



Environment

Prepared for:
NYSDEC
Albany, NY

Prepared By:
AECOM
Chestnut Ridge, NY
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May 2014

Site Management Plan Dzus Fasteners Site Site #1-52-033 Work Assignment No. D007626-17

Final

Revisions to Final Approved Site Management Plan:

Revision #	Submitted Date	Summary of Revision	NYSDEC Approval Date



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A handwritten signature in cursive script, reading "Paul Kareth".

Prepared By: Paul Kareth

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Reviewed By: Scott Underhill

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List of Acronyms

AECOM	AECOM Technical Services Northeast, Inc.
AWQS	Ambient Water Quality Standards
bgs	Below Ground Surface
BWE	Blue Water Environmental, Inc.
CAMP	Community Air Monitoring Plan
COC	Contaminant of Concern
DER	Division of Environmental Remediation
EC	Engineering Control
EE	Environmental Easement
EWP	Excavation Work Plan
ft bgs	Feet Below Ground Surface
HASP	Health and Safety Plan
IC	Institutional Control
LTMP	Long Term Monitoring Plan
NTU	Nephelometric Unit
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
O&M	Operation and Maintenance
OM&M	Operation, Maintenance and Monitoring
ORP	Oxidation-Reduction Potential
OU	Operable Unit
PPE	Personal Protective Equipment
PPM	Parts per Million
PRR	Periodic Review Report
QA/QC	Quality Assurance
QAPP	Quality Assurance Project Plan
RI/FS	Remedial Investigation and Feasibility Study
ROD	Record of Decision
SCDHS	Suffolk County Department of Health and Services
SMP	Site Management Plan
SPDES	State Pollutant Discharge Elimination System
SVE	Soil Vapor Extraction

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SVI	Soil Vapor Intrusion
TCLP	Toxicity Characteristic Leaching Procedure
µg/L	Micrograms per Liter
µg/m ³	Micrograms per Cubic Meter
USEPA	United States Environmental Protection Agency

Engineering Certification

I certify that I am currently a New York State registered professional engineer and that this Site Management Plan for the Dzus Fasteners Site (Site No. 1-52-033) was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the Department of Environmental Remediation (*DER*) *Technical Guidance for Site Investigation and Remediation (DER-10)*.

Respectfully submitted,
AECOM Technical Services Northeast, Inc.



May 7, 2014
Date

Scott A. Underhill
Registered Professional Engineer
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1.0 Introduction and Description of Remedial Program

1.1 Introduction

This document is required as an element of the remedial program at the Dzus Fasteners Site (hereinafter referred to as the "Site") under the New York State (NYS) Inactive Hazardous Waste Disposal Site Remedial Program administered by New York State Department of Environmental Conservation (NYSDEC). The Site is listed as a Class 4 site and has been issued Site Registry number 1-52-033.

1.1.1 General

This Site Management Plan (SMP) was prepared to manage remaining contamination at the Site until the Environmental Easement (EE) is extinguished in accordance with ECL Article 71, Title 36. All reports associated with the Site can be viewed by contacting the NYSDEC or its successor agency managing environmental issues in New York State.

This SMP was prepared by AECOM Technical Services Northeast, Inc. (AECOM), on behalf of NYSDEC, in accordance with the requirements in NYSDEC DER-10 Technical Guidance for Site Remediation (May 2010), and the guidelines provided by NYSDEC. This SMP addresses the means for implementing the Institutional Controls (ICs) and Engineering Controls (ECs) required by the EE for the Site. This SMP covers both Operable Units (OUs) associated with the site: OU1 for on-site and OU2 for off-site.

1.1.2 Purpose

The Site contains soil contamination left in place after completion of the remedial action. Engineering Controls have been incorporated into the remedy to control exposure to the remaining contamination during the use of the Site to ensure protection of public health and the environment. A Deed Restriction dated June 2, 2004 was recorded with the Suffolk County Clerk (Appendix A) will require compliance with this SMP and all ECs and ICs placed on the Site. The ICs place restrictions on Site use, and mandate operation, maintenance monitoring and reporting measures for all ECs and ICs. This SMP specifies the methods necessary ensure compliance with all ECs and ICs required by the EE for contamination that remains at the Site. This plan has been approved by the NYSDEC and compliance with this plan is required by the EE and the grantor's successors and assigns. This SMP may only be revised with the approval of NYSDEC.

This SMP provides a detailed description of all procedures required to manage remaining contamination at the site after completion of the Remedial Action. These procedures include:

- Implementation and management of all ECs and ICs;
- Groundwater monitoring;

- Performance of periodic inspections of the site;
- Certification of results;
- Submittal of Periodic Review Reports (PRRs); and
- Defining criteria for termination of monitoring and inspections.

To address these needs, this SMP includes two plans:

- An Engineering and Institutional Control Plan for implementation and management of EC/ICs;
- A Monitoring Plan for implementation of Site monitoring;
- A Sampling and Analysis Plan;
- An Excavation Work Plan;
- A Community Air Monitoring Plan; and
- Health and Safety Plan.

As there are no active treatment systems operating at the Site, an Operation and Maintenance (O&M) Plan is not required.

This plan also includes a description of PRRs for the periodic submittal of data, information, recommendations, and certifications to NYSDEC.

This SMP details the Site-specific implementation procedures required by the Record Of Decision (ROD) and EE. Failure to properly implement the SMP is a violation of the ROD and EE; and failure to comply with this SMP is also a violation of *New York State Environmental Conservation Law 6 NYCRR Part 375* (NYSDEC, December 2006) and thereby subject to applicable penalties.

1.1.3 Revisions

Revisions to the plan will be proposed in writing to the NYSDEC project manager. In accordance with the EE for the Site, the NYSDEC will provide a notice to any approved changes to the SMP and append these notices to the SMP in its files.

1.2 Site Background

1.2.1 Site Location and Description

The Dzus Fasteners Superfund site is located at 425 Union Boulevard, West Islip, Suffolk County, New York (Figure 1). The Site is bounded to the north by railroad tracks and Union Boulevard to the south and east. The Site is bounded to the west by Beach Street and commercial properties. On the southeast side of Union Boulevard is a shopping plaza and southeast of the shopping plaza is Willets Creek (a Class A surface water body). Willets Creek flows south, paralleling Everdell Avenue past the Beech Street Middle School and West Islip Senior High School, eventually discharging into Lake Capri approximately 4,500 ft south of the Site as shown on Figure 2. An aerial photograph of the Site dated 2010 is included as Figure 3.

1.2.2 Site History

The Dzus Fastener facility, a manufacturer of fasteners and springs since 1932, was responsible for the release of oils, heavy metals, and salts via onsite leaching pools used for the disposal of hazardous waste and formal discharge into Upper Willetts Creek. These operations led to soil and groundwater contamination at the Dzus facility and downstream groundwater, sediment, and surface water contamination of nearby Willetts Creek and Lake Capri, an 8-acre man-made lake.

An initial site inspection took place in August 1983. Contamination was discovered and a preliminary site assessment was completed in September 1984. A phase I investigation was completed and a phase II investigation was submitted by Dzus in August of 1990. Dzus then completed an Interim Remedial Measure (IRM) in October 1990. Approximately 1,960 cubic yards of contaminated soil were excavated from the industrial leach field on the eastern portion of the Site and disposed off-site. A 10-inch clay discharge pipe was discovered along the northern property boundary. A report on the IRM was prepared in June 1992. A remedial investigation / feasibility study (RI/FS) was initiated at the site in 1992. The site was then broken up into the two OUs: OU1, on-site soils at the Dzus facility; and OU2, groundwater contamination, and contaminated sediments and surface waters in Willetts Creek and Lake Capri. A Record of Decision (ROD) for OU1 was issued for the site in March 1995, and a ROD for OU2 was issued for the site in October 1997. Copies of the RODs are included in Appendix B.

In response to the ROD for OU1, the remedy for contaminated on-site soils at the Dzus facility consisted of source removal on the western portions of the site and in-situ stabilization/solidification of contaminated soils in the eastern portion of the Site.

The eastern parking lot at the Dzus facility was paved with asphalt to eliminate the potential for direct human contact with the underlying contaminated soils at the site, and to eliminate or reduce the mobility of soil contaminants that would cause further groundwater degradation. The selected remedy for OU1 consisted of the following:

- In-situ stabilization/solidification for soils containing cadmium at concentrations greater than 10 parts per million (ppm). Three areas on the western portion of the facility were excavated and mixed with the soils to be treated on the eastern portion of the Site (Figure 4);
- Design and installation of a final topsoil/asphalt cover at the eastern portion of the Site, which would protect the treatment cells from erosion;
- Implementation of institutional controls, such as deed restrictions at the Site. Dzus submitted a Declaration of Covenants and Restrictions with Suffolk County dated June 2, 2004 (Appendix A).

A ROD for OU2 was issued for the Site by NYSDEC in October 1997. The selected remedy for OU2 consisted of the following:

- The fish population of Lake Capri was eradicated using Rotenone, a NYSDEC approved fish eradicator, in July 1999 prior to dredging operations;
- Dredging, dewatering and off-site disposal of contaminated sediments from Lake Capri;
- Excavation and off-site disposal of approximately 100 cubic yards of sediment from Willetts Creek, corresponding to levels of cadmium exceeding 9 ppm (currently, the highest effects guidance value);
- Riprap was used to cover portions identified as having deeper zones of contamination in order to prevent future erosion;
- A long-term monitoring program to evaluate the effectiveness of the on-site remedy and to verify that existing groundwater plume does not impact public health or environment; and,
- The lake was restocked with silversides, bluegill (*Lepomis macrochirus*), and largemouth bass (*Microptera salmoides*) after completion of the remedial activities in 2000.

An Operation, Maintenance and Monitoring (OM&M) program for the Site was based on NYSDEC Draft DER-10 – Technical Guidance for Site Investigation and Remediation (December 2002). As part of the OM&M, a long term monitoring plan (LTMP) was developed for OU1 and OU2 with regard to monitoring of groundwater, surface water, sediment, and the asphalt cover (engineering control) in the manufacturing facility's eastern parking lot. The Final Sampling and Analysis Plan (SAP), dated June 2007, outlines the most recent sample collection procedures. Groundwater sampling procedures (low flow) were updated in an addendum for Round 5, May 2011.

The primary contaminant of concern at the Site is cadmium, but several other metals including antimony, arsenic, chromium, iron, lead, manganese, sodium, and thallium have been found in exceedance of published standards in soil and groundwater at the Dzus facility and in the water and sediments of nearby Willetts Creek and Lake Capri.

A total of 14 wells and six surface water/sediment sample locations were identified for long term monitoring at the Site (Figure 2).

1.2.3 Geologic Conditions

The Site is located in the Atlantic Coastal Plain Physiographic Province. The geology of Long Island is characterized by a southward-thickening wedge of unconsolidated Cretaceous and Cenozoic sediments unconformably overlying a gently dipping Pre-Cambrian bedrock surface. The site is underlain by the Upper Glacial Aquifer. The Upper Glacial Aquifer is an unconfined aquifer approximately 250 to 260 feet thick with 200 to 210 feet of saturated thickness consisting of mostly Pliocene and Pleistocene glacial deposits. The Upper Glacial Aquifer rests unconformably on the Cretaceous Magothy Formation. The water table beneath the site is approximately 14 feet below ground surface (ft bgs). A groundwater contour map was prepared for the Site based on elevations collected on August 20, 2012, and is shown on Figure 5. Based on these contours, the groundwater flow direction in the Upper Glacial Aquifer is to the south-southwest. A summary of well construction data is presented on Table 1. Groundwater elevations measured at the Site since June 2006 are presented in Table 2.

The horizontal gradient was calculated between MW-2 and MW-18. This well pair was selected because the well depths are approximately the same. The horizontal gradient was calculated by dividing the difference in water table elevation by the distance between the wells.

Well ID	Well Depth (ft)	Depth to Water (ft)	Screened Interval (ft)	Water Table (ft AMSL)	Distance Between Wells (ft)	Horizontal Hydraulic Gradient (ft/ft)
MW-2	14.3	8.33	Unknown	13.09	2,588	0.0014
MW-18	13.5	4.92	Unknown	9.39		

The vertical gradient(s) in the Upper Glacial Aquifer was calculated using well pairs MW-9/MW-9B and MW-22A/MW-22B. The vertical gradient was calculated by dividing the difference in the water table elevation by the vertical distance between the bottom of each well screen.

Based on these calculations, the vertical gradient is downward at MW-9/MW-9B with a calculated gradient of -0.0009 ft/ft. At well pair MW-22A/MW-22B, the vertical gradient is upward with a calculated gradient of +0.0010 ft/ft.

Well ID	Water Table (ft AMSL) (H)	Screened Interval (ft)	ΔH (ft)	Depth of Well (ft)	Vertical Distance Between Wells (ft)	Vertical Hydraulic Gradient (ft/ft)
MW-9	13.78	Unknown	0.03	11.5	33.0	-0.0009
MW-9B	13.75			44.5		
MW-22A	13.64	Unknown	0.03	14.4	30.1	+0.0010
MW-22B	13.67			44.5		

Using these calculated gradients and an assumed hydraulic conductivity value of 10^{-2} to 10^{-3} cm/sec, typical for an unconsolidated sandy/gravelly aquifer, lateral groundwater flow in the Upper Glacial Aquifer is expected to average approximately 2.4 to 24 feet per year. Vertical groundwater flow in the Upper Glacial Aquifer was calculated to be approximately 10 to 104 feet per year for MW-9/MW-9B and 5 to 52 feet per year for MW-22A/MW-22B feet per year.

1.3 Summary of Remedial Investigation Findings

The Dzus Fasteners facility was used to manufacture fasteners and springs from 1932 to the present. Discharge of oils, heavy metals and salts via onsite leaching pools led to the contamination of soil, groundwater, and nearby surface waters and sediment. The principal containment of concern is cadmium, reported as high as 1,100 parts per billion (ppb) during groundwater sampling in 1998, and in the Lake Capri and upper Willetts Creek sediments at maximum concentrations of 407 parts per million (ppm). Other constituents, such as chromium and cyanide in groundwater, and zinc, iron and

lead in surface water, were also present, but at frequencies and concentrations of lesser environmental concern. Of the 36 groundwater wells identified in the 1998 Pre-Design Investigation, 14 are currently used for groundwater monitoring (one of the wells used for monitoring was damaged between the 2007 and 2008 sampling events), eight have been covered over or abandoned, two were not found, and 12 are not currently a part of the regular monitoring at the Dzus facility.

Fish and shellfish specimens were collected and analyzed for cadmium in March 1994. Cadmium concentrations in fish tissue were as high as 1.9 mg/kg. Cadmium was also found in crab and clam samples. Due to contamination in Lake Capri and Willetts Creek, limits were placed on consumption of fish species from the lake to no greater than one meal per month.

The ROD issued in 1995 for OU1 consisted of source removal and ongoing natural attenuation for groundwater and solidification of on-site soils containing greater than 10 ppm cadmium for soils. These were completed in 1996. An asphalt cover at the eastern parking lot at the Dzus manufacturing facility was constructed to eliminate the potential for direct human contact with the underlying contaminated soils at the site, and to eliminate or reduce the mobility of soil contaminants that would cause further groundwater degradation.

In response to the ROD for OU2, Lake Capri and a portion of Willetts Creek were dredged in 1999 and riprap was used to cover portions identified as having deeper zones of contamination in order to prevent future erosion. Per the remedial design, fish population was eradicated from Lake Capri. Following the remedial measures for OU1 and OU2, the LTMP was developed in 2000. The Final Sampling and Analysis Plan (SAP) dated June 2007 is the most recent document outlining sampling procedures. Groundwater, surface water, and sediment sampling was completed in 2006, 2007, 2008, 2010, 2011 and 2012. Fish Tissue sampling was completed in 2006, 2007, 2010 and 2012. Below is a detailed description of remedial activities implemented at OU2.

Willetts Creek

Blue Water Environmental, Inc. (BWE) of Farmingdale, Long Island, New York, was the contractor who performed the dredging. BWE mechanically excavated impacted portions of Willetts Creek using a low ground pressure excavator and transporting excavated sediments directly to roll-offs. Water within the creek was controlled using isolation pumps.

Post excavation sampling and analysis were conducted after dredging of an area was complete to determine if the Willetts Creek target cleanup level of 9 mg/kg cadmium had been reached. They largely confirmed successful removal of targeted sediments for the excavated portions of Willetts Creek with the exception of the northern region (Earth Tech, 2000a). With approval from NYSDEC further remediation to that region involved placement of a non-woven geo-textile, 2-inch minus stone and 4 to 6-inch riprap to serve as an erosion barrier.

Lake Capri

Lake Capri, including the 0.25 acre lagoon in the northwest corner of the lake, was dredged using hydraulic dredging methods where possible, and mechanical excavation where the minimum draft of the dredge could not be met, and where maneuverability of the dredge was hampered by obstacles or debris. The east shoreline, north shoreline and the lagoon were mechanically excavated as well as regions around a small island in the northern part of the lake. The Design Analysis Report (DAR) estimated that approximately 19,000 cubic yards (cy) of sediment would be removed from Lake Capri and the lagoon. Actual sediments removed were approximately 17,095 cy, estimated from comparison of pre- and post-excavation hydrographic surveys. A model SP 920 Mudcat dredge was deployed in Lake Capri using an 8-inch diameter cutter head attachment and 100 horsepower booster pump for conveying the dredge slurry to the processing facility setup in the nearby high school parking lot.

Post excavation sampling and analysis were conducted for Lake Capri following the dredging to ensure removal of contaminated sediment. The sampling protocols were documented in the Post-Dredging/Excavation Confirmatory Sampling and Contingency Plan (Rust, 1998). The criterion were as follows: cadmium concentrations less than 1 ppm – dredging was complete; 1-9 ppm cadmium – decision by the On-Site Coordinator whether to continue dredging; and greater than 9 ppm cadmium – additional dredging required. The sampling results are provided in Appendix C.

Sediments removed by mechanical or hydraulic dredge were sampled on a per load basis for total and/or TCLP cadmium for waste classification, processed and disposed offsite in a manner complying with a NYSDEC Research, Design and Development permit allowing BWE to mix/process Lake Capri sediments. All the waste material from the Site was classified as non-hazardous. The resultant material was deemed a “beneficial use” under the permit specifications. The liquid portion of the dredged material was processed in a temporary water treatment system. Treated effluent was discharged back in to the lake under NYSDEC authorized State Pollutant Discharge Elimination System (SPDES) equivalent-permit limits. Both the liquid and solid treatment procedures and treatment system parameters are described in the Construction Certification Report (October 2000).

Per the remediation design, in July 1999 the fish population of Lake Capri was eradicated using a concentration of 20 milligrams per liter (mg/L) of Rotenone, a NYSDEC approved fish eradicator. 5,800 pounds of fish carcasses were removed via netting and collected in a vacuum truck for transport and disposal. In 2000 after completion of the remedial activities, the lake was restocked with silversides, bluegill (*Lepomis macrochirus*) and largemouth bass (*Microptera salmoides*).

1.4 Summary of Remedial Actions

The ROD for OU1 was issued for the site in March 1995. The remedial goals as specified in the OU1 ROD are as follows (NYSDEC, 1995):

- Eliminate the potential for direct human contact with the contaminated soils at the site;

- Eliminate or reduce the mobility of contaminants in on-site soils that would cause further groundwater contamination; and,
- Eliminate the hazardous wastes on-site or treat them to render them as non-hazardous.

The ROD for OU2 was issued for the site in October 1997. The remedial goals are as follows:

- Manage contaminated groundwater to prevent human exposure and to minimize impacts to the environment;
- Reduce cadmium concentrations in sediments to levels that are protective of human health and the environment; and,
- Eliminate the potential for direct human or animal contact with contaminated sediments.

Fish and shellfish tissue samples were collected in Willetts Creek and Lake Capri in March 1994. Elevated levels of cadmium were found in fish, crab and clam specimens. According to the OU2 ROD, there is a statewide advisory against eating crabs and clams. The OU2 ROD does not list specific criteria for fish tissue and there is no specific NYSDOH advisory against eating fish from Lake Capri other than a statewide advisory for consumption of sportfish.

Contaminants Of Concern and Cleanup Criteria By Media

Soil (mg/kg)	Sediment* (mg/kg)	Surface Water (µg/L)	Groundwater (µg/L)	Fish Tissue (mg/kg)
Cadmium 10	Cadmium 9	Cadmium 0.7	Cadmium 10	Health advisory against eating any fish from the Lake
Chromium 50	Chromium 110	Cyanide 5.2	Chromium 50	
	Lead 110		Cyanide 100	

Notes:

COCs and cleanup criteria taken from the March 1995 OU1 ROD, and the October 1997 OU2 ROD.

*indicates NYSDEC severe effects level sediment criterion.

In response to the ROD for OU1, the remedy for contaminated groundwater in the vicinity of the Dzus facility consisted of source removal and ongoing natural attenuation.

The eastern parking lot at the Dzus facility was paved with asphalt to eliminate the potential for direct human contact with the underlying contaminated soils at the site, and to eliminate or reduce the mobility of soil contaminants that would cause further groundwater degradation. The selected remedy for OU1 consisted of the following:

- In-situ stabilization/solidification for soils containing cadmium at concentrations greater than 10 parts per million (ppm). Three areas on the western portion of the facility were excavated and mixed with the soils to be treated on the eastern portion of the Site;
- Design and installation of a final topsoil/asphalt cover at the eastern portion of the Site, which would protect the treatment cells from erosion;
- Implementation of institutional controls, such as deed restrictions at the Site.

OU2 consisted of offsite contamination, including sediment and water contamination of Willetts Creek and Lake Capri. The selected remedy consisted of the following:

- The fish population of Lake Capri was eradicated using Rotenone, a NYSDEC approved fish eradicator, in July 1999 prior to dredging operations;
- Dredging, dewatering and off-site disposal of contaminated sediments from Lake Capri;
- Excavation and off-site disposal of approximately 100 cubic yards of sediment from Willetts Creek, corresponding to levels of cadmium exceeding 9 ppm (currently, the highest effects guidance value);
- Riprap was used to cover portions identified as having deeper zones of contamination in order to prevent future erosion;
- A long-term monitoring program to evaluate the effectiveness of the on-site remedy and to verify that existing groundwater plume does not impact public health or environment; and,
- The lake was restocked with silversides, bluegill (*Lepomis macrochirus*), and largemouth bass (*Microptera salmoides*) after completion of the remedial activities in 2000.

The primary contaminant of concern at the Site is cadmium, but several other metals including antimony, arsenic, chromium, iron, lead, manganese, sodium, and thallium have been found in exceedance of published standards in soil and groundwater at the Dzus facility and in the water and sediments of nearby Willetts Creek and Lake Capri.

1.4.1 Removal of Contaminated Materials from the Site

OU1 remedial measures included the removal of a leach field at the eastern side of the Site in 1991. Additional remedial activities included excavating three areas on the western side of the Site. This material was then mixed with soils from the eastern side of the Site and solidified. The material was then placed back in the ground and an asphalt cover was constructed over the consolidated materials.

The excavation and removal of sediment from Willetts Creek and Lake Capri was completed in December 1999. The upper Willetts Creek remedy consisted of excavating targeted contaminated sediments from the most impacted areas adjacent to the West Islip Junior High School and covering the identified deeper impacted sediments with rip-rap to prevent future erosion. Contaminated sediments in Lake Capri were removed by a combination of excavation near-shore areas and hydraulic dredging in deeper waters. An area of deeper impacted sediments in Lake Capri was covered with rip rap to isolate it from the environment. The removed sediments were dewatered onsite as necessary at the temporary staging area constructed at the West Islip High School parking

lot, processed off-site for beneficial use, and used as a structural material for construction at a nearby landfill, or placed in a landfill.

1.4.2 Site-Related Treatment Systems

There are no Site-related treatment systems currently in operation at the Site.

1.4.3 Remaining Contamination

Contaminated soils remain on-site at the Dzus facility. Contaminated soils in the eastern area of the Site were treated by in-situ stabilization/solidification. Seven areas were remediated as shown on Figure 4. Once the remedial action was completed, the area was paved with asphalt.

Contaminated sediments also remain in Willetts Creek. After excavation work was completed in the creek, an area adjacent to the strip mall was found to contain sediments above the cleanup criterion. A non-woven geotextile fabric was placed over the sediments and a minimum of 6-inches of rip rap was placed over the fabric. The area of rip rap is shown on Figure 5.

During the remedial action, an area just south of the stone bridge in the north cove area of Lake Capri required additional dredging to remove deeper regions of cadmium impacted sediments. A manufactured 50 ft by 50 ft non-woven geotextile and approximately eight inches of rip rap were used to encapsulate the excavated region. The approximate area of the riprap is shown on Figure 5A.

2.0 Engineering and Institutional Control Plan

2.1 Introduction

2.1.1 General

Since remaining contaminated soil and groundwater exists beneath the site, EC/ICs are required to protect human health and the environment. This Engineering and Institutional Control Plan describes the procedures for the implementation and management of all EC/ICs at the site. The Engineering and Institutional Control Plan is one component of the SMP and is subject to revision by NYSDEC.

2.1.2 Purpose

This plan provides:

- A description of all EC/ICs on the site;
- The basic operation and intended role of each implemented EC/IC;
- A description of the features that should be evaluated during each periodic inspection and compliance certification period;
- A description of the features to be evaluated during each required inspection and periodic review;
- A description of plans and procedures to be followed for implementation of EC/ICs,
- Any other provisions necessary to identify or establish methods for implementing the EC/ICs required by the site remedy, as determined by the NYSDEC; and
- A description of the reporting requirements for these controls.

2.2 Engineering Controls

2.2.1 Engineering Control Systems

2.2.1.1 Asphalt Cap

Exposure to remaining soil contamination is prevented by an asphalt cap placed over the mixed/solidified soil. This cap inhibits infiltration of rainwater into the shallow soils preventing leaching of contaminants into groundwater which can migrate off-site. Procedures for the inspection and maintenance of this cap are provided in the Monitoring Plan included in Section 4 of this SMP.

2.2.1.2 Security Fence

Some of the property is bounded by chain-link fence but it is not a security fence. While the property remains occupied by DFCI Solutions, there is no need for a security fence with signage as access is restricted to those people working at the facility.

2.2.2 Criteria for Completion of Remediation/Termination of Remedial Systems

Generally, remedial processes are considered completed when effectiveness monitoring indicates that the remedy had achieved the remedial action objectives identified by the decision document. The framework for determining when remedial processes are complete is provided in Section 6.6 of NYSDEC DER-10.

The remediation goals for OU1 include:

- Eliminate the potential for direct human contact with the contaminated soils at the Site;
- Eliminate or reduce the mobility of contaminants in on-site soils that would cause further groundwater contamination; and
- Eliminate the hazardous wastes on-site or treat them to render them non-hazardous.

The remediation goals for OU2 include:

- Implementation of a long-term groundwater monitoring program to evaluate the effectiveness of the on-site remedy and to verify that the existing off-site groundwater plume does not adversely impact public health or the environment;
- Dredging, dewatering and off-site disposal of approximately 12,000 cubic yards of contaminated sediments from Lake Capri; and
- Excavation and off-site disposal of approximately 100 cubic yards of sediment from Willetts Creek corresponding to levels of cadmium exceeding 9 mg/kg.

2.2.2.1 Asphalt Cap

The asphalt cap is a permanent control and the quality and integrity of the cap will be inspected at defined, regular intervals as stipulated in this SMP. Repairs will be made as necessary to maintain the integrity of the cap.

2.2.2.2 Security Fence

There is no security fence.

2.2.2.3 Monitored Natural Attenuation

Groundwater monitoring activities to assess natural attenuation will continue, as determined by NYSDEC, until residual groundwater concentrations are found to be consistently below NYSDEC standards or have become asymptotic at an acceptable level over an extended period of time. Monitoring will continue until permission to discontinue is granted in writing by the NYSDEC. If groundwater contaminant levels become asymptotic at a level that is not acceptable to the NYSDEC, additional source removal, treatment and/or control measures will be evaluated.

2.3 Institutional Controls

Institutional Controls are required by the ROD to: (1) implement, maintain and monitor ECs; (2) prevent future exposure to remaining contamination by controlling disturbances of the subsurface contamination; (3) limit the use and development of the Site to industrial use; and, (4) to limit use of on-site groundwater for potable or process water prior to treatment. Adherence to the ICs is required by an EE and will be implemented upon NYSDEC approval of the SMP.

The deed restriction includes the following restrictions on the Site:

- No person shall engage in any activity that will, or that reasonably is anticipated to, prevent or interfere significantly with any proposed, ongoing or completed program under the OU1 ROD at the Property or that will, or is reasonably foreseeable to, expose the public health or the environment to a significantly increased threat of harm or damage;
- The owner shall prohibit any excavation or disturbance of the asphalt cover in the treatment cell area and Parcel 2 unless the owner of the property first obtains permission to do so from the NYSDEC or its successor agency;
- The owner shall protect the treatment cell area from the effects of erosion by maintaining the final topsoil/asphalt cover as agreed upon between DFCI and NYSDEC;
- The property owner shall prohibit the property from ever being used for purposes other than non-residential commercial/industrial uses, excluding day-care and health care facilities without the express written waiver by the NYSDEC or its successor Agency;
- The owner shall prohibit the use of groundwater underlying the property without treatment rendering it safe for drinking water or industrial purposes, as appropriate, unless the owner first obtains permission from NYSDEC or its successor agency;
- The owner shall continue in full force and effect any institutional and engineering controls the NYSDEC required the owner put in place and maintain unless the owner first obtains permissions to discontinue such controls from the NYSDEC or its successor agency; and
- The owner shall provide an annual certification to the NYSDEC that the institutional and engineering controls are still in place.

2.3.1 Excavation Work Plan

The Site has been remediated for restricted (commercial) use. Any future intrusive work that will penetrate the asphalt cap, or encounter or disturb the remaining contamination, including any modifications or repairs to the existing cover system will be performed in compliance with the Excavation work plan (EWP) that is attached as Appendix D to this SMP. Any work conducted pursuant to the EWP must also be conducted in accordance with the procedures defined in the Health and Safety Plan (HASP) and Community Air Monitoring Plan (CAMP) prepared for the Site. The HASP is attached as Appendix E to this SMP and is in compliance with DER-10 and CFR 1910, 29 CFR 1926, and all other applicable Federal, State and local regulations. Based on future changes to State and federal health and safety requirements, and specific methods employed by future contractors, the HASP and CAMP (Appendix F) will be updated and re-submitted with notification provided in Section A-1 of the EWP. Any intrusive construction work will be performed

in compliance with the EWP, HASP and CAMP, and will be included in the periodic inspection and certification reports submitted under the Site Management Report Plan (Section 5).

The Site owner and associated parties preparing the remedial documents submitted to the State, and parties performing the work, are completely responsible for the safe performance of all intrusive work, the structural integrity of excavations, proper disposal of excavation de-water, control of runoff from open excavations into remaining contamination, and for structures that may be affected by excavations (such as building foundations and railroad tracks). The site owner will ensure that site development activities will not interfere with, or otherwise impair or compromise, the engineering controls described in this SMP.

2.3.2 Soil Vapor Intrusion (SVI) Evaluation

As the primary contaminant of concern at the Dzus Site is cadmium, a soil vapor intrusion evaluation is not necessary.

2.4 Inspections and Notifications

2.4.1 Inspections

Periodic inspections of all remedial components installed at the site will be conducted at the frequency specified in Section 3.6 this SMP. The inspections will determine and document the following:

- Whether ECs continue to perform as designed;
- If these controls continue to be protective of human health and the environment;
- Compliance with requirements of this SMP and the EE;
- Achievement of remedial performance criteria;
- Sampling and analysis of appropriate media during monitoring events;
- If site records are complete and up to date; and
- Changes, or needed changes, to the remedial or monitoring system.

Inspections will be conducted in accordance with the procedures set forth in the Monitoring Plan of this SMP (Section 3), using the Site-Wide Inspection Form included in Appendix G. The reporting requirements are outlined in the PRR section of this plan (Section 5).

If an emergency, such as a natural disaster or an unforeseen failure of any of the ECs occurs, an inspection of the Site will be conducted within five days of the event to verify the effectiveness of the EC/ICs implemented at the Site by a qualified environmental professional as determined by NYSDEC.

2.4.2 Notifications

Notifications will be submitted by the property owner and/or entity responsible for Site maintenance to the NYSDEC as needed for the following reasons:

- Verbal notice by noon of the following day of any emergency, such as a fire, flood, or earthquake that reduces or has the potential to reduce the effectiveness of ECs in place at the Site, with written confirmation within 7 days that includes a summary of actions taken, or to be taken, and the potential impact to the environment and the public;
- Notice within 48-hours of any damage or defect to the foundations structures that reduces or has the potential to reduce the effectiveness of other Engineering Controls and likewise any action to be taken to mitigate the damage or defect;
- Follow-up status reports on actions taken to respond to any emergency event requiring ongoing responsive action shall be submitted to the NYSDEC within 45 days and shall describe and document actions taken to restore the effectiveness of the ECs;
- 30-day advance notice of any proposed ground intrusive activities that may disturb material below the water table, so that an appropriate excavation plan may be developed; and
- 60-day advance notice of any proposed changes in Site use that are required under the terms.

Any change in the ownership of the Site or the responsibility for implementing this SMP will include the following notifications:

- At least 60 days prior to the change, the NYSDEC will be notified in writing of the proposed change. This will include a certification that the prospective purchaser has been provided with all approved work plans and reports, including this SMP;
- Within 15 days after the transfer of all or part of the Site, the new owner's name, contact representative, and contact information will be confirmed in writing; and
- Of 6 NYCRR Part 375 and/or the Environmental Conservation Law.

Notifications will be made to Payson Long, Remedial Bureau E, Section D, NYSDEC DER, 625 Broadway, Albany, NY 12233. In the event that NYSDEC develops a centralized notification system, that system will be used instead.

2.5 Contingency Plan

Emergencies may include injury to personnel, fire or explosion, environmental release, or serious weather conditions.

No development is allowed within the limits of the Site without NYSDEC coordination. No intrusive activities will be allowed that will disturb the remedy. If development is proposed, NYSDEC personnel will require notice at least 60 days in advance of the proposed change in site use and a work plan will be required 30 days in advance for assessing and managing any potentially impacted material.

If previously unidentified contaminant sources are found during post-remedial subsurface excavations or development-related construction, excavation activities will be suspended until the appropriate equipment is mobilized to address the condition, and any new health and safety issues are addressed.

In such an event, sampling will be performed on appropriate media as necessary to determine the nature of the material and proper disposal method. A sampling and analysis plan must be provided to NYSDEC for review and approval.

If any area of the Site is to be developed or excavated and dewatered, the NYSDEC must be informed at least 30 days in advance. The extracted groundwater must be analyzed for the COCs and treated on-site or transported off-site for proper disposal. The Site developer will be responsible for obtaining a permit for the installation and maintenance of any new treatment system.

Identification of unknown or unexpected contaminated media identified by screening during invasive Site work will be promptly communicated by telephone to the NYSDEC Project Manager. Reportable quantities of petroleum product will also be reported to the NYSDEC spill hotline. These findings will be included in daily and periodic reports.

2.5.1 Emergency Telephone Numbers

Medical, Fire, and Police	911
DigSafely New York	800-962-7962 or 811
Poison Control Center	800-2221222
Pollution Toxic Chemical Oil Spills	800-424-8802
NYSDEC Spills Hotline	800-457-7362
Payson Long, NYSDEC Project Manager	518-402-9813
Suffolk County Department of Health Services	631-854-0000

Note: Contact numbers are subject to change and should be updated as necessary

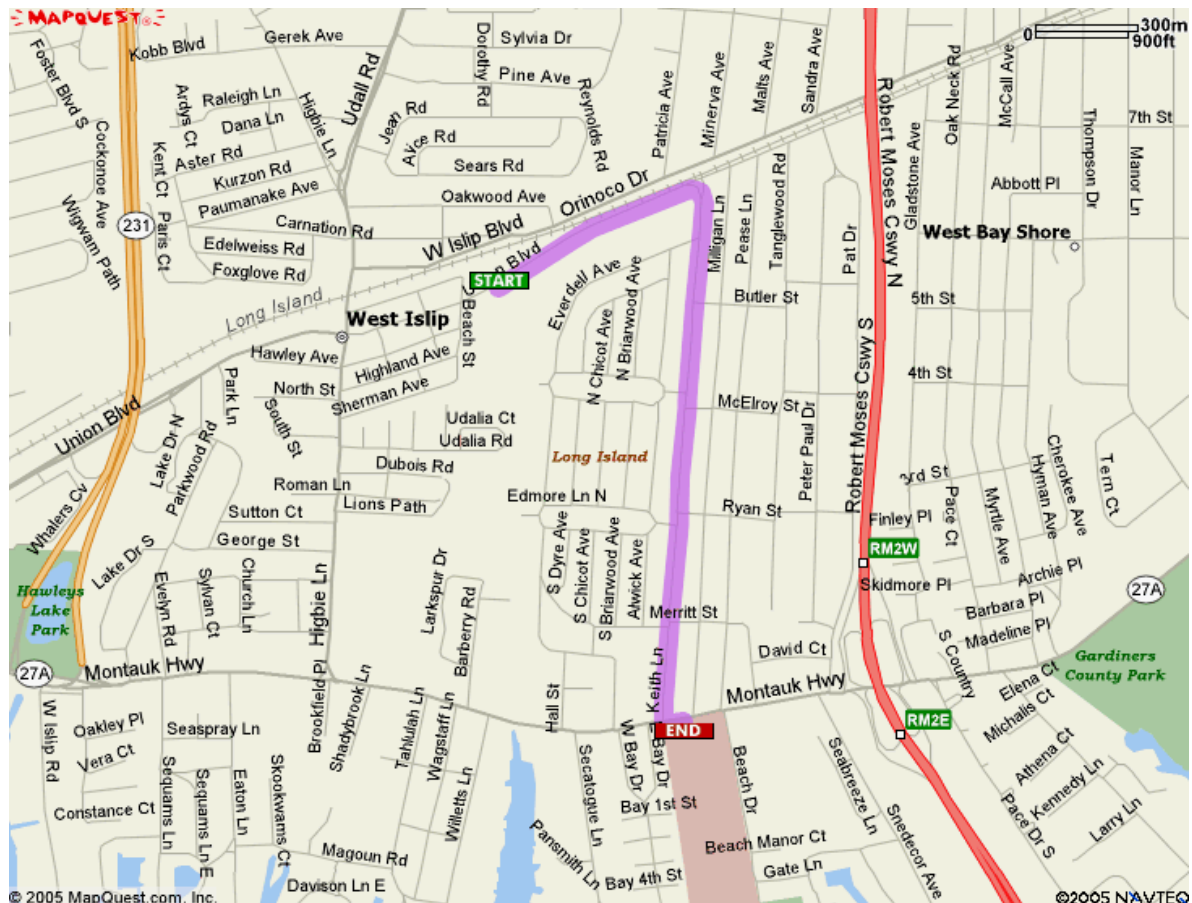
2.5.2 Map and Directions to Nearest Health Facility

Site Location: 425 Union Boulevard in West Islip, Suffolk County, NY

Nearest Hospital: Good Samaritan Health System
1000 Montauk Highway
West Islip, NY 11795
(631) 376-3000

Hospital directions: Start out going NORTHEAST on UNION BLVD / CR-50. Turn SLIGHT RIGHT onto KEITH LANE. Turn LEFT onto MONTAUK HWY / NY-27A. End at **Good Samaritan Health System** 1000 Montauk Hwy, West Islip, NY 11795, US

Total Est. Time: 4 minutes **Total Est. Distance:** 1.46 miles



2.5.3 Response Procedures

As appropriate, emergency response groups will be notified immediately by telephone of the emergency. A list of emergency numbers is provided in Section 2.5.2 of this SMP.

An evacuation plan is not necessary for the Site as field personnel do not enter the DFCI Building. Onsite activities are limited to periodic sampling and inspection events which occur outdoors. A spill plan is not necessary as there is no active treatment system and on-site activities are limited to groundwater sampling, surface water sampling, sediment sampling, and inspections.

Amendments to the contingency plan should be made subsequent to any incident investigation and changes should be approved by NYSDEC personnel.

Medical emergencies are addressed in the site HASP. Appropriate first aid will be administered, and if necessary, the injured individual will be sent to the designated medical facility. An ambulance will be summoned, if needed. The cause of the accident will be determined and corrected prior to continuing operations. First aid kits are maintained in all AECOM-owned or leased vehicles at all times.

All individuals performing work on-site will attend an initial 40-hour health and safety training course and annual 8-hour refresher training for conducting work at hazardous waste sites. These courses satisfy the initial and follow-up training requirements of 29 CFR 1910.120 (OSHA regulation of hazardous waste site activities). Other required task-specific training will be provided as appropriate based on task hazard analysis and training needs assessments.

All individuals are required to read, sign and comply with the site HASP at all times when performing work on the Site.

3.0 Site Monitoring Plan

3.1 Introduction

3.1.1 General

Monitoring of the environment at and around the Site will provide a basis for evaluating the remedial systems effectiveness in protecting human health and the environment from further exposure or contamination. Monitoring will be performed on the media that is potentially affected by further releases of contaminants from the facility, as well as those media that may contribute additional contaminants to the environment. A monitoring inspection schedule is included in Section 3.1.2 which includes the media to be sampled, schedule for sampling and the analysis that will be conducted.

3.1.2 Purpose and Schedule

This Monitoring Plan describes the methods to be used for:

- Sampling and analysis of all appropriate media (groundwater, surface water, and sediment);
- Assessing compliance with applicable NYSDEC standards, criteria and guidance, particularly NYS regulation 6 NYCRR Part 703 and Division of Water guidance (TOGS 1.1.1), and the Technical Guidance for Screening Contaminated Sediments (NYSDEC Department of Fish, Wildlife and Marine resources, March 1998);
- Assessing achievement of remedial performance criteria;
- Evaluating site information periodically 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, this Monitoring Plan provides information on:

- Sampling locations, protocols and frequency;
- Well logs;
- Analytical sampling requirements;
- Reporting requirements;
- Quality assurance/quality control (QA/QC) requirements;
- Inspection and maintenance requirements for monitoring wells;
- Monitoring well decommissioning procedures; and
- Periodic inspection and certification.

Groundwater, surface water and sediment will be monitored on a five-quarter basis. Trends in groundwater contaminant levels will be evaluated to determine if the remedy continues to be effective in achieving the remedial goals. Monitoring programs are summarized below and outlined in detail in Sections 3.2 and 3.3 below.

Monitoring /Inspection Schedule

Monitoring Program	Frequency ¹	Matrix	Analysis
Asphalt cap inspection	Five-quarter basis		Visual inspection ²
Monitoring well inspection	Five-quarter basis		Visual inspection
Fish Tissue sampling (up to 80 samples)	As required by NYSDEC	Fish tissue	Cadmium
Surface water (6 Locations)	Five-quarter basis	Surface water	TAL Metals
Sediment (6 Locations)	Five-quarter basis	Sediment	TAL Metals
Groundwater (14 Wells)	Five-quarter basis	Groundwater	TAL Metals

1 The frequency of events will be conducted as specified until otherwise approved by NYSDEC and NYSDOH.

2 Inspection form is included in Appendix G, extent of asphalt cap is shown on Figure 4.

3.2 Soil Cover System Monitoring

Monitoring is not applicable at the Site as there is no soil cover system.

3.3 Media Monitoring Program**3.3.1 Groundwater Monitoring**

Groundwater monitoring will be performed on a five-quarter basis. Monitoring well locations are shown on Figure 2. Fourteen monitoring wells have been selected for long term monitoring. These wells include: MW-1, MW-2, MW-3, MW-9, MW-9B, MW-13A, MW-13B, MW-15A, MW-15B, MW-18, MW-22A, MW-22B, MW-23A and MW-23B. These wells are screened at four different intervals as detailed on Table 1. Wells MW-1, MW-2, MW-3, MW-13A, MW-18, MW-22A and MW-23A are screened across the water table (approximately 5-6 ft bgs). Wells MW-9B, MW-13B, MW-22B and MW-23B are screened approximately 45 ft bgs. Well MW-15A is screened at 28 ft bgs and MW-15B is screened at 84 ft bgs.

Figure 6 shows groundwater elevations for the most recent sampling event conducted on August 21, 2012. Groundwater flow direction is towards the south and is similar to the conditions described during the remedial investigations conducted in the late 1990s.

Periodic sampling has been conducted at the Site since 2006. A summary of the metals detections is shown on Figure 7. Each well will be sampled for TAL metals. During recent sampling events (2011 and 2012), both field filtered and total metals samples were collected. Samples were filtered in the field using 0.45 micron filters.

The sampling frequency may be modified with approval of NYSDEC. The SMP will be modified to reflect changes in sampling plans approved by NYSDEC.

3.3.1.1 Sampling Protocol

Prior to sampling, a synoptic round of water levels will be collected. At each well location, a NYSDEC Monitoring Well Field Inspection Log will be completed prior to sampling. Groundwater sampling will be performed in accordance with the Sampling and Analysis Plan (Earth Tech, 2007) included as Appendix H. NYSDEC modified the sampling protocol for the May 2011 sampling event and all subsequent sampling events. Prior to 2011, groundwater samples were collected using the volumetric method; beginning in May 2011, groundwater samples were collected using low flow sampling techniques.

The number and frequency of the samples that will be collected for laboratory analysis from monitoring wells are listed in Section 3.2.1. The required equipment and supplies are as follows:

- Field book
- Project plans
- Personal Protective Equipment (PPE) in accordance with the HASP
- Electronic oil/water interface probe
- Flow through cell (temperature, pH, conductivity, dissolved oxygen, oxidation-reduction potential (ORP), and turbidity)
- Decontamination supplies
- Peristaltic or submersible pump capable of achieving low-flow rates (i.e., 0.5 liters per minute or less)
- Plastic tubing
- Plastic sheeting
- Photoionization detector
- Clear tape, duct tape
- Coolers and ice
- Laboratory sample bottles
- Federal Express labels

Purging

- Prior to sampling, the static water level will be measured to the nearest 0.01 foot from the surveyed well elevation mark on the top of the PVC casing with a decontaminated oil/water interface probe. The measurement will be recorded in the field book.
- The probe will be decontaminated between uses.
- Groundwater from the well will be purged until field parameters stabilize over three consecutive readings. Drawdown will be measured and limited to less than 0.3 ft. The

stabilization criteria are as follows: less than 50 nephelometric units for turbidity; +/- 3% for specific conductance; +/- 0.1 unit for pH; +/- 10% dissolved oxygen > 0.5 mg/L, +/- 0.1 mg/L < 0.5 mg/L; and +/- 10 mV for ORP. Purging will be conducted using the low-flow sampling technique specified by the U.S. EPA Region 1 in its guidance document entitled "Low-Stress (low flow) Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells".

- The flow rate measurement will be approximately 0.5 liter per minute or less.
- Purge water will be managed and disposed of properly.

Sampling

- Samples will be collected directly from the pump discharge line.
- Prior to filling the sample bottles, the temperature, pH, conductivity, ORP and turbidity will be measured within a flow-through cell. All measurements will be recorded on the purging and sampling forms.
- If filtered metals samples are included in the sampling effort, the sample will be filtered in the field using dedicated, disposable 0.45 micron filters.
- A 500 milliliter (mL) plastic bottle preserved with nitric acid will be filled for the total metals analysis.
- The sample containers will be labeled, placed in a laboratory-supplied cooler, and packed on ice (to maintain a temperature of 4 degrees C). The cooler will be shipped overnight or delivered to the laboratory for analysis.
- Chain of custody procedures will be followed.
- Well sampling data will be recorded on the Groundwater Sampling Record included in Appendix G.

All sampling and analyses will be performed in accordance with the requirements mentioned in this section:

- 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 ASP requirements.
- Field quality control samples (e.g., trip blanks, coded field duplicates, and matrix spike/matrix spike duplicates) will be collected as necessary.
- Sample Tracking and Custody will be filled out and copied for record.
- 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 USEPA SW-846 and subsequent updates that apply to the instruments used for the analytical methods.

3.3.1.2 Monitoring Well Repairs, Replacement and Decommissioning

The information collected on the Monitoring Well Field Inspection forms will be used to determine if the condition of each monitoring well is suitable for sampling. If a well has been damaged, a determination will be made as to whether to repair the well or replace it. Damaged wells that cannot be repaired will be decommissioned in accordance with the NYSDEC Groundwater Monitoring Well Decommissioning Policy (CP-43, dated November 2009 or most current update).

3.3.2 Surface Water – Sediment Sampling

Six co-located surface water and sediment samples will be collected from Lake Capri and Willetts Creek on a five-quarter basis. Sample locations are shown on Figure 2. These six locations will be sampled during each event unless a new location has been approved by NYSDEC. Samples will be analyzed for TAL metals. Surface water and sediment sampling will be performed in accordance with the Sampling and Analysis Plan (Earth Tech, 2007) included as Appendix H.

Periodic sampling has been conducted at the Site since 2006. A summary of the metals detections in surface water samples is shown on Figure 8. A summary of sediment samples is shown on Figure 9. Each co-located sample location will be sampled for TAL metals.

The sampling frequency may be modified with approval of NYSDEC. The SMP will be modified to reflect changes in sampling plans approved by NYSDEC.

The required equipment and supplies are as follows:

- Field book
- Project plans
- PPE in accordance with the HASP
- Small rowboat, personal floatation devices
- Ponar or Eckman grab sampler
- Decontamination supplies
- Clear tape, duct tape
- Coolers and ice
- Laboratory sample bottles
- Federal Express labels

Sampling

- Surface water samples will be collected by dipping a clean, dedicated, laboratory supplied container into the creek or lake and pouring the water into the laboratory supplied containers to avoid washing out the preservative.

- Sediment samples will be collected using a ponar or Eckman grab sampler to retrieve material from the lake or creek bottom. Material will be transferred to laboratory supplied containers using a clean, dedicated stainless steel spoon.
- For surface water, a 500 milliliter (mL) plastic bottle preserved with nitric acid will be filled for the total metals analysis; for sediment, material will be transferred from the sampler to a 4-oz laboratory supplied jar with a clean, dedicated stainless steel spoon.
- The sample containers will be labeled, placed in a laboratory-supplied cooler, and packed on ice (to maintain a temperature of 4 degrees C). The cooler will be shipped overnight or delivered to the laboratory for analysis.
- Chain of custody procedures will be followed.
- Sampling data will be recorded on the Field Sampling Record included in Appendix G.

All sampling and analyses will be performed in accordance with the requirements mentioned in this section:

- 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 ASP requirements.
- Field quality control samples (e.g., trip blanks, coded field duplicates, and matrix spike/matrix spike duplicates) will be collected as necessary.
- Sample Tracking and Custody will be filled out and copied for record.
- 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 USEPA SW-846 and subsequent updates that apply to the instruments used for the analytical methods.

3.3.3 Fish Sampling

Fish tissue samples will be collected on a five-quarter basis or at the discretion of NYSDEC. Samples will be obtained using collection techniques that would not influence the cadmium analysis. These techniques included box and minnow fish traps, gill nets, and baited lines. Traps will be baited with items such as frankfurters and cat food which are high in lipids and/or give off a strong odor. Minnow traps will be placed under logs, ledges, and other overhangs that would attract small fish. Box traps, which are designed to catch larger fish, will be placed in deeper locations where they could be submerged. After the traps are baited, they will be checked periodically.

Multi-sized mesh gill nets will be set in the lake on each of the sample days. The nets will be retrieved and reset each morning and evening. Nets will be weighted at the bottom with a lead line and anchors and floated at the top with floats and a float line.

In order to increase the potential to catch fish, lines with baited hooks will be deployed. The lines will be attached to vessels and poles and checked periodically.

The SAP calls for the collection of 80-gram to 100-gram samples from Lake Capri. Forty samples obtained from the northern boundary of the lake (near the mouth of Willetts Creek), and 40 samples near the weir (southern portion of the lake). However, the desired amount of samples may not be achievable as demonstrated during previous sampling events.

Captured fish will be removed from the water alive. The fish will be identified to species, measured for length, and then weighed. If the required number of fish is not collected, the fish will be grouped together by species, given a sample identification number, and placed in a plastic bag. The bag will be labeled with the sample number, and immediately placed in a cooler with ice as per NYSDEC instructions. Chain of custody procedures will be followed. The samples will then be shipped to a NYSDEC-certified laboratory for cadmium analysis.

A NYSDEC collection license will be required for each sampling event.

3.4 Site Wide Inspections

Site-wide inspections will be performed on a five-quarter basis concurrently with the groundwater sampling and after all severe weather conditions that may affect ECs or ICs. During these inspections, an inspection form will be completed (Appendix G). The form will be included in the PRR. The form will compile sufficient information to assess the following:

- Compliance with all ICs, including Site usage;
- An evaluation of the condition and continued effectiveness of ECs;
- General site conditions at the time of the inspection;
- Site management activities being conducted including, where appropriate, confirmation sampling and a health and safety inspection;
- Compliance with permits and schedules included in the Operation and Maintenance Plan; and
- Confirmation that site records are up-to-date.

If an emergency, such as a natural disaster or an unforeseen failure of any of the ECs occurs, an inspection of the Site will be conducted within 5 days of the event to verify the effectiveness of the EC/ICs implemented at the Site by a qualified environmental professional as determined by the NYSDEC.

3.5 Monitoring Quality Assurance/Quality Control

All sampling and analyses will be performed in accordance with the Quality Assurance Project Plan (Section 3.0 of the Sampling and Analysis Plan, Earth Tech, 2007) included as Appendix H of the SMP.

3.6 Monitoring Reporting Requirements

Groundwater monitoring reports (which include the surface water and sediment sampling) will be prepared and submitted subsequent to each groundwater monitoring event. This report will include, at a minimum:

- Date of event;
- Personnel conducting sampling;
- Description of the activities performed;
- Type of samples collected and list of wells sampled;
- Copies of all field forms completed (e.g., sampling logs, chain-of-custody documentation);
- Sampling 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 observations, conclusions, or recommendations; and
- A determination as to whether the groundwater quality and/or conditions have changed since the last reporting event where groundwater monitoring well data was provided.

Fish tissue sampling reports will be submitted separately following the procedures outlined above.

Forms and any other information generated during regular monitoring events and inspections will be kept on file in the consultant's office. Data will be compared to historic data to evaluate trends. Data will be presented in tables and figures. All inspection forms will be appended to the report. The report will be forwarded to NYSDEC for review and comment. A final electronic copy of the report will be forwarded to NYSDEC. All laboratory data will be submitted in EQulS data files to NYSDEC.

Information on the format of data submissions can be found at:

<http://www.dec.ny.gov/chemical/62440.html>

Information on document submissions can be found at:

<http://www.dec.ny.gov/regulations/2586.html>.

Schedule of Monitoring / Inspection Reports	
Task	Reporting Frequency*
Groundwater Sampling Report	Five quarter basis
Site Inspection	Five quarter basis, at the time of groundwater sampling
Fish tissue sampling	Five quarter basis or as required by NYSDEC
Asphalt Cap Inspection	Five quarter basis, at the time of groundwater sampling
Periodic Review Report	Every five years or as needed. The first PRR was finalized in January 2012; the second PRR was completed in April 2013.

4.0 Operation and Maintenance Plan

The remedy for the Dzus Fasteners Site does not rely on mechanical systems to protect public health and the environment. Therefore, operation and maintenance is not applicable to this SMP.

5.0 Inspections, Reporting and Certifications

5.1 Site Inspections

5.1.1 Inspection Frequency

All inspections (asphalt cover, riprap in Willetts Creek and riprap in Lake Capri) will be conducted on a five quarter basis as specified in the schedules provided in Section 3. Additional inspections will occur whenever severe conditions, such as a hurricane, tropical storm or flooding event, have taken place.

5.1.2 Inspection Forms, Sampling Data, and Maintenance Reports

All inspections and monitoring events will be recorded on the appropriate forms. Examples of these forms are provided in Appendix G. These forms will be included in each Groundwater Sampling Report prepared for each sampling event and in the PRR.

5.1.3 Evaluation of Records and Reporting

The results of the inspections and site monitoring data will be evaluated as part of the EC/IC certification to confirm that the:

- EC/ICs are in place, performing properly, and remain effective;
- The Monitoring Plan is being properly implemented; and
- The Site remedy continues to be protective of human health and the environment.

5.2 Certification of Engineering and Institutional Controls

A professional engineer licensed to practice in New York State will prepare the following certification.

For each institutional and engineering control identified at the Site, I certify the all of the following statements are true:

- The inspection of the Site to confirm the effectiveness of the institutional and engineering controls required by the remedial program was performed under my direction;
- The institutional and engineering controls employed at the Site are unchanged from the date the control as put in place, or last approved by the NSYDEC;
- Nothing has occurred that would impair the ability of the control to protect the public health and environment;
- The engineering controls are performing as designed and are effective; and
- The information presented is accurate and complete.

5.3 Periodic Review Report

PRRs will be submitted to the NYSDEC in accordance with the schedule outlined above. In the event that the Site is subdivided into separate parcels with different ownership, a single PRR will be prepared that addresses the Site as described in the RODs.

The report will be prepared in accordance with NYSDEC DER-10 and submitted 45 days prior to the end of each certification period. Media sampling results will also be incorporated into the PRR. The report will include:

- Identification, assessment and certification of all ECs/ICs 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 with comments and conclusions;
- Data summary tables and graphical representations of contaminants of concern by media (groundwater, soil vapor), which 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;
- 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; and
- A site evaluation, which includes the following:
 - The compliance of the remedy with the requirements of the Site-specific ROD;
 - Any new conclusions or observations regarding Site contamination based on inspections or data generated by the Monitoring Plan for the 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 to the NYSDEC Central Office in electronic format.

5.4 Corrective Measures Plan

If any component of the remedy is found to have failed, is no longer protective of human health or the environment, or if the periodic certification cannot be provided due to the failure of an institutional or engineering control, a corrective measures plan will be prepared and 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 and emergency condition exists, no work will be performed without approval by NYSDEC.

6.0 References

AECOM Technical Services Northeast, Inc., 2009. Final Groundwater Sampling Report (November 2008 Sampling Event). Multi Site G, Operation, Maintenance and Monitoring. Dzus Fasteners Site, West Islip, Suffolk County, NY, Site 1-52-033. Prepared for Superfund Standby Program, NYSDEC, August 2009.

AECOM Technical Services Northeast, Inc., 2010. Final Groundwater Sampling Report (March 2010 Sampling Event). Multi Site G, Operation, Maintenance and Monitoring. Dzus Fasteners Site, West Islip, Suffolk County, NY, Site 1-52-033. Prepared for Superfund Standby Program, NYSDEC, September 2010.

AECOM Technical Services Northeast, Inc., 2011a. Periodic Review Report. Multi Site G, Operation, Maintenance and Monitoring. Dzus Fasteners Site, West Islip, Suffolk County, NY, Site 1-52-033. Prepared for Superfund Standby Program, NYSDEC, March 2011.

AECOM Technical Services Northeast, Inc., 2011b. Final Groundwater Sampling Report (May 2011 Sampling Event). Multi Site G, Operation, Maintenance and Monitoring. Dzus Fasteners Site, West Islip, Suffolk County, NY, Site 1-52-033. Prepared for Superfund Standby Program, NYSDEC, October 2011.

AECOM Technical Services Northeast, Inc., 2013. Lake Capri Fish Sampling Report (September 2012 Sampling Event). Multi Site G, Operation, Maintenance and Monitoring. Dzus Fasteners Site, West Islip, Suffolk County, NY, Site 1-52-033. Prepared for Superfund Standby Program, NYSDEC, January 2013.

Earth Tech of New York, Inc., 2000a. Construction Certification Report, Dzus Fasteners Site (OU2). Construction and Remediation of Lake Capri and Willetts Creek. Prepared for Superfund Standby Program, NYSDEC. October 2000.

Earth Tech of New York, Inc., 2000b. Long Term Monitoring Plan, Dzus Fasteners Site (OU2). NYSDEC site No. 1-52-033, Lake Capri/Willetts Creek. Prepared for Superfund Standby Program, NYSDEC. November 2000.

Earth Tech Northeast, Inc., 2006. Final Semiannual Sampling Reports (June 2006 Sampling Event). Multi Site G, Operation, Maintenance and Monitoring. Dzus Fasteners Site, West Islip, Suffolk County, NY, Site 1-52-033. Prepared for Superfund Standby Program, NYSDEC, October 2006.

Earth Tech Northeast, Inc., 2007a. Final Sampling and Analysis Plan, Multi Site G, operation, Maintenance and Monitoring. Prepared for Superfund Standby Program, NYSDEC. June 2007.

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Earth Tech Northeast, Inc., 2007c. Final Groundwater Sampling Reports (August 2007 Sampling Event). Multi Site G, Operation, Maintenance and Monitoring. Dzus Fasteners Site, West Islip, Suffolk County, NY, Site 1-52-033. Prepared for Superfund Standby Program, NYSDEC, November 2007.

NYSDEC, 1995. Record of Decision, Dzus Fastener Company, Operable Unit 01, Inactive hazardous Waste Site, Site Number 152033. March 1995.

NYSDEC, 1997. Record of Decision, Dzus Fastener Site, Operable Unit #2, West Islip, Suffolk County, Site Number 1-52-033.

NYSDEC, 1999. Technical Guidance for Screening Contaminated Sediments, Division of Fish and Wildlife and Marine Resources. January 1999.

NYSDEC, 2002. Draft DER-10 Technical Guidance for Site Investigation and Remediation. December 2002.

NYSDEC, 2006. Rules and Regulations, 6 NYCRR Subpart 376-6, Remedial Program Soil Cleanup Objectives. December 14, 2006.

NYSDEC, 2008. Rules and Regulations, 6 NYCRR Subpart 703, Surface Water and groundwater Quality Standards and groundwater Effluent Limitations, January 17, 2008.

NYS Department of Health, 2009. Chemicals in Sport Fish and Game: 2009-2010 Health Advisories. <http://www.health.ny.us/environmental/outdoors/fish/fish.htm>.

Rust Environment & Infrastructure, 1998. Post Dredging / Excavation Confirmatory Sampling and Contingency Plan. Dzus Fasteners Site, West Islip, Suffolk County, NY, Site 1-52-033. Prepared for Superfund Standby Program, NYSDEC, December 1998.

Tables

TABLE 1
DZUS FASTENERS SITE (1-52-033)
WELL CONSTRUCTION DATA

Well Number	Latitude	Longitude	Ground Elevation	Top of Riser Elevation	Top of Casing Elevation	Total Depth of Well
MW-1	40° 42.49	73° 18.10	22.44	22.03	22.44	15.3
MW-2	40° 42.45	73° 18.10	22.16	21.42	22.16	14.3
MW-3	40° 42.49	73° 18.02	20.23	19.71	20.23	15.0
MW-9	40° 42.50	73° 18.02	19.14	18.83	19.14	11.5
MW-9B	40° 42.49	73° 18.01	19.08	18.75	19.08	44.5
MW-13A	40° 42.44	73° 17.100	16.34	16.02	16.34	10.7
MW-13B	40° 42.43	73° 17.99	16.14	15.82	16.14	44.3
MW-15A	40° 42.49	73° 17.97	19.45	19.09	19.45	28.8
MW-15B	40° 42.50	73° 17.96	19.35	19.06	19.35	84.7
MW-17						
MW-18			14.69	14.31	14.66	13.5
MW-22A	40° 42.491	73° 17.941	20.49	20.09	20.49	14.4
MW-22B	40° 42.491	73° 17.941	20.35	19.95	20.35	44.5
MW-23A	40° 42.402	73° 17.991	17.57	17.34	17.57	14.3
MW-23B	40° 42.403	73° 17.987	17.54	17.29	17.54	44.5

Notes:

All elevations and depths are in feet

Vertical datum: on-site benchmark from previous survey.

Latitude / Longitude taken from a previous report

Survey performed by YEC, Inc., on April 18, 2007

TABLE 2
DZUS FASTENERS SITE (1-52-033)
GROUNDWATER ELEVATIONS

Well #	Reference Elevation	Date	Depth To Water	Water Table Elevation	Comments
MW-1	22.03	6/8/06	8.00	14.03	could not be located, damaged during snow removal
		8/22/07	8.62	13.41	
		11/11/08	NC		
		3/10/10	NC		
		5/25/11	NC		
		8/22/12	NC		
MW-2	21.42	6/8/06	8.15	13.27	
		8/22/07	8.50	12.92	
		11/11/08	8.30	13.12	
		3/10/10	7.43	13.99	
		5/25/11	7.77	13.65	
		8/22/12	8.33	13.09	
MW-3	19.71	6/8/06	5.77	13.94	
		8/22/07	6.30	13.41	
		11/11/08	6.25	13.46	
		3/10/10	5.36	14.35	
		5/25/11	5.62	14.09	
		8/22/12	6.23	13.48	
MW-9	18.83	6/8/06	4.59	14.24	
		8/22/07	5.15	13.68	
		11/11/08	5.01	13.82	
		3/10/10	4.19	14.64	
		5/25/11	4.45	14.38	
		8/22/12	5.05	13.78	
MW-9B	18.75	6/8/06	4.50	14.25	
		8/22/07	5.05	13.70	
		11/11/08	4.93	13.82	
		3/10/10	4.11	14.64	
		5/25/11	4.36	14.39	
		8/22/12	5.00	13.75	
MW-13A	16.02	6/8/06	2.59	13.43	
		8/22/07	3.02	13.00	
		11/11/08	2.90	13.12	
		3/10/10	2.27	13.75	
		5/25/11	2.51	13.51	
		8/22/12	2.93	13.09	

TABLE 2
DZUS FASTENERS SITE (1-52-033)
GROUNDWATER ELEVATIONS

Well #	Reference Elevation	Date	Depth To Water	Water Table Elevation	Comments
MW-13B	15.82	6/8/06	2.39	13.43	
		8/22/07	2.85	12.97	
		11/11/08	2.69	13.13	
		3/10/10	2.08	13.74	
		5/25/11	2.32	13.50	
		8/22/12	2.77	13.05	
MW-15A	19.09	6/7/06	5.48	13.61	
		8/22/07	5.80	13.29	
		11/11/08	5.64	13.45	
		3/10/10	4.95	14.14	
		5/25/11	5.15	13.94	
		8/22/12	5.69	13.40	
MW-15B	19.06	6/7/06	5.35	13.71	
		8/22/07	5.70	13.36	
		11/11/08	5.58	13.48	
		3/10/10	NC		
		5/25/11	5.10	13.96	
		8/22/12	5.65	13.41	
MW-17		5/25/11			unable to access, ACE Hardware
MW-18	14.31	6/8/06	7.93	6.38	Could not be located
		8/23/07	5.05	9.26	
		11/11/08	4.98	9.33	
		3/10/10	4.52	9.79	
		5/25/11	4.70	9.61	
		8/22/12	4.92	9.39	
MW-22A	20.09	6/7/06	6.00	14.09	
		8/22/07	6.44	13.65	
		11/11/08	6.38	13.71	
		3/10/10	5.78	14.31	
		5/25/11	5.92	14.17	
		8/22/12	6.45	13.64	
MW-22B	19.95	6/7/06	5.82	14.13	
		8/22/07	6.30	13.65	
		11/11/08	6.20	13.75	
		3/10/10	5.61	14.34	
		5/25/11	5.74	14.21	
		8/22/12	6.28	13.67	

TABLE 2
DZUS FASTENERS SITE (1-52-033)
GROUNDWATER ELEVATIONS

Well #	Reference Elevation	Date	Depth To Water	Water Table Elevation	Comments
MW-23A	17.34	6/7/06	4.59	12.75	
		8/22/07	4.80	12.54	
		11/11/08	4.62	12.72	
		3/10/10	4.16	13.18	
		5/25/11	4.38	12.96	
		8/22/12	5.30	12.04	
MW-23B	17.29	6/7/06	4.51	12.78	
		8/22/07	5.05	12.24	
		11/11/08	4.59	12.70	
		3/10/10	4.06	13.23	
		5/25/11	4.31	12.98	
		8/22/12	4.62	12.67	

Notes:

All measurements in feet from top of casing

Vertical data NGVD

Figures



USGS NY Bay Shore West
Quadrangle

U.S.G.S. 1:24 000 SCALE
TOPOGRAPHIC MAP

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National Geographic Society
i-cubed

Prepared by:

AECOM

Prepared for:



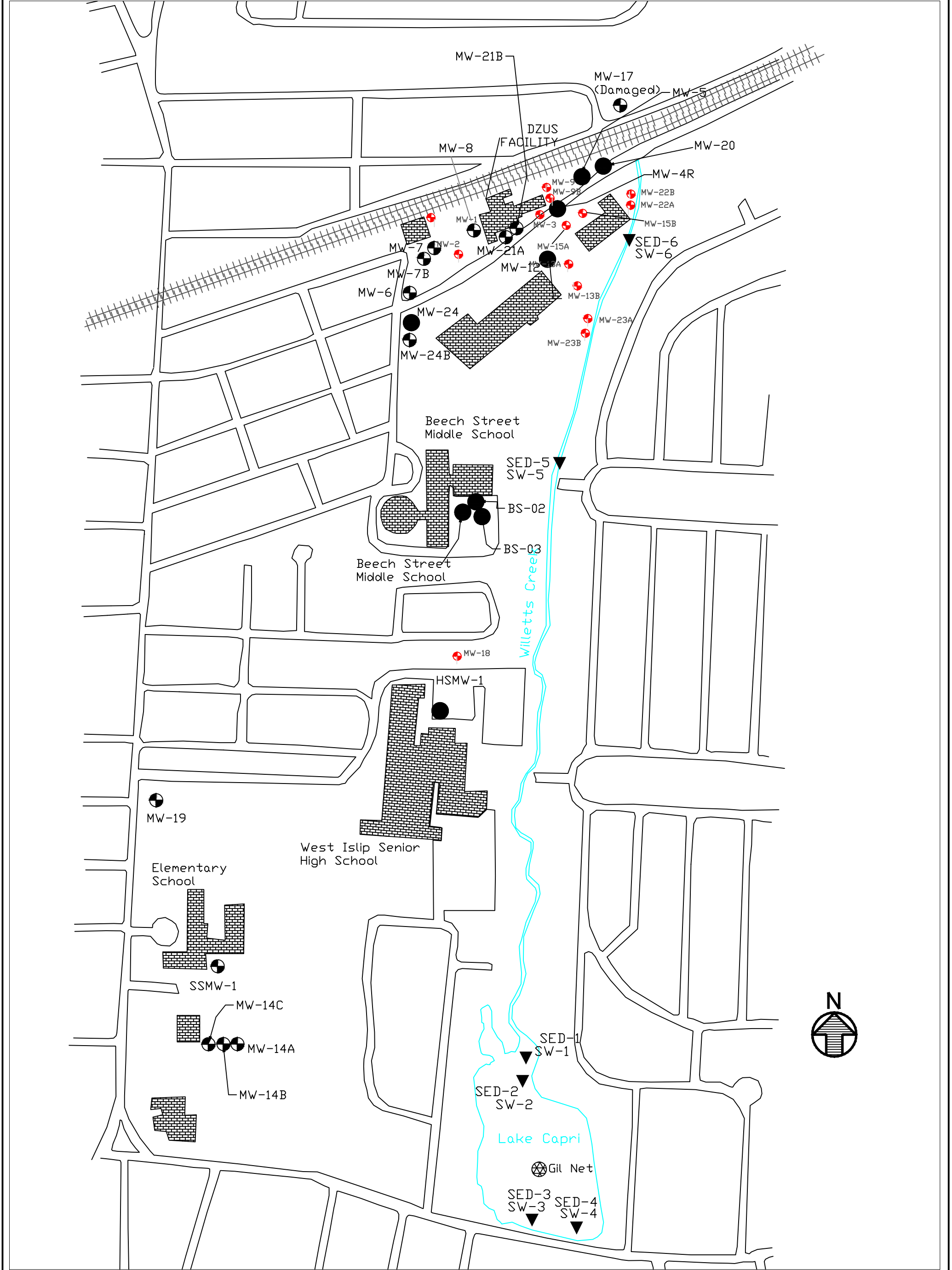
Multi Site G
Operation, Maintenance & Monitoring

Site Location
Dzus Fasteners Site





Date:
January 2013

Scale:
1 inch = 2,500 feet

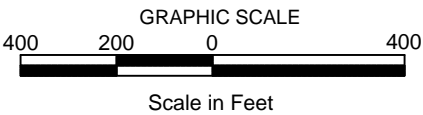
Figure No. :
1



LEGEND:

-  EXISTING MONITORING WELLS
-  EXISTING WELLS INCLUDED IN LONG TERM MONITORING
(MW-1 was damaged in December 2007.)
-  MISSING MONITORING WELLS
-  SURFACE WATER AND SEDIMENT SAMPLE LOCATION

RAILROAD TRACKS



Prepared by :

AECOM

SUBMITTED BY :

PK

DRAWN BY :

SC

APPROVED BY :

PK

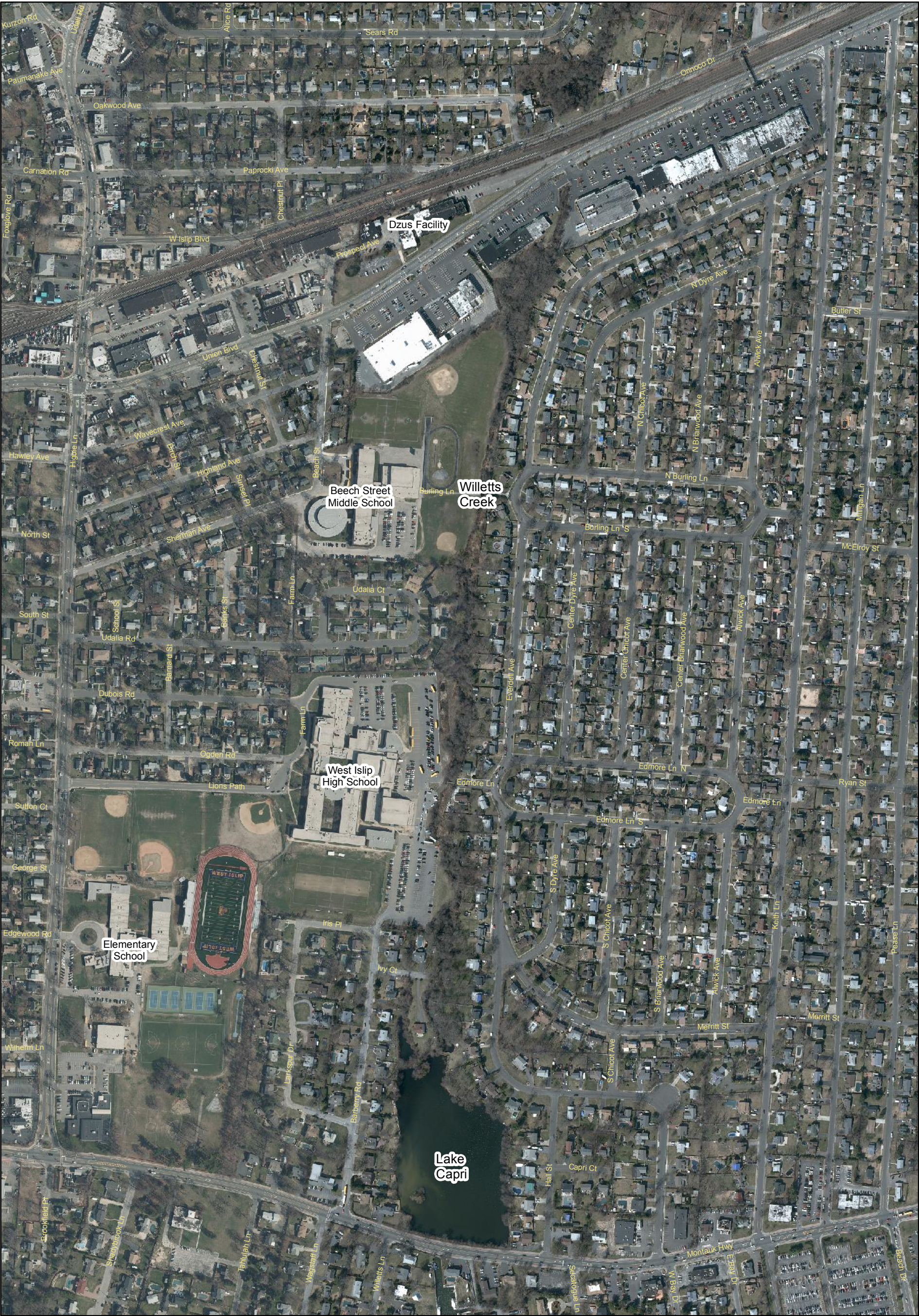
MULTI SITE G - Dzus Fasteners
SITE NO. 1-52-033


SITE PLAN

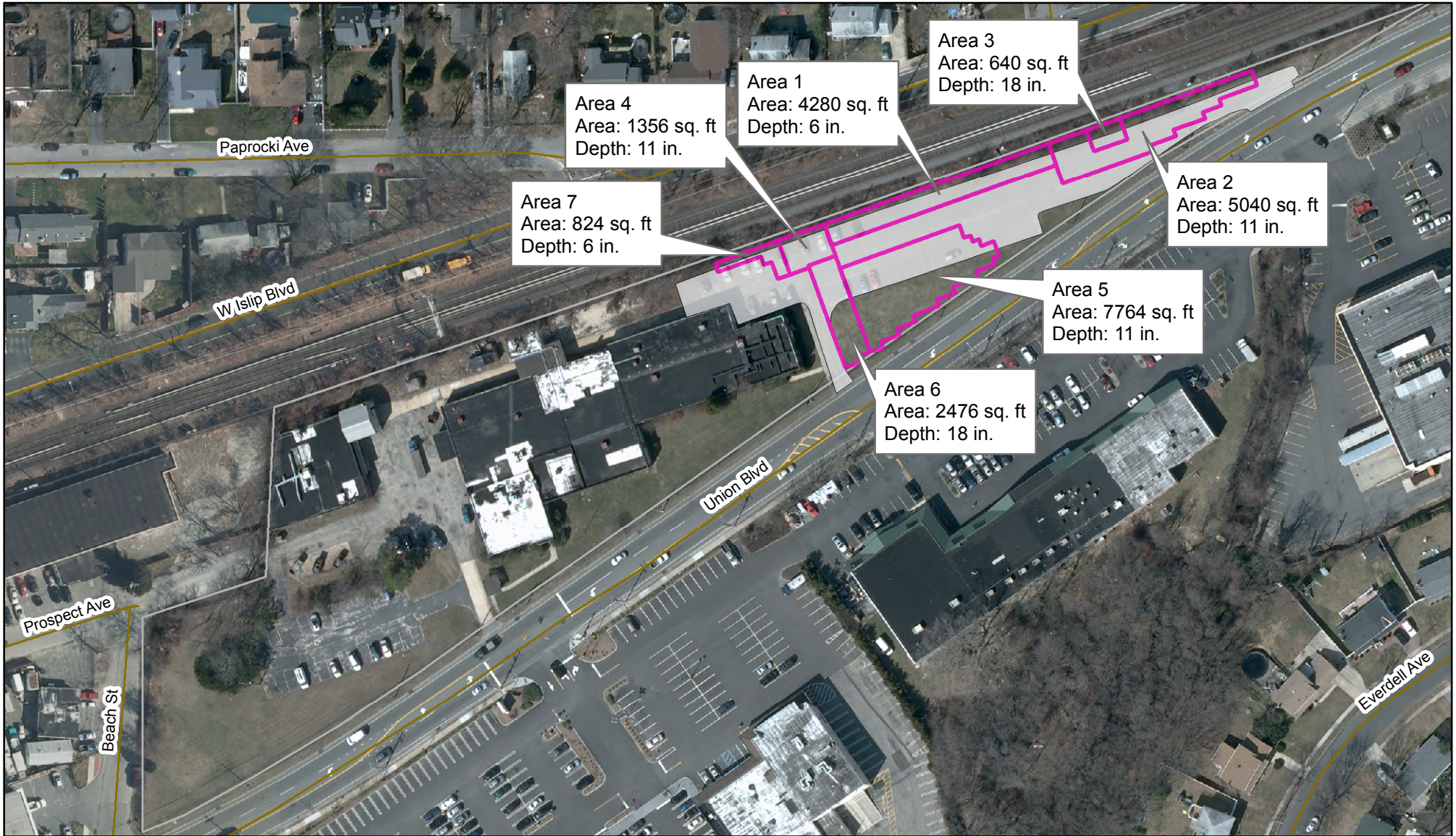
DATE :
JUNE 2010

SCALE :
AS SHOWN

DRAWING NO. :



<p>Reference: 2010 Half Foot 4 Band Long Island Zone New York Statewide Digital Orthoimagery Program</p>	<p>N 0 100 200 400 600 800 Feet</p>	Prepared by: AECOM		Prepared for: 	
		Multi Site G Operation, Maintenance & Monitoring			
		Aerial Map Dzus Fasteners Site			
		Date: December 2013	Scale: As Shown	Figure No. : 3	

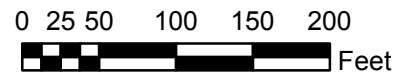


Legend

- Areas of Soil Stabilization
- Asphalt Cover

Sources:

1. Aerials, 2010 Half Foot 4 Band Long Island Zone New York Statewide Digital Orthoimagery Program
2. Lawler, Matusky and Skelly, As Built Survey, Soil Stabilization Plan-East Area Drawing, Revised 1996.



Prepared by:

AECOM

Prepared for:



Multi Site G Operation, Maintenance & Monitoring

Location of Soil treatment Cells
Dzus Fasteners Site

Date:
April 2014

Scale:
As Shown

Figure No. :
4



Legend

- Site
- Rip Rap

0 50 100 200
 Feet

Sources:

1. Aerials, 2010 Half Foot 4 Band Long Island Zone New York Statewide Digital Orthoimagery Program
2. Approximate rip rap location based on Construction Certification Report, EarthTech 2000.

Prepared by:

AECOM

Prepared for:



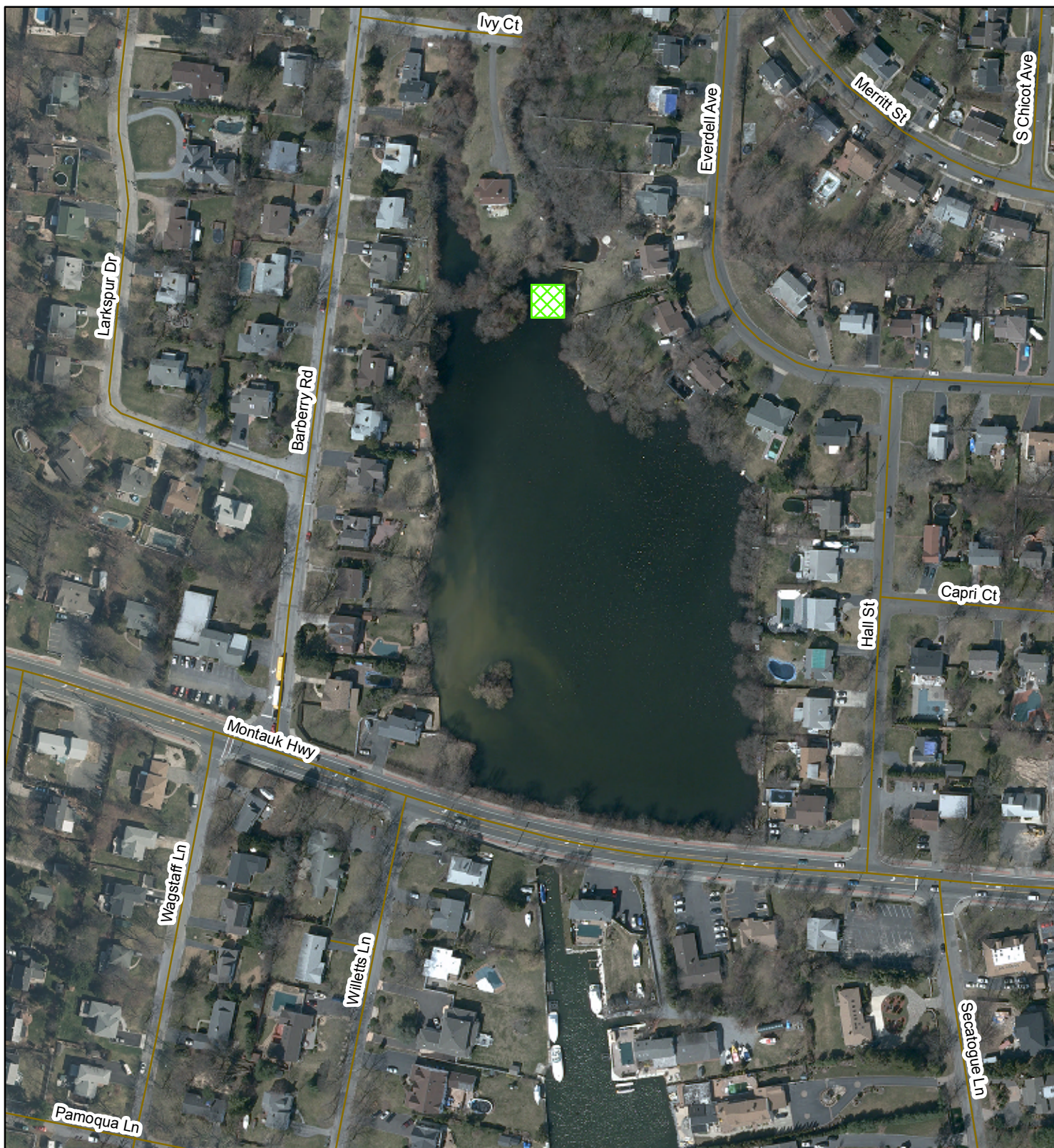
Multi Site G Operation, Maintenance & Monitoring

Extent of Rip Rap in Willets Creek
Dzus Fasteners Site

Date:
June 2013


Scale:
As Shown

Figure No. :
5



Legend

 Rip Rap

0 50 100 200
 Feet

Sources:

1. Aerials, 2010 Half Foot 4 Band Long Island Zone New York Statewide Digital Orthoimagery Program
2. Are of rip rap approximated.

Prepared by:

AECOM

Prepared for:



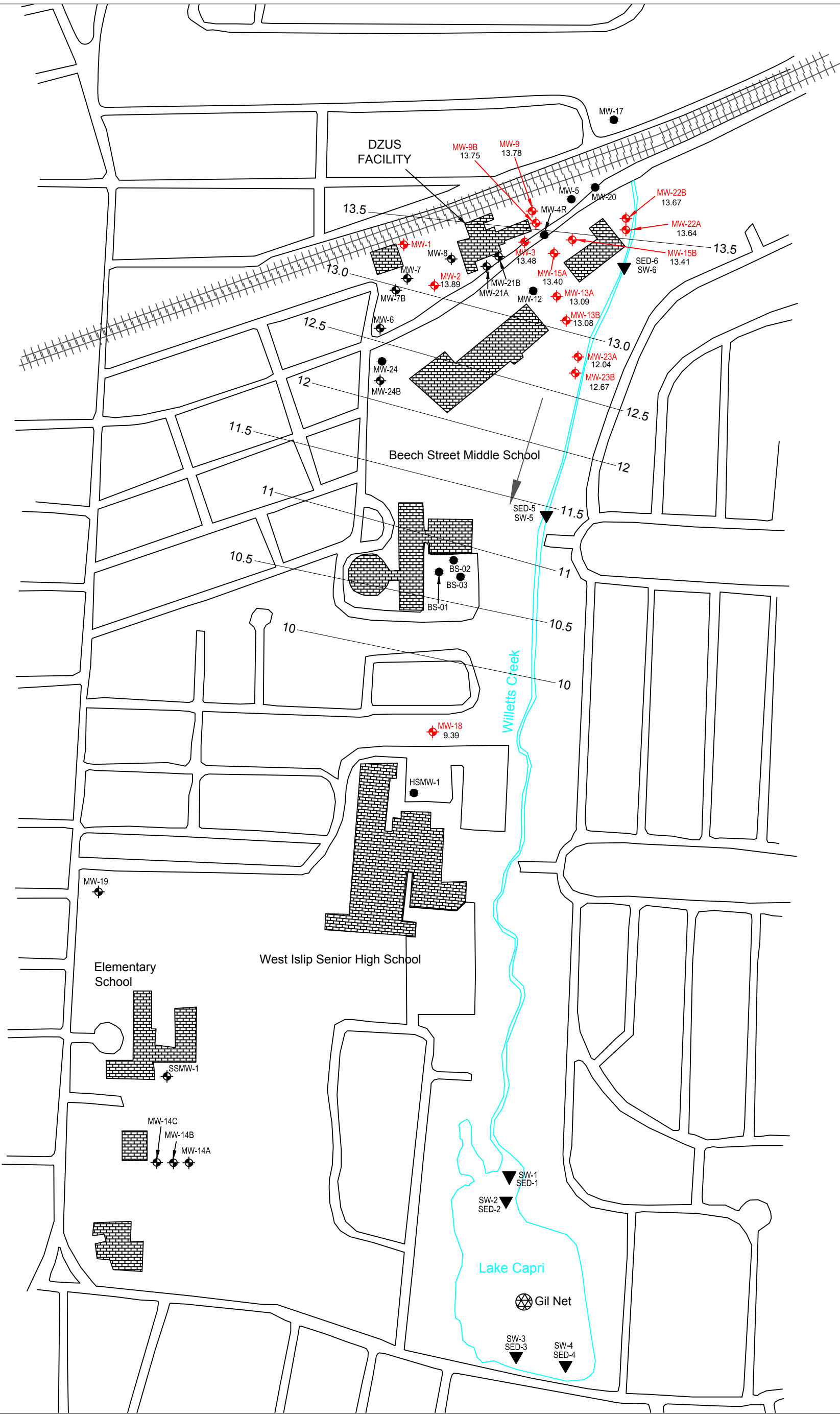
Multi Site G Operation, Maintenance & Monitoring

Extent of Rip Rap in Lake Capri
Dzus Fasteners Site

Date:
May 2014

Scale:
As Shown

Figure No. :
5A



LEGEND:

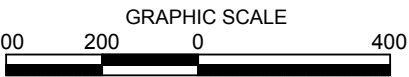
- EXISTING WELLS INCLUDED IN LONG TERM MONITORING (MW-1 was damaged in December 2007.)
- EXISTING MONITORING WELLS
- MISSING MONITORING WELLS

RAILROAD TRACKS

(9.39) GROUNDWATER ELEVATIONS IN FEET ABOVE MEAN SEA LEVEL

10.0 GROUNDWATER CONTOUR INTERVAL - 0.5 ft

DIRECTION OF GROUNDWATER FLOW



Scale in Feet

Prepared by :

AECOM

SUBMITTED BY :

PK

DRAWN BY :

SC/jk

APPROVED BY :

PK

MULTI SITE G - Dzus Fasteners

SITE NO. 1-52-033

GROUNDWATER CONTOUR MAP
AUGUST 22, 2012

DATE :

NOV. 2012

SCALE :

AS SHOWN

DRAWING NO. :

6

File: J:\Project\Zdus\Cadd\Drawings\GW tal Metal-2012-August-2014-04-23.dwg Layout: Fig7 User: karchi1 Plotted: Apr 23, 2014 - 11:17am



Compound	MW-9B							
	Jun-06	Aug-07	Nov-08	Mar-10	May-11	May-11	Aug-12	Aug-12
	U	U	U	U	U	F	U	F
Antimony	1.8 B	4.6 B	ND	ND	ND	ND	ND	ND
Iron	561	429	134 B	286 N	528	31.8 B	39.5 B	ND
Manganese	211	306	171	69.5	92.4	ND	ND	ND
Sodium	8,070	10,100	11,800	7,660	6,730	6,650	21,400 E	19,700
Selenium	ND	ND	ND	12.7 B	ND	ND	ND	ND

Compound	MW-1					
	Jun-06	Aug-07	Nov-08	Mar-10	May-11	Aug-12
	U	U	U	U	U	U
Cadmium	23.9	5.1	NA	NA	NA	NA
Iron	13,200	12,600	NA	NA	NA	NA
Sodium	22,500	23,100	NA	NA	NA	NA
Thallium	1.9 B	5.5 B	NA	NA	NA	NA

Compound	MW-2							
	Jun-06	Aug-07	Nov-08	Mar-10	May-11	May-11	Aug-12	Aug-12
	U	U	U	U	U	F	U	F
Antimony	ND	7.3 B	ND	9.4 B	ND	ND	ND	ND
Cadmium	4.2 B	8.6	2.7 B	10.4	ND	ND	ND	ND
Iron	14,900	25,200	23,300	12,000 N	88,900	17,600	1,590 E	1,060
Manganese	518	989	2,150	768	882	655	124	115
Sodium	21,500	66,200	18,600	18,200	25,200	24,100	24,400 E	23,500
Thallium	2.3 B	6.3 B	ND	ND	ND	ND	ND	ND

Compound	MW-3							
	Jun-06	Aug-07	Nov-08	Mar-10	May-11	May-11	Aug-12	Aug-12
	U	U	U	U	U	F	U	F
Antimony	ND	ND	ND	7.2 B	ND	ND	10.7 B	ND
Cadmium	77.4	74.4	70.8	98.4	73.5	13.1	16.3	15.1
Iron	4,430	649	253	3,680 N	7,430	ND	51 B	ND
Manganese	423	301	262	553	980	ND	ND	ND
Selenium	ND	8.4 B	ND	10.6 B	ND	ND	ND	ND
Sodium	27,700	31,000	25,000	20,700	20,400	19,400	23,400 E	23,000
Thallium	2.5 B	ND	ND	ND	ND	ND	ND	ND

Compound	MW-13A							
	Jun-06	Aug-07	Nov-08	Mar-10	May-11	May-11	Aug-12	Aug-12
	U	U	U	U	U	F	U	F
Cadmium	174	94.1	67.7	267	373	10.3	93.5	64.4
Iron	12,700	3,490	300	749 N	2,310	ND	3,690	1580
Manganese	9,560	8,040	16,400	33,900	61,600	1,720	6,190	3,430
Sodium	94,500	77,500	21,700	247,000	38,400	37,500	47,000	46,900
Thallium	44	ND	11.7 B	88.2	ND	ND	9.2 B	ND

Compound	MW-13B							
	Jun-06	Aug-07	Nov-08	Mar-10	May-11	May-11	Aug-12	Aug-12
	U	U	U	U	U	F	U	F
Cadmium	15	9.8	2.3 B	4.2 B	2.2 B	ND	1.5 B	1.1 B
Iron	614	404	106 B	286 N	469	ND	ND	ND
Manganese	621	426	153	243	148	ND	54.3	19.7 B

Compound	MW-18							
	Jun-06	Aug-07	Nov-08	Mar-10	May-11	May-11	Aug-12	Aug-12
	U	U	U	U	U	F	U	F
Antimony	ND	ND	5.1 B	12.2 B	ND	ND	ND	ND
Cadmium	3 B	1.2 B	9.8	18.1	1.3 B	ND	ND	ND
Iron	1,150	1,320	114 B	4,620	2,890	ND	35.3 B	ND
Manganese	6,270	4,490	2,870	10,100 *	3,450	ND	113	23.4 B
Selenium	ND	ND	ND	16.4 B	ND	ND	ND	ND
Thallium	26.5	ND	ND	64.5	ND	ND	ND	ND

Compound	MW-9							
	Jun-06	Aug-07	Nov-08	Mar-10	May-11	May-11	Aug-12	Aug-12
	U	U	U	U	U	F	U	F
Arsenic	32.6	16.2 B	ND	11.4 B	11.5 B	4.9 B	ND	ND
Cadmium	32.8	22.4	15.5	17.5	18.7	9.5	4.9 B	4.4 B
Chromium	125	62.2	35.3	62.7	85.5	2.9 B	8.3 B	4 B
Iron	21,600	12,400	3,670	11,300 N	11,600	1,760	556 E	ND
Sodium	25,500	52,100	16,100	29,100	72,800	68,700	26,300 E	25,900

Compound	MW-22B							
	Jun-06	Aug-07	Nov-08	Mar-10	May-11	May-11	Aug-12	Aug-12
	U	U	U	U	U	F	U	F
Antimony	ND	4.7 B	ND	8.7 B	ND	ND	ND	ND
Cadmium	29 B	4.4 B	1.2 B	1.7 B	ND	ND	ND	ND
Iron	4,600	1,120	518	358	164 B	ND	110 B	ND
Manganese	2,310	2,440	775	940 *	589	342	748	726
Selenium	ND	ND	ND	19 B	ND	ND	ND	ND
Thallium	20.1 B	3.5 B	ND	ND	ND	ND	ND	ND

Compound	MW-22A							
	Jun-06	Aug-07	Nov-08	Mar-10	May-11	May-11	Aug-12	Aug-12
	U	U	U	U	U	F	U	F
Antimony	1.7 B	5.2 B	ND	13 B	ND	ND	ND	ND
Cadmium	38.9	22.1	13.5	13.7	6.8	ND	ND	ND
Iron	70,400	22,400	22,000	61,100	16,700	2,260	2,700	2,690
Manganese	1,280	1,190	1,030	912 *	683	780	437	443
Selenium	8.7 B	ND	ND	24.3 B	ND	ND	ND	ND
Sodium	95,200	69,400	39,900	57,800	100,000	134,000	59,700	61,000
Thallium	ND	2.8 B	ND	ND	ND	ND	ND	ND

Compound	MW-15B							
	Jun-06	Aug-07	Nov-08	Mar-10	May-11	May-11	Aug-12	Aug-12
	U	U	U	U	U	F	U	F
Iron	4,780	1,320	875	NA	1,410	1,130	1,510 E	48.4 B
Sodium	46,600	45,200	43,900	NA	40,600	40,600	40,800 E	39,100
Thallium	3 B	ND	ND	NA	ND	ND	ND	ND

Compound	MW-15A							
	Jun-06	Aug-07	Nov-08	Mar-10	May-11	May-11	Aug-12	Aug-12
	U	U	U	U	U	F	U	F
Cadmium	28.8	29.1	33.9	62.3	63	12.2	16.8	9.7
Iron	2,320	158 B	ND	1,000 N	164 B	ND	ND	ND
Manganese	370	929	895	2,850	1,510	55.7	238	41.1 B
Sodium	18,000	13,300	9,040	17,100	19,500	19,800	20,400 E	20,400
Thallium	1.9 B	ND	ND	7.3 B	ND	ND	ND	ND

Compound	MW-23A							
	Jun-06	Aug-07	Nov-08	Mar-10	May-11	May-11	Aug-12	Aug-12
	U	U	U	U	U	F	U	F
Antimony	1.8 B	5.8 B	ND	9.5 B	ND	ND	ND	ND
Cadmium	110	702	1,080	704	924	9.5	31.7	3.3 B
Iron	10,300	29,700	13,100	11,500	15,200	2,030	1,860 E	602
Manganese	1,100	612	1,390	1,410 *	1,600	1,480	1,110	1,170
Selenium	1.3 B	6.1 B	ND	13.5 B	ND	ND	ND	ND
Sodium	60,200	32,400	37,800	64,600	67,900	70,800	74,100 E	73,400
Thallium	9.3 B	ND	ND	11.3 B	ND	ND	ND	ND

Compound	MW-23B							
	Jun-06	Aug-07	Nov-08	Mar-10	May-11	May-11	Aug-12	Aug-12
	U	U	U	U	U	F	U	F
Antimony	3.2 B	ND	ND	6.2 B	ND	ND	ND	ND
Cadmium	320	60	42.2	43.8	40.1	5.8	69.6	33.1
Chromium	74.9	13.9 B	4.3 B	61.6	12.6 B	8.5 B	10.7 B	7.8 B
Iron	8,220	2,140	1,270	7,870	5,200	36,100	279 E	117 B
Lead	35.7	10.3	17.7	43.9	22.6	ND	ND	ND
Manganese	548	508	52.1	398 *	126	169	138	135
Selenium	ND	8.6 B	ND	19.3 B	ND	ND	ND	ND
Sodium	2,390	3,870	2,200	84,400	18,900	18,500	15,000 E	14,700
Thallium	3.1 B	ND	ND	6.1 B	ND	ND	ND	ND

Compound	NYSDEC Criteria
Antimony	3
Arsenic	25
Cadmium	5
Chromium	50
Iron	300
Lead	25
Manganese	300
Selenium	10
Sodium	20,000
Thallium	0.5
U - Unfiltered sample	
F - Filtered sample	

LEGEND:

EXISTING WELLS INCLUDED IN LONG TERM MONITORING (MW-1 was damaged in December 2007.)

EXISTING MONITORING WELLS

MISSING MONITORING WELLS

ALL CONCENTRATIONS IN mg/Kg

BOLD RESULTS EXCEED CRITERION

RAILROAD TRACKS

Prepared by :

SUBMITTED BY :

PK

DRAWN BY :

SC/jk

APPROVED BY :

PK

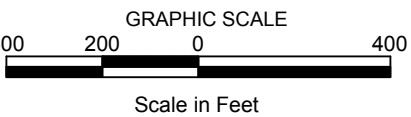
MULTI SITE G - Dzus Fasteners
SITE NO. 1-52-033

SUMMARY OF TAL METALS IN GROUNDWATER AUGUST 22, 2012

DATE :
NOV. 2012

SCALE :
AS SHOWN

DRAWING NO. :
7



MW-19

Elementary School

West Islip Senior High School

DZUS FACILITY

Beech Street Middle School

Willlets Creek



DZUS
FACILITY

Beech Street Middle School

West Islip Senior High School

Elementary
School

Willetts Creek

Lake Capri

Gil Net

Compound	SW-6					
	Jun-06	Aug-07	Nov-08	Mar-10	May-11	Sep-12
Antimony	ND	8 B	ND	ND	ND	ND
Cadmium	0.55 B	2.8 B	75.4	ND	ND	ND
Iron	5,400	2,170	4,010	639	2,280	6,840
Manganese	2,610	1,510 E	1,040	406	869	1,160
Selenium	ND	ND	ND	10.5 B	ND	ND
Sodium	29,200	33,600 E	26,000	20,500	33,800	32,100

Compound	SW-5					
	Jun-06	Aug-07	Nov-08	Mar-10	May-11	Sep-12
Antimony	1.5 B	4.4 B	ND	ND	ND	ND
Cadmium	5.7	5.6	3 B	5.1	8.8	4.1 B
Iron	632	599	1,060	959	4,080	690
Manganese	1,420	1,110	956	450	923	519
Sodium	21,100	21,800	18,100	20,300	26,900	28,100

Compound	SW-1					
	Jun-06	Aug-07	Nov-08	Mar-10	May-11	Sep-12
Antimony	ND	ND	6 B	ND	ND	ND
Iron	691	738	598	387	416	172 B
Manganese	1,050	862	1,610	996	1,000	552
Sodium	18,500	15,800	19,000	22,500	18,700	24,600

Compound	SW-3					
	Jun-06	Aug-07	Nov-08	Mar-10	May-11	Sep-12
Antimony	ND	ND	ND	7.2 B	ND	ND
Iron	788	280	772	332	311	144 B
Manganese	882	73.9 E	1,790	911	990	355
Sodium	18,300	16,800 E	17,700	23,300	18,800	23,500
Thallium	ND	ND	ND	5.9 B	ND	ND

Compound	SW-2					
	Jun-06	Aug-07	Nov-08	Mar-10	May-11	Sep-12
Antimony	ND	ND	ND	5.7 B	ND	ND
Iron	649	819	675	478	508	176 B
Manganese	1,010	819 E	1,560	968	1,080	564
Sodium	18,100	16,200 E	19,500	22,000	18,600	23,800
Thallium	ND	ND	ND	7.2 B	ND	ND

Compound	SW-4					
	Jun-06	Aug-07	Nov-08	Mar-10	May-11	Sep-12
Iron	610	609	741	344	322	152 B
Manganese	786	135 E	1,630	943	918	463
Sodium	18,100	16,600 E	17,800	22,900	18,700	23,900

LEGEND:

EXISTING WELLS INCLUDED
IN LONG TERM MONITORING
(MW-1 was damaged in December 2007.)

ALL CONCENTRATIONS IN mg/Kg

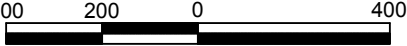
BOLD RESULTS EXCEED CRITERION

RAILROAD TRACKS

SURFACE WATER, SEDIMENT SAMPLE LOCATION

Compound	Surface Water Criteria
Antimony	3
Cadmium	5
Iron	300
Lead	50
Manganese	300
Selenium	10
Sodium	20,000
Thallium	0.5

GRAPHIC SCALE



Scale in Feet

Prepared by :

AECOM

SUBMITTED BY :

PK

DRAWN BY :

SC/jk

APPROVED BY :

PK

MULTI SITE G - Dzus Fasteners
SITE NO. 1-52-033

SUMMARY OF TAL
METALS IN SURFACE
WATER

DATE :
NOVEMBER 2012

SCALE :
AS SHOWN

DRAWING NO. :

8

File: J:\Project\Dzus\Tal 2012 Metal-2014-04-23.dwg Layout: Fig9 User: karcj1 Plotted: Apr 23, 2014 - 11:21am

Compound	SED-6					
	Jun-06	Aug-07	Nov-08	Mar-10	May-11	Sep-12
Antimony	0.076	0.38 B	2.6 N	0.38 B	0.44 BN	ND
Arsenic	0.97	0.84 B	6.4	0.79	2.7 *	0.64 B
Cadmium	0.23	0.31	101	0.31	ND	0.30
Chromium	2.4	3.4	41.8	4.4 *	15.9 *	5.4
Copper	28.3	6.3	77.3	9.4 *	21.5 *	8.0
Iron	3,290	2,900	25,600	2,810	36,900 *	2,120
Lead	7.9	10.3	109 E	9.5	39.7 N*	8.7
Manganese	102	30.4	978	21.3	118 *	16.2
Mercury	0.036 B	ND	0.15	ND	0.019 B	0.011 B
Nickel	1.8	1.9 BE	17.2	1.8 BE	10.1 *	2.0
Zinc	17.2	24.2	409 E	31 *	68.9 *	38.9

Compound	SED-5					
	Jun-06	Aug-07	Nov-08	Mar-10	May-11	Sep-12
Arsenic	0.6 B	0.52 B	8.2	6.5	9.3 *	1.6
Cadmium	0.43	1.6	52	28.8	73.5 *	1.7
Chromium	3.8	2.7	33.3	18.5 *	44 *	3.5
Copper	4.7	4.7	103	54 *	166 *	9.0
Iron	3,400	3,410	23,900	25,800	39,900 *	4,180
Lead	7.9	4.9	215 E	83.3	229 N*	9.4
Manganese	174	291	2,140	3,750	1,210 *	417
Mercury	0.016 B	0.0055 B	0.48	0.26	0.37	0.023 B
Nickel	1.6	1 B	19.2	8 E	22.5 *	1.9
Zinc	13.2	26.2	290 E	171 *	440 *	24.2

Compound	SED-1					
	Jun-06	Aug-07	Nov-08	Mar-10	May-11	Sep-12
Antimony	0.7 B	0.41 B	2.2 BN	6.4	ND	ND
Arsenic	7.9	1.5	8.7	16.1	15.2 *	18.1
Cadmium	47.8	11.6	61.4 N*E	69.2	81.2 *	89.8
Chromium	20.7	2.8	27.1 E	39.1 *	50 *	57.4
Copper	38.6	86.3	65.7	127 *	121 *	144
Iron	10,300	3,880	19,700 E	36,000	44,600 *	26,700
Lead	170	19.3	176 N*E	225	226 N*	289
Manganese	1,290	1,200	181 *	2,250	22,600 *	3,620
Mercury	0.21	0.0071 B	0.34	0.38	0.33 B	0.52
Nickel	11.4	3	19.4	24.1 E	24.1 *	27.3
Zinc	215	71.6	445 *E	493 *	572 *	642

Compound	SED-2					
	Jun-06	Aug-07	Nov-08	Mar-10	May-11	Sep-12
Arsenic	19.7	2 B	1.8	20.2	13.4 *	19.2
Cadmium	133	21.2	12.5 N*E	111	96.6 *	122
Chromium	33.7	7.7	6.5 E	49.4 *	45.2 *	47.7
Copper	210	19.6	15.6	97.7 *	80.2 *	91.0
Iron	20,300	8,940	3,850 E	27,500	17,300 *	25,400
Lead	315	40.7	25.8 N*E	375	315 N*	408
Manganese	153	1,300	769 *	3,510	1,480 *	3,790
Mercury	0.45	0.047 BN	0.018 B	0.35	0.50	0.49
Nickel	17.6	6.8 E	3.2 B	22 E	17.6 *	21.9
Zinc	402	138	67.9 *E	495 *	406 *	526

Compound	SED-3					
	Jun-06	Aug-07	Nov-08	Mar-10	May-11	Sep-12
Cadmium	1.5	27.7	1.7 N*E	22.3	16.1 *	14.1
Copper	2.7	16.7	32.4	32.5 *	10.9 *	8.5
Lead	9.2	44.2	34 N*E	85.9	46 N*	21.4
Manganese	89.8	568	908 *	357	1,090 *	132

Compound	SED-4					
	Jun-06	Aug-07	Nov-08	Mar-10	May-11	Sep-12
Arsenic	3.4	4.0	3.9	1.9	4.4 *	6.2 B
Cadmium	32.3	32.3	15.8 N*E	14.8	47.3 *	79.5
Chromium	8.6	12.5	6.8 E	8.1 *	21.7 *	45.4
Copper	21.6	35.7	17.1	22.6 *	49.5 *	117
Lead	71.2	193	34.3 N*E	60.6	129 N*	297
Manganese	837	845	11,700 *	272	1,150 *	1,820
Mercury	0.096	0.059 BN	0.21	0.082	0.18	0.39
Silver	ND	ND	1.1 B	ND	ND	ND
Zinc	122	186	110 *E	71.3 *	232 *	323

LEGEND:

EXISTING WELLS INCLUDED IN LONG TERM MONITORING (MW-1 was damaged in December 2007.)
ALL CONCENTRATIONS IN mg/Kg

BOLD RESULTS EXCEED CRITERION

RAILROAD TRACKS

SURFACE WATER, SEDIMENT SAMPLE LOCATION

Compound	NYSDEC Sediment Criteria	
	Lowest Effect	Highest Effect
Antimony	2.0	25
Arsenic	6.0	33
Cadmium	0.6	9
Chromium	26	110
Copper	16	110
Iron	20,000	20,000
Lead	31	110
Manganese	460	1,100
Mercury	0.15	1.3
Nickel	16	50
Zinc	120	270

GRAPHIC SCALE



Scale in Feet

Prepared by :

AZCOM

SUBMITTED BY :

PK

DRAWN BY :

SC/jk

APPROVED BY :

PK

MULTI SITE G - Dzus Fasteners
SITE NO. 1-52-033

SUMMARY OF TAL METALS IN SEDIMENT

DATE :

NOV. 2012

SCALE :

AS SHOWN

DRAWING NO. :

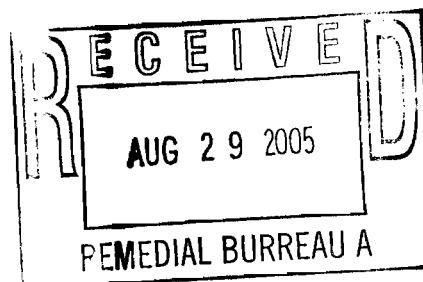
9

Appendix A

Deed Restriction



VIA FEDERAL EXPRESS
August 24, 2005



Mr. Gerard Burke
Central Office - New York State Department
of Environmental Conservation
625 Broadway, 11th Floor
Albany, NY 12233-7015

Re: *DFCI Solutions, Inc. f/k/a Dzus Fastener Co. Inc.*
Inactive Hazardous Waste Disposal Site No. 1-52-033

Dear Mr. Burke:

This will confirm our recent telephone conversations including August 23, 2005.

DFCI Solutions, Inc. is the owner of its company premises at 425 Union Boulevard, West Islip, New York. The property is listed on the Registry of Inactive Hazardous Waste Disposal Sites as Site No. 1-52-033, and is subject to an Order on Consent W1-0538-90-04. At this time, we respectfully request that the Site boundary be redefined as shown on Appendix "A" attached. Also the Site be reclassified from Class "2" to Class "5".

For your information, I herewith forward a copy of the Declaration of Covenants and Restrictions which we filed with Suffolk County on June 9, 2004. Should you have any questions, please do not hesitate to contact me at #1-631-669-0494 X 154; Fax #1-631-669-4084 or marie@dfcis.com.

Thank you in advance for your consideration and approval, in this matter of great importance to our small business.

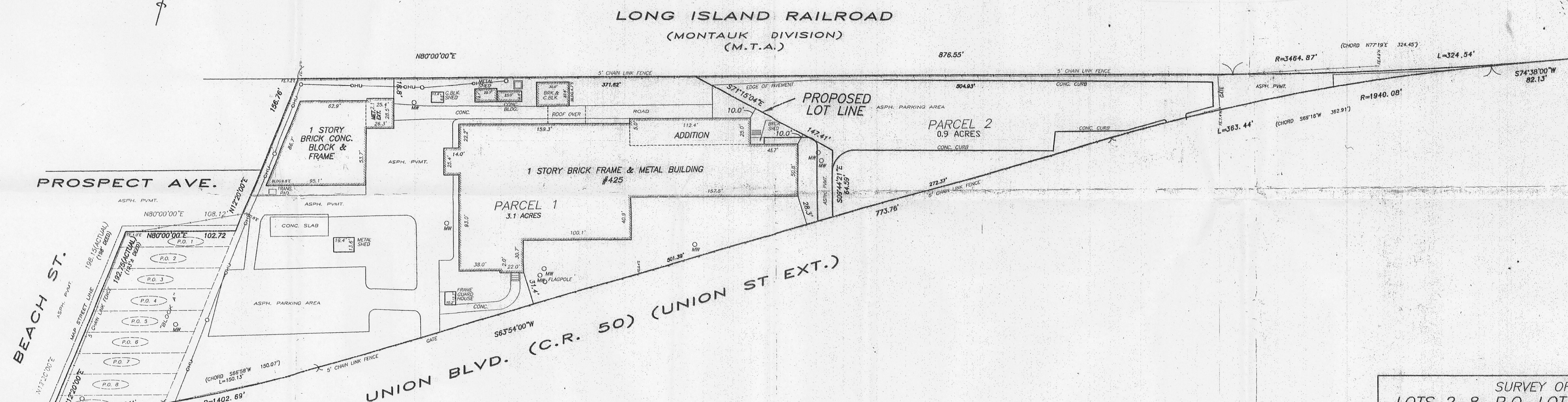
Sincerely yours,

A handwritten signature in cursive script, appearing to read "Olivia Marie".

Olivia Marie
Vice President
Enclosures (2)

DFCI Solutions, Inc.

Sales Office: 5401 S. Kirkman Road Suite 310 Orlando, FL 32819 Phone: 407.926.0231 Fax: 407.926.0232
Factory: 425 Union Boulevard West Islip, New York 11795 Phone: 631.669.0494 Fax: ~~631.669.0766~~
Web: www.dfcis.com Email Quotations: quotes@dfcis.com Email Other: marketing@dfcis.com



SURVEY OF
LOTS 2-8, P.O. LOTS 1,9 & 10
MAP OF
"BABYLON DEVELOPMENT OF THE
LONG ISLAND SEASHORE CO. INC."
SITUATE AT
WEST ISLIP
TOWN OF ISLIP
SUFFOLK COUNTY, NEW YORK
SCALE 1"=50' NOVEMBER 26, 2003

AES
AMERICAN ENGINEERING SERVICES, P.C.
1800 OLD COUNTRY ROAD - SUITE 202
PLAINVIEW, NEW YORK 11803
516.454.7500
FAX 454.1218

surveyors engineers architects planners

STEPHEN E. RAVIN, L.S. NO. 49664

FILE NO. 92
FILED: 4/5/1921
JOB NO. 9959
REVISIONS:
N.C.T.M. DIST. 500 SEC. 455 BLK. 01 LOT 64.1



SUFFOLK COUNTY CLERK
RECORDS OFFICE
RECORDING PAGE

Type of Instrument: DECLARATION/DOP
Number of Pages: 8
Receipt Number : 04-0065429

Recorded: 06/09/2004
At: 09:36:02 AM

LIBER: D00012323
PAGE: 907

District:	Section:	Block:	Lot:
0500	455.00	01.00	064.001

EXAMINED AND CHARGED AS FOLLOWS

Received the Following Fees For Above Instrument

		Exempt			Exempt
Page/Filing	\$24.00	NO	Handling	\$5.00	NO
COE	\$5.00	NO	NYS SRCHG	\$15.00	NO
TP-584	\$0.00	NO	Notation	\$0.00	NO
Cert.Copies	\$15.60	NO	RPT	\$30.00	NO
SCTM	\$0.00	NO			

Fees Paid \$94.60

THIS PAGE IS A PART OF THE INSTRUMENT
THIS IS NOT A BILL

Edward P.Romaine
County Clerk, Suffolk County

Number of pages

8

TORRENS

Serial # _____

Certificate # _____

Prior Ctf. # _____

RECORDED
2004 Jun 09 09:36:02 AM
Edward P. Romaine
CLERK OF
SUFFOLK COUNTY
L D00012323
P 907

Deed / Mortgage Instrument

Deed / Mortgage Tax Stamp

Recording / Filing Stamps

3

FEES

Page / Filing Fee 24

Handling 5.00

TP-584 _____

Notation _____

EA-52 17 (County) _____

EA-5217 (State) _____

R.P.T.S.A. 30

Comm. of Ed. 5.00

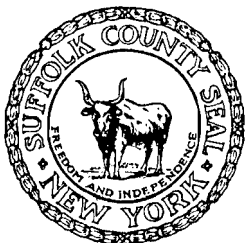
Affidavit _____

3 Certified Copy 1560

NYS Surcharge 15.00

Other _____

Sub Total 29



Sub Total 65

Grand Total 9460

Mortgage Amt. _____

1. Basic Tax _____

2. Additional Tax _____

Sub Total _____

Spec./Assit. _____

or

Spec. /Add. _____

TOT. MTG. TAX _____

Dual Town _____ Dual County _____

Held for Appointment _____

Transfer Tax _____

Mansion Tax _____

The property covered by this mortgage is or will be improved by a one or two family dwelling only.

YES _____ or NO _____

If NO, see appropriate tax clause on page # _____ of this instrument.

4

Dist 5500

Section 4500

Block 0100

Lot 004001

5

Community Preservation Fund

Real Property
Tax Service
Agency
Verification



Consideration Amount \$ _____

CPF Tax Due \$ _____

Improved _____

Vacant Land _____

TD _____

TD _____

TD _____

6

Satisfactions/Discharges/Releases List Property Owners Mailing Address

RECORD & RETURN TO:

DFCI SOLUTIONS, INC.
ATT: OLIVIA MARIE
VICE PRESIDENT
425 UNION BOULEVARD
WEST ISLIP, NY 11795

7

Title Company Information

Co. Name

Title #

8

Suffolk County Recording & Endorsement Page

This page forms part of the attached DECLARATION OF COVENANTS AND RESTRICTIONS made by:
(SPECIFY TYPE OF INSTRUMENT)

DFCI SOLUTIONS, INC.

The premises herein is situated in
SUFFOLK COUNTY, NEW YORK.

TO

In the Township of ISLIP
In the VILLAGE _____
or HAMLET of _____

BOXES 6 THRU 8 MUST BE TYPED OR PRINTED IN BLACK INK ONLY PRIOR TO RECORDING OR FILING.

(over)

DECLARATION of COVENANTS and RESTRICTIONS

THIS COVENANT, made the 2nd day of June 2004, by **DFCI SOLUTIONS, INC.** - formerly known as **DZUS FASTENER CO. INC.**; referred to herein as "**DFCI**") a corporation organized and existing under the laws of the State of New York and having an office for the transaction of business at 425 Union Blvd., West Islip, NY 11795.

WHEREAS, DFCI is the owner of an inactive hazardous waste disposal Site which is listed in the Registry of Inactive Hazardous Waste Disposal Sites in New York State as Site Number 1-52-033, located at 425 Union Blvd., West Islip, NY 11795, consisting of approximately 4.02 acres, P.O. Lots 2-8 and 101, 9 and 10, Block A, Map of Babylon Development by the Long Island Seashore Co., Inc. filed April 5, 1921, File No. 92 in the Office of the County Clerk at the County of Suffolk hereinafter referred to as the "Property"; and

WHEREAS, the Property is the subject to Order on Consent Index # W1-0538-90-04 issued by the New York State Department of Environmental Conservation to DFCI on December 13, 1993; and

WHEREAS, the New York State Department of Environmental Conservation set forth a remedy to eliminate or mitigate all significant threats to the environment presented by hazardous waste disposal on the Site in an Operable Unit 1 Record of Decision ("OU-1 ROD") dated March 1995, and such OU-1 ROD or the Work Plan for the implementation of the OU-1 ROD required that the Property be subject to restrictive covenants.

WHEREAS, the remedy selected in the OU-1 ROD has been implemented, except for the on-going Operation, Maintenance, and Monitoring phase.

NOW, THEREFORE, DFCI, for itself and its successors and/or assigns, covenants that:

First, the Property subject to this Declaration of Covenants and Restrictions is described in a Metes and Bounds Description attached to this declaration as Appendix "A" and made a part hereof.

Second, unless prior written approval by the New York State Department of Environmental Conservation 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, no person shall engage in any activity that will, or that reasonably is anticipated to, prevent or interfere significantly with any proposed, ongoing or completed program under the OU-1 ROD at the Property or that will, or is reasonably foreseeable to, expose the public health or the environment to a significantly increased threat of harm or damage.

Third, the owner of the Property shall prohibit any excavation or disturbance of the asphalt cover in the Treatment Cell Area, which Treatment Cell Area is described in the Metes and Bounds description in Appendix "B1" and as Parcel 2 in the survey by American Engineering Services, P.C. dated November 26, 2003, in Appendix "B2", unless the owner of the Property first obtains permission to do so from the Relevant Agency.

Fourth, the owner of the Property shall protect the Treatment Cell Area from the effects of erosion by maintaining the final topsoil/asphalt cover as agreed upon between DFCI and the Department, or after obtaining the written approval of the Relevant Agency, by capping the Property with another material. Currently the Treatment Cell Area has an asphalt cover.

Fifth, the owner of the Property shall prohibit the Property from ever being used for purposes other than for non-residential commercial/industrial uses, excluding day-care and health care facilities, without the express written waiver of such prohibition by the Relevant Agency. Except as provided herein and in the OU-1 ROD, this Declaration of Covenants and Restrictions is not intended to impair any legal use of the Property.

Sixth, the owner of the Property shall prohibit the use of the groundwater underlying the Property without treatment rendering it safe for drinking water or industrial purposes, as appropriate, unless the user first obtains permission to do so from the Relevant Agency.

Seventh, the owner of the Property shall continue in full force and effect any institutional and engineering controls the Department required owner to put into place and maintain unless the owner first obtains permission to discontinue such controls from the Relevant Agency. Currently the institutional and engineering controls in place consist of the Treatment Cell asphalt cover, the maintenance thereof, and the on-going sampling and maintenance of the groundwater monitoring wells under the OU-1 ROD, which monitoring wells are being maintained by the DEC. The DEC is hereby granted access to the Property to continue the maintenance of such monitoring wells until such time as it determines such wells are no longer required. Such monitoring wells are noted in Appendix "B2".

Eighth, the owner of the Property shall provide an annual certification to the Relevant Agency that the institutional and engineering controls are still in place, unless the DEC determines otherwise.

STATE OF NEW YORK
COUNTY OF SUFFOLK

SS:

I EDWARD P. ROMAIN, CLERK OF THE COUNTY OF SUFFOLK AND CLERK OF THE SUPREME COURT OF THE STATE OF NEW YORK IN AND FOR SAID COUNTY (SAID COURT BEING A COURT OF RECORD) DO HEREBY CERTIFY THAT I HAVE COMPARED THE ANNEXED COPY OF DEED LIBER 12323 AT PAGE 907 RECORDED 6-9-04 AND THAT IT IS A JUST AND TRUE COPY OF SUCH ORIGINAL DECLARATION AND OF THE WHOLE THEREOF.

IN TESTIMONY WHEREOF, I HAVE HEREUNTO SET MY HAND AND AFFIXED THE SEAL OF SAID COUNTY AND COURT THIS 9th DAY OF June 2004

Edward P. Romaine
CLERK

12-0189, 12/97cg

By: Stephen Meshover

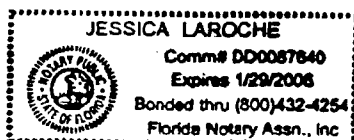
Stephen Meshover, President

STATE OF FLORIDA)

) ss.:

COUNTY OF ORANGE)

On the 09 day of June in the year 2004, before me, the undersigned, a Notary Public in and for said State, personally appeared STEPHEN MESHOWER, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name(s) is (are) subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their capacity(ies), and that by his/her/their signature(s) on the instrument, the individual(s), or the person upon behalf of which the individual(s) acted, executed the instrument.



Jess Laroche
Notary Public

Sixth, the owner of the Property shall prohibit the use of the groundwater underlying the Property without treatment rendering it safe for drinking water or industrial purposes, as appropriate, unless the user first obtains permission to do so from the Relevant Agency.

Seventh, the owner of the Property shall continue in full force and effect any institutional and engineering controls the Department required owner to put into place and maintain unless the owner first obtains permission to discontinue such controls from the Relevant Agency. Currently the institutional and engineering controls in place consist of the Treatment Cell asphalt cover, the maintenance thereof, and the on-going sampling and maintenance of the groundwater monitoring wells under the OU-1 ROD, which monitoring wells are being maintained by the DEC. The DEC is hereby granted access to the Property to continue the maintenance of such monitoring wells until such time as it determines such wells are no longer required. Such monitoring wells are noted in Appendix "B2".

Eighth, the owner of the Property shall provide an annual certification to the Relevant Agency that the institutional and engineering controls are still in place, unless the DEC determines otherwise.


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, consents to the enforcement by the Relevant Agency of the prohibitions and restrictions recorded by this Declaration of Covenants and Restrictions, and hereby covenants not to contest the authority of the Department to seek enforcement.

Tenth, the owner of the Property may petition the Department to modify or terminate this Declaration of Covenants and Restrictions at such time as it can certify that reliance upon such covenants and restrictions is no longer required to meet the goals of the Remedial Program under the OU-1 ROD. Such certification shall be made by a Professional Engineer. The Department shall not unreasonably withhold its consent to such petition.

Eleventh, any deed of conveyance of the Property, or any portion thereof, shall recite, unless the Relevant Agency has consented to the termination of such covenants and restrictions that said conveyance is subject to this Declaration of Covenants and Restrictions.

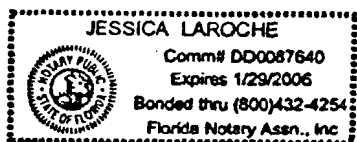
IN WITNESS WHEREOF, the undersigned has executed this instrument the day written below.

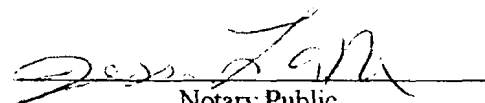
DFCI SOLUTIONS, INC.

By: 
Stephen Meshover, President

STATE OF FLORIDA)
) ss.:
COUNTY OF ORANGE)

On the 16th day of June in the year 2004, before me, the undersigned, a Notary Public in and for said State, personally appeared STEPHEN MESHOVER, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name(s) is (are) subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their capacity(ies), and that by his/her/their signature(s) on the instrument, the individual(s), or the person upon behalf of which the individual(s) acted, executed the instrument.




Notary Public

APPENDIX "A"

METES AND BOUND DESCRIPTION OF PROPERTY

SCHEDULE "A"

ALL that plot, piece or parcel of land, with the buildings and improvements thereon erected, situate lying and being at West Islip, Town of Islip, County of Suffolk, State of New York, being more particularly bounded and described as follows;

BEGINNING at a point on the north side of Union Avenue (C.R. 50), said point being the intersection of the north line of Union Avenue (C.R. 50) and the east line of Beach Street (as widened).

RUNNING THENCE from said point of BEGINNING northerly along the east side of Beach Street (as widened) North 12 degrees 20 minutes 00 seconds East a distance of 192.75 feet; to the southerly line of Prospect Avenue;

THENCE easterly along said line of Prospect Avenue (as widened) North 80 degrees 00 minutes 00 seconds East a distance of 102.72 feet; to a point on the easterly line of Prospect Avenue;

THENCE northerly along said line North 12 degrees 20 minutes East a distance of 156.76 feet; to the southerly side line of land now or formerly of Long Island Railroad (M.T.A.) (Montauk division);

THENCE along said lands the following courses; North 80 degrees 00 minutes 00 seconds East a distance of 876.55 feet;

THENCE along the arc of a curve bearing to the left, having a radius of 3464.87 feet and a length of 324.54 feet, to a point on the northerly line of Union Avenue (C.R. 50);

THENCE along the north line of Union Avenue (C.R. 50) the following courses; South 74 degrees 38 minutes 00 seconds West a distance of 82.13 feet;

THENCE, along the arc of a curve bearing to the left, having a radius of 1940.08 feet and a length of 363.44 feet;

THENCE South 63 degrees 54 minutes 00 seconds West a distance of 773.76 feet;

THENCE, along the arc of a curve bearing to the right having a radius of 1402.69 feet and a length of 259.24 feet to the point or place of BEGINNING.

Containing within said bounds 4.0 acres more or less.

APPENDIX "B1"

TREATMENT CELL AREA METES AND BOUNDS DESCRIPTION

ALL that plot, piece or parcel of land, with the buildings and improvements thereon erected, situate lying and being at West Islip, Town of Islip, County of Suffolk, State of New York, being more particularly bounded and described as follows;

BEGINNING at a point on the south line of lands now or formerly of Long Island Railroad, said point being North 12 degrees 20 minutes 00 seconds East a distance of 156.76 feet;

THENCE North 80 degrees 00 minutes 00 seconds East a distance of 371.62 feet from the southeast corner of the terminus of Prospect Avenue;

RUNNING THENCE from said point of beginning along the south line of said lands of Long Island Railroad the following courses; North 80 degrees 00 minutes 00 seconds East a distance of 504.93 feet;

THENCE along the arc of a curve bearing to the left, having a radius of 3464.87 feet and a length of 324.54 feet to a point on the North side of Union Avenue (C.R. 50);

THENCE along the arc of a curve bearing to the left, having a radius of 1940.08 feet and a length of 363.44 feet;

THENCE along the North side of Union Avenue (C.R. 50) the following courses; South 74 degrees 38 minutes 00 seconds West a distance of 82.13 feet;

THENCE along the arc of a curve bearing to the left, having a radius of 1940.08 feet and a length of 363.44 feet;

THENCE South 63 degrees 54 minutes 00 seconds West a distance of 272.37 feet to a point on the North side of Union Avenue (C.R. 50);

THENCE in a northerly direction the following courses; North 09 degrees 44 minutes 21 seconds East a distance of 64.59 feet;

THENCE North 71 degrees 15 minutes 04 seconds East a distance of 147.41 feet to the point or place of BEGINNING.

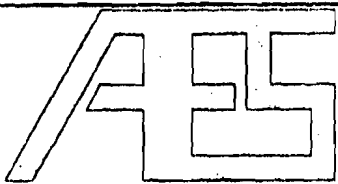
Containing within said bounds 0.9 acres more or less.

APPENDIX B 2
PS 1/3

SURVEY OF
LOTS 2-8, P.O. LOTS 1,9 & 10
MAP OF

"BABYLON DEVELOPMENT OF THE
LONG ISLAND SEASHORE CO. INC."
SITUATE AT

SCALE 1"=50' NOVEMBER 26, 2003



1601 J.F. COLLIER ROAD SUITE 202
PLAINVILLE, NEW YORK 12903
PHONE 454-7500
FAX 454-1715

AMERICAN ENGINEERING SERVICES, P.C.

surveyors engineers architects planners



STEPHEN E. RAY, N.Y.S. NO. 49664

FILE NO. 92

FILED: 4/5/1921

JOB NO. 9959

REVISIONS:

N.C.T.M. DIST. 500 SEC. 455 BLK. 01 LOT 64.1

M.T.A.)

PROPOSED
LOT LINE

PARCEL 2
0.9 ACRES

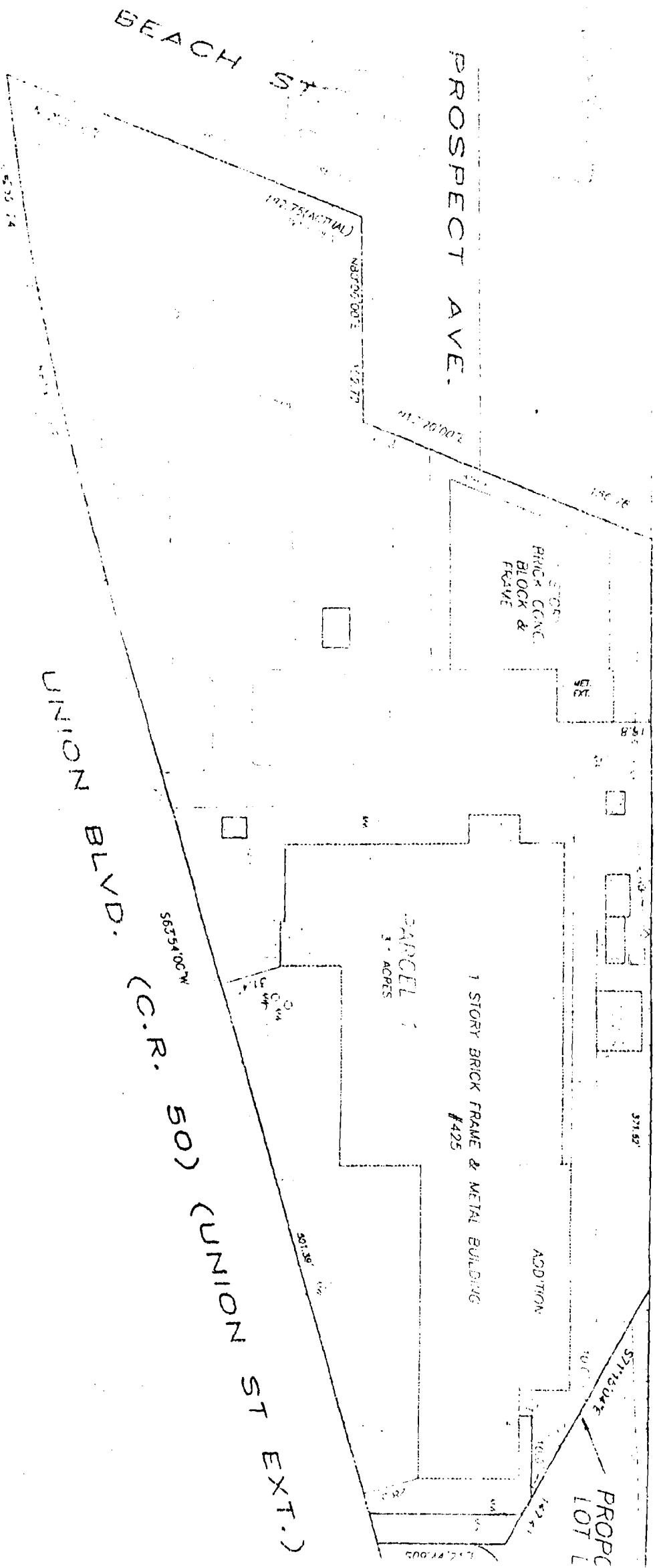
Appendix B 2
ps 2/3

ST
EXT.

LOTS 2-8, P.O. LOTS 1,
SURVEY OF

"BABYLON BE FORTWENTH"
LONG BEACH BEATORE
SQUATE AT

LONG ISLAND RAILR
(MONTAUK DIVISION)
(M.T.A.)



Appendix B

Records of Decision, OU1 - March 1995, OU2 - September 1997



Division of Hazardous Waste Remediation

Record of Decision

DZUS FASTENER COMPANY
Operable Unit 01
Inactive Hazardous Waste Site
Site Number 152033

March 1995

TECHNOLOGY
SECTION
COPY

New York State Department of Environmental Conservation
GEORGE E. PATAKI, *Governor* MICHAEL D. ZAGATA, *Commissioner*

RECORD OF DECISION

DZUS FASTENER COMPANY
INACTIVE HAZARDOUS WASTE SITE
OPERABLE UNIT 1

WEST ISLIP, SUFFOLK COUNTY

SITE NO. 152033

PREPARED BY:
NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF HAZARDOUS WASTE REMEDIATION

MARCH 1995

DECLARATION STATEMENT - RECORD OF DECISION

Dzus Fastener Company Inactive Hazardous Waste Site Town of Islip, Suffolk County, New York Site No. 152033

STATEMENT OF BASIS AND PURPOSE

The selected remedial action for Operable Unit 1 for the Dzus Fastener Site is presented in this decision document. The selection of the remedy was made in accordance with the New York State Environmental Conservation Law (ECL), and is consistent with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA). The factual and legal bases for selecting the remedy for this operable unit are summarized in this document.

A list of the documents that comprise the Administrative Record for this site is presented as Exhibit A. The documents in the Administrative Record were used to provide the bases for this Record of Decision.

ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from this site, if not addressed by implementing the response action described in this Record of Decision (ROD), present a current or potential threat to public health, welfare, or the environment.

DESCRIPTION OF THE SELECTED REMEDY

The components of the remedy for the on-site soils remedy (Operable Unit 1) are:

1. Design and implementation of an in-situ stabilization/solidification technology to remediate on-site soils contaminated with cadmium at concentrations greater than 10 parts per million (ppm).
2. Design and installation of a final topsoil/asphalt cover as agreed upon between the Dzus Fastener Company and the NYSDEC. The purpose of this cover is to protect the treatment cell from the effects of erosion.
3. Implementation of institutional controls designed to protect the integrity of the treated soils. These controls will depend upon the future use of the area to be treated.

DECLARATION

The selected remedy is protective of human health and the environment, is in compliance with State and Federal requirements that are legally applicable or relevant and appropriate to the remedial action to the extent possible, and is cost effective. This remedy is considered to be a permanent remedy. The preference for remedies which result in the reduction in the toxicity and mobility of the waste is satisfied to the maximum extent possible.

3/30/95
DATE



Michael J. O'Toole, Jr., Director
Division of Hazardous Waste Remediation

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2. Site Plan
3. Generalized Isoconcentration Map of Cadmium in the Shallow Groundwater
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2. Fish Data Summary (April 1994)
3. Soil Sample Summary (April 1994)

Exhibits

- A. Administrative Record
- B. Responsiveness Summary
 - a. Comparison of Stream Course

**RECORD OF DECISION
DZUS FASTENER COMPANY
SITE NUMBER: 152033**

SECTION 1: SITE LOCATION AND DESCRIPTION

The Dzus Fastener site is located at 425 Union Boulevard, West Islip, Suffolk County. The site is one acre in size and is located in a mixed residential, commercial, and industrial area. The site is triangular in shape and is bounded by Union Avenue to the south, Beach Street to the west, and Long Island Railroad tracks to the north. Immediately to the east of the site is Willetts Creek which drains into Lake Capri which is a man-made lake (see Figure 1). The Lake drains into the tidal portion of Willetts Creek via a culvert located underneath Montauk Highway.

The New York State Department of Environmental Conservation (NYSDEC) has divided this project into two operable units. Operable units are used to separate a site into distinct, manageable areas where each area may require a different remedy. The remediation of the contaminated on-site soils is covered under Operable Unit 1 (O.U. 1) which is the subject of this decision document. The remediation of the contaminated groundwater and sediments (Willetts Creek and Lake Capri) will be addressed under Operable Unit 2 (O.U. 2). A proposed remedy for O.U. 2 will be presented in a Proposed Remedial Action Plan (PRAP) which should be issued by the NYSDEC in late-1995 or 1996.

SECTION 2: SITE HISTORY

2.1: Operational/Disposal History

Since 1932, the Dzus Fastener Company has manufactured fasteners, small springs and other specialty devices. Until 1985, portions of the manufacturing process produced electroplating

and metal cleansing wastes which were discharged into a series of drywells and a leach field, thereby releasing contaminants (primarily cadmium, chromium, and cyanide) into the soil and groundwater. A waste water discharge pipe was discovered along the northern boundary of the site, ending near Willetts Creek. It appears that sometime in the past, likely in the early periods of the manufacturing history of the site, waste waters were discharged directly into the Creek.

2.2: Remedial History

The Dzus Fastener Company site was added to the NYSDEC's Registry of Inactive Hazardous Waste Sites in New York State in 1982. In 1991, the site was classified as a Class 2 site, meaning that the site poses a significant threat to human health or the environment.

The first environmental investigation conducted at the site was a Phase I Investigation conducted in 1984 by the NYSDEC. A literature/file search, a review of disposal practices and a site reconnaissance were conducted during the Phase I Investigation.

A Phase II Investigation, funded by Dzus Fastener (Dzus) with oversight by the NYSDEC, was conducted in 1990. Numerous soil samples were collected on-site, and fourteen groundwater monitoring wells were installed and sampled during the investigation. Elevated levels of cadmium, chromium, and cyanide were detected in groundwater both on-site and off-site. The source of this contamination appeared at that time to be the industrial leach field on the eastern portion of the site.

An Interim Remedial Measure (IRM), funded by Dzus, was conducted in 1991 with oversight by

the NYSDEC. The purpose of this IRM was to remove the aforementioned leach field. Approximately 1960 cubic yards of contaminated soil were excavated and disposed of off-site before the IRM program stopped due to economic problems at Dzus. A report on the IRM activities was prepared in June 1992.

The NYSDEC started the Remedial Investigation/Feasibility Study in May 1992. This investigation was funded through the 1986 Environmental Quality Bond Act (EQBA). The consulting engineering firm hired by the NYSDEC conducted the RI/FS and submitted the final RI/FS Report in October 1994.

SECTION 3: ENFORCEMENT HISTORY

The Potentially Responsible Parties (PRPs) in this action include:

- Dzus Fastener Company, Inc. (Dzus Fastener);
- Dzus International Limited (Dzus International); and
- Theodore Dzus, Sr.

The PRPs refused to sign a consent order with the NYSDEC in which they would have agreed to conduct an RI/FS at the site. As a result, the NYSDEC, using EQBA funds, conducted the RI/FS. The funds required for remediating the site (implementing the remedy outlined in the ROD) will also come from EQBA bonds.

Dzus Fastener and Dzus International signed consent orders which became effective on December 13, 1993 in which they agreed to pay the State the following amounts which are to go towards the investigation and remediation of the site:

- Dzus Fastener: \$1,100,000
- Dzus International: \$400,000

A legal action was filed by the Attorney General of the State of New York against Mr. Theodore

Dzus, Sr. on November 18, 1994. In this action, the State is seeking to recover approximately \$632,000 spent to date by the State in investigating the site as well as future costs to be incurred by the State in this matter.

SECTION 4: HIGHLIGHTS OF COMMUNITY PARTICIPATION

In order to inform the local community and to provide a mechanism for citizens to make the NYSDEC aware of their concerns, a citizen participation program has been implemented by the NYSDEC. In accordance with the 1988 New York State Citizen Participation Plan, the following goals have been accomplished:

- 1 - Information repositories have been established at the West Islip Public Library and the NYSDEC Region 1 Office in Stony Brook.
- 2 - Documents and reports pertaining to this site have been placed into the aforementioned repositories.
- 3 - A "contact list" of interested parties (e.g.- local citizens, media, public interest groups, and elected government officials) has been developed.
- 4 - A public meeting was held in September 1992 during which the work plan for the RI/FS was presented to the public.
- 5 - Public meetings were held in June and December of 1993 to update the local community on the progress of the RI/FS.
- 6 - A questionnaire was distributed to those residents living along Willetts Creek and Lake Capri. The purpose of this questionnaire was to elicit information regarding the Creek and Lake (such as flooding events and recreational uses of the Lake).
- 7 - A public availability session was held in June 1994 during which local residents were able to meet with representatives of the NYSDEC and NYSDOH to discuss the ongoing RI/FS.

8 - A public notice on the completion of the on-site RI/FS and the development of the Proposed Remedial Action Plan for Operable Unit 1 was distributed to the contact list on January 16, 1995. A public comment period extended from January 16, 1995 - February 24, 1995 during which time the public was invited to submit written questions or comments on the proposed remedy to the NYSDEC.

9 - A public meeting was held on February 6, 1995 during which the NYSDEC and NYSDOH presented the proposed remedy for Operable Unit 1 to the public, and provided the public with an update on the status of the work completed and proposed for Operable Unit 2.

A summary of the questions/comments offered during the February 6, 1995 public meeting and written questions/comments received during the public comment period, as well as the State's responses to these questions/comments is presented in Exhibit B, the Responsiveness Summary, of this document.

SECTION 5: CURRENT STATUS

The NYSDEC, under the State Superfund Program, initiated a Remedial Investigation / Feasibility Study (RI/FS) at the Dzus site in May 1992 in order to determine the nature and extent of the contamination attributable to the site, and to develop a remedy for addressing said contamination.

5.1: Summary of the Remedial Investigation

The Remedial Investigation (RI) was conducted in two phases. The first phase began in May 1992 and ended in March 1993. The second phase began in August 1993 and ended in April 1994. The results of the work conducted during the RI are presented in Chapters 1 through 8 of the RI/FS Report dated October 1994. A brief summary of the work conducted during the RI is presented below:

- Area Well Inventory: An inventory of wells screened in the upper glacial aquifer in areas south of the site was

conducted. A total of 18 wells were inventoried, none of which are used as public or private water supplies. It is believed that all residences, businesses, schools, etc. in these areas are hooked-up to a public water supply.

■ Identification of On-site Source Areas: Six (6) source areas were identified during the course of the RI (see Figure 2):

1 - Former oil/water separator: During the Phase II Investigation, oil-stained soils were observed to a depth of 14 feet in the vicinity of the oil/water separator. The top eight feet of soil were excavated during the IRM in 1991. The soils at the bottom of the excavation were sampled during the IRM and were determined to be hazardous waste (cadmium). Cadmium concentrations are as high as 81 parts per million (ppm) at a depth of 8-10 feet below grade.

2 - Former dry wells: Contaminated soils were excavated to a depth of eight feet in this area during the IRM. Soils along the sides and at the bottom of the excavation were sampled during the IRM and were determined to be hazardous waste (cadmium). The highest cadmium concentration along the sidewall was 2,060 ppm and the highest cadmium concentration at the bottom of the excavation was 884 ppm.

3 - Laterals from Dry Well #4: This dry well was removed during the IRM. However, not all of the laterals (piping) connected to this dry well were removed. Stains were visible near joints in the piping, and the soils in this area are contaminated with cadmium at concentrations as high as 570 ppm.

4 - Drainline to Willetts Creek: A discharge pipe along the northern property line was used for the discharge of wastes. This 10 inch diameter pipe

was discovered during the IRM excavation activities. The outlet of this pipe is located in a cobble leachfield on the eastern portion of the site. Based on the analytical data from samples collected beyond the east gate of the site, it appears that, at some time in the past, wastes were disposed of directly into Willetts Creek. These wastes consisted of cadmium and chromium compounds.

Soil samples were collected from eleven locations along the area where this pipe was located. Cadmium concentrations as high as 2,190 ppm (5-7 feet deep) were detected near the eastern gate on the site. Significant levels of cadmium were detected at depths of 10-12 feet below grade (34 ppm).

5 - Western catch basins: A former catch basin was identified during the Phase I RI. Soils in this area were stained with oil. The source of this oil is believed to be a spill event. Cadmium was detected in a surface soil sample at a concentration of 12 ppm.

6 - Industrial leach pool: During the RI, an industrial leach pool which had not been referenced in previous studies was discovered on the western portion of the site. Based on the samples collected from this leach pool, it appears that this is the source of the western plume of groundwater contamination (see Figure 3.)

- Groundwater Quality Investigation: A total of 21 groundwater monitoring wells were installed during the RI. The analytical results from the sampling of these wells and 11 pre-existing monitoring wells are summarized in the RI/FS Report. A graphic representation of the cadmium groundwater plumes is presented on Figure 3. In addition to cadmium, cyanide was detected on-site at concentrations ranging up to 705 ppb

(the standard is 100 ppb). Chromium was also detected in on-site and off-site wells at concentrations ranging up to 258 ppb (the standard is 50 ppb).

- Surface Water and Sediment Investigation: Surface water (SW) and sediment (SED) samples were collected from 22 locations on Willetts Creek and in Lake Capri. Cadmium was detected in surface water at two locations in Willetts Creek and at one location in Lake Capri. The highest cadmium concentration in Willetts Creek was 37.6 ppb (SW-3, see Figure 1) which is significantly higher than the NYSDEC's surface water standard of 0.7 ppb. Cyanide was also detected at the SW-3 location at a concentration of 13.1 ppb. The surface water standard for cyanide is 5.2 ppb. Cadmium was detected in only one of ten surface water samples collected in Lake Capri at a concentration of 3.8 ppb. In each of these cases, it is believed that the source of the observed surface water contamination was contaminated sediment entrained in the surface water samples.

Cadmium was detected in most of the sediment samples (see Table 1 and Figure 1). The sediments in the southern half of Lake Capri have been significantly impacted with cadmium. Cadmium concentrations as high as 347 ppm were detected in the top layer of the sediments in this part of the Lake. As a result, fish tissues were sampled to determine if cadmium is bioaccumulating in the food chain.

- Analysis of Fish Tissues: Fish were collected from Lake Capri via electrofishing in March 1994. The fillets and carcasses of the fish were analyzed separately for cadmium. The results of this work are summarized in Table 2. Carp were the most contaminated species with cadmium at

concentrations up to 1.4 ppm in the fillet samples. While there are no established guidelines or standards for cadmium in fish, the NYSDOH has concerns regarding the consumption of fish caught from Lake Capri, and has issued a health advisory:

1. no one should eat more than one meal of carp per month, and
2. women of childbearing age and children under 15 years of age should not eat any fish from Lake Capri.

- Sampling of Residential Soils: Soil samples were collected from thirteen residences along Willetts Creek and Lake Capri. The samples were analyzed for cadmium and chromium. Cadmium concentrations ranged from non-detectable levels to 1.8 ppm (the health-based clean-up goal is 10 ppm). The results are presented in Table 3.

The analytical data obtained during the RI were compared to applicable Standards, Criteria, and Guidance values (SCGs) in determining the need for remedial action goals for the site. Groundwater, surface water, and drinking water SCGs identified for the Dzus Fastener Company site were based upon the NYSDEC Ambient Water Quality Standards and Guidance Values and Part V of the New York State Sanitary Code. Soil and sediment SCGs identified for the site were based on NYSDEC clean-up guidelines and health-based clean-up goals developed by the NYSDOH.

Based upon a comparison of the analytical results outlined above and the SCGs for this site, it has been determined that the following areas and media are contaminated above SCGs:

- On-site soils in the locations shown on Figure 4 contain cadmium at concentrations greater than the 10 ppm health-based clean-up goal established by the NYSDOH. In the areas shaded on

Figure 4, the cadmium concentrations ranged from 10 to 2,190 ppm, with an average concentration of 280 ppm (43 samples). Some of this contamination is located below the water table.

- Groundwater contamination at concentrations greater than 10 ppb exists both on- and off-site (see Figure 3).
- Sediments in Willetts Creek and Lake Capri are contaminated above the guidance value of 0.6 ppm (see Table 1 and Figure 1) which represents the lowest level above which detrimental effects to benthic organisms may occur. Cadmium is bioaccumulating in the food chain as evidenced by the cadmium contamination detected in the fish specimens.

(NOTE: As stated in Section 1, remedies for groundwater, Willetts Creek and Lake Capri will be developed, and evaluated in a PRAP/ROD to be issued in late-1995 or 1996.)

5.2: Summary of Human Exposure Pathways

A baseline human health evaluation/ risk assessment was conducted to assess the potential risks to human health which might be related to chemicals originating from the site. In this investigation, the likelihood of non-carcinogenic effects was indicated by the hazard index, whereas the carcinogenic effects were presented as probabilities.

The hazard index, which is used to describe the potential for noncancer health effects to occur in an individual, is expressed as a ratio of estimated contaminant intake to the risk reference dose. A risk reference dose is the estimated daily intake of a chemical that is likely to be without an appreciable risk of health effects. A ratio equal to or less than one is generally considered to be an insignificant (minimal) increase in risk.

Increased cancer risks were estimated using site-specific information on exposure levels for the

contaminants of concern and interpreting them using cancer potency estimates derived for that contaminant by the United States Environmental Protection Agency (USEPA). For known or suspected carcinogens, the NYSDOH considers an individual lifetime cancer risk exceeding one in one million to be unacceptable. In other words, an individual would have no greater than an approximately one in one million chance of developing cancer over a lifetime (i.e., 70 years) as a result of site-related exposure under specific exposure conditions.

The potential human exposure pathways at the Dzus site and the associated contaminants are:

<u>Chemical</u>	<u>Exposure Pathway</u>
Cd, Ni	Ingestion of chemicals in soil by adult on-site workers
Cd, Ni	Ingestion of chemicals in soil by children trespassing on-site
Cd, Cr	Ingestion of chemicals in residential soils by adults
Cd, Cr	Ingestion of chemicals in residential soils by children

NOTE: Cd = cadmium, Cr = chromium, Zn = Zinc, Ni = Nickel, CN = cyanide

For noncarcinogenic effects, it was assumed that workers are exposed only through the ingestion of contaminated soils while present on-site. For the residential scenario, it was assumed that adults may potentially be exposed to site contaminants through the ingestion of contaminated soils from yards along Willetts Creek and Lake Capri. Children may potentially be exposed to site contaminants through the ingestion of chemicals while trespassing on-site and ingestion of chemicals in residential soils.

Based upon the results of the noncarcinogenic risk calculations, it is unlikely that the contaminants of concern at the Dzus Fastener site will result in adverse human health effects at the concentrations currently identified in the

surface soils on-site and in off-site residential yards. Of the scenarios evaluated, the ingestion of chemicals in soil by adult workers on-site resulted in the highest hazard index (0.128).

Based upon the results of the cancer risk calculations, the inhalation of airborne cadmium and nickel on-site does not pose a significant health risk to either children or adults at the site. The off-site inhalation exposure pathway has been eliminated from consideration as off-site contaminant exposures are unlikely to exceed on-site levels.

Cancer risk calculations were not performed for inhalation exposure to hexavalent chromium as none was detected in any of the surface soil samples collected at the site. No evidence exists that suggests a cancer risk exists from the inhalation of chromium in the trivalent form. Carcinogenic health effects are not known to result from inhalation exposures to cyanide and zinc. No evidence currently exists that suggests that cadmium and cyanide are carcinogenic upon ingestion. Only very limited evidence exists that suggests that zinc may cause cancer by the oral route of exposure. Therefore, oral exposures to these contaminants are not expected to pose an increased risk of cancer to human populations.

If sub-surface soils containing cadmium at levels which are considered to be hazardous waste are allowed to remain at the site, then a health risk exists for persons who may, through excavation activities, come into contact with these soils.

5.3: Summary of Environmental Exposure Pathways

The cadmium contamination in the on-site soils is a continuing source of groundwater contamination, and thus poses a continuing threat to the environment.

The groundwater and off-site issues above will be addressed via a PRAP/ROD to be issued by the NYSDEC in late-1995 or 1996.

SECTION 6: SUMMARY OF THE REMEDIATION GOALS

The goals for the remedial program have been established through the remedy selection process outlined in 6 NYCRR Part 375-1.10. These goals were established under the guidelines of meeting all Standards, Criteria, and Guidance values (SCGs) and protecting human health and the environment.

At a minimum, the remedy implemented should eliminate all significant threats to public health and to the environment posed by the disposal of hazardous waste at the site through the proper application of scientific and engineering principles.

The goals selected for O.U. 1 of the Dzus Fastener Company site are:

- Eliminate the potential for direct human contact with the contaminated soils at the site.
- Eliminate or reduce the mobility of contaminants in on-site soils that would cause further groundwater contamination.
- Eliminate the hazardous wastes on-site or treat them to render them as non-hazardous.

SECTION 7: SUMMARY OF THE EVALUATION OF ALTERNATIVES

The potential alternatives for O.U. 1 of the Dzus Fastener Company site were identified, screened and evaluated during the Feasibility Study (FS). This analysis is presented in Chapters 9-13 of the RI/FS Report. A summary of this analysis follows.

7.1: Description of the Remedial Alternatives

The potential alternatives which were developed for remediating the Dzus Fastener Company site involved different technologies for achieving the

major goals of this project (see Section 6). Fourteen alternatives were developed and evaluated during the Feasibility Study.

As presented below, present worth is defined as the amount of money needed up-front (in 1994 dollars at 5% interest) in order to fund the construction, and operation and maintenance (O&M) costs for each alternative. Construction, rental, and engineering costs are included in the capital cost estimates. The average yearly costs for operating treatment systems and the costs for maintaining the remedy are included in the O&M cost estimates.

The remedial alternatives for O.U. 1 which were evaluated during the Feasibility Study can be divided into two categories:

- A. No Action
- B. Remediation of On-site Soils

(NOTE: The alternatives presented below are somewhat different than those presented in the RI/FS Report.)

A. No Action Alternative

Alternative 1 - No Action

Capital Cost: \$ 0
O&M Costs: \$ 0
Present Worth: \$ 0

Under this alternative, no remediation would be conducted at the site. This alternative was developed pursuant to the National Contingency Plan as a baseline for comparing the other alternatives which were developed during the Feasibility Study.

Deed restrictions would be incorporated into this remedy.

B. Remediation of On-site Soils

Alternative 2 - Source Isolation

Capital Cost: \$4,862,000
O&M Costs: \$ 8,000/year
Present Worth: \$4,985,000

Vertical and horizontal barriers would be constructed at the site in order to prevent contaminated groundwater from migrating offsite. A surface cap consisting of a 12-inch layer of gravel overlain by 4 inches of asphalt would be constructed to prevent precipitation from infiltrating the contaminated soil. The vertical and bottom horizontal barriers would consist of either bentonite/cement or soil/bentonite slurries.

Deed restrictions would also be incorporated into this remedy.

Alternative 3 - In-situ Solidification/Stabilization of Soils

Capital Cost: \$1,077,000
O&M Costs: \$ 0/year
Present Worth \$1,077,000

The soils contaminated with cadmium at concentrations greater than 10 ppm would be treated in-place under this alternative. This treatment would be accomplished by mixing the soils with a chemical reagent such as a cement / bentonite slurry. As a result, the cadmium would be converted to an insoluble compound which would be fixated in a concrete-like matrix.

Approximately 8,100 cubic yards (cy) of soil would be treated under this alternative. A more accurate estimate of the volume of the waste which would be treated would be determined during the remedial design.

A site drainage and erosion control plan will be developed and implemented in order to protect the treatment cell.

Deed restrictions would also be incorporated into this remedy.

Alternative 4A - Excavation with Off-site Disposal of Wastes

Capital Cost: \$4,129,000
O&M Costs: \$ 0/year
Present Worth \$4,129,000

Soils contaminated with cadmium at concentrations above the 10 ppm action level would be excavated and disposed of off-site. Approximately 5900 cubic yards (cy) of soils are anticipated to be hazardous wastes and would be disposed of at a hazardous waste landfill. Approximately 2200 cy of cadmium-contaminated soils at concentrations greater than 10 ppm but which would not be classified as hazardous wastes, would be excavated and disposed of off-site at an industrial waste landfill. The excavations would be backfilled with clean soil from an off-site source.

A more accurate estimate of the volume of the waste which would be excavated would be determined during the remedial design.

Alternative 4B - Excavation with Solidification/Stabilization of Wastes

Capital Cost: \$3,159,000
O&M Costs: \$ 0/year
Present Worth: \$3,159,000

Approximately 8100 cy of cadmium-contaminated soils would be excavated under this alternative. The estimated 5900 cy of soil which are anticipated to be classified as hazardous wastes would be treated on-site via a solidification/ stabilization process. A chemical reagent (such as a cement/bentonite mixture) would be mixed with these soils to render them non-hazardous. This treated waste, along with approximately 2200 cy of cadmium-contaminated soil with concentrations greater than 10 ppm, but which would not be classified as hazardous wastes, would be disposed of off-site at an industrial waste landfill. The excavations would

be backfilled with clean soil from an off-site source.

A more accurate estimate of the volume of the waste which would be excavated would be determined during the remedial design.

Alternative 4C - Excavation with Soil Washing of Wastes

Capital Cost: \$4,114,000
O&M Costs: \$ 0/year
Present Worth: \$4,114,000

Approximately 8100 cy of cadmium-contaminated soils would be excavated under this alternative. The estimated 5900 cy of soil which is anticipated to be classified as hazardous wastes would be treated with a chemical solution designed to strip the metals from the soil. The treated soil, along with 2200 cy of soil (non-hazardous waste) containing cadmium at concentrations above the 10 ppm clean-up goal, would be disposed of off-site at an industrial waste landfill. The excavations would be backfilled with clean soil from an off-site source.

A more accurate estimate of the volume of the waste which would be excavated would be determined during the remedial design.

7.2: Evaluation of the Remedial Alternatives

The criteria used to compare and contrast the potential remedial alternatives are defined in 6 NYCRR Part 375. For each of the criteria, a brief description is provided followed by an evaluation of the alternatives against that criterion. A detailed discussion of the evaluation criteria and comparative analysis is contained in the RI/FS Report.

Threshold Criteria - The first two criteria must be satisfied in order for an alternative to be eligible for selection.

1. **Protection of Human Health and the Environment** - This criterion is an overall and final evaluation of the health

and environmental impacts to assess whether each alternative is protective. This evaluation is based upon a composite of factors assessed under other criteria, especially short/long term effectiveness and compliance with Standards, Criteria, and Guidance values (SCGs).

The institutional controls incorporated into Alternative 1 would not be protective of human health or the environment because direct contact with the waste could still occur and cadmium would continue to migrate via the groundwater and surface water from the site into Willetts Creek and Lake Capri. The source isolation component incorporated into Alternative 2 may not be reliable, and cadmium may still migrate into the Creek and Lake.

The treatment technologies incorporated into Alternatives 3 and 4A-C would be protective of human health and the environment in that the direct contact pathway would be eliminated and the potential for contaminants to migrate off-site would be decreased significantly. Cadmium which is already in the off-site groundwater would continue to move southward.

2. **Compliance with New York State Standards, Criteria, and Guidance values (SCGs)** - Under this criterion, the issue of whether a remedy will meet all of the Federal or State environmental laws and regulations is addressed. If these laws and regulations will not be met, then grounds for invoking a waiver must be provided.

The SCGs for this site would not be met if Alternatives 1 or 2 were implemented. The soil SCGs would be met if any of the other on-site remedies were implemented.

Primary Balancing Criteria - The next five "primary balancing criteria" are used to compare and contrast the positive and negative aspects of the various alternatives.

3. Short-term Effectiveness - Under this criterion, the potential short-term impacts of the remedial action upon the community, the workers, and the environment are evaluated. The period of time required to achieve the remedial objectives is estimated and compared/contrasted with the other alternatives.

The eastern portion of the site would be unusable to the Dzus Fastener Company for approximately 4 months if Alternatives 2 or 3 were implemented. Most of the property would be unusable to the company for approximately 2-4 months if Alternatives 4A-4C were implemented. Dust controls would be needed to keep dust emissions to a minimum. There are no adverse short-term impacts associated with Alternative 1.

4. Long-term Effectiveness and Permanence - If wastes or residuals will remain at the site after the selected remedy has been implemented, then the following items are evaluated: 1) the magnitude and nature of the risk posed by the remaining wastes; 2) the adequacy of the controls intended to limit the risks posed by the remaining wastes; and 3) the reliability of these controls.

The greatest degree of long-term effectiveness and permanence would be realized by implementing Alternatives 4A, 4B, or 4C because the contamination at the site would be removed from the site. Alternative 3 is expected to be effective in preventing further leaching of contaminants into the surrounding environment. The long-term effectiveness of Alternative 2 is unknown, and long-term monitoring would be required to verify the effectiveness of that remedy. Alternative 1 would not be effective in the long-term.

5. Reduction of Toxicity, Mobility, and Volume - Preference is given to alternatives that permanently, and by treatment, reduce the toxicity, mobility,

or volume of the wastes at the site. This includes assessing the fate of the residues generated from treating the wastes at the site.

The implementation of Alternative 1 would not result in the reduction of toxicity, mobility, or volume of the wastes on- or off-site. A reduction in the mobility of the contaminants on-site would result if Alternatives 2 or 3 were implemented; however, an increase in the waste mass would occur. A reduction in the mobility and volume of the waste would result if Alternatives 4A and 4B were implemented. A reduction of toxicity would result in addition to a reduction of mobility if Alternative 4C were implemented.

6. Implementability - Under this criterion, the technical and administrative feasibility of implementing each alternative is evaluated. Technically, this includes the difficulties associated with the construction and operation of the alternative and the ability to effectively monitor the effectiveness of the remedy. Administratively, the availability of the necessary personnel and material is evaluated along with potential difficulties in obtaining special permits, rights-of-way for construction, etc.

Alternative 1 is the easiest alternative to implement as there are no difficult technical or administrative tasks associated with this alternative. An impermeable sub-grade horizontal barrier would be extremely difficult to construct, therefore, Alternative 2 would be very difficult to implement. The in-situ solidification/stabilization technology is a new technology, and there may be some difficulty implementing Alternative 3. The treatment and disposal options incorporated into Alternatives 4A-C should be easily implementable; however, the excavation of the soils may be very difficult due to the high water table and the close proximity of the proposed excavation areas to the active railroad tracks.

On-site deed restrictions can only be imposed with the concurrence of the property owner.

7. Cost - Under this criterion, capital and operational and maintenance costs are estimated for the alternatives and compared on a present worth basis. Although cost is the last criterion evaluated, where two or more alternatives have met the requirements of the other criteria, lower cost can be used as the basis for final selection.

The present worth costs of the remedies range from no cost for Alternative 1 (No Action Alternative) to \$4,985,000 for Alternative 4A (Source Isolation).

Modifying Criterion - This final criterion is taken into account after evaluating those above. It is focused upon after public comments on the Proposed Remedial Action Plan (PRAP) have been received.

8. Community Acceptance - The concerns of the community regarding the RI/FS Report and the PRAP were evaluated. These concerns are presented along with the NYSDEC's responses to these concerns in the Responsiveness Summary (Exhibit B of this Record of Decision).

SECTION 8: SUMMARY OF THE SELECTED REMEDY

Based upon the results of the RI/FS conducted at the Dzus site, the NYSDEC has selected the following remedy for O.U. 1:

- Design and implementation of the in-situ stabilization/solidification alternative for remediating soils containing cadmium at concentrations greater than 10 ppm at the Dzus site (Alternative 3). Three small areas on the western portion of the site would be excavated and mixed with the soils to be treated on the eastern portion of the site. The clean soils which were used to backfill the IRM excavations will not be treated.

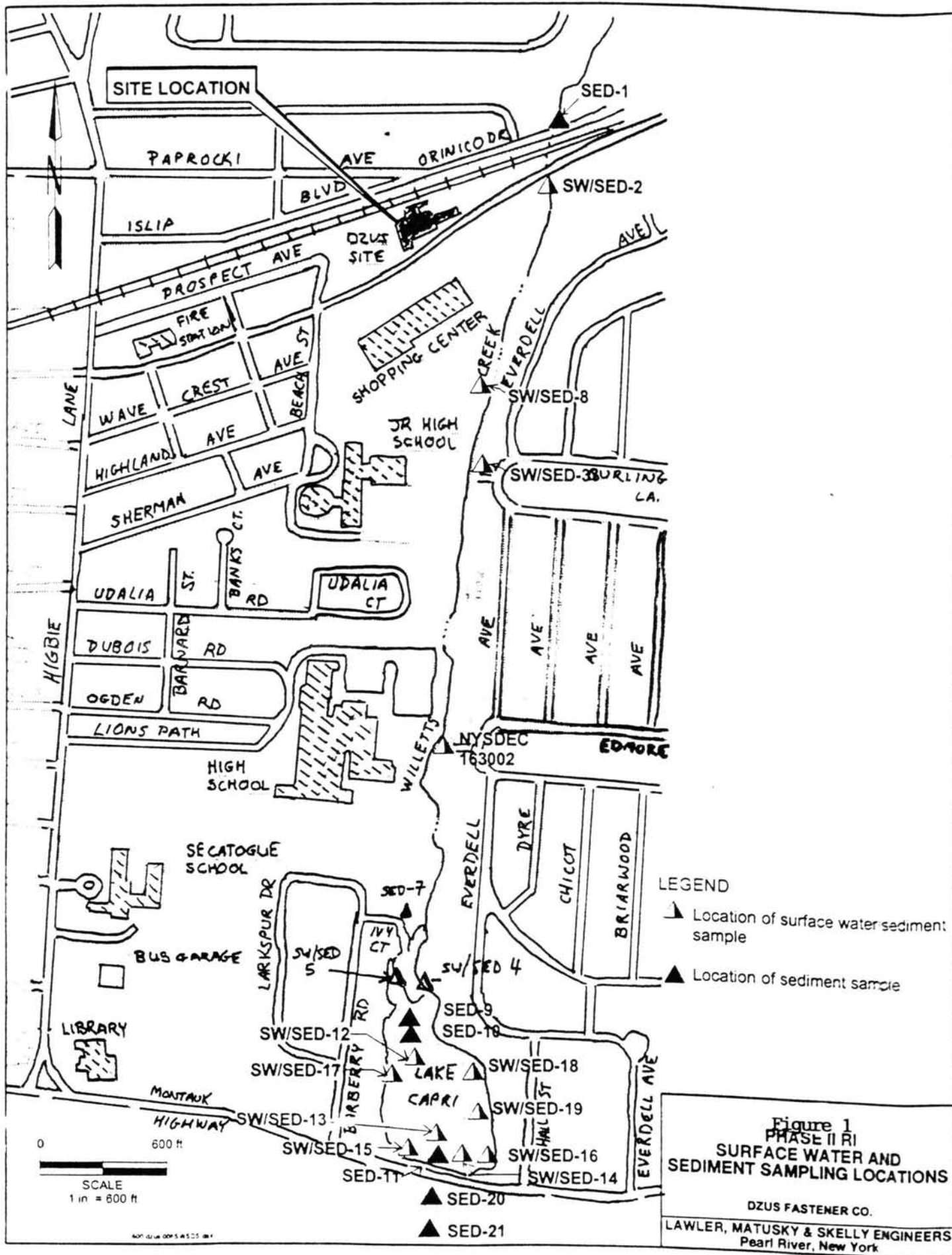
This treatment would be accomplished by mixing the soils with a chemical reagent such as portland cement using a drill rig outfitted with augers. A bench-scale test will be conducted in order to determine the optimal chemical reagent for this project as well as to develop an estimate for the curing time. If portland cement is used, it is anticipated that the curing time would be approximately four (4) weeks.

- Design and installation of a final topsoil/asphalt cover as agreed upon between the Dzus Fastener Company and the NYSDEC. The purpose of this cover is to protect the treatment cell from the effects of erosion.
- Implementation of institutional controls such as deed restrictions at the site.

The estimated capital cost and present worth of this remedy is \$1,077,000. There are no operation and maintenance costs associated with this remedy.

GLOSSARY OF ACRONYMS

CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
cy	cubic yards
ECL	Environmental Conservation Law (New York State)
EQBA	Environmental Quality Bond Act
IRM	Interim Remedial Measure
6 NYCRR	Title 6 of the Official Compilation of Codes, Rules and Regulations
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
O&M	Operation and Maintenance
O.U.	Operable Unit
ppb	parts per billion
ppm	parts per million
PRAP	Proposed Remedial Action Plan
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
SARA	Superfund Amendments Reauthorization Act
SCGs	Standards, Criteria, and Guidance values of NYS
USEPA	United States Environmental Protection Agency



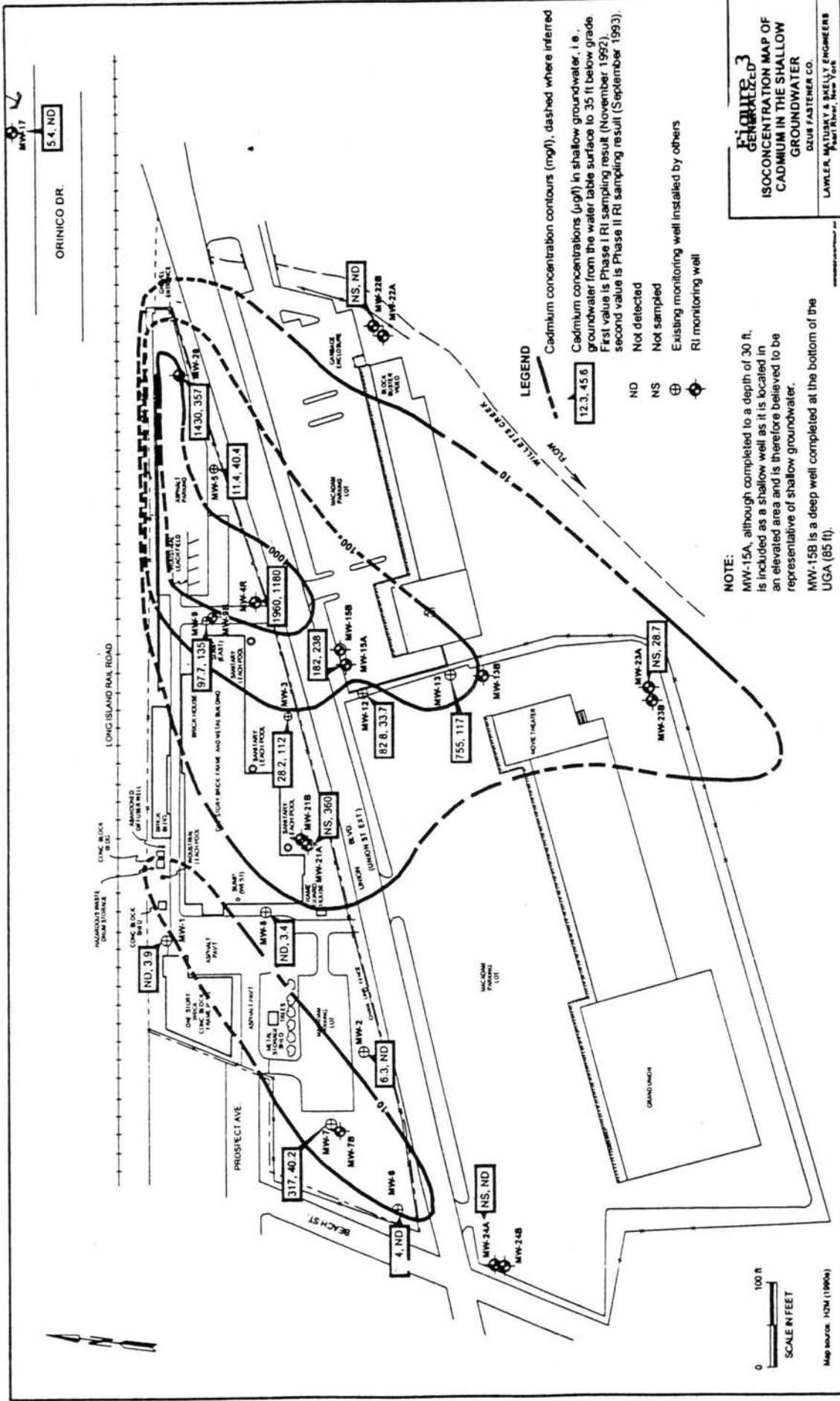


TABLE 1
SEDIMENT DATA FROM WILLETTS CREEK AND LAKE CAPRI

LOCATION AND DEPTH	CADMIUM (ppm)	CHROMIUM
SED-1	ND	12.1
SED-1	ND	9.4
SED-3	79.8	17.3
163002	2.1	14.0
DUP 163002	1.6	1.9
SED-8	ND	2.6
SED-9 (0-5 in)	9.0	ND
SED-9 (5-10 in)	2.0	ND
SED-10 (0-7)	23.6	14.2
SED-10 (7-14 in)	4.9	ND
SED-11 (0-9 in)	249	44.6
DUP SED-11 (0-9 in)	247	48.4
SED-11 (9-18 in)	15.8	3.8
SED-12 (0-14 in)	14.7	9.3
SED-12 (14-28 in)	ND	3.9
SED-13 (0-5 in)	306	72.4
SED-13 (5-10 in)	37.1	5.2
DUP SED-13 (0-5 in)	310	74.7
SED-14 (0-5 in)	175	29.9
SED-14 (5-10 in)	33.4	4.7
SED-15 (0-6 in)	347	78.3
SED-15 (6-12 in)	79.2	19.9
SED-16 (0-7.5 in)	41.3	9.4
SED-16 (7.5-15 in)	7.3	3.8
SED-17 (0-7 in)	12.1	4.5
SED-17 (7-14 in)	ND	2.5
SED-18 (0-7 in)	1.4	9.7
SED-18 (7-14 in)	ND	9.6
SED-19 (0-3 in)	102	13.0
SED-19 (3-6 in)	14.6	3.5
SED-20	4.2	3.5
SED-21	5.9	8.2

Note: See Figure 1 for sampling locations

ND = Not Detected

	<u>Guidance Values</u>	
	LEL ⁻¹	SEL ⁻²
Cadmium	0.6 ppm	9.0 ppm
Chromium	26	110 ppm

1 - LEL = Lowest Effect Level

2 - SEL = Severe Effect Level

TABLE 2

FISH DATA SUMMARY (APRIL 1994)
DZUS FASTENER CO.

Parameter	AE#1	AE#2	AE#3	AE#4	AE#5	BSF#1-5 Fillet	BSF#5 Carcass	BSF#6- 10 Fillet	BSF#10 Carcass	CARP#1 -3 Fillet
(mg/kg) Cadmium	0.19	0.35	0.41	0.57	0.33	0.19	0.25	0.19	0.25	0.32

Parameter	CARP#1 Carcass	DUP CARP#1 Carcass	CARP#4 & 5 Fillet	CARP#4 Carcass	LMB#1 & 2 Fillet	LMB#2 Carcass	LMB#3 & 4 Fillet	LMB#3 Carcass	PS#1&2 Fillet	PS#2 Carcass
(mg/kg) Cadmium	1.90	1.67	1.40	0.49	ND	0.19	ND	0.07B	0.18	0.27

* Results are reported on a wet weight basis

B Value is less than the contract-required detection limit but greater than the instrument limit

AE Americal eel

ND Note detected at analytical detection limit

PS Pumpkinseed

BSF Bluegill sunfish

DUP Duplicate sample analysis

LMB Largemouth bass

CARP Carp

TABLE 3

SOIL SAMPLE SUMMARY (APRIL 1994)
DZUS FASTENER CO.

Parameter	Residence Number													Recommended Soil Clean-up Objective
	1	2	3	4	5	6	7	8	9	10	11	12	13	
(mg/kg) Cadmium	0.32B	ND	ND	0.39B	1.8B	.47B	0.83B	0.6B	.06B	1.6	1.7	0.93B	1.1B	10
Chromium	7.6	7.2	5.2	17.1	12.3	10.9	16.2	9.7	9.7	8.9	7.5	10.7	9.8	40

ND= not detected

B = Estimated concentration

EXHIBIT A

ADMINISTRATIVE RECORD DZUS FASTENER COMPANY SITE NUMBER: 152033

I - Reports

1. Phase II Investigation Report, prepared by H2M Group, July 1990.
2. Interim Remedial Measure Work Plan for Dzus Fastener Co., Inc., prepared by H2M Group, September 1990.
3. Report on Interim Remedial Measures Conducted at Dzus Fastener Co., Inc., prepared by H2M Group, June 1992.
4. Health and Safety Plan, prepared by Lawler, Matusky & Skelly Engineers, dated August 1992.
5. Quality Assurance Project Plan, prepared by Lawler, Matusky & Skelly Engineers, dated August 1992.
6. Field Activities Plan, prepared by Lawler, Matusky & Skelly Engineers, dated September 1992.
7. Remedial Investigation/Feasibility Study Report, prepared by Lawler, Matusky & Skelly Engineers, dated September 1994, 3 volumes.
8. Proposed Remedial Action Plan, prepared by the NYSDEC, dated January 1995.

II - Legal Documents

9. Order on Consent between Dzus Fastener Co., Inc. (Respondent) and the NYSDEC dated December 28, 1989. Signed by: Theodore Dzus, Jr. (for Respondent) and Edward Sullivan (NYSDEC).
10. Order on Consent between Dzus Fastener Co., Inc. and W.I. Holdings Ltd. (Respondents) and the NYSDEC dated December 13, 1993. Signed by: Stephen Meshover (for Respondents) and Thomas Jorling (NYSDEC).
11. Order on Consent between Dzus International Limited (Respondent) and the NYSDEC dated December 13, 1993. Signed by Michael Knight for Respondent and Thomas Jorling (NYSDEC).

III - Correspondence

12. Letter to Mr. Theodore Dzus from Robert L. Marino (NYSDEC) dated February 21, 1991.
13. Memorandum to Joshua Epstein (NYSDEC) from Andrew English (NYSDEC) dated July 27, 1992. Attached to memorandum:
 - i. Citizen Participation Plan, Dzus Fastener Site, prepared by the NYSDEC dated July 1992.

14. Letter to Mr. Thomas Pease (Lawler, Matusky & Skelly Engineers - (LMS)) from Michael J. O'Toole, Jr. (NYSDEC).
15. Fact Sheet - Dzus Fastener Company, prepared by the NYSDEC and NYSDOH dated February 1993.
16. Letter to Mr. John Barnes (NYSDEC) from Ms. Ruth Fritsch (LMS) dated 19 July 1993.
Attached to letter:
 - i. Memorandum to file from Ms. Ruth Fritsch dated 16 July 1993.
17. Letter to Mr. John Barnes from Ms. Ruth Fritsch dated 3 December 1993.
Attached to letter:
 - i. Data tables from the September 1993 sampling event.
 - ii. Analysis of the historical movement of the Willetts Creek streambed.
18. Notice of Public prepared by the NYSDEC dated November 1993.
Attached to the Notice:
 - i. Fact Sheet, prepared by the NYSDEC dated November 1993.
19. Letter to Ms. Ruth Fritsch from John Barnes dated June 9, 1994.
Attached to letter:
 - i. Chemical Information Sheet (cadmium), prepared by the NYSDOH.
20. Fact Sheet - Dzus Fastener Company, prepared by the NYSDEC dated January 1995.
21. Letter to John Barnes and John Olm (NYSDOH) from Ronald Pollio (attorney representing Dzus Fastener) dated January 31, 1995.

IV - Miscellaneous

22. Video tape of the February 6, 1995 public meeting.

EXHIBIT B

RESPONSIVENESS SUMMARY PROPOSED REMEDIAL ACTION PLAN DZUS FASTENER COMPANY SITE NUMBER: 152033

The issues addressed below were raised during the public meeting held on February 6, 1995 at the Beach Street Middle School, West Islip, Suffolk County, and in letters received from commentors. The purpose of the meeting was to present the Proposed Remedial Action Plan (PRAP) for Operable Unit 1 at the site to the public and to receive comments on the PRAP for consideration during the final selection of a remedy. The video tape of the public meeting is the official record of the meeting and is incorporated into the Administrative Record for this site. Written questions/comments which were received during the public comment period (January 16, 1995 - February 24, 1995) have also been incorporated into the Administrative Record. The documents included in the Administrative Record are available for public review at the document repositories.

The following is a list of comment letters received by the NYSDEC during the public comment period:

1. Statement by Ms. Lorraine Pace dated January 30, 1995.
2. Letter to John Barnes (NYSDEC) and John Olm (NYSDOH) from Ronald Pollio (attorney representing Dzus Fastener) dated January 31, 1995.

The comments which have been received by the NYSDEC and the corresponding responses are presented below:

1. **Will sediment samples be collected from the Great South Bay?**

Any sampling conducted must be designed such that the results can be linked to a specific site. It would be impossible to link any cadmium or chromium contamination found in the Great South Bay to the Dzus Fastener site due to all of the non-point source discharges into the Great South Bay. Therefore, sediment samples will not be collected from the Great South Bay as part of the Dzus Fastener RI/FS.

2. **A 10-inch diameter pipe was found along the northern boundary of the site. The NYSDEC has concluded that "at some time in the past, wastes were disposed of directly into Willetts Creek" via this pipe. A commentor asked how the NYSDEC reached this conclusion considering that there were no significant levels of cadmium detected in a sample collected from Willetts Creek at the northeast corner of the site.**

The drainline in question extended from the rear of the plant to the eastern end of the site. Cadmium was detected in the soils just beyond the eastern gate at the site at concentrations as high as 2190 parts per million.

The Willetts Creek stream bed has been moved to the east by man over the past thirty-three years (see Figure A). It appears that some time in past, the stream bed existed along the eastern boundary of the site.

It is not surprising that the sample referenced above did not contain a significant concentration of cadmium because the streambed has been moved since the time that the discharge pipe was in use.

3. **Why is the NYSDEC not addressing the contaminated groundwater now?**

The NYSDEC is still researching possible groundwater remedies for this site. The NYSDEC had not found a viable remedial alternative at the time this document was prepared.

4. **Why is the contaminated groundwater not considered part of the source area?**

The source areas are defined as those areas where hazardous wastes were disposed of on-site. The groundwater plumes emanating from the site are the result of releases from the source areas.

5. **Why is Dzus Fastener not paying for the remediation of their site?**

The Dzus Fastener Company lacks sufficient financial resources to fund the entire remedial program and continue in business. If the NYSDEC forced Dzus Fastener to pay for the remedial program, they would go out of business, and their employees would be out of work.

The Dzus Fastener Company, along with their parent company (Dzus International Limited) signed consent orders with the NYSDEC in December 1993 in which they agreed to pay a total of \$1,500,000 to the NYSDEC to off-set the costs incurred in conducting the RI/FS and the remedial program.

The Attorney General of the State of New York has filed a lawsuit against Mr. Theodore Dzus, Sr. In this action, the State is seeking to recover \$632,000 spent to date by the State in investigating the site as well as future costs to be incurred in this matter.

6. **Was a crime committed when Dzus disposed of wastes on-site?**

It is not the position of the NYSDEC's Division of Hazardous Waste Remediation to determine if a crime was committed, but rather to investigate and remediate the contamination that exists at the site in order to protect human health and the environment.

7. **How were cadmium, chromium, and cyanide used at the site?**

Electroplating operations were conducted at the site in which products manufactured at the plant were treated with cadmium and chromium. Cyanides were also used in the plating vats.

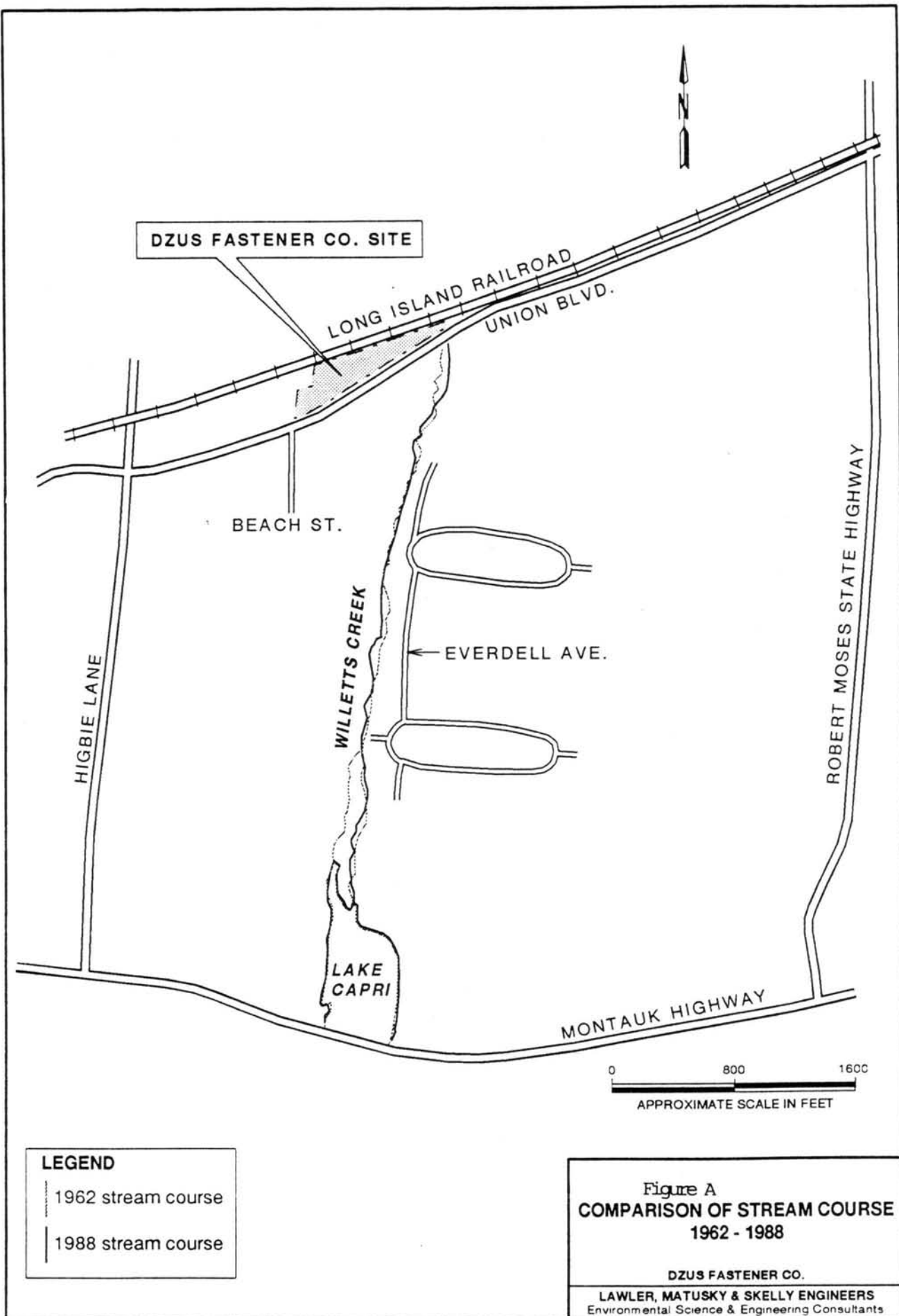
8. **Are there any fact sheets containing information on potential health impacts from exposures to site contaminants?**

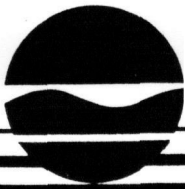
Yes. These can be obtained from Ms. Nina Knapp of the New York State Department of Health at 1-800-458-1158 ext. 402.

9. **Why weren't the disposal practices at the site discovered back in the 1970's (or before)?**

Most of the environmental protection laws and regulations concerning hazardous waste did not come into effect until after the Love Canal case reached national prominence in the 1970's.

The Dzus Fastener Company did not have a State Pollutant Discharge Elimination System (SPDES) Permit to discharge waste water until 1976. Prior to that, few, if any inspections of the facility occurred.





Division of Environmental Remediation

Record of Decision
Dzus Fastener Site
Operable Unit #2
West Islip, Suffolk County
Site Number 1-52-033

September 1997

DECLARATION STATEMENT - RECORD OF DECISION

Dzus Fastener Company Inactive Hazardous Waste Disposal Site Operable Unit #2 West Islip, Suffolk County, New York Site No. 1-52-033

Statement of Purpose and Basis

The Record of Decision (ROD) presents the selected remedial action for Operable Unit #2 of the Dzus Fastener Company inactive hazardous waste disposal site which was chosen in accordance with the New York State Environmental Conservation Law (ECL). The selected remedial program is not inconsistent with the National Oil and Hazardous Substances Pollution Contingency Plan of March 8, 1990 (40CFR300).

This decision is based upon the Administrative Record of the New York State Department of Environmental Conservation (NYSDEC) for the Dzus Fastener Company Inactive Hazardous Waste Disposal 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 B of the **ROD**.

Assessment of the Site

Actual or threatened release of hazardous waste constituents from this site, if not addressed by implementing the response action selected in this ROD, presents a current or potential threat to public health and the environment.

Description of Selected Remedy

Based upon the results of the Remedial Investigation/Feasibility Study (RI/FS) for the Dzus Fastener Company site and the criteria identified for evaluation of alternatives, the NYSDEC has selected groundwater monitoring and dredging Lake Capri with off-site disposal of contaminated sediments. The components of the remedy are as follows:

- A long-term groundwater monitoring program to evaluate the effectiveness of the on-site remedy and to verify that the existing off-site groundwater plume does not adversely impact public health or the environment. Institutional Controls.
- Dredging, dewatering and off-site disposal of approximately 12,000 cubic yards of contaminated sediments from Lake Capri.

- Excavation and off-site disposal of approximately 100 cubic yards of sediment from Willetts Creek, corresponding to levels of cadmium exceeding ~~9 ppm~~.

10 ppm

New York State Department of Health Acceptance

The New York State Department of Health concurs with the remedy 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 preference for remedies that reduce toxicity, mobility, or volume as a principal element.

Date

Michael J. O'Toole, Jr., Director
Division of Environmental Remediation

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SECTION 1: SITE LOCATION AND DESCRIPTION

The ~~Dzus~~ Fastener Company site is located at **425** Union Boulevard, West Islip, Suffolk County. The site comprises one acre and is located in a mixed residential, commercial, and industrial area. The site is triangular in shape and is bounded by Union Avenue to the south, Beach Street to the west, and the Long Island Railroad tracks to the north. Immediately to the east of the site is Willetts Creek, which drains into Lake Capri (*see* Figure 1). Lake Capri is an eight-acre man-made lake which drains into the tidal portion of Willetts Creek through a culvert located underneath Montauk Highway.

This site has been divided into two operable units. Contamination in on-site soils was addressed as Operable Unit 1 (O.U. 1), for which a Record of Decision was signed in March 1995. Operable Unit 2 (O.U. 2) addresses contamination in groundwater and in the sediments and surface waters of Willetts Creek and Lake Capri.

SECTION 2: SITE HISTORY:

2.1 : Operational/Disposal History

Since 1932, the Dzus Fastener Company has manufactured fasteners, small springs and other specialty devices. Until 1985, electroplating and metal cleansing wastes were discharged into a series of drywells and a leach field, thereby releasing contaminants (primarily cadmium, chromium, and cyanide) into the soil and groundwater. A discharge pipe was discovered along the northern boundary of the site, ending near Willetts Creek. From this, the DEC believes that wastewaters may have been discharged directly into the creek during past operations of the site.

2.2: Remedial History

The Dzus Fastener Company site was added to the NYSDEC's Registry of Inactive Hazardous Waste Disposal Sites in New York State in 1982. In 1991, the site was classified as a Class 2 site; meaning that it poses a significant threat to human health or the environment.

In 1984, the NYSDEC conducted a Phase I investigation of the site. This consisted of a literature/file search, a review of disposal practices and a site reconnaissance.

A Phase II Investigation, funded by Dzus Fastener (Dzus) with oversight by the NYSDEC, was conducted in 1990. Soil samples were collected across the site, and fourteen groundwater monitoring wells were installed and sampled during the investigation. Elevated levels of cadmium, chromium, and cyanide were detected in groundwater both on-site and off-site. The source of this contamination was found to be the industrial leach field on the eastern portion of the site.

An Interim Remedial Measure (IRM), funded by Dzus, was conducted in 1991 with oversight by the NYSDEC. The purpose of this IRM was to remove the contaminated leach field. Approximately 1960 cubic yards of contaminated soil were excavated and disposed off site before the project was terminated due to a lack of funds. During this IRM, a 10-inch clay discharge pipe was discovered along the northern property boundary. A report on the IRM activities was prepared in June 1992.



2

- The NYSDEC began the Remedial Investigation/Feasibility Study in May 1992. This investigation was funded by the Environmental Quality Bond Act of 1986 (EQBA). The final RI/FS Report was prepared in October 1994 and an addendum to the RI/FS Report was completed in October 1995.

The Proposed Remedial Action Plan (PRAP) for Operable Unit 1 (O.U. 1) was issued by the NYSDEC in January 1995. The ROD for O.U. 1, which specified in-situ stabilization/solidification of cadmium-contaminated soils, was issued by the NYSDEC in March 1995, and treatment of site soils was completed in December 1996.

To provide a broader range of alternatives to address cadmium contamination in Lake Capri sediments, the NYSDEC prepared a Supplemental Feasibility Study, which was finalized in March 1997.

SECTION 3: CURRENT STATUS

The NYSDEC conducted a Remedial Investigation/Feasibility Study (RI/FS) at the Dzus site between May 1992 and March 1997. The purpose of these studies was to determine the nature and extent of contamination attributable to the site, and to develop and evaluate alternative remedies for addressing this contamination.

3.1: Summary of the Remedial Investigation

The Remedial Investigation (RI) was conducted in two phases between May 1992 and April 1994. Additional sampling was conducted through 1995. A description of the work conducted during the RI is presented below, and the results of this work are summarized in Section 3.1.2 of this document (Extent of Contamination).

- Area Well Inventory: An inventory of wells screened in the Upper Glacial Aquifer to the south of the site was conducted. A total of 18 wells were identified, none of which is used as a public or private water supply. It is believed that all residences, businesses, schools, etc. in these areas are served by the public water supply.
- Groundwater Quality Investigation: A total of 21 groundwater monitoring wells were installed during the RI. These and 11 pre-existing monitoring wells were sampled during the investigation and these samples were analyzed for Volatile Organic and Semivolatile Organic Compounds (VOCs and SVOCs), and Inorganics.
- Groundwater Flow Model: A computer model of groundwater flow was developed to model the future extent of the groundwater contamination migrating from the site. The MODFLOW and MT3D software packages were used to simulate the three-dimensional flow of groundwater and contaminant particles. The model was first calibrated to the known existing contaminant plume, and then used to simulate the migration of cadmium in 50, 100 and 200 years. A more detailed description of the computer model appears in the October 1995 RI/FS Addendum.

- Surface Water and Sediment Investigation: Surface water and sediment samples were collected from 35 locations on Willetts Creek and in Lake Capri. At 11 of these locations, samples were taken of both surface sediment and deeper sediments to determine the depth of cadmium contamination.
- Analysis of Fish and Shellfish Tissues: Fish specimens were collected from Lake Capri by electrofishing in March 1994. The fillets and carcasses of the fish were analyzed separately for cadmium. Specimens of blue crabs and hardshell clams were collected from the tidal portions of both Willetts Creek and Carlls River and analyzed for cadmium. The specimens collected from the Carlls River are considered to be the background control group for this study.
- Sampling of Residential Soils: Soil samples were collected from the yards of thirteen residences along Willetts Creek and Lake Capri. These samples were analyzed for cadmium and chromium.

The analytical data obtained during the RI were compared to applicable Standards, Criteria, and Guidance values (SCGs) in determining the need for remedial action goals for this operable unit. Groundwater, surface water, and drinking water SCGs identified for the Dzus Fastener Company site were based upon the NYSDEC Ambient Water Quality Standards and Guidance Values and Part V of the New York State Sanitary Code. Soil and sediment SCGs identified for the site were based on NYSDEC clean-up guidelines and health-based clean-up guidelines developed by the NYSDOH.

Guidance values for cadmium in sediments are established at two thresholds: the Lowest Effect Level (LEL) of 0.6 ppm and a Severe Effect Level (SEL) of 9.0 ppm. The LEL indicates a level that can be tolerated by the majority of benthic organisms, but which still causes toxicity to a few species. The SEL indicates the concentration at which pronounced disturbance of the sediment-dwelling community can be expected. Cadmium concentrations between the LEL and SEL (0.6 and 9.0 ppm) are considered to be contaminated, with moderate impacts to benthic life.

Chemical concentrations are reported in parts per billion (ppb) and parts per million (ppm). For comparison purposes, Table 1 lists SCGs for each medium.

3.1.1 Nature of Contamination

Based upon a comparison of the analytical results outlined above and the SCGs for this site, it has been determined that the following areas and media are contaminated above SCGs:

- Cadmium levels in groundwater exceed 10 ppb both on- and off-site.
- Surface water in Willetts Creek are contaminated with cadmium and cyanide at concentrations exceeding water quality standards.
- Sediments in Willetts Creek and Lake Capri are contaminated with cadmium above the guidance value of 0.6 ppm. Cadmium is bioaccumulating in the food chain as demonstrated by the cadmium contamination detected in the fish specimens.

3.1.2 Extent of Contamination

Groundwater

mwp

■ Cadmium concentrations in groundwater under the Dzus Fastener Company site ranged from non-detectable at the northern boundary to **1,430** ppb in the leach field area in the eastern corner of the site. Cadmium concentrations in off-site groundwater ranged from non-detectable at all locations south of the Junior High School to 755 ppb at **MW-13**, located at the shopping center across Union Blvd. from the site. The ambient groundwater standard for cadmium is **10** ppb. From this groundwater monitoring data, a plume of cadmium-contaminated groundwater was mapped, extending approximately 700 feet south from the site, to where it discharges into Willetts Creek.

In addition to cadmium, cyanide was detected on-site at concentrations ranging up to **2,490** ppb (the ambient groundwater standard is **100** ppb). Chromium was also detected in on-site and off-site wells at concentrations ranging up to **258** ppb (the groundwater standard is 50 ppb).

The groundwater flow model predicted the extent of the cadmium plume 50, 100 and 200 years after the source of contamination has been remediated. The model estimates that cadmium levels in excess of the groundwater standard (10 ppb) will extend no further than 1000 feet from the site **100** years in the future.

Sediments

Cadmium was detected in most of the Willetts Creek and Lake Capri sediment samples, as shown in Table 1 and Figure 2. Figure 3 shows the sample detections and a contour plot of cadmium concentrations in the lake, averaged over the top **12"** of sediments.

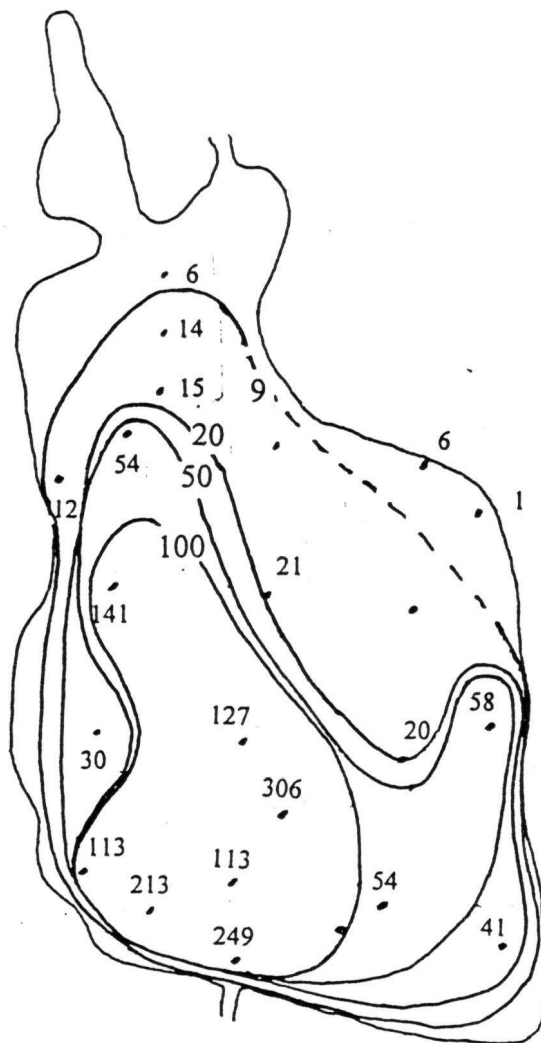
• Concentrations of cadmium in Willetts Creek sediments ranged from 0.82 to **79.8** ppm, with non-detectable levels at 6 locations.

In Lake Capri, cadmium was detected in the surface sediments at all sampling locations, at concentrations ranging from **1.4** to **347** ppm. Cadmium concentrations in deeper sediments were consistently lower than in surface sediments, ranging from non-detectable to **79** ppm. Due to sampling variability, the deeper sediment samples were not taken from a consistent depth; they range from **3"-6"** to **12"-24"**.

Lead was detected in **6** samples from both Willetts Creek and Lake Capri at levels that exceed the sediment quality guideline. At all **6** locations, the sediment guideline for cadmium was also exceeded.

Surface Water

Cadmium was detected in surface water at two locations on Willetts Creek and at one location in Lake Capri. The highest cadmium concentration in Willetts Creek was **37.7** ppb at location **SED-3/SW-3** (see Figure 2), which is significantly higher than the NYSDEC's surface water standard of **0.7** ppb. Cyanide was also detected at the SW-3 location at a concentration of **15** ppb. The surface water standard for cyanide is **5.2** ppb. The location of these detections closely matches the current extent of the groundwater



Scale: 1" = 200' (approx)

C = 100 ppm Cd	V = 3,000 cu yds
C = 50 ppm Cd	V = 5,600 cu yds
C = 20 ppm Cd	V = 6,500 cu yds
C = 9 ppm Cd	V = 9,950 cu yds
C = 1 ppm Cd	V = 12,000 cu yds

Volume estimates based on 12" depth of excavation
Sediment concentrations averaged over top 12"

FIGURE 3: Sediment Concentration Isopleths and Estimated Volumes

contaminant plume, indicating that contaminated groundwater is discharging to this portion of Willetts Creek. Cadmium was detected in only one of ten surface water samples collected in Lake Capri at a concentration of **3.8** ppb.

Residential Surface Soils

Cadmium concentrations ranged from non-detectable levels to 1.7 ppm (the health-based clean-up guideline is 10 ppm) in samples collected from the yards of residences along Willetts Creek. Cadmium was also detected at **2.6** ppm in a sample taken adjacent to a picnic table at the Dzus Site. Chromium was detected at concentrations ranging from 5.2 to 20.2 ppm, compared to the DEC cleanup guideline of 50 ppm. These results are presented in Table 1.

Biota

The results of fish and shellfish analyses are summarized in Table 1. Carp were the most contaminated species with cadmium at concentrations up to 1.9 ppm in the fillet samples. While there are no established guidelines or standards for cadmium in fish, the NYSDOH has issued a health advisory against the consumption of fish from the lake. In crab and clam samples, cadmium was detected at a greater frequency in the specimens collected from Willetts Creek than in those of the control group collected in Carlls River. In the Willetts Creek crab specimens, cadmium was found more frequently and in higher concentrations in the hepatopancreas (liver/pancreas) than in the muscle tissue.

Statewide, the NYSDOH has issued **an** advisory against eating the hepatopancreas of the blue crabs due to presence of PCBs and cadmium. In addition, the consumption of clams is prohibited due to the presence of coliform in these species.

3.2: Interim Remedial Measures

Interim Remedial Measures (IRMs) are conducted at sites when a source of contamination or exposure pathway can be effectively addressed before completion of the RI/FS.

In 1991, the Dzus Fastener Company excavated and removed approximately 1960 cubic yards of contaminated soil and several leach field appurtenances from the on-site leach field (See Section 2.2).

3.3: Summary of Human Exposure Pathways

A baseline human health evaluation and risk assessment was conducted to identify potential exposure pathways to site-related contaminants and to assess the potential risks to human health associated with those pathways.

The potential human exposure pathways at the Dzus site and the associated contaminants are:

<u>Exposure Pathway</u>	<u>Chemical</u>
Ingestion of chemicals in residential soils by adults	Cd, Cr
Ingestion of chemicals in residential soils by children	Cd, Cr
Ingestion of surface water in Willetts Creek	Cd, Zn, CN
Ingestion of chemicals in sediments in Willetts Creek	Cd, Zn, Ni
Dermal contact with chemicals in Willetts Creek	CN
Dermal contact with chemicals in the sediment of Lake Capri	Cd, Cr

NOTE: Cd = Cadmium, Cr = chromium, Zn = Zinc, Ni = Nickel CN = Cyanide

For noncarcinogenic effects associated with off-site exposure, it was assumed that adults may be exposed to site contaminants through the ingestion of contaminated soils from yards along Willetts Creek and Lake Capri. Children may potentially be exposed to site contaminants through the ingestion of surface water and sediments in Willetts Creek, dermal contact with contaminants in surface water while wading in Willetts Creek and Lake Capri, and ingestion of chemicals in residential soils.

To describe the potential for noncancer health effects to occur in an individual, the hazard index is used, which is expressed as **the** ratio of an estimated contaminant intake to the risk reference dose. **A** risk reference dose is the estimated daily intake of a chemical that is likely to exist without an appreciable risk of health effects. **A** ratio equal to or less than one is generally considered to be an acceptable level of risk.

The total noncancer risk to adults, including the fish ingestion pathway, is 0.376. The corresponding risk to children is 0.710. The largest contribution to these risks is from the ingestion of cadmium in fish, totalling 0.373 and 0.620 for adults and children, respectively. These results indicate that it is unlikely that the contaminants of concern at the Dzus Fastener site will result in adverse human health effects at the concentrations currently identified in the surface soils in residential yards, surface water, sediments or fish of Willetts Creek or Lake Capri.

Cancer risks were calculated using standard exposure estimates for site-specific levels of the contaminants of concern. Cancer risks are expressed as the probability of developing an additional case of cancer in the exposed population. For known or suspected carcinogens, the NYSDOH compares site-related cancer risks to the health risk goal of one additional cancer in one million (1×10^{-6}).

In the evaluation of on-site contamination (O.U.1), cancer risks were estimated based on the inhalation of airborne cadmium in soils by on-site workers and children trespassing on the site. These risks were calculated as 3.74×10^{-7} and 1.32×10^{-6} , respectively. Because on-site contamination has now been remediated, off-site contaminant levels are much lower than those on-site, and inhalation of contaminated sediments is an unlikely exposure pathway, airborne exposure to cadmium was not evaluated for Operable Unit 2.

Carcinogenic health effects are not known to result from inhalation exposures to cyanide, zinc or chromium in its trivalent form. No evidence currently exists that cadmium and cyanide are carcinogenic by the ingestion pathway. Therefore, oral exposures to these contaminants are not expected to pose an increased risk of cancer to human populations. Dermal exposures to cyanide are also not expected to result in carcinogenic effects for children wading in Willetts Creek.

3.4: Summary of Environmental Exposure Pathways

Cadmium was detected in the sediments of Willetts Creek and Lake Capri at concentrations above those known to cause toxic effects to benthic organisms living on or in the sediments. At the detected concentrations, it is likely that benthic species richness and diversity are low, and that the lake is inhabited by a few tolerant species at low population levels.

Cadmium is entering the food chain as demonstrated by detections of this contaminant in fish specimens collected from Lake Capri. It is also likely that birds and mammals which consume plants and/or invertebrates from the lake are at risk from the uptake of cadmium from lake water and sediments. Impacts to fish at the detected concentrations include mortality, retarded growth and impaired reproduction. Migratory waterfowl which may be exposed to cadmium in aquatic plants and invertebrates may be at risk of kidney damage, infertility and reduced egg production. Waterfowl may also bioaccumulate cadmium in their tissues, which may pose a route of exposure to humans who hunt and consume them.

SECTION 4: ENFORCEMENT STATUS

The Potentially Responsible Parties (PRPs) in this action include:

- Dzus Fastener Company, Inc. (Dzus Fastener);
- Dzus International Limited (Dzus International); and
- Theodore Dzus. Sr.

The PRPs initially refused to sign a consent order with the NYSDEC to conduct an RI/FS at the site. As a result, the NYSDEC, using state funds, conducted the RI/FS. The funds required for remediating Operable Unit 2 of the site will also come from state funds provided by the Environmental Quality Bond Act of 1986.

Dzus Fastener and Dzus International later signed Orders on Consent, which became effective on December 13, 1993, agreeing to pay the State the following amounts towards the investigation and remediation of the site:

- Dzus Fastener: \$1,100,000
- Dzus International: \$400,000

A. Alternatives for Remediating Contaminated Groundwater

Alternative A1 - No Action

Under this alternative, no remediation would be conducted. The no action alternative is evaluated as a procedural requirement and as a basis for comparison. This alternative would leave the site in its present condition and would not provide any additional protection to human health or the environment.

Capital Cost: \$ 0
O&M Costs: \$ 0/year
Present Worth: \$ 0

Alternative A2 - Monitoring and Institutional Controls

A long-term monitoring program would be developed and implemented. An estimated 20 monitoring wells would be sampled periodically and analyzed for cadmium, chromium, and cyanide, which are the contaminants of concern in groundwater. This monitoring would be performed to verify the current expectation that contaminants in groundwater will not migrate significantly from their current extent. Existing institutional controls would be continued to ensure that no public or private water supply wells are installed in areas of contaminated groundwater.

Capital Cost: \$ 0
O&M Costs: \$ 21,950/year
Present Worth: \$ 337,500

Alternative A3 - Pump and Treat Groundwater for Aquifer Restoration

This alternative was developed to evaluate the feasibility of pumping and treating groundwater to restore the aquifer to ambient water quality standards. Three groundwater extraction wells would be installed, a treatment plant would be constructed, and the system would be operated until groundwater quality standards are achieved in the aquifer. Groundwater would be treated via chemical oxidation (to remove cyanide) and precipitation (to remove cadmium and chromium) and would then be reinjected into the aquifer.

A long-term monitoring program would be developed to evaluate the performance of the pump and treat system. An estimated 20 monitoring wells would be sampled periodically and analyzed for cadmium, chromium, and cyanide.

Capital Cost: \$ 3,793,000
O&M Costs: \$ 201,700/year
Present Worth: \$12,763,000

Alternative A4 - Pump and Treat Groundwater for Containment

This alternative was developed to evaluate the feasibility of pumping and treating groundwater to contain the contaminant plume and to prevent the discharge of contaminants to Willetts Creek. One groundwater

extraction well, located behind the Grand Union Shopping Center would be installed and operated under this alternative. Groundwater would be treated as described above and reinjected into the aquifer.

A long-term monitoring program would be developed to evaluate the performance of the pump and treat system. An estimated 20 monitoring wells would be sampled periodically and analyzed for cadmium, chromium, and cyanide.

Capital Cost: \$ 1,428,000
O&M Costs: \$ 58,350/year
Present Worth \$ 4,528,500

B. Alternatives for Remediating Cadmium-Contaminated Sediments in Willetts Creek and Lake Capri.

Alternative B1 - No Action

Under this alternative, no remediation would be conducted. The no action alternative is evaluated as a procedural requirement and as a basis for comparison. It requires only continued monitoring of sediment, surface water and fish tissue, allowing the site to remain in an unremediated state. This alternative would leave the site in its present condition and would not provide any additional protection to human health or the environment.

Capital Cost: \$0
O&M Costs: \$1,500/year
Present Worth \$23,055

Alternative B2 - Dredging Lake Capri with Off-site Disposal of the Sediments

The entire lake bottom to a depth of approximately one foot (approximately 12,000 cubic yards) would be dredged from Lake Capri under this alternative. These dredged sediments would be pumped as a slurry to a treatment unit for dewatering. A temporary treatment facility would be established at a nearby location, such as the back parking lot of the West Islip High School adjacent to Willetts Creek. The sediments would be dewatered using filter presses to produce a solid material for transport to a disposal facility. Water removed from the sediments would be treated and discharged into Willetts Creek in compliance with discharge permit requirements.

Also, approximately 100 cubic yards of sediment from Willetts Creek would be excavated mechanically and transported to a disposal facility. This corresponds to the higher levels of cadmium (greater than 9 ppm) found near locations **SED-3** and **SED-23**.

After dredging, lake vegetation would be allowed to naturally re-establish, and the lake would be restocked with fish. Monitoring would be performed as described for Alternative B1.

Capital Cost: \$ 5,153,200
O&M Costs: \$ 1,500/year
Present Worth \$ 5,176,255

Alternative B3 - Dredging the Southern Portion of Lake Capri with Off-site Disposal of the Sediments

Under this alternative, only the most contaminated Lake Capri sediments (approximately 4,000 cubic yards) would be dredged, treated and disposed **as** described above. This corresponds to a cleanup level of approximately 100 ppm cadmium. Also, approximately 100 cubic yards of sediment from Willetts Creek would be excavated mechanically and transported to a disposal facility. This corresponds to the higher levels of cadmium (greater than 9 ppm) found near locations SED-3 and SED-23.

Capital Cost: \$ 1,896,700
O&M Costs: \$ 1,500/year
Present Worth: \$ 1,919,755

Alternative B4 - Fill in Lake Capri

Under this alternative, contaminated sediments would be treated by solidification and then buried under clean soil **as** the lake is filled in. A culvert would be installed under the lake bed to carry Willetts Creek water through the filled area. A barrier cap would be constructed in order to prevent humans, plants, or wildlife from coming into contact with the contaminated sediments.

Capital Cost: \$ 2,693,600
O&M Costs: \$ 1,500/year
Present Worth \$ 2,716,655

Alternative B5 - Consolidation of the Contaminated Sediments in a Containment Cell along the Shore of Lake Capri

For this alternative, a containment cell would be constructed along a portion of the shoreline, as shown in Figure 4. Contaminated sediments outside the containment cell (approximately 10,000 cubic yards) would be hydraulically dredged and pumped into the cell for gravity settling. Water would be decanted from the cell or subcells, treated, and discharged in compliance with permitting requirements. The cell would comprise approximately 1.3 acres, and its exact location would be determined by the availability of permanent easements. As shown in Figure 5, the containment cell would be capped with a geomembrane and covered with backfill and vegetative cover to prevent humans, plants or wildlife from coming into contact with it.

Also, approximately 100 cubic yards of sediment from Willetts Creek would be excavated mechanically and transported to a disposal facility. This corresponds to the higher levels of cadmium (greater than 9 ppm) found near locations SED-3 and SED-23.

Capital Cost: \$ 2,316,600
O&M Costs: \$ 1,500/year
Present Worth \$ 2,355,025

Alternative B6 - Consolidation of the Contaminated Sediments in a Containment Cell in the Middle of Lake Capri

A circular containment cell would be constructed in Lake Capri in the general location shown in Figure 4, and having the cross section shown in Figure 5. As described above, contaminated sediments would be dredged from the lake and pumped into the cell for gravity settling. The cell would comprise approximately 1.0 acre, and its location would be determined by the availability of easements. The dredged material would then be capped in a manner to prevent humans, plants, or wildlife from coming into contact with it.

Also, approximately 100 cubic yards of sediment from Willetts Creek would be excavated mechanically and transported to a disposal facility. This corresponds to the higher levels of cadmium (greater than 9 ppm) found near locations SED-3 and SED-23.

Capital Cost: \$ 1,418,476
O&M Costs: \$ 1,500/year
Present Worth \$ 1,456,901

Alternative B7 - Dredging with Combined Off-Site Disposal and Underwater Capping

This alternative involves dredging and removing the most contaminated portion of the lake sediments, and consolidating the remaining low-level sediments in an underwater containment cell. Figure 6 shows the conceptual cross section of this containment cell. Approximately 6,500 cubic yards of contaminated sediments would be dredged from the lake, dewatered as described in Alternatives B2 and B3, and disposed in an off-site landfill. This volume of sediments corresponds to an estimated depth of 1 foot and a minimum level of approximately 20 ppm of cadmium. Based on current sampling data, this would result in the removal of 92.4% of the mass of cadmium from the lake. Also, approximately 100 cubic yards of sediment from Willetts Creek would be excavated mechanically and transported to a disposal facility. This corresponds to the higher levels of cadmium (greater than 9 ppm) found near locations SED-3 and SED-23.

After the most contaminated sediments are dredged and removed, additional uncontaminated sediments would be excavated to create a cavity for the placement of sediments containing lower levels of cadmium. These over-excavated sediments, which would be free of contaminants, would be stockpiled on shore for use as the final cover over the disposal cell. The underwater disposal cell would contain approximately 5,500 cubic yards of sediments, with an estimated average concentration of 10 ppm cadmium.

Capital Cost: \$ 3,859,567
O&M Costs: \$ 1,500/year
Present Worth \$ 3,882,622

Section 6.2: Evaluation of the Remedial Alternatives

The criteria used to compare and contrast the potential remedial alternative are defined in 6 NYCRR Part 375. For each of the criteria, a brief description is provided, followed by an evaluation of the alternatives against that criterion.

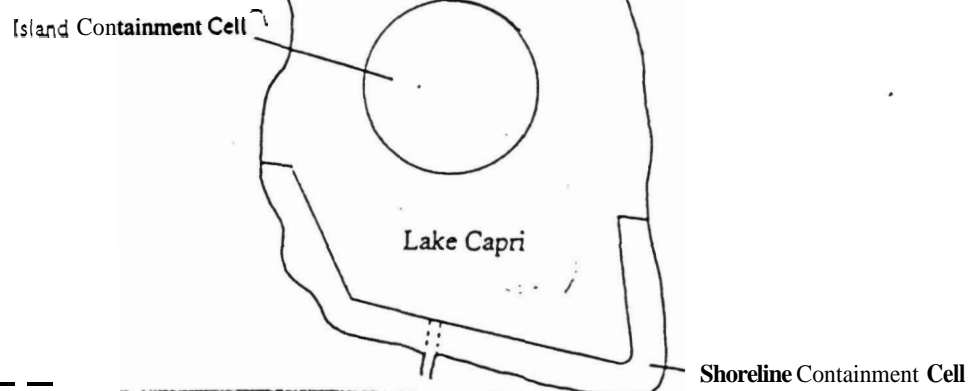


FIGURE 4: Location of Shoreline and Island Containment Cells (Alternatives B5 and B6)

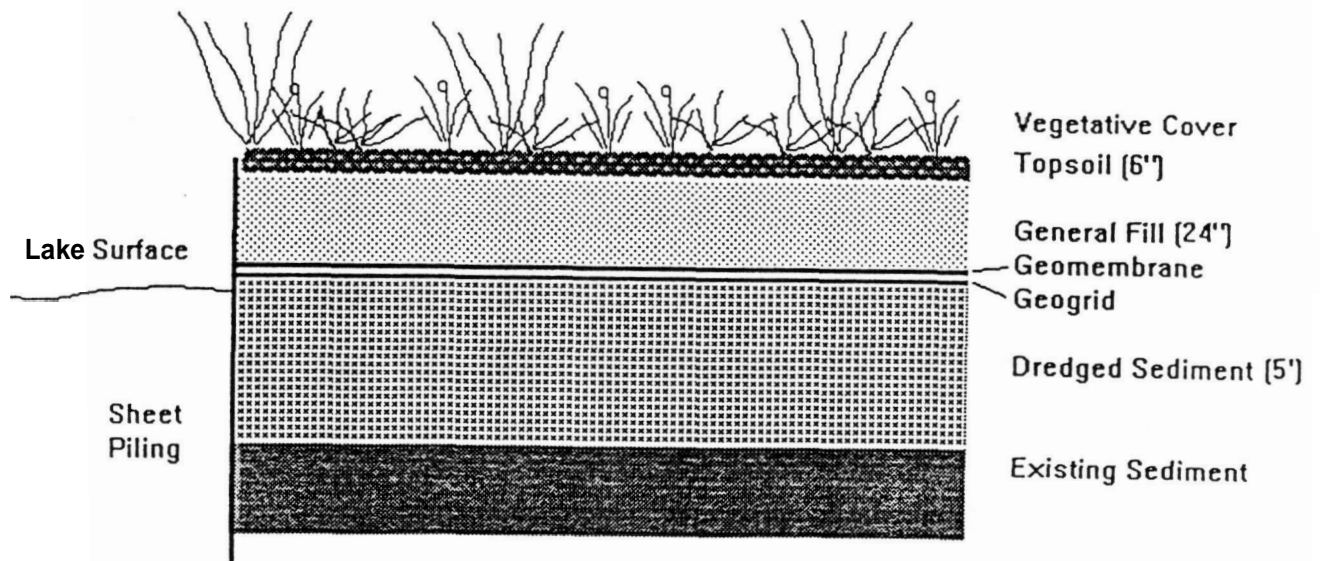


FIGURE 5: Cross Section of Shoreline and Island Containment Cells (Alternatives B5 and B6)

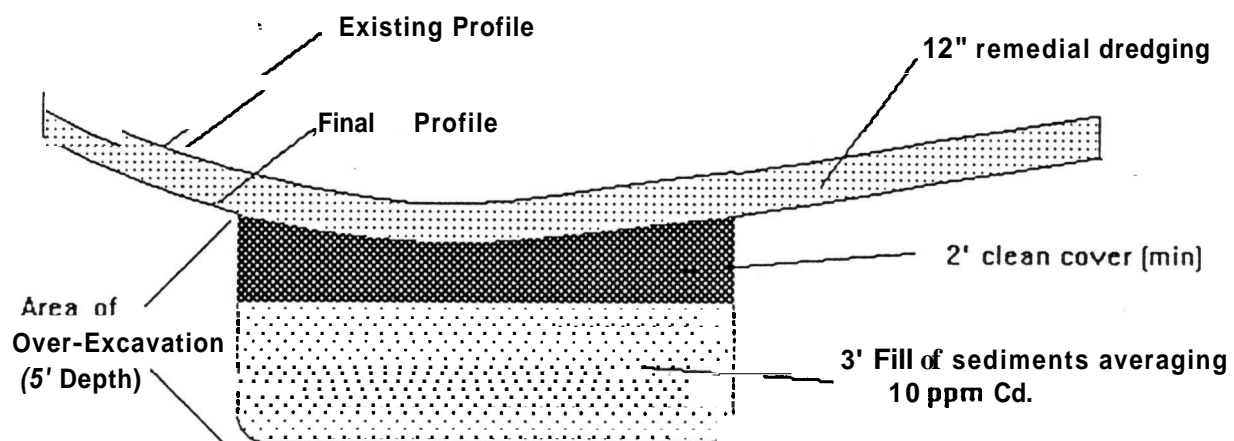


Figure 6: Conceptual Cross-Section of Underwater Containment Cell (Alternative B7)

Threshold Criteria - The first two criteria must be satisfied in order for an alternative to be eligible for selection.

1. Protection of Human Health and the Environment - This criterion is an overall and final evaluation of the health and environmental impacts to assess whether each alternative is protective. This evaluation is based upon a composite of factors assessed under other criteria, especially short/long term effectiveness and compliance with Standards, Criteria, and Guidance values (SCGs).

All of the groundwater alternatives would be protective of human health because no public exposure to contaminated groundwater presently exists or is expected to occur. Alternatives A3 and A4 would provide more certain environmental protection than Alternatives A1 and A2 because groundwater would be actively removed and treated. The main environmental threat from contaminated groundwater is the release of contaminants to surface water (Willetts Creek). Surface water standards for cadmium and cyanide are presently exceeded in the upper reaches of Willetts Creek (locations SW-3 and SW-24 on Figure 2). The groundwater model indicates that these exceedances are likely to continue under Alternatives A1 and A2. However, based on current conditions, the NYSDEC believes that groundwater contamination will not cause widespread surface water quality impacts to Willetts Creek if no remedial action is undertaken. Alternative A2 would confirm this expectation through monitoring.

Alternative B2 (Full Dredging & Off-site Disposal) provides the greatest degree of environmental protection because all sediments containing excessive levels of cadmium would be removed from the ecosystem. Alternative B7 (Dredging and Underwater Capping) would provide the next best level of protection because more than 90% of the cadmium would be removed from the lake, and the remainder would be isolated by the underwater cap.

Alternatives B5 and B6 would be somewhat less protective of the environment because all cadmium-contaminated sediments, including those with high levels, would be managed in containment cells in or along the lake. The risk of release to the environment is greater for these alternatives than for the underwater capping alternative. Alternative B3 (Partial Dredging) would provide a lesser degree of protection because moderate to high levels of cadmium (up to 100 ppm) would remain exposed to the environment. Alternative B4 (Filling the Lake) would provide protection from cadmium contamination, but the environment as a whole would be severely degraded. Alternative B1 (No Action) would provide the least degree of environmental protection.

2. Compliance with New York State Standards, Criteria, and Guidance values (SCGs) - Under this criterion, the issue of whether a remedy will meet all of the Federal or State environmental laws and regulations is addressed. If these laws and regulations will not be met, then grounds for invoking a waiver must be provided.

In time, groundwater standards would be met under all four groundwater alternatives under consideration. These standards would be achieved more quickly under Alternatives A3 and A4 because groundwater would be actively pumped and treated. Alternatives A1 and A2 rely on natural attenuation and dilution processes to achieve standards, which are expected to require a very long period of time. However, during this time, no unacceptable public exposure to site contaminants is expected to occur.

As discussed in Section 3.1, guidance values for cadmium in sediments are established at two thresholds: the Lowest Effect Level (LEL) of 0.6 ppm and a Severe Effect Level (SEL) of 9.0 ppm. In addition, the NYSDEC provides guidance on recommended management practices for dredging and disposing of contaminated sediments.

With respect to the sediment guidance values, Alternatives B2 and B7 would provide the best compliance. The Severe Effects Level (SEL) would be achieved and the Lowest Effects Level (LEL) would be approached. Alternatives B5 and B6 would remediate sediments to levels that meet the guidance values for cadmium, but the level of cadmium disposed in the containment cells would exceed that recommended as a best management practice. Alternative B3 would not meet the guidance values because sediments left undredged would exceed the SEL for cadmium. Alternative B4 would result in compliance with sediment guidance values because the lake would no longer contain sediments. However, filling in the lake would violate other promulgated criteria such as the state Freshwater Wetlands Act and Section 404 of the federal Clean Water Act. Alternative B1 would not comply with guidance values for sediment contamination, but would not violate any action-specific criteria because no action would be taken.

Primary Balancing Criteria - The next five "primary balancing criteria" are used to compare and contrast the positive and negative aspects of the various alternatives.

3. Short-term Effectiveness - Under this criterion, the potential short-term impacts of the remedial action upon the community, the workers, and the environment are evaluated. The period of time required to achieve the remedial objectives is estimated and compared/contrasted with the other alternatives.

There are no short-term impacts associated with Alternatives A1 and A2 because no action would be taken. There would be some short-term impacts to the community under Alternatives A3 and A4 as wells, piping systems and treatment facilities are installed. These activities should take one to three months to complete, during which no exposure to contaminants is expected.

There are no short-term impacts associated with the implementation of Alternative B1. There are significant short-term impacts associated with the implementation of the remaining sediment alternatives (B2 - B7). It is estimated that it would take three to four months to implement Alternatives B5 and B6, and an additional month to implement Alternative B7. During that time, there would be significant aesthetic and environmental impacts to Lake Capri and the surrounding community. These impacts would include temporary destruction of the sediment habitat, elimination of resident fish, increased truck traffic, construction activities on properties adjoining the lake and increased noise during construction periods.

Dredging operations on the lake would only occur during working hours. Access to the lake would be restricted, particularly in the designated containment and water treatment areas, and in areas of active dredging. Dewatering processes and treatment equipment would be operated for 24 hours per day during the hydraulic dredging phase. A temporary structure would enclose this equipment to minimize the noise. Temporary access roads may be required along all or part of the shoreline, which would require temporary easements, followed by restoration. Alternatives B5, B6 and, possibly, B7, which require sheet pile containment, would create additional noise as the piles are driven.

Short-term environmental impacts of dredging include the disturbance of the sediment habitat and the suspension of cadmium-contaminated material. Some desorption of cadmium from the solid to the dissolved phase could also occur, resulting in increased water column concentrations. These impacts would be minimized by careful

monitoring and contingency planning. Temporary silt curtain containment may be required in areas of active dredging to control the migration of suspended particles.

4. Long-term Effectiveness and Permanence - If wastes or residuals will remain **at** the site after the selected remedy has been implemented, then the following items are evaluated: 1) the magnitude and nature of the risk posed by the remaining wastes; 2) the adequacy of the controls intended to limit the risks posed by the remaining wastes; and 3) the reliability of these controls.

Alternatives A3 and A4 would provide more certain long term effectiveness as groundwater contaminants would be actively removed from the aquifer. Alternatives A1 and A2 rely on natural processes to limit the migration of contaminants now that the source has been removed. In Alternative A2, the plume would be monitored periodically to confirm the NYSDEC's expectation of little future contaminant migration and human health or environmental impacts.

Alternative B2 would provide the greatest degree of long-term effectiveness because all sediments containing excessive levels of cadmium would be removed from the ecosystem. This alternative would provide a permanent solution to cadmium contamination in the lake. Alternative B4 would also provide long term protection from cadmium contamination. Alternative B7 would provide the next best level of protection and permanence because more than 90% of the cadmium would be removed from the lake and the remainder would be isolated by the underwater cap. The capped area would require monitoring and possibly maintenance to ensure that low level contaminants are not transported from the capped area back into the environment.

Alternatives B5 and B6 would provide somewhat less long-term effectiveness because all cadmium-contaminated sediments, including those with high levels, would be managed in containment cells in or along the lake. The risk of release to the environment, and the degree of long-term operation and maintenance, is greater for these alternatives than for the underwater capping alternative.

Alternative B3 (Partial Dredging) would provide a lesser degree of long-term effectiveness because moderate to high levels of cadmium would remain exposed to the environment. Alternative B1 (No Action) would provide no long term effectiveness or permanence.

5. Reduction of Toxicity, Mobility, and Volume - Preference is given to alternatives that permanently, and by treatment, reduce the toxicity, mobility, or volume of the wastes at the site. This includes assessing the fate of the residues generated from treating the wastes at the site.

The volume and mobility of the contaminants in the aquifer would be reduced if Alternatives A3 and A4 are implemented. The magnitude of these reductions would be greater under Alternative A3 than A4 due to the higher rate of pumping. Alternatives A1 and A2 provide no reduction in the toxicity, mobility, or volume of the contamination in the aquifer.

Alternative B2 would provide the greatest reduction in the volume and mobility of cadmium because all contaminated sediments would be dewatered and disposed off site.

The mobility of cadmium would be reduced to a lesser degree under Alternative B7, but more than 90% of the cadmium would be removed from the lake and disposed off-site. The volume of this material would be significantly reduced by the mechanical dewatering process. The mobility of the remaining contaminated sediments

would be reduced by the cap over the underwater containment cell, which would prevent migration of cadmium in the solid phase.

- The mobility of cadmium in Lake Capri sediments would be reduced to a lesser degree by the containment cells in Alternatives B5 and B6, and by the fill in Alternative B4. The volume of contaminated sediments would be reduced slightly by gravity dewatering and consolidation in the containment cell.

6. Implementability - Under this criterion, the technical and administrative feasibility of implementing each alternative is evaluated. Technically, this includes the difficulties associated with the construction and operation of the alternative and the ability to effectively monitor the effectiveness of the remedy. Administratively, the availability of the necessary personnel and material is evaluated along with potential difficulties in obtaining special permits, rights-of-way for construction, etc.

Alternative A1 would be the easiest groundwater alternative to implement since there would be no difficult technical or administrative tasks associated with this alternative. Alternative A2 would also be easy to implement because only an institutional action is required. Alternatives A3 and A4 would be more difficult to implement because pumping, piping and treatment systems would have to be designed and constructed.

Alternative B1 would be the easiest sediment alternative to implement since it requires only institutional action and continued monitoring. The remaining alternatives involve well-established technologies for dredging and dewatering contaminated sediments, and for treating contaminated water for discharge. However; site-specific conditions pose several technical challenges that impact Alternatives B2 through B7 to varying degrees.

For all dredging alternatives, access to Lake Capri would be required for the dredge and supporting equipment. The level of the lake may have to be lowered to provide better access for shore-based mechanical dredges. This should be easily done by means of the outlet culvert along the Montauk Highway. Alternative B3 would be easier to implement because it generally involves dredging in the deepest part of the lake. Alternatives B2, B3 and B7 would require access for sediment dewatering and water treatment facilities at a nearby location.

Alternatives B5 and B6 would be somewhat more difficult to implement because, in addition to the difficulties associated with dredging, they require installation of sheet pile containment structures in or along the lake. These would be difficult to install from the shallow draft barges which would be necessary in this lake. The shoreline cell (Alternative B5) would be easier to construct because access would be available from the shoreline. The containment island (Alternative B6) would be more difficult because the piles would have to be transported to and installed in the middle of the lake. These alternatives would not require a sediment dewatering process, and access to a nearby property may not be required. However, water decanted from the containment cells would require treatment prior to discharge to Willetts Creek, and so construction of a treatment facility would be necessary in the work area.

Alternative B7 would be the most difficult to implement because it requires both hydraulic and mechanical dredging, as well as the removal, dewatering and temporary stockpiling of clean cover material. Alternative B4 has uncertain implementability due to the unknown rate of groundwater recharge into the lake.

With respect to administrative implementability, it is likely that permits and approvals could be obtained for all alternatives except Alternative B4 (Filling in the Lake). Filling in Lake Capri is likely a violation of the state Freshwater Wetlands Act and the federal Clean Water Act and is not implementable. All three containment

alternatives (Alternatives **B5**, **B6** and **B7**) may also be difficult to implement administratively. The lake is privately owned by at least 20 homeowners, and permanent easements would be required to construct any on-site containment cell. A shoreline containment cell located along the Montauk Highway would impact at least 3 properties, filling nearly all the lake contained in them. The island containment cell would require a greater number of easements, but would involve filling a much smaller fraction of each property. Past discussions with property owners suggest that permanent easements would be very difficult to obtain.

7. **Cost** - Under this criterion, capital and operational **and** maintenance costs are estimated for the alternatives and compared on a present worth basis. Although cost is the last criterion evaluated; where two or more alternatives have met the requirements of the other criteria, lower cost can be used as the basis for final selection.

A summary of the costs for each alternative are presented in Table 2.

Modifying Criterion - This final criterion is taken into account after evaluating those above. It is focused upon after public comments on this Proposed Remedial Action Plan (PRAP) have been received.

8. **Community Acceptance** - Concerns of the community regarding the RI/FS reports and the Proposed Remedial Action Plan have been evaluated. No written comments were received during the comment period. The "Responsiveness Summary" included as Appendix A presents comments and questions received from the public during the August 6, 1997 public meeting and the Department's response to them. The 69 attendees of the public meeting were asked to raise their hands if they supported the proposed remedy and the response was strongly favorable. As a result, the NYSDEC did not modify the remedy as a result of public comment.

SECTION 7: SUMMARY OF THE SELECTED REMEDY

Based upon the results of the RI/FS, and the evaluation presented in Section 6, the NYSDEC is selecting the following remedy:

- a A long-term groundwater monitoring program to evaluate the effectiveness of the on-site remedy and to verify that the existing groundwater plume does not impact public health or the environment (Alternative A2). Institutional controls...
- Dredging, dewatering and off-site disposal of contaminated sediments from Lake Capri (Alternative B2).
- Excavation and off-site disposal of approximately 100 cubic yards of sediment from Willetts Creek, corresponding to levels of cadmium exceeding 9 ppm near locations SED-3 and SED-23.

Monitoring groundwater will verify the expectation that the contaminant plume will not migrate significantly beyond its current extent. It should be noted that exceedances of cadmium and cyanide standards are likely to continue in the upper reaches of Willetts Creek. However, concentrations of these contaminants will continue to be diluted by clean groundwater in southern sections of the creek, and ambient water quality standards are expected to be met as the creek enters Lake Capri. Because the basis for these standards is fish propagation, the impact of these exceedances is to the environment, not to public health. Because a portion of upper Willetts Creek is an intermittent stream, and the remainder is not a valuable habitat for fish propagation, the environmental impact of continued

exceedances will be minor. Surface water and sediments in Willetts Creek and Lake Capri will be monitored to verify this expectation.

Dredging-and off-site disposal of cadmium-contaminated sediments (Alternative B2) provides the greatest degree of environmental protection and compliance with SCGs. Although Alternative B2 is significantly more expensive than Alternative B7, which also provides a high degree of environmental protection, the construction of **an** underwater containment cell under Alternative B7 would be much more difficult to implement technically and administratively. As a result, the estimated costs of Alternative B7 are less certain. In addition, all of the containment alternatives would require maintenance for **an** indefinite period to maintain their integrity. This would not be necessary for the off-site disposal alternative. Because Alternative B2 provides the best level of environmental protection with a high degree of certainty for technical and administrative success, it is the selected alternative for remediating the sediments of Lake Capri.

SECTION 8: HIGHLIGHTS OF COMMUNITY PARTICIPATION

As part of the remedial investigation process, a number of Citizen Participation (CP) activities were undertaken in an effort to inform and educate the public about conditions at the site and the potential remedial alternatives. The following public participation activities were conducted for the site:

- A Citizen Participation Plan was developed and a repository for site-related documents was established.
- A public contact list was established which included nearby property owners, local political officials, local media and other interested parties.
- Public informational meetings were held in September 1992, June 1993, December 1993, and June 1994 to discuss this project and answer questions posed by the public.
- A questionnaire was distributed to residents living along Willetts Creek and Lake Capri in January 1994.
- A public meeting was held on February 6, 1995 regarding the State's proposed remedy for Operable Unit 1 (on-site source remedy).
- In October 1996, **an** availability session'was held with residents of the lake and elected officials to discuss the alternatives under consideration at that time, and to evaluate the feasibility of constructing on-site containment cells in the lake.
- In August 1997 a fact sheet was mailed to the public contact list and a public meeting was held to present the Proposed Remedial Action Plan for Operable Unit #2. A 30-day public comment period was established for the receipt of written comments.
- In September 1997 a Responsiveness Summary was prepared to address the comments and questions received during the public comment period for the PRAP. This was sent to the meeting attendees and placed in the document repositories.

Table 1
Nature and Extent of Contamination

MEDIA	CLASS	CONTAMINANT OF CONCERN	CONCENTRATION RANGE (ppb)	FREQUENCY of SCG EXCEEDANCE	SCG (ppb)
Groundwater	Volatile Organic Compounds (VOCs)	1,1,1-Trichloroethane	ND - 5	1 of 15	5.0
		1,1-Dichloroethane	ND - 5	1 of 15	5.0
	Semivolatile Organics (SVOCs)	1,4 -Dichlorobenzene	ND - 6	1 of 15	4.7
		1,2-Dichlorobenzene	ND - 24	1 of 15	4.7
	Metals	Cadmium	ND - 1,430	18 of 48	5
		Chromium	ND - 258	1 of 43	50
		Cyanide	ND - 2,490	7 of 48	100
		Iron	ND - 54,000	33 of 38	300
		Manganese	33 - 5,420	25 of 38	300
		Sodium	3,220 - 92,300	8 of 38	20,000
Residential Surface-Soils	Metals	Cadmium	ND - 1.7	0 of 15	10 ppm
		Chromium	5.2 - 20.2	0 of 15	50
Sediments	Metals	Cadmium	ND - 347	23 of 39	0.6 - 9.0 ppm
		Lead	ND - 610	6 of 18	110
Surface Water	Metals	Cadmium	ND - 37.7	9 of 22	0.7
		Cyanide	ND - 15	5 of 11	5.2
Biota	Metals	Cadmium	ND - 1.9	N/A	None

Table 2
Remedial Alternative Costs

Remedial Alternative	Capital Cost	Annual O&M	Total Present Worth
Groundwater Alternatives			
A1 - No Action	\$0	\$0	\$0
A2 - Monitoring and Institutional Controls	\$ 0	\$ 2 1,950	\$ 337,500
A3 - Pump & Treat for Groundwater Remediation	\$3,793,000	\$201,700	\$ 12,763,000
A4 - Pump & Treat for Groundwater Containment	\$ 1,428,000	\$ 58,350	\$4,528,500
Sediment Alternatives			
B1 - No Action	\$0	\$0	\$0
B2 - Dredging with Off-Site Disposal	\$ 5,153,200	\$1,500	\$5,176,255
B3 - Partial Dredging with Off-Site Disposal	\$1,896,700	\$1,500	\$1,9 19,755
B4 - Fill in Lake Capri	\$2,693,600	\$1,500	\$2,7 16,655
B5 - Dredging with Shoreline Containment Cell	\$2,3 16,600	\$1,500	\$2,355,025
B6 - Dredging with Island Containment Cell	\$ 1,418,476	\$1,500	\$1,456,90 1
B7 - Dredging with Combined Off-Site Disposal and Underwater Containment	\$3,859,567	\$1,500	\$3,882,622

APPENDIX A: RESPONSIVENESS SUMMARY

No written comments were received during the public comment period. The following are the questions and comments that were verbally raised during the August 6, 1997 public meeting. Most of these were answered during the meeting.

The following questions relate to the proposed remedy:

Question/Comment: How much of Willetts Creek will be dredged?

Response: The selected remedy will dredge sediments from Willetts Creek where the cadmium concentration exceeds the Severe Effect Level of 9.0 ppm. This corresponds to a current estimate of 100 cubic yards of sediments. However, because contaminated sediments may have moved since the last samples were taken in 1995, samples will be taken during the design phase to determine the exact volume of sediments to be removed from Willetts Creek.

Question/Comment: What is the time frame for dredging the lake and stream?

Response: The DEC expects that design of the remedy will require one year, and construction of the remedy will require six months. Of the six month construction duration, an estimated three months would be for the dredging process, and the remainder would be for mobilization and demobilization activities.

Question/Comment: Why was phytoextraction not considered as one of the final alternatives?

Response: Phytoextraction, the use of plants to extract contaminants from soil and sediments, was rejected because of its unknown effectiveness. The DEC researched this technology during the Supplemental Feasibility Study, but could not find any documented evidence that it could completely remove cadmium from sediments in a reasonable amount of time. Also, to implement this technology would have meant completely vegetating the lake with reed grass (*phragmites*) for several growing seasons, which the DEC anticipated would not be acceptable to the community.

Question/Comment: Are funds currently allocated to perform the dredging? What is the procedure and time frame for ensuring such funds are available?

Response: Funds are not currently allocated for the construction phase of the project. The DEC's standard procedure is to encumber funds for construction when the design of the remedy is complete and a detailed engineer's estimate is available before the project is bid. The DEC expects this to occur in early fall of 1998.

Question/Comment: Why did the DEC change the recommended alternative to full dredging and off-site disposal since previous public meetings?

Response: At prior meetings, the DEC presented the two containment cell alternatives to the community to evaluate the administrative feasibility of obtaining easements to construct them. In addition to the community's resistance to the on-site containment of contaminated sediments, off-site disposal is consistent with remedies proposed and selected elsewhere in the state. The DEC also determined that off-site disposal provided the highest degree of environmental protection and permanence, and required the least amount of long term monitoring and maintenance to be effective. On balance, these factors outweighed the higher cost.

Question/Comment: How long after the public meeting will a final decision be made?

Response: Provided that no strong opposition is received during the comment period, a Record of Decision should be finalized by the end of September, 1997.

Question/Comment: Explain the difference between the Severe Effects Level (SEL) and the Lowest Effects Level (LEL) as sediment guidance values.

Response: Guidance values for cadmium in sediments are established at two thresholds: the Lowest Effect Level (LEL) of 0.6 ppm and a Severe Effect Level (SEL) of 9.0 ppm. The LEL indicates a level that can be tolerated by the majority of sediment-dwelling organisms, but which still causes toxicity to a few species. This affects the population distribution of sediment species, with corresponding effects up the food chain. The SEL indicates the concentration at which a pronounced disturbance of the sediment-dwelling community can be expected as a result of toxicity to most benthic organisms.

Question/Comment: For how long will the fish advisory be necessary?

Response: After the lake is dredged and re-stocked, the DEC and DOH expect that the fish advisory could be discontinued. Periodic sampling of fish and sediments will confirm whether this is appropriate.

Question/Comment: The DEC should do more to prevent children from accessing Lake Capri and fishing there. The lakeshore should be posted to ensure that people are aware of the fishing advisory.

Response: The State Department of Environmental Conservation (DEC) and Department of Health (DOH) will evaluate what additional measures can be taken to ensure that people are aware of the fishing advisory. Such measures may include posting a notice of the fish advisory on posts inside the fence along the Montauk Highway, where most of the trespass occurs. With a chain link fence in place along the highway, there are few additional measures that the DEC or DOH could take to physically restrict access to the lake. Maintenance of the fence is the responsibility of the Town of

Islip, which has provided timely repairs of recent breaks in the fence. The DEC and DOH will continue to ensure that the Town is notified immediately of future damage if it should occur.

The following comments relate to dredging Lake Capri:

Question/Comment: Will dredging activities affect lower Willetts Creek? Could suspended contaminants pass over the spillway and enter the tidal portion?

Response: During dredging activities, the DEC will minimize the transport of both suspended and dissolved contaminants from the work area. Silt curtains will be used in both the immediate area of dredging, and also at the lake outlet into lower Willetts Creek. Past dredging experience in slow flowing rivers and lakes indicates that silt curtains are very effective in controlling contaminant migration. During construction, the DEC will establish action levels for suspended solids (turbidity) and dissolved cadmium levels in both the work zone and at the lake outlet. Any exceedance of these action levels will cause work to be suspended and modified as necessary to achieve compliance.

Question/Comment: What is the expected effectiveness of dredging in terms of the percentage of cadmium removed from the lake bottom? How will debris in the lake be handled during dredging?

Response: It is difficult to predict the overall effectiveness of dredging in terms of the percentage of contaminants removed. The performance of hydraulic dredge equipment is affected by the composition of the sediment, particularly the presence of cobbles, boulders and debris. Based on the limited sampling conducted to date, it appears that the sediment does not contain a significant amount of this large material, and the DEC believes that the dredge performance will be excellent.

Subsurface debris such as logs, stumps, tires, concrete blocks, etc. will be identified and located by a surface reconnaissance and, if necessary, a diver survey. These will be removed mechanically as one of the first stages of construction.

Question/Comment: Will the widening of the Montauk Highway pose a problem with implementing the proposed remedy?

Response: During the public meeting, Senator Johnson's representative stated that the widening of the Montauk Highway will be done within the existing curb-to-curb right-of-way. **As** a result, this should not affect implementation of the remedy.

Question/Comment: When will the lake sediments be sampled to confirm the effectiveness of dredging? Will the lake be re-dredged if these samples indicate continued contamination?

Response: The DEC expects that Lake Capri will be dredged in distinct working areas of perhaps 1 acre each. These working areas would be enclosed by silt curtains to minimize the transport of suspended sediments to other areas of the lake. After dredging is complete in each working area,

lake sediments would be immediately sampled (confirmation sampling) so that additional dredging could be done before work moves on into the next dredging area.

In addition to construction-phase confirmation sampling, sediments would be sampled periodically (long-term monitoring) to ensure that they remain clean. The first such sampling would occur within one year of completion of construction, along with sampling of surface water, groundwater and fish, as part of the monitoring program for the remedy as a whole. The frequency of this long-term monitoring may be adjusted based on the initial results.

If long-term monitoring finds that sediments become recontaminated, the DEC will first determine the source of contamination and then potentially re-evaluate the site remedy. Re-dredging the lake, along with additional source controls are potential options for addressing this situation.

Question/Comment: What type of easements will be necessary to perform the project? Are easements necessary from all affected property owners on Lake Capri? What happens if some homeowners refuse to grant access to the lake for dredging?

Response: The DEC will require temporary construction-phase easements to all the sediments and shoreline of Lake Capri and to the area of Willetts Creek that will be dredged. If design-phase sampling indicates that sediments on certain properties do not exceed the action level, then easements to those properties will not be required. The easements will require the DEC's contractors to restore any land or bulkheads that are damaged during construction. If some homeowners refuse to grant access to the lake sediments, the DEC will first determine the cause of their concerns and negotiate the terms of the easement to address such concerns. If easements still cannot be obtained, the DEC will consider several options, including not dredging that portion of the lake (depending on its location and contaminant levels), and using the authority under the Environmental Conservation Law Article 27 to obtain site access.

Question/Comment: How will the dredge and barge be brought to the lake?

Response: The dredge and barge will likely be brought to the lake on a flat-bed trailer. Access to a location along the lake will be necessary to off-load this equipment into the lake. During the negotiation of temporary easements, the DEC will discuss the possibility of obtaining this type of access with property owners along the lake.

Question/Comment: Is the DEC currently negotiating with the school district for access to any property for the temporary treatment system?

Response: No, the DEC is not currently negotiating with the West Islip School District. The school district had granted permission for use of part of the high school parking lot for a pilot dredging project that was never implemented. As a result, the high school property is regarded as a potential location for the treatment facility. The DEC will begin discussions with the West Islip School District when design of the remedy begins in early 1998.

Question/Comment: The lake is a valuable habitat for migrating waterfowl because it doesn't ice over in the winter. Dredging should not be performed during the winter because it would displace ducks and geese. ■

Response: The DEC agrees that the lake is valuable waterfowl habitat. Dredging will be scheduled for the summer months for many reasons, including the impacts to migrating waterfowl.

Question/Comment: What will be the odor and noise impacts during construction?

Response: Generally, dredged sediments can cause odors when sulfur-bearing compounds, especially hydrogen sulfide, are released into the air when the sediments are pumped to the surface. The odor potential depends on the total amount of sulfide in the sediments, and on the general chemistry of the sediments (pH, organic content, oxidation/reduction potential). These factors are presently unknown, but they will be determined during the sampling to be conducted during design of the remedy. The hydraulic dredge system is essentially enclosed until the sediments reach the treatment plant, so the potential for odors is greater at the treatment location than at the dredging location. If necessary, the sediment chemistry can be adjusted at the treatment facility, for example by adding lime, to remove the hydrogen sulfide and minimize odors.

Typically, the hydraulic dredge would operate 8-10 hours per day and create the noise equivalent of a small powerboat at low speed. Operations at the treatment facility would operate 24 hours per day, and would have a greater potential for noise. Noise mitigation will be addressed during design, including the feasibility of enclosing noise-generating equipment.

Question/Comment: Will reverse osmosis be used for removing cadmium from water pressed from the sediments?

Response: Probably not. The October 1995 RI/FS Report Addendum included a bench-scale treatability study that indicated that pH adjustment and sand filtration could effectively treat the sediment filtrate to meet effluent discharge standards. However, additional testing will be performed during design to confirm these results. Because reverse osmosis is a more expensive process, it would only be used if filtration was found to be ineffective.

The following comments relate to potential human health impacts from the site:

Question/Comment: There is a high rate of breast cancer in this area of Long Island. Cancer rates in West Islip have been mapped and they are very high. Could cadmium contamination from this site be the cause?

Response: By law, all cases of cancer are reported to the New York State Department of Health. A cancer incidence study was completed in July 1996 for several census tracts in the area surrounding the Dzus Fastener Company site in the Town of Islip, Suffolk County. This study

compared the observed number of cancers to what would be expected overall and broken down by cancer type. A statistically significant deficit was found among females for breast cancer (86 cases observed; 108 cases expected).

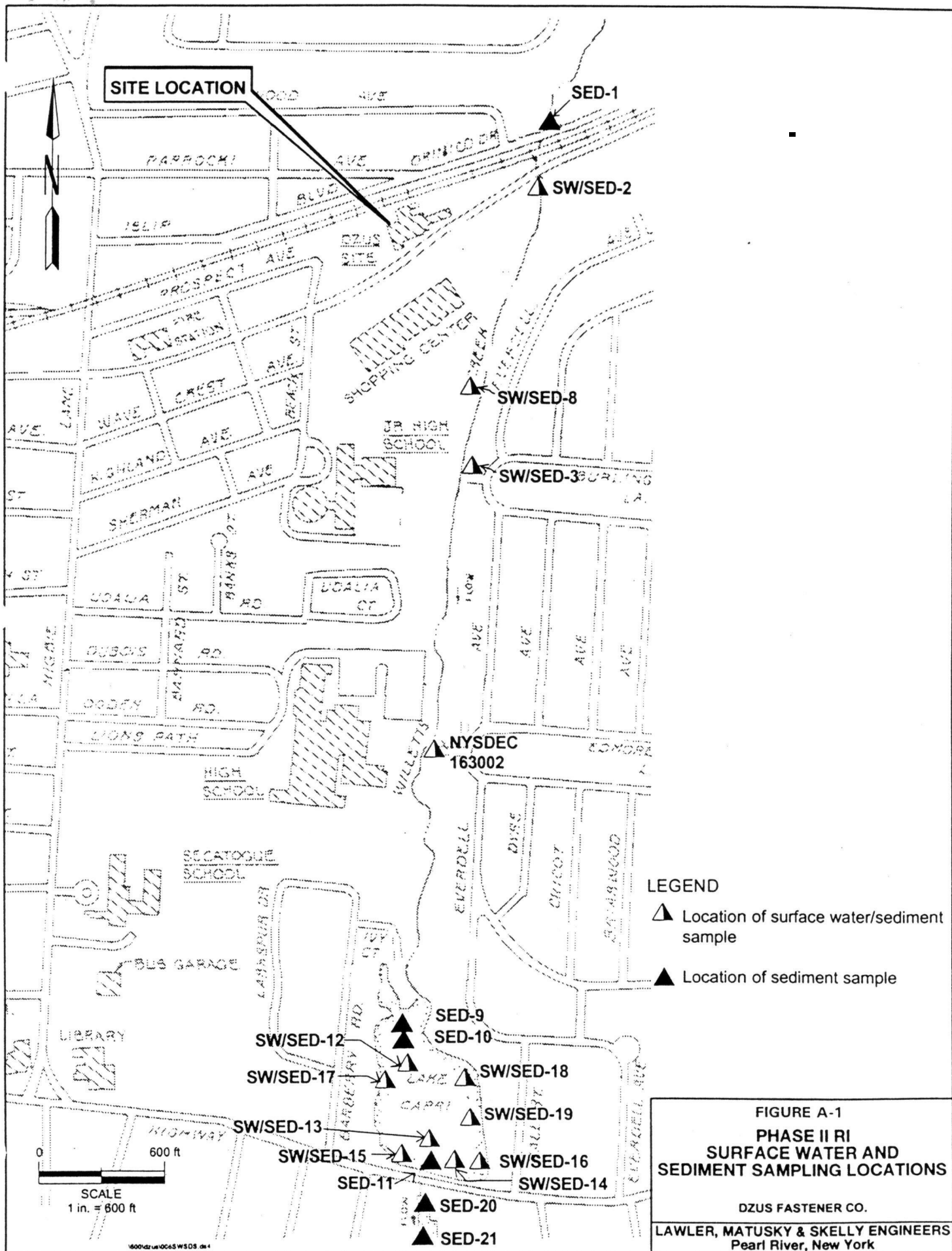
Age-adjusted breast cancer incidence rates for community groups were calculated in the *Small Area Analysis of Breast Cancer Incidence Rates, 1978-1987*. The rate for West Islip during this time period was 85.77, compared to the range from 60.77 to 134.64 per 100,000 for other areas of Suffolk County.

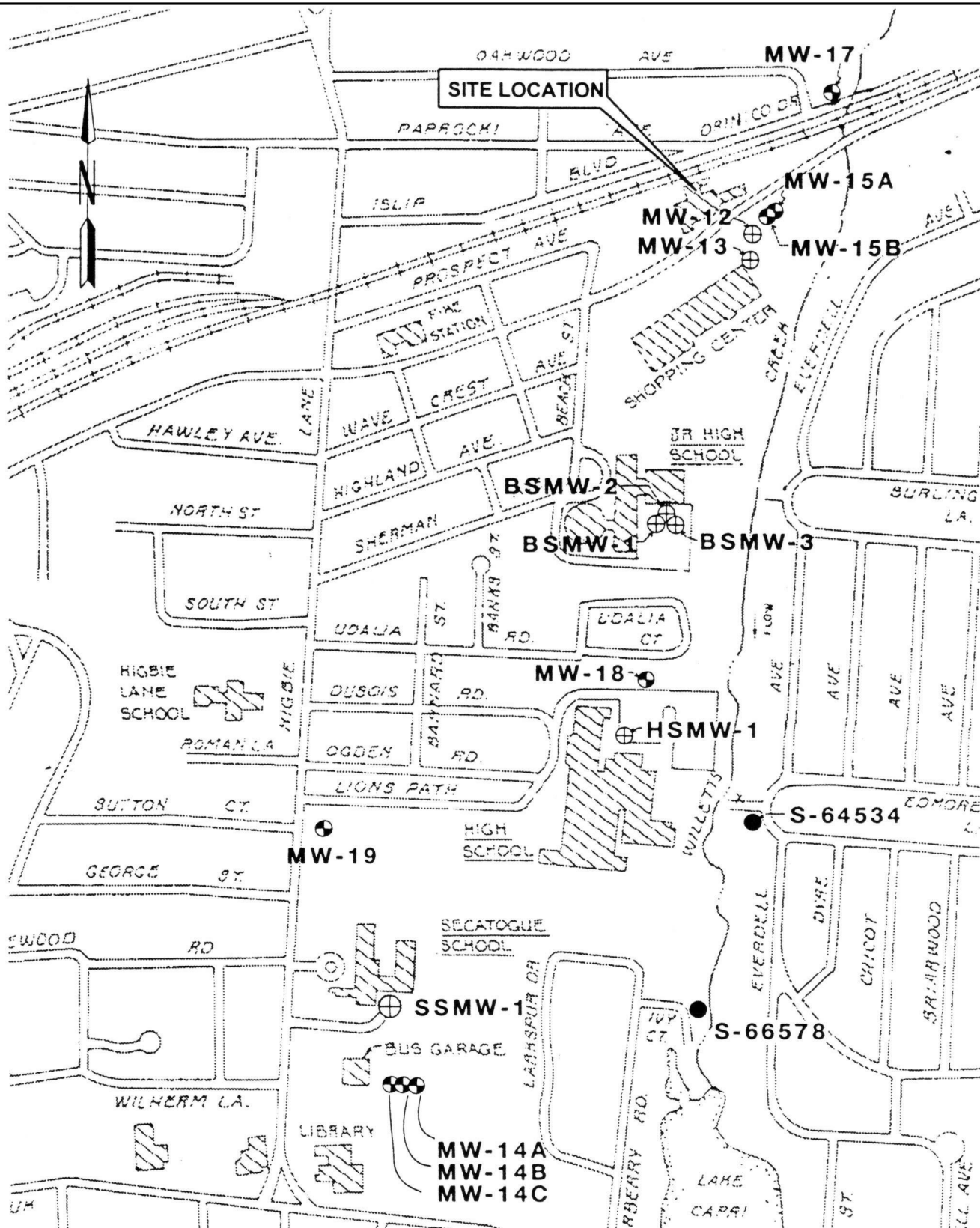
An extensive literature search found only one recent study that specifically examined cadmium exposure and breast cancer. The results neither prove nor disprove the role of cadmium in breast cancer initiation, promotion, or progression.

Question/Comment: A correlation has been found between cadmium exposure and prostate cancer, as reported by Dr. Jules Elias at SUNY Stony Brook. A recent study linked cadmium exposure to breast cancer. A study reported on the World Wide Web indicated that cadmium is assimilated through the skin. Additional studies are necessary to determine the cancer potential and exposure routes for cadmium.




Response: Cadmium and cadmium compounds have been classified as carcinogenic to humans by the International Agency for Research on Cancer (IARC). Evidence for carcinogenicity in humans comes from studies of workers exposed to cadmium mostly through inhalation of dust and fumes. These studies showed consistent associations between cadmium exposure and lung cancer, and less consistent evidence of associations with prostate cancer. There have been no reported studies of cancer incidence among humans who had ingested cadmium in their food or water, which would have been the route of exposure most likely to occur in persons with recreational contact with cadmium discharged into waterways. Studies of laboratory animals given high levels of cadmium compounds in their food or drinking water for their lifetimes provide only limited evidence of associations with cancers, specifically leukemias and cancers of the testes and prostate. None of the specific sites that have been associated with cadmium exposure in humans or animals were elevated in the July 1996 cancer incidence study.

The NYSDOH found little data on the dermal absorption of cadmium, and so reliance was placed on the Toxicological Profile for Cadmium prepared by the Agency for Toxic Substances and Disease Registry (ATSDR, 1993) for the following information. Cadmium is absorbed through the skin of animals, but it is likely that the rate of absorption into the body is slow and only a small percentage of the dose applied to the skin is absorbed. For example, one study showed that the total amount of cadmium found in the liver and kidney of mice and rabbits was only 0.2% and 0.8%, respectively, of the dose applied to the skin over the course of 1-5 weeks. Because most of absorbed cadmium accumulates in these 2 organs, these results suggest that dermal absorption is low. They also suggest that dermal absorption may be a concern only in situations where the potential for dermal exposure is considerably greater than from inhalation or oral exposures. Thus, skin contact is probably not a significant route of absorption for most people.





LEGEND

-  Location of Phase I RI groundwater monitoring well
-  Location of existing groundwater monitoring well
-  Location of existing Suffolk County well



1 in. = 600 ft

FIGURE A-2
OFF-SITE PHASE I RI
MONITORING WELL LOCATIONS

DZUS FASTENER CO.
LAWLER, MATUSKY & SKELLY ENGINEER!
Pearl River, New York

Two sediment samples were taken from lower Willetts Creek in March 1994 and analyzed for cadmium and chromium. At SED-20, located 20 feet south of the Montauk Highway, cadmium and chromium concentrations were 4.2 ppm and 5.9 ppm, respectively. At SED-21, located 250 feet south of the Montauk Highway, cadmium and chromium concentrations were 2.5 ppm and 6.4 ppm, respectively. As explained above, the Lowest Effect Level (LEL) for cadmium is 0.6 ppm and the Severe Effects Level (SEL) is 9.0. For chromium the LEL is 26 ppm and the SEL is 110 ppm.

No surface water or groundwater samples were taken south of the Montauk Highway during this study. Groundwater samples taken from the southernmost monitoring wells, MW-14, located south of the Secatogue School property behind the school bus garage, and MW-18, located near the northeast corner of the West Islip High School, did not contain any contamination above drinking water standards. From a total of 12 samples taken at these two locations, only one contained a detectable level of cadmium, and two contained detectable levels of chromium, all below their water quality standards. Because there is little or no contamination at these locations, the DEC believes there is no reason to expect contamination south of the Montauk Highway.

Question/Comment: In the tidal portion of Willetts Creek is a 600' by 100' sandbar that is exposed at low tide. This material is deposited as Willetts Creek slows down and widens into the Great South Bay. Contaminated material may have been deposited there and it should be sampled.

Response: The DEC agrees that this deposit should be sampled for possible contamination. This will be done during the design phase, along with the sampling of Lake Capri.

Question/Comment: There are 3 east-west canals in the tidal portion of Willetts Creek where contaminated material may also have accumulated. The recent lack of barnacles on bulkheads and docks may indicate contamination, and these should be sampled.

Response: The DEC agrees that these deposits should be sampled for possible contamination. This will be done during the design phase, along with the sampling of Lake Capri.

Question/Comment: What sampling was performed north of the LIRR tracks and what were the results? A real estate purchase in this area was reportedly canceled due to environmental concerns.

Response: Sediment samples were taken from a single location (SED-1) north of the LIRR tracks in October 1992 and September 1993. During both sampling events, the creek was dry, and so a surface water sample could not be obtained. The sediment results and corresponding guidelines for the contaminants of concern are summarized below:

	SED-1 (10/92)	SED-1 (9/93)	LEL	SEL
Cadmium	6.9 ppm	ND	0.6	9
Chromium	35.3	12.1	26	110
Lead	821	149	31	110

The **high** levels of lead in these samples may be due to past **fuel-related** emissions along the railroad tracks and Union Blvd. The DEC does not believe these are related to the Dzus site. Groundwater samples north of the LIRR tracks are discussed below.

Question/Comment: A resident has observed personnel sampling from a stickup pipe located on Town property on Orinico Drive. What was sampled and what were the results?

Response: Monitoring well MW-17 is located along Orinico Drive between Oakwood Avenue and Willetts Creek. This well was installed upgradient of the Dzus site to evaluate background groundwater conditions. This well was sampled in November 1992 and September 1993 and the results **are** summarized below. The DEC is unaware of any sampling activities at this location after 1993.

Contaminant in MW-17	November 1992	September 1993	Groundwater Standard
Cadmium	5.4 ppb	ND	10 ppb
Chromium	15.9	ND	50
Lead	20.2	8.5 ppb	25
Cyanide	ND	ND	100
Volatile Organics	ND	Not Analyzed	5 (most VOCs)
Semivolatile Organics	ND	Not Analyzed	Varies by chemical

Question/Comment: What were the results of surface water and sediment samples taken north of the railroad tracks (Sed/SW-1 and Sed/SW-2)?

Response: See the response above for results of SED-1 sampling. Sample station SW-2 is located south of the railroad tracks and Union Boulevard, contrary to the location given by the DEC during the public meeting. **As** shown below and in Figure 2 of the ROD, cadmium was not detected in the

sediment sample taken from this location.

	SED-2 (10/92)	SED-2 (9/93)	LEL	SEL	SW-2 (10/92)	SW-2 (9/93)
Cadmium	ND	ND	0.6	9	ND	ND
Chromium	ND	9.4	26	110	ND	31.6
Lead	12.9	39.6	31	110	6.6	161

Question/Comment: Could flooding cause contaminants to migrate northward? The DEC should sample north of the railroad tracks to determine whether this is a concern.

Response: It is unlikely that flooding could cause sediment contaminants to migrate northward. To move sediments, the force of water must be sufficient to scour them from their present location and then transport them upstream. The likelihood of such a high energy event in the Willetts Creek environment is remote. The SED-1 sample results presented above indicate that northward migration of cadmium has not occurred.

Question/Comment: Did the DEC sample Pine Lake? There is an algae bloom on the lake and no ducks are present.

Response: The DEC did not sample Pine Lake as part of this study. Algae blooms are typically caused by a lack of oxygen, which favors the growth of algae over competing plant species. This effect is generally caused by a lack of fresh, oxygenated water entering a pond or lake, and not to chemical contamination.

Question/Comment: Prior to 1985 residences on Barnhard Street and Sherman Lane had private wells. What exposure may have occurred before public water was provided?

Response: Based on the sampling results from monitoring wells in the area:

- BSMW-I, located in the parking lot behind the Junior High School;
- MW-18, located near the northeast corner of the West Islip High School; and
- MW-19, located near the intersection of Lions Path and Higbie Lane,

it appears that no exposure to site-related contaminants would have occurred in private wells in the area. At the above locations, cadmium, chromium and cyanide were not detected in any samples. The plume of contaminants lies further to the east, between the Junior High School and Willetts Creek.

Question/Comment: Were any of the solvents used in the plating operation found in groundwater

samples? Where and in what concentrations were they found?

Response: In the off-site monitoring wells, volatile organic contaminants were found in only one well, MW-14B, at very low concentrations. At this location, behind the school district bus garage, the following contaminants were found:

- 1,1-Dichloroethane 5 ppb
- 1,1,1-Trichloroethane 3 ppb
- Trichloroethylene 3 ppb

The water quality standard for all three contaminants is 5 ppb, so the standard was not exceeded. Because this location is 3500 feet away from the site, is not directly downgradient, and because no monitoring wells between the site and MW-14 contained these contaminants, the DEC believes that these detections are not related to the Dzus site.

Question/Comment: When were the most recent soil, sediment and groundwater samples taken?

Response: Groundwater samples were taken from four off-site monitoring wells in August 1995. Prior to that, samples were taken from more wells in September 1993. Sediment and surface water samples were taken from Willetts Creek and Lake Capri in August 1995. Soil samples were taken from residential properties in April 1994.

The following questions relate to water flows into the lake:

Question/Comment: Is the lake recharging groundwater and introducing contaminants to the subsurface? A resident received a letter from the DEC stating that Lake Capri is a “Watershed Lake”. What does this mean?

Response: Water level measurements and regional geologic studies indicate that Lake Capri is a spring fed lake, so groundwater is discharging into the lake, not the reverse. It is difficult to explain the reference to a “Watershed Lake” without examining the letter in question. Willetts Creek and Lake Capri are part of the Long Island Sound/Atlantic Ocean drainage basin, or watershed. Funding for clean water projects under the Environmental Quality Bond Act of 1996 is allocated by watershed, which may explain the letter’s reference. However, this project will be funded by the 1986 EQBA, which does not assign funds on a watershed basis.

Question/Comment: Is surface water delivering contaminants into Lake Capri?

Response: The presence of cadmium in the surface water of upper Willetts Creek indicates that it is a source for contaminants to enter Lake Capri. However, of the ten surface water samples taken from Lake Capri only one had a detectable level of cadmium. Also, samples taken from Willetts Creek just north of the lake contained lower contaminant concentrations than those taken from the

upper reaches. This indicates that the loading of contaminants from Willetts Creek into Lake Capri is small, and the impact is diluted by the flow of clean groundwater into lower Willetts Creek and Lake Capri.

Question/Comment: Is the proper flow of water into the lake necessary for the lake's recovery? The volume of water pumped by the West Islip School District is insufficient to maintain proper flow in Willetts Creek and Lake Capri. The school's discharge pipe should be enlarged to ensure sufficient flow.

Response: Yes, the proper supply of water into the lake, via both groundwater and surface flow is important for the environmental health of the lake. Primarily, these flows provide oxygen, which is necessary for the survival of fish species and to prevent algae blooms. The DEC will investigate the impact of the school's pumping system and determine the feasibility of correcting any problems associated with it.

Miscellaneous Questions:

Question/Comment: Cadmium fungicides may have been used in the past on residential properties. Could this be the cause of present contamination?

Response: Without information as to where and when cadmium fungicides were used in the area, it is difficult to determine their present impact. The documented presence of high levels of cadmium at the Dzus site and well-established migration pathways through groundwater, surface water and into Lake Capri indicate that the site is the cause of this contamination.

Appendix C

Lake Capri Post- Excavation Sampling Results

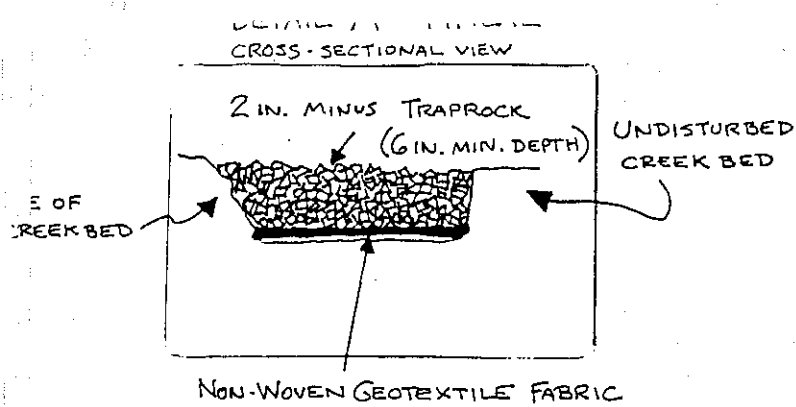
DZUS Fastener Site
NYSDEC Site ID Number 1-52-033

**COMPARISON OF ANALYTICAL RESULTS FROM PRE-DESIGN INVESTIGATION,
PRE-EXCAVATION, AND POST-EXCAVATION OF WILLETS CREEK**

Location (In Feet)	PDI West	PDI Centerline	Pre-Excavation	Post-Excavation
900	142 ppm	1.9 ppm		92.8 ppm
850			18.6 ppm	114.0 ppm
800	239 ppm	1.6 ppm		97.2 ppm
550				4.99 ppm
500	20.3 ppm	12.2 ppm		
450	8.8 ppm	ND	11.8 ppm	4.70 ppm
400	17.3 ppm	3.3 ppm		
350	9.4 ppm	14.9 ppm	17.3 ppm	11.8 ppm
300	1.3 ppm	6.5 ppm		
250	51.4 ppm	0.6 ppm		1.24 ppm
200	37.1 ppm	5.0 ppm		
150	11.4 ppm	10.2 ppm	110 ppm	9.65 ppm
100	368 ppm	11.2 ppm		
50	1.2 ppm	6.8 ppm		2.32 ppm, ND*
00	37.6 ppm	9.7 ppm	152 ppm	<MDL*
-50				

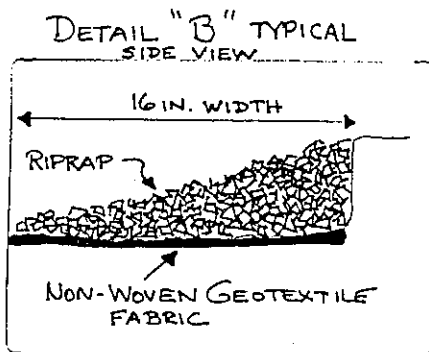
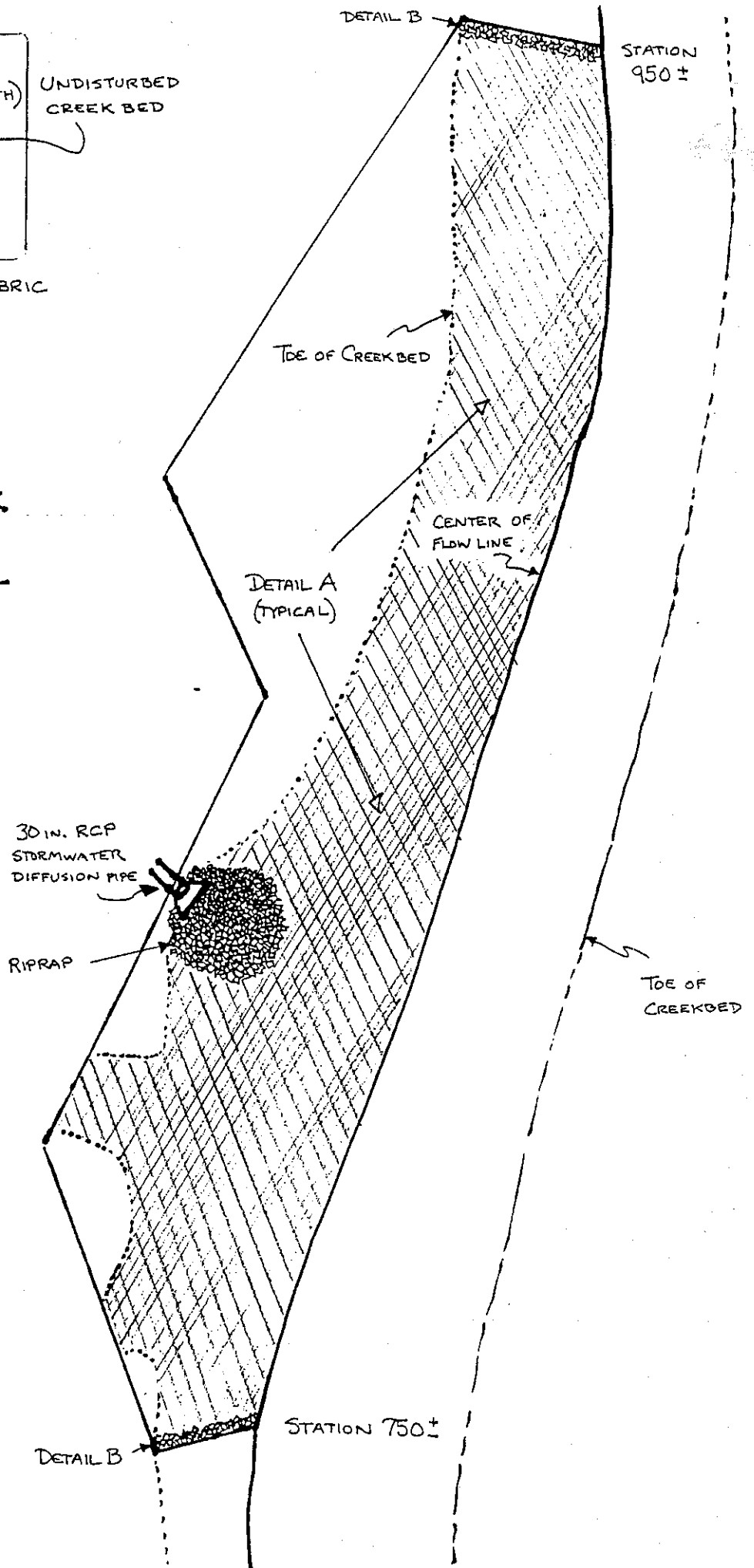
* These samples were not taken exactly at 50 ft north of bridge, but within 15 - 35 feet north of bridge.

NOTE: The analytical results was the basis for decision to encapsulate per detail "Willets Creek Backfill Detail".



WILLETTS CREEK BACKFILL DETAIL

[N.T.S.]



CONSTRUCTION CERTIFICATION REPORT

DZUS FASTENER SITE (OU2)

APPENDIX D

POST DREDGING/EXCAVATION DATA

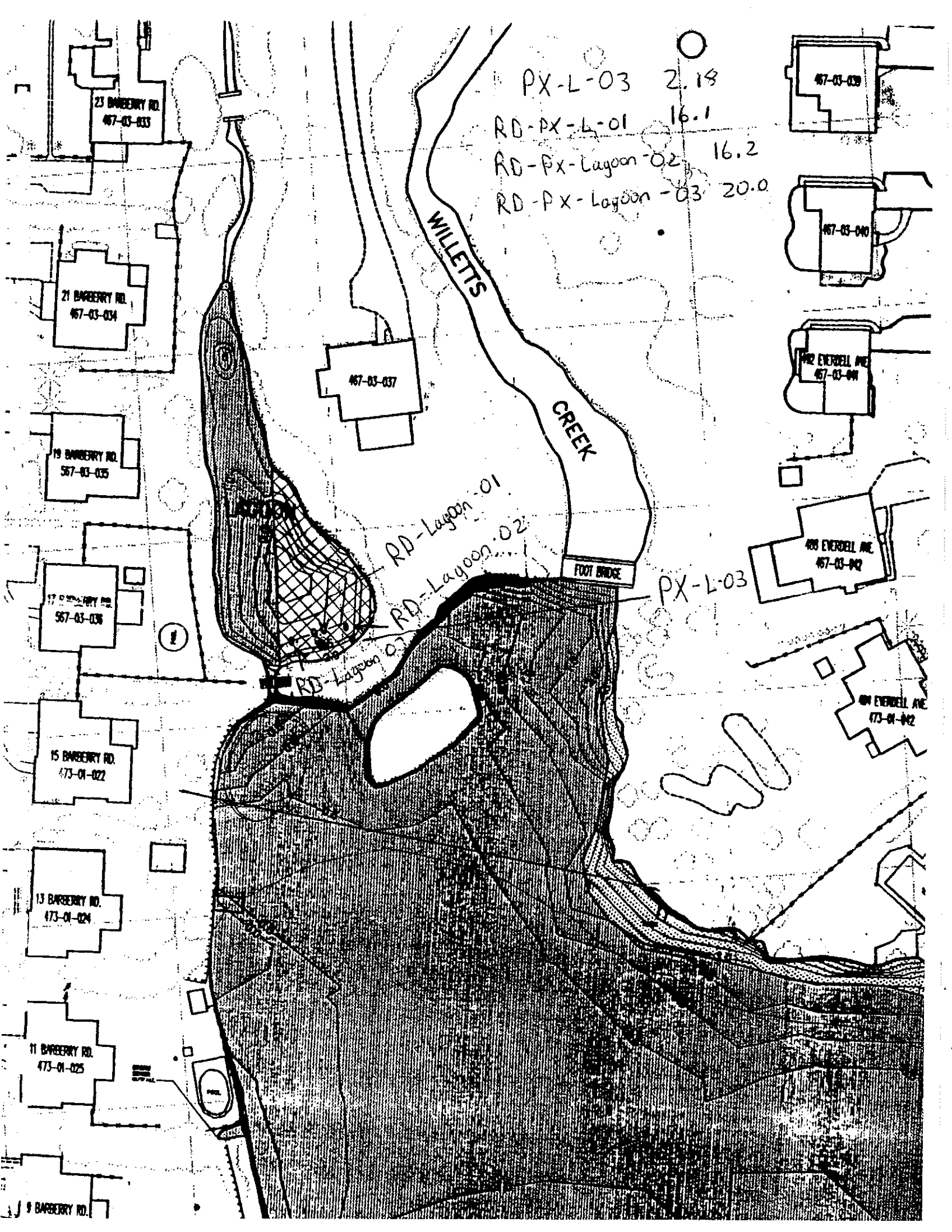
LAGOON ANALYTICAL DATA SUMMARY

DZUS Fastener Site
NYSDEC Site ID Number 1-52-033
POST- EXCAVATION SAMPLING REQUIREMENTS

NORTH LAGOON AREA

POST EXCAVATION SAMPLES

ID#	Collection Date	Collected By	Collection Time	Analytical Results		Comments
PX-L-01	07/20/99	JShn	1455 hrs.	<0.5 ppm Cd total		
PX-L-02	07/22/99	JShn	1400 hrs.	0.42 ppm		
PX-L-03	07/22/99	JShn	1415 hrs	2.18 ppm		
				11.7 ppm	(SciLab)	split check
RD-PX-L-01	07/28/99	JShn	1515 hrs	16.1 ppm		post redredge
				6.5 ppm	(SciLab)	split check
RD-PX-L-02	08/03/99	Jwolf	1540 hrs	18.2 ppm		6ft under H20
				12.7 ppm	(SciLab)	
RD-PX-L-03	08/03/99	Jwolf	1550 hrs	20.0 ppm		8ft under H20
				24.3 ppm	(SciLab)	
RD-PX-L-04	09/10/99	Jwolf	1330 hrs	50.5 ppm		
RD-PX-L-05	09/10/99	Jwolf	1340 hrs	131 ppm		
RD-PX-L-06	09/10/99	Jwolf	1350 hrs	1.14 ppm		
RD-PX-L-07	09/10/99	Jwolf	0400 hrs	0.30 ppm		
RD-PX-L-08	09/13/99	Jwoif	1500 hrs	0.17 ppm		
				2.3 ppm	(SciLab)	
RD-PX-L-09	09/13/99	Jwolf	1515 hrs	0.23 ppm		
				0.93 ppm	(SciLab)	



CONSTRUCTION CERTIFICATION REPORT

DZUS FASTENER SITE (OU2)

APPENDIX D

POST DREDGING/EXCAVATION DATA

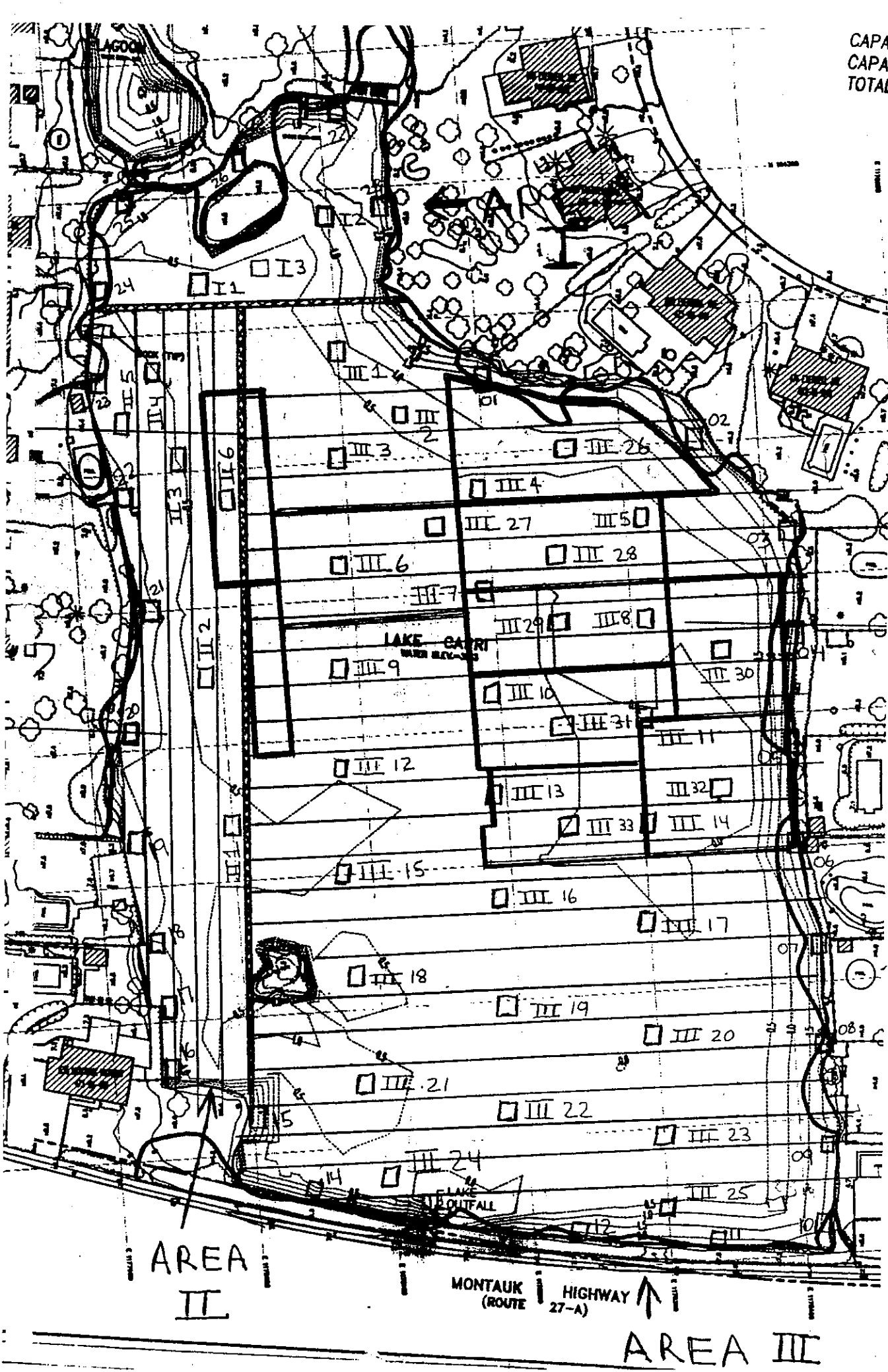
LAKE CAPRI ANALYTICAL DATA SUMMARY

Lake

DZUS Fastener Site
NYSDEC Site ID Number 1-52-033

SHORELINE POST-EXCAVATION SAMPLES - Total Cd (ppm)

PX	Dry	Wet	Wet + 4hr	QA/QC
1	1.02	0.41		
2	0.71	0.70		
3	0.11	0.45		
4	9.96	0.17		
4d	1.13			
4s	8.60			
5	0.98	0.55		
6	0.70	1.13		
7	0.89	1.56		1.30
8	1.98		2.07	
9	NA		1.59	0.90
10	NA	1.73		
11	NA	61.20	3.37	
12	NA	0.47	6.47	
13	NA		1.77	
14	NA			
15	NA			
16	NA			
17	NA			
18	NA	1.43		0.80
19	NA	0.29		
20	NA	0.62		
21	NA	0.74	0.86	0.70
22	NA	0.25	0.70	
23	NA	0.82	0.22	<0.1
24	NA	2.45		
25	NA	0.18		
26	NA			
27	NA	0.31		
28	NA	1.00		



CAPA
CAPA
TOTAL

Shoreline Samples: PX-Shore line - 01 → PX-Shore line - 28

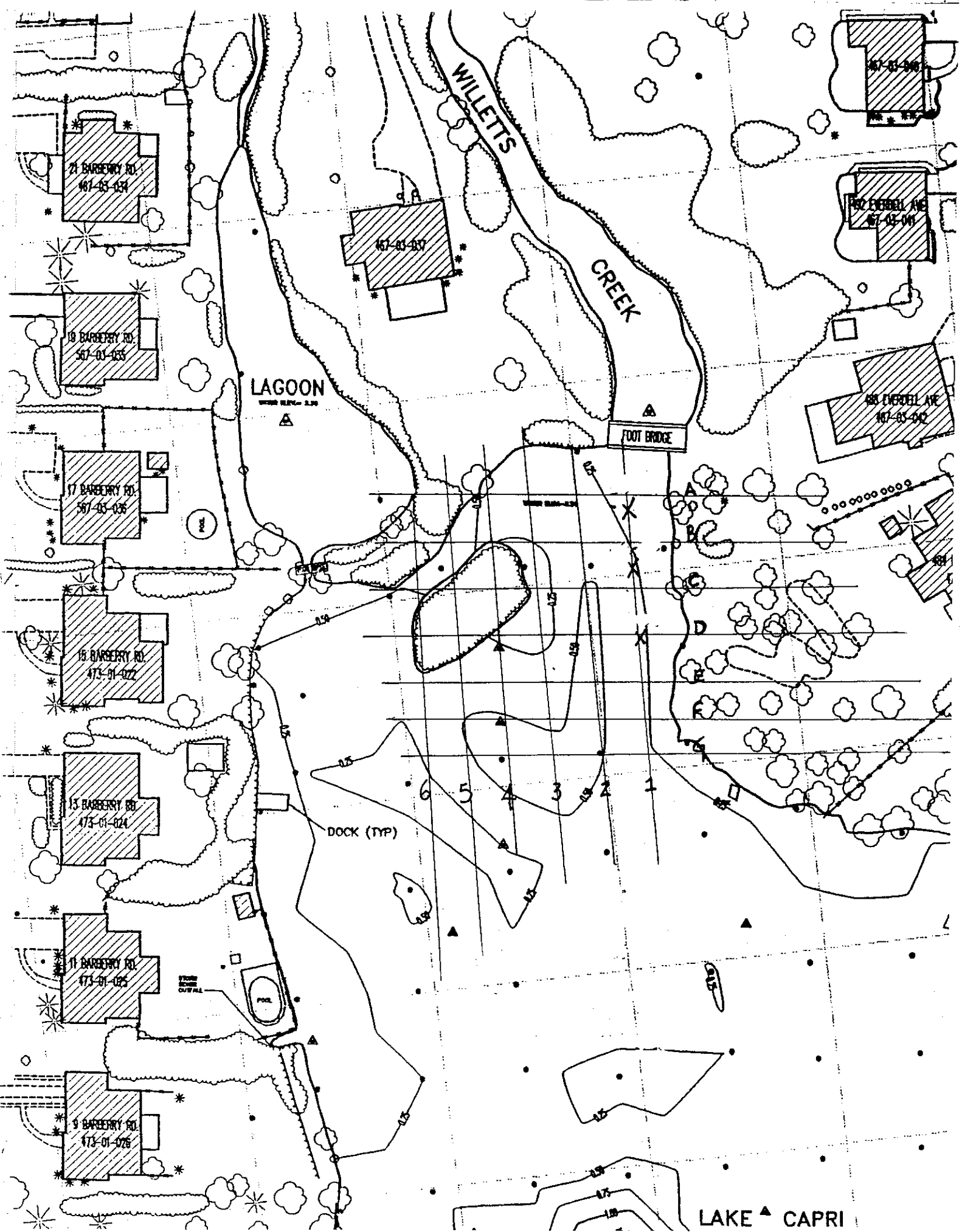
Lake Samples: PX-Lake - I - 1
Area ↑ Sample #

DZUS Fastener Site
NYSDEC Site ID Number 1-52-033
ANALYTICAL RESULTS FOR NORTHEAST COVE AREA

<i>GRID LOCATION</i>	<i>AT GRADE</i>	<i>12 in < GRADE</i>	<i>30 in < GRADE</i>
A1	0.12 ppm	<MDL	
B1			
C1	37.8 ppm	0.4 ppm	3.7 ppm
D1			
E1	11.5 ppm	0.7 ppm	
F1		0.3 ppm	
G1			
A2			
B2	12.4 ppm	1.2 ppm	73 ppm
C2			6.5 ppm
D2	24.1 ppm	11.0 ppm	1.0 ppm /1.7 ppm
E2			
F2	5.96 ppm	0.1 ppm	<MDL
G2			
A3	28.6 ppm	1.1 ppm	
B3			
C3	10.3 ppm	2.7 ppm	
D3			
E3	44.9 ppm		0.20 ppm
F3		3.9 ppm	
G3	31.0 ppm		
A4			
B4			
C4			
D4			
E4			0.70 ppm
F4			

DZUS Fastener Site
NYSDEC Site ID Number 1-52-033
ANALYTICAL RESULTS FOR NORTHEAST COVE AREA

<i>GRID LOCATION</i>	<i>AT GRADE</i>	<i>12 in < GRADE</i>	<i>30 in < GRADE</i>
G4			
A5			
B5			
C5			
D5			
E5			
F5	135 ppm	0.1 ppm	
G5			
A6			
B6			
C6			
D6			
E6			
F6			
G6	1.0 ppm /4.0 ppm		
A7			
B7			
C7			
D7			
E7			
F7			
G7			
A8			
B8			
C8			
D8			
E8			



**DZUS Fastener Site
NYSDEC Site ID Number 1-52-033**

POST EXCAVATION (TOTAL CADMIUM) LABORATORY ANALYTICAL RESULTS

Chain of Custody #	ERM Sample ID	Date Collected	Date Analyzed	Date Data Received	Date Cat B Package Received	Earth Tech Analytical Results (ppm)	ERM/BWE Analytical Results (ppm)	Notes
I 7116-1	Dup 091799	09/17/99	09/18/99	09/20/99	10/15/99		34.8	
I 7116-2	PX-Cove-A1	09/17/99	09/18/99	09/20/99	10/15/99		0.13	J - Concentration detected below MDL
I 5258-1	PX-Cove-A1-RD	10/28/99	10/29/99	10/29/99	12/08/99		0.44	J - Concentration detected below MDL Revised 12/2/99 Orig. reported as 0.34 ppm U
I 7116-3	PX-Cove-C1	09/17/99	09/18/99	09/20/99	10/15/99		37.8	
I 5258-2	PX-Cove-C1-RD	10/28/99	10/29/99	10/29/99	12/08/99		2.71	
I 7116-4	PX-Cove-E1	09/17/99	09/18/99	09/20/99	10/15/99		11.5	
I 5258-3	PX-Cove-E1-RD	10/28/99	10/29/99	10/29/99	12/08/99		2.01	
I 7116-9	PX-Cove-B2	09/17/99	09/18/99	09/20/99	10/15/99		12.4	
J 5254-2	PX-Cove-B2-RD	10/27/99	10/28/99	10/28/99	12/02/99		1.95	Experimental Sample 1' below grade Revised 11/29/99 Orig. reported as 1.95 ppm
I 7116-7	PX-Cove-D2	09/17/99	09/18/99	09/20/99	10/15/99		24.1	
J 5254-1	PX-Cove-D2-RD	10/26/99	10/28/99	10/28/99	12/02/99		174.1	Experimental Sample 1' below grade Revised 11/29/99
I 7116-5	PX-Cove-F2	09/17/99	09/18/99	09/20/99	10/15/99		6.02	
J 5254-3	PX-Cove-F2-RD	10/27/99	10/28/99	10/28/99	12/02/99		57.3	Experimental Sample 1' below grade Revised 11/29/99
I 7116-10	PX-Cove-A3	09/17/99	09/18/99	09/20/99	10/15/99		28.6	
I 7116-11	PX-Cove-A3 MS/MSD	09/17/99	09/18/99	09/20/99	10/15/99		28.5	
J 5253-3	PX-Cove-A3-RD	10/26/99	10/28/99	10/28/99	12/02/99		60.8	Experimental Sample 1' below grade Revised 11/29/99 Orig. reported as 60.9 ppm
I 7116-8	PX-Cove-C3	09/17/99	09/18/99	09/20/99	10/15/99		10.4	
J 5253-2	PX-Cove-C3-RD	10/26/99	10/28/99	10/28/99	12/02/99		8.63	Experimental Sample 1' below grade Revised 11/29/99

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DZUS Fastener Site
NYSDEC Site ID Number 1-52-033

POST EXCAVATION (TOTAL CADMIUM) LABORATORY ANALYTICAL RESULTS

Chain of Custody #	ERM Sample ID	Date Collected	Date Analyzed	Date Data Received	Date Cat B Package Received	Earth Tech Analytical Results (ppm)	ERM/BWE Analytical Results (ppm)	Notes
I 1716-6	PX-Cove-E3	09/17/99	09/18/99	09/20/99	10/15/99		44.8	
J 5253-1	PX-Cove-E3-RD	10/26/99	10/28/99	10/28/99	12/02/99		38.0	Experimental Sample 1' below grade Revised 11/29/99
LAKE BOTTOM								
I 5160-1	PX-LB-201	10/09/99	10/11/99	10/12/99	11/19/99		0.22	J - Concentration detected below MDL
J 3965-1	PX-Lake-25A	12/10/99	12/13/99	12/15/99	01/19/00		14.1	
J 4623-1	PX-Lake-25A +4	12/17/99	10/20/99	12/21/99	01/19/00	.80/90/90	1.99	Revised 1/13/00 Orig. reported as 1.98 ppm
SHORELINE								
I 9836-1	PX-Shoreline-01	09/29/99	09/29/99	09/30/99	11/19/99		0.41	
I 9836-2	PX-Shoreline-02	09/29/99	09/29/99	09/30/99	11/19/99		0.70	
I 9836-3	PX-Shoreline-03	09/29/99	09/29/99	09/30/99	11/19/99		0.45	
I 9836-4	PX-Shoreline-04	09/29/99	09/29/99	09/30/99	11/19/99		0.17	
I 9836-5	PX-Shoreline-05	09/29/99	09/29/99	09/30/99	11/19/99		0.55	
I 9836-6	PX-Shoreline-06	09/29/99	09/29/99	09/30/99	11/19/99		1.13	
J 3953-2	PX-Shoreline-07 +4	12/05/99	12/07/99	12/07/99	01/19/00	1.3	1.59	Revised 1/11/00 Orig. reported as 1.56 ppm
J 3956-2	PX-Shoreline-08 +4	12/08/99	12/10/99	12/13/99	01/19/00		2.06	Revised 1/12/00 Orig. reported as 2.07 ppm
J 3962-2	PX-Shoreline-09 +4	12/09/99	12/13/99	12/14/99	01/19/00	0.9	1.59	
J 3946-2	PX-Shoreline-10	12/03/99	12/04/99	12/06/99	01/19/00		1.73	Prior to Augering Revised 1/11/00
J 3946-3	PX-Shoreline-11	12/03/99	12/04/99	12/06/99	01/19/00		61.0	Orig. reported as 61.2 ppm Prior to Augering
J 3964-2	PX-Shoreline-11 +4	12/10/99	12/14/99	12/14/99	01/19/00		3.37	Revised 1/12/00 Orig. reported as 3.40 ppm
J 4619-4	PX-Shoreline-11 +4 RS	12/15/99	12/16/99	12/16/99	01/19/00		1.58	Revised 1/13/00 Orig. reported as 1.6 ppm
J 3946-4	PX-Shoreline-12	12/03/99	12/04/99	12/06/99	01/19/00		0.92	Prior to Augering J - Concentration detected below MDL

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DZUS Fastener Site
NYSDEC Site ID Number 1-52-033

POST EXCAVATION (TOTAL CADMIUM) LABORATORY ANALYTICAL RESULTS

Chain of Custody #	ERM Sample ID	Date Collected	Date Analyzed	Date Data Received	Date Cat B Package Received	Earth Tech Analytical Results (ppm)	ERM/BWE Analytical Results (ppm)	Notes
J 3964-3	PX-Shoreline-12 +4	12/10/99	12/14/99	12/14/99	01/19/00		6.47	
J 4620-1	PX-Shoreline-12 +4 RD	12/15/99	12/16/99	12/16/99	01/19/00		0.46	
J 3964-4	PX-Shoreline-13 +4	12/10/99	12/14/99	12/14/99	01/19/00		1.76	Revised 1/12/00 Orig. reported as 1.77 ppm
J 3966-2	PX-Shoreline-14	12/10/99	12/13/99	12/15/99	01/24/00		69.8	
J 4620-3	PX-Shoreline-14 +4	12/15/99	12/16/99	12/16/99	01/19/00		1.63	
J 3966-3	PX-Shoreline-15	12/10/99	12/13/99	12/15/99	01/24/00		2.09	
J 4619-1	PX-Shoreline-15 +4	12/15/99	12/16/99	12/16/99	01/19/00		2.51	Revised 1/13/00 Orig. reported as 2.52 ppm
J 4619-2	PX-Shoreline-16 +4	12/15/99	12/16/99	12/16/99	01/19/00		2.75	Revised 1/13/00 Orig. reported as 2.76 ppm
J 4618-2	PX-Shoreline-17 +4	12/14/99	12/15/99	12/15/99	01/19/00	0.2	0.69	
J 3414-3	PX-Shoreline-18	11/13/99	11/18/99	11/19/99	01/07/00	0.8	1.43	
J 3414-2	PX-Shoreline-19	11/13/99	11/18/99	11/19/99	01/07/00		0.48	
J 3414-1	PX-Shoreline-20	11/13/99	11/18/99	11/19/99	01/07/00		0.62	
J 3411-1	111299 Dup	11/12/99	11/18/99	11/18/99	01/07/00		0.47	J - Concentration detected below MDL Revised 1/04/00 Orig. reported as 0.74 ppm
J 3411-2	PX-Shoreline-21	11/12/99	11/15/99	11/18/99	01/07/00		0.75	
J 3415-3	PX-Shoreline-21 +4	11/13/99	11/21/99	11/22/99	01/07/00	0.7	0.86	
J 3411-3	PX-Shoreline-22	11/12/99	11/15/99	11/18/99	01/07/00		0.49	J - Concentration detected below MDL
J 3415-2	PX-Shoreline-22 +4	11/13/99	11/21/99	11/22/99	01/07/00		0.70	
I 5165-1	PX-Shoreline-23	10/14/99	10/18/99	10/20/99	12/02/99		1.05	Revised 11/29/99 Orig. reported as 0.82 ppm
J 3415-1	PX-Shoreline-23 +4	11/13/99	11/21/99	11/22/99	01/07/00	BDL	0.48	J - Concentration detected below MDL
I 5164-1	PX-Shoreline-24	10/14/99	10/15/99	10/18/99	11/19/99		2.44	
I 5162-1	PX-Shoreline-25	10/13/99	10/15/99	10/18/99	11/19/99		0.18	J - Concentration detected below MDL
I 5075	PX-Shoreline 26 is PX-Lake-01	07/26/99					1.02	

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**DZUS Fastener Site
NYSDEC Site ID Number 1-52-033**

POST EXCAVATION (TOTAL CADMIUM) LABORATORY ANALYTICAL RESULTS

Chain of Custody #	ERM Sample ID	Date Collected	Date Analyzed	Date Data Received	Date Cat B Package Received	Earth Tech Analytical Results (ppm)	ERM/BWE Analytical Results (ppm)	Notes
I 5257-1	PX-Shoreline-27	10/27/99	10/29/99	10/29/99	12/08/99		0.47	J - Concentration detected below MDL
I 5261-1	PX-Shoreline-28	10/28/99	10/29/99	10/29/99	12/08/99		1.00	
LAKE I								
I 5256-1	PX-Lake-I-2	10/27/99	10/29/99	10/29/99	12/02/99		35.8	Revised 11/29/99 Orig. reported as 37.2 ppm
I 5256-2	102799	10/27/99	10/29/99	10/29/99	12/02/99		30.6	Duplicate Revised 11/29/99 Orig. reported as 30.3 ppm
I 17123-1	PX-Lake-I-2-RD	11/05/99	11/10/99	11/11/99	12/08/99		2.98	Revised 12/2/99 Orig. reported as 2.99 ppm
J 3416-2	PX-Lake-I-3 +4	11/15/99	11/18/99	11/19/99	01/07/00		0.43	U - Analytical value is a non-detect
LAKE II								
I 17126-2	PX-Lake-II-1	11/08/99	11/10/99	11/16/99	12/08/99		0.450	J - Concentration detected below MDL Revised 12/2/99 Orig. reported as 0.34 ppm U
J 3415-4	PX-Lake-II-1 +4	11/13/99	11/21/99	11/22/99	01/07/00	1.7	1.45	
I 17126-3	PX-Lake-II-2	11/09/99	11/10/99	11/16/99	12/08/99		0.45	J - Concentration detected below MDL
J 3415-5	PX-Lake-II-2 +4	11/13/99	11/21/99	11/22/99	01/07/00		0.43	
J 3409-1	PX-Lake-II-3	11/11/99	11/15/99	11/17/99	01/19/00		0.43	U - Analytical value is a non-detect
J 3415-6	PX-Lake-II-3 +4	11/13/99	11/21/99	11/22/99	01/07/00		0.45	J - Concentration detected below MDL
J 3409-2	PX-Lake-II-4	11/11/99	11/15/99	11/17/99	01/19/00		0.42	J - Concentration detected below MDL
J 3415-7	PX-Lake-II-4 +4	11/13/99	11/21/99	11/22/99	01/07/00		0.51	
J 3411-4	PX-Lake-II-5	11/12/99	11/15/99	11/18/99	01/07/00		0.45	J - Concentration detected below MDL
J 3415-8	PX-Lake-II-5 +4	11/13/99	11/21/99	11/22/99	01/07/00		0.45	J - Concentration detected below MDL
I 17126-1	PX-Lake-II-6	11/08/99	11/10/99	11/16/99	12/08/99		0.45	J - Concentration detected below MDL
J 3415-9	PX-Lake-II-6 +4	11/13/99	11/21/99	11/22/99	01/07/00	0.1	0.83	J - Concentration detected below MDL Revised 01/04/00 Orig. reported as 1.48 ppm
LAKE III								

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Appendix D

Excavation Work Plan

EXCAVATION WORK PLAN

1.0 NOTIFICATION

At least 15 days prior to the start of any activity that is anticipated to encounter remaining contamination, the site owner or their representative will notify the Department. Currently, this notification will be made to:

Payson Long
NYSDEC
Division of Environmental Remediation
625 Broadway
Albany, NY 12233
Office (518) 402-9813
Email: pdlong@gw.dec.state.ny.us

This notification will include:

- A detailed description of the work to be performed, including the location and areal extent, plans for site re-grading, intrusive elements or utilities to be installed below the soil cover, estimated volumes of contaminated soil to be excavated and any work that may impact an engineering control,
- A summary of environmental conditions anticipated in the work areas, including the nature and concentration levels of contaminants of concern, potential presence of grossly contaminated media, and plans for any pre-construction sampling;
- A schedule for the work, detailing the start and completion of all intrusive work,
- A summary of the applicable components of this EWP,
- A statement that the work will be performed in compliance with this EWP and 29 CFR 1910.120,
- A copy of the contractor's health and safety plan, in electronic format, if it differs from the HASP provided in Appendix F of this document,
- Identification of disposal facilities for potential waste streams,
- Identification of sources of any anticipated backfill, along with all required chemical testing results.

2.0 SOIL SCREENING METHODS

Visual, olfactory and instrument-based soil screening will be performed by a qualified environmental professional during all remedial and development excavations into known or potentially contaminated material (remaining contamination). Soil screening will be performed regardless of when the invasive work is done and will include all excavation and invasive work performed during development, such as excavations for foundations and utility work, after issuance of the COC.

Soils will be segregated based on previous environmental data and screening results into material that requires off-site disposal, material that requires testing, material that can be returned to the subsurface, and material that can be used as cover soil.

3.0 STOCKPILE METHODS

Soil stockpiles will be continuously encircled with a berm and/or silt fence. Hay bales will be used as needed near catch basins, surface waters and other discharge points.

Stockpiles will be kept covered at all times with appropriately anchored tarps. Stockpiles will be routinely inspected and damaged tarp covers will be promptly replaced.

Stockpiles will be inspected at a minimum once each week and after every storm event producing greater than ½ inches of rain within 24 hours. Results of inspections will be recorded in a logbook and maintained at the site and available for inspection by NYSDEC.

4.0 MATERIALS EXCAVATION AND LOAD OUT

A qualified environmental professional or person under their supervision will oversee all invasive work and the excavation and load-out of all excavated material.

The owner of the property and its contractors are solely responsible for safe execution of all invasive and other work performed under this Plan.

The presence of utilities and easements on the site will be investigated by the qualified environmental professional. It will be determined whether a risk or impediment to the planned work under this SMP is posed by utilities or easements on the site.

Loaded vehicles leaving the site will be appropriately lined, tarped, securely covered, manifested, and placarded in accordance with appropriate Federal, State, local, and NYSDOT requirements (and all other applicable transportation requirements).

A truck wash will be operated on-site. The qualified environmental professional will be responsible for ensuring that all outbound trucks will be washed at the truck wash before leaving the site until the activities performed under this section are complete.

Locations where vehicles enter or exit the site shall be inspected daily for evidence of off-site soil tracking.

The qualified environmental professional will be responsible for ensuring that all egress points for truck and equipment transport from the site are clean of dirt and other materials derived from the site during intrusive excavation activities. Cleaning of the adjacent streets will be performed as needed to maintain a clean condition with respect to site-derived materials.

5.0 MATERIALS TRANSPORT OFF-SITE

All transport of materials will be performed by licensed haulers in accordance with appropriate local, State, and Federal regulations, including 6 NYCRR Part 364. Haulers will be appropriately licensed and trucks properly placarded.

Material transported by trucks exiting the site will be secured with tight-fitting covers. Loose-fitting canvas-type truck covers will be prohibited. If loads contain wet material capable of producing free liquid, truck liners will be used.

All trucks will be washed prior to leaving the site. Truck wash waters will be collected and disposed of off-site in an appropriate manner.

Truck transport routes are as follows:

Exit the Site, turn right onto Suffolk Ave, proceed east to Washington Avenue, turn left, proceed north on Washington Avenue to the Long Island Expressway. Follow the Service Road to the nearest entrance (east or westbound).

All trucks loaded with site materials will exit the vicinity of the site using only these approved truck routes. This is the most appropriate route and takes into account: (a) limiting transport through residential areas and past sensitive sites; (b) use of city mapped truck routes; (c) prohibiting off-site queuing of trucks entering the facility; (d) limiting total distance to major highways; (e) promoting safety in access to highways; and (f) overall safety in transport.

Trucks will be prohibited from stopping and idling in the neighborhood outside the project site.

Egress points for truck and equipment transport from the site will be kept clean of dirt and other materials during site remediation and development.

Queuing of trucks will be performed on-site in order to minimize off-site disturbance. Off-site queuing will be prohibited.

6.0 MATERIALS DISPOSAL OFF-SITE

All soil/fill/solid waste excavated and removed from the site will be treated as contaminated and regulated material and will be transported and disposed in accordance with all local, State (including 6NYCRR Part 360) and Federal regulations. If disposal of soil/fill from this site is proposed for unregulated off-site disposal (i.e. clean soil removed for development purposes), a formal request with an associated plan will be made to the NYSDEC. Unregulated off-site management of materials from this site will not occur without formal NYSDEC approval.

Off-site disposal locations for excavated soils will be identified in the pre-excavation notification. This will include estimated quantities and a breakdown by class of disposal facility if appropriate, i.e. hazardous waste disposal facility, solid waste landfill, petroleum treatment facility, C/D recycling facility, etc. Actual disposal quantities and associated documentation will be reported to the NYSDEC in the Periodic Review Report. This documentation will include: waste profiles, test results, facility acceptance letters, manifests, bills of lading and facility receipts.

Non-hazardous historic fill and contaminated soils taken off-site will be handled, at minimum, as a Municipal Solid Waste per 6NYCRR Part 360-1.2. Material that does not meet Track 1 unrestricted soil cleanup objectives is prohibited from being taken to a New York State recycling facility (6NYCRR Part 360-16 Registration Facility).

7.0 MATERIALS REUSE ON-SITE

Chemical criteria for on-site reuse of material will be approved by NYSDEC prior to any excavation work. The qualified environmental professional will ensure that procedures defined for materials reuse in this SMP are followed and that unacceptable material does not remain on-site. Contaminated on-site material, including historic fill and contaminated soil, that is acceptable for re-use on-site will be placed below the demarcation layer or impervious surface, and will not be reused within a cover soil layer, within landscaping berms, or as backfill for subsurface utility lines.

Any demolition material proposed for reuse on-site will be sampled for asbestos and the results will be reported to the NYSDEC for acceptance. Concrete crushing or processing on-site will not be performed without prior NYSDEC approval. Organic matter (wood, roots, stumps, etc.) or other solid waste derived from clearing and grubbing of the site will not be reused on-site.

8.0 FLUIDS MANAGEMENT

All liquids to be removed from the site, including excavation dewatering and groundwater monitoring well purge and development waters, will be handled, transported and disposed in accordance with applicable local, State, and Federal regulations. Dewatering, purge and development fluids will not be recharged back to the land surface or subsurface of the site, but will be managed off-site.

Discharge of water generated during large-scale construction activities to surface waters (i.e. a local pond, stream or river) will be performed under a SPDES permit.

9.0 COVER SYSTEM RESTORATION

After the completion of soil removal and any other invasive activities the cover system will be restored in a manner that complies with the Record of Decision. The demarcation layer, consisting of orange snow fencing material or equivalent material will be replaced to provide a visual reference to the top of the 'Remaining Contamination Zone', the zone that requires adherence to special conditions for disturbance of remaining contaminated soils defined in this SMP. If the type of cover system changes from that which exists prior to the excavation (i.e., a soil cover is replaced by asphalt), this will constitute a modification of the cover element of the remedy and the upper surface of the 'Remaining Contamination'. A figure showing the modified surface will be included in the subsequent PRR and in any updates to the SMP.

10.0 BACKFILL FROM OFF-SITE SOURCES

All materials proposed for import onto the site will be approved by the qualified environmental professional and will be in compliance with provisions in this SMP prior to receipt at the site.

Material from industrial sites, spill sites, or other environmental remediation sites or potentially contaminated sites will not be imported to the site.

All imported soils will meet the backfill and cover soil quality standards established in 6NYCRR 375-6.7(d). Soils that meet 'exempt' fill requirements under 6 NYCRR Part 360, but do not meet backfill or cover soil objectives for this site, will not be imported onto the site without prior approval by NYSDEC. Solid waste will not be imported onto the site.

Trucks entering the site with imported soils will be securely covered with tight fitting covers. Imported soils will be stockpiled separately from excavated materials and covered to prevent dust releases.

11.0 STORMWATER POLLUTION PREVENTION

Barriers and hay bale checks will be installed and inspected once a week and after every storm event. Results of inspections will be recorded in a logbook and maintained at the site and available for inspection by NYSDEC. All necessary repairs shall be made immediately.

Accumulated sediments will be removed as required to keep the barrier and hay bale check functional.

All undercutting or erosion of the silt fence toe anchor shall be repaired immediately with appropriate backfill materials.

Manufacturer's recommendations will be followed for replacing silt fencing damaged due to weathering.

Erosion and sediment control measures identified in the SMP shall be observed to ensure that they are operating correctly. Where discharge locations or points are accessible, they shall be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters

Silt fencing or hay bales will be installed around the entire perimeter of the construction area.

12.0 CONTINGENCY PLAN

If underground tanks or other previously unidentified contaminant sources are found during post-remedial subsurface excavations or development related construction, excavation activities will be suspended until sufficient equipment is mobilized to address the condition.

Sampling will be performed on product, sediment and surrounding soils, etc. as necessary to determine the nature of the material and proper disposal method. Chemical analysis will be performed for full a full list of analytes (TAL metals; TCL volatiles and semi-volatiles, TCL pesticides and PCBs), unless the site history and previous sampling results provide a sufficient justification to limit the list of analytes. In this case, a reduced list of analytes will be proposed to the NYSDEC for approval prior to sampling.

Identification of unknown or unexpected contaminated media identified by screening during invasive site work will be promptly communicated by phone to NYSDEC's Project Manager. Reportable quantities of petroleum product will also be reported to the NYSDEC spills hotline. These findings will be also included in the PRRs prepared pursuant to Section 5 of the SMP.

13.0 COMMUNITY AIR MONITORING PLAN

A Community Air Monitoring Plan (CAMP) will be prepared and submitted to the NYSDEC for approval prior to commencement of intrusive site activities. Air monitoring will be carried out at locations between the work area and onsite receptors, as well as at the site perimeter in the downwind direction, when conducting intrusive work. The objective is to prevent potential human exposure downwind of the site. The monitoring plan includes the use of a dust monitor.

The following information will be included in the CAMP:

- Air monitoring stations will be positioned upwind and downwind of the work area and equipment will be equipped with logging capabilities and alarms indicating action level exceedance.
- Air monitoring station locations will be adjusted on a daily or more frequent basis based on actual wind directions to provide an upwind and at least two downwind monitoring stations.
- Additionally, a separate PID will be used for worker breathing zone monitoring and will be positioned in the work area.

Background levels will be established at the beginning of each workday. The action levels associated with PID readings are 5 parts per million (ppm) and 25 ppm. A combination of temporary work stoppage and source control measures will be required when the PID readings exceed 5 ppm at the downwind site perimeter. When PID readings exceed 25 ppm, work is required to be shutdown and resumed only following appropriate source abatement and consultation with the NYSDEC.

Action levels associated with dust monitoring are 100 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) and 150 $\mu\text{g}/\text{m}^3$. Dust suppression measures, for example spraying water on dry soil, etc., will be required when downwind dust levels are more than 100 $\mu\text{g}/\text{m}^3$. Activities resulting in downwind dust concentrations to exceed 150 $\mu\text{g}/\text{m}^3$ will be stopped.

Exceedances of action levels listed in the CAMP will be reported to NYSDEC and NYSDOH Project Managers.

14.0 ODOR CONTROL PLAN

This odor control plan is capable of controlling emissions of nuisance odors off-site. If nuisance odors are identified at the site boundary, or if odor complaints are received, work will be halted and the source of odors will be identified and corrected. Work will not resume until all nuisance odors have been abated. NYSDEC and NYSDOH will be notified of all odor events and of any other complaints about the project. Implementation of all odor controls, including the halt of work, is the responsibility of the property owner's Remediation Engineer, and any measures that are implemented will be discussed in the Periodic Review Report.

All necessary means will be employed to prevent on- and off-site nuisances. At a minimum, these measures will include: (a) limiting the area of open excavations and size of soil stockpiles; (b) shrouding open excavations with tarps and other covers; and (c) using foams to cover exposed odorous soils; [add other elements as appropriate]. If odors develop and cannot be otherwise controlled, additional means to eliminate odor nuisances will include: (d) direct load-out of soils to trucks for off-site disposal; (e) use of chemical odorants in spray or misting systems; and, (f) use of staff to monitor odors in surrounding neighborhoods [add others as necessary].

If nuisance odors develop during intrusive work that cannot be corrected, or where the control of nuisance odors cannot otherwise be achieved due to on-site conditions or close proximity to sensitive receptors, odor control will be achieved by sheltering the excavation and handling areas in a temporary containment structure equipped with appropriate air venting/filtering systems.

15.0 DUST CONTROL PLAN

A dust suppression plan that addresses dust management during invasive on-site work will include, at a minimum, the items listed below:

- Dust suppression will be achieved through the use of a dedicated on-site water truck for road wetting. The truck will be equipped with a water cannon capable of spraying water directly onto off-road areas including excavations and stockpiles.
- Clearing and grubbing of larger sites will be done in stages to limit the area of exposed, unvegetated soils vulnerable to dust production.
- Gravel will be used on roadways to provide a clean and dust-free road surface.
- On-site roads will be limited in total area to minimize the area required for water truck sprinkling.

16.0 OTHER NUISANCES

A plan for rodent control will be developed and utilized by the contractor prior to and during site clearing and site grubbing, and during all remedial work.

A plan will be developed and utilized by the contractor for all remedial work to ensure compliance with local noise control ordinances.

Appendix E

Health And Safety Plan

New York State Department of Environmental Conservation
Contract No. D007626
Task/Delivery Order No. 17, Site No. 1-52-033

HEALTH AND SAFETY PLAN

Multi Site G
Dzus Fasteners
425 Union Boulevard
West Islip, Suffolk County, NY

Prepared for:

Superfund Standby Program
New York State
Department of Environmental Conservation
625 Broadway
Albany, New York 12233

Prepared by:

AECOM
100 Red Schoolhouse Road
Chestnut Ridge, NY 10977

Health and Safety Plan Expiration Date: January 31, 2015

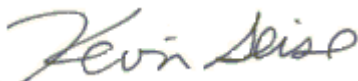
Project No: 60277021

Project Health and Safety Plan

approval page

This project Health and Safety Plan (HASP) was prepared for employees performing a specific, limited scope of work. It was prepared based on the best available information regarding the physical and chemical hazards known or suspected to be present on the project site. While it is not possible to discover, evaluate, and protect in advance against all possible hazards, which may be encountered during the completion of this project, adherence to the requirements of the HASP will significantly reduce the potential for occupational injury.

By signing below, I acknowledge that I have reviewed and hereby approve the HASP for the Dzus Fasteners site. This HASP has been written for the exclusive use of AECOM, its employees, and subcontractors. The plan is written for specified site conditions, dates, and personnel, and must be amended if these conditions change.

Prepared by:

Kevin Seise
EH&S Coordinator
201-923-7155

Date March 1, 2013

Concurrence by:

Peter Sullivan
EH&S Manager
978-905-2417

Date

Approved by:

Paul Kareth
Project Manager
845-425-4980

Date March 1, 2013

Executive Summary

The purpose of this Health and Safety Plan (HASP) is to address health and safety concerns related to AECOM managed activities at the Dzus Fasteners site, located in West Islip, New York. The specific roles, responsibilities, authority, and requirements as they pertain to the safety of employees and the scope of services are discussed herein. The document is intended to identify known potential hazards and facilitate communication and control measures to prevent injury or harm. Additionally, provisions to control the potential for environmental impact from these activities are included where applicable.

AECOM will be performing groundwater sampling and monitoring well maintenance as required to perform the long term monitoring of the site.

The primary physical hazards which may be encountered include:

- Traffic controls
- Biological hazards
- Heat and cold stress
- Working on and around water
- Hostile wildlife

The chemical hazards which may be encountered include:

- Chlorinate solvents dissolved in groundwater

All staff are bound by the provisions of this HASP and are required to participate in a preliminary project safety meeting to familiarize them with the anticipated hazards and respective onsite controls. The discussion will cover the entire HASP subject matter, putting emphasis on critical elements of the plan; such as the emergency response procedures, personal protective equipment, site control strategies, and monitoring requirements. In addition, daily tailgate safety meetings will be held to discuss: the anticipated scope of work, required controls, identify new hazards and controls, incident reporting, review the results of inspections, any lessons learned or concerns from the previous day.

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ATTACHMENTS

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Attachment B	Material Safety Data Sheets & Site-Specific Spill Response Plan
Attachment C	Client-Specific Health and Safety Guidelines
Attachment D	Applicable SH&E SOPs
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1.0 Introduction

This Health and Safety Plan (HASP) including the Attachments provides a general description of the levels of personal protection and safe operating guidelines expected of each employee or subcontractor associated with the environmental services being conducted at the Dzus Fasteners site, located at in West Islip, New York. This HASP also identifies chemical and physical hazards known to be associated with the AECOM-managed activities addressed in this document.

HASP Supplements will be generated as necessary to address any additional activities or changes in site conditions, which may occur during field operations.

1.1 General

The provisions of this HASP are mandatory for all AECOM personnel engaged in fieldwork associated with the environmental services being conducted at the subject site. A copy of this HASP, any applicable HASP Supplements and the AECOM's North America Safety, Health, and Environmental (SH&E) Procedures and Manual shall be accessible on site and available for review at all times. Record keeping will be maintained in accordance with this HASP and the applicable Standard Operating Procedures (SOPs). In the event of a conflict between this HASP, the SOPs and federal, provincial, state, and local regulations, workers shall follow the most stringent/protective requirements. Concurrence with the provisions of this HASP is mandatory for all personnel at the site covered by this HASP and must be signed on the acknowledgement page.

1.2 Project Policy Statement

AECOM is committed to protecting the safety and health of our employees and meeting our obligations with respect to the protection of others affected by our activities. We are also committed to protecting and preserving the natural environment in which we operate. The safety of persons and property is of vital importance to the success of this project and accident prevention measures shall be taken toward the avoidance of needless waste and loss. It shall be the policy of this project that all operations be conducted safely. Onsite supervisors are responsible for those they supervise by maintaining a safe and healthy working environment in their areas of responsibility, and by fairly and uniformly enforcing safety and health rules and requirements for all project personnel. Subcontractors shall comply with the requirements of this HASP, provisions contained within the contract document and all applicable rules, requirements and health, safety and environmental regulations. All practical measures shall be taken to promote safety and maintain a safe place to work. Contractors are wholly responsible for the prevention of accidents on work under their direction and shall be responsible for thorough safety and loss control programs and the execution of their own safety plans for the protection of workers.

1.3 References

This HASP conforms to the regulatory requirements and guidelines established in the following documents:

- Title 29, Part 1910 of the Code of Federal Regulations (29 CFR 1910), Occupational Safety and Health Standards (with special attention to Section 120, Hazardous Waste Operations and Emergency Response).
- Title 29, Part 1926 of the Code of Federal Regulations (29 CFR 1926), Safety and Health Regulations for Construction.
- National Institute for Occupational Safety and Health (NIOSH)/OSHA/U.S. Coast Guard (USCG)/EPA, Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities, Publication No. 85-115, 1985.
- In Canada there is no direct federal or provincial counterpart to HAZWOPER; however, as due diligence and in compliance with applicable provincial duty of care/general duty clauses, staff working in Canada will comply with S3NA-509-PR Hazardous Waste Operations and Emergency Response Activities.

2.0 Site Information and Scope of Work

AECOM will conduct environmental services at the Dzus Fastener site. Work will be performed in accordance with the applicable Statement of Work (SOW) and associated Project Work Plan developed for project site. Deviations from the listed SOW will require that a Safety Professional review and changes made to this HASP, to ensure adequate protection of personnel and other property.

The following is a summary of relevant data concerning the project site, and the work procedures to be performed. The Project Work Plan prepared by AECOM as a companion document to this HASP provides more detail concerning both site history and planned work operations.

2.1 Site Information

This section provides a general description and historical information associated with the site.

2.1.1 General Description

The Dzus Fasteners Superfund site is located at 425 Union Boulevard, West Islip, New York. The Site is bounded to the north by railroad tracks. To the southeast is Union Boulevard and on the southeast side of Union Boulevard is a shopping plaza which is bounded by Willetts Creek. Willetts Creek flows south past a junior high school, a high school and eventually discharges into Lake Capri approximately 4,500 feet south of the Site. A total of 14 wells have been identified for long term monitoring at the Site.

2.1.2 Site Background/History

The Dzus Fastener company manufactured fasteners and springs since 1932, was responsible for the release of oils, heavy metals, and salts via onsite leaching pools used for the disposal of hazardous waste and formal discharge into Upper Willetts Creek. These operations led to soil and groundwater contamination at the Dzus facility and downstream groundwater, sediment, and surface water contamination of nearby Willetts Creek and Lake Capri, an 8-acre man-made lake.

An initial site inspection took place in August 1983. Contamination was discovered and a preliminary site assessment was completed in September 1984. A phase I investigation was completed and a phase II investigation was submitted by Dzus in August of 1990. Dzus then completed an Interim Remedial Measure (IRM) in October 1990. During the IRM a leach field on the eastern side of the site was removed. A remedial investigation / feasibility study (RI/FS) was initiated at the site in 1992. The site was then broken up into the two Operable Units (OU), OU1, the Dzus facility; and OU2, the offsite localities including Willetts Creek and Lake Capri. A Record of Decision (ROD) for OU1 was issued for the site in March 1995, and a ROD for OU2 was issued for the site in October 1997.

In response to the ROD for OU1, the remedy for contaminated groundwater in the vicinity of the Dzus facility consisted of source removal and ongoing natural attenuation.

The eastern parking lot at the Dzus facility was paved with asphalt to eliminate the potential for direct human contact with the underlying contaminated soils at the site, and to eliminate or reduce the mobility of soil contaminants that would cause further groundwater degradation. The selected remedy consisted of the following:

- In-situ stabilization/solidification for soils containing cadmium at concentrations greater than 10 parts per million (ppm). Three areas on the western portion of the facility were excavated and mixed with the soils to be treated on the eastern portion of the Site;
- Design and installation of a final topsoil/asphalt cover at the eastern portion of the Site, which would protect the treatment cells from erosion;
- Implementation of institutional controls, such as deed restrictions at the Site.

The second operable unit, Operable Unit 2 (OU2) consisted of offsite contamination, including sediment and water contamination of Willetts Creek and Lake Capri. A ROD for OU2 was issued for the Site by NYSDEC in October 1997.

The selected remedy consisted of the following:

- The fish population of Lake Capri was eradicated using Rotenone, a NYSDEC approved fish eradicator, in July 1999 prior to dredging operations;
- Dredging, dewatering and off-site disposal of contaminated sediments from Lake Capri;
- Excavation and off-site disposal of approximately 100 cubic yards of sediment from Willetts Creek, corresponding to levels of cadmium exceeding 9 ppm (currently, the highest effects guidance value);
- Riprap was used to cover portions identified as having deeper zones of contamination in order to prevent future erosion;

- A long-term monitoring program to evaluate the effectiveness of the on-site remedy and to verify that existing groundwater plume does not impact public health or environment; and,
- The lake was restocked with silversides, bluegill, and largemouth bass after completion of the remedial activities in 2000.

An Operation, Maintenance and Monitoring (OM&M) program for the Site was based on NYSDEC Draft DER-10 – Technical Guidance for Site Investigation and Remediation (December 2002). As part of the OM&M, a long-term monitoring plan (LTMP) was developed for OU1 and OU2 with regard to monitoring of groundwater, surface water, sediment, and the asphalt cover (engineering control) in the manufacturing facility's eastern parking lot. The Final Sampling and Analysis Plan (SAP), dated June 2007, outlines the most recent sample collection procedures.

The primary contaminant of concern at the Site is cadmium, but several other metals including antimony, arsenic, chromium, iron, lead, manganese, sodium, and thallium have been found in exceedance of published standards in soil and groundwater at the Dzus facility and in the water and sediments of nearby Willets Creek and Lake Capri.

A total of 14 wells and six surface water/sediment sample locations were identified for long term monitoring at the Site and will be sampled during this work..

2.1.3 Previous Investigations

Table 2-1: Previous Investigation Data

Contaminants	Groundwater (ug/l)	Sediment (mg/kg)	Surface Water (ug/l)
Cadmium	1080 Unfiltered	122	4.1 ug/L

2.2 Scope of Work

2.2.1 Groundwater Sampling

The groundwater sampling process will consist of initially purging each of 14 wells using dedicated polyethylene tubing and a suitable pump. Physical measurements (i.e. pH, specific conductance, temperature, turbidity) will be collected, in addition to measuring water level and total well depths with a water level indicator, which will be washed in a Liquinox bath and rinsed with tap water before each use. Once the minimum volume of water has been evacuated, a dedicated Teflon bailer will be used to collect a groundwater sample from each well in accordance with the QAPP.

2.2.2 Surface Water and Sediment Sampling

Six surface water samples will be collected from Lake Capri during each of the semi-annual sampling events. A small boat will be used to gain access to the Lake. Each surface water sample will be collected by dipping laboratory-supplied bottles into the Lake and then transferring the water to the laboratory-supplied bottles containing preservative. At each surface water location, a co-located sediment sample will also be collected. Sediment samples will be collected using a hand auger or Ponar sampler to reach the bottom of the Lake.

2.2.3 Fish Tissue Sampling

AECOM will collect fish samples at two stations in Lake Capri as noted below:

Station 1 – The north end of Lake Capri south of the footbridge over the east branch of Willets Creek in the general vicinity of sediments samples SED-1N and SED-2N;

Station 2 – The south end of Lake Capri near the lake outfall and in the general vicinity of sediment samples SED-3S and SED 4S.

At each station, 10 samples of each target species will be collected for a total of 40 analyses. Target species include American eel, bluegill, carp and largemouth bass. 40 samples at each station will be collected for cadmium analysis. An individual sample mass of 100 grams minimum will be collected for tissue analysis, which may require sample compositing.

AECOM will collect fish via fish traps or netting from a boat. Due to the shallow draft of Lake Capri and difficult access, AECOM will use a small row boat to reach the sampling stations.

The fish for each sample will be placed in plastic bags, labeled, and stored in a cooler with ice (to keep below 45 degrees Fahrenheit). At the end of each sampling day, the fish will be shipped in a cooler with ice to Mitkem, Inc. for cadmium analysis. Samples will be prepared for analysis by the contract laboratory.

2.2.4 Site Surveying

Prior to the start of each groundwater sampling event, water levels will be measured in each well to provide a synoptic event. The survey will include measuring the depth of water within the wells from a monitoring point of known elevation established at the top of the well riser. The water elevations will be calculated based on the known elevation and measured depth to water.

In addition, AECOM will also record the depth of the well to assist in identification during the future sampling events. A handheld global positioning system (GPS) unit (WAAS enabled) will be used to locate each well during sampling and the coordinates will be recorded in the field notes. The GPS unit will also be used to locate the surface water/sediment sample locations. .

3.0 Hazard Assessment (Safety)

3.1 Physical Hazards

Work will be conducted on wells in residential and commercial neighborhoods and along busy roadways. Lifting of pumps and sampling equipment will be required.

Sediment and surface water sampling will involve the need to work on and around water. AECOM will rent a two person row boat to allow for the collection of surface water and sediment samples from within Lake Capri. Surface water and sediment samples from Willetts Creek will be collected using waterproof boots or hip waders as appropriate.

3.2 Wildlife, Plant and Insect Hazards

The work involves sampling of wells in grassy areas as well as sediment samples from denser vegetated areas. Poison ivy and stinging insects may be present. Past sampling events on Lake Capri have encountered a highly territorial swan which has attacked the sampling boats and personnel.

3.3 Ultraviolet Hazards

The 2009 historical UV Index for the West Islip, New York area showed that worker's UV exposures were in the HIGH category beginning in April and lasting until November with worker's exposures in the EXTREME category from July through September. In 2009, West Islip had 51 days in the HIGH category, 111 days in the VERY HIGH category, and 0 days in the EXTREME category. Workers performing field work outdoors may be susceptible to sunburn if not properly protected with sunscreen or protective clothing and hats. Skin can burn in minutes when the UV Index is VERY HIGH. Protective measures are advisable.

3.4 Weather Hazards

The Site Safety Officer will be attentive to daily weather forecasts for the project area each morning. Predicted weather conditions of potential field impact are to be included in safety briefings and the Task Hazard Analysis (THA) for that day. Weather changes should initiate a review and updates (THA) as necessary.

Severe weather can occur with little warning. Employees will be vigilant for the potentials for storms, lightning, high winds, and flash flood events.

3.5 Hazard Analysis

Task Hazard Analyses (THAs) have been completed for all tasks identified in the Scope of Work (Attachment A).

3.5.1 Unanticipated Work Activities/Conditions

As a result of unanticipated work activities or changing conditions, additional THAs may be required. All additional THAs will be reviewed and approved by the SH&E Professional.

3.6 Task Specific SH&E Procedures

As discussed in Section 5.0, personnel may be exposed to a variety of chemical, physical, and radiological hazards resulting from task or equipment-specific activities. The controls for many of these hazards are discussed in SOPs found in the **Series 300 to 500** North America SH&E SOPs.

SOP#	TITLE	SOP#	TITLE
S3NA 300 Series Field(Common)		S3NA 500 Series Industrial Hygiene	
<input type="checkbox"/> S3NA-301-PR	Confined Spaces	<input type="checkbox"/> S3NA-501-PR	Asbestos
<input type="checkbox"/> S3NA-302-PR	Electrical, General	<input type="checkbox"/> S3NA-502-PR	Benzene
<input type="checkbox"/> S3NA-303-PR	Excavation and Trenching	<input type="checkbox"/> S3NA-503-PR	Blood borne Pathogen Program
<input type="checkbox"/> S3NA-304-PR	Fall Protection	<input type="checkbox"/> S3NA-504-PR	Cadmium
<input type="checkbox"/> S3NA-305-PR	Hand and Power Tools	<input type="checkbox"/> S3NA-505-PR	Cold Stress Prevention
<input type="checkbox"/> S3NA-306-PR	Highway and Road Work	<input type="checkbox"/> S3NA-506-PR	Compressed Gases
<input type="checkbox"/> S3NA-307-PR	Housekeeping, Worksite	<input type="checkbox"/> S3NA-507-PR	Hazardous Materials Communication / WHMIS
<input type="checkbox"/> S3NA-308-PR	Manual Lifting, Field	<input type="checkbox"/> S3NA-508-PR	Hazardous Materials Handling and Shipping
<input type="checkbox"/> S3NA-309-PR	Mobile or Heavy Equipment	<input type="checkbox"/> S3NA-509-PR	Hazardous Waste Operations and Emergency Response Activities
<input type="checkbox"/> S3NA-310-PR	Rigging, Hoisting, Cranes and Lifting Devices	<input type="checkbox"/> S3NA-510-PR	Hearing Conservation Program
<input type="checkbox"/> S3NA-311-PR	Scaffolding	<input type="checkbox"/> S3NA-511-PR	Heat Stress Prevention
<input type="checkbox"/> S3NA-312-PR	Ladders and Stairways	<input type="checkbox"/> S3NA-512-PR	Laboratory Safety
<input type="checkbox"/> S3NA-313-PR	Wildlife, Plants and Insects	<input type="checkbox"/> S3NA-513-PR	Lead
<input type="checkbox"/> S3NA-314-PR	Working Alone & Remote Travel	<input type="checkbox"/> S3NA-514-PR	Munitions and Explosives of Concern / Unexploded Ordnance (MEC-UXO)
<input type="checkbox"/> S3NA-315-PR	Water, Working Around	<input type="checkbox"/> S3NA-515-PR	Nanotechnology
		<input type="checkbox"/> S3NA-516-PR	Radiation Safety Programs
S3NA 400 Series Field (Uncommon)		<input type="checkbox"/> S3NA-517-PR	Radiation, Non-Ionizing
<input type="checkbox"/> S3NA-401-PR	Aircraft Charters	<input type="checkbox"/> S3NA-518-PR	Radiation, Gauge Source program
<input type="checkbox"/> S3NA-402-PR	All Terrain Vehicles (ATVs)	<input type="checkbox"/> S3NA-519-PR	Respiratory Protection Program
<input type="checkbox"/> S3NA-403-PR	Avalanches	<input type="checkbox"/> S3NA-520-PR	Spill Response, Incidental
<input type="checkbox"/> S4NA(US)-404-PR	Commercial Motor Vehicles		
<input type="checkbox"/> S3NA-405-PR	Drilling and Boring		
<input type="checkbox"/> S3NA-406-PR	Electrical Lines, Overhead		
<input type="checkbox"/> S3NA-407-PR	Electro-fishing		
<input type="checkbox"/> S3NA-408-PR	Elevated Work Platforms and Aerial Lifts		
<input type="checkbox"/> S3NA-409-PR	Forklifts (operation of)		
<input type="checkbox"/> S3NA-410-PR	Hazardous Energy Control		
<input type="checkbox"/> S3NA-411-PR	Machine Guarding		
<input type="checkbox"/> S3NA-412-PR	Powder-Actuated Tools		
<input type="checkbox"/> S4NA(US)-413-PR1	Process Safety Management		
<input type="checkbox"/> S4NA(US)-414-PR	Railway Sites		
<input type="checkbox"/> S4NA(US)-415-PR	RCRA Regulated Facilities		
<input type="checkbox"/> S3NA-416-PR	Tunnel and Underground Work		
<input type="checkbox"/> S3NA-417-PR	Utilities, Underground		
<input type="checkbox"/> S3NA-418-PR	Welding, Cutting and Other Hot Work		
<input type="checkbox"/> S3NA-419-PR	Water, Marine Operations, Boating		
<input type="checkbox"/> S3-NA420-PR	Water, Underwater Diving		

4.0 SH&E Requirements (Safety)

4.1 HAZWOPER Qualifications

Personnel performing work at the job site must be qualified as HAZWOPER workers (unless otherwise noted in specific THAs or by the SSO), and must meet the medical monitoring and training requirements specified in the AECOM's North America SH&E Standard Operating Procedures.

If site monitoring procedures indicate that a possible exposure has occurred above the OSHA permissible exposure limit (PEL), employees may be required to receive supplemental medical testing to document any symptoms that may be specific to the particular materials present.

4.2 Site-Specific Safety Training

All AECOM personnel performing activities at the site will be trained in accordance with *S3NA-003-PR SH&E Training*. All personnel are required to remain current in all of their required training and evaluate their need for additional training when there is a change in work. In addition to the general health and safety training programs, personnel will be required to complete any supplemental task specific training developed for the tasks to be performed. Administration and compliance with the requirements for additional task-specific training will be the responsibility of the project or lead manager. Any additional required training that is completed will be documented and tracked in the project files.

4.2.1 Competent Person Training Requirements

In order to complete the planned scope of work, an (OSHA conformance) competent person must be designated to perform the required daily on site inspections of operations and/or equipment. The competent person may be an AECOM (if responsible for supervising that activity) or the subcontractor's employee. Designated competent person(s) for this project are shown in Table 4-2:

Table 4.2.1-2: Task-Specific Competent Persons

Employee Name	Organization	Area of Competency
Paul Kareth	AECOM	Groundwater sampling
John Rollino	AECOM	Surface water, sediment, and fish sampling

Note: The training requirements for competent persons are specified in the indicated SOPs and/or *S3NA-202-PR Competent Person Designation*. By identifying an employee as a "competent person", that person has now been authorized to take prompt corrective measures to eliminate hazards.

4.3 Tailgate Meetings

Prior to the commencement of daily project activities, a tailgate meeting will be conducted by the SSO to review the specific requirements of this HASP, applicable THA. Attendance at the daily tailgate meeting is mandatory for all employees at the site covered by this HASP and must be documented on the attendance form. All safety training documentation is to be maintained in the project file by the SSO.

4.4 Hazard Communication

Hazardous materials that may be encountered as existing on-site environmental or physical/health contaminants during the work activities are addressed in this HASP and their properties, hazards and associated required controls will be communicated to all affected staff and subcontractors.

In addition, any employee or organization (contractor or subcontractor) intending to bring any hazardous material onto this AECOM-controlled work site must first provide a copy of the item's Material Safety Data Sheet (MSDS) to the SSO for review and filing (the SSO will maintain copies of all MSDS on site). MSDS may not be available for locally-obtained products, in which case some alternate form of product hazard documentation will be acceptable in accordance with the requirements of *S3NA-507-PR Hazardous Materials Communication/WHMIS*.

All personnel shall be briefed on the hazards of any chemical product they use, and shall be aware of and have access to all MSDS.

All containers on site shall be properly labeled to indicate their contents. Labeling on any containers not intended for single-day, individual use shall contain additional information indicating potential health and safety hazards (flammability, reactivity, etc.).

Attachment B provides copies of MSDS for those items planned to be brought on site at the time this HASP is prepared. This information will be updated as required during site operations.

4.5 Confined Space Entry

The SSO/site supervisor shall identify all potential confined spaces in accordance with *S3NA-301-PR Confined Spaces*. In addition; the SSO/site supervisor will inform all employees of the location of onsite confined spaces, and their associated security controls and procedures.

4.6 Hazardous, Solid, or Municipal Waste

If hazardous, solid, and/or municipal wastes are generated during any phase of the project, the waste shall be accumulated, labeled, and disposed of in accordance with applicable Federal, State, Provincial, Territorial and/or local regulations. Consult the Regional SH&E Manager for further guidance.

4.7 General Safety Rules

All site personnel shall conduct themselves in a safe manner and maintain a working environment that is free of additional hazards, in adherence to *S3NA-001-PR Safe Work Standards and Rules* and *S3NA-103-PR General Housekeeping*.

4.7.1 Housekeeping

During site activities, work areas will be continuously policed for identification of excess trash and unnecessary debris. Excess debris and trash will be collected and stored in an appropriate container (e.g., plastic trash bags, garbage can, roll-off bin) prior to disposal. At no time will debris or trash be intermingled with waste PPE or contaminated materials.

4.7.2 Smoking, Eating, or Drinking

Smoking, eating and drinking will not be permitted inside any controlled work area at any time. Field workers will first wash hands and face immediately after leaving controlled work areas (and always prior to eating or drinking). Consumption of alcoholic beverages is prohibited at any AECOM site. Smoking, eating or drinking must be in an approved area.

4.7.3 Personal Hygiene

The following personal hygiene requirements will be observed:

Water Supply: A water supply meeting the following requirements will be utilized:

Potable Water - An adequate supply of potable water will be available for field personnel consumption. Potable water can be provided in the form of water bottles, canteens, water coolers, or drinking fountains. Where drinking fountains are not available, individual-use cups will be provided as well as adequate disposal containers. Potable water containers will be properly identified in order to distinguish them from non-potable water sources.

Non-Potable Water - Non-potable water may be used for hand washing and cleaning activities. Non-potable water will not be used for drinking purposes. All containers of non-potable water will be marked with a label stating:

***Non-Potable Water
Not Intended for Drinking Water Consumption***

Toilet Facilities: A minimum of one toilet will be provided for every 20 personnel on site, with separate toilets maintained for each sex except where there are less than 5 total personnel on site. For mobile crews where work activities and locations permit transportation to nearby toilet facilities on-site facilities are not required.

Washing Facilities: Employees will be provided washing facilities (e.g., buckets with water and Alconox) at each work location. The use of water and hand soap (or similar substance) will be required by all employees following exit from the Exclusion Zone, prior to breaks, and at the end of daily work activities.

4.7.4 Buddy System

All field personnel will use the buddy system when working within any controlled work area. Personnel belonging to another organization on site can serve as "buddies" for AECOM personnel. Under no circumstances will any employee be present alone in a controlled work area. For areas not in controlled work areas, the procedures outlined in *S3NA-314-PR Working Alone Remote Travel* will be followed at all times.

4.8 Stop Work Authority

All employees have the right and duty to stop work when conditions are unsafe and to assist in correcting these conditions as outlined in *S3NA-002-PR Stop Work Authority*. Whenever the SSO determines that workplace conditions present an uncontrolled risk of injury or illness to employees, immediate resolution with the appropriate supervisor shall be sought.

Should the supervisor be unable or unwilling to correct the unsafe conditions, the SSO is authorized and required to stop work, which shall be immediately binding on all affected AECOM employees and subcontractors.

Upon issuing the stop work order, the SSO shall implement corrective actions so that operations may be safely resumed. Resumption of safe operations is the primary objective; however, operations shall not resume until the Safety Professional has concurred that workplace conditions meet acceptable safety standards.

4.9 Client Specific Safety Requirements

The client has specified no additional health and safety requirements.

5.0 Exposure Monitoring Procedures (Health)

5.1 Contaminant Exposure Hazards

The following is a discussion of the hazards presented to worker personnel during this project from on-site chemical and radiological hazards known, suspected or anticipated to be present on site.

Exposure symptoms and applicable first aid information for each suspected site contaminant identified in the Scope of Work are located in the following subsections.

- Cadmium
- Heavy Metals

5.1.1 Heavy Metals

As a group, the heavy metals (including lead, arsenic, chromium, nickel, cadmium, and selenium) are toxic to a number of organs and organ systems in the body including the liver, kidneys, blood-forming organs (primarily located in the bones), and the CNS (especially lead). Acute exposure to metals can produce symptoms such as stomach distress and vomiting, mental confusion and sluggishness, heart palpitations, breathing difficulties, and renal (kidney) failure. Chronic exposures can be characterized by deterioration in function of the liver and kidneys, CNS degradation, and abnormal changes in blood cell counts (especially white blood cells). Exposure to chromium may also lead to formation of lung and gastric cancers.

The primary route of exposure to heavy metals of concern during this project is contact with contaminated soils and water, which can lead to entry through open wounds or contamination and ingestion of food. Preventing this route of exposure necessitates the use of dust control measures and appropriate protective clothing and decontamination procedures.

5.2 Route of Entry Assessment of Exposure Hazards

Inhalation: Based on the known site conditions with dissolved and degraded chlorinated solvents, it is unlikely that inhalation of contaminants will occur. Monitoring of well headspace with a PID is required to confirm this condition.

Skin Contact: Based on the known site conditions with dissolved and degraded chlorinated solvents, it is unlikely that skin contact will occur, however, as a preventative measure, AECOM staff will be required to wear PPE including chemical resistant gloves when handling contaminate groundwater.

Ingestion: Drinking of groundwater is prohibited from the wells within the work area. Employees must wash their hands upon completion of work and prior to breaks or meals which would require hand to mouth contact. Protection against exposure via ingestion can be accomplished by performance of proper decontamination procedures when exiting contaminated work areas.

Monitoring procedures will be employed during site characterization activities to assess employee exposure to chemical and physical hazards. Monitoring will consist primarily of onsite determination of various parameters (e.g., airborne contaminant concentrations and heat stress effects), but may be supplemented by more sophisticated monitoring techniques, if necessary.

5.3 Real-Time Exposure Measurement

Monitoring shall be performed within the work area on site in order to detect the presence and relative levels of toxic substances. The data collected throughout monitoring shall be used to determine the appropriate levels of PPE. Monitoring shall be conducted as specified in each THA as work is performed.

Table 5-1 specifies the real-time monitoring equipment, which will be used for this project.

Table 5-1: Monitoring Parameters and Equipment

INSTRUMENT	MANUFACTURER/MODEL*	SUBSTANCES DETECTED
Photo Ionization Detector (PID)	RAE Systems mini-RAE Photovac Microtip HNU Model Hnu (min. 10.2 eV bulb)	Petroleum hydrocarbons Organic Solvents

*Or similar unit, as approved by the SH&E Professional

5.4 Health and Safety Action Levels

An action level is a point at which increased protection is required due to the concentration of contaminants in the work area or other environmental conditions. The concentration level (above background level) and the ability of the PPE to protect against that specific contaminant determine each action level. The action levels are based on concentrations in the breathing zone.

If ambient levels are measured which exceed the action levels in areas accessible to unprotected personnel, necessary control measures (barricades, warning signs, and mitigative actions to limit, etc.) must be implemented prior to commencing activities at the specific work area.

Personnel should also be able to upgrade or downgrade their level of protection with the concurrence of SSO or the Safety Professional.

Reasons to upgrade:

- Known or suspected presence of dermal hazards.
- Occurrence or likely occurrence of gas, vapor, or dust emission.
- Change in work task that will increase the exposure or potential exposure to hazardous materials.

Reasons to downgrade:

- New information indicating that the situation is less hazardous than was originally suspected.
- Change in site conditions that decrease the potential hazard.
- Change in work task that will reduce exposure to hazardous materials.

5.4.1 Monitoring Procedures

Upon arrival at each monitoring well to be sampled or repaired, the field personnel will open the lid and screen the headspace with a PID to assess vapor levels within the well head. The monitor will remain in place during the purging and sampling of the wells.

5.4.1.1 Monitoring Equipment Calibration

All instruments used will be calibrated at the beginning and end of each work shift, in accordance with the manufacturer's recommendations. If the owner's manual is not available, the personnel operating the equipment will contact the applicable office representative, rental agency or manufacturer for technical guidance for proper calibration. If equipment cannot be pre-calibrated to specifications, site operations requiring monitoring for worker exposure or off-site migration of contaminants will be postponed or temporarily ceased until this requirement is completed.

5.4.1.2 Personal Sampling

Should site activities warrant performing personal sampling (breathing zone) to better assess chemical exposures experienced by AECOM employees, the SSO, under the direction of a Certified Industrial Hygienist (CIH), Certified Safety Professional (CSP) will be responsible for specifying the monitoring required. Within five working days after the receipt of monitoring results, the CIH or CSP will notify each employee, in writing, of the results that represent that employee's exposure. Copies of air sampling results will be maintained in the SSO project files.

If the site activities warrant, the subcontractor will ensure its employees' exposures are quantified via the use of appropriate sampling techniques. The subcontractor shall notify the employees sampled in accordance with health and safety regulations, and provide the results to the SSO for use in determining the potential for other employees' exposure.

5.5 Heat and Cold Stress

Heat and cold stress may vary based upon work activities, PPE/clothing selection, geographical locations, and weather conditions. To reduce the potential of developing heat/cold stress, be aware of the signs and symptoms of heat/cold stress and watch fellow employees for signs of heat/cold stress.

Heat stress can be a significant field site hazard, particularly for non-acclimated personnel operating in a hot, humid setting. Site personnel will be instructed in the identification of a heat stress victim, the first-aid treatment procedures for the victim and the prevention of heat stress casualties. Work-rest cycles will be determined and the appropriate measures taken to prevent heat stress as outlined in *S3NA-511-PR Heat Stress Prevention Program*.

5.5.1 Responding to Heat-Related Illness

The guidance below will be used in identifying and treating heat-related illness.

Table 5.5.1: Identification and Treatment of Heat-Related Illness

Type of Heat-Related Illness	Description	First Aid
Mild Heat Strain	The mildest form of heat-related illness. Victims exhibit irritability, lethargy, and significant sweating. The victim may complain of headache or nausea. This is the initial stage of overheating, and prompt action at this point may prevent more severe heat-related illness from occurring.	<ul style="list-style-type: none"> • Provide the victim with a work break during which he/she may relax, remove any excess protective clothing, and drink cool fluids. • If an air-conditioned spot is available, this is an ideal break location. • Once the victim shows improvement, he/she may resume working; however, the work pace should be moderated to prevent recurrence of the symptoms.
Heat Exhaustion	Usually begins with muscular weakness and cramping, dizziness, staggering gait, and nausea. The victim will have pale, clammy moist skin and may perspire profusely. The pulse is weak and fast and the victim may faint unless they lie down. The bowels may move involuntarily.	<ul style="list-style-type: none"> • Immediately remove the victim from the work area to a shady or cool area with good air circulation (<i>avoid drafts or sudden chilling</i>). • Remove all protective outerwear. • Call a physician. • Treat the victim for shock. (<i>Make the victim lie down, raise his or her feet 6–12 inches, and keep him/her cool by loosening all clothing</i>). • If the victim is conscious, it may be helpful to give him/her sips of water. • Transport victim to a medical facility ASAP.
Heat Stroke	The most serious of heat illness, heat stroke represents the collapse of the body's cooling mechanisms. As a result, body temperature may rise to 104 degrees Fahrenheit or higher. As the victim progresses toward heat stroke, symptoms such as headache, dizziness, nausea can be noted, and the skin is observed to be dry, red, and hot. Sudden collapse and loss of consciousness follows quickly and death is imminent if exposure continues. Heat stroke can occur suddenly.	<ul style="list-style-type: none"> • Immediately evacuate the victim to a cool/shady area. • Remove all protective outerwear and as much personal clothing as decency permits. • Lay the victim on his/her back w/the feet slightly elevated. • Apply cold wet towels or ice bags to the head, armpits, and thighs. • Sponge off the bare skin with cool water. • The main objective is to cool without chilling the victim. • Give no stimulants or hot drinks. • Since heat stroke is a severe medical condition requiring professional medical attention, emergency medical help should be summoned immediately to provide onsite treatment of the victim and proper transport to a medical facility.

6.0 Environmental Program (Environment)

6.1 Environmental Compliance and Management

This project and the individual tasks will comply with all federal, state, provincial, and local environmental requirements.

7.0 Personal Protective Equipment

7.1 Personal Protective Equipment

The purpose of personal protective equipment (PPE) is to provide a barrier, which will shield or isolate individuals from the chemical and/or physical hazards that may be encountered during work activities. *S3NA-208-PR Personal Protective Equipment Program* lists the general requirements for selection and usage of PPE. Table 7-1 lists the minimum PPE required during site operations and additional PPE that may be necessary. The specific PPE requirements for each work task are specified in the individual THAs.

By signing this HASP the employee agree having been trained in the use, limitations, care and maintenance of the protective equipment to be used by the employee at this project. If training has not been provided, request same of the PM/SSO for the proper training before signing.

Table 7-1: Personal Protective Equipment

<u>TYPE</u>	<u>MATERIAL</u>	<u>ADDITIONAL INFORMATION</u>
Minimum PPE		
Safety Vest	ANSI Type II high-visibility	Must have reflective tape/be visible from all sides.
Boots	Leather	ANSI approved safety toe.
Safety Glasses		ANSI Approved; ≥98% UV protection.
Hard Hat		ANSI Approved; recommended wide-brim.
Work Uniform		No shorts/cutoff jeans or sleeveless shirts.
Additional PPE		
Personal Floatation Device	Coast Guard approved personal floatation devices	If working on Lake Capri
Hearing Protection	Ear plugs and/ or muffs	In hazardous noise areas.
Leather Gloves		If working with sharp objects or powered equipment.
Protective Chemical Gloves	Outer: Nitrile	To prevent contact with groundwater
Sunscreen	SPF 30 or higher	
Cold Weather Gear	Hard hat liner, hand warmers, insulated gloves	

7.2 PPE Doffing and Donning (UTILIZATION) Information

The following information is to provide field personnel with helpful hints that, when applied, make donning and doffing of PPE a more safe and manageable task:

- Never cut disposable booties from your feet with basic utility knives. This has resulted in workers cutting through the bootie and the underlying sturdy leather work boot, resulting in significant cuts to the legs/ankles. Recommend using a pair of scissors or a package/letter opener (cut above and parallel with the work boot) to start a cut in the edge of the bootie, then proceed by manually tearing the material down to the sole of the bootie for easy removal.
- When applying duct tape to PPE interfaces (wrist, lower leg, around respirator, etc.) and zippers, leave approximately one inch at the end of the tape to fold over onto itself. This will make it much easier to remove the tape by providing a small handle to grab while still wearing gloves. Without this fold, trying to pull up the tape end with multiple gloves on may be difficult and result in premature tearing of the PPE.
- Have a “buddy” check your ensemble to ensure proper donning before entering controlled work areas. Without mirrors, the most obvious discrepancies can go unnoticed and may result in a potential exposure situation.
- Never perform personal decontamination with a pressure washer.

7.3 Decontamination

7.3.1 General Requirements

All possible and necessary steps shall be taken to reduce or minimize contact with chemicals and contaminated/impacted materials while performing field activities (e.g., avoid sitting or leaning on, walking through, dragging equipment through or over, tracking, or splashing potential or known contaminated/impacted materials, etc).

All personal decontamination activities shall be performed with an attendant (buddy) to provide assistance to personnel that are performing decontamination activities. Depending on specific site hazards, attendants may be required to wear a level of protection that is equal to the required level in the Exclusion Zone (EZ).

All persons and equipment entering the EZ shall be considered contaminated, and thus, must be properly decontaminated prior to entering the SZ.

Decontamination procedures may vary based on site conditions and nature of the contaminant(s). If chemicals or decontamination solutions are used, care should be taken to minimize reactions between the solutions and contaminated materials. In addition, personnel must assess the potential exposures created by the decontamination chemical(s) or solutions. The applicable Material Safety Data Sheet (MSDS) must be reviewed, implemented, and filed by personnel contacting the chemicals/solutions.

All contaminated PPE and decontamination materials shall be contained, stored and disposed of in accordance with site-specific requirements determined by site management.

7.3.2 Decontamination Equipment

The equipment required to perform decontamination may vary based on site-specific conditions and the nature of the contaminant(s). The following equipment is commonly used for decontamination purposes:

- Soft-bristle scrub brushes or long-handled brushes to remove contaminants;
- Hoses, buckets of water or garden sprayers for rinsing;
- Large plastic/galvanized wash tubs or children's wading pools for washing and rinsing solutions;
- Large plastic garbage cans or similar containers lined with plastic bags for the storage of contaminated clothing and equipment;
- Metal or plastic cans or drums for the temporary storage of contaminated liquids; and
- Paper or cloth towels for drying protective clothing and equipment.

7.3.3 Personal/Equipment Decontamination

All equipment leaving the EZ shall be considered contaminated and must be properly decontaminated to minimize the potential for exposure and off-site migration of impacted materials. Such equipment may include, but is not limited to: sampling tools, heavy equipment, vehicles, PPE, support devices (e.g., hoses, cylinders, etc.), and various handheld tools.

All employees performing equipment decontamination shall wear the appropriate PPE to protect against exposure to contaminated materials. The level of PPE may be equivalent to the level of PPE required in the EZ. Other PPE may include splash protection, such as face-shields and splash suits, and knee protectors. Following equipment decontamination, employees may be required to follow the proper personal decontamination procedures above.

Personal decontamination will consist of the removal of any coveralls followed by the removal of chemical resistant gloves.

For larger equipment, a high-pressure washer may need to be used. Some contaminants require the use of a detergent or chemical solution and scrub brushes to ensure proper decontamination.

For smaller equipment, use the following steps for decontamination:

- Remove majority of visible gross contamination in EZ.
- Wash equipment in decontamination solution with a scrub brush and/or power wash heavy equipment.
- Rinse equipment.
- Visually inspect for remaining contamination.
- Follow appropriate personal decontamination steps outlined above.

All decontaminated equipment shall be visually inspected for contamination prior to leaving the Contaminant Reduction Zone (CRZ). Signs of visible contamination may include an oily sheen, residue or contaminated soils left on the equipment. All equipment with visible signs of contamination shall be discarded or re-decontaminated until clean. Depending on the nature of the contaminant, equipment may have to be analyzed using a wipe method or other means.

8.0 Project Health and Safety Organization

8.1 Project Manager Paul Kareth

The Project Manager (PM) has overall management authority and responsibility for all site operations, including safety. The PM will provide the site supervisor with work plans, staff, and budgetary resources, which are appropriate to meet the safety needs of the project operations.

8.2 Site Supervisor To Be Determined

The site supervisor has the overall responsibility and authority to direct work operations at the job site according to the provided work plans. The PM may act as the site supervisor while on site.

8.2.1 Responsibilities

The site supervisor is responsible to:

- Discuss deviations from the work plan with the SSO and PM.
- Discuss safety issues with the PM, SSO, and field personnel.
- Assist the SSO with the development and implementation of corrective actions for site safety deficiencies.
- Assist the SSO with the implementation of this HASP and ensuring compliance.
- Assist the SSO with inspections of the site for compliance with this HASP and applicable SOPs.

8.2.2 Authority

The site supervisor has authority to:

- Verify that all operations are in compliance with the requirements of this HASP, and halt any activity that poses a potential hazard to personnel, property, or the environment.
- Temporarily suspend individuals from field activities for infractions against the HASP pending consideration by the SSO, the Safety Professional, and the PM.

8.2.3 Qualifications

In addition to being Hazardous Waste Operations and Emergency Response (HAZWOPER)-qualified (see Section 4.1), the Site Supervisor is required to have completed the 8-hour HAZWOPER Supervisor Training Course in accordance with 29 CFR 1910.120 (e)(4).

8.3 Site Safety Officer To Be Determined

8.3.1 Responsibilities

The SSO is responsible to:

- Update the site-specific HASP to reflect changes in site conditions or the scope of work. HASP updates must be reviewed and approved by the Safety Professional.
- Be aware of changes in AECOM Safety Policy.
- Monitor the lost time incidence rate for this project and work toward improving it.
- Inspect the site for compliance with this HASP and the SOPs using the appropriate audit inspection checklist provided by an AECOM Safety Professional.
- Work with the site supervisor and PM to develop and implement corrective action plans to correct deficiencies discovered during site inspections. Deficiencies will be discussed with project management to determine appropriate corrective action(s).
- Contact the Safety Professional for technical advice regarding safety issues.

- Provide a means for employees to communicate safety issues to management in a discreet manner (i.e., suggestion box, etc.).
- Determine emergency evacuation routes, establishing and posting local emergency telephone numbers, and arranging emergency transportation.
- Check that all site personnel and visitors have received the proper training and medical clearance prior to entering the site.
- Establish any necessary controlled work areas (as designated in this HASP or other safety documentation).
- Present tailgate safety meetings and maintain attendance logs and records.
- Discuss potential health and safety hazards with the Site Supervisor, the Safety Professional, and the PM.
- Select an alternate SSO by name and inform him/her of their duties, in the event that the SSO must leave or is absent from the site.

8.3.2 Authority

The SSO has authority to:

- Verify that all operations are in compliance with the requirements of this HASP.
- Issue a "Stop Work Order" under the conditions set forth in this HASP.
- Temporarily suspend individuals from field activities for infractions against the HASP pending consideration by the Safety Professional and the PM.

8.3.3 Qualifications

In addition to being HAZWOPER-qualified, the SSO is required to have completed the 8-hour HAZWOPER Supervisor Training Course in accordance with 29 CFR 1910.120 (e)(4).

8.4 Employees

8.4.1 Employee Responsibilities

Responsibilities of employees associated with this project include, but are not limited to:

- Understanding and abiding by the policies and procedures specified in the HASP and other applicable safety policies, and clarifying those areas where understanding is incomplete.
- Providing feedback to health and safety management relating to omissions and modifications in the HASP or other safety policies.
- Notifying the SSO, in writing, of unsafe conditions and acts.

8.4.2 Employee Authority

The health and safety authority of each employee assigned to the site includes the following:

- The right to refuse to work and/or stop work authority when the employee feels that the work is unsafe (including subcontractors or team contractors), or where specified safety precautions are not adequate or fully understood.
- The right to refuse to work on any site or operation where the safety procedures specified in this HASP or other safety policies are not being followed.
- The right to contact the SSO or the Safety Professional at any time to discuss potential concerns.
- The right and duty to stop work when conditions are unsafe, and to assist in correcting these conditions.

8.5 Safety Professional Peter Sullivan

The Safety Professional is the member of the AECOM Safety, Health and Environmental Department assigned to provide guidance and technical support for the project. Duties include the following:

- Approving this HASP and any required changes.
- Approving the designated Site Safety Officer (SSO).
- Reviewing all personal exposure monitoring results.
- Investigating any reported unsafe acts or conditions.

8.6 Subcontractors

The requirements for subcontractor selection and subcontractor safety responsibilities are outlined in *S3NA-213-PR Subcontractors*. Each AECOM subcontractor is responsible for assigning specific work tasks to their employees. Each subcontractor's management will provide qualified employees and allocate sufficient time, materials, and equipment to safely complete assigned tasks. In particular, each subcontractor is responsible for equipping its personnel with any required personnel protective equipment (PPE and all required training.

AECOM considers each subcontractor to be an expert in all aspects of the work operations for which they are tasked to provide, and each subcontractor is responsible for compliance with the regulatory requirements that pertain to those services. Each subcontractor is expected to perform its operations in accordance with its own unique safety policies and procedures, in order to ensure that hazards associated with the performance of the work activities are properly controlled. Copies of any required safety documentation for a subcontractor's work activities will be provided to AECOM for review prior to the start of onsite activities, if required.

Hazards not listed in this HASP but known to any subcontractor, or known to be associated with a subcontractor's services, must be identified and addressed to the AECOM PM or the Site Supervisor prior to beginning work operations. The Site Supervisor or authorized representative has the authority to halt any subcontractor operations, and to remove any subcontractor or subcontractor employee from the site for failure to comply with established health and safety procedures or for operating in an unsafe manner.

8.7 Visitors

Authorized visitors (e.g., client representatives, regulators, AECOM management staff, etc.) requiring entry to any work location on the site will be briefed by the PM on the hazards present at that location. Visitors will be escorted at all times at the work location and will be responsible for compliance with their employer's health and safety policies. In addition, this HASP specifies the minimum acceptable qualifications, training and personal protective equipment which are required for entry to any controlled work area; visitors must comply with these requirements at all times.

8.7.1 Visitor Access

Visitors to any HAZWOPER controlled-work area must comply with the health and safety requirements of this HASP, and demonstrate an acceptable need for entry into the work area. All visitors desiring to enter any controlled work area must observe the following procedures:

- A written confirmation must be received by AECOM documenting that each of the visitors has received the proper training and medical monitoring required by this HASP. Verbal confirmation can be considered acceptable provided such confirmation is made by an officer or other authorized representative of the visitor's organization.
- Each visitor will be briefed on the hazards associated with the site activities being performed and acknowledge receipt of this briefing by signing the appropriate tailgate safety briefing form.
- All visitors must be escorted by an AECOM employee.

If the site visitor requires entry to any EZ, but does not comply with the above requirements, all work activities within the EZ must be suspended. Until these requirements have been met, entry will not be permitted.

Unauthorized visitors, and visitors not meeting the specified qualifications, will not be permitted within established controlled work areas.

9.0 Site Control

9.1 General

The purpose of site control is to minimize potential contamination of workers, protect the public from site hazards, and prevent vandalism. The degree of site control necessary depends on the site characteristics, site size, and the surrounding community.

Controlled work areas will be established at each work location, and if required, will be established directly prior to the work being conducted. Diagrams designating specific controlled work areas will be drawn on site maps, posted in the support vehicle or trailer and discussed during the daily safety meetings. If the site layout changes, the new areas and their potential hazards will be discussed immediately after the changes are made.

9.2 Controlled Work Areas

Each HAZWOPER controlled work area will consist of the following three zones:

- Exclusion Zone: Contaminated work area.
- Contamination Reduction Zone: Decontamination area.
- Support Zone: Uncontaminated or "clean area" where personnel should not be exposed to hazardous conditions.

Each zone will be periodically monitored in accordance with the air monitoring requirements established in this HASP. The Exclusion Zone and the Contamination Reduction Zone are considered work areas. The Support Zone is accessible to the public (e.g., vendors, inspectors).

9.2.1 Exclusion Zone

The Exclusion Zone is the area where primary activities occur, such as sampling, remediation operations, installation of wells, cleanup work, etc. This area must be clearly marked with hazard tape, barricades or cones, or enclosed by fences or ropes. Only personnel involved in work activities, and meeting the requirements specified in the applicable THA and this HASP will be allowed in an Exclusion Zone.

The extent of each area will be sufficient to ensure that personnel located at/beyond its boundaries will not be affected in any substantial way by hazards associated with sample collection activities.

All personnel should be alert to prevent unauthorized, accidental entrance into controlled-access areas (the EZ and CRZ). If such an entry should occur, the trespasser should be immediately escorted outside the area, or all HAZWOPER-related work must cease. All personnel, equipment, and supplies that enter controlled-access areas must be decontaminated or containerized as waste prior to leaving (through the CRZ only).

9.2.2 Contamination Reduction Zone

The Contamination Reduction Zone is the transition area between the contaminated area and the clean area. Decontamination is the main focus in this area. The decontamination of workers and equipment limits the physical transfer of hazardous substances into the clean area. This area must also be clearly marked with hazard tape and access limited to personnel involved in decontamination.

9.2.3 Support Zone

The Support Zone is an uncontaminated zone where administrative and other support functions, such as first aid, equipment supply, emergency information, etc., are located. The Support Zone shall have minimal potential for significant exposure to contaminants (i.e., background levels).

Employees will establish a Support Zone (if necessary) at the site before the commencement of site activities. The Support Zone would also serve as the entry point for controlling site access.

9.3 Site Access Documentation

If implemented by the PM, all personnel entering the site shall complete the "Site Entry/Exit Log" located at the site trailer or primary site support vehicle.

9.4 Site Security

9.4.1 Site security is necessary to:

- Prevent the exposure of unauthorized, unprotected people to site hazards.
- Avoid the increased hazards from vandals or persons seeking to abandon other wastes on the site.
- Prevent theft.
- Avoid interference with safe working procedures.

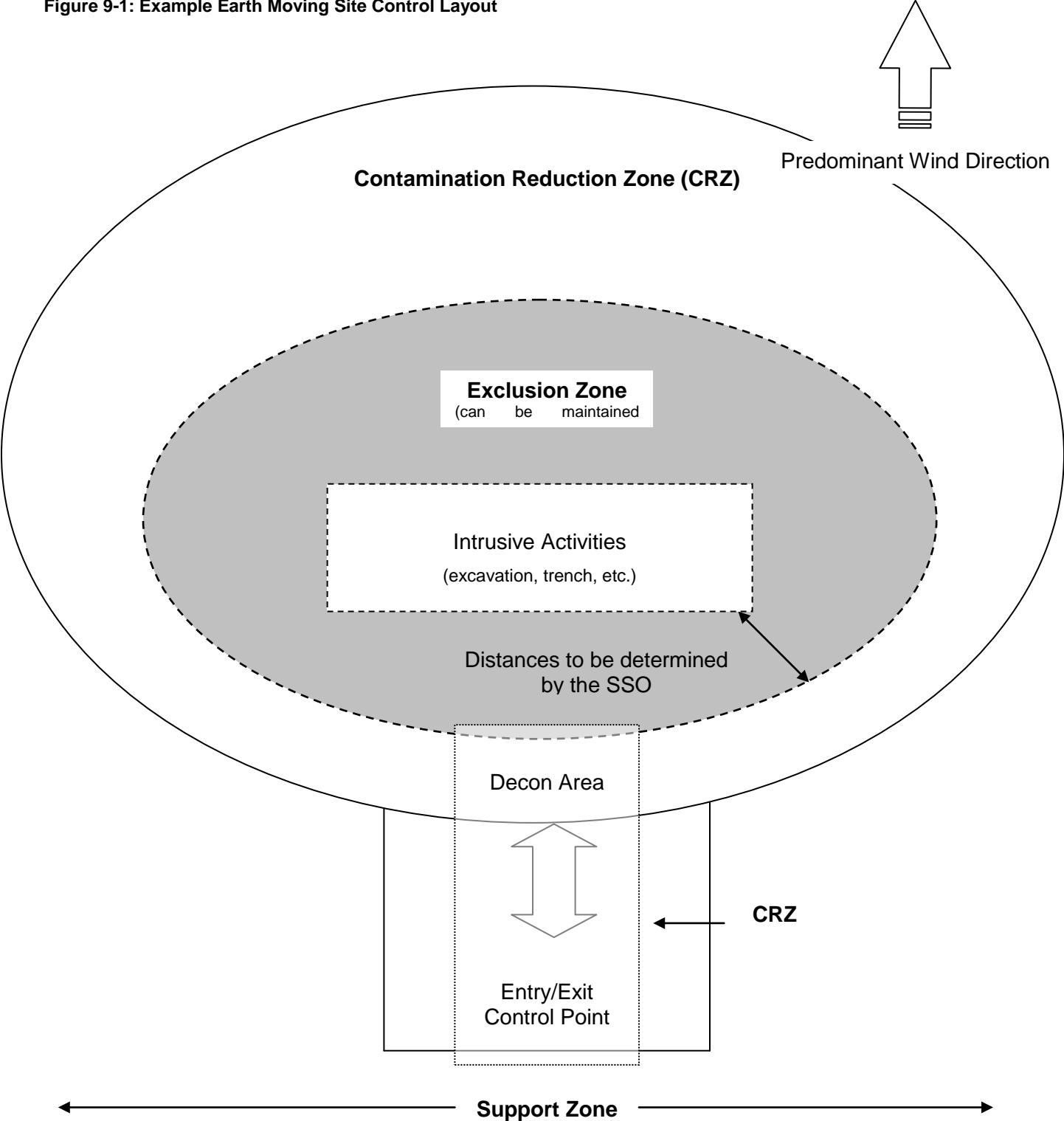
9.4.2 To maintain site security during working hours:

- Maintain security in the Support Zone and at access control points.
- Establish an identification system to identify authorized persons and limitations to their approved activities.
- Assign responsibility for enforcing authority for entry and exit requirements.
- When feasible, install fencing or other physical barrier around the site.
- If the site is not fenced, post signs around the perimeter and whenever possible, use guards to patrol the perimeter. Guards must be fully apprised of the hazards involved and trained in emergency procedures.
- Have the PM approve all visitors to the site. Make sure they have valid purpose for entering the site. Have trained site personnel accompany visitors at all times and provide them with the appropriate protective equipment.

9.4.3 To maintain site security during off-duty hours:

- If possible, assign trained, in-house technicians for site surveillance. They will be familiar with the site, the nature of the work, the site's hazards, and respiratory protection techniques.
- If necessary, use security guards to patrol the site boundary. Such personnel may be less expensive than trained technicians, but will be more difficult to train in safety procedures and will be less confident in reacting to problems around hazardous substances.
- Enlist public enforcement agencies, such as the local police department, if the site presents a significant risk to local health and safety.
- Secure the equipment.

Figure 9-1: Example Earth Moving Site Control Layout



10.0 Emergency Response Planning

10.1 Emergency Action Plan

Although the potential for an emergency to occur is remote, an emergency action plan has been prepared for this project should such critical situations arise. The only significant type of onsite emergency that may occur is physical injury or illness to a member of the AECOM team. The Emergency Action Plan (EAP) will be reviewed by all personnel prior to the start of field activities. A test of the EAP will be performed within the first three (3) days of the project field operations. This test will be evaluated and documented in the project records.

10.1.1 Three major categories of emergencies could occur during site operations:

- Illnesses and physical injuries (including injury-causing chemical exposure)
- Catastrophic events (fire, explosion, earthquake, or chemical)
- Workplace Violence, Bomb Threat
- Safety equipment problems

10.1.2 Emergency Coordinator

The duties of the Emergency Coordinator (EC) include:

- Implement the EAP based on the identified emergency condition.
- Notify the appropriate project and SH&E Department personnel of the emergency (Table 9-3).
- Verify emergency evacuation routes and muster points are accessible.
- Conduct routine EAP drills and evaluate compliance with the EAP.

10.1.3 Site-Specific Emergency Procedures

Prior to the start of site operations, the EC will complete Table 9-1 with any site-specific information regarding evacuations, muster points, communication, and other site-specific emergency procedures.

Table 10-1: Emergency Planning

Emergency	Evacuation Route	Muster Location
Chemical Spill	Upwind	To Be Determined
Fire/Explosion	Upwind	Vehicle
Tornado	Northward	Vehicle
Lightning	Sit in car	Vehicle
Additional Information		
Communication Procedures	Personnel will stay within voice range while working and will have cell phones when it is necessary to split up.	
CPR/First Aid Trained Personnel	Dependent on assigned personnel	
Site-Specific Spill Response Procedures	Spills will be cleaned up immediately and the spill reported to the Project Manager	

10.1.4 Spill Containment Procedure

Work activities may involve the use of hazardous materials (i.e. fuels, solvents) or work involving drums or other containers. Where these activities exist, a site-specific Spill Reporting Card will be developed (Attachment D). Procedures outlined below will be used to prevent or contain spills:

- All hazardous material will be stored in appropriate containers
- Tops/lids will be placed back on containers after use.
- Containers of hazardous materials will be stored appropriately away from moving equipment.

At least one spill response kit, to include an appropriate empty container, materials to allow for booming or diking the area to minimize the size of the spill, and appropriate clean-up material (i.e. speedy dri) shall be available at each work site (more as needed).

- All hazardous commodities in use (i.e. fuels) shall be properly labeled.
- Containers shall only be lifted using equipment specifically manufactured for that purpose.
- Drums/containers will be secured and handled in a manner which minimizes spillage and reduces the risk of musculoskeletal injuries.

10.1.5 Safety Accident/Incident Reporting

All accidents and incidents that occur on-site during any field activity will be promptly reported to the SSO and the immediate supervisor.

If any AECOM employee is injured and requires medical treatment, the Site Supervisor will report the incident in accordance with AECOM's incident reporting procedures. A copy of the final Supervisor's Report of Incident will be provided to the SH&E Professional before the end of the following shift.

If any employee of a subcontractor is injured, documentation of the incident will be accomplished in accordance with the subcontractor's procedures; however, copies of all documentation (which at a minimum must include the OSHA Form 301 or equivalent) must be provided to the SSO within 24 hours after the accident has occurred.

All accidents/incidents will be investigated. Copies of all subcontractor accident investigations will be provided to the SSO within five (5) days of the accident/incident.

10.1.6 Environmental Spill/Release Reporting

All environmental spills or releases of hazardous materials (e.g., fuels, solvents, etc.), whether in excess of the Reportable Quantity or not, will be reported according to the sequence identified in the *Site-Specific Spill Reporting Card*. In determining whether a spill or release must be reported to a regulatory agency, the Site Supervisor will assess the quantity of the spill or release and evaluate the reporting criteria against the state-specific reporting requirements, your applicable regulatory permit, and/or client-specific reporting procedures. In order to support the Site Supervisor and expedite the decision to report to a state regulatory agency, a site-specific Spill Reporting Card will be developed (Attachment D). **If reporting to a US state or Federal regulatory agency is required, AECOM has 15 minutes from the time of the spill/release to officially report it.**

Chemical-specific Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Reportable Quantities for the known chemicals onsite are shown in Table 10.1.

Table 10.1: CERCLA Reportable Quantities

Hazardous Substance	Regulatory Synonyms	Final RQ (lbs)
Benzene	N/A	10
Trichloroethylene	Trichloroethene, TCE	100
Tetrachloroethylene	Perchloroethylene, PCE	100

Table 10.1: Emergency Contacts

Emergency Coordinators / Key Personnel			
<u>Name</u>	<u>Title/Workstation</u>	<u>Telephone Number</u>	<u>Mobile Phone</u>
Payson Long	Client Contact		
	Account/Client Manager		
Paul Kareth	Project Manager	(845) 425-4980	
To be determined	Site Supervisor		
To be determined	Site Safety Officer		
Pete Sullivan	Regional SH&E Manager	(978) 905-2417	
Rich Renzi	District SH&E Manager	(781) 224-6450	
Incident Reporting	Incident Reporting Line	(800) 348-5046	
Kevin Seise	Emergency Coordinator (EC)	201-923-7155	
Al Lopilato	Secondary EC	+1 845 425 4980	
Organization / Agency			
<u>Name</u>		<u>Telephone Number</u>	
Police Department (local)		911	
Fire Department (local)		911	
Ambulance Service (EMT will determine appropriate hospital for treatment)		911	
-Emergency Hospital (Use by site personnel is only for non-emergency cases)			
Southside Hospital		631-968-3000	
301 East Main Street			
Bay Shore, New York, 11706			
Emergency Hospital Route: Depends on which well, check GPS or smart phone for directions			
Poison Control Center		(800) 222-1222	
Pollution Emergency		(800) 292-4706	
National Response Center		(800) 424-8802	
INFOTRAC(insert account number)		(800) 355-5053	

Title 3 Hotline	(800) 424-9346
Public Utilities	
<u>Name</u>	<u>Telephone Number</u>
<i>Call Before You Dig</i>	811

Attachment A

Task Hazard Analyses

[attach THAs]

Attachment B

Material Safety Data Sheets

[attach MSDSs]

Attachment C

Client-Specific Health and Safety Guidelines

[attach guidelines]

Attachment D
Applicable SH&E SOPs

[attach SOPs]

Attachment E
Client Specific SH&E Guidelines and
Subcontractors SH&E Information

[attach information]

Appendix F

Community Air Monitoring Plan

COMMUNITY AIR MONITORING PLAN

1.0 Community Air Monitoring Plan

Real-time air monitoring for volatile compounds and particulates at the perimeter of the hot zone will be performed during all intrusive activities.

VOCs will be monitored at the downwind perimeter of the hot zone if total organic vapors in the worker breathing zone exceed 5 ppm above background, or at least twice every hour. Monitoring will be conducted with a PID equipped with a 10.2 or 10.6 eV lamp. If total organic vapor levels exceed 1 ppm above background at the perimeter, excavation activities must be halted and monitoring continued. All readings must be recorded and be available for State (NYSDEC & NYSDOH) personnel to review.

If dust becomes a concern, particulates will be monitored downwind of the hot zone with a portable particulate monitor that will have an alarm set at 150 mg/m^3 . Background particulate levels will be established at the start of work. If downwind particulate levels, integrated over a period of 15 minutes, exceed 150 mg/m^3 , then particulate levels upwind of the survey or work site will be measured. If the downwind particulate level is more than 100 mg/m^3 greater than the upwind particulate level, then excavation activities will be stopped and dust suppression techniques will be employed. Activities will also cease and corrective action will be taken if particulate levels exceed 2.5 times the background particulate level. All readings must be recorded and be available for review by the NYSDEC and/or NYSDOH. These action levels will be modified if particulates are better characterized and identified.

1.1 Vapor Emission Response Plan

If the ambient air concentration of organic vapors exceeds 1 ppm above background at the perimeter of the hot zone, excavation activities will be halted or odor controls will be employed, and monitoring continued. If the organic vapor level decreases below 1 ppm above background, excavation activities can resume provided:

- The organic vapor level 200 ft. downwind of the hot zone or half the distance to the nearest residential or commercial structure, whichever is less, is below 1 ppm over background; and
- More frequent intervals of monitoring, as directed by the SSO, are conducted.

If the organic vapor level is greater than 1 ppm above background at the perimeter of the hot zone, work activities must be shut down or odor controls must be employed. When work shut-down occurs, downwind air monitoring as directed by the SSO will be implemented to ensure

that vapor emission does not impact the nearest residential or commercial structure at levels exceeding those specified in the Major Vapor Emission section.

1.2 Major Vapor Emission

If any organic levels greater than 1 ppm over background are identified 200 feet downwind from the work site, or half the distance to the nearest residential or commercial property, whichever is less, all work activities must be halted or odor controls must be implemented.

If, following the cessation of the work activities, or as the result of an emergency, organic levels persist above 1 ppm above background 200 feet downwind or half the distance to the nearest residential or commercial property from the hot zone, then the air quality must be monitored within 20 feet of the perimeter of the nearest residential or commercial structure (20 Foot Zone).

If either of the following criteria is exceeded in the 20 Foot Zone, then the Major Vapor Emission Response Plan shall automatically be implemented.

- Sustained organic vapor levels approaching 1 ppm above background for a period of more than 30 minutes, or
- Organic vapor levels greater than 5 ppm above background for any time period.

1.3 Major Vapor Emission Response Plan

Upon activation, the following activities will be undertaken:

1. The local police authorities will immediately be contacted by the SSO and advised of the situation;
2. Frequent air monitoring will be conducted at 30 minute intervals within the 20 Foot Zone. If two successive readings below action levels are measured, air monitoring may be halted or modified by the SSO; and
3. All Emergency contacts will go into effect as appropriate.

Appendix G

Site Inspection Forms



SITE INSPECTION FORM

Dzus Fasteners Site
425 Union Boulevard, West Islip, Suffolk County, NY
NYSDEC Site ID # 1-52-033

Client: New York State Department of Environmental Conservation

Preparer's Name: _____ Date/Time: _____

Asphalt Cap

Has the condition of the asphalt degraded since the last inspection?	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> NA
Are any cracks visible in the asphalt pavement?	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> NA
Is there evidence of uneven settling and or ponding?	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> NA
Is there damage to any surface coverage?	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> NA

Willetts Creek

Has the riprap in the creek been disturbed? ☐ YES ☐ NO ☐ NA

Lake Capri

Is there evidence of excessive weed growth in the Lake? ☐ YES ☐ NO ☐ NA

Is the fence/gate along Sunrise Highway functioning properly? ☐ YES ☐ NO ☐ NA

Has the Lake level changed significantly from the previous inspection? ☐ YES ☐ NO ☐ NA

Site Condition

Is there any evidence of illegal disposal?	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> NA
Is there uncontrolled vegetation growth?	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> NA
Is there any evidence of unauthorized entry?	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> NA

If yes to any question above, provide additional information below.

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

SITE NAME: Dzus Fasteners Site

SITE ID.: 1-52-033

INSPECTOR: _____

MONITORING WELL FIELD INSPECTION LOG

DATE/TIME: _____

WELL ID.: DMW-

WELL VISIBLE? (If not, provide directions below) _____

YES	NO
<input type="checkbox"/>	<input type="checkbox"/>

WELL COORDINATES? NYTM X _____ NYTM Y _____ See Report

PDOP Reading from Trimble pathfinder: _____ Satellites: _____

GPS Method (circle) Trimble And/Or Magellan

WELL I.D. VISIBLE? _____

YES	NO
<input type="checkbox"/>	<input type="checkbox"/>

WELL LOCATION MATCH SITE MAP? (if not, sketch actual location on back) _____

WELL I.D. AS IT APPEARS ON PROTECTIVE CASING OR WELL: _____

YES	NO
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>

SURFACE SEAL PRESENT? _____

SURFACE SEAL COMPETENT? (If cracked, heaved etc., describe below) _____

PROTECTIVE CASING IN GOOD CONDITION? (If damaged, describe below) _____

HEADSPACE READING (ppm) AND INSTRUMENT USED _____

TYPE OF PROTECTIVE CASING AND HEIGHT OF STICKUP IN FEET (If applicable) _____

PROTECTIVE CASING MATERIAL TYPE: _____

MEASURE PROTECTIVE CASING INSIDE DIAMETER (Inches): _____

YES	NO
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>

LOCK PRESENT? _____

LOCK FUNCTIONAL? _____

DID YOU REPLACE THE LOCK? _____

IS THERE EVIDENCE THAT THE WELL IS DOUBLE CASED? (If yes, describe below) _____

WELL MEASURING POINT VISIBLE? _____

MEASURE WELL DEPTH FROM MEASURING POINT (Feet): _____

MEASURE DEPTH TO WATER FROM MEASURING POINT (Feet): _____

MEASURE WELL DIAMETER (Inches): _____

WELL CASING MATERIAL: _____

PHYSICAL CONDITION OF VISIBLE WELL CASING: _____

ATTACH ID MARKER (if well ID is confirmed) and IDENTIFY MARKER TYPE _____

PROXIMITY TO UNDERGROUND OR OVERHEAD UTILITIES _____

DESCRIBE ACCESS TO WELL: (Include accessibility to truck mounted rig, natural obstructions, overhead power lines, proximity to permanent structures, etc.); ADD SKETCH OF LOCATION ON BACK, IF NECESSARY.

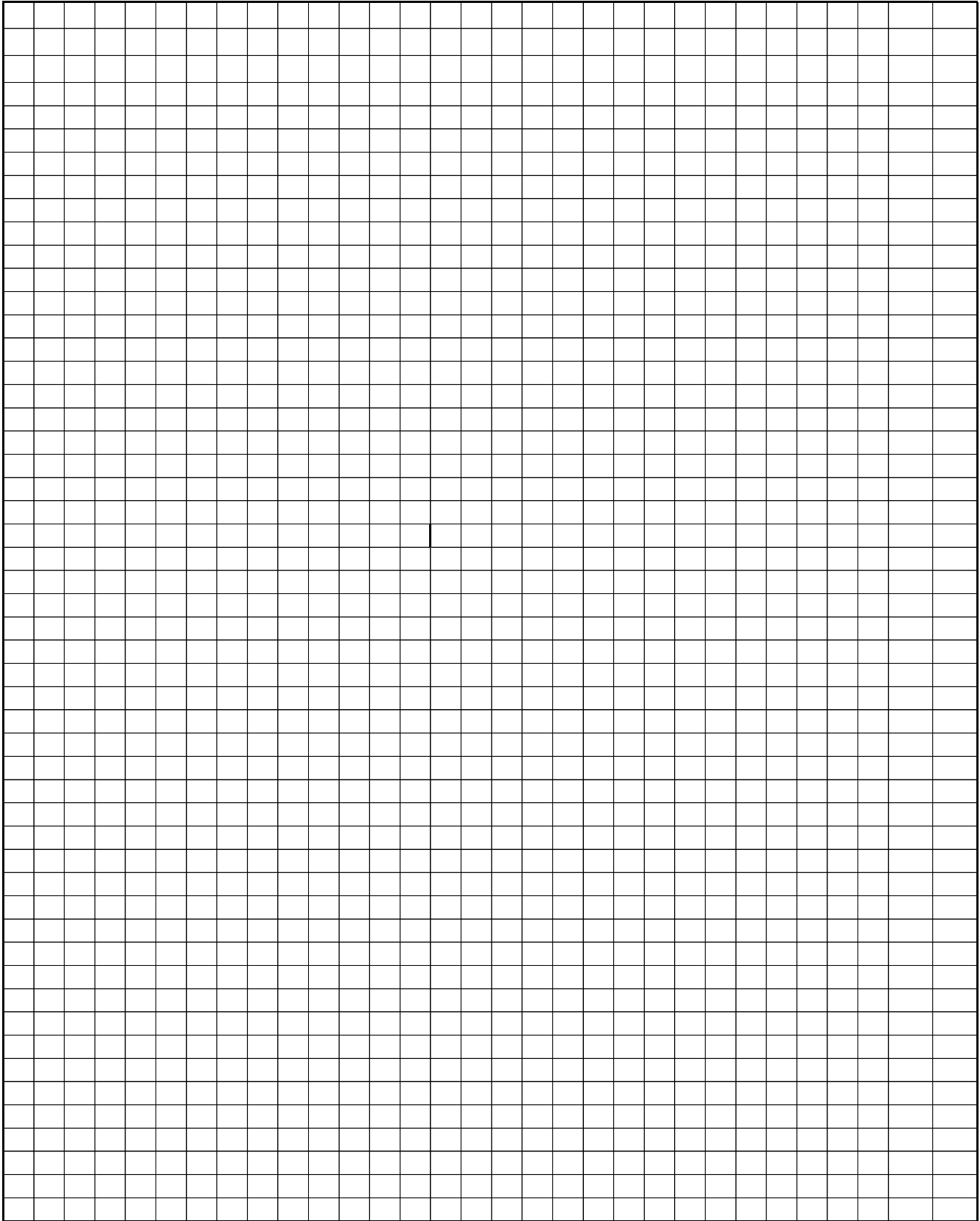
DESCRIBE WELL SETTING (For example, located in a field, in a playground, on pavement, in a garden, etc.) AND ASSESS THE TYPE OF RESTORATION REQUIRED.

IDENTIFY ANY NEARBY POTENTIAL SOURCES OF CONTAMINATION, IF PRESENT

(e.g. Gas station, salt pile, etc.):

REMARKS:

MONITORING WELL INSPECTION LOG
SKETCH





WELL NO.

[illegible]

Appendix H

Sampling and Analysis Plan

**FINAL
SAMPLING AND ANALYSIS PLAN**

**Multi Site G
Operation, Maintenance & Monitoring**

***Dzus Fasteners
425 Union Boulevard, West Islip, NY
Site No. 1-52-033***

**Work Assignment No.
D004445-14.1**

Prepared for:



**SUPERFUND STANDBY PROGRAM
New York State
Department of Environmental Conservation
625 Broadway
Albany, New York 12233**

June 2007

Prepared by:

Earth Tech Northeast, Inc.
300 Broadacres Drive
Bloomfield, New Jersey

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1.0 INTRODUCTION

1.1 PURPOSE OF THE WORK ASSIGNMENT

The purpose of this Sampling and Analysis Plan (SAP) is to describe activities planned for the field sampling portions of the remedial action at the Dzus Fasteners site (hereafter referred to as the “Site”). The Site is an Inactive New York State Superfund site (Site No. 1-52-033).

The work described in this SAP is being performed under the Earth Tech Northeast, Inc. (Earth Tech) New York State Department of Environmental Conservation (NYSDEC) Superfund Standby Contract Work Assignment No. D004445-14.1. The two major components of this SAP are the Field Sampling Plan (FSP) and the Quality Assurance Project Plan (QAPP). The FSP provides the detailed procedures for the collection of environmental samples. The FSP has been prepared in accordance with the United States Environmental Protection Agency’s (USEPA’s) “Compendium of Superfund Field Operation Methods”, where applicable.

The QAPP prescribes requirements for assuring that the work assignment is planned and executed in a manner consistent with the project’s quality assurance objectives. The objective of the QAPP is to ensure that the technical data generated during the work assignment are of sufficient quality for making informed decisions regarding Site environmental sample quality. The content and format of the QAPP are based on USEPA’s “Combined Work/Quality Assurance Project Plans For Environmental Monitoring”, May 1984, and the USEPA’s “Data Quality Objectives For Remedial Response Activities” March 1987.

The objective of the work assignment is to collect groundwater samples from monitoring wells and surface water and co-located sediment samples from Lake Capri on a five quarter basis. A fish sampling program will also be implemented to determine cadmium concentrations in fish tissue from Lake Capri.

1.2 SITE DESCRIPTION

The Dzus Fasteners Superfund site is located at 425 Union Boulevard, West Islip, New York (Figure 1). The Site is bounded to the north by railroad tracks. To the southeast is Union Boulevard. On the southeast side of Union Boulevard is a shopping plaza and southeast of the shopping plaza is Willetts Creek. Willetts Creek flows south past a junior high school and high school, and eventually discharges into Lake Capri approximately 4,500 ft south of the Site. A total of 14 wells have been identified for long term monitoring at the Site (Figure 2).

1.3 SITE ACCESS

Several monitoring wells are present at off-site locations including shopping areas south of the Site, the junior and senior high schools and the area west of Lake Capri. Arrangements will be made with the various property owners to obtain site access prior to sampling. A license to collect and possess fish was obtained from the NYSDEC Division of Fish, Wildlife and Marine Resources (DFWMR) in June 2006. The permit is valid through June 2007. Earth Tech will reapply for a new fish permit for sampling beyond June 2007. Earth Tech will assist NYSDEC in contacting the Lake Capri home-owners association prior to fish sample collection in Lake Capri. A Site Contact List is provided in Appendix A.

2.0 FIELD SAMPLING PLAN

This section outlines the procedures that will be used in the collection of groundwater, surface water and sediment samples at the Site. Fourteen monitoring wells have been identified for long-term monitoring and are summarized in Table 1. Groundwater will be collected from the monitoring wells using the procedures described below. Six surface water samples and six co-located sediment samples will be collected from Lake Capri. The subtasks described below are intended to generate the data necessary to accomplish the objective of long term monitoring at the Site.

2.1 GENERAL FIELD ACTIVITIES

General field activities include mobilization, implementing the Safe Work Plan (included in Appendix B), groundwater sampling and surface water/sediment sample collection.

2.1.1 Mobilization

Following authorization to proceed with the field investigation from NYSDEC, Earth Tech will mobilize necessary materials and equipment to the Site.

A project kick-off meeting will be held prior to initiating field work to orient field team members and subcontractors with the Site and to familiarize Earth Tech personnel and our subcontractor personnel with site background, scope of work, potential dangers, health and safety requirements, emergency contingencies and other field procedures.

2.1.2 Health and Safety

The Safe Work Plan prepared under the previous contract has been reviewed and updated as needed. It is anticipated that the work to be completed at the Site will be performed in level D personal protection. Should health and safety monitoring during field activities indicate a threat to field personnel or warrant an upgrade beyond level C protection, work will be stopped and site conditions will be re-evaluated by NYSDEC and Earth Tech.

2.1.3 Decontamination and Handling of Investigation Derived Waste

Non-dedicated equipment and tools used to collect samples for chemical analysis will be decontaminated prior to and between each sample interval using an alconox wash, tap water rinse and distilled water rinse prior to reuse. Personal protective equipment and disposable sampling equipment will be placed in plastic garbage bags for disposal as solid waste.

Monitoring well purge water will be disposed on the ground surface adjacent to the well location from which it was derived.

2.2 GROUNDWATER SAMPLING (SUBTASK 3A)

Earth Tech will conduct two rounds of groundwater sampling at the Site. The first round will occur within a few weeks of Notice To Proceed from NYSDEC. The second round will occur approximately five quarters after the first round is completed.

2.2.1 Water Level Survey

Prior to the start of each groundwater sampling event, water levels will be measured in each well to provide a synoptic event. The survey will include measuring the depth of water within the wells from a monitoring point of known elevation established at the top of the well riser. The water elevations will be calculated based on the known elevation and measured depth to water. Water level measurements will be recorded in the Field Notebook and on the Well Sampling Form included in Appendix C.

In addition, Earth Tech will also record the depth of the well to assist in identifying the well during the future sampling events. A handheld global positioning system (GPS) unit (WAAS enabled) will be used to locate each well during sampling and the coordinates will be recorded in the field notes. The NYSDEC Monitoring Well Field Inspection Log sheet will be completed for each well to be sampled. The GPS unit will also be used to locate the surface water/sediment sample locations. A digital camera will be used during the sampling events to photo-document the work and to provide a visual record of each well to assist in locating the wells during future sampling events.

2.2.2 Groundwater Sampling

Two rounds of groundwater samples will be collected from the 14 monitoring wells identified at the Site. These wells include: MW-1, MW-2, MW-3, MW-9, MW-9B, MW-13A, MW-13B, MW-15A, MW-15B, MW-18, MW-22A, MW-22B, MW-23A, and MW-23B. The first groundwater sampling event will occur approximately one month after notice to proceed. The second Groundwater sampling event will occur approximately five quarters after the first event is completed.

Groundwater samples will be collected using conventional sampling techniques. Initially, the volume of water within the well will be calculated by measuring the total depth of the well and measuring the depth to water. A minimum of three times this well volume of water will be evacuated from the well. Purging will be accomplished using dedicated polyethylene tubing and a suitable pump (centrifugal pump for shallow groundwater or a submersible pump for deeper wells). Measurements of pH, specific conductance and temperature will be made after each well volume is removed. Once the minimum volume of water has been evacuated, a dedicated Teflon bailer will be used to collect a groundwater sample. The sample will be placed into laboratory supplied containers and transported to the analytical laboratory in accordance with the procedures and chain-of-custody requirements in the QAPP. In addition to measuring pH, specific conductance and temperature, turbidity will be measured to provide an indication of the amount of suspended sediment within the sample. These measurements will be recorded on the Well Sampling Form included in Appendix C.

2.2.3 Surface Water and Sediment Sampling

Six surface water samples will be collected from Lake Capri during each of the semi-annual sampling events. A small boat will be used to gain access to the lake. Each surface water sample will be collected by dipping laboratory supplied bottles into the lake and then transferring the water to the laboratory supplied preserved bottles. At each surface water location, a co-located sediment sample will also be collected. Sediment samples will be collected using a ponar or push core to reach the bottom of the lake depending on the conditions found on the lake bottom. Excess water will be decanted from the sediment sample prior to placement in the laboratory provided sample jars. The anticipated depth to sediment is between three and five feet below the lake surface based on the final survey performed as part of the Construction Certification Report (Earth Tech, 2000).

2.3 ANALYSES OF GROUNDWATER, SURFACE WATER AND SEDIMENT SAMPLES

Groundwater, surface water and sediment samples will be analyzed by a Mitkem Laboratory, a New York State Department of Health (NYSDOH), Environmental Laboratory Accreditation Program (ELAP) certified laboratory for target analyte list (TAL) metals. Metals analysis for groundwater and surface water will be performed on unfiltered samples.

Fish tissue samples will be analyzed for cadmium by Pace Analytical Services, as directed by NYSDEC DFWMR.

2.4 SURVEY

As the survey data for the Site cannot be located, Earth Tech will have each well scheduled for sampling surveyed by YEC, Inc., a New York licensed surveyor. The survey data will be used to prepare groundwater contours maps for each sampling event. During each semi-annual sampling event, a hand-held global positioning system (GPS) unit (WAAS enabled) will be used to locate each well at the time of sample collection. The location will be recorded on the NYSDEC Monitoring Well Field Inspection Log sheet included in Appendix CB. Digital photographs will also be taken to record the location of each well and document the sampling procedures.

2.5 FISH SAMPLING (SUBTASK 3B)

This Scope of Work (SOW) for fish sampling is in response to the information provided under “Fish Collection” in the NYSDEC’s comment letter on the Draft Sampling and Analysis Plan (SAP) dated April 5, 2006. A copy of this letter is included in Appendix D.

A fish advisory remains in effect for Lake Capri. Two rounds of fish tissue samples will be collected from Lake Capri during early Spring, one in 2007 and a second round in 2008. The existing fish collection permit (obtained for the 2006 sampling effort) is valid through June 30, 2007. Earth Tech will renew this license for the continued sampling in 2008. The Lake Association will also be notified prior to the start of sampling. If possible, eighty 100-gram samples will be collected and submitted for cadmium analysis; 40 from the southern end of Lake Capri and 40 from the northern end of Lake Capri. Fish tissue samples will be collected using a variety of methods including electroshocking, gill nets, and traps. The results of the fish tissue sampling will be incorporated into the Site Investigation and Inspection Report discussed in Section 2.6.

2.5.1 Collection Permit

Earth Tech obtained a collection permit from NYSDEC DFWMR in June 2006. The permit expires in June 2007. Earth Tech will reapply for the collection permit through the NYSDEC DFWMR for sampling efforts beyond June 2007.

2.5.2 Sampling Location

Earth Tech will collect fish samples at two locations in Lake Capri as noted below:

- Station 1 – The north end of Lake Capri south of the footbridge over the east branch of Willets Creek in the general vicinity of sediments samples SED-1N and SED-2N;
- Station 2 – The south end of Lake Capri near the lake outfall and in the general vicinity of sediment samples SED-3S and SED 4S.

Each station location will be recorded through the use of a hand-held GPS as noted in Section 2.4.

2.5.3 Sample Quantity

At each station, Earth Tech will collect 10 samples for each target species (as identified in the NYSDEC April 5, 2006 comment letter) for a total of 40 analyses. Target species include American eel, bluegill, carp and largemouth bass. If target species are not available, the sample goal will be 10 samples across four species. If less than four species are available, the total samples should be still equal to 40 for the available species.

A total of 80 samples (40 per station) will be analyzed for cadmium only.

It is the objective of the sampling to obtain an individual sample mass of 100 grams for tissue analysis, (whether the sample is an individual fish or a composite). If more mass is available it will be included to improve quantitative analysis.

It may be necessary to composite individuals to achieve 100-gram mass for a sample. Before compositing, individuals will be sorted by species and grouped into categories based on similar lengths. The fish comprising a particular composited sample will be clearly identified (e.g., species, age, length) in the collection record.

2.5.4 Sample Method and Analysis

Earth Tech will collect fish via electroshocking. Due to the shallow draft of Lake Capri and difficult access, Earth Tech will use a back-pack mounted electroshocker. If the lake bottom is solid and the depth of water is sufficiently shallow, field personnel will enter the water using chest waders to perform electroshocking. If electroshocking proves inadequate for fish sample collection, other methods such as seine nets, gill nets or baited fish traps may be employed to collect fish. All fish collected for sample analysis will be captured with a net and placed on ice.

The fish for each sample will be placed in plastic bags, labeled, and stored in a cooler with ice (to keep below 45 degrees Fahrenheit). At the end of each sampling day, the fish will be shipped in a cooler with ice to Pace Analytical Services, a NYSDOH ELAP certified laboratory (ELAP certification number 11436) for sampling analysis. Pace will prepare all samples for cadmium analysis as per NYSDEC's Procedures for Collection and Preparation of Aquatic Biota for Contaminant Analysis included as Appendix D.

2.5.5 Sampling Records

Earth Tech will provide the following:

- Legally defensible chains of custody.
- Fish collection records. It is assumed that Earth Tech will use the example Biota Collection Record from Draft Procedures for Collection and Preparation of Aquatic Biota for Contaminant Analysis.
- Providing a report to the Department in the form of a letter report that contains
 - A. Copies of all field collection sheets.
 - B. Copies of completed chain of custody forms.

- C. A figure that clearly identifies fish sampling location.
- D. A summary of analytical results that includes individual sample results and means for each species and a comparison to 1994 and 1999 fish sampling data.
- E. All chemical laboratory analysis data sheets and QA/QC package.
- F. Information from fish collection records in an Excel or other database format.

Earth Tech will provide the DFWMR at least two weeks prior to fish collection, so that the Department and DFWMR may participate and/or observe collection activities.

Earth Tech will consult with DFWMR if fish collection does not produce the targeted mass or before any modification to the sampling plan by field personnel.

2.6 SITE INVESTIGATION AND INSPECTION REPORT (SUBTASK 3C)

Earth Tech will submit a letter report in portable document format (.pdf) summarizing the findings of the two rounds of sampling at the Site. Each report will include a groundwater contour map and contaminant isopleth maps for selected compounds. Where practical, all maps will be formatted to 11' x 17". In addition, each letter report will also provide an assessment whether the existing remedy at the site is performing effectively.

3.0 QUALITY ASSURANCE PROJECT PLAN

3.1 SAMPLE LABELING, HANDLING AND SHIPPING

Field notebooks will be used during all on-site work. A dedicated field notebook will be maintained by the field technician performing the site activities. In addition to the notebook, any and all original sampling forms, purge forms and notebooks used during the field activities, shall be submitted to the NYSDEC as part of the final sampling report. Field procedures, including groundwater sampling, sediment sampling and fish collection, will be photo-documented.

3.1.1 Sample Identification

Samples will be assigned a unique identification sample-specific identifier. The following general sample identification format will be used for the Site:

Groundwater	DF-MW-XX (Where, XX represents the MW ID, i.e., MW-5, etc.)
Surface Water	DF-SW-XX (Where XX represents the sample number, 1 through 6)
Sediment	DF-SED-XX (Where XX represents the sample number, 1 through 6 and is the same as the collocated surface water sample)
Fish tissue	DF-F#-Sp-XX (Where F# is fish station # 1 or 2, Sp is the species [American eel - E, bluegill - B, carp - C, largemouth bass - L, and XX is sample number 1 through 10])

Field duplicate samples will be submitted blind to the laboratory; a fictitious sample ID will be created using the same system as the original for groundwater, surface water and sediment samples. Duplicates will not be submitted for fish tissue. The sample identifications (of the original sample and its field duplicate) will be marked in the field book and on the copy of the chain-of-custody kept by the sampler and copied to the project manager.

3.1.2 Labeling

Sample containers will be labeled in the field prior to the collection of samples. A non-removable label on which the following information is recorded will be affixed to each sample container for shipment to the laboratory:

- project name/location;
- sample identification code;
- date and time the sample was collected (except for field duplicates);
- type of sample, and
- analysis requested.

3.1.3 Containers, Preservation and Holding Times

Sample containers used for groundwater, surface water and sediment will be of traceable quality, purchased and supplied by the laboratory. Fish samples will be placed in new zip-lock bags. All samples will be collected and preserved when necessary, and analytical holding times will conform to the USEPA SW-846 Protocols (December, 1996).

3.1.4 Chain-of-Custody Protocol and Shipping Requirements

Standard chain-of-custody protocol will be followed.

3.1.5 Cleaning of Field Sampling Equipment

Non-dedicated hand equipment (ponars, hand augers) and tools will be decontaminated using the following procedures:

- Scrub/wash with a laboratory grade detergent (e.g., alconox);
- Tap water rinse;
- Distilled/de-ionized water rinse.

If equipment is to be stored for future use, it will be allowed to air dry, and then wrapped in aluminum foil or sealed in plastic bags. Decontamination fluids will be discharged directly to the ground away from any surface water.

3.2 ANALYTICAL LABORATORY/ANALYTICAL METHODS

Mitkem Laboratory, a Minority Business Enterprise (MBE), has been selected to perform the sample analyses. Mitkem is a NYSDOH ELAP certified laboratory (ELAP certification number 11522). Mitkem is certified for applicable Contract Laboratory Protocol (CLP) parameters.

Groundwater, surface water and sediment samples will be analyzed for TAL metals using USEPA Method 6000/7000. The laboratory will provide all applicable documentation, data reduction and reporting protocols as specified in the October 1995 NYSDEC ASP CLP Category B deliverable format.

Fish tissue samples will be analyzed for cadmium by USEPA Method 6010B by Pace analytical Services. Pace is a NYSDOH ELAP certified laboratory (ELAP certification number 11436).

3.3 DATA QUALITY REQUIREMENTS

Routine monitoring data will not be subject to formal data validation or data quality review. Results will be compared to previous data (if available), and a limited review of the laboratory-reported QC will be conducted. If obvious anomalies or other data quality problems are noted during this review, a recommendation will be made to NYSDEC for corrective action or additional formal review.

3.3.1 Duplicate Samples

Field duplicate samples are used to assess the variability of a matrix at a specific sampling point and to assess the reproducibility of the sampling method. Aqueous field duplicate samples are second samples collected from the same location, at the same time, in the same manner as the first, and placed into a separate container (technically, these are co-located samples). Each duplicate sample will be analyzed for the same parameters as the original sample. Field duplicates will be collected at a frequency of one per 20 environmental samples or one per event, per matrix at this Site: one monitoring well, one surface water and one sediment duplicate. Field duplicates will not be collected for fish tissue samples.

3.3.2 Equipment Blanks

Equipment blanks are not required when dedicated sampling equipment (such as disposable Teflon bailers) is used. Equipment blanks will be collected for sediment samples. Laboratory supplied blank water will be poured over the sampling apparatus prior to sampling and collected into laboratory supplied containers. The equipment blanks will be analyzed using the same methods as the environmental samples.

3.3.3 Trip Blanks

No trip blanks will be collected as no aqueous volatile organics are being sampled and shipped.

3.4 LABORATORY QUALITY ASSURANCE SAMPLES

3.4.1 Method Blanks

Method blanks are used to assess the background variability of the method and to assess the introduction of contamination to the samples by the method, technique, or instrument as the sample is prepared and analyzed in the laboratory. A method blank is defined as an aliquot of laboratory deionized water on which every step of the method is performed and analyzed along with the samples. Method blanks are analyzed at a frequency of one for every 20 samples analyzed, or every analytical batch, whichever is more frequent.

3.4.2 Spiked Samples

Matrix spike and matrix spike duplicate (MS/MSD) (or matrix duplicate [MD] for inorganics) samples are analyzed to evaluate instrument and method performance and performance on samples of similar matrix. MS/MSD samples will be analyzed at a frequency of one (pair) for every 20 samples. MS/MSD/MD will be performed on additional samples as designated by Earth Tech's field staff.

3.5 EQUIPMENT CALIBRATION AND MAINTENANCE

3.5.1 Field Equipment

Field testing of groundwater will be performed during purging of wells prior to sampling for laboratory samples. Field QC checks of control limits for pH, specific conductance (conductivity), temperature and turbidity are detailed below. The calibration frequencies discussed below are the minimum. Field personnel can and should check calibration more frequently in adverse conditions, if anomalous readings are obtained, or subjective observations of instrument performance suggest the possibility of erroneous readings.

3.5.1.1 pH

The pH meter will be calibrated each morning prior to initial use, using two standards bracketing the range of interest (generally 4.0 and 7.0). If the pH QC control sample (a pH buffer, which may be the same or different than those used to initially calibrate the instrument) exceeds ± 0.1 pH units from the true value, the source of the error will be determined and the instrument recalibrated. If a continuing calibration check with pH 7.0 buffer is off by ± 0.1 pH units, the instrument will be recalibrated. Expired buffer solutions will not be used.

Note that gel-type probes take longer to equilibrate (up to 15 minutes at near-freezing temperatures); this must be taken into account in calibrating the instrument and reading samples and standards.

3.5.1.2 Specific Conductivity

A vendor-provided conductivity standard will be used to check the calibration of the conductivity meter each morning prior to initial use. Specific conductance QC samples will be on the order of 0.01 or 0.1 molar potassium chloride solutions in accordance with manufacturer's recommendations.

3.5.1.3 Turbidity

The turbidity meter will be calibrated using a standard as close as possible to 50 nephelometric turbidity units (NTU) (the critical value for determining effectiveness of well development and evacuation). The turbidity meter will be calibrated and checked each morning prior to initial use. The turbidity QC sample will be a commercially prepared polymer standard (Advanced Polymer System, Inc., or similar).

3.5.1.4 Temperature

Temperature probes associated with instruments (such as the YSI SCT-33 conductivity and temperature meter) are not subject to field calibration, but the calibration should be checked to monitor instrument performance. It is recommended that the instrument's temperature reading be checked against a NBS-traceable thermometer concurrently with checking the conductivity calibration. The instrument manual will be referenced for corrective actions if accurate readings cannot be obtained.

3.5.2 Laboratory Equipment

Laboratory equipment is calibrated according to the requirements of SW-846, Test Methods for Evaluating Solid Waste and Methods for the Chemical Analysis of Waters and Waste (USEPA, 1983) methods for each analysis and/or in accordance with the manufacturer's specifications.

In general, preventative maintenance of laboratory equipment follows the guidelines recommended by the manufacturer. A malfunctioning instrument is repaired immediately or through a service call to the manufacturer.

3.6 DATA DOCUMENTATION

3.6.1 Field Notebook

Field notebooks will be initiated at the start of on-site work. The field notebook will include the following daily information for all site activities:

- \$ Date;
- \$ Meteorological conditions (temperature, wind, precipitation);
- \$ Site conditions (e.g., dry, damp, dusty, etc.);
- \$ Identification of crew members (Earth Tech and subcontractor present) and other personnel (e.g., agency or site owner) present;
- \$ Description of field activities;
- \$ Location(s) where work is performed;
- \$ Problems encountered and corrective actions taken;
- \$ Records of field measurements or descriptions recorded; and
- \$ Notice of modifications to the scope of work.

During sampling of wells, field samplers will add the following:

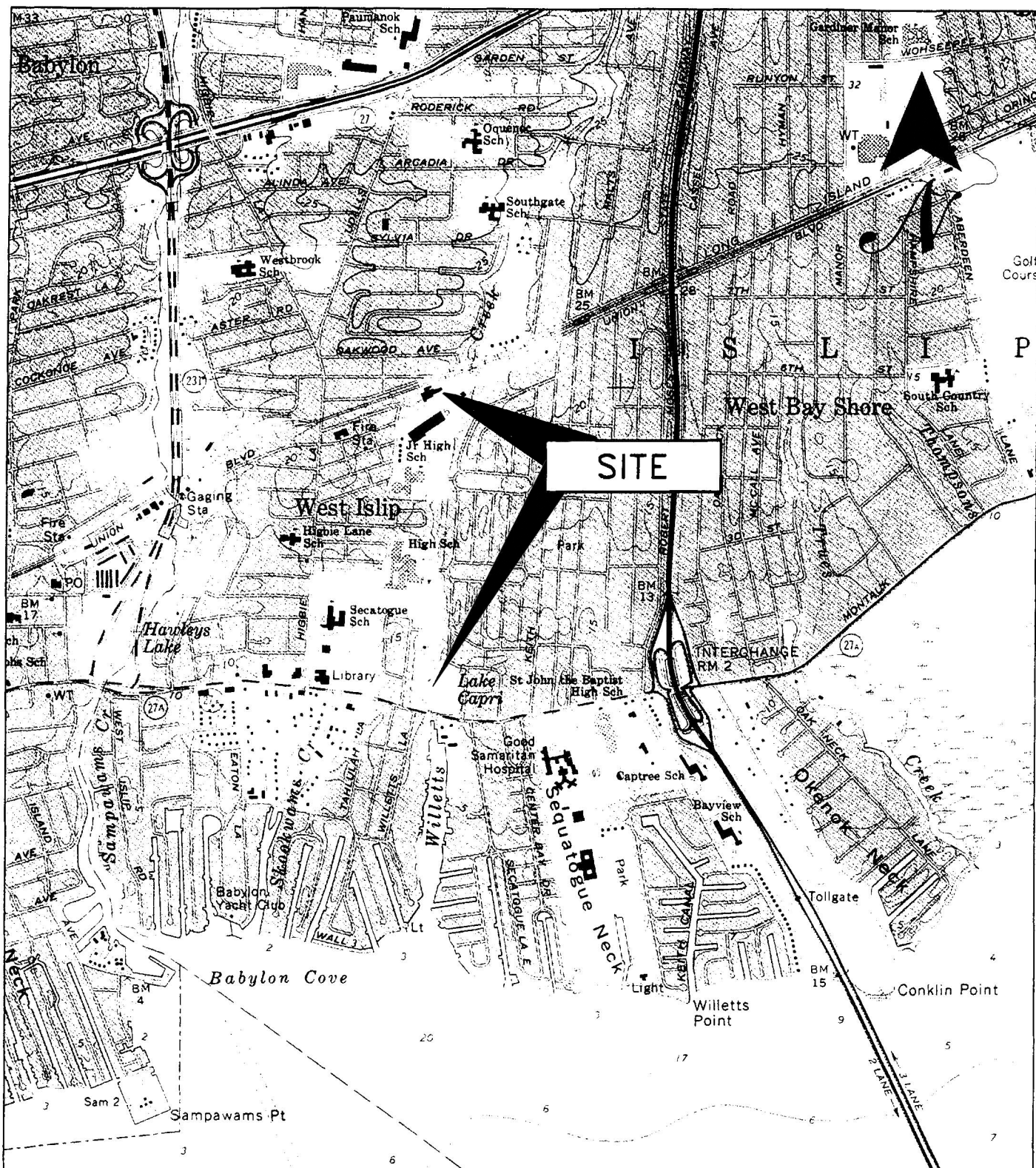
- \$ Sampling point locations and test results such as pH, conductance, etc.;
- \$ Information about sample collection (e.g., duplicate sample location);
- \$ Chain of custody information; and
- \$ Field equipment calibration.

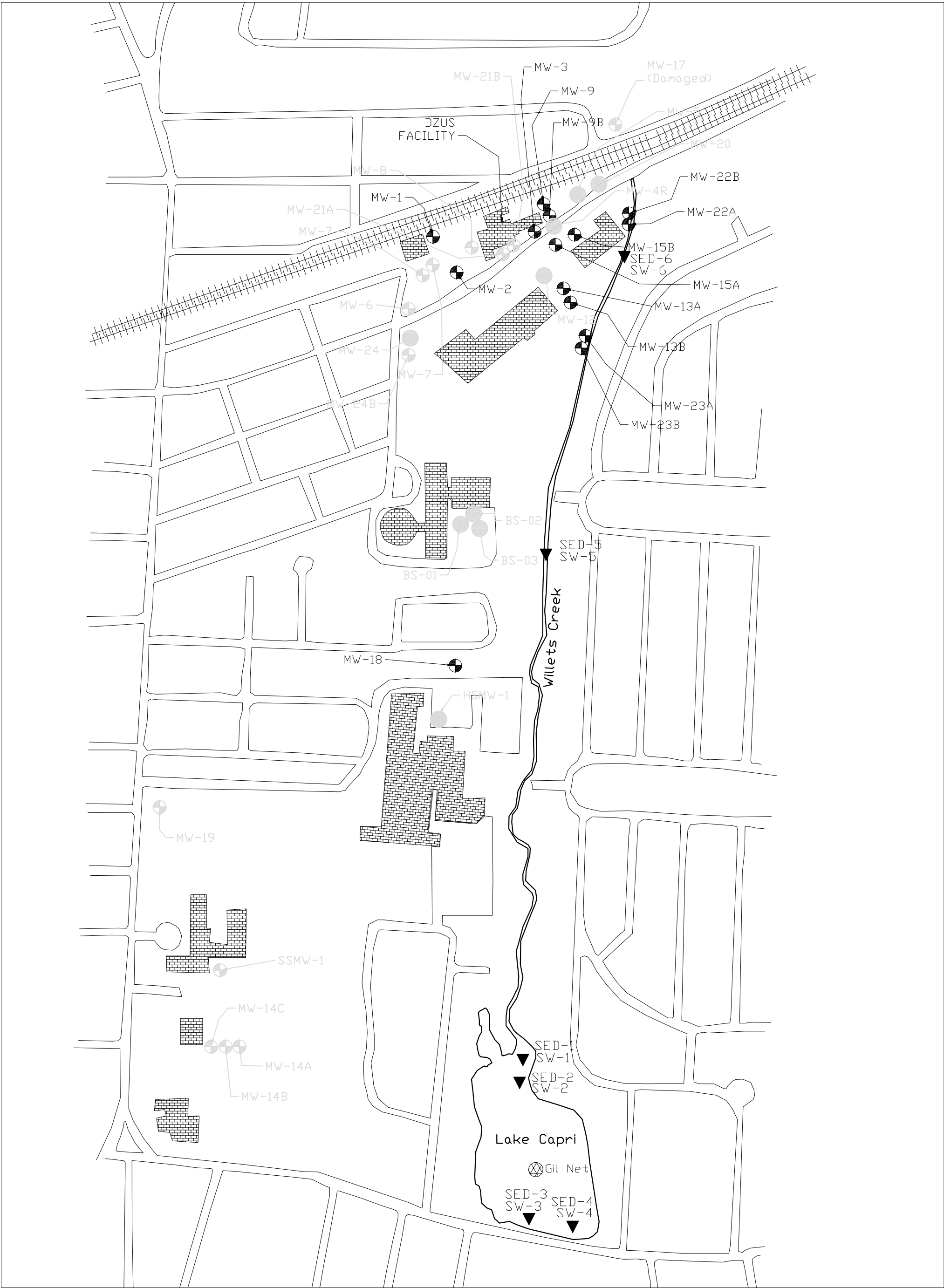
During surface water / sediment sampling, field samplers will add the following:

- \$ Depth of water;
- \$ Depth of ponar or hand auger penetration;
- \$ Information about sample collection (e.g., duplicate sample location);
- \$ GPS coordinates; and
- \$ Information about sample collection (e.g., duplicate sample location);

TABLE 1
DZUS FASTENERS SITE
MONITORING WELL LOCATIONS

Well ID	Latitude	Longitude	Comments
MW-1	40°42.49	73°18.10	Located in the grassy area just north of the parking lot between the main building and the shed
MW-2	40°42.45	73°18.10	Located in the grassy area just south of the western parking lot
MW-3	40°42.49	73°18.02	In grass in front of the eastern half on the Dzus building
MW-9	40°42.50	73°18.02	In driveway on eastern end of Dzus building
MW-9B	40°42.49	73°18.01	In driveway on eastern end of Dzus building
MW-13B	40°42.43	73°17.99	In parking lot on eastern end of the shopping center
MW-13A	40°42.44	73°17.100	In parking lot on eastern end of the shopping center
MW-15A	40°42.49	73°17.97	In parking lot in front of hardware store in the smaller shopping center
MW-15B	40°42.50	73°17.96	In parking lot in front of hardware store in the smaller shopping center
MW-22A	40°42.491	73°17.941	In grass to the east of Block Buster video store
MW-22B	40°42.491	73°17.941	In grass to the east of Block Buster video store
MW-23A	40°42.402	73°17.991	In eastern parking lot behind the shopping center
MW-23B	40°42.403	73°17.987	In eastern parking lot behind the shopping center
HSMW-1	40°42.140	73°18.110	Located on the north side of West Islip High School along the fence line near the back parking lot





Site Plan- June 2006

Legend

- Existing Monitoring Well
- Missing Monitoring Well
- Surface Water and Sediment Sample Location

N

A **tyco** International Ltd. Company

Multisite G	PROJECT NO.	DWG NO.	REV
	87616.03	2	1
Dzus Fasteners	SCALE Not to Scale	SHEET	

APPENDIX A

Site Contact List

Site Contact List

Lake Capri Homeowners

Margaret Schaeffler &	23 Barberry Rd	West Islip, NY 11795
Anthony & Angela Conti &	21 Barberry Rd	West Islip, NY 11795
Jane Matlach	19 Barberry Rd	West Islip, NY 11795
Don V & Kerry J Rivera	17 Barberry Rd	West Islip, NY 11795
John & Karen Mc Leod	4 Ivy Ct	West Islip, NY 11795
Charles Jr. & Patricia Tom	504 Everdell Ave	West Islip, NY 11795
Dennis & Cathy A Siedleck	500 Everdell Ave	West Islip, NY 11795
Carl & Susan Muller	496 Everdell Ave	West Islip, NY 11795
Kevin & Mary Peterman	492 Everdell Ave	West Islip, NY 11795
Gary & Victoria Bruckner	488 Everdell Ave	West Islip, NY 11795
Michael P & Eileen M Baci	15 Barberry Rd	West Islip, NY 11795
Kurt H Tummel, Jr.	13 Barberry Rd	West Islip, NY 11795
Franklyn F Butler	11 Barberry Rd	West Islip, NY 11795
Joanna Pellati	9 Barberry Rd	West Islip, NY 11795
Donald & Joanne Henig	7 Barberry Rd	West Islip, NY 11795
Richard & Denise Devilla	5 Barberry Rd	West Islip, NY 11795
Christopher Piaszczyk &	3 Barberry Rd	West Islip, NY 11795
Cecilia L Lando	1 Barberry Rd	West Islip, NY 11795
Thomas & Catherine Crafa	635 Montauk Hwy	West Islip, NY 11795
Nancine Vitale	723 Montauk Hwy	West Islip, NY 11795
Gary & Barbara Anne Willi	8 Hall St	West Islip, NY 11795
Patricia Dinonno	12 Hall St	West Islip, NY 11795
Gary V & Beryl C Hayes	16 Hall St	West Islip, NY 11795
Arline A Vizzi	20 Hall St	West Islip, NY 11795
Agim & Melody Zajmi	24 Hall St	West Islip, NY 11795
Henry P & Kimberley Cerru	28 Hall St	West Islip, NY 11795
William & Nancy Becher	472 Everdell Ave	West Islip, NY 11795
Frederick Oakes Jr. & Wife	476 Everdell Ave	West Islip, NY 11795
Eric Turner	480 Everdell Ave	West Islip, NY 11795
Ronald & Lisa Hofmann	484 Everdell Ave	West Islip, NY 11795

Dzus Fasteners

Olivia Marie – Vice President

Schools

Junior High School

Senior High School

School District Superintendent

Grand Union Plaza

Manager

Property adjacent to Grand Union

APPENDIX B

Safe Work Plan

Superseded by the March 1, 2013 HASP
included as Appendix E in the FINAL
Dzus SMP, May 2014

APPENDIX C

Well Sampling Form, NYSDEC Monitoring Well Field Inspection Log



A Tyco International Ltd. Company

WELL NO.

[illegible]

SITE NAME: _____

SITE ID.: _____

INSPECTOR: _____

MONITORING WELL FIELD INSPECTION LOG

DATE/TIME: _____

WELL ID.: _____

WELL VISIBLE? (If not, provide directions below)

YES	NO

WELL COORDINATES? NYTM X _____ NYTM Y _____

PDOP Reading from Trimble pathfinder: _____ Satelites: _____

GPS Method (circle) Trimble And/Or Magellan

YES	NO

WELL I.D. VISIBLE?

WELL LOCATION MATCH SITE MAP? (if not, sketch actual location on back)

WELL I.D. AS IT APPEARS ON PROTECTIVE CASING OR WELL:

YES	NO

SURFACE SEAL PRESENT?

SURFACE SEAL COMPETENT? (If cracked, heaved etc., describe below)

PROTECTIVE CASING IN GOOD CONDITION? (If damaged, describe below)

HEADSPACE READING (ppm) AND INSTRUMENT USED

TYPE OF PROTECTIVE CASING AND HEIGHT OF STICKUP IN FEET (If applicable)

PROTECTIVE CASING MATERIAL TYPE:

MEASURE PROTECTIVE CASING INSIDE DIAMETER (Inches):

YES	NO

LOCK PRESENT?

LOCK FUNCTIONAL?

DID YOU REPLACE THE LOCK?

IS THERE EVIDENCE THAT THE WELL IS DOUBLE CASED? (If yes, describe below)

WELL MEASURING POINT VISIBLE?

MEASURE WELL DEPTH FROM MEASURING POINT (Feet):

MEASURE DEPTH TO WATER FROM MEASURING POINT (Feet):

MEASURE WELL DIAMETER (Inches):

WELL CASING MATERIAL:

PHYSICAL CONDITION OF VISIBLE WELL CASING:

ATTACH ID MARKER (if well ID is confirmed) and IDENTIFY MARKER TYPE

PROXIMITY TO UNDERGROUND OR OVERHEAD UTILITIES

DESCRIBE ACCESS TO WELL: (Include accessibility to truck mounted rig, natural obstructions, overhead power lines, proximity to permanent structures, etc.); ADD SKETCH OF LOCATION ON BACK, IF NECESSARY.

DESCRIBE WELL SETTING (For example, located in a field, in a playground, on pavement, in a garden, etc.)

AND ASSESS THE TYPE OF RESTORATION REQUIRED.

IDENTIFY ANY NEARBY POTENTIAL SOURCES OF CONTAMINATION, IF PRESENT

(e.g. Gas station, salt pile, etc.):

REMARKS:

SKETCH

[illegible]

Appendix D

NYSDEC Comment Letter dated April 5, 2006

**NYSDEC Draft Procedures for Collection and Preparation
of Aquatic Biota for Contaminant Analysis**



APR 5 2006

RECEIVED

APR 10 2006

EARTH TECH
BLOOMFIELD, NJ

Mr. Paul Kareth
Project Manager
Earth Tech Northeast, Inc.
300 Broadacres Drive
Bloomfield, New Jersey 07003

RE: Dzus Fasteners, Site No. 152033
Servall Laundry, Site No. 152077
Draft Sampling Work Plans

Dear Mr. Kareth:

The Earth Tech Sampling Work Plan for Dzus Fasteners site has been reviewed, and the following comments are provided for your use and consideration to finalize the draft sampling plan.

Incorporate the following fish sampling program at Lake Capri into the Dzus Fasteners Sampling Plan.

Objective: The objective of the fish sampling program is to obtain fish samples from Lake Capri to determine the concentration of cadmium in fish tissues following the 1999 remediation of sediments from Willets Creek and Lake Capri.

Fish Collection: Fish will be collected from two sampling locations shown on Figure 1, and locations and sampling requirements will be described in more detail below.

- Station 1 The north end of Lake Capri south of the foot bridge over the east branch of Willets Creek in the general vicinity of sediments samples SED-1N and SED-2N.
- Station 2 The south end of Lake Capri near the lake outfall and in the general vicinity of sediment samples SED-3S and SED 4S.

Number of Samples - At each station, 10 samples will be obtained for each target species for a total of 40 analyses. Even if target species are not available, the sample goal should be 10 samples across 4 species. If fewer than 4 species are available, the total samples analyzed should still equal 40 for the species available.

Target Species - The target species for this collection will be the same as species collected during the 1999 fish collection and analysis for Lake Capri: American eel (*Anguilla rostrata*), bluegill (*Lepomis macrochirus*), carp (*Cyprinus carpio*), and largemouth bass (*Microptera salmoides*). However, since the lake was treated with the piscicide rotenone prior to remediation in 1999, all target species may not be present. According to the "Long-Term Monitoring Plan, Dzus Fastener Site (OU1 & OU2), NYSDEC Site No. 1-52-033, Lake Capri/Willets Creek" dated November 2000 and prepared by Earth Tech of New York, Inc., the lake was re-stocked with silversides, bluegills, and largemouth bass following remedial activities in the lake. American eels are known to move beyond barriers (like the outlet at Lake Capri) that block passage of other species of fish and it is likely that eels from the tidal portion of Willets Creek have returned to the lake. Whether carp have accidentally or intentionally been re-established is unclear. If targeted species

cannot be captured, non-target species should be retained for analysis. Information on these “targets of opportunity” is preferable to no data.

Collection Method - Electroshocking is the recommended collection method for sampling Lake Capri, however other suitable methods may be used. The method of collection should not interfere with the analysis for cadmium.

Mass of Samples - A sample mass of 100 grams should be sufficient to provide the contractor supplied laboratory with adequate fish mass for tissue analysis, whether the sample is an individual fish or a composite. If more mass is available it should be included to improve quantitative analysis and ease of handling. It is the contractor’s responsibility to determine the appropriate mass required by the contractor’s chosen laboratory.

It may be necessary to composite individuals to achieve 100-gram mass for a sample. Before compositing, individuals should be sorted by species and grouped into categories based on similar lengths. Accumulation rates and concentrations may vary with age. Fish length is a good surrogate for actual aging since there is generally a good correlation between age and length. The fish comprising a particular composited sample should be clearly identified in the collection record.

Collection and Sample Preparation Procedures - The procedures should follow the protocols described in Draft Procedures for Collection and Preparation of Aquatic Biota for Contaminant Analysis, except as noted in Contractor Responsibilities.

Analysis - Each sample is to be analyzed and reported for cadmium concentration. A detection limit of 1 ppb must be achieved.

Contractor Responsibilities for Fish Sampling Plan

The contractor is responsible for the following:

- I. Providing all services including analytical, equipment, personnel, supplies, etc. to carry out the Fish Sampling Plan for Lake Capri; Contractor Responsibilities; and Draft Procedures for Collection and Preparation of Aquatic Biota for Contaminant Analysis.
- II. Obtaining a license to collect and possess from the New York State Department of Environmental Conservation (Department) Division of Fish, Wildlife and Marine Resources (DFWMR). An application is attached.
- III. Ensuring that all fish samples are processed following the procedures in Draft Procedures for Collection and Preparation of Aquatic Biota for Contaminant Analysis.
- IV. Providing legally defensible chains of custody. An example of a chain of custody form is provided in Draft Procedures for Collection and Preparation of Aquatic Biota for Contaminant Analysis.
- V. Providing fish collection records. The contractor can use the example Biota Collection Record from Draft Procedures for Collection and Preparation of Aquatic Biota for Contaminant Analysis or use their own form provided that it contains at a minimum the information on the example Biota Collection Record.
- VI. Selecting a laboratory with appropriate analytical proficiency for the analyte being tested.

- VII. Determining the appropriate mass of sample required by the contractor's chosen laboratory for cadmium analysis.
- VIII. Providing a report to the Department in the form of a letter report that contains at minimum:
 - A. Copies of all field collection sheets.
 - B. Copies of completed chain of custody forms.
 - C. A figure that clearly identifies fish sampling location.
 - D. A summary of analytical results that includes individual sample results and means for each species and a comparison to 1994 and 1999 fish sampling data.
 - E. All chemical laboratory analysis data sheets and QA/QC package.
- IX. Providing an electronic copy of 8d and 8e above.
- X. Providing information from fish collection records in an excel or other database format.
- XI. Consult with Sean Madden of DFWMR prior to implementing fish sampling to establish a clear understanding of objectives of the plan. Mr. Madden can be reached by phone at (518) 402-8977 or by email at ssmadden@gw.dec.state.ny.us.
- XII. Notify myself and Sean Madden of DFWMR at least two weeks prior to fish collection, so that the Department and DFWMR may participate and/or observe collection activities.
- XIII. Consult with myself and Sean Madden of DFWMR if fish collection does not produce the targeted mass or before any modification to the sampling plan.

GPS Location of all wells and sample locations

Our experience with a handheld GPS unit is that the unit cannot be turned on from a "cold start," a reading quickly taken, and the unit turned off. Using a handheld unit in that manner is a common mistake and will guarantee inaccurate readings. From a "cold start" the GPS unit needs to search the sky trying to find satellites in view. This takes time and can take ten minutes. Include a note in the Dzus Fasteners work plan to specify that the GPS unit is to remain on at a location to be measured for a minimum ten-minute period of time to stabilize prior to taking a reading. Field staff can be doing other things, but it is important the unit stay on for best accuracy. Also, spare batteries need to be on hand during fieldwork. If the handheld GPS unit accuracy does not prove satisfactory during the first round of sampling, we can consider using a more accurate unit during the second round.

Servall Laundry Soil Vapor Intrusion

The following comments are provided for your use and consideration for the finalization of the Servall Laundry draft sampling work plan.

Due to insufficient data on groundwater contamination concentrations, a staggered investigation is recommended. Following the sampling of all monitoring wells and receiving the laboratory results, the Department, in cooperation with the New York State department of Health (NYSDOH), will determine locations for the Soil Vapor Intrusion (SVI) sampling points. Once the SVI Sampling points are determined, Earth Tech will be issued a notice to proceed. Earth Tech will request permission from property owners (via Department-approved form letters or phone contact) for the installation of temporary soil vapor and groundwater sample collections. If permission to collect samples on private property is denied, Earth Tech will work with the Department to select an alternative sample location.

A CD-ROM has been enclosed that contains the Servall Laundry Remedial Investigation/Feasibility Study Report prepared in January 1992 and Plume Discharge Report prepared in December 1995. These reports should be useful to locate monitoring wells and piezometers and to evaluate the plume.

If you have any questions, please feel free to contact myself or Carl Hoffman at (518) 402-9812.

Sincerely,

A handwritten signature in black ink, appearing to read "Payson Long", followed by a stylized flourish or initials.

Payson Long
Project Manager
Remedial Bureau D
Division of Environmental Remediation

Enclosures



LICENSE TO COLLECT OR POSSESS APPLICATION

Please Refer to the Instructions Before Completing This Application.
 (Please Print or Type)

Fee: \$10.00

1. Applicant Last Name		First Name		M.I.	<u>FOR OFFICIAL USE ONLY</u> License Number _____ Effective Date _____ Expiration Date _____ Region _____
2. Business/Organization Name (if applicable)					
3. Street 1			4. Telephone # (Day)		
Street 2			Telephone # (Night)		
City/Town		State	Zip Code (Zip + 4)		
County		5. Date of Birth			

6. This Application Is For a:

☐ New Application
 ☐ Renewal of Current License WITHOUT Change
 ☐ Renewal of Current License WITH Change

7. Describe, in detail, your purpose for which you applying for this license:

(If more space is needed, attach additional sheets)

8. List the species and number you wish to possess and sell:

	<u>COMMON NAME</u>	<u>SCIENTIFIC NAME</u>	<u>TOTAL</u>	
			Male	Female
a.	_____	_____	_____	_____
b.	_____	_____	_____	_____
c.	_____	_____	_____	_____
d.	_____	_____	_____	_____
e.	_____	_____	_____	_____

(If more space is needed, attach additional sheets)

9. Check the appropriate category:

☐ Species will be collected from the wild in New York State.
 ☐ Species will NOT be collected from the wild in New York State.

10. If you WILL NOT be collecting species from the wild in New York State, describe how you will obtain the species you list in Question 8:

(If more space is needed, attach additional sheets)



NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF FISH, WILDLIFE AND MARINE RESOURCES - SPECIAL
625 BROADWAY, ALBANY, NEW YORK 12233-4752



LICENSE TO COLLECT OR POSSESS APPLICATION

Continued

Answer Questions 11 through 13 ONLY if you WILL be collecting from the wild of New York State

11. Describe the methods that you will be employing to collect the species listed in Question 8:

(If more space is needed, attach additional sheets)

12. List the locations where you wish collect the species listed in Question 8:

(If more space is needed, attach additional sheets)

13. List the time periods when you will make your collections:

(If more space is needed, attach additional sheets)

14. Describe the final disposition of the species you wish to collect:

(If more space is needed, attach additional sheets)

15. Do you wish to designate agents, under your license, to assist you in making collections?

☐

Yes

☐

No

If YES, Please attach a list with the names and addresses of each agent to the application.

16. Do you possess valid State and/or Federal Licenses or permits which relate to your proposed activity?

☐

Yes

☐

No

If YES, Please attach photocopies of relevant licenses or permits to the application.

Make Check or Money Order Payable to:

New York State Department of Environmental Conservation

Please - DO NOT send cash.

NOTICE: Pursuant to ECL Section 3-0301(2)(Q) False statements made on this application are punishable pursuant to Section 210.45 of the New York State Penal Code.

Date

Signature of Applicant

RETURN THE COMPLETED APPLICATION (BOTH SHEETS) AND ANY ADDITIONAL SHEETS, TO THE ADDRESS AT THE TOP

LICENSE TO COLLECT OR POSSESS APPLICATION

Instructions

STATUTORY AUTHORITY: Environmental Conservation Law Section 11-0515 (1) and 6 NYCRR Part 175.

The Department of Environmental Conservation (DEC) may issue a License to Collect or Possess to qualified individuals to collect or possess fish, wildlife, shellfish, crustacea, aquatic insects, birds' nests or eggs. This license is issued only for the following purposes: propagation, banding, scientific, or exhibition.

Individuals applying for a license to collect, possess, or band migratory birds must possess a valid Federal Permit from the U.S. Fish and Wildlife Service, for the pertinent activity. State licenses for banding migratory birds will be issued for five years. Individuals applying for a license to exhibit mammals to the public must write the U.S.D.A. for information for licensing under the Animal Welfare Act. Applications for licenses for educational, research or scientific institutions should be completed by the individual authorized by the institution to supervise all activities listed on the application.

The following addresses are provided for your convenience:

U.S. Department of the Interior
U.S. Fish and Wildlife Service
P.O. Box 779
Hadley, MA 01035-0779

U.S. Department of the Interior
Bird Banding Laboratory
Patuxent Wildlife Research Center
Laurel, MD 20708

U.S. Department of Agriculture
APHIS REAC
2568-A Riva Rd
Annapolis, MD 21401-7400

The following instructions correspond numerically with the numbers on the License to Collect or Possess Application. When completing this application, please provide sufficient detail to fully answer the questions. The answers you provide are the criteria for approving or denying your license. Incomplete or vague applications will be returned to the applicant.

1. Name of applicant.
2. If applying as a business or organization list the name of the business.
3. Mailing address and county of residence of the applicant.
4. Day and night telephone number of the applicant.
5. Date of birth of the applicant.
6. Please check the box that pertains to your application.
7. Describe, in detail, the purpose for which you are applying for this license. If relevant, attach a copy of your research prospectus. Also, provide the name and address of the educational or scientific organization that sanctions your proposed activities or the organization that employs you.
8. Please provide the common name, scientific name (genus species) and the total number, male and/or female, of the species you wish to collect OR possess.
NOTE: Endangered or Threatened Species may not be included on this application.
9. Check the box which indicates if you will or will not be collecting species from the wild in New York.
10. If you are applying for a license to possess species which were not collected from the wild in New York, describe how and from where you will obtain the species. Please include the name, address, telephone number and Special License Name and Number of the person who legally possesses the species you wish to obtain.
11. Describe, in detail, the methods you will use to collect the species you listed in Question 8. Include the type and number of traps, type and length of nets, etc. (Only if collecting from the wild).
12. Please provide a descriptive location of your collecting sites. Include county, township, name of the body of water, sampling points in a particular body of water, etc. (Only if collecting from the wild).
13. Please provide a detailed schedule of the times you will make your collections. Include months, days, time of day, etc. (Only if collecting from the wild).
14. Please describe exactly what you will do with the specimens you collect or species you possess.
Examples: released at trap site, given to educational institutions for study skins, continue to hold for exhibition, etc.

(continued on next page)

LICENSE TO COLLECT OR POSSESS APPLICATION

Instructions (continued)

15. Individuals affiliated with educational, research or scientific institutions may designate individuals to function as agents under their license. If you answer yes to this question, please attach a list with the name and address of each person you would like as an agent under your license.
16. If you answer yes to this question, please attach a photocopy of each State or Federal license or permit which relates to your application.

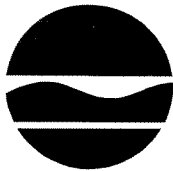
Please read the NOTICE and sign and date on the appropriate lines provided at the bottom of the application.

The fee for a License to Collect or Possess is \$10.00. The license is valid for one year or as noted on the license. The Department in its discretion may require an applicant to submit written testimonials from two well-known scientists and to file a bond of two hundred dollars.

Send the completed application, any attachments and a check for \$10.00, payable to NYS Department of Environmental Conservation to:

New York State Department of Environmental Conservation
Special Licenses Unit
625 Broadway
Albany, New York 12233-4752

Approximately 45 days are required to review and process completed applications.



New York State Department of Environmental Conservation

Division of Fish, Wildlife & Marine Resources
Bureau of Habitat

DRAFT

Procedures for Collection and Preparation of Aquatic Biota
for Contaminant Analysis

October 2002

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NYSDEC Procedures for Fish Collection and Preparation for Analysis

1. **Sampling Plan** - A sampling plan should be submitted prior to collection. Each sampling plan must consider the unique set of conditions that apply to the particular site or chemical perturbation. The following items should be included, however, absolute adherence to these requirements should not be substituted for objectivity, commonsense, and attention to site ecological conditions.
 - a. Planning and Permitting
 - A sampling plan should be submitted for NYSDEC review which outlines the objectives of the sampling, the proposed sampling schedule, locations and methods, and the targeted species. The sampling plan should include a brief site description and incorporate the procedures outlined below. Once the sampling plan is approved, the NYSDEC should be provided with the date and time of actual sampling so that a representative can observe and/or participate in the sampling. A two week notification is requested.
 - A scientific collector's license should be obtained from: NYSDEC Division of Fish, Wildlife and Marine Resources, Special Licenses Unit, 625 Broadway, Albany, NY 12233-4752. Phone: 518 457-0689. [For hazardous waste sites or CERCLA sites, although no permit is required, the NYSDEC must make the determination that the proposed sampling meets the substantive technical requirements of the regulations. Submittal of application materials is the most efficient way to make this determination.] A copy of the Special License approval letter should be submitted with the final report.
 - b. Sampling locations
 - The sampling locations should be shown on both a detailed site map and a topographic map showing the affected water body as well as upstream and downstream tributaries. For large water bodies such as the Hudson River or New York Harbor, navigational charts showing the sampling locations should be submitted. UTM coordinates of the sampling locations should be provided.
 - The number of sampling locations will depend on the size of the site and anticipated downstream movement of contaminants. In general, for stream or river sampling, the minimum requirement is one upstream location (or other unaffected reference area), one location at the site and one downstream of the site. If sampling takes place in a pond, lake or non-flowing water, locations should be chosen to represent expected impacted and unimpacted areas based on knowledge of contaminant source (outfall, seep, disposal area runoff), tidal flow, depositional areas etc.
 - Any man made or natural features (dams, waterfalls) limiting fish movements should be noted as well as pool, riffles, or significant aquatic or marine vegetation if applicable.

- c. Target Species and Number of Samples
- The species targeted for sampling should be appropriate to the goals of the study, however, on-site field conditions will be the final consideration in the actual retention of specimens. The field biologist is responsible for assessing the on-site conditions and adjusting or tailoring sample collection to those conditions. Flexibility to make these adjustments should be built into the sampling plan.
 - For investigation of human health concerns, species known to be taken from the subject waterbody for human consumption should be targeted for sampling. Individuals of appropriate size for a meal should be retained. For a study of impacts to fish and/or wildlife, at least one larger fish and one forage species should be collected. With regard to bioaccumulative contaminants, larger species, older individuals or species foraging mainly on sediment associated food items are generally best for assessing a worst case scenario.
 - Target species should be identified prior to sampling so that effort is directed to obtaining the same species at each location. If targeted species cannot be captured, non-target species captured during sampling should be retained for analysis **even if they are not specified in the sampling plan or do not meet the stated objectives of the study**. Information obtained from these “targets of opportunity” is preferable to no data, and can satisfy the overall objective of determining whether the contaminant of concern has been incorporated into biota.
 - In order to provide an estimate of variability and statistical reliability, a minimum of five samples of each species should be collected at each location. For ecological assessments, it is necessary to obtain samples of both smaller forage fish and large fish at each location.
 - Smaller invertebrates, frogs and fish can be composited to obtain enough mass for each of the five samples.
- d. Collection Methods — The method chosen should be tailored to the waterbody, the target species and objectives of the study. Usually, any method that does not jeopardize the chemical analysis is acceptable including:
- Electroshocking
 - Nets and traps – seining (works well for forage fish or younger, schooling age classes), eel pots, crab pots
 - Rock picking and dip nets – crayfish, frogs, caddisfly larvae, other macroinvertebrates
- e. Analytical Information — The sampling plan should include the name of the laboratory chosen for the analytical work and indicate the analyses to be done, proposed methods and detection limits. Required QA/QC procedures are outlined in Section 6 below.

2. **Field Data Collection** - Record the following data on the Collection Record Form (see Appendix A for preferred format).
- a. Individual fish and larger amphibians and invertebrates :
 - Date collected
 - Method of collection and preservation
 - Sample number
 - Species identification (assigning genus and species)
 - Sample location
 - Total length (nearest millimeter or smallest sub-unit on measuring instrument). Record as soon as possible with calibrated, protected instruments and prior to freezing.
 - Weight (nearest tenth (0.1) of a gram or smallest sub-unit of weight on weighing instrument). Record as soon as possible with calibrated, protected instruments and prior to freezing.
 - Sex, where specifically required. Fish may be cut enough to allow sexing, but do not eviscerate.
 - Age - An age determination of each fish is optional.
 - b. Compositeds fish, amphibians and invertebrates
 - Date collected
 - Method of collection
 - Sample number
 - Species
 - Location
 - Composite weight to the nearest 0.1 gram
 - Number of individuals (approximate if necessary)
3. **Handling and Transport**
- a. Place each fish in a plastic bag. (Do not eviscerate.) Groups of fish of the same species may be placed in one large plastic bag **per sampling location**. Bags from one location can be placed in one larger bag provided it is labeled with the contents. Note appropriate information on each bag tag (e.g. date, location, species, sample or tag numbers, program or project name).
 - b. Keep fish samples as cool as possible. All fish must be kept at a temperature below 45°F immediately following data processing. During warm weather, keep fish on ice in a cooler and freeze later on. As soon as possible, freeze at 0°F to 10°F. Due to occasional freezer failures, daily freezer temperature logs are required. If fish are held more than 24 hours without freezing, this should be noted on the collection form.
 - c. Small specimens such as young-of -year fish and invertebrates should be kept alive in water of appropriate temperature (use ice if needed) until sampling is completed at a given location. Wrap young fish in hexane rinsed-foil and bag. Place invertebrates in hexane-washed glass jars. (Hexane rinsing is not needed for metals analysis.) Keep jars on ice in a cooler until placement in a freezer.

- d. All samples should be accompanied by the original Collection Record and Chain of Custody forms (samples attached as Appendix A and B) during transport and upon delivery to the lab.
4. **Tissue Preparation - Samples for determining fish consumption advisories**
- a. Procedures for Standard Filleting - The standard fillet is the portion of edible flesh analyzed for the purpose of obtaining information regarding **human health risks**. The methodology is slightly modified from the U.S. Food and Drug Administration procedures.
- Remove scales from fish. Do not remove the skin.
 - Make a cut along the ventral midline of the fish from the vent to the base of the jaw.
 - Make a diagonal cut from the base of the cranium following just behind the gill to the ventral side just behind the pectoral fin.
 - Remove the flesh and ribcage from one-half of the fish by cutting from the cranium along the spine and dorsal rays to the caudal fin.
 - Score the skin and homogenize the entire fillet.
- b. Modifications to Standard Filleting - The following modifications of the standard fillet procedure are designed to account for variations in fish size or known preferred preparation methods of the fish for **human consumption**.
- Some fish are too small to fillet by the above procedure. Fish less than approximately 6 inches long and rainbow smelt are prepared by cutting the head off from behind the pectoral fin and eviscerating the fish. Ensure that the belly flap is retained on the carcass to be analyzed. When this modification is used, it should be noted when reporting analytical results.
 - Some species are generally eaten by skinning the fish. The skin from these species is also difficult to homogenize in the sample. For the following list of species, skin the fish prior to filleting:
 - (1) Brown, black and yellow bullhead
 - (2) Atlantic sturgeon
 - (3) White catfish
 - (4) Channel catfish
 - (5) Lake Sturgeon
 - Prepare American eel by removing the head, skin and viscera; do not attempt to fillet.
5. **Tissue Preparation for ecological assessment**
- a. Fish Whole Body Analysis All fish should be analyzed whole to determine contaminant concentrations for risks to fish and wildlife. **Do not eviscerate or remove the head or scales before compositing**. Fish should be chopped and homogenized whole.

- b. See Table 1 for additional information on tissue preparation.
6. **Laboratory Analysis** - The following considerations apply for laboratory analysis of biological samples.
- a. Proposed procedures for preparation and analysis of tissue samples should follow this SOP. Analytical methods must be specified for Department approval for each analyte to be tested.
 - b. Laboratories may be required to provide a demonstration of performance for biological samples prior to conducting analysis. Demonstration of analytical proficiency and ability to meet detection limits can be made by analysis of reference materials or samples to be provided by the Department. **ELAP certification does not apply for analysis of biological samples.**
 - c. Analysis of lipid content is required for certain analytes such as PCBs and other organochlorine compounds. Lipid analysis should follow the Soxhlet extraction procedures contained in EPA method 3540C Soxhlet Extraction using acetone/hexane (1:1) as provided in section 5.4.1.1.
 - d. General quality control recommendations for tissue are contained in Table 2.
 - e. The QAPP for tissue analysis should follow the outline in EPA publication "Preparation Aids for the Development of Category 1 Quality Assurance Project Plans" (EPA/600/8-91/003).
7. **Reporting**
- a. A Collection and Analysis Report should be submitted following completion of the study. The report should describe the sampling event and any deviations from the sampling plan. Copies of all field notes, collection records, chain of custody forms and laboratory analytical sheets should be included. A sample report outline is included as Appendix C.
 - b. Summary data should be provided in a table. Final detection limits should be defined and listed. Units of measurement should be consistent throughout the table and be consistent with that in the text. Tables should be complete and annotated to the extent that they can stand alone as an interpretable document.
 - c. Morphological and analytical data should be provided in electronic format on compact disc. Database formats (i.e. Access, FoxPro) are preferable. Spreadsheet formats suitable for data analysis are also acceptable (i.e. Excel, QuatroPro).

Table 1. Sample preparation methods for aquatic organisms.

Group and/or Species	Human Health Assessment	Ecological Assessment
Fish - edible fish of legal size, except as provided more specifically below	Standard fillet - skin on, scales removed.	Whole fish unless otherwise specified.
Fish - edible fish of small sizes and rainbow smelt	Remove head and eviscerate; retain belly flap. Generally applies to fish less than 6" (153 mm)	Whole fish unless otherwise specified.
Fish - non-edible fish; forage fish; young-of-year	Not applicable.	Whole fish unless otherwise specified.
Fish - American Eel	Remove head, skin and viscera; do not fillet	Whole fish unless otherwise specified.
Fish - Bullheads, catfishes, sturgeons	Standard fillet minus skin. For large sturgeon, an alternative method may be a composite of three skinless steaks, one each taken from the anterior, mid and posterior portions of the fish.	Whole fish unless otherwise specified.
Fish from markets	As obtained from the market unless inedible portions are present. In latter case, approximate the standard fillet.	Not applicable.
Bivalves	All soft parts plus liquors	> 15 mm width, all soft parts plus liquors < 15 mm width, entire organism
Decapods - Lobster, crayfish, shrimp	Muscle tissues in tail, and for American lobster include the muscle in the claws. For American lobster only, hepatopancreas.	Whole organism unless otherwise specified.
Decapods - Crabs	Muscle tissue in legs and body; For Blue Crabs only, hepatopancreas.	Whole organism unless otherwise specified.
Cephalopods - Squid	Entire minus cartilage.	Whole organism unless otherwise specified.
Macroinvertebrates	Not applicable.	Whole organism.
Zooplankton	Not applicable.	Decant water. Entire sample.

Table 2: Quality control requirements for chemical analyte groups.

Sample Type/Frequency	Analyte Groups	Control Limits	Corrective Actions
Calibration standards (minimum of 3 over expected range of sample analyte concentrations with lowest near MDL); Freq. = Once daily minimum; 1/15 samples if 15 or more samples analyzed daily	Organics Metals	RSD of RFs of calibration standards ≤ 20 percent % R of all calibration standards = 95 to 105	Determine cause of problem (e.g., instrument instability or malfunction, contamination, inaccurate preparation of calibration standards); take appropriate corrective action; recalibrate and reanalyze all suspect samples, or flag all suspect data.
Blanks (method, processing, reagent, or matrix); Freq. = 1/15 samples as appropriate for analytical parameters being determined	Organics and metals	Concentration of any analyte $< \text{MDL}$ or MQL , as determined by program manager	Determine cause of problem (e.g., contaminated reagents, solvents, or equipment); remove any sources of contamination; reanalyze all suspect samples, or flag all suspect data.
Matrix spikes; Freq. = 1/15 samples	Organics Metals	% R ≥ 70 with good precision % R = 75 to 125	Determine cause of problem (e.g., incomplete extraction or digestion, contamination); take appropriate corrective action; reanalyze all suspect samples, or flag all suspect data. Zero percent recovery requires rejection of all suspect data.
Reference materials; Freq. = 1/15 samples	Organics Metals	Measured value within 95% confidence intervals, if certified. Otherwise, % R = 70 to 130 % R = 85 to 115	Determine cause of problem (e.g., inaccurate calibration, contamination); take appropriate corrective action; reanalyze all suspect samples, or flag all suspect data.

Sample Type/Frequency	Analyte Groups	Control Limits	Corrective Actions
Laboratory replicates; Freq. = 1/15 samples if conducted without analytical replicates, 1/30 samples if conducted with analytical replicates	Organics Metals	A difference no more than a factor of two (approximately a 50% coefficient of variation) $ RPD \leq 20$ for duplicates	Determine cause of problem (e.g., composite sample not homogenous, instrument instability or malfunction); take appropriate corrective action; reanalyze all suspect samples, or flag all suspect data.
Analytical replicates; Freq. = 1/15 if conducted without laboratory replicates, 1/30 samples if conducted with laboratory replicates	Metals	Determined by program manager	Determine cause of problem (e.g., instrument instability or malfunction); take appropriate corrective action; reanalyze sample.
Surrogate spikes - isotopically labeled target analytes; Freq. = with each sample	Chlorinated dioxins and furans, PAHs	Determined by program manager	Determine cause of problem (e.g., incomplete extraction or digestion, contamination, inaccurate preparation of surrogates); take appropriate corrective action; reanalyze all suspect samples, or flag all suspect data.
Surrogate spikes (or internal controls) - surrogate compounds; Freq. = with each sample	Chlorinated dioxins and furans, PAHs	Determined by program manager	Determine cause of problem (e.g., incomplete extraction or digestion, contamination, inaccurate preparation of surrogates); take appropriate corrective action; reanalyze all suspect samples, or flag all suspect data.
Accuracy-based performance evaluation samples; Freq. = at discretion of Project Quality Assurance Officer, minimum of one set of samples	Organics Metals	% R = 70 to 130 % R = 85 to 115	Determine cause of problem. Do not begin or continue analysis of samples until laboratory capability is clearly demonstrated.

BIOTA COLLECTION RECORD

Collections made by (names):

Preservation method: ☐ Freezing; ☐ Other (specify) _____

[illegible]

Appendix B. Sample Chain of Custody Form

CHAIN OF CUSTODY

I, _____, of _____ have collected the following
 (Print Name) (Print Address)

on _____, 20____ from _____ in the vicinity of _____
 (Date)

Town of _____, _____ County.

Item(s): _____
 —

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I have assigned the identification number(s) _____ to these samples, and
 have recorded pertinent data on the attached collection records. The samples were handled according to
 sampling protocols provided to me prior to collection. I placed the samples in the custody of

 on _____, 20____.

I, _____, of _____ have received the above mentioned
 sample(s) on the date specified for the purpose of _____. The sample(s)
 remained in my custody until subsequently transferred, prepared or shipped at times and dates as attested to below.

Signed _____ Date _____

SECOND RECIPIENT (Print Name)	TIME & DATE	PURPOSE OF TRANSFER
SIGNATURE	AFFILIATION	
THIRD RECIPIENT (Print Name)	TIME & DATE	PURPOSE OF TRANSFER
SIGNATURE	AFFILIATION	
FOURTH RECIPIENT (Print Name)	TIME & DATE	PURPOSE OF TRANSFER
SIGNATURE	AFFILIATION	
RECEIVED IN LABORATORY BY (Print Name)	TIME & DATE	
SIGNATURE	AFFILIATION	

NOTICE OF WARRANTY

By signature to the chain of custody (reverse), the signator warrants that the information provided is truthful and accurate to the best of his/her ability.

Appendix C. Sample Report Outline

Project Description

Collection Narrative and Summary Results Tables

Waterbody map with sampling locations labeled

Collection Records and field notes

Chain of Custody and Lab Sheets

QA/QC report

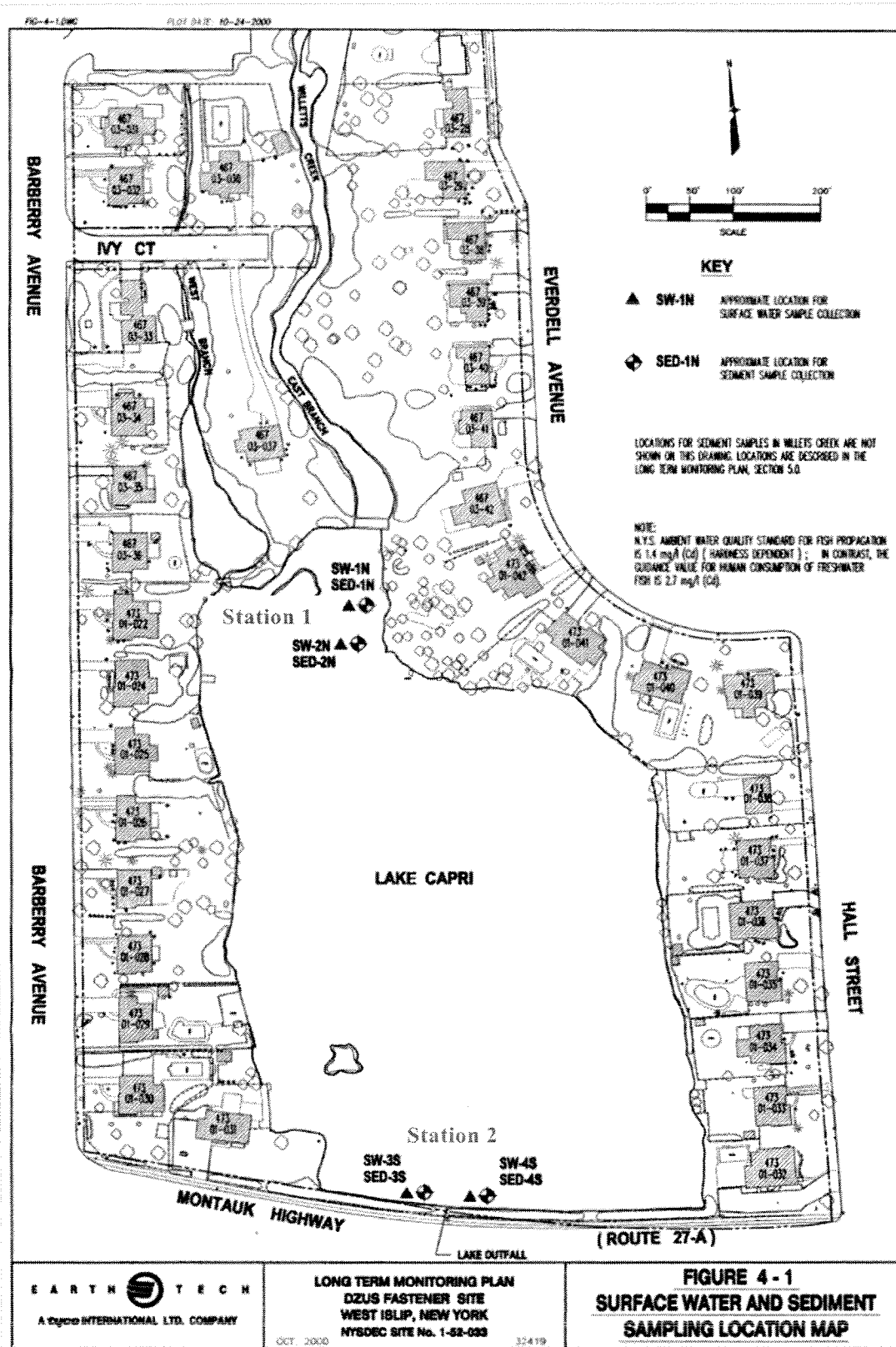


Fig 1. Fish sampling location map. Figure adapted from Figure 4-1 in “Long-Term Monitoring Plan, Dzus Fastener Site (OU1 & OU2), NYSDEC Site No. 1-52-033, Lake Capri/Willets Creek” dated November 2000 and prepared by Earth Tech of New York, Inc.

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