific QAPP and other planning documents to the project team members.

In addition to the QAPP and other planning documents, the primary documentation for the project is field records and analytical data packages. Requirements for field records are documented in site monitoring firm's Standard Operating Procedures (SOPs) for Field Activities Logbooks and Geotechnical Logbooks and are described briefly below. Requirements for analytical data packages for NYSDEC





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activities are also described below. The remainder of the QAPP describes additional project documentation and record requirements for QA/QC assessments, data validation, data management, and other areas.

1.6.1 Field Documentation

Sample Identification

Samples will be identified using the format described below. Each sample will be labeled, chemically preserved (if required), and sealed immediately after collection. To minimize handling of sample containers, labels will be completed prior to sample collection as practicable. The sample label will be completed using waterproof ink and will be firmly affixed to sample containers and protected with clear tape. The sample label will give the following information:

- Date of collection;
- Unique sample number;
- Analyses requested; and
- Preservation.

Each sample will be referenced by sample number in the logbook and on the chain-of-custody (COC) record.

Individual samples will be identified by a unique alphanumeric code. Normal field samples (non-quality-control) will be numbered according to the following convention:

SSS-MC-###-Q

- SSS Three letter code for site name
- MC Matrix code as designated below
- ### Sequential sample number
 - Q Quality control sample code such as D for duplicate, F for filtered, S for split, etc.

The matrix codes are as follows:

- AS Bulk Asbestos
- BA Indoor Air from Basement or Crawlspace
- DW Drinking Water
- EB Equipment Blank





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FA - Indoor Air, First Floor (not basement)

GW - Groundwater

OA - Outdoor Air

SD - Sediment

SB - Subsurface Soil

SF - Surface Soil

SS - Sub-slab Vapor

SV - Soil Vapor

SW - Surface Water

TB - Trip Blank

WS - Waste

Samples collected with an additional volume for matrix spike/matrix spike duplicates (MS/MSD) will be designated on the COC.

Field Logs and Data Forms

Field logs and data forms are necessary to provide sufficient data to enable participants to reconstruct events that occurred during the project and to refresh the memory of field personnel should they be called upon to give testimony during legal proceedings. Field logs also should document any deviations from the work plan, QAPP, or other applicable planning document. Procedures for recording information are specified in the Field Activities Logbook SOP. All field logs will be kept in a bound notebook containing numbered pages unless a specific field form is completed. All entries will be made in waterproof ink and the time of the entry will be recorded. The top of each page of the logbook or field form will contain the site specific project number, project name, and date that the entries on that page were recorded. No pages will be removed for any reason. Corrections will be made according to the procedures given later in this section. The field logs will include both site- and task-specific information.

Recording of information related to site activities is the responsibility of the site specific monitoring staff and will include a complete summary of the day's activities at the site and any communications outside the project team. Site information includes:

- Name of the person making the entry (signature);
- Names of team members, subcontractors, and visitors on site;
- Levels of personal protection equipment (PPE):
 - Level of protection originally used,
 - Changes in protection, if required, and
 - Reasons for changes; and



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■ Time spent on site.

Task-specific information may be recorded in multiple field logbooks. The task-specific information will include:

- Drilling information, including:
 - Method employed,
 - Diameter of borehole and well casing,
 - Materials used,
 - Depth of borehole, and
 - Well construction (if appropriate);
- Documentation on samples collected, including:
 - Construction of existing wells (if appropriate),
 - Sampling location and sample identification number,
 - Sampling depth for subsurface soil and surface water (if depth-specific surface water samples are collected) samples,
 - Flow rate of water from in-place plumbing (500 milliliters per minute [mL/min]) for samples of existing water supplies,
 - Sampling date, time, and personnel,
 - Sample sequence (order in which samples were collected),
 - Equipment used (including the use of fuel-powered units/motors during surface water sampling),
 - Type of sample (e.g., grab, composite, QC) and matrix,
 - Amount of each subsample or aliquot (if sample is a composite), and
 - Sample preservation and verification of preservation;
- Types of field QC samples, including when and where they were collected. The description of rinsate sample collection should include the equipment rinsed and the actual field samples collected with that equipment prior to collection of the rinsate;
- Information regarding well purging including:
 - Depth to water and total well depth,
 - Calculations used for volume purged,
 - Volume purged,
 - Equipment used,
 - Field measurements,
 - Length of purge time, and
 - Date and time well was purged;
- Drum inventory:
 - Type of drum and description of contents, and



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- Description of material in the drum and which ayers were sampled (if performed);
- Field equipment used, equipment identification numbers, and calibration information;
- On-site measurement data;
- Field observations and remarks;
- Weather conditions;
- Decontamination procedures;
- Unusual circumstances or difficulties; and
- Initials of person recording information.

Corrections to Documentation Notebook

As with any data logbooks, no pages will be removed for any reason. If corrections are necessary, they must be made by drawing a single line through the original entry (so that the original entry can still be read) and writing the corrected entry alongside. The correction must be initialed and dated. Most corrected errors will require a footnote explaining the correction.

Photographs

Photographs will be taken as directed by the site specific Team Leader. Documentation of a photograph is crucial to its validity as a representation of an existing situation. The following information will be noted in the task log concerning photographs:

- Date, time, location, and direction photograph was taken;
- Description of the photograph taken;
- Reasons why the photograph was taken;
- Sequential number of the digital photo; and
- Camera system used.

1.6.2 Laboratory Data Reporting

The data packages for all CLP and similar Superfund analytical services are consistent with NYSDEC Analytical Services Protocol (ASP) Category B (July 2005)



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and, therefore, must include a full data package with all associated sample and QC results, calibrations, and raw data. The data packages for long-term monitoring events are consistent with NYSDEC ASP Category A, and therefore must consist of a case narrative, COC, summary table of sample identifications and sample tracking information, a summary of analytical results, and a summary of QC results. The laboratory will provide a summary package of results for all data packages. The laboratory will provide a summary of the sample analyzed, methods used, and date and time of analysis. The laboratory will provide an electronic data deliverable that matches all data reported on the hard copy analytical report. Electronic data report requirements are described in Section 2.10.

Within 48 hours of sample receipt, the laboratory will provide a sample receipt file and copy of the completed COC.

The analytical summary report will include the sample aliquot analyzed, final extract volume, and dilution factor. The analytical summary data report also will include the laboratory reporting limit and method detection limit (MDL) for all target compounds. These limits will be corrected for percent moisture and all dilution factors. Any compounds found less than the reporting limit, but greater than the MDL will be reported and qualified with a "J" flag as estimated.

QC reports must provide a summary report or batch identifier clearly linking all QC results to actual field sample results. QC summary reports must include the laboratory control limits and flag any result reported outside control limits. The case narrative must include an explanation of all QC results reported outside control limits. The laboratory must provide copies of any nonconformance or corrective action forms associated with data in the laboratory report.

For Category A, the laboratory should provide copies of chromatograms for any samples for which elevated reporting limits are used because of sample matrix, but no target compounds are found above the reporting limit.

For organic analytes reported in both Category A and Category B deliverables, the laboratory must report results of the most concentrated extract analysis in order to achieve required quantitation limits.

1.6.3 Record Retention

All records related to the project must be stored in secure areas consistent with requirements in site specific QMP. All records related to the analytical effort must be maintained at the laboratory or in the office (for field screening data) in lockable filing cabinets for at least one year, except those stored in the computer (i.e., cost information, scheduling, custody transfers, and management records). All records must be maintained in a secure area for a period of six years after the end of the calendar year in which the final report is issued.





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Types of records to be maintained in addition to the final technical reports for NYSDEC include the following:

- Field logbooks, sampling documents, photographs, QA/QC records, and any other supporting documentation for collection of field samples;
- Administrative records including time cards, costing, and scheduling information; and
- Client correspondence, subcontractor records, minutes of meetings, and any related project management records.

Types of records to be maintained by the laboratory in addition to the analytical report for the NYSDEC include the following:

- Complete COC records from sample receipt to destruction. Sample destruction records must contain information on the manner of final disposal;
- Supporting documentation for any nonconformance or corrective action forms supplied in the analytical report or related to the analysis of project samples;
- Computer records on disk with magnetic tape backup of cost information, scheduling, laboratory COC transfers, and laboratory management records;
- All laboratory notebooks including raw data such as readings, calibration details, and QC results; and
- Hard copies of data system printouts (i.e., chromatograms, mass spectra, and inductively coupled plasma [ICP] data files).

2

Data Generation and Acquisition

This section of the QAPP contains descriptions of all aspects of the implementation of field, laboratory and data handling procedures to meet the requirements of NYSDEC activities. The QAPP provides the basis for ensuring that appropriate methods are used and thoroughly documented. These procedures will be adapted, as appropriate, to meet the objectives of each NYSDEC project as described in the appropriate work plan.

2.1 Sampling Process Design

The sampling process design is documented in the work plan or in the FSP for each site. The FSP will include a project schedule and a summary table listing the type of samples collected, the sampling location, the rationale for selecting the location, sample handling procedures, analytical methods, and the number and type of QA/QC samples.

2.2 Sampling Methods

The sampling methods are documented in the work plan or in the FSP. The site specific monitoring firm's sampling SOPs serve as the basis for sampling procedures.

In general, sampling at a site will progress from clean areas to contaminated areas. This minimizes the potential for cross contamination of samples and, subsequently, eliminates data anomalies or misinterpretation of the extent of contamination. The order of sample collection at a specific location normally proceeds as follows:

- 1. Volatile organic compounds (VOCs) or other volatile parameters;
- 2. Extractable organics (including total recoverable petroleum hydrocarbons [TRPH]);
- 3. Oil and grease;
- 4. Total metals;



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- 5. Dissolved metals;
- 6. Microbiological samples;
- 7. Other inorganics; and
- 8. Physical parameters (including ignitability, corrosivity, and reactivity).

This sequence helps maintain the representativeness of samples and analytical results.

The remainder of this section describes typical procedures for equipment decontamination and the handling of investigation-derived waste (IDW), and sample containers, preservatives, holding times, packing, and shipping. Specific procedures for each site are provided in the work plan or in the FSP.

2.2.1 Equipment Decontamination

Sampling methods and equipment are chosen to minimize decontamination requirements and the possibility of cross-contamination. Equipment or supplies that cannot be effectively decontaminated (e.g., sample tubing or rope) will be disposed of after sampling. Investigation/sampling equipment will be cleaned at the site prior to use, between sampling locations, and prior to transport off-site. Decontamination of field equipment will be noted in the field logbook. If it is necessary to make decontamination procedure changes in the field, the changes will be noted in the logbook. Otherwise, a notation will be made each day that decontamination was conducted as specified in the work plan or in the FSP. Rinsate blanks will be collected to verify the effectiveness of decontamination procedures. If field blanks indicate poor techniques, the QA Officer and Project Manager will ensure techniques are modified and samplers trained appropriately.

All decontamination will be performed in accordance with NYSDEC-approved procedures. Decontamination of large equipment will consist of the following:

- Removal of foreign matter; and
- High-pressure steam cleaning.

Decontamination of heavy equipment will be performed by the subcontractor and will be performed in a decontamination pad as described in the contract.

The following alternative procedures will be used for smaller equipment and may also be employed for downhole tooling such as split spoons and Geoprobe rods or routine sampling equipment:



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- Initially remove all foreign matter;
- Scrub with brushes in a laboratory-grade detergent solution (e.g., Alconox);
- Rinse with potable water with a final deionized or distilled water rinse; and
- Allow to air dry.

If sampling for metals is conducted, then an additional rinse with a 10% nitric acid solution will be added between the potable and deionized water rinses.

Sensitive down-hole devices that only contact water (e.g., water level indicator and miniTROLL pressure transducer) may be decontaminated by triple rinsing with deionized or distilled water. A temporary decontamination area will be established in each work area using heavy plastic sheeting as a pad. The decontamination will be performed by the field team.

Fluids generated during decontamination will be handled according to procedures described in Section 2.2.2.

2.2.2 Investigation-Derived Waste (IDW)

Unless otherwise directed by NYSDEC staff, all IDW will be handled in a manner consistent with requirements in the work plan and applicable federal and state regulations. IDW includes disposable equipment and PPE, purge and development waters, drilling fluids, soil cuttings, and decontamination fluids. Waste streams will not be mixed and will be segregated to the maximum extent possible.

Investigation-derived soils and water will be field-screened for organic vapors with an organic vapor analyzer (OVA) or photoionization detector (PID) and visual inspected to initially determine whether these wastes are potentially contaminated. In order to minimize the generation of drummed wastes and the costs associated with storage, testing, transportation, and disposal of drums, IDW will be handled in the following manner:

- Soil cuttings from boreholes: as much of the soil cuttings as possible will be used as backfill. Remaining cuttings that are not significantly contaminated (OVA or PID readings of 5 parts per million [ppm] or less and lack of staining, sheen, etc.) will be spread on the ground near the site of generation if the location is in a suitably undeveloped area. If this is not possible or if contamination is suspected, the excess soil cuttings will be drummed;
- Soil cuttings from monitoring well boreholes: cuttings that are not significantly contaminated (OVA or PID readings of 5 ppm or less and lack of staining, sheen, etc.) will be spread on the ground near the site of generation if the



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location is in a suitably undeveloped area. If this is not possible or if contamination is suspected, the excess soil cuttings will be drummed;

- Development and purge waters from monitoring wells and decontamination water: water that is not significantly contaminated (OVA or PID readings of 5 ppm or less, lack of sheen, etc.) will be discharged to the surface in the area where it was generated only if the area is suitably undeveloped (e.g., not paved and not on residential property). If the water cannot be discharged to the surface, then it may be discharged to the municipal sanitary sewer system pending receipt of a temporary discharge permit from the local sewer department. Alternatively, significantly contaminated waters or waters that cannot be discharged will be drummed; and
- Used sampling equipment and PPE: unless field screening indicates that PPE and other solid wastes are contaminated to the level that they can not be disposed of as non-hazardous waste, this material will be double-bagged and disposed of off-site as non-regulated solid waste.

Wastes that need to be drummed will be placed in United States Department of Transportation (DOT) approved 55-gallon drums and stored at a central storage location selected by NYSDEC, pending analysis and disposal. Drums will be staged within secondary containment units and covered with a plastic tarp if stored outside. All drums containing IDW will be labeled as to their contents, the site name, location where the material was generated, and date the waste was generated. Composite samples of like wastes will be collected for toxicity characteristic leaching procedure (TCLP) VOCs, TCLP semivolatile organic compounds (SVOCs), TCLP pesticides/herbicides, TCLP metals, PCBs, and pH. A waste disposal firm will then be subcontracted to haul the waste off-site to an appropriate disposal facility as either solid or hazardous waste. The site specific monitoring firm will coordinate drum hauling with the NYSDEC project manager to ensure that NYSDEC or NTC (Owner) is available to sign the waste shipping manifest(s), as legal waste generator.

2.3 Sample Handling and Custody

2.3.1 Sample Containers

The volumes and containers required for sampling activities are indicated in Table 2-1. Prewashed sample containers will be provided by the laboratory and will be wide-mouth jars with Teflon-lined caps unless otherwise indicated. The laboratory must use an approved specialty container supplier, which prepares containers in accordance with EPA bottle-washing procedures. The laboratory must maintain a record of all sample bottle lot numbers shipped in the event of a contamination problem. Trip blanks will be transported to the site inside the same box as volatile organic analysis (VOA) vials or as the air sampling canisters.

Parameter	Method	Containers/Preservative for Solid Samples ^a	Containers/Preservative for Aqueous Samples ^a	Holding Time for Solid Samples ^a	Holding Time for Aqueous or Air Samples ^a
Contract Laborator	y Program Analysis				
TCL VOCs	OLM04.2/SOM01.0	Two pre-weighed 40-mL plus one pre-weighed 40-mL vial with stir bar and methanol and one 4-oz. glass vial with septum (if no other containers are shipped)	Three 40-mL glass vials with septa, preserved HCl < pH 2	48 hours for analysis or freezing to <7°C and 12 days for analysis following freezing	12 days for waters with chemical preservative, and 5 days for unpreserved sample
TCL SVOCs	OLM04.2/SOM01.0	One 8-oz. glass jar	Two 1-L amber glass bottles	12 days/40 days ^d	5 days/40 days ^d
TCL Pest/PCB	OLM04.2/SOM01.0	One 8-oz. glass jar	Two 1-L amber glass bottles	12 days/40 days ^d	5 days/40 days ^d
TAL Metals/ Mercury	ILM05.3	One 8-oz. glass jar	One 1-L HDPE bottle, preserved HNO ₃ to pH <2	180 days/26 days for mercury	180 days/26 days for mercury
TAL Cyanide	ILM05.3	One 8-oz. glass jar	One 1-L HDPE bottle, preserved NaOH to pH >12	180 days/12 days for cyanide	180 days/12 days for cyanide
Air/Vapor Samples			1	, ,	,
Target VOCs	TO-15 ^g	1.0, 1.4, or 6.0 L Minican (depending on lab availability	NA		30 Days
Solid Waste					
Ignitability	SW-846 Chapter 8 (8.1)	One 8-oz. glass jar	One 1-L HDPE bottle for both tests	40 days	40 days
Corrosivity (as pH)	SW-846 Chapter 8 (8.2)	One 8-oz. glass jar		28 days	28 days
Reactivity	SW-846 Chapter 8 (8.3)	One 8-oz. glass jar	Two 1-L HDPE bottles	28 days	28 days

Parameter	Method	Containers/Preservative for Solid Samples ^a	Containers/Preservative for Aqueous Samples ^a	Holding Time for Solid Samples ^a	Holding Time for Aqueous or Air Samples ^a
TCLP Extraction	1311	Two 8-oz. glass jars	Various (see below)	5 days for SVOCs and mercury, 7 days for VOCs, 180 days for metals	5 days for SVOCs and mercury, 7 days for VOCs, 180 days for metals
TCLP Metals/ Mercury	6010B/7471	One 8-oz. glass jar	One 1-L HDPE bottle ^c	26 days ^b for mercury, 180 days for metals	26 days ^b for mercury, 180 days for metals
TCLP Volatile Organics	8260B	One 125-mL VOA jar	Two 40-ml glass vials with septa	7 days	7 days
TCLP Base/ Neutral Acid Extractables	8270C	One 8-oz. glass jar	Two 1-L amber glass bottles	7 days, 40 days for analysis ^b	7 days, 40 days for analysis ^b
TCLP Pesticides	8081A	One 8-oz. glass jar	Two 1-L amber glass bottles	7 days, 40 days for analysis ^b	7 days, 40 days for analysis ^b
TCLP Herbicides	8151A	One 8-oz. glass jar	Two 1-L amber glass bottles	7 days, 40 days for analysis ^b	7 days, 40 days for analysis ^b
TCLP STARS Base/Neutral Extractables	8270C	One 8-oz. glass jar	Two 1-L amber glass bottles	7 days, 40 days for analysis ^b	analysis ^b
TCLP STARS Volatile Organics	8021B or 8260B	One 125 mL VOA jar	Two 40-mL glass vials with septa	7 days ^b	7 days ^b
Additional Methods	1			I	
Hardness	130.1,130.2	NA	One 1-L HDPE bottle (can combine with metals) preserved HNO ₃ to pH <2	NA	180 days
рН	150.1	NA	To be performed in the field	NA	ASAP
TDS	160.1	NA	One 1-L HDPE bottle	NA	24 hours
TSS	160.2	NA	One 1-L HDPE bottle	NA	5 days

Parameter	Method	Containers/Preservative for Solid Samples ^a	Containers/Preservative for Aqueous Samples	Holding Time for Solid Samples ^a	Holding Time for Aqueous or Air Samples ^a
Priority Pollutant	200.7	One 4-oz. glass jar	One 1-L HDPE bottle preserved	180 days, 26 days	180 days, 26 days
Metals			HNO_3 to pH <2	for mercury	for mercury
Alkalinity	310.1, 310.2	NA	One 1-L HDPE bottle	NA	12 days
Nitrate or Nitrite	353.2/300,/9056	One 4-oz. glass jar	One 1-L HDPE bottle (can combine with pH and BOD ₅)	24 hours	24 hours
Nitrate-Nitrite	353.2	One 4-oz. glass jar	One 1-L HDPE bottle preserved H ₂ SO ₄ to pH <2	26 days	26 days
Orthophosphorus	365.2/300,/9056	NA	One 1-L HDPE bottle (can combine with pH and BOD ₅)	NA	24 hours
Total Phosphorus	365.2	One 4-oz. glass jar	One 1-L HDPE bottle preserved H ₂ SO ₄ to pH <2	26 days	26 days
Chloride, Bromide, Sulfate, Fluoride	300, 9056 or individual methods	One 4-oz. glass jar	One 1-L HDPE bottle	26 days	26 days
COD	410.1	NA	One 1-L HDPE bottle (can combine with ammonia and TKN) preserved H ₂ SO ₄ to pH <2	NA	26 days
Oil/Grease	1664	One 4-oz. glass jar	One 1-L amber glass bottle preserved HNO ₃ to pH <2	26 days	26 days
TRPH	1664	One 4-oz. glass jar	One 1-L amber glass bottle preserved H ₂ SO ₄ to pH <2	26 days	26 days
Metals/Mercury	6010B	One 4-oz. glass jar	One 125-mL HDPE bottle preserved HNO ₃ to pH <2	180 days/26 days for mercury	180 days/26 days for mercury
Chromium, Hexavalent	7196A	One 4-oz. glass jar	One 1-L HDPE bottle unpreserved or preserved pH of 9.3 to 9.7 with an ammonia sulfate buffer solution	24 hours from collection for unpreserved soils and 28 days for preserved soils	24 hours from collection for unpreserved water and 28 days for preserved water

Parameter	Method	Containers/Preservative for Solid Samples ^a		Holding Time for Solid Samples ^a	Holding Time for Aqueous or Air Samples ^a
PCBs	8082	One 4-oz. glass jar	Two 1-L amber glass bottles	12 days/40 days ^d	5 days/40 days ^d
VOCs and related tests	8260B/8021B/8015B	Two pre-weighed 40-mL with deionized water and one pre-weighed 40-mL vial with stir bar and methanol and one 4-oz. glass vial with septum(if no other containers are shipped)	Three 40-mL glass vials with septa preserved HCl < pH 2	48 hours for analysis or freezing to <7°C and 12 days for analysis following freezing	12 days for waters with chemical preservative, and 5 days for unpreserved sample
SVOCs and related tests	8270C	One 8-oz. glass jar	Two 1-L amber glass bottles	12 days/40 days ^d	5 days/40 days ^d
Chlorinated Dioxins and Furans	8280A or 8290	One 8-oz. glass jar	Two 1-L amber glass bottles	30 days/45 days ^d	30 days/45 days ^d
Cyanide	9010C/9012B	One 4-oz. glass jar	One 1-L HDPE bottle preserved NaOH to pH >12	12 days	12 days
TOX	9020B	One 4-oz. glass jar	One 1-L amber glass preserved H ₂ SO ₄ to pH <2	7 days	7 days
рН	9045C/9040B	One 4-oz. glass jar	One 125-mL HDPE bottle	ASAP	ASAP
Total Phenols	420.1	One 4-oz. glass jar	One 1-L amber glass preserved H ₂ SO ₄ to pH <2	26 days	26 days
Total Organic Carbon	Lloyd Kahn; 415.1; 9060	One 4-oz. glass jar	NA	26 days	26 days
Total Glycol	DEC 89-9	One 4-oz. glass jar	One 1-L glass	26 days	14 days
Specific Gravity	SM 22710 F	NA	Can combine with other analyses (requires 500 mL)	NA	40 days

Parameter	Method	Containers/Preservative for Solid Samples ^a	Containers/Preservative for Aqueous Samples ^a	Holding Time for Solid Samples ^a	Holding Time for Aqueous or Air Samples ^a
TKN	351.3		One 1-L HDPE bottle (can combine with COD and ammonia) preserved H ₂ SO ₄ to pH <2	26 days	26 days
Ammonia	350.2	E 9	One 1-L HDPE bottle (can combine with COD and TKN) preserved H ₂ SO ₄ to pH <2	26 days	26 days
BOD ₅	405.1	NA	One 1-L HDPE bottle (can combine with pH and nitrates)	NA	24 hours

^a All samples to be cooled to 4°C except for metals analysis samples shipped alone. Sample containers must have Teflon-lined lids. Holding times are based on verified times of sample receipt and are consistent with NYSDEC requirements. 0.008% Na2S2O3 to be added to water samples in the presence of residual chlorine.

Key:

ASAP = As soon as possible.

 BOD_5 = Biochemical oxygen demand-5.

BTX = Benzene, toluene, xylene.

COD = Chemical oxygen demand.

EPA = U.S. Environmental Protection Agency.

HDPE = High-density polyethylene.

 $HNO_3 = Nitric acid.$

 $H_2SO_4 = Sulfuric acid.$

L = Liter.

mL = Milliliter.

NA = Not applicable.

NaOH = Sodium hydroxide.

oz. = Ounce.

PCBs = Polychlorinated biphenyls.

SM = Standard Methods of Analysis for Water and Wastewater.

STARS = NYSDEC Spill Technology and Remediation Series (Memorandum No. 1 [1992]).

SVOCs = Semivolatile organic compounds.

TAL = Target Analyze List.

TCL = Target Compound List.

TCLP = Toxicity characteristic leaching procedure.

TDS = Total dissolved solids.

TKN = Total Kjeldahl nitrogen.

TOX = Total Organic Halides.

TRPH = total recoverable petroleum hydrocarbon.

TSS = Total suspended solids.

VOC = Volatile organic compounds.

^b Time listed is from TCLP extraction.

^c TCLP analysis of water samples assumes less than 0.5% solids.

^d Holding time is 5 days from collection to extraction and 40 days from extraction to analysis.



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For air samples, laboratories will follow cleaning procedures and checking for canisters as outlined in Method TO-15 and the NYSDOH Guidance for Soil Vapor Instrusion. Laboratories are required to certify that containers are clean and provide copies of the certification in the data package.

2.3.2 Samples Preservation and Holding Times

All samples requiring preservation will be collected in containers pre-preserved by the laboratory supplier. If field preservation is necessary, preservation will be immediately after collection and transportation to the site office. A clean, disposable pipette or a premeasured, single-use, glass ampule will be used to transfer liquid preservatives to the sample container. Care will be taken to avoid contact between the pipette or ampule and the sample or sample container. Solid preservatives will be transferred to the sample container using a clean, stainless-steel spoon. The sample preservation will be checked on representative samples by pouring the sample into a clean cup and testing with pH paper to determine if a sufficient amount of preservative has been used. Preserved samples for VOA will be tested on an extra vial at a rate of approximately 10%. Use of additional preservative also will be recorded in the logbook. Field blanks, which require preservation, will be preserved with a volume of reagent equal to the volume of reagent used in the samples that the blanks represent. A list of preservatives and holding times for each type of analysis are indicated in Table 2-1. Additional preservation requirements and holding times for non-target analyses are listed in the NYSDEC ASP.

Samples for soil VOCs will be collected in accordance with Method 5035. The laboratory must supply two pre-tarred VOA vials with 5 mL of deionized water, one pre-tarred vial with methanol, and one 2-ounce container for dry weight analysis (only if no other tests are required). The laboratory also must provide one coring device per sample for collection of a 5-gram plug. Soil samples for VOCs must arrive at the laboratory within 48 hours to be frozen at -7°C.

Reagents used for preservation are reagent-grade and are supplied by the laboratory or approved chemical supplier. The laboratory must maintain traceability records on preservatives in the event of potential field contamination of samples. Each bottle is received from the laboratory and must be clearly labeled with laboratory name, type of chemical, lot number, and expiration date. Field personnel should record the date used in the field, site name, and site specific project number on the label or in the site logbook. Fresh sample containers and preservatives will be obtained from laboratory stocks prior to mobilization for each sampling event. Preservatives stored on site will be disposed of after use unless containers are sealed and stored under COC in a secure area. No preservatives will be used passed the expiration date.



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Sample preservation will be verified at the laboratory at receipt or prior to analysis for VOCs. The preservation or pH will be recorded in the logbook. If samples are improperly preserved, a corrective action form will be submitted to the laboratory project manager for follow-up action. The laboratory will notify the Field Leader or Project Manager to implement corrective action in the field.

Methods for the analysis of soils, sediments, or solid matrices for VOCs will be used in conjunction with Method 5035A: Closed-System Purge-and-Trap and Extraction for Volatile Organics in Soil and Waste Samples. The recommended collection technique for Method 5035A calls for the transfer of a 5-gram aliquot of sample to a tarred empty 40-mL VOA vial. The sample is iced at 4°C for transport to the lab. The laboratory will refrigerate VOA vials at 4°C \pm 2°C for 48 hours or less or preserve by freezing at < -7°C within 48 hours of receipt to extend holding time to 14 days.

2.3.3 Sample Handling

The transportation and handling of samples must be accomplished in a manner that not only protects the integrity of samples but also prevents any detrimental effects due to the possible hazardous nature of the samples. Regulations for packaging, marking, labeling, and shipping of hazardous materials are promulgated by the DOT in 49 CFR 171 through 177. The site specific monitoring firm needs to trains all staff responsible for the shipment of samples in these regulations. Procedures for sample packing and shipping are documented in the site specific monitoring firm's SOP.

Sample Packaging

Samples must be packaged carefully to avoid breakage or contamination and must be shipped to the laboratory at proper temperatures. The following sample packaging requirements will be followed:

- Sample bottle lids must never be mixed. All sample lids must stay with their original containers;
- Shipping coolers must be partially filled with packing materials and ice (when required) to prevent bottles from moving and breaking during shipping;
- Environmental samples are to be cooled. Wet ice packaged in sealable, plastic bags will be used to cool samples during shipping. Ice is not to be used as a substitute for packing materials;
- Any remaining space in the cooler should be filled with inert packing material such as bubble wrap. Under no circumstances should material such as sawdust or sand be used;



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- A duplicate custody record must be placed in a plastic bag and taped to the inside of the cooler lid. Custody seals are affixed to the sample cooler; and
- All containers for a given sample will be shipped in the same cooler when possible. In cases where samples for volatile analysis would be shipped in several coolers on a single day, VOA vials will be consolidated into a single cooler to minimize the number of required trip blanks.

Shipping Containers

Environmental samples will be properly packaged and labeled for transport and dispatched to the laboratory facility. The SOP procedure will be followed to mark and label sample shipments. A separate COC record must be prepared for each shipping container. The following requirements for shipping containers will be followed.

Sample shipping containers will generally be commercially purchased coolers (e.g., Coleman coolers) or boxes provided from the laboratory for air canisters. Each container will be custody-sealed for shipment, as appropriate. The container custody seal will consist of filament tape wrapped around the package at least twice and custody seals affixed in such a way that access to the container can be gained only by cutting the filament tape and breaking a seal.

Field personnel will make arrangements for transportation of samples to the laboratory. In most cases, samples will be shipped using an overnight express carrier (e.g., Federal Express). Field monitoring personnel will provide the laboratory with a shipment schedule and notify them of deviations from planned activities. The field monitoring personnel will notify the laboratory of all of samples intended for Saturday delivery, no later than 3 p.m. (Eastern Standard Time) on Thursday.

2.3.4 Sample Custody

Formal sample custody procedures begin when the precleaned sample containers leave the laboratory or upon receipt from the container vendor. The laboratory must follow written and approved SOPs for shipping, receiving, logging, and internally transferring samples. Sample identification documents must be carefully prepared so that sample identification and COC can be maintained and sample disposition controlled. Sample identification documents include:

- Field notebooks;
- Sample labels;
- Custody seals; and



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■ COC records.

The primary objective of COC procedures is to provide an accurate written or computerized record that can be used to trace the possession and handling of a sample from sampling through completion of all required analyses. A sample is in custody if it is:

- In a team member's physical possession;
- In a team member's view;
- Locked up; or
- Kept in a secured area that is restricted to authorized personnel.

Field Custody Procedures

Precleaned sample containers will be relinquished by the laboratory to the Field monitoring personnel. The Field monitoring personnel will record receipt of the sample containers in the project logbook. The following field custody procedure will be used for collection of samples:

- As few persons as possible should handle samples;
- Coolers or boxes containing cleaned bottles should be sealed with a custody tape seal during transport to the field or while in storage prior to use;
- The sample collector is personally responsible for the care and custody of samples collected until they are transferred to another person or dispatched properly under COC rules;
- The sample collector will record sample data in the field logbook; and
- The Field monitoring personnel will determine whether proper custody procedures were followed during the fieldwork and decide if additional samples are required.

Chain-of-Custody Record

The COC form must be fully completed in duplicate by the field technician designated by the site specific monitoring firm's Project Manager as responsible for sample shipment to the appropriate laboratory for analysis. In addition, if samples are known to require rapid turnaround in the laboratory because of project time constraints or analytical concerns (e.g., extraction time or sample retention period limitations), the person completing the COC record should note these constraints. The custody record also should indicate any special preservation techniques nec-



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essary or whether samples need to be filtered. Copies of COC records are maintained with the project file.

Custody Seals

Custody seals are preprinted, adhesive-backed seals with security slots designed to break if the seals are disturbed. DOT-approved sample shipping containers are sealed in as many places as necessary to ensure security. Seals must be signed and dated before use. Upon receipt at the laboratory, the custodian must check and document on a cooler receipt form that seals on boxes are intact.

2.3.5 Laboratory Custody Procedures

All laboratory custody procedures must maintain a system that provides for sample log-in, sign-out and sign-in of samples to and from individual analysts, data storage and reporting, and sample disposal. These procedures must ensure continuous documentation of sample custody from receipt to disposal. Procedures used by the laboratory must meet all NYSDEC requirements. Laboratories must complete a cooler receipt form documenting the temperature and condition of samples on receipt. The form must be provided in the laboratory data package.

The laboratory must submit sample receipt documents for each set of samples received. A sample delivery group (SDG) is defined as a batch of up to 20 samples collected during one calendar week. Samples shipped on Friday will normally conclude an SDG. The sample receipt documents consist of the Sample Receipt file, a pdf of the COC, and a pdf of the laboratory log report showing the tests selected

The laboratory must implement, practice, and maintain programs for managing waste disposal. The site specific monitoring firm's and NYSDEC markings must be removed from all sample containers prior to disposal. Waste disposal procedures must include use of a certified hauler and meet Federal and State regulations.

2.4 Analytical Method Requirements

Analytical method requirements will be documented in the appropriate work plan or FSP. The specific implementation of analytical methods will be documented in laboratory SOPs. Laboratory SOPs and the QA program will be reviewed and approved as part of the procurement process.

2.4.1 Standard Laboratory Analytical Procedures

Analytical methods in support of NYSDEC activities are referenced in NYSDEC's ASP. The protocol is based on the following methods:

1. 40 CFR Part 136, Guidelines Establishing Test Procedures for the Analysis of Pollutants under the Clean Water Act;



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- 2. "Standard Methods for the Examination of Water and Wastewater," APHA/AWWA/WEF, 21st ed, 1992;
- 3. Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79-020, Revised March 1983;
- 4. "Test Methods for Evaluating Solid Waste, Physical Chemical Methods," 3rd ed, SW-846, 1998, latest update;
- 5. "Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air," 2nd ed, EPA/625/R-96/010b, January 1999;
- 6. "USEPA Contract Laboratory Program Statement of Work for Organics Analysis, Multi-Media, Multi-Concentration, OLM04.3, 2003or SOM01.2, 2007";
- 7. "EPA Contract Laboratory Program, Statement of Work for Inorganic Analysis, Multi-Media, Multi-Concentration ILM05.4, 2007; and
- 8. American Society for Testing and Materials (ASTM).

The laboratory must be certified by the NYSDOH ELAP for all analytical methods for which the NYSDOH provides an approval program. Laboratories also must be National Environmental Laboratory Accreditation Program (NELAP) approved by NYSDOH or related accrediting authority.

Table 2-1 lists all analyses that may be performed for NYSDEC projects. Reporting limits for any additional methods will be included in the site-specific QAPP.

The site specific monitoring firm's anticipates that laboratories will use the most current method available and/or recommended by EPA. For example, EPA has promulgated the use of Standard Methods references instead of the water method reference listed above. The actual methods for the project will be reviewed and approved as part of the project planning process.

2.5 Quality Control

QC data are necessary to determine precision and accuracy and to demonstrate the absence of interferences and/or contamination of glassware and reagents. Field QC will include duplicates, trip blanks, field equipment blanks, and miscellaneous field QC samples. Field QC samples will be preserved, documented, and transported in the same manner as the samples they represent. Laboratory-based QC will consist of standards, replicates, spikes, and blanks. Method QC limits for analyses need to be provided by the site specific monitoring firm's laboratory or



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are included in NYSDEC ASP 2005. Quality control limits for any additional methods will be included in the site-specific work plan or FSP.

2.5.1 Field Quality Control Samples

The collection of field QC samples and the conditions, under which the samples were collected, will be documented in the field logbook. Unless otherwise directed by NYSDEC, the field QC samples listed below will be collected and analyzed at the frequency listed in Table 2-2.

Table 2-2 Field Quality Control Guidelines, NYSDEC Projects

QC Sample	Description
Field Duplicate	One per matrix per 20 samples for each analysis.
Field Equipment	One per equipment per 20 samples for each analysis. Only equipment sets
Blank	that are subject to decontamination require equipment blanks. Dedicated
	or disposal equipment does not require equipment blanks.
Field Background	Per sampling day for indoor air samples as specified in the guidance for
Samples	soil vapor intrusion.
Trip Blank	One per shipment for each cooler in which aqueous samples for VOC
	analysis are shipped or one per shipment batch for air samples. Trip
	blanks are analyzed for all VOC methods designated for samples. Trip
	blanks are shipped only for aqueous matrix.

Duplicate Samples

Duplicate samples will be collected at the rate one duplicate per 20 project samples of the same matrix. Duplicate soil samples will be prepared by collecting equal aliquots from the same sample source and placing them in separate sample bottles. Duplicate water samples will be prepared by collecting successive volumes of water and placing them in separate bottles. Duplicate air samples will collected with a tubing splitter. Duplicate samples will be shipped with the samples they represent and will be analyzed in the same manner.

The RPD between the concentration in the original and duplicate sample measures the overall precision of the field sampling and analytical method. Field duplicates are evaluated by using two times the laboratory QC criteria for duplicates (i.e., RPDs of 40% for water and air and 70% for soils). If all other laboratory QC criteria are met, RPD results outside control limits indicate potential matrix effects. Significant deviations in RPD results of field duplicates are assessed to evaluate whether data met all quality objectives for the project.

Trip Blanks

Trip blanks are collected to establish that the transport of sample bottles to and from the field does not result in contamination of the sample from external sources. Trip blanks will be collected for, and in conjunction with, only VOA for aqueous samples. If the 40-milliliter (mL) VOA vials are shipped to the field team



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by the laboratory sample custodian, a representative number of vials filled with analyte-free water (preserved, capped, and labeled) will accompany the shipment to and from the laboratory. Trip blanks will be treated in the same manner as the VOA samples they represent and will be taken to representative field sample sites, but remain unopened. Trip blanks will be sent with each sample-shipping container that contains aqueous samples for VOA.

Field Equipment Blanks

Field equipment blanks are blank samples (also called rinsate blanks) designed to demonstrate that sampling equipment has been properly prepared and cleaned before field use and that cleaning procedures between samples are sufficient to minimize cross-contamination. Field equipment blanks will be prepared in the field using an approved water source. Sampling of the water source may also be required if analyte-free water is not obtained from the lab. The field equipment blank will be preserved, documented, shipped, and analyzed in the same manner as the samples it represents. Equipment blanks will be collected at the rate of one sample per day, per equipment set.

An equipment set is all sampling equipment required to collect one sample. For example, one soil sample equipment set may include a stainless-steel bowl, a stainless-steel trowel, and a bucket auger. Samples collected with dedicated or disposable equipment do not require equipment blank samples.

Field equipment and trip blanks serve to demonstrate contamination-free procedures in the field and during sample transport. The goal is for field blanks to be free of contamination. Low-level contamination may be present, but must be less than five times the level found in associated samples. If contamination is greater, the sample results are qualified as non-detect at an elevated-reporting limit. If field blank contaminants are also present in the method blank, or are typical laboratory contaminants, or are not present in project samples, then no further action is required. All other sources of contamination must be investigated as part of the corrective action process. Sample results that do not meet quality objectives after qualification, re-sampling may be required. The QA Officer, Project Chemist, and Project Manager must determine potential changes in field procedures to eliminate contamination sources prior to re-sampling.

Miscellaneous Field QC Samples

This type of QC sampling involves analysis of investigation water sources and monitoring well drilling fluids (if used). Because the water supply source is used in decontamination and well drilling activities, it may be necessary to determine the possibility for the introduction of outside contaminants. Drilling fluids (muds) that are used during well installation may also be analyzed in order to assess the possibility of such constituents affecting groundwater samples.



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Field background samples are required for air sampling events. Results of the background sample are used in the assessment process to determine whether contamination is site-related or significant.

2.5.2 Laboratory Quality Control Analyses

Analytical performance is monitored through QC samples and spikes, such as laboratory method blanks, surrogate spikes, QC check samples, matrix spikes, matrix spike duplicates, duplicate samples, and duplicate injections (see Table 2-3). All QC samples are applied on the basis of a laboratory batch. Batches do not exceed 20 samples excluding associated field and laboratory QC samples. The QC samples associated with sample preparation include method blanks, laboratory control samples (LCSs) (also called matrix spike blanks [MSB] by NYSDEC), matrix spikes, and duplicates. The run batch represents all samples analyzed together in the run sequence. The run sequence is typically limited to 24 hours unless defined differently for the analytical method. For some analyses, such as volatile organics, the run batch is equivalent to the preparation batch. The QC samples associated with the run sequence include calibration standards, instrument blanks, and reference standards. Unless otherwise directed by NYSDEC staff, the laboratory QC samples listed below will be collected and analyzed at the frequency listed in Table 2-3.

Instances may arise where high sample concentrations, nonhomogeneity of samples, or matrix interferences preclude achieving detection limits or associated QC target criteria. In such instances, data will not be rejected *a priori* but will be examined on a case-by-case basis. The laboratory will report the reason for deviations from these detection limits or noncompliance with QC criteria in the case narrative.

Table 2-3 Laboratory Quality Control Sample Guidelines, NYSDEC Projects

QC Sample	Description
MB	One per matrix per preparation batch for each analysis.
LCS/MSB	One per matrix per preparation batch for each analysis. The
	LCS/MSB must contain all target analytes of concern at the site.
Surrogate Spikes	All samples analyzed for organic methods.
Internal Standards	All samples analyzed by GC/MS methods.
MS/MSD	One per matrix per SDG for each analysis. The spike solution
	must contain a broad range of the analytes of concern at the site.
	The overall frequency of MS/MSD on project samples must be
	at least one set per 20 samples.
MS/MD	One per matrix per SDG for metals and general chemistry meth-
	ods. The spike solution must contain a broad range of analytes
	of concern at the site. The overall frequency of MS/MD on the
	project samples must be at least one set per 20 samples.





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Table 2-3 Laboratory Quality Control Sample Guidelines, NYSDEC Projects

QC Sample	Description
Serial Dilution/Post Digestion	All samples analyzed for metals.
Spike	

Key:

SDG = Sample Delivery Group.

LCS = Laboratory Control Samples.

MSB = Matrix Spike Blank.

MS/MD = Matrix Spike/Matrix Duplicate.

MS/MSD = Matrix Spike/Matrix Spike Duplicate.

MB = Method Blank.

TAL = Target Analyte List.

Laboratory Method Blank

Laboratory method blanks serve to demonstrate a contamination-free environment in the laboratory. The goal is for method blanks to be free of contamination. Low-level contamination may be present, but must be less than the reporting limit. If contamination is greater, samples are reanalyzed. If contaminants are present in the method blank but not in project samples, no further action is required. All sources of contamination that are not common laboratory contaminants as defined in the method SOPs must be investigated as part of the corrective action process. Sample results must not be blank subtracted unless specifically required by the analytical method.

Surrogate Standards

Surrogate recoveries must be within QC criteria for method blanks and LCSs to demonstrate acceptable method performance. If surrogate recoveries are outside QC criteria for method blanks or LCSs, corrective action is required and the Project Chemist should be notified. Surrogate recoveries in the samples indicate the method performance on the particular sample matrix. Surrogate recoveries that are outside QC criteria for a sample indicate a potential matrix effect. Matrix effects must be verified based on review of recoveries in the method blank or LCS, sample reanalysis, or evaluation of interfering compounds. Sample clean-up procedures are required by the NYSDEC ASP must be implemented to alleviate potential matrix problems.

Laboratory Control Sample

LCS recoveries must be monitored on control charts for all non-CLP methods. Laboratory QC criteria must be established for each method and matrix using a minimum of 30 points. QC criteria should be updated annually for all non-CLP methods. The LCS recovery must be within the control limits to demonstrate acceptable method performance. Sporadic marginal failures of a few target analytes reported when greater than five target analytes are required are allowed as part of the data review guidance. If LCS recoveries are outside QC criteria for more than a few target analytes, recoveries are significantly low, or the compounds were detected in the samples, then corrective action is required. After corrective action is



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complete, sample re-analysis is required for failed parameters. If LCS recoveries exceed the QC criteria, and that parameter is not found in any samples, re-analysis is not necessary. For any other deviations from LCS control limits that can not be resolved by sample re-analysis within holding times, the Project Chemist must be notified immediately. If critical samples are affected, the Project Manager may determine that re-sampling is required.

Matrix Spike Sample

MS recoveries are a measure of the performance of the method on the sample being analyzed. Field and trip blanks must not be chosen for spiking. MS recoveries outside the control limits applied to the LCS indicate matrix effects. Sample clean-up procedures may be warranted for samples with severe matrix effects. The laboratory should notify the Project Chemist of these instances to determine an appropriate corrective action.

Matrix Spike Duplicate Sample

The MSD sample is commonly prepared in conjunction with the MS sample. The MSD is prepared from a separate portion of the sample and processed with the same additions as the MS. The MSD is prepared for methods that do not typically show concentrations of target analytes above MDLs, such as organic methods. The RPD between the recoveries in the MS and MSD measures the precision of the analytical method on actual project samples. QC criteria for RPDs are 20% for waters and 35% for soils unless the laboratory provides additional statistical criteria.

Duplicate Sample

The duplicate is prepared for methods that typically show concentrations of target analytes above MDLs, such as metals and wet chemistry methods. The RPDs between recoveries in the original and duplicate measures the precision of the analytical method on the actual project samples. QC criteria for RPDs are 20% for waters and 35% for soils unless the laboratory provides additional statistical criteria.

If all other QC criteria are met, RPD results outside control limits indicate potential matrix effects. The laboratory should investigate significant deviations in the RPD results by observing the sample to determine any visual heterogeneity or reviewing sample chromatograms for matrix interference. If visual observation does not indicate a potential problem, the sample may be reanalyzed. Potential matrix effects are reported in the case narrative.

Instrument Blanks

Instrument or reagent blanks are analyzed in the laboratory to assess laboratory instrument procedures as possible sources of sample contamination. Instrument blanks are part of the laboratory corrective action if method blanks show contami-





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nation or the analyst suspects carryover from a high concentration sample. Instrument blank results are reported on a laboratory corrective action form.

QC Check Standards

A QC check standard is obtained from a different source or at a minimum a lot different from that of the calibration standard. A check standard result is used to validate an existing concentration calibration standard file or calibration curve. The check standard provides information on the accuracy of the instrumental analytical method, independent of various sample matrices. Check standards are analyzed with each new calibration curve.

Internal standard area counts for water and solid sample analysis for all samples must be in the inclusive range of 50% to 200%, and retention time must not marry more than +/- 30 seconds of its associated 12-hour calibration standard (i.e., opening Continuing Calibration Verification or mid-point standard from Initial Calibration).

The serial dilution analysis (a five-fold dilution) must agree within a 10% difference of the original determination after correction for the dilution if the analyte concentration is sufficiently high (concentration in the original sample is >50 times [50x] the MDL).

The post-digestion spike (%R) must be within the acceptance limits of 75% to 125%. However, spike recovery limits do not apply when the sample concentration is greater than 4x the spike added.

Other Laboratory QC Samples

The laboratory performs analysis of other QC samples or standards, depending on the analytical method. Method-specific QC samples or standards include internal standard spikes for gas chromatography/mass spectrometry (GC/MS) methods; post-digestion spikes and serial dilutions for metals analysis; and interference check samples (ICSs) for ICP analysis.

Blind QC Check Samples

Types of blind QC check samples include external performance evaluation (PE) samples provided by an outside certifying agency and internal QC samples submitted for routine analysis by the laboratory QA officer. The laboratory must pass NYSDOH samples as part of the approval process. If methods are used that are not included in NYSDOH approval process, blind QC samples may be submitted to the laboratory to evaluate method performance.



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2.6 Instrument/Equipment Testing, Inspection, and Maintenance

All laboratory and field instruments and equipment used for sample analysis must be serviced and maintained only by qualified personnel. Laboratory instrument maintenance procedures will be evaluated to verify that there will be no impacts on analysis of project samples due to instrument malfunction. For example, the laboratory must have duplicate instrumentation and/or major laboratory instruments (e.g., GC/MS, ICP, atomic absorption spectroscopy [AAS]) maintained under service agreements with the manufacturer that require rapid respond by manufacturer-approved service agents.

Field instruments will be rented through approved suppliers that have manufacturer-approved maintenance programs.

2.6.1 Field Equipment Maintenance

Field equipment will be checked upon receipt to verify that instruments are in working condition and that the rental company provided appropriate calibration records or certifications. On-site operation will be performed in accordance with manufacturer manuals. If any problems occur, the instrument will be replaced immediately. Equipment purchased for the contract will be maintained in accordance with manufacturer guidance.

2.6.2 Laboratory Equipment Maintenance

The laboratory must maintain a stock of spare parts and consumables for all analytical equipment. Routine preventive maintenance procedures should be documented in site specific monitoring firm's SOPs. Maintenance performed on each piece of equipment must be documented in a maintenance logbook. Daily checks of the laboratory deionized water and other support systems are required. The laboratory must operate backup instrumentation for most of its analytical equipment in the event of major instrument failure or have an alternative approached to ensure analytical work proceeds within holding times with no adverse impacts on data quality.

2.7 Instrument/Equipment Calibration and Frequency

All instruments and equipment used during sampling and analysis will be operated and calibrated according to the manufacturer's guidelines and recommendations, as well as criteria set forth in applicable analytical methodology references. Personnel properly trained in these procedures will perform operation and calibration of all instruments. Documentation of all field maintenance and calibration information will be maintained in the field logbook. Table 2-4 lists typical monitoring equipment used during fieldwork. This equipment is representative of instruments typically required for NYSDEC projects. All equipment used for the NYSDEC projects will be NYSDEC-owned or rented. All field personnel receive annual refresher training on the field operation of all health and safety related

 Table 2-4 General Field Equipment and Calibration Procedures

Instrument or Equipment	Description ^a	Field Calibration Procedure	Acceptability/ Performance Criteria	Responsible Personnel
Organic Vapor Analyzer (OVA)	Flame Ionization Detector to provide continuous data on organic vapor concentrations. Unit must be Class I, Division 1, Grade A,B,C,D. Unit must have rechargeable battery, range of 0 to 1,000 ppm, and ultrahigh purity hydrogen as fuel source.	Units are factory calibrated to remain with performance specification for an excess of 6 months. During field use, a carbon filter is used with the OVA to distinguish methane from other organics. The unit is checked daily with calibration gas to ensure the response is consistent. If needed, the unit will be re-calibrated to manufacturer specifications. When the OVA is used to screen samples (except samples for headspace analysis), periodic ambient air readings will also be recorded in the logbook.	A carbon filter must remove sources of organic vapors other than methane (i.e., marker). Instrument must detect organic vapors without filter. Response should be checked daily with calibration gas. The accuracy will depend on the application.	Site Safety Officer, Project Geologist
O ₂ Explosimeter	Gas monitor designed to simultaneously monitor areas for oxygen deficiency and dangerous levels of combustible gas. Units must be equipped with sample pumps and hoses to measure gases in a confined space. Range O ₂ - 0 to 25%, LEL - 0 to 100%, H ₂ S - 0 to 200 ppm, and CO - 0 to 999 ppm. Not all units have the additional capability to detect hydrogen sulfide or H ₂ S or carbon dioxide.	Procedures for field calibration of the O₂/explosimeter are as follows: ■ Inspect instrument to ensure entry and exit ports are clear; ■ Turn the switch to ON position; ■ Allow the meters to stabilize and then press the	Alarm must sound during calibration procedure. Battery must have sufficient charge for operation. Blocking the sample line probe and observing the drop of the flow indicator float checks flow system. If flow system is not functioning, return unit for repairs.	Site Safety Officer, Project Geologist

Table 2-4 General Field Equipment and Calibration Procedures

Instrument or Equipment	Description ^a	Field Calibration Procedure	Acceptability/ Performance Criteria	Responsible Personnel
pH/Conductivity,	Meter designed for field use with	Before use, pH, specific conductance, DO, and	Turbidity and DO ± 10%	Project Geologist,
Temperature, Dis-	battery operation. The unit must	ORP probes need to be calibrated or tested for re-	pH ± 0.01 pH	Sampler
solved Oxygen	contain separate pH, temperature,	sponsiveness. The pH probe will be calibrated first.	Conductivity at ± 2% FSD	
(DO), Oxidation	conductivity, DO, and ORP probes	This is done by placing the probe in pH 7, then pH	The instrument will be	
Reduction	in one unit.	4, standard solutions and adjusting the pH calibra-	checked with a pH standard	
(REDOX) Meter		tion knobs until the correct measurement is ob-	every 4 hours and at the end	
		tained. The ORP probe is then calibrated with the	of the sampling day. If the	
		ORP standard solution (Zobell), and the DO probe	response is greater than 0.2	
		is checked in accordance with manufacturer guide-	units more or less than the	
		lines. The probes should be rinsed with deionized	standard, complete calibra-	
		water between each calibration solution and follow-	tion will be conducted.	
		ing calibration. Used calibration solution is to be		
		discarded. Finally, the conductivity probe is		
		checked with a solution of known conductivity.		
Turbidity Meter	Nephelometer designed for field use	The unit is factory calibrated. Field procedures	± 10%	Sampler
	with battery operation. Range 0.01	involve checking the unit's responsiveness at least		
	to 1,000 NTU.	once a day using factory supplied standards. The		
		responsiveness should be checked on the 0 to 10		
		range, 0 to 100 range, and 0 to 1,000 range.		

Table 2-4 General Field Equipment and Calibration Procedures

Instrument or Equipment	Description ^a	Field Calibration Procedure	Acceptability/ Performance Criteria	Responsible Personnel
PID Meter	The PID is a portable, non-	In the field, PIDs will be calibrated at the start of	Meter must give consistent	Site Safety Offi-
	destructive trace gas analyzer. Units	each field event by the manufacturer. Initial cali-	background readings.	cer, Project Ge-
	for site characterization must have a	bration must be verified by a certificate of calibra-		ologist
	range of 0 to >2,000 ppm and a 10.6	tion from the rental company or field calibration is		_
	or 11.7 eV lamp (e.g., MiniRAE	required. There is no field calibration for a		
	2000). Units for indoor air monitor-	MiniRae 2000. If a significant change in weather		
	ing must have a range of 1 ppb to	occurs during the day (i.e., change in humidity or		
	2,000 ppm and a 10.6 eV lamp (e.g.,	temperature) or if the unit is turned off for an ex-		
	ppb RAE Plus).Calibration check	tended period, then there is a field test, called a		
	gas (e.g., isobutylene) must be pro-	Bump Test. It consists of having the unit sniff		
	vided with unit.	100ppm cal gas and determine the reading. If the		
		unit is reading 100 ppm or close to it, then it is OK.		
		If not, depending on how far off it is, either dry out		
		the unit on a heater (due to potential fogging of the		
		lamp), or send the unit back to the rental company		
		for in-house calibration.		

^a Description is for typical equipment; equivalent units may be used.



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equipment, which includes calibration procedures. Brief descriptions of calibration procedures for major field instruments are listed on Table 2-4.

The site specific monitoring firm requires laboratories to use the most current method available for calibration criteria. For example, EPA no longer allows the use of the grand mean to evaluate calibration linerity for organic methods. The site specific monitoring firm requires that the most stringent method criteria be met for all compounds of concern at site. Unless modified by the method, the site specific monitoring firm requires at least a five point curve for all calibrations for organics and a minimum of three calibration points for inorganics; exclusion of points is not allowed to meet criteria without technical justification. Any manual integration performed for calibrations needs to be documented with the rationale and included in the data package. Manual integrations of internal standards or surrogates in calibrations are not allowed.

2.8 Inspection/Acceptance of Supplies and Consumables

Measures are established by the site specific monitoring firm's QMP to assure that purchased material, equipment, and services whether purchased directly or through contractors or subcontractors conform to procurement documents.

2.9 Non-Direct Measurements

For data acquired from non-direct measurement sources include the following:

- Physical information such as descriptions of sampling activities and geologic logs;
- State and local environmental agency files;
- Reference computer databases and literature files; and
- Historical reports on a site and subjective information gathered through interviews.

Data from non-direct measurements will be reviewed and used as indicated in the work plan. Data from all non-direct measurement sources are stored as indicated in Section 1.6.

2.10 Data Management

Data management procedures track samples and results from work plan generation to the final report. The field data include approved work planning tables, labels, field sampling forms, COC forms, and logbooks. The surveyor will provide coordinates for all sample locations. The field team leader of the monitoring firm will review all field data for accuracy. Any field data not provided by the laboratory will be entered into a database or spreadsheet.

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Electronic data will be provided in accordance with the most recent version of EPA Region 2's standardized electronic data deliverable (EDD) format. The format is based on the Multimedia Electronic Data Deliverable, or MEDD format. Further information on MEDD is available at the Web site http://www.epa.gov/region02/superfund/medd.htm. Currently this is the EPA Region 2 EDD dated December 2003. If required for the project, the laboratory also may provide an alternative EDD consistent with the Corporate EDD or other approved format.

The site specific monitoring firm will process the EDD to verify that criteria established in this QAPP are met. The Project Chemist will review all laboratory and field data to verify the results against the hard copy and check for transcription errors. The Project Chemist will verify qualifiers added by data processing and add any data qualifiers. The individual SDG EDD files will be processed to a centralized data management system to store all reviewed and approved data. Data that will appear on data tables for the report will be generated from the centralized database, which will serve as the central, protected data source for all data handling operations.

The central database will be stored in a secure area on site specific monitoring firm's network with access limited to data management specialists designated by the Project Manager. Data users may enter additional electronic data such as risk-based criteria for comparison of results. This data will be stored in separate tables in the database and linked to the actual results. Any data from outside sources will include a description of the data, a reference to the source, and the date updated. Outside data will be checked prior to use verify that current values are used. The central database will be used to create tables for the final report.

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Assessment and Oversight

The site specific monitoring firm's assessment and oversight procedures will be implemented in accordance with the QMP. The QMP outlines general roles and responsibilities for the project team.

3.1 Assessment and Response Actions

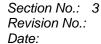
The site specific monitoring firm's overall assessment activities include management assessments, development of SOPs, and performance evaluations. Management assessments include weekly meetings and conference calls to evaluate project readiness and staff utilization. Assignment of qualified personnel, maintenance of schedules and budgets, and quality of project deliverables are verified as part of these assessments. The development of SOPs and performance evaluations are used to provide trained and qualified personnel for the project.

The site specific monitoring firm's technical assessment activities include peer review, data quality reviews, and technical system audits (i.e., laboratory and field). Procedures for assessment and audit of data quality are described in Section 4 of this QAPP. Procedures for peer review and technical assessments are summarized briefly below.

Both overall and direct technical assessment activities may result in the need for corrective action. The site specific monitoring firm's approach to implementing a corrective action response program for both field and laboratory situations is summarized briefly below. The NYSDEC QA Officer has stop work authority on all NYSDEC projects that may have negative quality impacts prior to completion of corrective actions.

3.1.1 Peer Review

The site specific monitoring firm's implements peer review for all project deliverables including work plans, QAPPs, draft and final reports, and technical memoranda. The peer review process provides for a critical evaluation of the deliverable by an individual or team to determine if the deliverable will meet established criteria, quality objectives, technical standards, and contractual obligations. The Project Manager will assign peer reviewers, when the publications schedule is established. The publications staff will be responsible for ensuring all peer review-





3. Assessment and Oversight

ers participate in the review process and approve all final deliverables. For technical memoranda and other project documents, the Project Manager will be responsible for obtaining principal review and approval.

3.1.2 Technical Systems Assessments

The entire project team is responsible for ongoing assessment of the technical work performed by the team, identification of nonconformance with the project objectives, and initiation, implementation and documentation of corrective action. Independent performance and systems audits are technical assessments that are a possible part of the QA/QC program. The following describes types of audits conducted, frequency of these audits, and personnel responsible for conducting audits.

Field Audits

Field audits are performed under the direction of the QA Officer. The need for field audits will be determined during project planning and indicated in the work plan. Field audits will be documented on the site specific monitoring firm's field audit checklists. Field audits will be typically performed during the early field programs.

Field Inspections

The Project Manager will be responsible for inspecting all field activities to verify compliance of activities with project plans.

Laboratory Audits

The laboratory must implement a comprehensive program of internal audits to verify compliance of their systems with SOPs and QA manuals.

NYSDOH must certify the laboratory and will perform external systems audits at an approximate frequency of once a year. External audits include reviews of analytical capabilities and procedures, COC procedures, documentation, QA/QC, and laboratory organization. These audits also include analysis of blind PE samples.

The QA Officer or designee may also audit laboratories. These audits are typically performed to verify laboratory capabilities and implementation of any complex project requirements or in response to a QC nonconformance identified as part of the data review process.

3.1.3 Corrective Action

Corrective actions will be implemented as needed. In conjunction with the QA Officer and Laboratory QA Coordinator, the Project Manager is responsible for initiating corrective action and implementing it in the field and office, and the laboratory project manager is responsible for implementing it in the laboratory. It is their combined responsibility to see that all sampling and analytical procedures

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are followed as specified and that the data generated meet the prescribed acceptance criteria. Specific corrective actions necessary will be clearly documented in the logbooks or analytical reports.

Field Situations

The need for corrective action in the field may be determined by technical assessments or by more direct means such as equipment malfunction. Once a problem has been identified, it may be addressed immediately or an audit report may serve as notification to project management staff that corrective action is necessary. Immediate corrective actions taken in the field will be documented in the project logbook. Corrective actions may include, but are not limited to:

- Correcting equipment decontamination or sample handling procedures if field blanks indicated contamination;
- Recalibrating field instruments and checking battery charge;
- Training field laboratory personnel in correct sample handling or collection procedures; and
- Accepting data with an acknowledged level of uncertainty.

After a corrective action has been implemented, its effectiveness will be verified. If the action does not resolve the problem, appropriate personnel will be assigned to investigate and effectively remediate the problem. Corrective actions recommended by NYSDEC personnel will be addressed in a timely manner.

Laboratory Situations

Out-of-control QC data, laboratory audits, or outside data review may determine the need for corrective action in the laboratory. Corrective actions may include, but are not limited to:

- Reanalyzing samples, if holding times permit;
- Correcting laboratory procedures;
- Recalibrating instruments using freshly prepared standards;
- Replacing solvents or other reagents that give unacceptable blank values;
- Training additional laboratory personnel in correct sample preparation and analysis procedures; and
- Accepting data with an acknowledged level of uncertainty.

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The laboratory corrective actions must be defined in analytical SOPs. Any deviations from approved corrective actions must be documented and approved by the Project Chemist.

Whenever corrective action is deemed necessary by the Project Chemist or NYSDEC technical staff, the laboratory project manager will ensure that the following steps are taken:

- The cause of the problem is investigated and determined;
- Appropriate corrective action is determined;
- Corrective action is implemented and its effectiveness verified by the laboratory QA officer; and
- Documentation of the corrective action verification is provided to the Project Chemist and NYSDEC staff in a timely manner.

3.2 Reports to Management

For reports to management include the following:

- Audit Reports Audit reports are prepared by the audit team leader immediately after completion of the audit. The report will list findings and recommendations and will be provided to the Project Manager and QA Officer.
- **Data Usability Summary Report** A DUSR will be completed by the Project Chemist and provided to the NYSDEC technical staff in the appendix of the report. Impacts on the usability of data will be tracked by adding qualifiers to individual data points as described in Section 4.

Upon completion of a project sampling effort, analytical and QC data will be included in a comprehensive technical report that summarizes field activities and provides a data evaluation. A discussion of the validity of results in the context of QA/QC procedures will be made and the DUSR will be provided.

Serious analytical problems will be reported immediately to NYSDEC personnel. Time and type of corrective action (if needed) will depend on the severity of the problem and relative overall project importance. Corrective actions may include altering procedures in the field, conducting an audit, or modifying laboratory protocol.



Data Validation and Usability

The site specific monitoring firm will implement procedures for data validation and usability described below. These procedures will be adapted, if necessary, to meet project-specific requirements as determined in the work plan or FSP. A generic data usability validation checklist report forms are provided in Appendix A.

4.1 Data Review, Validation, and Verification Requirements

All data generated will be reviewed by comparing accuracy and precision results for the QC samples to QC criteria listed in NYSDEC ASP 2005. The following types of data will be reviewed:

- Analytical reporting limits and target compounds will be compared to limits listed in the site-specific QAPP;
- Holding times will be verified against Table 2-1;
- QC summary data for surrogates, method blanks, LCS, and MS/MSD samples will be compared to criteria listed in the site-specific QAPP;
- Field QC results for duplicates and blanks will be compared to criteria listed in Section 2.5.1;
- Calibration summary data will be checked by the laboratory to verify that all positive results for target compounds were generated under an acceptable calibration as defined by the analytical method. Any deviations will be noted in the case narrative and reviewed by the Project Chemist;
- Field data such as sample identifications and sample dates will be checked against the laboratory report; and
- Any raw data files from the field and laboratory will not be reviewed unless there is a significant problem noted with the summary information.



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4. Data Validation and Usability

4.2 Validation and Verification Methods

The data review scheme for analytical results from the receipt of the analytical data through the validated report is described below. The laboratory is responsible for performing internal data review. The laboratory data review must include 100% analyst review, 100% peer review, and 100% review by the laboratory project manager or designated QC reviewer to verify that all project-specific requirements are met. All levels of laboratory review must be fully documented and available for review if requested or if a laboratory audit is performed.

After receipt from the laboratory, project data will be validated using the following steps:

Evaluation of Completeness

The Project Chemist checks the electronic files for compliance with required format and the project target compounds and units. If errors in loading are found, the EDD files will be returned to the laboratory and the Project Chemist will request resubmission via SubLab. The Project Chemist also verifies that the laboratory information matches the field information and that the following items are included in the data package:

- COC forms and laboratory sample summary forms;
- Case narrative describing any out-of-control events and summarizing analytical procedures;
- Data report forms (i.e., Form I);
- QA/QC summary forms; and
- Chromatograms documenting any QC problems.

If the data package is incomplete, the Project Chemist will request resubmission. The laboratory must provide all missing information within one day.

Evaluation of Compliance

The Project Chemist will review all processed files and add data qualifiers for outliers. If QC data are provided in the EDD, the results will be used to verify compliance electronically. If no QC data are provided in the EDD, the reports will checked manually. Additional compliance checks on representative portions of the data are briefly outlined below:

 Review chromatograms, mass spectra, and other raw data if provided as backup information for any apparent QC anomalies;

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- Review of calibration summaries or any other QC samples not provided in the EDD by the laboratory;
- Ensure that all analytical problems and corrections are reported in the case narrative and that appropriate laboratory qualifiers are added;
- For any problems identified, review concerns with the laboratory, obtain additional information if necessary, and check all related data to determine the extent of the error;
- Project chemists will follow qualification guidelines in EPA Region 2 data validation SOPs or *EPA CLP National Functional Guidelines for Organic Data Review, EPA 540/R-99-008* (October 1999) or *EPA CLP National Functional Guidelines for Inorganic Data Review,* EPA 540-R-04-004 (October 2004), but will use the specific method criteria for evaluation. The DUSR will be completed as specified in NYSDEC *Guidance of the Development of DUSRs* (July 1999); and

Data Review Reporting

The Project Chemist will perform the following reporting functions:

- Alert the Project Manager to any QC problems, obvious anomalous values, or discrepancies between the field and laboratory data, that may impact data usability; and
- Discuss QC problems in a DUSR for each laboratory report. DUSR will include a short narrative and print out of qualified data;
- Prepare analytical data summary tables of qualified data that summarize those samples and analytes for which detectable concentrations were exhibited including field QC samples; and
- At the completion of all field and laboratory efforts, summarize planned versus actual field and laboratory activities and data usability concerns in the technical report.

4.3 Reconciliation with User Requirements

For routine assessments of data quality, The site specific monitoring firm's will implement the data validation procedures described in Section 4.2 and assign appropriate data qualifiers to indicate limitations on the data. The Data Validation Chemist will be responsible for evaluating precision, accuracy, representativeness, comparability, and completeness of data using procedures described in Section 2.5 of this QAPP. Any deviations from analytical performance criteria or quality ob-

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jectives for the project will be documented in the DUSR provided to the data users for the project.

The QA Officer or Project Chemist will work with the final users of the data in performing data quality assessments. The data quality assessment may include some or all of the following steps:

- Data that are determined to be incomplete or not usable for the project will be discussed with the project team. If critical data points are involved which impact the ability to complete project objectives, data users will report immediately to the Project Manager. The Project Manager will discuss resolution of the issue with NYSDEC technical staff and implement necessary corrective actions (for example re-sampling);
- Data that are non-detect but have elevated reporting limits due to blank contamination or matrix interference will be compared to screening values. If reporting limits exceed the screening values, then results will be handled as incomplete data as described above; and
- Data that are qualified as estimated will be used for all project decision making. If an estimated result is close to a screening value, then there is uncertainty in any conclusions as to whether the result exceeds the screening value. The data user must evaluate the potential uncertainty in developing recommendations for the site. If estimated results become critical data points in making final decisions on the site, the Project Manager and NYSDEC technical staff should evaluate the use of the results and may consider the data point incomplete.

The assessment process involves comparing analytical results to screening values and background concentrations to determine if the contamination present is site-related (i.e., above background levels) or significant (i.e., above screening values). Additional data assessment may be performed on a site-by-site basis.



Data Usability Summary Report Model

Data Usability Summary Report	Project: Niagara Transformer Corp. Site
Date Completed:	Completed by:

The analytical data provided by the laboratory were reviewed for precision, accuracy, and completeness per NYSDEC Division of Environmental Remediation Guidance for the Development of DUSRs (June 1999). Specific criteria for QC limits were obtained from the project QAPP. Compliance with the project QA program is indicated on the in the checklist and tables. Any major or minor concerns affected data usability are summarized listed below. The checklist and tables also indicate whether data qualification is required and/or the type of qualifier assigned.

Reference:

Table 1 Sample Summary Tables from Electronic Data Deliverable

Work Orders, Tests and Number of Samples included in this DUSR

General Sample Information		
Do Samples and Analyses on COC check against Lab Sample Tracking Form?	Yes	
Did coolers arrive at lab between 2 and 6°C and in good condition as indicated on COC and Cooler Receipt Form?	Yes	
Frequency of Field QC Samples Correct? Field Duplicate - 1/20 samples Trip Blank - Every cooler with VOCs waters only Equipment Blank - 1/ set of samples per day?	Yes	
All ASP Forms complete?	Yes	
Case narrative present and complete?	Yes	
Any holding time violations (See table below)?	No - All samples were prepared and analyzed within holding times.	

Insert Holding time table below.

The following tables are presented at the end of this DUSR and provided summaries of results outside QC criteria.

- Method Blanks Results (Table 2)
- Surrogates Outside Limits (Table 3)
- MS/MSD Outside Limits (Table 4)
- LCS Outside Limits (Table 5)
- Re-analysis Results (Table 6)
- Field Duplicate Results (Table 7)

Go to Tables List

Data Usability Summary Report	Project: Niagara Transformer Corp. Site
Date Completed:	Completed by:

Volatile Organics and Semi-volatile Organics by GCMS		
Description	Notes and Qualifiers	
Any compounds present in method, trip and field blanks (see Table 2)?	No	
For samples, if results are <5 times the blank or < 10 times blank for common laboratory contaminants then "U" flag data. Qualification also applies to TICs.	Samples are flagged U as noted on Table 2a for method blanks and Table 2b for field blanks.	
Surrogate for method blanks and LCS within limits? Surrogate for samples and MS/MSD within limits? (See Table 3). All samples should be re-analyzed for VOCs? Samples should re-analyzed if >1 BN and/or > AP for BNAs is out. Matrix effects should be established.	Yes Yes	
Laboratory QC frequency one blank and LCS with each batch and one set of MS/MSD per 20 samples?	Yes	
MS/MSD within QC criteria (see Table 4)? If out and LCS is compliant, then J flag positive data in original sample due to matrix?	Yes	
LCS within QC criteria (see Table 5)? If out, and the recovery high with no positive values, then no data qualification is required.	Yes	
Do internal standards areas and retention time meet criteria? If not was sample re-analyzed to establish matrix (see Table 6)?	Yes	
Is initial calibration for target compounds <15 %RSD or curve fit?	Yes	
Is continuing calibration for target compounds < 20.5%D.	Yes	
Were any samples re-analyzed or diluted (see Table 6)? For any sample re-analysis and dilutions is only one reportable result by flagged?	No	
For TICs are there any system related compounds that should not be reported?	No	
Do field duplicate results show good precision for all compounds except TICs (see Table 7)?	Yes	

Pesticide and PCBs by GC/ECD	
Description	Notes and Qualifiers
Any compounds present in method and field blanks as noted	No.
on Table 2?	
For samples, if results are <5 times the blank then "U" flag	Samples are flagged U as noted on
data.	Table 2a for method blanks and Table
	2b for field blanks.
Surrogate for method blanks and LCS within limits?	Yes
Surrogate for samples and MS/MSD within limits? (See	Yes
Table 3). Matrix effects should be established.	
Laboratory QC frequency one blank and LCS with each	Yes
batch and one set of MS/MSD per 20 samples?	
MS/MSD within QC criteria (see Table 4)? If out and LCS is	Yes
compliant, then J flag positive data in original sample due to	
matrix?	
LCS within QC criteria (see Table 5)? If out, and the	Yes
recovery high with no positive values, then no data	
qualification is required.	
Is initial calibration for target compounds <15 %RSD or	Yes
curve fit?	

Data Usability Summary Report	Project: Niagara Transformer Corp. Site
Date Completed:	Completed by:

Pesticide and PCBs by GC/ECD	
Description	Notes and Qualifiers
Is continuing calibration for target compounds < 15.5%D.	Yes
Were any samples re-analyzed or diluted (see Table 6)? For any sample re-analysis and dilutions is only one reportable result by flagged?	No
Spot check retention time windows and second column confirmations as complete.	Acceptable.
Do field duplicate results show good precision for all compounds (see Table 7)?	Yes

Metals by ICP and Mercury by CVAA		
Description	Notes and Qualifiers	
Any compounds present in method and field blanks as noted on Table 2?	No.	
For samples, if results are <5 times the blank then "U" flag data.	Samples are flagged U as noted on Table 2a for method blanks and Table 2b for field blanks.	
Laboratory QC frequency one blank and LCS with each batch and one set of MS/MSD per 20 samples?	Yes	
MS/MSD within QC criteria (see Table 4)? QC limits are not applicable to sample results greater than 4 times spike amount. All N flagged data for MS are flagged J as estimated.	Yes	
Were elements recovered ≤30%? If so, "R" flag associated NDs on Form 1's.	No	
LCS within QC criteria (see Table 5)? If out, and the recovery high with no positive values, then no data qualification is required.	Yes	
Is there one serial dilution per 20 samples? Flag all data reported with an "E" as "J".	Yes	
Spot check ICS recoveries 80-120%. Contact lab.	All are acceptable.	
Spot check ICV 95-105%. Contact lab.	All are acceptable.	
Spot check CCV 90-110% or 80-120% for Hg. Contact lab.	All are acceptable.	
Do field duplicate results show good precision for all compounds (see Table 7)?	Yes	

Data Usability Summary Report	Project: Niagara Transformer Corp. Site
Date Completed:	Completed by:

General Analytical Methods	
Description	Notes and Qualifiers
Any compounds present in method and field blanks as noted on Table 2?	No.
For samples, if results are <5 times the blank then "U" flag data.	Samples are flagged U as noted on Table 2a for method blanks and Table 2b for field blanks.
Laboratory QC frequency one blank and LCS with each batch and one set of MS/MSD per 20 samples?	Yes
MS/MSD within QC criteria (see Table 4)? QC limits are not applicable to sample results greater than 4 times spike amount.	Yes
LCS within QC criteria (see Table 5)? If out, and the recovery high with no positive values, then no data qualification is required.	Yes
Do field duplicate results show good precision for all compounds (see Table 7)?	Yes

_		
	Summary of Potential Impacts on Data Usability	
	Major Concerns	
	None	
	Minor Concerns	
	None	

Data Usability Summary Report	Project: Niagara Transformer Corp. Site
Date Completed:	Completed by:

Table 2 - List of Positive Results for Blank Samples

None

Table 2A - List of Samples Qualified for Method Blank Contamination

None

Table 2B - List of Samples Qualified for Field Blank Contamination

None

Table 3 - List of Samples with Surrogates outside Control Limits

None

Table 4 - List MS/MSD Recoveries and RPDs outside Control Limits

None

Table 5 - List LCS Recoveries outside Control Limits

None

Table 6 –Samples that were Reanalyzed

None

Table 7 – Summary of Field Duplicate Results

None

Key:

A = Analyte

NC = Not Calculated

ND = Not Detected

PQL = Practical Quantitation Limit

RPD = Relative Percent Difference

T = Tentatively Identified Compound



Generic Health and Safety Plan

HEALTH AND SAFETY PLAN

Project: Niagara Transformer Corporation Site Operations a	and Maintenance
Project No.:	
TDD/PAN No.:	_
Project Location: 1747 Dale Road, Town of Cheektow	raga, Erie County, NY
Proposed Date of Field Activities: <u>December 2009 -</u>	
Project Director:	_
Project Manager:	
Prepared by:	Date Prepared: April 2009
Approved by:	Date Annroyed:

1. INTRODUCTION

1.1 POLICY

It is the CONSULTANT'S policy to ensure the health and safety of its employees, the public, and the environment during the performance of work it conducts. This Generic health and safety plan (GHASP) establishes the procedures and requirements to ensure the health and safety of the Consultant's employees for the above-named project. The Consultant's overall safety and health program is described in the Consultant's *Corporate Health and Safety Program for Toxic and Hazardous Substances* (CHSP). After reading this plan, applicable field staff employees shall read and sign the Consultant's Site-Specific Health and Safety Plan Acceptance form.

This GHASP has been developed for the sole use of the Consultant's employees and is not intended for use by firms not participating in the Consultant's training and health and safety programs. Subcontractors are responsible for developing and providing their own safety plans.

This GHASP has been prepared to meet the following applicable regulatory requirements and guidance:

Applicable Regulation/Guidance	
29 CFR 1910.120, Hazardous Waste Operations and Emergency Response (HAZWOPER)	
Other:	

1.2 SCOPE OF WORK

Description of Work: This project involves operations, maintenance and monitoring of a NYSDEC inactive hazardous waste site, including sampling of PCB-contaminated environmental media, such as surface water, groundwater and sediments.

Equipment/Supplies: Attachment 1 contains a checklist of equipment and supplies that will be needed for this work.

The following is a description of each numbered task:

Task Number	Task Description	
1	Long-Term Monitoring and Reporting.	
2	Operation and Maintenance.	
3	Surface Water/Storm Water Study.	

1.3 SITE DESCRIPTION

Site Map: A site map or sketch is attached at the end of this plan.

Site History/Description (see project work plan for detailed description): The NTC facility previously handled PCB-containing dielectric fluids for use in transformer rebuilding, repair and manufacture. A portion of the facility was contaminated by PCBs. Additional off-site streams, ditches, and retention ponds were also contaminated as a result

of off-site transport of PCBs by sediments and surface waters. Remedial activities took place at the site from			
March 1996 to September 1997, which involved excavation and off-site disposal of approximately 45,000 tons of			
PCB contaminated soil beneath the parking lot to the south of the facility. An Interim Remedial Measure (IRM)			
was implemented in 2004 to replace	the storm sewer syst	em onsite in an effort	to segregate the storm water from
groundwater. Low level residual PC	CBs (<1 ppm) are pres	sent in groundwater,	sediments and storm water.
Is the site currently in operation? X Yes Locations of Contaminants/Wastes: PCB of water and sediment in the storm sew	ver system.	ent in the subsurface	soils and groundwater as well as
Types and Characteristics of Contaminants/Wastes:			
X Liquid	X Solid	☐ Sludge	☐ Gas/Vapor
☐ Flammable/Ignitable	☐ Volatile	☐ Corrosive	☐ Acutely Toxic
☐ Explosive	☐ Reactive	☐ Carcinogenic	☐ Radioactive
☐ Medical/Pathogenic	Other:		

2. ORGANIZATION AND RESPONSIBILITIES

The Consultant's team personnel shall have on-site responsibilities as described in the Consultant's standard operating procedure (SOP) for Site Entry Procedures. The project team, including qualified alternates, is identified below.

Name	Site Role/Responsibility
TBD based on actual field crew and activities	Project Manager
TBD based on actual field crew and activities	Field Tech
TBD based on actual field crew and activities	Field Tech
TBD based on actual field crew and activities	Site Safety Officers

3. TRAINING

Prior to work, the CONSULTANT'S team personnel shall have received training as indicated below. As applicable, personnel shall have read the project work plan, sampling and analysis plan, and/or quality assurance project plan prior to project work.

Required
X
X
X
X

4.1 MEDICAL SURVEILLANCE PROGRAM

The CONSULTANT'S field personnel shall actively participate in THE CONSULTANT'S medical surveillance program as described in the CHSP and shall have received, within the past year, an appropriate physical examination and health rating.

The CONSULTANT'S health and safety record (HSR) form will be maintained on site by each of the CONSULTANT'S employees for the duration of his or her work. The CONSULTANT'S employees should inform the site safety officer (SSO) of any allergies, medical conditions, or similar situations that are relevant to the safe conduct of the work to which this GHASP applies.

Is there a concern for radiation at the site? \square Yes X No If no, go to 5.1.
4.2 RADIATION EXPOSURE 4.2.1 External Dosimetry
Thermoluminescent Dosimeter (TLD) Badges: <u>TLD badges are to be worn by all of the CONSULTANT'S field personnel on certain required sites.</u>
Pocket Dosimeters:
Other:
4.2.2 Internal Dosimetry
\square Whole body count \square Bioassay \square Other
Requirements:

4.2.3 Radiation Dose

Dose Limits: The CONSULTANT'S radiation dose limits are stated in the CHSP. Implementation of these dose limits may be designated on a site-specific basis.

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Site-Specific Dose Limits:

ALARA Policy: Radiation doses to the CONSULTANT'S personnel shall be maintained as low as reasonably achievable (ALARA),

taking into

account the work objective, state of technology available, economics of improvements in dose reduction with respect to overall health

and safety, and other societal and socioeconomic considerations.

5. SITE CONTROL

5.1 SITE LAYOUT AND WORK ZONES

Site Work Zones: None

Site Access Requirements and Special Considerations: None

Illumination Requirements: None

Sanitary Facilities (e.g., toilet, shower, potable water): None available onsite. Potable water shall be brought onsite by field personnel for

activities onsite, as necessary.

On-Site Communications: Field staff will utilize E&E cell phones.

Other Site-Control Requirements: All field personnel must sign in at NTC reception desk and coordinate with CSX transport and St.

Adalbert's Cemetery, as necessary.

5.2 SAFE WORK PRACTICES

Daily Safety Meeting: Safety meetings will be conducted as necessary.

Work Limitations: Work shall be limited to a maximum of 12 hours per day. If 12 consecutive days are worked, at least one day off shall be provided before work is resumed. Work will be conducted in daylight hours unless prior approval is obtained and the

illumination requirements in 29 CFR 1910.120(m) are satisfied.

Weather Limitation: None

Other Work Limitations: No confined space entry allowed.

Buddy System: Buddy system will be utilized.

Line of Sight: Field staff shall remain in the line of sight and within verbal communication of at least one other team member.

Eating, Drinking, and Smoking: <u>Eating, drinking, smoking, and the use of tobacco products shall be prohibited in the exclusion</u>

and contamination reduction areas, at a minimum, and shall only be permitted in designated areas.

Contamination Avoidance: Field personnel shall avoid unnecessary contamination of personnel, equipment, and materials to the

extent practicable.

Sample Handling: Protective gloves of a type designated in Section 7 will be worn when containerized samples are handled for

labeling, packaging, transportation, and other purposes.

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Vermiculite Handling: None

Other Safe Work Practices: <u>Hard hat, safety glasses, and steel toed boots are required within the NTC production area.</u> Field personnel must be aware of active railroads at the south end of the site.

6. HAZARD EVALUATION AND CONTROL

6.1 PHYSICAL HAZARD EVALUATION AND CONTROL

Potential physical hazards and their applicable control measures are described in the following table for each task.

Hazard	Task Number	Hazard Control Measures
Biological (flora, fauna, etc.)	1, 2, and 3	■ Potential hazard:
		 Establish site-specific procedures for working around identified hazards.
		Other:
Cold Stress	1, 2, and 3	Provide warm break area and adequate breaks.
		 Provide warm, noncaffeinated beverages.
		 Promote cold stress awareness.
		 See Cold Stress Prevention and Treatment (attached at the end of this plan if cold stress is a potential hazard).
Compressed Gas Cylinders	N/A	 Use caution when moving or storing cylinders.
		 A cylinder is a projectile hazard if it is damaged or its neck is broken.
		 Store cylinders upright and secure them by chains or other means.
		Other:
Confined Space	N/A (See page 5)	■ Ensure compliance with 29 CFR 1910.146.
		 See SOP for Confined Space Entry. Additional documentation is required.
		• Other:
Drilling	1	 See SOP for Health and Safety on Drilling Rig Operations. Additional documentation may be required.
		 Landfill caps will not be penetrated without prior discussions with corporate health and safety staff.
		• Other:
Drums and Containers	2	Ensure compliance with 29 CFR 1910.120(j).
		 Consider unlabeled drums or containers to contain hazardous substances and handle accordingly until the contents are identified.
		 Inspect drums or containers and assure integrity prior to handling.
		• Move drums or containers only as necessary; use caution and warn nearby personnel of potential hazards.

Hazard	Task Number	Hazard Control Measures
		 Open, sample, and/or move drums or containers in accordance with established procedures; use approved drum/container-handling equipment.
		■ Other:
Electrical	2	■ Ensure compliance with 29 CFR 1910 Subparts J and S.
		 Locate and mark energized lines.
		 De-energize lines as necessary.
		Ground all electrical circuits.
		 Guard or isolate temporary wiring to prevent accidental contact.
		 Evaluate potential areas of high moisture or standing water and define special electrical needs.
		■ Other:
Excavation and Trenching	2	 Ensure that excavations comply with and personnel are informed of the requirements of 29 CFR 1926 Subpart P.
		 Ensure that any required sloping or shoring systems are approved as per 29 CFR 1926 Subpart P.
		Identify special personal protective equipment (PPE) (see Section 7) and monitoring (see Section 8) needs if personnel are required to enter approved excavated areas or trenches.
		 Maintain line of sight between equipment operators and personnel in excavations/trenches. Such personnel are prohibited from working in close proximity to operating machinery.
		 Suspend or shut down operations at signs of cave in, excessive water, defective shoring, changing weather, or unacceptable monitoring results.
		■ Other:
Fire and Explosion	2	 Inform personnel of the location(s) of potential fire/explosion hazards.
		 Establish site-specific procedures for working around flammables.
		 Ensure that appropriate fire suppression equipment and systems are available and in good working order.
		■ Define requirements for intrinsically safe equipment.
		 Identify special monitoring needs (see Section 8).
		 Remove ignition sources from flammable atmospheres.
		 Coordinate with local fire-fighting groups regarding potential fire/explosion situations.
		 Establish contingency plans and review daily with team members.
		Other:
Heat Stress	1, 2, and 3	 Provide cool break area and adequate breaks.
		 Provide cool, noncaffeinated beverages.
		■ Promote heat stress awareness.
		 Use active cooling devices (e.g., cooling vests) where

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Hazard	Task Number	Hazard Control Measures
		specified.
		 See Heat Stress Prevention and Treatment (attached at the end of this plan if heat stress is a potential hazard).
Heavy Equipment Operation	2	 Define equipment routes, traffic patterns, and site-specific safety measures.
		 Ensure that operators are properly trained and equipment has been properly inspected and maintained. Verify back-up alarms.
		 Ensure that ground spotters are assigned and informed of proper hand signals and communication protocols.
		 Identify special PPE (Section 7) and monitoring (Section 8) needs.
		 Ensure that field personnel do not work in close proximity to operating equipment.
		 Ensure that lifting capacities, load limits, etc., are not exceeded.
		• Other:
Heights (Scaffolding,	N/A	■ Ensure compliance with applicable subparts of 29 CFR 1910.
Ladders, etc.)		 Identify special PPE needs (e.g., lanyards, safety nets, etc.)
		• Other:
Noise	2	 Establish noise level standards for on-site equipment/operations.
		Inform personnel of hearing protection requirements (Section 7).
		 Define site-specific requirements for noise monitoring (Section 8).
		• Other:
Overhead Obstructions	N/A	Wear hard hat.
		• Other:
Power Tools	2	 Ensure compliance with 29 CFR 1910 Subpart P.
		• Other:
Sunburn	1, 2, and 3	 Apply sunscreen.
		 Wear hats/caps and long sleeves.
		• Other:
Utility Lines	1	 Identify/locate existing utilities prior to work.
		 Ensure that overhead utility lines are at least 25 feet away from project activities.
		 Contact utilities to confirm locations, as necessary.
		• Other:
Weather Extremes	1, 2, and 3	■ Potential hazards:
		 Establish site-specific contingencies for severe weather situations.
		 Provide for frequent weather broadcasts.
		 Weatherize safety gear, as necessary (e.g., ensure eye wash units cannot freeze, etc.).
		 Identify special PPE (Section 7) needs.
		 Discontinue work during severe weather.
		• Other:

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Hazard	Task Number	Hazard Control Measures
Other: Slip, Trip, and Fall	1, 2, and 3	•
Other:		•

6.2 CHEMICAL HAZARD EVALUATION AND CONTROL

6.2.1 Chemical Hazard Evaluation

Potential chemical hazards are described by task number in Table 6-1. Hazard Evaluation Sheets for major known contaminants are attached at the end of this plan.

Table 6-1 CHEMICAL HAZARD EVALUATION

		Exposure Limits (TWA)						FID/	PID	
Task Number	Compound	PEL	REL	TLV	Dermal Hazard (Y/N)	Route(s) of Exposure	Acute Symptoms	Odor Threshold/ Description	Relative Response	Ioniz. Poten. (eV)
1, 2, & 3	Polychlorinated biphenyl 1242*	1 mg/m3 Sk	0.001 mg/m3 Sk	1 mg/m3 Sk	Y	Inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, chloracne; liver damage; reproductive effects; [potential occupational carcinogen]	 <u>Butterlike</u>	<u>N/A</u>	<u>N/A</u>
1, 2, & 3	Polychlorinated biphenyl 1254*	0.5 mg/m3 Sk	0.001 mg/m3 Sk	0.5 mg/m3 Sk	<u>Y</u>	Inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, chloracne; liver damage; reproductive effects; [potential occupational carcinogen]	 <u>Butterlike</u>	<u>N/A</u>	<u>N/A</u>
			_							

Note: Use an asterisk (*) to indicate known or suspected carcinogens.

6.2.2 Chemical Hazard Control

An appropriate combination of engineering/administrative controls, work practices, and PPE shall be used to reduce and maintain employee exposures to a level at or below published exposure levels (see Section 6.2.1).

Applicable Engineering/Administrative Control Measures: None

PPE: See Section 7.

6.3 RADIOLOGICAL HAZARD EVALUATION AND CONTROL

6.3.1 Radiological Hazard Evaluation

Potential radiological hazards are described below by task number. Hazard Evaluation Sheets for major known contaminants are attached at the end of this plan.

Task Number	Radionuclide	DAC (μCi/ml)	Route(s) of Exposure	Major Radiation(s)	Energy(s) (MeV)	Half-Life

6.3.2 Radiological Hazard Control

Engineering/administrative controls and work practices shall be instituted to reduce and maintain employee exposures to a level at or below the permissible exposure/dose limits (see sections 4.2.3 and 6.3.1). Whenever engineering/administrative controls and work practices are not feasible or effective, any reasonable combination of engineering/administrative controls, work practices, and PPE shall be used to reduce and maintain employee exposures to a level at or below permissible exposure/dose limits.

Applicable Engineering/Administrative Control Measures:

PPE: See Section 7.

7. LEVEL OF PROTECTION AND PERSONAL PROTECTIVE EQUIPMENT

7.1 LEVEL OF PROTECTION

The following levels of protection (LOPs) have been selected for each work task based on an evaluation of the potential or known hazards, the routes of potential hazard, and the performance specifications of the PPE. On-site monitoring results and other information obtained from on-site activities will be used to modify these LOPs and the PPE, as necessary, to ensure sufficient personnel protection. The authorized LOP and PPE shall only be changed with the approval of the regional safety coordinator or designee. Level A is not included below because Level A activities, which are performed infrequently, will require special planning and addenda to this GHASP.

Task Number	В	C	D	Modifications Allowed
All			X	Disposable gloves to be used during all sampling activities

Note: Use "X" for initial levels of protection. Use "(X)" to indicate levels of protection that may be used as site conditions warrant.

7.2 PERSONAL PROTECTIVE EQUIPMENT

The PPE selected for each task is indicated below. The CONSULTANT'S PPE program complies with 29 CFR 1910.120 and 29 CFR 1910 Subpart I and is described in detail in the CHSP. Refer to 29 CFR 1910 for the minimum PPE required for each LOP.

	Task Number/LOP				
PPE	ALL				
Full-face APR					
PAPR					
Cartridges:				_	
P100					
GMC-P100					
GME-P100					
Other:					
Positive-pressure, full-face SCBA					
Spare air tanks (Grade D air)					
Positive-pressure, full-face, supplied-air system					
Cascade system (Grade D air)					
Manifold system					
5-Minute escape mask					
Safety glasses	(X)				
Monogoggles					
Coveralls/clothing	X				

		Task Nur	nber/LOP	
PPE	ALL			
Protective clothing:				
Tyvek	(X)			
Saranex				
Other:				
Splash apron				
Inner gloves:				
Cotton	(X)			
Nitrile	X			
Latex				
Other:				
Outer gloves:				
Viton				
Rubber				
Neoprene				
Nitrile	X			
Other:				
Work gloves				
Safety boots (as per ANSI Z41)				
Neoprene safety boots (as per ANSI Z41)	(X)			
Boot covers (type:)				
Hearing protection (type:)				
Hard hat	(X)			
Face shield				
Other:				
Other:				

8. HEALTH AND SAFETY MONITORING

Health and safety monitoring will be conducted to ensure proper selection of engineering/administrative controls, work practices, and/or PPE so that employees are not exposed to hazardous substances at levels that exceed permissible exposure/dose limits or published exposure levels. Health and safety monitoring will be conducted using the instruments, frequency, and action levels described in Table 8-1. Health and safety monitoring instruments shall have been appropriately calibrated and/or performance-checked prior to use.

Low-level residual PCBs are known to exist on-site. No instrumentation is available for PCBs.

				Table	e 8-1			
			HEAL	TH AND SAFI	ETY MONITORING			
Instrument	Task Number Contaminant(s) Monitoring Moni Frequency				Action I	Action Levels a		
□ PID (e.g., HNu IS-101) □ FID (e.g., OVA 128-GC) □ TVA	N/A				Unknown Vapors Background to 1 ppm above background: Level D 1 to 5 ppm above background: Level C 5 to 500 ppm above background: Level B >500 ppm above background: Level A	Contaminant-Specific		
Oxygen Meter/Explosimeter	N/A				Oxygen <19.5% or >22.0%: Evacuate area; eliminate ignition sources; reassess conditions. 19.5 to 22.0%: Continue work in accordance with action levels for other instruments.	Explosivity ≤10% LEL: Continue work in accordance with action levels for other instruments; monitor continuously for combustible atmospheres. >10% LEL: Evacuate area; eliminate ignition sources; reassess conditions.		
Radiation Alert Monitor (Rad-mini or RAM-4)	N/A				<0.1 mR/hr: Continue work in accordance with ≥0.1 mR/hr: Evacuate area; reassess work plan			
Mini-Ram Particulate Monitor	N/A				General/Unknown Evaluate health and safety measures when dust levels exceed 2.5 milligrams per cubic meter.	Contaminant-Specific		
HCN/H ₂ S (Monitox)	N/A				≥4 ppm: Leave area and consult with SSO.			
Draeger Colorimetric Tubes	N/A				Tube Action Leve	I Action		
Air Monitor/Sampler Type: Sampling medium:	N/A				Action Level	Action		

Table 8-1 HEALTH AND SAFETY MONITORING

Instrument	Task Number	Contaminant(s)	Monitoring Location	Monitoring Frequency	Action Levels ^a			
Personal Sampling Pump					Action Level Action			
Type:Sampling medium:	N/A							
Micro R Meter	N/A				<2 mR/hr: Continue work in accordance with action levels for other instruments. 2 to 5 mR/hr: In conjunction with a radiation safety specialist, continue work and perform stay-time calculations to ensure compliance with dose limits and ALARA policy. >5 mR/hr: Evacuate area to reassess work plan and evaluate options to maintain personnel exposures ALARA and within dose limits.			
Ion Chamber	N/A				See micro R meter action levels above.			
Radiation Survey Ratemeter/Scaler with External Detector(s)	N/A				Detector Action Level Action			
Noise Dosimeter (Sound Level Meter)	N/A				≤85 decibels as measured using the A-weighed network (dBa): Use hearing protection if exposure will be sustained throughout work shift. >85 dBA: Use hearing protection. >120 dBA: Leave area and consult with safety personnel.			
Other:								
Other:								

Unless stated otherwise, airborne contaminant concentrations are measured as a time-weighted average in the worker's breathing zone. Acceptable concentrations for known airborne contaminants will be determined based on OSHA/NIOSH/ACGIH and/or NRC exposure limits. As a guideline, 1/2 the PEL/REL/TLV, whichever is lower should be used.

9. DECONTAMINATION PROCEDURES

All equipment, materials, and personnel will be evaluated for contamination upon leaving the exclusion area. Equipment and materials will be decontaminated and/or disposed and personnel will be decontaminated, as necessary. Decontamination will be performed in the contamination reduction area or any designated area such that the exposure of uncontaminated employees, equipment, and materials will be minimized. Specific procedures are described below.

10. EMERGENCY RESPONSE

This section contains additional information pertaining to on-site emergency response and does not duplicate pertinent emergency response information contained in earlier sections of this plan (e.g., site layout, monitoring equipment, etc.). Emergency response procedures will be rehearsed regularly, as applicable, during project activities.

10.1 EMERGENCY RESPONSIBILITIES

All Personnel: All personnel shall be alert to the possibility of an on-site emergency; report potential or actual emergency situations to the team leader and SSO; and notify appropriate emergency resources, as necessary.

Team Leader: The team leader will determine the emergency actions to be performed by the CONSULTANT'S personnel and will direct these actions. The team leader also will ensure that applicable incidents are reported to the appropriate CONSULTANT and client project personnel and government agencies.

SSO: The SSO will recommend health/safety and protective measures appropriate to the emergency.

Other:

10.2 LOCAL AND SITE RESOURCES (including phone numbers)

Ambulance: 911	
Hospital: St. Joseph Hospital, 2605 Harlem Rd, Cheektowaga, NY 142	<u>25</u>
Directions to Hospital (map attached at the end of this plan): From the s	site, turn left on Dale Road. Turn left on Walden Ave. Turn right on
Harlem Rd. Travel 0.4 miles to St. Joseph Hospital on the right side.	
Poison Control: Poison Control Center of Western New York 1-800-22	<u>!2-1222.</u>
Police Department: 911 for emergency/Cheektowaga Police Departmen	nt (716) 686-3500 for non-emergency.
Fire Department: 911	
Client Contact: William Welling, NYSDEC	
Site Contact: Bob Fishlock, NTC, (716) 896-6500	
On-Site Telephone Number: <u>N/A</u>	
Cellular Telephone Number: <u>TBD</u>	
Radios Available: No	
Other: Craig Sollenberger, CSX Transportation, (716) 891-6027	
Terry Gladkowski, St. Adalbert's Cemetery, 716-681-3090	
10.3 THE CONSULTANT'S EMERGENCY CONTACTS	
Corporate Health and Safety Director, :	716/ (office)
Regional Office Contact:	716/(office) 716/(home)(office)
Other:	(home) (office)
a. THE CONSULTANT'S Emergency Response Center:	716/
b. Corporate Health and Safety Director,:	
v. Corporate reason and salety Breeton,	716/(office) 716/(home)
c. Assistant Corporate Safety Director,, CIH:	716/
10.4 OTHER EMERGENCY RESPONSE PROCEDURES	
On-Site Evacuation Signal/Alarm (must be audible and perceptible above	ve ambient noise and light levels):
On-Site Assembly Area: North of the NTC office building parking lot	
Emergency Egress Route to Get Off Site:	
Off-Site Assembly Area:	
Preferred Means of Reporting Emergencies: Team leader will contact e	

 $\begin{array}{c} \text{HASP 03/03} \\ \text{L-20} \end{array}$

ATTACHMENT 1 EQUIPMENT/SUPPLIES CHECKLIST						
INSTRUMENTATION	No.	EMERGENCY EQUIPMENT	No.			
OVA		First aid kit	X			
Thermal desorber		Stretcher				
O ₂ /explosimeter w/cal. Kit		Portable eye wash	X			
Photovac tip		Blood pressure monitor				
HNu (probe:eV)		Fire blanket				
Magnetometer		Fire extinguisher	X			
Pipe locator		Thermometer (medical)				
Weather station		Spill kit	X			
Draeger tube kit (tubes:)						
Brunton compass						
Real-time cyanide monitor						
Real-time H ₂ S monitor						
Heat stress monitor						
Noise equipment		DECONTAMINATION EQUIPMENT				
Personal sampling pumps and supplies		Wash tubs				
MiniRam dust monitor		Buckets				
Mercury monitor		Scrub brushes				
Spare batteries (type:)		Pressurized sprayer				
		Spray bottle				
		Detergent (type:)				
RADIATION EQUIPMENT/SUPPLIES		Solvent (type:)				
Documentation forms		Plastic sheeting				
Portable ratemeter		Tarps and poles				
Scaler/ratemeter		Trash bags				
1" NaI gamma probe		Trash cans				
2" NaI gamma probe		Masking tape				
ZnS alpha probe		Duct tape				
GM pancake probe		Paper towels				
Tungsten-shielded GM probe		Face mask				
Micro R meter		Face mask sanitizer				
Ion chamber		Step ladders				
Alert monitor		Distilled water				
Pocket dosimeter		Deionized water				
Dosimeter charger						
Radiation warning tape						
Radiation decon supplies						
Spare batteries (type:)						

ATTACHMENT 1 EQUIPMENT/SUPPLIES CHECKLIST							
SAMPLING EQUIPMENT		MISCELLANEOUS (Cont.)					
8-oz. bottles		Gatorade or equivalent					
Half-gallon bottles		Tables					
VOA bottles		Chairs					
String	X	Weather radio					
Hand bailers	X	Two-way radios					
Thieving rods with bulbs		Binoculars					
Spoons		Megaphone					
Knives		Cooling vest					
Filter paper		Hand tools	X				
Bottle labels	X						
1 L amber bottles	X						
8 oz soil jars	X						
Nitrile disposable gloves	X						
Ice	X	SHIPPING EQUIPMENT					
		Coolers					
MISCELLANEOUS		Paint cans with lids, 7 clips each					
Pump		Vermiculite					
Surveyor's tape		Shipping labels					
100' Fiberglass tape		DOT labels:					
300' Nylon rope		"Up"					
Nylon string	X	"Danger"					
Surveying flags		"Inside Container Complies"					
Camera	X	Hazard Group					
Film		Strapping tape	X				
Bung wrench		Baggies					
Soil auger		Custody seals	X				
Pick		Chain-of-custody forms	X				
Shovel		Express shipment forms	X				
Catalytic heater		Clear packing tape	X				
Propane gas		Permanent markers					
Banner tape							
Surveying meter stick							
Chaining pins and ring							
Logbooks (large,small)	X						
Required MSDSs							
Intrinsically safe flashlight							
Potable water	X						

HASP 03/03

Material Safety Data Sheet

ULTRA Scientific · 250 Smith Street · North Kingstown, RI, USA 02852 · 401-294-9400

Product # RPC-1242 Last Updated: 4/23/2004

Section I Product Identification

Name: Aroclor 1242 (PCB 1242)

Matrix: neat compound

Section II Composition / Information on Ingredients

Component CAS# % by Wt. LD50 OSHA PEL ACGIH TLV RTECS # Codes

Aroclor 1242 (PCB 1242)

4250 mg/kg oral rat

E-NTP Group 1 carcinogen; F-NTP Group 2 carcinogen; G-SARA Title III compound; H-California Proposition 65 compound.

053469-21-9 100

1 mg/m3 1 mg/m3

Codes: A-OSHA regulated carcinogen; B-IARC Group 1 carcinogen; C-IARC Group 2A carcinogen; D-IARC Group 2B carcinogen;

N/A

Section III Hazards Identification

Contains carcinogen(s) or cancer suspect agent(s)

Irritant

All chemicals should be considered hazardous - direct physical contact should be avoided.

Section IV First Aid Measures

Inhalation: If inhaled, remove to fresh air. Give oxygen, if necessary. Contact a physician.

Skin In case of skin contact, flush with copious amounts of water. Remove contaminated clothing.

Contact: Contact a physician.

In case of eye contact, flush with copious amounts of water, lifting eyelids occasionally. Contact Eve

Contact: a physician.

Ingestion: If ingested, contact poison center immediately for recommended procedure. Contact a

physician.

Fire Fighting Measures Section V

Fire and Explosion Hazard Data for Compound

Flash Point: N/A Fire Hazard: N/A

Auto-Ignition Temperature: N/A LEL: N/A UEL: N/A

Extinguishing Media: Carbon dioxide, dry chemical powder, or water spray.

Section VI Accidental Release Measures

Ventilate area of the leak or spill. Wear appropriate personal protective equipment as specified in Section VIII. A leaking bottle, vial, or ampule may be placed in a plastic bag, and normal disposal procedures followed. Take up spilled material with sand or other non-combustible absorbant material, and place in an appropriate container for later disposal. Flush spill area with water.

Section VII Handling and Storage

May be stored at room temperature

Keep in a tightly closed container, and store in a corrosion proof area.

This product should only be used by persons trained in the safe handling of hazardous chemicals.

Section VIII Exposure Controls / Personal Protection

Ensure that there is adequate ventilation to prevent airborne levels from exceeding recommended exposure

limits (see Section II). Use appropriate MSHA/NIOSH approved safety equipment. Wear chemical goggles, face shield, gloves, and chemical resistant clothing, such as a laboratory coat and/or a rubber apron, to prevent contact with eyes, skin, and clothing.

Section IX Physical and Chemical Properties

Physical Data for Compound

Melting Pt.: N/A Boiling Pt.: N/A Density: N/A

Vapor Pressure: N/A Vapor Density: N/A Water Solubility: N/A

Appearance: N/A Odor: N/A

Section X Stability and Reactivity

Reactivity Data for Compound

Stability: stable Incompatibilities: N/A

Hazardous Decomposition Products: N/A Hazardous Effects of Polymerization: no

Section XI Toxicological Information

See Section II for specific toxicological information for the ingredients of this product.

Section XII Ecological Information

No information is available.

Section XIII Disposal Considerations

Recycle, if possible. Any material which cannot be saved for recovery or recycling should be disposed of at an appropriate and approved waste disposal facility. Processing, use, and/or contamination of this product may change waste management requirements. Observe all applicable federal, state, and local environmental regulations concerning disposal.

Section XIV Transport Information

Shipment Type: Dangerous Goods in Excepted Quantity (US DOT Small Quantity Exemption)
UN Number: UN2315 Shipping Class: 9 Packing Group: N/A

Section XV Regulatory Information

No information is available.

Section XVI Other Information

The above information is believed to be correct, but does not purport to be all-inclusive. This data should be used only as a guide in handling this material. ULTRA Scientific, Inc., shall not be held liable for any damage resulting from handling or from contact with the above product.

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Material Safety Data Sheet

ULTRA Scientific · 250 Smith Street · North Kingstown, RI, USA 02852 · 401-294-9400

Product # RPC-1248 Last Updated: 4/23/2004

Section I Product Identification

Name: Aroclor 1248 (PCB 1248)

Matrix: neat compound

Section II Composition / Information on Ingredients

Component CAS # % by Wt. LD50 OSHA PEL ACGIH TLV RTECS # Codes

Aroclor 1248 (PCB 1248) 012672-29-6 100 11000 mg/kg oral rat N/A N/A N/A

Codes: A-OSHA regulated carcinogen; B-IARC Group 1 carcinogen; C-IARC Group 2A carcinogen; D-IARC Group 2B carcinogen; E-NTP Group 1 carcinogen; F-NTP Group 2 carcinogen; G-SARA Title III compound; H-California Proposition 65 compound.

Section III Hazards Identification

Contains carcinogen(s) or cancer suspect agent(s)

Irritant

All chemicals should be considered hazardous - direct physical contact should be avoided.

Section IV First Aid Measures

Inhalation: If inhaled, remove to fresh air. Give oxygen, if necessary. Contact a physician.

Skin In case of skin contact, flush with copious amounts of water. Remove contaminated clothing.

Contact: Contact a physician.

Eye In case of eye contact, flush with copious amounts of water, lifting eyelids occasionally. Contact

Contact: a physician.

Ingestion: If ingested, contact poison center immediately for recommended procedure. Contact a

physician.

Section V Fire Fighting Measures

Fire and Explosion Hazard Data for Compound

Flash Point: N/A Fire Hazard: N/A

Auto-Ignition Temperature: N/A LEL: N/A UEL: N/A

Extinguishing Media: Carbon dioxide, dry chemical powder, or water spray.

Section VI Accidental Release Measures

Ventilate area of the leak or spill. Wear appropriate personal protective equipment as specified in Section VIII. A leaking bottle, vial, or ampule may be placed in a plastic bag, and normal disposal procedures followed. Take up spilled material with sand or other non-combustible absorbant material, and place in an appropriate container for later disposal. Flush spill area with water.

Section VII Handling and Storage

May be stored at room temperature

Keep in a tightly closed container, and store in a corrosion proof area.

This product should only be used by persons trained in the safe handling of hazardous chemicals.

Section VIII Exposure Controls / Personal Protection

Ensure that there is adequate ventilation to prevent airborne levels from exceeding recommended exposure

limits (see Section II). Use appropriate MSHA/NIOSH approved safety equipment. Wear chemical goggles, face shield, gloves, and chemical resistant clothing, such as a laboratory coat and/or a rubber apron, to prevent contact with eyes, skin, and clothing.

Physical and Chemical Properties Section IX

Physical Data for Compound

Boiling Pt.: N/A Melting Pt.: N/A Density: N/A

Vapor Pressure: N/A Vapor Density: N/A Water Solubility: N/A

Appearance: N/A Odor: N/A

Stability and Reactivity Section X

Reactivity Data for Compound

Stability: stable Incompatibilities: N/A

Hazardous Decomposition Products: N/A Hazardous Effects of Polymerization: no

Section XI Toxicological Information

See Section II for specific toxicological information for the ingredients of this product.

Section XII **Ecological Information**

No information is available.

Section XIII **Disposal Considerations**

Recycle, if possible. Any material which cannot be saved for recovery or recycling should be disposed of at an appropriate and approved waste disposal facility. Processing, use, and/or contamination of this product may change waste management requirements. Observe all applicable federal, state, and local environmental regulations concerning disposal.

Section XIV Transport Information

Shipment Type: Dangerous Goods in Excepted Quantity (US DOT Small Quantity Exemption) UN Number: UN2315 Shipping Class: 9 Packing Group: N/A

Section XV Regulatory Information

No information is available.

Section XVI Other Information

The above information is believed to be correct, but does not purport to be all-inclusive. This data should be used only as a guide in handling this material. ULTRA Scientific, Inc., shall not be held liable for any damage resulting from handling or from contact with the above product.

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L-28

Material Safety Data Sheet

ULTRA Scientific · 250 Smith Street · North Kingstown, RI, USA 02852 · 401-294-9400

Product # RPC-1254 Last Updated: 4/23/2004

Section I Product Identification

Name: Aroclor 1254 (PCB 1254)

Matrix: neat compound

Section II Composition / Information on Ingredients

0.5 mg/m3	N/A	CF
		0.5 mg/m3 N/A ARC Group 2B carcinogen;

Section III Hazards Identification

Contains carcinogen(s) or cancer suspect agent(s)

Irritant

All chemicals should be considered hazardous - direct physical contact should be avoided.

Section IV First Aid Measures

Inhalation: If inhaled, remove to fresh air. Give oxygen, if necessary. Contact a physician.

Skin In case of skin contact, flush with copious amounts of water. Remove contaminated clothing.

Contact: Contact a physician.

Eye In case of eye contact, flush with copious amounts of water, lifting eyelids occasionally. Contact

Contact: a physician.

Ingestion: If ingested, contact poison center immediately for recommended procedure. Contact a

physician.

Section V Fire Fighting Measures

Fire and Explosion Hazard Data for Compound

Flash Point: N/A Fire Hazard: N/A

Auto-Ignition Temperature: N/A LEL: N/A UEL: N/A

Extinguishing Media: Carbon dioxide, dry chemical powder, or water spray.

Section VI Accidental Release Measures

Ventilate area of the leak or spill. Wear appropriate personal protective equipment as specified in Section VIII. A leaking bottle, vial, or ampule may be placed in a plastic bag, and normal disposal procedures followed. Take up spilled material with sand or other non-combustible absorbant material, and place in an appropriate container for later disposal. Flush spill area with water.

Section VII Handling and Storage

May be stored at room temperature

HASP 03/03

Keep in a tightly closed container, and store in a corrosion proof area.

This product should only be used by persons trained in the safe handling of hazardous chemicals.

Section VIII Exposure Controls / Personal Protection

Ensure that there is adequate ventilation to prevent airborne levels from exceeding recommended exposure

limits (see Section II). Use appropriate MSHA/NIOSH approved safety equipment. Wear chemical goggles, face shield, gloves, and chemical resistant clothing, such as a laboratory coat and/or a rubber apron, to prevent contact with eyes, skin, and clothing.

Section IX Physical and Chemical Properties

Physical Data for Compound

Melting Pt.: N/A Boiling Pt.: N/A Density: N/A

Vapor Pressure: N/A Vapor Density: N/A Water Solubility: N/A

Appearance: N/A Odor: N/A

Section X Stability and Reactivity

Reactivity Data for Compound

Stability: stable Incompatibilities: N/A

Hazardous Decomposition Products: N/A Hazardous Effects of Polymerization: no

Section XI Toxicological Information

See Section II for specific toxicological information for the ingredients of this product.

Section XII Ecological Information

No information is available.

Section XIII Disposal Considerations

Recycle, if possible. Any material which cannot be saved for recovery or recycling should be disposed of at an appropriate and approved waste disposal facility. Processing, use, and/or contamination of this product may change waste management requirements. Observe all applicable federal, state, and local environmental regulations concerning disposal.

Section XIV Transport Information

Shipment Type: Dangerous Goods in Excepted Quantity (US DOT Small Quantity Exemption)
UN Number: UN2315 Shipping Class: 9 Packing Group: N/A

Section XV Regulatory Information

No information is available.

Section XVI Other Information

The above information is believed to be correct, but does not purport to be all-inclusive. This data should be used only as a guide in handling this material. ULTRA Scientific, Inc., shall not be held liable for any damage resulting from handling or from contact with the above product.

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Directions to Cheektowaga, NY 14225-4018

Page 1 of 1

Directions to Cheektowaga, NY 14225-4018

Summary and Notes

START Niagara Transformer Corporation (716) 896-6500
1747 Dale Rd, Cheektowaga, NY

FINISH D 2605 Harlem Rd, Cheektowaga, NY 14225-4018

Total Distance: 1.1 miles, Total Time: 2 mins (approx.)

14225-4915



Add your notes here...

Distance

1747 DALE RD, CHEEKTOWAGA, NY 14225-4915

- 1. Start at 1747 DALE RD, CHEEKTOWAGA
- go 0.4 mi

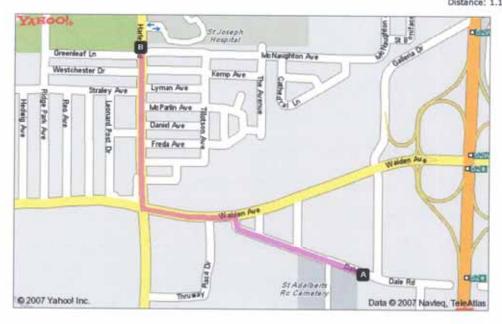
2. Turn On WALDEN AVE

go 0.3 mi

3. Turn R on HARLEM RD[RT-240]

- go 0.4 mi
- 4. Arrive at 2605 HARLEM RD, CHEEKTOWAGA, on the
 - 2605 HARLEM RD, CHEEKTOWAGA, NY 14225-4018

Distance: 1.1miles, Time: 2 mins



When using any driving directions or map, it's a good idea to do a reality check and make sure the road still exists, watch out for construction, and follow all traffic safety precautions. This is only to be used as an aid in planning.

http://xml1.maps.yahoo.com/prnt.php?v3=0&&mvt=m&q2=2605%20Harlem%20Road,%20chee... 4/10/2007



Material Safety Data Sheets

Monsanto

Material Safety Data

POLYCHLORINATED BIPHENYLS (PCBs)

Emergency Phone No. (Call Collect) 314-694-1000

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME:

POLYCHLORINATED BIPHENYLS (PCBs)

Aroclor® Series 1016, 1221, 1232, 1242, 1248, 1254, 1260, 1262, 1268

Therminol® FR Series

MSDS Number: M00018515

Date: 12/95

Chemical Family:

Chlorinated Hydrocarbons

Chemical Name:

Polychlorinated biphenyis

Synonyms:

PCBs, Chlorodiphenyls, Chlorinated biphenyls

Trade Names/Common Names:

PYRANOL® and INERTEEN® are trade names for commonly used dielectric fluids that may have contained varying amounts of PCBs as well as other components including chlorinated benzenes.

ASKAREL is the generic name for a broad class of fire resistant synthetic chlorinated hydrocarbons and mixtures used as dielectric fluids that commonly contained about 30 - 70% PCBs. Some ASKAREL fluids contained 99% or greater PCBs and some contained no PCBs.

PYDRAUL® is the trade name for hydraulic fluids that, prior to 1972, may have contained varying amounts of PCBs and other components including phosphate esters.

The product names/trade names are representative of several commonly used Monsanto products (or products formulated with Monsanto products). Other trademarked PCB products were marketed by Monsanto and other manufacturers. PCBs were also manufactured and sold by several European and Japanese companies. Contact the manufacturer of the trademarked product, if not in this listing, to determine if the formulation contained PCBs.

In 1972, Monsanto restricted sales of PCBs to applications involving only closed electrical systems, (transformers and capacitors). In 1977, all manufacturing and sales were voluntarily terminated. In 1979, EPA restricted the manufacture, processing, use, and distribution of PCBs to specifically exempted and authorized activities.

MONSANTO COMPANY, 800 N. LINDBERGH BLVD., ST. LOUIS, MO 63167

FOR CHEMICAL EMERGENCY, SPILL, LEAK, FIRE, EXPOSURE, OR ACCIDENT Call CHEMTREC - Day or Night - 1-800-424-9300 Toll free in the continental U.S., Hawaii, Puerto Rico, Canada, Alaska, or Virgin Islands. For calls originating elsewhere: 202-483-7616 (collect calls accepted)

For additional nonemergency information, call: 314-694-3344.

2. COMPOSITION/INFORMATION ON INGREDIENTS

Chemically, commercial PCBs are defined as a series of technical mixtures, consisting of many isomers and compounds that vary from mobile, oily liquids to white crystalline solids and hard noncrystalline resins. Technical products vary in composition, in the degree of chlorination, and possibly according to batch.

The mixtures generally used contain an average of 3 atoms of chlorine per molecule (42% chlorine) to 5 atoms of chlorine per module (54% chlorine). They were used as components of dielectric fluids in transformers and capacitors. Prior to 1972, PCB applications included heat transfer media, hydraulic, and other industrial fluids, plasticizers, carbonless copy paper, paints, inks, and adhesives.

Component	CAS No.
chlorinated biphenyl Aroclor 1016 Aroclor 1221 Aroclor 1232 Aroclor 1242 Aroclor 1248 Aroclor 1254 Aroclor 1260 Aroclor 1262 Aroclor 1262	1336-36-3 12674-11-2 11104-28-2 11141-16-5 53469-21-9 12672-29-6 11097-69-1 11096-82-5 37324-23-5 11100-14-4
MIDDIDI 1200	1 1 100-14-4

There are also CAS Numbers for Individual PCB congeners and for mixtures of Aroclor® products.

PCBs are identified as hazardous chemicals under criteria of the OSHA Hazard Communication Standard (29 CFR Part 1910.1200). PCBs have been listed in the International Agency for Research on Cancer (IARC) Monographs (1987)-Group 2A and in the National Toxicology Program (NTP) Annual Report on Carcinogens (Seventh).

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Appearance and Odor: PCB mixtures range in form and color from clear to amber liquids to white crystalline solids.

They have a mild, distinctive odor and are not volatile at room temperature. Refer to Section

9 for details,

WARNING! CAUSES EYE IRRITATION MAY CAUSE SKIN IRRITATION

PROCESSING AT ELEVATED TEMPERATURES MAY RELEASE VAPORS OR FUMES WHICH MAY CAUSE RESPIRATORY TRACT IRRITATION

POTENTIAL HEALTH EFFECTS

Likely Routes

of Exposure: Skin contact and inhalation of heated vapors

Eve Contact: Causes moderate irritation based on worker experience.

Skin Contact: Prolonged or repeated contact may result in redness, dry skin and defatting based on human

experience. A potential exists for developing chloracne. PCBs can be absorbed through intact skin.

Inhaiation: Due to the low volatility of PCBs, exposure to this material in ambient conditions is not expected to

produce adverse health effects. However, at elevated processing temperatures, PCBs may produce

a vapor that may cause respiratory tract irritation if inhaled based on human experience.

Ingestion: No more than slightly toxic based on acute animal toxicity studies. Coughing, choking and shortness

of breath may occur if liquid material is accidentally drawn into the lungs during swallowing or

vomiting.

MSDS #: MOOO18515

Other:

Numerous epidemiological studies of humans, both occupationally exposed and nonworker environmentally exposed populations, have not demonstrated any causal relationship between PCB exposure and chronic human illnesses such as cancer or neurological or cardiovascular effects. PCBs at high dosage can cause skin symptoms; however, these subside upon removal of the exposure source.

Refer to Section 11 for toxicological information.

4. FIRST AID MEASURES

IF IN EYES, immediately flush with plenty of water for at least 15 minutes. If easy to do, remove any contact lenses. Get medical attention. Remove material from skin and clothing.

IF ON SKIN, immediately flush the area with plenty of water. Wash skin gently with soap as soon as it is available. Get medical attention if irritation persists.

IF INHALED, remove person to fresh air. If breathing is difficult, get medical attention.

IF SWALLOWED, do NOT induce vomiting. Rinse mouth with water. Get medical attention. Contact a Poison Control Center. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.

NOTE TO PHYSICIANS: Hot PCBs may cause thermal burn. If electrical equipment arcs between conductors, PCBs or other chlorinated hydrocarbon dielectric fluids may decompose to produce hydrochloric acid (HCI), a respiratory irritant. If large amounts are swallowed, gastric lavage may be considered.

5. FIRE FIGHTING MEASURES

Flash Point: 284 degrees F (140 degrees C) or higher depending on the chlorination level of the Aroclor product

Fire Point: 349 degrees F (176 degrees C) or higher depending on the chlorination level of the Aroclor product

NOTE: Refer to Section 9 for individual flash points and fire points.

Extinguishing

Media:

Extinguish fire using agent suitable for surrounding fire. Use dry chemical, foam, carbon dioxide or water spray. Water may be ineffective. Use water spray to keep fire-exposed containers or transformer cool.

PCBs are fire-resistant compounds. They may decompose to form CO, CO2, HCl, phenolics, aldehydes, and other toxic combustion products under severe conditions such as exposure to flame or hot surfaces.

Dielectric fluids having PCBs and chlorinated benzenes as components have been reported to produce polychlorinated dibenzo-p-dioxins (PCDDs) and furans (PCDFs) during fire situations involving electrical equipment. At temperatures in the range of 600-650 degrees C in the presence of excess oxygen, PCBs may form polychlorinated dibenzofurans (PCDFs). Laboratory studies under similar conditions have demonstrated that PCBs do not produce polychlorinated dibenzo-p-dioxins (PCDDs).

Federal regulations require all PCB transformers to be registered with fire response personnel.

If a PCB transformer is involved in a fire-related incident, the owner of the transformer may be required to report the incident. Consult and follow appropriate federal, state and local regulations.

Fire Fighting Equipment: Fire fighters and others exposed to products of combustion should wear self-contained breathing apparatus. Equipment should be thoroughly decontaminated after use.

6. ACCIDENTAL RELEASE MEASURES

Cleanup and disposal of liquid PCBs and other PCB items are strictly regulated by the federal government. The regulations are found at 40 CFR Part 761. Consult these regulations as well as applicable state and local regulations prior to any cleanup or disposal of PCBs, PCB items, or PCB contaminated items.

If PCBs leak or are spilled, the following steps should be taken immediately:

All nonessential personnel should leave the leak or spill area.

The area should be adequately ventilated to prevent the accumulation of vapors.

The spill/leak should be contained. Loss to sewer systems, navigable waterways, and streams should be prevented. Spills/leaks should be removed promptly by means of absorptive material, such as sawdust, vermiculite, dry sand, clay, dirt or other similar materials, or trapped and removed by pumping or other suitable means (traps, drip-pans, trays, etc.).

Personnel entering the spill or leak area should be furnished with appropriate personal protective equipment and clothing as needed. Refer to Section 8 for personal protection equipment and clothing.

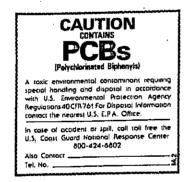
Personnel trained in emergency procedures and protected against attendant hazards should shut off sources of PCBs, clean up spills, control and repair leaks, and fight fires in PCB areas.

Refer to Section 13 for disposal information and Sections 14 and 15 for information regarding reportable quantity, and Section 7 for marking information.

7. HANDLING AND STORAGE

Care should be taken to prevent entry into the environment through spills, leakage, use vaporization, or disposal of liquid or containers. Avoid prolonged breathing of vapors or mists. Avoid contact with eyes or prolonged contact with skin. If skin contact occurs, remove by washing with soap and water. Following eye contact, flush with water. In case of spillage onto clothing, the clothing should be removed as soon as practical, skin washed, and clothing laundered. Comply with all federal, state, and local regulations.

Federal regulations under the Toxic Substances Control Act require PCBs, PCB items, storage areas, transformer vaults, and transport vehicles to be marked (check regulations, 40 CFR 761, for details).





Storage:

The storage of PCB items or equipment (those containing 50 ppm or greater PCBs) and PCB waste is strictly regulated by 40 CFR Part 761. The storage time is limited, the storage area must meet physical requirements, and the area must be labeled.

Avoid contact with eyes.
Wash thoroughly after handling.
Avoid breathing processing fumes or vapors.
Process using adequate ventilation.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Eye

Protection:

Wear chemical splash goggles and have eye baths available where there is significant potential for

eve contact.

Skin Protection: Wear appropriate protective clothing and chemical resistant gloves to prevent skin contact. Consult glove manufacturer to determine the appropriate type glove for a given application. Wear chemical goggles, face shield, and chemical resistant clothing such as a rubber apron when splashing is likely. Wash immediately if skin is contacted. Remove contaminated clothing promptly and launder before reuse. Clean protective equipment before reuse. Provide a safety shower at any location where skin contact can occur. Wash thoroughly after handling.

ATTENTION! Repeated or prolonged skin contact may cause chloracne in some people.

Respiratory Protection:

Avoid breathing vapor, mist, or dust. Use NIOSH/MSHA approved equipment when airborne exposure limits are exceeded. Full facepiece equipment is recommended when airborne exposure limits are exceeded and, if used, replaces the need for face shield and/or chemical splash goggles. Consult respirator manufacturer to determine the type of equipment for a given application. The respirator use limitations specified by NIOSH/MSHA or the manufacturer must be observed. High airborne concentrations may require use of self-contained breathing apparatus or supplied air respirator. Respiratory protection programs must be in compliance with 29 CFR Part 1910.134.

ATTENTION! Repeated or prolonged inhalation may cause chloracne in some people.

Ventilation:

Provide natural or mechanical ventilation to control exposure levels below airborne exposure limits (see below). If practical, use local mechanical exhaust ventilation at sources of vapor or mist, such as open process equipment.

Airborne Exposure Limits:

Product:

Chlorodiphenyl (42% chlorine)

OSHA PEL:

1 mg/m3 8-hour time-weighted average - Skin*

ACGIH TLV:

1 mg/m³ 8-hour time-weighted average - Skin*

Product:

Chlorodiphenyl (54% chlorine)

OSHA PEL: ACGIH TLV: 0.5 mg/m³ 8-hour time-weighted average - Skin* 0.5 mg/m³ 8-hour time-weighted average - Skin*

*For Skin notation see Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices, American Conference of Government Industrial Hygienists, 1995-1996.

9. PHYSICAL AND CHEMICAL PROPERTIES

		PROPERTIE	S OF SELE	CTED AROC	CLORS	•	
PROPERTY	1016	1221	1232	1242	1248	1254	1260
Color (APHA)	40	100	100	100	100	100	150
Physical state	mobile oil	mobile oil	mobile oil	mobile oil	mobile oil	viscous liquid	sticky resin
Stability	inert	inert	inert	inert	inert	inert	inert
Density (lb/gal 25°C)	11.40	9.85	10.55	11.50	12.04	12.82	13.50
Specific gravity x/15.5°C	1.36-1.37 x-25°	1.18-1.19 x-25°	1.27-1.28 x-25°	1.30-1.39 x-25°	1.40-1.41 x-65°	1.49-1.50 x-65°	1.55-1.56 x-90°
Distillation range (°C)	323-356	275-320	290-325	325-366	340-375	365-390	385-420
Acidity mg KOH/g, maximum	.010	.014	.014	.015	.010	.010	.014
Fire point (°C)	none to boiling point	176	238	none to boiling point	none to boiling point	none to boiling point	none to boiling point
Flash point (°C)	170	141-150	152-154	176-180	193-196	none	none
Vapor pressure (mm Hg @ 100°F)	NA	NA	0.005	0.001	0.00037	0.00006	NA
Viscosity (Saybolt Univ. Sec. @ 100°F) (centistokes)	71-81 13-16	38-41 3.6-4.6	44-51 5.5-7.7	82-92 16-19	185-240 42-52	1800-2500 390-540	_

NA-Not Available

NOTE: These physical data are typical values based on material tested but may vary from sample to sample. Typical values should not be construed as a guaranteed analysis of any specific lot or as specifications for the product.

10. STABILITY AND REACTIVITY

Stability: PCBs are very stable, fire-resistant compounds.

Materials to Avoid: None Hazardous Decomposition

Products: PCBs may decompose to form CO, CO₂, HCl, phenolics, aldehydes, and other toxic combustion

products under severe conditions such as exposure to flame or hot surface.

Hazardous Polymerization: Does not occur.

11. TOXICOLOGICAL INFORMATION

Data from laboratory studies conducted by Monsanto and from the available scientific literature are summarized below. Single exposure (acute) studies indicate:

Oral - Slightly Toxic (Rat LD50 - 8.65 g/kg for 42% chlorinated; 11.9 g/kg for 54% chlorinated)

The liquid products and their vapors are moderately irritating to eye tissues. Animal experiments of varying duration and at different air concentrations show that for similar exposure conditions, the 54% chlorinated material produces more liver injury than the 42% chlorinated material.

There are literature reports that PCBs can impair reproductive functions in monkeys. The National Cancer Institute (NCI) performed a study in 1977 using Aroclor 1254 with both sexes of rats. NCI stated that the PCB, Aroclor 1254, was not carcinogenic under the conditions of their bioassay. There is sufficient evidence in the scientific literature to conclude that Aroclor 1260 can cause liver cancer when fed to rodents at high doses. Similar experiments with less chlorinated PCB products have produced negative or equivocal results.

The consistent finding in animal studies is that PCBs produce liver injury following prolonged and repeated exposure by any route, if the exposure is of sufficient degree and duration. Liver injury is produced first, and by exposures that are less than those reported to cause cancer in rodents. Therefore, exposure by all routes should be kept sufficiently low to prevent liver injury.

Numerous epidemiological studies of humans, both occupationally exposed and nonworker environmentally exposed population, have not demonstrated any causal relationship between PCB exposure and chronic human illnesses such as cancer or neurological or cardiovascular effects. PCBs at high dosage can cause skin symptoms; however, these subside upon removal of the exposure source.

PCBs have been listed in the International Agency for Research on Cancer (IARC) Monographs (1987)-Group 2A and in the National Toxicology Program (NTP) Seventh Annual Report on Carcinogens.

12. ECOLOGICAL INFORMATION

Care should be taken to prevent entry of PCBs into the environment through spills, leakage, use, vaporization or disposal of liquid or solids. PCBs can accumulate in the environment and can adversely affect some animals and aquatic life. In general, PCBs have low solubility in water, are strongly bound to soils and sediments, and are slowly degraded by natural processes in the environment.

13. DISPOSAL CONSIDERATIONS

The disposal of PCB items or equipment (those containing 50 ppm or greater PCBs) and PCB wastes is strictly regulated by 40 CFR Part 761. For example, all wastes and residues containing PCBs (wiping cloths, absorbent material, used disposable protective gloves and clothing, etc.) should be collected, placed in proper containers, marked and disposed of in the manner prescribed by EPA regulations (40 CFR Part 761) and applicable state and local regulations.

14. TRANSPORT INFORMATION

The data provided in this section are for information only. Please apply the appropriate regulations to properly classify a shipment for transportation.

DOT Classification:

IF WEIGHT OF PCBs TO BE SHIPPED IS OVER ONE POUND, THE FOLLOWING

CLASSIFICATION AND LABEL APPLY.

DOT Label:

Environmentally Hazardous Substance, liquid, n.o.s. (Contains PCB),

9, UN 3082, III

LIQUID: SOLID:

Environmentally Hazardous Substance, solid, n.o.s. (Contains PCB),

9, UN 3077, III

DOT Label:

DOT Reportable Quantity:

IMO Classification:

Class: 9 One Pound

Polychlorinated Biphenyls, IMO Class 9, UN 2315, II

IMÓ Page 9034, EMS 6.1-02

IATA/ICAO Classification;

Polychlorinated Biphenyls, 9, UN2315, Il

15. REGULATORY INFORMATION

For regulatory purposes, under the Toxic Substances Control Act, the term "PCBs" refers to a chemical substance limited to the biphenyl molecule that has been chlorinated to varying degrees or any combination of substances which contain such a substance (40 CFR Part 761).

TSCA Inventory: not listed.

Hazard Categories Under Criteria of SARA Title III Rules (40 CFR Part 370): Immediate, Delayed. SARA Section 313 Toxic Chemical(s): Listed-1993 (De Minimis concentration 0.1%.)

Reportable Quantity (RQ) under DOT (49 CFR) and CERCLA Regulations: 1 lb. (polychlorinated biphenyls) PCBs.

Release of more than 1 (one) pound of PCBs to the environment requires notification to the National Response Center (800-424-8802 or 202-426-2675).

Various state and local regulations may require immediate reporting of PCB spills and may also define spill cleanup levels. Consult your attorney or appropriate regulatory officials for information relating to spill reporting and spill cleanup.

16. OTHER INFORMATION

Reason for revision: Conversion to the 16 section format, Supersedes MSDS dated 10/88.

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FOR ADDITIONAL NONEMERGENCY INFORMATION, CONTACT:

Gary W. Mappes

Manager, Product & Environmental Safety

Robert G. Kaley, II Director, Environmental Affairs

Monsanto Company 800 North Lindbergh Boulevard St. Louis, MO 63167 (314) 694-3344

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MSDS Number: D2208 * * * * * Effective Date: 05/26/09 * * * * * Supercedes: 08/17/06

Material Safety Data Sheet

From: Mailinckrodi Baker, inc.

222 Red School Lane Philipsburg, NJ 08865

Mallinckrodt CHEMICALS J.T.Bak

National Response in Canada CANUTEC: 510-996-6666

Outside U.S. and Canad Charaltee: 703-527-3817

NOTE: CHEATREC, CANUTEC and trational Response Cemeremergancy numbers to be used only in the event of the skall emergencie involving a polit, leak, fire, exposure or acciden

All non-emergency questions should be directed to Customer Service (1-600-582-2537) for assistance.

O-DICHLOROBENZENE

1. Product Identification

Synonyms: 1,2-dichlorobenzene; ortho-Dichlorobenzene; DCB

CAS No.: 95-50-1 Molecular Weight: 147.00 Chemical Formula: C6H4Cl2

Product Codes: J.T. Baker: 9217, 9233 Mallinckrodt: 1830

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
o-Dichlorobenzene	95-50-1	> 99%	Yes
p-Dichlorobenzene	106-46-7	0 - 0.16%	Yes

3. Hazards Identification

Emergency Overview

DANGER! ASPIRATION MAY CAUSE LUNG DAMAGE. VAPORS CAUSE IRRITATION TO EYES AND RESPIRATORY TRACT. LIQUID CAUSES SKIN IRRITATION AND SEVERE EYE IRRITATION. HARMFUL IF SWALLOWED, INHALED OR ABSORBED THROUGH SKIN. AFFECTS LIVER, KIDNEYS AND BLOOD. COMBUSTIBLE LIQUID AND VAPOR. POSSIBLE CANCER HAZARD. CONTAINS P-DICHLOROBENZENE WHICH MAY CAUSE CANCER BASED ON ANIMAL DATA. Risk of cancer depends upon duration and level of exposure.

SAF-T-DATA(tm) Ratings (Provided here for your convenience)

Health Rating: 2 - Moderate (Poison) Flammability Rating: 2 - Moderate Reactivity Rating: 0 - None Contact Rating: 3 - Severe

Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES

Storage Color Code: Red (Flammable)

Potential Health Effects

Inhalation:

Causes irritation to the respiratory tract. Can cause headache, nausea, swelling around the eyes, runny nose, loss of appetite and weight loss. Higher concentrations may cause drowsiness, central nervous system depression, kidney and liver damage, unconsciousness, and death.

Toxic! A liver and kidney poison. May cause systemic poisoning with/symptoms paralleling inhalation. May be an aspiration hazard if swallowed.

Skin Contact:

Skin contact causes irritations and possibly burns if contact is repeated or prolonged. May be absorbed through the skin.

Eye Contact:

Vapors cause irritation, redness, and pain. Contact with liquid may cause burning of the eyes and tissue damage.

Chronic Exposure:

Chronic exposure may damage blood, liver and kidneys. p-Dichlorobenzene is a possible carcinogen. Prolonged or repeated skin exposure may cause dermatitis and blisters. Prolonged or repeated exposure through any route may cause symptoms paralleling acute inhalation,

Aggravation of Pre-existing Conditions:

Persons with pre-existing skin problems, kidney or liver damage may be more susceptible to the affects of this material.

4. First Aid Measures

Inhalation:

Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Ingestion:

Aspiration hazard. If swallowed, vomiting may occur spontaneously, but DO NOT INDUCE. If vomiting occurs, keep head below hips to prevent aspiration into lungs. Never give anything by mouth to an unconscious person, Call a physician immediately.

Skin Contact:

Immediately flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention, Wash clothing before reuse. Thoroughly clean shoes before reuse.

Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

5. Fire Fighting Measures

Fire:

Flash point: 66C (151F) CC

Autoignition temperature: 648C (1198F)

Flammable limits in air % by volume:

Iel: 2,2; uel: 9.2

Combustible.

Explosion:

Above flash point, vapor-air mixtures are explosive within flammable limits noted above.

Fire Extinguishing Media;

Water spray, dry chemical, alcohol foam, or carbon dioxide. Water spray may be used to keep fire exposed containers cool.

Special Information:

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode. Combustion by-products include phosgene and hydrogen chloride gases.

6. Accidental Release Measures

Ventilate area of leak or spill. Remove all sources of ignition, Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Use non-sparking tools and equipment. Collect liquid in an appropriate container or absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer! US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

J. T. Baker SOLUSORB® solvent adsorbent is recommended for spills of this product.

7. Handling and Storage

Keep in a tightly closed container. Store in a cool, dry, ventilated area away from sources of heat or ignition. Protect against physical damage. Store separately from reactive or combustible materials, and out of direct sunlight. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product,

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:

-OSHA Permissible Exposure Limit (PEL):

50 ppm Ceiling limit

for p-Dichlorobenzene: 75 ppm (TWA)

-ACGIH Threshold Limit Value (TLV):

25 ppm (TWA) 50 ppm (STEL), listed as A4, Not classifiable as a human carcinogen

for p-Dichlorobenzene: 10 ppm (TWA), listed as A3, animal carcinogen.

Ventilation System:

A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, Industrial Ventilation, A Manual of Recommended Practices, most recent edition, for details.

Personal Respirators (NIOSH Approved):

If the exposure limit is exceeded, a full facepiece respirator with organic vapor cartridge and dust/mist filter may be worn up to 50 times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. WARNING: Air purifying respirators do not protect workers in oxygen-deficient atmospheres. This compound possibly exists in both particulate and vapor phase. A dust/mist prefilter should be used for the particulate. Skin Protection:

Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

Eye Protection:

Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

9. Physical and Chemical Properties

Appearance: Colorless to yellowish liquid. Odor: Pleasant odor. Solubility; Practically insoluble in water. Specific Gravity: 1,30 @ 20C/4C pΗ: No information found. % Volatiles by volume @ 21C (70F): No information found. Boiling Point: 180C (356F) Melting Point: -17.6C (0F) Vapor Density (Air=1): Vapor Pressure (mm Hg): 1,2 @ 20C (68F) Evaporation Rate (BuAc=1):

10. Stability and Reactivity

Stable under ordinary conditions of use and storage,

Hazardous Decomposition Products:

May emit oxides of carbon and hydrogen chloride gas when heated to decomposition. May produce carbon monoxide, carbon dioxide, hydrogen chloride and phosgene when heated to decomposition.

Hazardous Polymerization:

Will not occur.

Incompatibilities:

Strong oxidizers, aluminum or aluminum alloys.

Conditions to Avoid:

Heat, flames, ignition sources and incompatibles.

11. Toxicological Information

Oral rat LD50; 500 mg/kg. Investigated as a tumorigen, mutagen, reproductive effector.

\Cancer Lists\		Carcinogen	
Ingredient	Known	Anticipated	IARC Category
o-Dichlorobenzene (95-50-1) p-Dichlorobenzene (106-46-7)	No No	· No Yes	3 2B

12. Ecological Information

When released into the soil, this material may biodegrade to a moderate extent. When released into the soil, this material may leach into groundwater. When released into the soil, this material may evaporate to a moderate extent. When released into water, this material may biodegrade to a moderate extent. When released into water, this material may evaporate to a moderate extent. Although this material has a relatively short half-life in water, it can also readily be adsorbed to sediment and persist for decades. When released into water, this material is expected to have a half-life between 10 and 30 days. This material has an experimentally-determined bioconcentration factor (BCF) of greater than 100. This material may bioaccumulate to some extent. When released into the air, this material may be moderately degraded by reaction with photochemically produced hydroxyl radicals. When released into the air, this material may be removed from the atmosphere to a moderate extent by wet deposition. When released into air, this material is expected to have a half-life between 10 and 30 days. Environmental Toxicity:

For o-Dichlorobenzene:

96 Hr EC50 Selenastrum capricomutum: 91.6 mg/L;

96 Hr LC50 Pimephales promelas: 9.47 mg/L [flow-through]; 96 Hr LC50 Pimephales promelas: 5.8 mg/L [static];

96 Hr LC50 Brachydanio rerio: 5.2 mg/L [flow-through];

96 Hr LC50 Lepomis macrochirus: 5.6 mg/L [static];

24 Hr EC50 Daphnia magna: 1.7 mg/L

Microtox data for o-Dichlorobenzene:

5 min EC50 Photobacterium phosphoreum: 4.76 mg/L;

15 min EC50 Photobacterium phosphoreum: 4.98 mg/L;

30 min EC50 Photobacterium phosphoreum: 5.99 mg/L

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Domestic (Land, D.O.T.)

Proper Shipping Name: O-DICHLOROBENZENE

Hazard Class: 6.1

UN/NA: UN1591

Packing Group: III

Information reported for product/size: 4L

International (Water, I.M.O.)

Proper Shipping Name: ORTHO-DICHLOROBENZENE

Hazard Class: 6.1

UN/NA: UN1591

Packing Group: III

Information reported for product/size: 4L

International (Air, I.C.A.O.)

Proper Shipping Name: ORTHO-DICHLOROBENZENE

Hazard Class: 6.1 UN/NA: UN1591

Packing Group: III Information reported for product/size: 4L

15. Regulatory Information

\Chemical Ingredient					TSCA	EC	Japan	Australia
o-Dichlorobenzene p-Dichlorobenzene	(95-50-1)				Yes Yes		Yes Yes	Yes
\Chemical	Inventory	Status -	Part 2	!\				
Ingredient						DSL		Phil.
o-Dichlorobenzene p-Dichlorobenzene	(95~50~1)				Yes Yes	Yes	No	Yes Yes
\Federal, Ingredient				-SARA RQ	302- TPQ	Lis	SAR st Che	A 313 mical Catg
o-Dichlorobenzene p-Dichlorobenzene	(95-50-1)			No No		Ye.		No
\Federal, Ingredient				CERCLI	A	-RCRA- 261.33	T:	SCA- (d)
o-Dichlorobenzene p-Dichlorobenzene	(95-50-1)			100 100		υ070 υ072	N	

TSCA 12(b): Yes CDTA: Yes Chemical Weapons Convention: No TSCA 1: SARA 311/312: Acute: Yes Chronic: Yes Fire: Yes Pressure; No Reactivity: No (Mixture / Liquid)

THIS PRODUCT CONTAINS A CHEMICAL(S) KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER.

Australian Hazchem Code; 2Z

Poison Schedule: None allocated.

This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

16. Other Information

NFPA Ratings: Health; 2 Flammability; 2 Reactivity: 0

Label Hazard Warning:

DANGER! ASPIRATION MAY CAUSE LUNG DAMAGE, VAPORS CAUSE IRRITATION TO EYES AND RESPIRATORY TRACT. LIQUID CAUSES SKIN IRRITATION AND SEVERE EYE IRRITATION. HARMFUL IF SWALLOWED, INHALED OR ABSORBED THROUGH SKIN. AFFECTS LIVER, KIDNEYS AND BLOOD. COMBUSTIBLE LIQUID AND VAPOR. POSSIBLE CANCER HAZARD. CONTAINS P-DICHLOROBENZENE WHICH MAY CAUSE CANCER BASED ON ANIMAL DATA. Risk of cancer depends upon duration and level of exposure.

Label Precautions:

Do not breathe vapor.

Do not get in eyes, on skin, or on clothing.

Keep container closed.
Use only with adequate ventilation.
Wash thoroughly after handling.
Keep away from heat and flame,

Label First Aid:

Aspiration hazard. If swallowed, vomiting may occur spontaneously, but DO NOT INDUCE. If vomiting occurs, keep head below hips to prevent aspiration into lungs. Never give anything by mouth to an unconscious person. Call a physician immediately. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Get medical attention. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Product Use: Laboratory Reagent. Revision Information; No Changes.

Disclaimer:

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Prepared by: Environmental Health & Safety Phone Number: (314) 654-1600 (U.S.A.)

SUPELCO INC (CANCELLED W/REPLACEMENT 54968) -- 1,3-DICHLOROBENZENE (SEE SUPPL) -- -

```
Product ID:1,3-DICHLOROBENZENE (SEE SUPPL)
MSDS Date: 10/26/1988
FSC:NIIN:Submitter:D RV
Status Code: A
Kit Part:Y
MSDS Number: CLNWB
=== Responsible Party ===
Company Name: SUPELCO INC (CANCELLED W/REPLACEMENT 54968)
Address: SUPELCO PARK
City: BELLEFONTE
State: PA
ZIP:16823-0048
Country: US
Info Phone Num: 814-359-3441
Emergency Phone Num:814-359-3441
Resp. Party Other MSDS Num.: R430260
CAGE: 6F718
=== Contractor Identification ===
Company Name: SIGMA-ALDRICH INC.
Address: 3050 SPRUCE STREET
Box:14508
City:ST. LOUIS
State:MO
ZIP:63103
Country: US
Phone: 314-771-5765/414-273-3850X5996
Contract Num: DLA120-89-M-1B45
CAGE: 54968
Company Name: SUPELCO INC (CANCELLED W/REPLACEMENT 54968)
Address: SUPELCO PARK
Box: City: BELLEFONTE
State: PA
ZIP:16823-0048
Country: US
Phone: 814-359-3441
CAGE: 6F718
======== Composition/Information on Ingredients =========
Ingred Name: 1, 3-DICHLOROBENZENE
CAS:541-73-1
RTECS #:CZ4499000
EPA Rpt Qty:100 LBS
DOT Rpt Qty:100 LBS
Routes of Entry: Inhalation: YES Skin: YES Ingestion: YES
Health Hazards Acute and Chronic: HARMFUL IF ABSORBED THROUGHTHE SKIN.
    HARMFUL IF INHALED. MAY BE FATAL IF SWALLOWED. DEPENDING ON THE
    INTENSITY AND DURATION OF EXPOSURE, EFFECTS MAY VARY FROM MILD
    IRRITATION TO SEVERE DESTRUCTION OF TISSUE. MAY CAUSE ALLERGIC
    SKIN REACTION.
Effects of Overexposure: HARMFUL IF ABSORBED THROUGHTHE SKIN. HARMFUL IF
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INHALED. MAY BE FATAL IF SWALLOWED. DEPENDING ON THE INTENSITY AND DURATION OF EXPOSURE, EFFECTS MAY VARY FROM MILD IRRITATION TO SEVERE DESTRUCTION OF TISSUE. MAY CAUSE ALLERGIC SKIN REACTION. First Aid: EYE: FLUSH WITH WATER FOR 15 MINUTES. SKIN: FLUSH WITH LARGE VOLUMES OF WATER. REMOVE CONTAMINATED CLOTHING. INHALTION: IMMEDIATELY MOVE TO FRESH AIR. GIVE OXYGEN IF BREATHING IS LABORED. IF BREATHING STOPS, GIVE ARTIFICIAL RESPIRATION. CONTACT PHYSICIAN. Extinguishing Media: WATER, CO2, DRY CHEMICAL, ALCOHOL FOAM Fire Fighting Procedures: WEAR SELF-CONTAINED BREATHING APPARATUS WHEN FIGHTING A CHEMICAL FIRE. Unusual Fire/Explosion Hazard: THE FOLLOWING TOXIC VAPORS ARE FORMED WHEN THIS MATERIAL IS HEATED TO DECOMPOSITION: HYDROGEN CHLORIDE GAS. ============== Accidental Release Measures ================= Spill Release Procedures: TAKE UP WITH ABSORBENT MATERIAL. VENTILATE AREA. ELIMINATE ALL IGNITION SOURCES. FLUSH AREA WITH WATER. Handling and Storage Precautions: STORE IN SEALED CONTAINER IN COOL, SRY LOCATION. KEEP AWAY FROM IGNITION SOURCES. Other Precautions: AVOID EYE AND SKIN CONTACT. AVOID BREATHING VAPORS. ======= Exposure Controls/Personal Protection ========= Respiratory Protection: WEAR NIOSH/OSHA APPROVED RESPIRATORY PROTECTION. Ventilation: USE ONLY IN WELL VENTILATED AREA. Protective Gloves: WEAR RUBBER GLOVES Eye Protection: WEAR PROTECTIVE GLASSES Supplemental Safety and Health CONTD FROM PRODUCT ID: 48760, PURGABLE AROMATIC KIT 602-N CONTAINING: CHLOROBENZENE; 1,2-DISCHLORBENZENE; 1,3-DICHLOROBENZENE; 1,4-DICHLOROBENZENE; ETHYLBENZENE; BENZENE; TOLUENE. THIS IS A PART OF A K IT, KIT PART NUMBERS (MSDS # CLNWC, CLNVZ, CLNVY, CLNVX, CLNVW, CLNVY, CLNVT) ========== Physical/Chemical Properties ==============

HCC:T4

Boiling Pt:=172.C, 341.6F Melt/Freeze Pt:=-24.C, -11.2F

Spec Gravity: 1.288

Solubility in Water: .123

Appearance and Odor: CLEAR COLORLESS LIQUID

Stability Indicator/Materials to Avoid:YES
OXIDIZING AGENTS, ALUMINUM AND ITS ALLOYS
Hazardous Decomposition Products:HYDROGEN CHLORIDE GAS

=========== Disposal Considerations =========================

Waste Disposal Methods: COMPLY WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS.

============ Regulatory Information =========================

SARA Title III Information: THIS PRODUCT IS SUBJECT TO SARA SECTION 313 REPORTING REQUIREMENTS.

State Regulatory Information: CALIFORNIA PROPOSITION 65: THIS PRODUCT IS/CONTAINS CHEMICALS KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER. EUROPEAN INFORMATION: EC INDEX NO: 602-012-00-7. R45 MAY CAUSE CANCER. R11 HIGHLY FLAMMA BLE. R22 HARMFUL IF SWALLOWED. R36/37/38 IRRITATING TO EYES, RESPIRATORY SYSTEM & SKIN. S53 AVOID EXPOSURE-OBTAIN SPECIAL INSTRUCTIONS BEFORE USE. S45 IN CASE OF ACCIDENT/IF YOU FEEL UNWELL, SEEK MEDI CAL ADVICE IMMEDIATELY (SHOW THE LABEL WHERE POSSIBLE).

============== Other Information ============================

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MSDS Number; D2224 * * * * * Effective Date: 07/05/07 * * * * * Supercedes: 05/07/07



From: Mallinckrodt Baker, Inc. 222 Red School Lane Phillipsburg, NJ 08865



24 Hour Emergency Talephone; 908-859-2151 CHEMTREC: 1-800-424-9300

National Response in Canada CANUTEC: 613-996-6656

Outside U.S. And Canada Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a splif, jeak, fire, exposure or accident involving chemicals.

vice (1-800-582-2537) for assistance.

p-DICHLOROBENZENE

1. Product Identification

Synonyms: 1,4-Dichlorobenzene; para-dichlorobenzene; Paracide; PDCB

CAS No.: 106-46-7

Molecular Weight: 147.01 Chemical Formula: C6H4Cl2

Product Codes: G970

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
p-Bichlorobenzene	106-46-7	100%	Yes

3. Hazards Identification

Emergency Overview

WARNING! HARMFUL IF SWALLOWED, INHALED OR ABSORBED THROUGH SKIN. AFFECTS THE RESPIRATORY SYSTEM, LIVER, KIDNEYS, EYES, SKIN AND BLOOD. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. COMBUSTIBLE. POSSIBLE CANCER HAZARD, MAY CAUSE CANCER BASED ON ANIMAL DATA.

SAF-T-DATA(tm) Ratings (Provided here for your convenience)

Health Rating: 3 - Severe (Cancer Causing) Flammability Rating: 2 - Moderate Reactivity Rating: 1 - Slight

Contact Rating: 2 - Moderate (Life)

Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES; CLASS B EXTINGUISHER

Storage Color Code: Red (Flammable)

Potential Health Effects

Inhalation of dust or vapors can irritate the nose and throat. May also cause headache, swelling around the eyes and runny nose. Can cause loss of appetite, nausea, vomiting, central nervous system effects, weight loss and liver and kidney damage.

Toxic, Swallowing can produce adverse health effects paralleling inhalation,

Skin Contact:

Causes skin irritation, with a slight burning sensation. Red blotching of the skin due to allergic reactions may occur. May be absorbed through the skin; symptoms may parallel inhalation.

Eve Contact;

Causes irritation, redness, and pain.

Chronic Exposure:

Chronic exposure may damage blood, lungs, central nervous system, liver and kidneys. p-Dichlorobenzene is a possible carcinogen,

Aggravation of Pre-existing Conditions:

Persons with pre-existing skin disorders or eye problems, or impaired liver, kidney or respiratory function may be more susceptible to the effects of the substance.

4. First Aid Measures

Inhalation:

Remove to fresh air, If not breathing, give artificial respiration, If breathing is difficult, give oxygen, Call a physician.

Induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. Call a physician.

Skin Contact:

Wash skin with soap or mild detergent and water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse, Call a physician.

Eye Contact:

Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

5. Fire Fighting Measures

Flash point: 66C (151F) CC

Combustible!

Explosion:

Above the flash point, explosive vapor-air mixtures may be formed. Contact with strong oxidizers may cause fire.

Fire Extinguishing Media:

Water spray, dry chemical, alcohol foam, or carbon dioxide. Water spray may be used to keep fire exposed containers cool, dilute spills to nonflammable mixtures, protect personnel attempting to stop leak and disperse vapors.

Special Information:

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

6. Accidental Release Measures

Remove all sources of ignition. Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Clean up spills in a manner that does not disperse dust into the air. Use non-sparking tools and equipment. Reduce airborne dust and prevent scattering by moistening with water. Pick up spill for recovery or disposal and place in a closed container. US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

7. Handling and Storage

Protect against physical damage. Outside or detached storage is preferred. Inside storage should be in a standard flammable liquids storage room or cabinet. Separate from oxidizing materials, Storage and use areas should be No Smoking areas, Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:

-OSHA Permissible Exposure Limit (PEL):

75 ppm (TWA)

-ACGIH Threshold Limit Value (TLV):

10 ppm (TWA), listed as A3, animal carcinogen.

Ventilation System:

A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, Industrial Ventilation, A Manual of Recommended Practices, most recent edition, for details.

Personal Respirators (NIOSH Approved):

If the exposure limit is exceeded, and engineering controls are not feasible, a full-face piece respirator with an organic vapor cartridge and particulate filter (NIOSH type N100 filter) may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. If oil particles (e.g. lubricants, cutting fluids, glycerine, etc.) are present, use a NIOSH type R or P particulate filter. For emergencies or instances where the exposure levels are not known, use a full-face piece positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

Skin Protection:

Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

Eve Protection:

Use chemical safety goggles and/or full face shield where dusting or splashing of solutions is possible. Maintain eye wash fountain and quick-drench facilities in work area.

9. Physical and Chemical Properties

Appearance: White crystals. Odor: Moth-ball odos Solubility: Practically insoluble in water. Specific Gravity: 1.25 @ 20C/4C pH;

No information found.
% Volatiles by volume @ 21C (70F);
100
Boilling Point:
174C (345F)
Melting Point:
53C (127F)
Vapor Density (Air=1);
5.08
Vapor Pressure (mm Hg);
10 @ 54.8C (131F)
Evaporation Rate (BuAc=1);
Not applicable.

10. Stability and Reactivity

Stability:

Stable under ordinary conditions of use and storage.

Hazardous Decomposition Products:

May produce carbon monoxide, carbon dioxide, hydrogen chloride and phosgene when heated to decomposition.

Hazardous Polymerization:

Will not occur.

Incompatibilities:

Oxidizing agents, aluminum and its alloys.

Conditions to Avoid:

Heat, flames, ignition sources and incompatibles.

11. Toxicological Information

Oral rat LD50: 500 mg/kg; skin rabbit LD50: > 2 gm/kg; investigated as a tumorigen, mutagen, reproductive effector.

Cancer Lists\			
	NTP	Carcinogen	
Ingredient	Known	Anticipated	IARC Category
p-Dichlorobenzene (106-46-7)	No	Yes	2B

12. Ecological Information

Environmental Fate:

When released into the soil, this material may leach into groundwater. When released into the soil, this material may evaporate to a moderate extent. When released into the soil, this material may biodegrade to a moderate extent. When released into water, this material may evaporate to a moderate extent. When released into water, this material may biodegrade to a moderate extent. This material has an experimentally-determined bioconcentration factor (BCF) of greater than 100. This material may bioaccumulate to some extent. When released into the air, this material may be moderately degraded by reaction with photochemically produced hydroxyl radicals. When released into the air, this material is expected to have a half-life of greater than 30 days. When released into the air, this material may be removed from the atmosphere to a moderate extent by wet deposition.

Environmental Toxicity:
The LC50/96-hour values for fish are between 1 and 10 mg/l. The LC50/96-hour values for fish are between 10 and 100 mg/l. This material may be toxic to aquatic life.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved incinerator or disposed in a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Domestic (Land, D.O.T.)

Proper Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (PARA-DICHLOROBENZENE) Hazard Class: 9
UN/NA: UN3077
Packing Group: Ill
Information reported for product/size: 5KG

International (Water, I.M.O.)

Proper Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (PARA-DICHLOROBENZENE)
Hazard Class: 9
UN/NA: UN3077
Packing Group: III

http://www.jtbaker.com/msds/englishhtml/d2224.htm23

Information reported for product/size: 5KG

International (Air, I.C.A.O.)

Proper Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (PARA-DICHLOROBENZENE)

Hazard Class: 9 UN/NA: UN3077

Packing Group: Information reported for product/size: 5KG

15. Regulatory Information

\Chemical					TSCA	EC	Japan	Australia
p-Dichlorobenzene					Yes	Yes	Yes	Yes
\Chemical	Inventory	Status -	Part	2\			 ınada	
Ingredient					Korea		NDSL	Phil.
p-Dichlorobenzene					Yes	Yes	No	Yes
\Federal,	State & Ir	nternation	nal Re	gulatio -SARA	ons - 302-	Part 1	.\ SAR	 A 313
Ingredient				RQ				mical Catg.
p-Dichlorobenzene				No	No		3	
\Federal,	State & Ir	nternation	nal Re	gulatio	ons -	Part 2	ار الاست	
Ingredient				CERCL			8	
p-Dichlorobenzene				100		U072	N	0

TSCA 12(b): Yes Chemical Weapons Convention: No CDTA: Yes Chronic: Yes Fire: Yes Pressure: No SARA 311/312; Acute: Yes Reactivity: No (Pure / Solid)

WARNING:

THIS PRODUCT CONTAINS A CHEMICAL(S) KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER.

Australian Hazchem Code: None allocated.

Poison Schedule: None allocated.

WHMIS:

This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

16. Other Information

NFPA Ratings: Health: 2 Flammability: 2 Reactivity: 0

Label Hazard Warning:

WARNING! HARMFUL IF SWALLOWED, INHALED OR ABSORBED THROUGH SKIN. AFFECTS THE RESPIRATORY SYSTEM, LIVER, KIDNEYS, EYES, SKIN AND BLOOD. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. COMBUSTIBLE. POSSIBLE CANCER HAZARD. MAY CAUSE CANCER BASED ON ANIMAL DATA.

Label Precautions:

Avoid breathing dust or vapors.

Use only with adequate ventilation. Avoid contact with eyes, skin and clothing.

Keep container closed.

Use with adequate ventilation.

Wash thoroughly after handling,

Keep away from heat and flame.

Label First Aid:

If swallowed, induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse, In all cases call a physician.

Product Use:

Laboratory Reagent.

Revision Information; MSDS Section(s) changed since last revision of document include: 3.

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Prepared by: Environmental Health & Safety Phone Number: (314) 654-1600 (U.S.A.)

MSDS Number: T4875 * * * * * Effective Date: 05/26/09 * * * * * Supercedes: 07/06/06



From: Mallinckrodt Baker, Inc. 222 Red School Lane Philipsburg, NJ 08865



24 Hour Emergency Telephone: 908-859-2151 CHEMTREC: 1-800-424-9300

National Response in Canada CANUTEC: 613-996-6656

Outside U.S. And Canada Chemtrec: 703-527-3887

NOTE; CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

vice (1-800-582-2537) for assistance

1,2,4-Trichlorobenzene

1. Product Identification

Synonyms: unsym-Trichlorobenzene

CAS No.: 120-82-1 Molecular Weight: 181.45 Chemical Formula: C6H3Cl3

Product Codes: 9444

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
1,2,4-Trichlorobenzene	120-82-1	90 - 100%	Yes

3. Hazards Identification

Emergency Overview

WARNING! HARMFUL IF SWALLOWED, INHALED OR ABSORBED THROUGH SKIN. AFFECTS CENTRAL NERVOUS SYSTEM, LIVER AND REPRODUCTIVE SYSTEM, VAPOR CAUSES RESPIRATORY TRACT IRRITATION AND SEVERE EYE IRRITATION. LIQUID CAUSES SKIN AND EYE IRRITATION.

SAF-T-DATA(tm) Ratings (Provided here for your convenience)

Health Rating: 3 - Severe (Life) Flammability Rating: 1 - Slight Reactivity Rating: 0 - None Contact Rating: 3 - Severe (Life)

Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES

Storage Color Code: Blue (Health)

Potential Health Effects

Causes irritation to the respiratory tract. Symptoms may include coughing, shortness of breath. Inhalation may lead to drowsiness, uncoordination, narcosis, liver damage, headache, increased heart rate and blood pressure, and tremors.

Causes irritation to the gastrointestinal tract. Symptoms may include nausea, vomiting and diarrhea. Other symptoms may parallel those from inhalation. Ingestion of a few ounces could prove fatal.

Skin Contact:

Causes irritation to skin. Symptoms include redness, itching, and pain. Prolonged contact may cause skin burns. May be absorbed through the skin with possible systemic effects.

Eye Contact:

Vapors and liquid cause irritation, redness and pain. Vapor concentrations over 5 ppm can cause severe irritation.

Chronic Exposure:

Prolonged or repeated exposure may affect lungs, liver, kidneys, and skin. May have teratogenic effects,

Aggravation of Pre-existing Conditions:

Persons with pre-existing disorders of the blood, skin, liver, kidneys or lungs may be at an increased risk from exposure.

4. First Aid Measures

Inhalation:

Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Ingestion:

Induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention.

Skin Contact:

Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Thoroughly clean shoes before reuse.

Eye Contact:

Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

5. Fire Fighting Measures

Flash point: 105C (221F) CC

Flammable limits in air % by volume:

lel; 2.5; uel: 6.6

Upper and lower explosive limits were measured at 150C (302F).

Above flash point, vapor-air mixtures are explosive within flammable limits noted above. Vapors can flow along surfaces to distant ignition source and flash

Water spray, dry chemical, alcohol foam, or carbon dioxide. Use water spray to blanket fire, cool fire exposed containers, and to flush non-ignited spills or vapors

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

6. Accidental Release Measures

Ventilate area of leak or spill. Remove all sources of ignition. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Use non-sparking tools and equipment. Collect liquid in an appropriate container or absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer! US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802,

7. Handling and Storage

Keep in a tightly closed container. Store in a cool, dry, ventilated area away from sources of heat or ignition. Protect against physical damage. Store separately from reactive or combustible materials, and out of direct sunlight. Protect from freezing. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:

ACGIH STEI

5 ppm (Ceiling)

Ventilation System:

A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, Industrial Ventilation, A Manual of Recommended Practices, most recent edition, for details.

Personal Respirators (NIOSH Approved):

If the exposure limit is exceeded, a half-face organic vapor respirator may be worn for up to ten times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. A full-face piece organic vapor respirator may be worn up to 50 times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. For emergencies or instances where the exposure levels are not known, use a full-face piece positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

Skin Protection:

Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

Eve Protection:

Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

9. Physical and Chemical Properties

Appearance: Clear, colorless liquid. Odor: Characteristic aromatic odor. Solubility: Negligible (< 0.1%) Specific Gravity: 1.45 @ 20C/4C

pH:
No information found.
% Volatiles by volume @ 21C (70F):
100
Boiling Point:
213C (415F)
Melting Point:
17C (63F)
Vapor Density (Air=1):
6.26
Vapor Pressure (mm Hg):
1 @ 38.4C (100F)
Evaporation Rate (BuAc=1):
Noinformation found.

10. Stability and Reactivity

Stability:

Stable under ordinary conditions of use and storage.

Hazardous Decomposition Products:

May produce carbon monoxide, carbon dioxide, hydrogen chloride and phosgene when heated to decomposition,

Hazardous Polymerization:

Will not occur.

Incompatibilities:

Acids, acid fumes, oxidizers, steam.

Conditions to Avoid:

Heat, flames, ignition sources and incompatibles,

11. Toxicological Information

Toxicological Data:

Oral, rat, LD50; 756 mg/kg; Skin, rat, LD50; 6319 mg/kg. Investigated as a tumorigen, mutagen, reproductive effector.

Reproductive Toxicity:

May cause teratogenic effects.

Carcinogenicity:

EPA / IRIS classification: Group D1 - Not classifiable as a human carcinogen.

/Cancer Discs/			
	NTP	Carcinogen	
Ingredient	Known	Anticipated	IARC Category
1,2,4-Trichlorobenzene (120-82-1)	No	No	None

12. Ecological Information

Environmental Fate:

When released into the soil, this material may biodegrade to a moderate extent. When released into the soil, this material is not expected to leach into groundwater. When released into water, this material may biodegrade to a moderate extent. When released into water, this material may evaporate to a moderate extent. When released into water, this material is expected to have a half-life between 10 and 30 days. This material has an experimentally-determined bioconcentration factor (BCF) of greater than 100. This material is expected to significantly bioaccumulate. When released into the air, this material may be moderately degraded by reaction with photochemically produced hydroxyl radicals. When released into the air, this material is not expected to be degraded by photolysis. When released into air, this material is expected to have a half-life between 10 and 30 days.

Environmental Toxicity:

This material is expected to be toxic to aquatic life. The LC50/96-hour values for fish are between 1 and 10 mg/l.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Domestic (Land, D.O.T.)

Proper Shipping Name: TRICHLOROBENZENES, LIQUID Hazard Class: 6.1 UN/NA: UN2321 Packing Group: III

Information reported for product/size: 18L

International (Water, I.M.O.)

Proper Shipping Name: TRICHLOROBENZENES, LIQUID Hazard Class: 6.1 UN/NA: UN2321 Packing Group: III Information reported for product/size: 18L

International (Air, I.C.A.O.)

Proper Shipping Name: TRICHLOROBENZENES, LIQUID

Hazard Class: 6.1 UN/NA: UN2321 Packing Group: III

Information reported for product/size: 18L

15. Regulatory Information

\Chemical Inventory Status - Part 1\ Ingredient	TSCA	EC		Australia
1,2,4-Trichlorobenzene (120-82-1)	Yes		Yes	Yes
\Chemical Inventory Status - Part 2\			nada	
Ingredient		DSL	NDSL	Phil.
1,2,4-Trichlorobenzene (120-82-1)	Yes			Yes
\Federal, State & International Regula	tions -	Part 1	.\SAR.	A 313
				mical Catg.
	No No	Yes	· · · · · · · · · · · · · · · · · · ·	No
1,2,4-Trichlorobenzene (120-82-1) No	No ntions -	Yes Part 2 -RCRA- 261.33		No SCA- (d)

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No SARA 311/312: Acute: Yes Chronic: Yes Fire: No Pressure: No Reactivity: No (Pure / Liquid)

Australian Hazchem Code: 2Z Poison Schedule: None allocated

This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

16. Other Information

NFPA Ratings: Health: 2 Flammability: 1 Reactivity: 0

Label Hazard Warning:

WARNING! HARMFUL IF SWALLOWED, INHALED OR ABSORBED THROUGH SKIN. AFFECTS CENTRAL NERVOUS SYSTEM, LIVER AND REPRODUCTIVE SYSTEM. VAPOR CAUSES RESPIRATORY TRACT IRRITATION AND SEVERE EYE IRRITATION. LIQUID CAUSES SKIN AND EYE IRRITATION.

Label Precautions:

Avoid contact with eyes, skin and clothing.

Wash thoroughly after handling.

Avoid breathing vapor or mist.

Keep container closed,

Use only with adequate ventilation.

Label First Aid:

In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. If swallowed, induce vemiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In all cases, get medical attention.

Product Use:

Laboratory Reagent.

Revision Information:

MSDS Section(s) changed since last revision of document include: 3.

Disclaimer:

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Prepared by: Environmental Health & Safety Phone Number: (314) 654-1600 (U.S.A.)