Cover Certification Report

Atlantic Avenue Associates, Inc.
Tax Map 10-1-8
41 Atlantic Avenue
Woburn, Massachusetts 01801

September 30, 2008

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(Tax Map 10-1-8)

1.0 INTRODUCTION

The Industri-Plex Site Remedial Trust (Remedial Trust) is required by the Consent Decree entered on April 24, 1989 by the United States District Court for the District of Massachusetts in the matter styled *United States v. Stauffer Chemical Company et al.*, Civil Action No. 89-0195-MC, and *Commonwealth of Massachusetts v. Stauffer Chemical Company et al.*, Civil Action No. 89-0196-MC, and recorded at the Middlesex South Registry of Deeds in Book 19837, Page 476 (Consent Decree) to fund and administer the obligations of the Consent Decree. At the request of the Remedial Trust, Roux Associates, Inc. (Roux Associates) has prepared this property-specific Final Cover Certification Report (Cover Certification Report) in compliance with the Consent Decree requirements. This Cover Certification Report documents completion of a portion of the Remedial Action for soil, sediments, and air at the Industri-Plex Superfund Site (Industri-Plex Site), Woburn, Massachusetts. Site wide completion of the Remedial Action for soil, sediments, and air is documented in the Master Cover Certification Report for the Industri-Plex Site. The specific property addressed in this report is owned by Atlantic Avenue Associates, Inc. (Tax Map 10-1-8) and located at 41 Atlantic Avenue in Woburn, Massachusetts. Construction of the Remedial Action for soil, sediment, and air was completed on June 28, 1996. Changes to the cover at this property may have been made since that date. Approved changes to the cover are documented in the Administrative Record for the Industri-Plex Site.

In accordance with the Consent Decree and the Contract Documents for the Remedial Action, a certification report must be prepared by a registered professional engineer certifying that all remedial activities have been completed in full satisfaction of the requirements of the Consent Decree. As defined by the United States Environmental Protection Agency (EPA), (Federal Register, July 26, 1982) certification does not constitute a guarantee or warranty, but a "rendering of a professional opinion concerning compliance with a requirement of the regulations by a qualified professional in the field."

1.1 Site Description and History

The Industri-Plex Site is a 245 (+/-) acre area, located about 10 miles northwest of Boston, Massachusetts in the north part of Woburn, within the Aberjona River Valley. The Site is bounded on the east side by Interstate 93, and Interstate 95/State Route 128 is located about one half mile south of the Site. The Boston Edison Power Company right-of-way No. 9 is the southwest boundary of the Site. The Massachusetts Bay Transportation Authority (MBTA)

railway transects roughly the western third of the Site in a northwest-southeast direction. The Industri-Plex Site was surveyed by SAIC Engineering, Inc. and Liu Aerial Surveys in 1990 and 1991.

Since the mid-1800s, the Industri-Plex Site has been used primarily by companies producing chemicals for textile, leather, and paper. Chemical manufacturing operations occurred at the Site from 1853 to 1931, producing sulfuric acid and related chemicals, arsenic insecticides, acetic acid, dry colors, phenol, benzene, picric acid, toluene and trinitrotoluene (TNT). By 1929, the Merrimac Chemical Company, which occupied the Industri-Plex Site, had become one of the leading producers of insecticides and other chemicals in the United States. The Merrimac Chemical Company plant included 90 buildings on 417 acres, many of which were within the current Industri-Plex Site. Early operations included disposal of wastes in pits or low-lying wetlands. Liquid wastes were discharged into streams and later sewers. As a result, heavy metal wastes from the chemical operations contaminated Site soils and wetland sediments.

From 1934 to 1969, the property was used by several companies to manufacture glues and gelatins from animal hides. Raw, salted or limed hides, hide fleshings, or chrome tanned leather scraps from cattle, hogs, sheep or other animals were used to manufacture glue by extracting a protein called collagen from animal tissues or bones. Animal hide waste products from the rendering process were disposed of in mounds or hide piles on-Site. A developer purchased the plant property in the early 1970s intending to build a complex of industrial buildings (hence Industri-Plex) and began grading operations. During hide pile excavation, noxious gases and odors, attributable to the decomposing hide wastes, were released. The distinctive odor became known as the "Woburn odor." Complaints from local residents and encroachment on wetland areas stopped further development of the Site.

In 1981, the EPA proposed the Industri-Plex Site for the National Priorities List (NPL), also known as Superfund. The Industri-Plex Site was finalized on the NPL in 1983. In May 1982, EPA and the Massachusetts Department of Environmental Quality Engineering [DEQE – currently known as the Massachusetts Department of Environmental Protection (MassDEP)] entered into a Consent Order with Stauffer Chemical Company to undertake a Remedial Investigation/Feasibility Study (RI/FS). In April 1985, Phase II of the RI/FS was completed. The Remedial Investigation identified arsenic, lead, and chromium in Site soils and wetland

sediments as well as impacts to the ground water and odors due to hydrogen sulfide and methyl mercaptans emitted from the hide piles. Abandoned buildings and waste lagoons were also present on the Site. Based on the RI/FS, EPA, along with MassDEP, established a Record of Decision (ROD) in 1986 for the first phase of the cleanup at the Industri-Plex Site (known as Operable Unit 1, OU-1), which included a protective cover over more than 100 acres of soil contaminated with heavy metals and animal wastes, a gas collection and treatment system, institutional controls, an interim groundwater remedy, as well as further investigations of Site related contamination at and downstream of the Site to support a future second phase (known as Operable Unit 2, OU-2). The location of the protective cover is illustrated in **Attachment 1** and includes an impermeable cover for the gas collection and treatment system situated at what is known as the East Hide Pile.

Further details of the Industri-Plex Site history can be found in the 1986 Record of Decision.

In a 1989 Consent Decree between EPA, MassDEP and the current and former property owners, two Trusts were established which set in motion the remediation and reuse of the Industri-Plex Site. The Remedial Trust was formed to prepare and implement the remedy according to the ROD. The Industri-Plex Site Custodial Trust (Custodial Trust) was formed to hold, manage, and sell a portion of the Site.

Golder Associates, Inc. (Golder) was selected in 1989 by the Remedial Trust to design the remediation for the Industri-Plex Site. The remedial design included pre-design investigations of the soils, wetlands, air, and groundwater.

The pre-design investigations included sampling analysis and studies to determine the extent of contamination and, in accordance with the Consent Decree, to evaluate cover types. Designs were needed to prepare the ground surface for cover. The remedial design included:

1. Plans for the demolition or decommissioning of abandoned buildings, railroad tracks, underground utilities, a personnel tunnel, and over 120 existing observation wells and piezometers used during the preliminary investigation.
2. Plans for controlling odors, fugitive dusts, and surface water runoff during construction to prevent off-Site impacts.

3. Evaluation of, and considerations for the future stability of, the hide pile slopes.
4. Plans for collecting and treating waste gases in a Thermal Oxidation Unit.
5. Plans for dredging, remediating, and revitalizing streams and wetlands.

The remedial design for contaminated soils and air included both permeable (soil and geotextile) and impermeable (soil and geomembrane) covers. A permeable cover system was designed for 60 acres of upland soils and three hide piles (known as the West, East-Central and South Hide Piles) contaminated with high concentrations of heavy metals and decomposing organic wastes. The permeable cover included a geotextile base to maintain separation between contaminated soils and clean cover material, a clean grading fill, and topsoil with vegetation. An impermeable cover was designed for a fourth hide pile (known as the East Hide Pile) which was approximately four acres in size and an active odor source. The impermeable cover included a high permeability gas collection layer, geomembrane, cover grading fill, topsoil, and vegetation. An active gas collection system was designed to collect gases trapped by the impermeable cover and convey the gases to a Thermal Oxidation Unit for treatment. The permeable cover system for the Site was further divided into two categories: "Engineered Cover"; and "Equivalent Cover". The Engineered Cover was designed and constructed by the Industri-Plex Site Remedial Trust as part of the response activities at the Site to prevent exposure to contaminated soil, and may be comprised of one or more of the following materials: geotextile, geomembrane, soil, gravel, bituminous concrete and/or asphalt. The Equivalent Cover represents existing structures serving as an adequate permeable cover. Equivalent Cover, although not designed as part of the Engineered Cover, functions to prevent exposure to contaminated soil, and may be comprised of one or more of the following ground covering structures or features, or portions of such structures or features: buildings; foundations; slabs; paved driveways, walkways, parking lots and/or roads; or other such ground covering structures or features. The location of Engineered and Equivalent Covers are illustrated in the Record Drawings.

Site remediation also required capping approximately five acres of contaminated streams and wetland sediment. Approximately seven acres of wetland enhancement, restoration, and creation were designed to compensate for wetland losses. Normandeau Associates, Inc. of Bedford, New Hampshire, was a key designer of the wetland mitigation plans.

A revised final (100%) Design Report was issued on May 8, 1992. Approval for the 100% Design Report was issued by EPA in consultation with the MassDEP on May 18, 1992. A Remedial Action Work Plan for Soil, Sediment and Air Remedy was issued on June 22, 1994, and approved by EPA, in consultation with MassDEP, on July 11, 1994.

1.2 Scope of the Remedial Action

The Remedial Action (RA) implemented the Remedial Design prepared by Golder and distributed for bidding in April 1992. The RA included covering metal-contaminated soils encountered over an approximately 100-acre portion of the 245-acre Site, a portion of which this property represents, as shown on Sheet B-11 of **Attachment 1**. This certification addresses the remedial action performed on the Atlantic Avenue Associates, Inc. Property (Tax Map 10-1-8). The remedial action on this property included a designed permeable cover of clean soil overlying a geotextile layer that was placed directly on prepared existing ground and fill soil.

Work conducted between 1992 and December 1997 is addressed in this report.

This report includes the following information as it pertains to the remedial action performed on the Atlantic Avenue Associates, Inc. Property (Tax Map 10-1-8):

- Relevant portions of the Final 100% Design Report (**Appendix A**);
- The submittal log (**Appendix B**);
- Modifications of specifications and plans (**Appendix C**);
- Results of Site air and surface water monitoring (**Appendix D**);
- Results of soil conformance and in-place material testing during the Remedial Action (**Appendix F**);
- Results of geosynthetics conformance material testing (**Appendix H**);
- Observations of subgrade preparation and geosynthetic installation (**Appendix I**);
- EPA comments (**Appendix L**); and
- Review of lines and grade control.

1.3 Report Format

This property-specific Cover Certification Report was derived from the Master Cover Certification Report documenting the completion of the soil, sediment and air remedies at the Site [excluding MassPort Authority property documented in the April 1998 Regional Transportation Center (RTC) Cover Certification Report]. Other property-specific Cover Certification Reports will be produced for the remaining properties at the Site. This property-specific Cover Certification Report presents a generic description of all work performed to complete the soil, sediment and air remedies, some of which are applicable to this property. For those portions/sections which are not relevant to this property-specific Cover Certification Report, those sections have be identified as "[Not Applicable to This Property]". The Master Cover Certification Report contains property-specific details and record drawings for 31 Tax Map lots at the Site including additional general and Woburn Roads/Right of Way information. Please reference the Master Cover Certification Report for this additional Site-wide information.

2.0 PROJECT PARTICIPANTS

In July of 1989 Golder was retained by the Remedial Trust to prepare the Remedial Design for the Site. The Consent Decree included the Remedial Design/Remedial Action Plan (RDAP). The RDAP required the preparation of Pre-Design Investigations and a Remedial Design. The design was executed in accordance with the requirements of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) as amended and re-authorized. From 1990 to 1992 Golder prepared Preliminary, Intermediate, Pre-Final and Final Design Reports in conformance with the RDAP.

The Remedial Trust entered into an agreement with Chemical Waste Management, Inc. Remediation Services Group of Princeton, New Jersey, (CWM, also Contractor) to perform the Remedial Action in accordance with the RDAP and the Remedial Design plans and specifications. The name of the Contractor changed January 1, 1993 when CWM was acquired by Rust Remedial Services Inc. (Rust), then again in May of 1995 when OHM acquired Rust. The name Chemical Waste Management was retained as the legal name of the Contractor throughout the period covered by this report.

Several subcontractors assisted the Contractor with specific tasks during the remedial work. A list of the subcontractors and the services they provided is presented below:

- Rust Environment and Infrastructure, formerly SEC Donohue Inc., of Burlington, Massachusetts provided engineering support;
- Earth Tech Inc. (Earth Tech), formerly HMM Associates Inc., of Concord, Massachusetts provided surveying services from 1992 to 1993 and Meridian Land Services Inc. (Meridian) of Milford, New Hampshire provided surveying services from 1993 to 2001. Both surveying companies collected field documentation that would be used to establish the as-built drawings for this report;
- Eastmont Environmental Inc. of Walpole, Massachusetts conducted perimeter air monitoring;
- Beattie Enterprises of Lancaster, New Hampshire assisted with clearing and grubbing the Site;
- Midway Paving of Chelmsford, MA or its subcontractors performed paving work for the Site during 1992-1995;
- HMM Associates, Inc. (HMM) of Concord, MA performed surface water monitoring services;

- Toxikon Laboratories, of Woburn, Massachusetts, and 21st Century Environmental Inc. of Bridgeport, New Jersey, assisted the Contractor with water and soil analytical testing; and,

- Reliable Fence Company of Woburn, Massachusetts installed chain link fence on the Site.

In accordance with the Consent Decree, EPA contracted with Halliburton NUS (HNUS) of Wilmington, Massachusetts to provide technical oversight. Representatives of EPA and the MassDEP met with the Remedial Trust monthly (approximately) throughout the Remedial Action to oversee the performance of the work. Minutes of the meetings were recorded but are not included in this report.

Golder provided engineering quality assurance (QA) for the Remedial Action from September 1992 through December 1995. QA included examining and testing materials and procedures to verify and assure the Remedial Trust that the construction conformed to the specifications and drawings. The Remedial Trust directed Golder to perform a geophysical investigation during May 1993. Golder Construction Services Inc. (Golder Construction) provided on-Site construction management services for the Remedial Trust from March 1995 through December 1995.

The Remedial Trust contracted with Professional Service Industries, Inc. (PSI) of Canton, Massachusetts to perform soil moisture/density testing of compacted soils, soil laboratory testing, and asphalt testing. PSI also performed on-Site QA testing from August 1993 through December 1995.

During 1995, the Remedial Trust contracted with *de maximis, inc.* to be the Site manager for the Remedial Trust and to coordinate the work conducted by Golder, CWM, and other contractors. In 1998, the Site manager role was assumed by Maverick Construction Management Services, Inc. (Maverick). Following remedial construction activities, the Remedial Trust contracted directly with Maverick to coordinate the documentation of as-built cover conditions, to manage construction activities necessary to bring the cover into compliance with the 100% Design and to prepare a Draft Cover Certification Report. In 2007, the Remedial Trust contracted with Roux Associates to complete the certification of the cover, including the completion of the draft and final Cover Certification Report.

3.0 CONSTRUCTION DOCUMENTS

RD/RA work performed for the Remedial Trust was completed according to the documents, plans, and specifications described in Sections 3.1 through 3.4.

3.1 Consent Decree

The Consent Decree (EPA, 1989) entered into between the Plaintiffs [*i.e.*, EPA and the MassDEP (Agencies)] and the Settlers defined the work that was to be undertaken at the Site. This definition is within the Consent Decree as well as the RDAP. The Consent Decree was based on the Record of Decision (ROD) for the Site (EPA, 1986). While the Consent Decree, the RDAP, and the ROD were consulted for the specific definition of the remedies to be implemented at the Site, the RDAP generalized the remedy and formed the basis for Golder's preparation of the Remedial Design Work Plan and ultimately the Final 100% Design Report. This certification applies to the Consent Decree but the primary component is the RDAP.

3.2 100% Design Report and Addenda

Golder developed the design and specifications and produced the "Final 100% Design Report, Part I" for the Industri-Plex Site (**Appendix A**), which was submitted to EPA and MassDEP in December 1991. This report applied to the remedy for soil, sediments, and air for the Site. Other Consent Decree requirements were deferred in accordance with the Agencies' instructions. The Agencies provided comments on the 100% Design Report, and responses to those comments were submitted April 3, 1992. A revised final 100% Design Report was issued April 3, 1992. The 100% Design was issued for bid April 25, 1992. The 100% Design Report was approved on May 18, 1992.

Subsequent addenda were issued for the 100% Design Report including the following:

- Addendum 1 issued May 1992 (EPA/MassDEP Approval March 11, 1993)
- Addendum 2 issued June 1992 (EPA/MassDEP Approval March 11, 1993)
- Addendum 3 issued May 14, 1993 (EPA/MassDEP Approval May 27, 1993)
- Addendum 3 revision 1 August 27, 1993 (EPA/MassDEP Approval September 10, 1993)
- Addendum 3 revision 2 October 18, 1993 (EPA/MassDEP Approval November 2, 1993)

On October 1, 1996, EPA approved an alternative permeable cover design for the RTC entitled RTC Alternate Cover Design (Golder, 1996). Details of the construction and certification of the RTC Alternative Cover Design are presented in the RTC Cover Certification Report (Golder, 1998), which was approved by EPA in April 28, 1998.

3.3 Remedial Action Work Plan

According to the Consent Decree, the Remedial Action Work Plan (RAWP) was to be submitted to the Agencies within sixty (60) days after EPA and the Commonwealth received notification of the selected Remedial Action Contractor. The RAWP was prepared by the Remedial Action Contractor for the Remedial Trust to implement the Site remedy consistent with the approved design for each Site area. The Consent Decree required that the RAWP contain:

(1) A description of all the activities necessary to implement the Remedial Actions; and

(2) A timetable for the completion of all these activities, which shall also identify major and minor milestone events in the Remedial Action process. The schedule of significant events shall be consistent with Attachment D, [Project Schedule and Remedial Design/Action Milestones].

On August 18, 1992, prior to EPA's receipt, review, and acceptance of the RAWP, the Remedial Trust requested EPA and MassDEP approval of a preparatory, non-intrusive work plan for work that would begin in September. Submittal of this work plan allowed the Contractor to maximize the construction work season while awaiting final approval of the RAWP. An addendum to the August request was submitted to EPA and MassDEP on October 9, 1992 expanding the earlier request to include debris removal and non-intrusive work and above ground structure demolition. Both the August 18 and October 9 requests were tacitly approved by EPA in consultation with MassDEP. As required, the Remedial Trust submitted a RAWP to EPA on October 5, 1992 (Consent Decree Attachment, Section B, Subsection 3B).

An interim RAWP was submitted to EPA on October 22, 1992 with a request to begin work west of the MBTA railroad tracks. EPA in consultation with MassDEP provided comments on the interim RAWP on November 25, 1992 and a revised interim work plan was submitted to EPA in December 1992. With EPA and MassDEP concurrence, the Remedial Trust authorized the Contractor to begin remediation of the Site on December 2, 1992.

EPA's review of the original RAWP, in consultation with MassDEP, continued through the first half of 1993. EPA, in consultation with MassDEP, provided a conditional approval of the RAWP on March 11, 1993. The Agencies had two main concerns, 1) "the effect of the proposed groundwater treatment changes on the 'Created Wetlands' (CW); and 2) the maintenance of air and stream water quality (ARARs) during the construction of the Remedy." EPA, after consultation with MassDEP, requested the following: 1) a revised CW design with a buffer and separation from the groundwater; and 2) implementation of a program for surface water sampling for contaminants.

Following the Remedial Trust's responses, EPA after consultation with MassDEP, presented an approval of the RAWP on May 19, 1993, contingent upon: 1) sampling of surface water to measure water quality; 2) resolution of water treatment design questions; 3) provision of a copy of the Contractor drilling and blasting plan; and 4) a requirement to cover all frequently used roads with a minimum of 4 inches of crushed stone. On July 2, 1993, EPA, after consultation with MassDEP and the Remedial Trust, reached an agreement on procedures for testing surface water and revisions to the CW.

Erosion and sediment control issues prompted further revisions to the RAWP. On March 1, 1994, a major revision to the RAWP was submitted to EPA. EPA, after consultation with MassDEP, approved the revision on July 11, 1994. Subsequent revisions were submitted and the latest version of the RAWP at the preparation of this report is August 21, 1995.

3.4 Health and Safety Plan

A Health and Safety Plan (HASP), prepared by CWM and dated August 1992, for the remediation of the Site was transmitted to EPA, after consultation with MassDEP, on September 2, 1992. The submission was made in fulfillment of the requirements to the Consent Decree Appendix I, Section F. The Remedial Trust was informed at the March 22, 1993 meeting that EPA, after consultation with MassDEP, would not approve the HASP but would provide comments. The HASP was revised on March 16, 1994; December 20, 1994; May 5, 1995; and June 29, 1995 largely to address changes to the Emergency Response Plan. In accordance with the Agencies' policy, the HASP was reviewed but not approved. The latest version of the HASP as of this report is June 29, 1995.

4.0 REMEDIAL DESIGN/ACTIONS

4.1 Soil Remedy

The soil remedy for the Site involved covering on-Site soils containing lead, arsenic, or chromium at or above the action levels established by the Consent Decree with permeable soil cover. An impermeable cover was designed for a four-acre hide pile (East Hide Pile) on Site, which was an active odor source. The Atlantic Avenue Associates, Inc. Property (Tax Map 10-1-8), however, does not include the East Hide Pile and therefore required only permeable soil cover.

4.1.1 Soil Remedy - Consent Decree Requirements

The RDAP is included as Appendix I of the Consent Decree. Throughout the RDAP, the remedy for the Site is referred to as the "cap". However, the 100% Design refers to the Site remedy as the "cover". The term "cover" has been retained for the text of this report, excluding the RDAP.

Page 1 of the RDAP states the following:

"The remedial action for soils, sediments, and sludges contaminated with Hazardous Substances, other than those emitting odors (the East Hide Pile), shall include site grading, capping with a permeable soil cover, excavation, dredging, and/or consolidation for all areas containing Hazardous Substances at concentrations above established action levels (arsenic = 300 ppm, lead = 600 ppm, chromium = 1,000 ppm)...."

Furthermore the RDAP states, "Settlers shall design and implement remedial action for soils contaminated with Hazardous Substances above the action level for metals that shall consist of site grading and capping together with Institutional Controls. Areas already covered adequately by buildings, roadways, parking lots, or other ground covering features, would not receive cover material, instead allowing the structures themselves to act as the protective cap.

For small areas on-Site, such as the landscaped areas between buildings and parking lots, Settlers may propose location-specific alternatives to capping consisting of excavation of contaminated soil and consolidation on-site with similarly contaminated soils, or placement of a protective layer such as asphalt to cap the contaminated soils.

Settlers shall design and implement the remedial actions for contaminated soils in accordance with the following requirements:

(1) cap design and construction activities shall be in accordance with regulations and/or guidance on cap design for permeable covers as summarized in [RDAP] Attachment A provided that an alternative permeable cap design including a permeable synthetic fabric and a soil layer less than 30 inches in depth, may be used in all areas of the Site where Settlers demonstrate to EPA and the Commonwealth that the alternative cap design will perform as well as or better than the permeable cap design summarized in Attachment A."

Attachment A to the RDAP states that:

"Permeable covers shall be designed and constructed to include at a minimum the following:

A. A vegetated top layer which shall be:

1. of a minimum thickness of six (6) inches;

2. capable of supporting vegetation that minimizes erosion and minimizes continued maintenance;

3. planted with a persistent species with roots that will not penetrate into the contaminated soils;

4. designed and constructed with a top slope of between 3 percent and 5 percent after settling and subsidence or, if designed and constructed with less than 3 percent, a drainage plan to ensure that the ponding of surface water does not occur or, if designed and constructed with a slope of greater than 5 percent, an expected soil loss of less than 2 tons/acre/year using the USDA universal soil loss equation; and

5. designed and constructed with a surface drainage system capable of conducting effective run-off across the cap.

B. A base layer that shall be:

1. of a minimum thickness of twenty-four (24) inches of appropriate fill material; and

2. designed and constructed to prevent clogging."

Two alternative permeable covers were designed as part of the remedy under the Consent Decree. The first alternative permeable cover design concept utilizing a 16-inch thick borrow cover overlaying a geotextile was developed in the Alternative Cover Design Report (Golder, 1989). This design was subsequently approved by the EPA and MassDEP in a letter dated September 11, 1989. The second alternative permeable cover design was the design to accommodate the RTC Alternative Cover (VHB/Golder, 1996). The EPA, in consultation with the MassDEP, approved the RTC Alternate Cover design in a letter dated October 1, 1996. The RTC Alternative Cover was properly constructed and documented in the RTC Cover Certification Report (Golder, 1998), approved by EPA on April 28, 1998.

4.2 Sediment Remedy [Not Applicable To This Property]

4.3 Air Remedy [Not Applicable To This Property]

5.0 SITE CONTROLS AND DOCUMENTATION

5.1 Survey Control

The Contractor utilized Meridian and Earth Tech to provide record survey documentation of the extent of cover, configuration of grading and general as-built conditions of the cover and any buried or concealed construction. The results of these record surveys are provided in **Attachment 1** (Sheets B-11 through B-15). The record drawings are based on the survey control provided in the 100% Design Report plans.

5.2 Construction Control

During the RA work, the Contractor was required by the project specifications to provide controls to maintain a safe work environment and protect the public health and safety. Such controls included air monitoring and surface water monitoring (**Appendix D**).

Air Monitoring

The objective of the ambient air monitoring program was to monitor total reduced sulfur (TRS) compounds and total suspended particulate (TSP) and inhalable particulate (PM10) as well as heavy metals (arsenic, lead and chromium) in TSP at fenceline locations during remediation efforts.

Specification section 01562 - Dust Control of the 100% Design Report required the contractor to employ construction methods and means that would keep airborne particulates below the following action levels:

- PM10 particulates were to be limited to an annual average of less than 150 micrograms per cubic meter ($\mu g/m^3$) at Site monitoring points; and
- Respirable dust concentrations were limited to 90 $\mu g/m^3$ at Site monitoring points and 5,000 $\mu g/m^3$ in the worker's breathing zone.

Data gathered by dust monitoring devices was used to monitor metals in the particulates to ensure that they were below the following threshold limit values (TLVs) outlined in the American Council of Governmental and Industrial Hygienists:

Arsenic	Chromium	Lead
0.02 $\mu g/m^3$ (of air)	1.36 $\mu g/m^3$ (of air)	1.36 $\mu g/m^3$ (of air)

Appendix B to Volume 6 of the 100% Design Report provides a detailed Odor Control Plan which specifies that TRS compounds in air at the perimeter of the Site may not exceed 47 parts per billion (ppb).

Eastmount Environmental Inc. conducted ambient air quality testing, beginning in September 1992. The particulates and heavy metals were sampled at four perimeter monitoring locations. TRS sampling was conducted at seven perimeter monitoring locations. See **Appendix D.1** for a map indicating sampling points.

TSP and PM10 Sampling

TSP and PM10 samples were collected using Hi-Volume samplers. Each Hi-Volume sampler was programmed to sample at each of the four sample locations from midnight to midnight on six day intervals. In addition to the four sample locations, a duplicate TSP sampler was stationed at Location 4 and a duplicate PM10 sampler was stationed at Location 2. The duplicate TSP sample was also analyzed for metals (arsenic, chromium, and lead).

Eastmount Environmental prepared Hi-Volume Sampling Summary reports. The Summary of Hi-Volume Results tables from those reports issued for periods during performance of work on the RA are included in **Appendix D.1**. Analytical results showed levels of TSP, PM10, and metals below the action levels.

TRS Sampling

The ambient TRS sampling was conducted using a Photovac 10S Plus portable gas chromatograph capable of measuring odorous sulfur compounds in the low part per billion range. Ambient TRS sampling was conducted twice a week from the beginning of the sampling program up until December 1992. After that, the sampling frequency was reduced to once every six days.

Eastmount Environmental prepared Ambient Air Sampling Summary reports. The Summary of Ambient TRS Results tables from those reports issued for periods during performance of work on the RA are included in **Appendix D.1**. The majority of TRS results were non-detects. Hydrogen sulfide was detected on a few occasions; however, there were no exceedances of the 47 ppb action level.

Surface Water Monitoring

CWM was also required to monitor surface water during remedial activities. According to the Site Surface Water Monitoring Plan (RAWP, Section 5.2), the following Ambient Water Quality Control (AWQC) concentrations were used as the response action levels for the Industri-Plex Site:

- AWQC chronic concentration for arsenic = 0.190 milligrams per liter (mg/L)
- AWQC chronic concentration for chromium = 0.210 mg/L
- AWQC acute concentration for lead = 0.082 mg/L

The above-tabulated AWQC limits correspond to a hardness of 100 parts per million (ppm). Water hardness values on-Site indicated moderately hard to very hard conditions (EPA, 1986). Historical background surface water data collected from surface water drainways periodically contained lead concentrations of 0.025 mg/L. Since these background levels routinely exceeded the threshold value of the AWQC chronic concentration for lead, the AWQC acute concentration was approved on June 8, 1994 as the response action level by MassDEP and EPA.

Surface water sampling was conducted to meet the project specifications and the RAWP requirements. The surface water controls established by EPA and included in the Contractor's RAWP required the following procedures:

- Each work day, field measurements were conducted at various stations (whenever there was flow) for turbidity, dissolved oxygen, temperature, specific conductivity, and pH. The sample from each station with the highest turbidity during the week was submitted for laboratory analyses of total and dissolved arsenic, lead, and chromium, total suspended solids (TSS), and hardness. Any sample with a turbidity greater than or equal to 85 nephelometric turbidity units (NTU) was also submitted for the same laboratory analyses.

- Additional sampling was conducted if a storm and/or a construction event caused the turbidity to rise above 85 NTU at the monitoring stations. The samples were analyzed for total and dissolved metals (arsenic, chromium, and lead), TSS, and hardness. Field measurements for turbidity, dissolved oxygen, temperature, specific conductivity, and pH were conducted at the time of sampling.

HMM conducted surface water quality sampling as a subcontractor to CWM. Test results indicate that the surface water quality remained below the response action thresholds with the exception of exceedances as listed in **Appendix D.2**. Specific reasons and mitigating actions for each exceedance are described in the Quarterly Reports of 1993-1995. Generally, the Agencies were notified and the mitigating actions were performed to the satisfaction of the Agencies.

5.3 Decontamination

CWM was required to decontaminate all equipment that came in contact with contaminated soils, sediments, and sludges during the work. Water used during the pressure washing was collected and treated at the on-Site storage areas. The decontamination was performed in accordance with the specifications and the project work plans. Water generated from decontamination activities was stored in a Modu-tank on the east side (across the MBTA rail lines) of the Site. The water was treated and properly disposed of on-Site as approved by the Agencies.

Personnel entering work areas (exclusion zones) during the RA, wore protective equipment as specified by CWM's Health and Safety Plan (HASP). The HASP also specified personal decontamination procedures. All personnel leaving work areas were required to properly clean or dispose of all protective equipment, small tools and instruments.

5.4 Facility Documentation for Off-Site Disposal

Prior to disposing of any materials off-Site during the RA, EPA was to determine if the proposed facilities were of "acceptable status" and could receive materials from the Site. Only non-hazardous vegetation (cleared/cut above ground surface) was disposed off-Site during the RA. During the work, as previously discussed, wastewater from decontamination activities was stored on the east side of the Site and treated prior to disposal.

All grubbed vegetation (containing soil), and contaminated soil, sediments, and sludges excavated from the Site were consolidated in other areas of the Site in accordance with the RDAP. All contaminated materials excavated from the Site were placed on the hide piles that were covered as part of the approved RA. However, prior to placement on the hide piles, saturated sediments and sludges were dried over large areas east of the MBTA rail lines on the Site within the remedial cover area.

6.0 SOURCE AND CONFORMANCE TESTING

Testing performed for the Remedial Trust, such as testing of soil and soil products and geosynthetics, is described in Sections 6.1 and 6.2, respectively. The testing methods according to the specifications are summarized in **Table 2** [*i.e.*, Golder's Quality Assurance Procedure Plan (QAPP) Table 1-1]. Abbreviations used in the supporting documentation found in the appendices are summarized in **Table 3**.

6.1 Soil and Soil Products

6.1.1 Compacted Fill

The majority of compacted fill materials were derived from on-Site grubbing and dredging operations. Compacted fills were used as stabilizing fill to flatten hide pile slopes and re-grade low relief areas to promote drainage. A portion of rock and concrete demolition debris generated by crushing and screening operations was also used to a limited degree as compacted fill material. The remaining compacted fill was imported from off-Site borrow areas. Most of the off-Site fill was composed of silty sand from a quarry in Hubbardston, Massachusetts and glacial till from a borrow pit on Deer Island, Boston Harbor, Massachusetts. Compacted fill tests included grain size distribution and primarily Standard Proctor tests with some Modified Proctor tests as needed.

6.1.2 Cover Soil

All cover soil used on-Site was from off-Site sources. Cover soil placed on slopes flatter than 8 horizontal to 1 vertical (8H:1V) was typically a granular silt from a glacial till deposit on Deer Island. Cover soil placed on slopes steeper than 8H:1V and some slopes flatter than 8H:1V was a silty sand from a quarry in Hubbardston. Cover soil tests included grain size distribution, Standard and Modified proctor densities, interface friction, and Atterburg Limits. Results of the testing are provided in **Appendix F**. Analytical testing was performed on Deer Island cover soil materials to verify the levels of potential contaminants. All soil materials tested and placed on-Site met the clean soil thresholds set up by EPA, after consultation with MassDEP, or were otherwise approved by a variance in accordance with EPA in consultation with MassDEP criteria. EPA in consultation with MassDEP clean soil threshold criteria for cover soil used at the Site are summarized in **Table 1**. Analytical test results are provided in **Appendix F.1**.

6.1.3 Topsoil

According to the Consent Decree, topsoil must be capable of supporting vegetation that minimizes both erosion and continued maintenance. Topsoil used for the cover in upland areas and as a wetland vegetative cover soil came from several off-Site sources. Such source locations were from the following Massachusetts towns: Andover, Reading, Salem, and Tewksbury. Other topsoils were sourced from the following New Hampshire towns: Nashua, New Boston, and Manchester. Each source was tested for grain size distributions, organic content, and soil fertility or Baker Soil test. Results of testing are provided in **Appendix F.2.3**. Where the topsoil did not meet some criteria, but would be capable of meeting the Consent Decree requirement for being capable of supporting vegetation, a variance was requested and received from EPA, after consultation with MassDEP.

6.1.4 Subangular Stone [Not Applicable To This Property]

6.1.5 Stone Riprap [Not Applicable To This Property]

6.1.6 Subbase

Road Structural Fill as specified in Section 02223 was used as subbase in the Remedial Action. Tests for the subbase material included gradation and compaction. All subbase materials were supplied by an off-Site quarry. Test results are provided in **Appendix F.2.1**.

6.2 Geosynthetics

6.2.1 Geotextile

6.2.1.1 Materials

Geotextile materials were supplied by the following three manufacturers: Nicolon/Mirafi, Polyfelt Americas Inc., and Synthetic Industries. Nicolon/Mirafi provided 6-ounce (oz), 10-oz and 16-oz geotextile, Polyfelt Americas Inc. provided 6-oz and 16-oz geotextile and Synthetic Industries provided 16-oz geotextile. All fabrics are permeable, non-woven, needle-punched monofilament and allow percolation. The geotextile was used in the cover to primarily separate the contaminated soil from the clean cover soil (Golder, 1989). The geotextile also precludes upward migration of contaminated material by frost heave effects; provides a drainage capillary

break layer at the base of the cover on slopes to prevent sloughing during thaws; and provides further means of reducing the chance of incidental contact through land use.

6.2.1.2 Quality Control Testing

The manufacturers of the geotextile material provided Quality Control certificates for the installed 6-, 10-, and 16-oz materials. Copies of the Quality Control Certificates are presented in **Appendix H.1.2**. As material was delivered to the Site, Golder reviewed the Quality Control Certificates for conformance with the 100% Design through the submittal process.

6.2.1.3 Quality Assurance Testing

Rolls of 6-, 10- and 16-oz geotextile were tested for conformance to the 100% Design Report specifications. Conformance testing was performed by Golder Construction Service's Geosynthetic Laboratory (Golder Construction's Geosynthetic Laboratory) located in Atlanta, Georgia. Test results are provided in **Appendix H.1.3**. Before individual rolls of geotextile were deployed on-Site, Golder reviewed the test results for conformance with the project specifications.

6.2.2 Geomembrane [Not Applicable To This Property]

6.2.3 Geocomposite [Not Applicable To This Property]

6.2.4 Geogrid [Not Applicable To This Property]

6.2.5 Interface Friction [Not Applicable To This Property]

6.3 Bituminous Materials [Not Applicable To This Property]

7.0 REMEDY CONSTRUCTION

7.1 Construction Sequence

7.1.1 Decommissioning

7.1.1.1 Decommissioning Wells

[Not Applicable to This Property]

7.1.1.2 Decommissioning Utilities and Structures

The 100% Design Report identified features that required decommissioning or abandonment prior to construction of the cover for the RA. Other abandoned below grade features that were discovered during construction of the cover were either removed to a depth 2 feet below the placement of the permeable cover or cleaned and backfilled with clean concrete. These features were left in place without any demolition or decommissioning if they did not otherwise impair the long-term effectiveness of the remedy. The general majority of the structure decommissioning occurred during construction of the RTC. A more detailed illustration of this decommissioning can be found in the RTC Cover Certification Report dated April 1998 and prepared by Golder.

7.1.2 Soil Remedy

7.1.2.1 Subgrade and Drainage

Existing vegetation was cleared and root matter grubbed to a minimum depth of one foot prior to placement of the permeable cover. No herbicides were employed to control re-establishment of vegetative growth. Tree roots were grubbed to a depth of 2 feet. Woody material from above ground, roots and other vegetation were chipped and stockpiled for later placement as fill under the permeable cover. Rocks and concrete debris grubbed from the surface were crushed on-Site in order to comply with the fill material specifications. Reinforcing steel was removed from the concrete during the crushing operations and stockpiled for off-Site disposal.

The cover area in the vicinity of bedrock outcrops or exposed concrete structures was grubbed of vegetation and cleaned in accordance with recommendations of the Site Health and Safety

Officer and documented by the Contractor. The surrounding soil cover was extended up to the outcrop or structure.

Existing subgrade soils were proof rolled prior to placing the cover and fill materials were compacted and tested. The final prepared grade was rolled with a 10-ton smooth wheel compactor or in small areas compacted with a hand operated plate vibratory compactor. Where positive drainage was called for in the 100% Design Report plans, such drainage was achieved in the finish grade of the cover. Throughout construction, erosion and sedimentation measures were generally utilized and maintained in accordance with the 100% Design Report specifications to control soil loss. Any deficiencies in the erosion and sedimentation measures were corrected in accordance with EPA in consultation with MassDEP guidelines.

7.1.2.2 Geosynthetics

After proof rolling, the prepared subgrade was inspected and any protruding debris or roots greater than ½-inch in diameter were manually removed prior to placing geosynthetics. After geosynthetics were placed, filling was performed to reach final elevations.

A 6-oz per square yard non-woven geotextile was used in the permeable cover on the subject property. The geotextile materials were sewn together using white nylon thread for dark fabric and black thread for white fabric.

The geotextile seam was initially placed with a minimum slack along the seam to protect it and allow for movement in the geotextile during placement of cover soil. This procedure was primarily practiced in the developed areas of the Site with little topographic relief. Subsequent reviews of the procedure and the 100% Design Report concluded the extra slack was unnecessary and the procedure was discontinued for the remainder of the Remedial Action (**Appendix C, DSCR-030-R2**).

7.1.2.3 Cover Soil

Cover soils placed over the geotextile on slopes greater than 8H:1V were granular materials from off-Site sources that had an inherently low potential to clog the geotextile. For slopes flatter than 8H:1V, the cover soil from off-Site sources could contain more than 12 percent by weight passing the #200 sieve. In all areas where the remediated slope was steeper than 33 percent, a

geogrid reinforcement layer was included at the base of the cover soil immediately above the geosynthetic layer. The cover soil was placed in a manner that minimized imposed stresses on the underlying geosynthetics by using low ground pressure earth moving equipment and maintaining a minimum thickness of 12 inches of soil between the rubber tire equipment and the geosynthetic. Cover soil placed in unpaved areas with permeable cover was nominally compacted by the action of the placing equipment only.

Other cover sections used in limited areas or for access roads were comprised of various combinations of cover soil and dense graded aggregate subbase or riprap. Each modified section of cover is designed to be a minimum of 16 inches in accordance with the specifications of the 100% Design Report. The types and locations of these modified sections are included in the record drawing documentation, **Attachment 1**.

Minimum thicknesses of cover soil are detailed in Section 02242 of the 100% Design Report. Generally, the permeable cover consists of 12 inches of select soil fill and 4 inches of topsoil. The tolerance, in thickness is -0.0 feet and +0.3 feet. Based upon survey data collected both at the time of construction, as well as post construction data collected, the vast majority of the Site met the design thickness within the tolerances.

Any isolated areas identified by multiple post construction survey data points to be below the acceptable tolerances, were corrected by the placement of additional cover fill to meet the required thickness. This repair of cover fill was performed during the summer of 1999 by Maverick.

Based on analysis of the of the relevant survey data points located on the Atlantic Avenue Associates, Inc. Property (Tax Map 10-1-8), the minimum thickness of cover soil specified in Section 02242 of the 100% Design Report was met at all locations surveyed throughout the subject parcel.

7.1.2.4 Topsoil and Vegetation

Topsoil was placed over the cover soil in 4-, 6- or 8-inch thicknesses as specified by the 100% Design Report. After placing the top soil, lime and fertilizer were applied to the topsoil by a York rake in larger areas and by a walk-behind drop-spreader for small areas. Seed was

broadcast by the hydroseed method in all other areas using fertilizer mulch and seed according to the 100% Design Report, or approved variances.

7.1.2.5 Revegetation

The vegetation on the upland soil covers of the Site has been restored to an herbaceous meadow to protect the underlying geotextile from penetration of large, woody roots of trees and shrubs. Drainways adjacent to upland covers have been revegetated with shallow-rooted overhanging vegetation which will eventually provide cooling shade and organic input in the form of leaves.

Criteria for selecting the revegetation plants and seeds in the 100% Design Report included:

- Endemic to Central Massachusetts;
- Tolerant of full sun and water levels;
- Easily established, with fibrous root systems rather than tap roots; and
- Perennials, or prolific annuals.

7.1.3 Sediment Remedy [Not Applicable To This Property]

7.1.4 Air Remedy [Not Applicable To This Property]

8.0 DESIGN CHANGES

Section 8.0 describes design changes associated with the Alternative Cover Design Report (Golder, 1989), approved by EPA on September 11, 1989, and the RTC Cover Certification Report (VHB/Golder, 1996), approved by EPA on October 1, 1996.

8.1 Change Management

During the Remedial Action from 1992 to 1994 for the Site, changes were managed through the Remedial Trust. At the start of 1995, the Remedial Trust and Contractor agreed to a new scope and cost contract for the remaining remedial work. The Construction Management contractor, Golder Construction, performed change management during 1995 as an agent for the Remedial Trust.

Managing changes for the Remedial Action primarily included changing the agreed upon scope of work or technical details of the 100% Design Report. Requirements identified in the Consent Decree were not changed unless approved by EPA, after consultation with MassDEP. Changes could be initiated from any of the following: EPA or MassDEP, the Contractor, the Remedial Trust or Golder as the designer, and later, Golder Construction in the role of Construction Managers.

Changes were divided into two categories, design specification changes and administrative, cost and schedule changes. Design specification changes were usually technical in nature and involved specific changes to the details of the specifications and plans presented in the 100% Design Report. Generally these changes were minor and EPA, after consultation with MassDEP, initially wanted only to review significant changes. Design changes were originally documented as design/specification change requests (DSCR). Impacts to cost and schedule were handled by another system administered by the Remedial Trust.

Early in 1994, the Contractor made several management revisions including a new method for managing changes. The Contractor introduced a change management system that included Variance Requests (VRs), Change Request Authorizations (CRAs), Corrective Action Requests (CARs), and Requests for Information (RFIs), procedures that subsequently were accepted by the Remedial Trust. The DSCR system was phased out by mid 1994 with the introduction of this

change management system. Copies of all the associated forms pertaining to this Cover Certification Report are included in **Appendix C**.

8.2 Site Wide Design Changes

A series of DSCRs, CARs, and VRs were adopted for Site wide application.

The Site wide design changes listed below were approved by the resident design engineer, project manager, EPA and/or MassDEP. The design changes generally related to grubbing, geotextile selection, geotextile installation, fill materials selection, fill materials sampling, and materials selection and placement. Several design changes applied to design details that required revision to match the 100% Design Report. The approved design changes included:

- DSCR-001
- DSCR-002
- DSCR-003
- DSCR-023
- DSCR-027
- DSCR-030
- DSCR-056
- DSCR-069
- VR-064
- VR-090

Additional Site wide design changes were identified as requiring further review in order to verify compliance with the 100% Design Specifications. These design changes include:

- CAR-053 involved a request for resampling of Deer Island Stockpile materials due to incorrect initial sampling procedures. The stockpile was resampled on March 30, 1994 and approved by the Agencies on April 28, 1994. The CAR was not signed completely by the design engineer, which appears to be an administrative discrepancy that does not affect the integrity of the cover.

- CAR-071 involved a request for resampling of soil Stockpiles 5 and 6. Hold times for volatiles in the soils were exceeded. The Remedial Trust decided to accept data for Stockpile 5, but requested Stockpile 6 be resampled. Stockpile 6 was resampled on March 30, 1994, and test results were approved by the Agencies on April 28, 1994. The CAR was not signed completely by the design engineer, which appears to be an administrative discrepancy that does not affect the integrity of the cover.

Additional details and documentation of Site wide design changes are located in **Appendix C**.

8.3 Property-Specific Design Changes

A series of DSCRs and VRs were adopted for application on the subject property.

The property-specific design changes listed below were approved by the resident design engineer, project manager, EPA and/or MassDEP. The design changes generally related to fill materials selection and surface grading transitions. The approved design changes included:

- DSCR-035
- VR-008
- VR-067
- VR-077
- VR-079

Record Drawings B-12 through B-14 depict a change in the extent of Class C land in the western portion of this property, indicating that the land on this property had been re-classified and Class B land. These drawings reference a report by Golder Associates, dated October 12, 1995. No further information is available regarding this change in land classification. During preparation of this report, Remedial Trust personnel interviewed EPA personnel and EPA contractors who were present during cover construction. These personnel recalled the change, but could not provide further information or written records regarding the change. Roux Associates has performed the following research:

A comprehensive review of records regarding the construction of the OU-1 cover including review of all available design change documents, field notes, engineers log books, cover construction contractors notes, field investigation reports, meeting minutes, correspondence, and laboratory analytical reports;

A comprehensive review of records regarding design and construction of the Andersen Regional Transportation Center cover including review of all available design documents, design change documents, field notes, engineers log books, cover construction contractors notes, field investigation reports, meeting minutes, correspondence, and laboratory analytical reports;

A screen of all other records and reports available in the Remedial Trusts files; and

A review of documents available in EPA's New England Records Center.

This research has failed to locate a copy of or further reference to the October 12, 1995 report or other documentation supporting this change in land classification. Rous Associates has concluded that, based on historic knowledge of EPA and EPA Contractor personnel, that this change in land classification was accepted by EPA, however the documentation of this change has been misplaced. Elimination of cover within this area, therefore, is in compliance with an accepted change to the 100% cover design.

Additional details and documentation of these property-specific design changes are located in **Appendix C**.

9.0 QUALITY ASSURANCE OBSERVATION AND TESTING

Construction documentation includes daily field reports and weekly reports to the Remedial Trust. Inspection field diaries were also prepared, and photographs were taken on a regular basis throughout construction. The Golder reports and diaries are not included in this document, but are available for review at Golder's Manchester, New Hampshire office.

9.1 Decommissioning

Decommissioning operations were conducted under intermittent field observation by Golder as a representative of the Trust. Decommissioning operations on the subject property occurred during construction of the RTC. A more detailed illustration of this decommissioning can be found in the RTC Cover Certification Report dated April 1998 and prepared by Golder.

9.2 Compacted Fill

Field moisture-density tests were generally performed at least once per 5,000 square feet per lift using a Troxler Model 3440 Nuclear Density gauge. Golder periodically monitored the soil testing operations performed by PSI. Failing tests were retested. During 1993 to 1994 the Contractor performed soil moisture density tests as quality control testing. The QC testing was performed by Express Geotesting, Concord, Massachusetts.

9.3 Subgrade Preparation

Subgrade preparation was inspected by Golder or PSI and the Contractor prior to geotextile deployment. A subgrade inspection form was prepared by Golder, PSI, or the Contractor for areas in which deployment would take place. Subgrade inspection forms are provided in **Appendix I.1**.

9.4 Permeable Cover

Geotextile was deployed over the prepared subgrade and seamed. The seams were inspected by Golder or PSI and the Contractor to verify the connection. A geotextile seam inspection form was prepared by Golder, PSI, or the Contractor. Geotextile seam inspection forms are provided in **Appendix I.2**.

Cover soil was placed as permeable cover over the geotextile in accordance with the 100% Design Report, and was nominally compacted by the placing equipment. No inspection or testing was required according to the 100% Design Report. Surveyors verified the cover thickness prior to placing topsoil or gravel. Topsoil, soil amendments, and seeds were then added, and the seed germinated with rainfall or water applied from water trucks. The quality of vegetative cover was evaluated. Erosion control matting was utilized in areas where seed did not germinate well.

9.5 Impermeable Liner Installation [Not Applicable To This Property]

9.6 Geocomposite Drainage [Not Applicable To This Property]

9.7 Geogrid Reinforcing [Not Applicable To This Property]

9.8 Manholes and Culverts [Not Applicable To This Property]

9.9 Seeding and Wetland Vegetation

Calculations for soil loss, based on the United States Department of Agriculture (USDA) Soil Loss Equation, verify assumptions of the topsoil type, anticipated rainfall, vegetative cover type, and slope steepness are still valid with a calculated loss of less than 2 tons per acre per year. Erosion control matting was installed as a temporary measure to supplement the vegetated cover when the remaining growing season was too short to establish protective vegetative growth.

10.0 RECORD DRAWINGS

Based on the Survey Control (Section 5.1) established for the Industri-Plex Site, Record Drawings of the as-built conditions were established for the soil, sediment and air remedies constructed at the Site, and certified by a Massachusetts Land Surveyor (Meridian Land Services, Inc.). The Record Drawings for this property at the Site are included in **Attachment 1**.

The Record Drawings include an elaborate survey network and extensive details on the horizontal and vertical locations of the various protective covers installed for the soil, sediment and air remedies. These details may aid in the future monitoring and management of the remedy, and Institutional Controls/Grant of Environmental Restrictions for the Site. The Record Drawings also illustrate the Institutional Controls/Grant of Environmental Restrictions boundaries denoted as Class A, B, C and D Lands.

Where located in Class C lands, existing concrete structures such as concrete pads, stairways, ramps, and loading docks remained in-place as an equivalent cover. These structures are similar to cover types 4, paved equivalent cover, and 5, building equivalent cover. However, because they were not specifically identified in the 100% Design Report, they have not been identified as a specific equivalent cover type herein.

The Record Drawings have plan views and points charts. The plan view shows grid points and intermediate point locations. The points chart shows elevation data collected at each point shown on the plan view. The plan views include contour lines for subgrade and finish grade. A summary of the separate sections of the Record Drawings is as follows:

- Sheet B-11: Specific Property Location;
- Sheet B-12: Boundary Lines, Land Classifications, Easements and As-Built Drainage;
- Sheet B-13: Record Points, Topography & Limits of Engineer Cover;
- Sheet B-14: Cover Types and Transitions; and
- Sheet B-15: Details and Transitions.

11.0 CERTIFICATION

On behalf of the Remedial Trust, Roux Associates certifies that the remedial action carried out on the Atlantic Avenue Associates, Inc. Property (Tax Map 10-1-8) was completed in compliance with the approved remedial design and work plans, approved design variances, and the Consent Decree. Any exceptions to this design are noted within this Cover Certification Report. Changes to the cover made following construction completion on June 28, 1996 are not addressed in this report. Approved changes to the cover made since that date are documented in the Administrative Record. The Professional Engineer's certification (below) comprises a declaration of his professional judgment. It does not constitute a warranty or guarantee, expressed or implied, nor does it release any other party of their responsibility to abide by contract documents or applicable codes, standards, regulations, and ordinances. The Professional Engineer's certification is based upon a review of the remedial action documentation. Roux Associates' certification relies upon the accuracy of the as-built survey and record drawings prepared by Meridian and upon the representations made and information provided by the Remedial Trust and its representatives, contractors and consultants involved with the remedial action effort. These contractors and consultants include CWM, Golder, PSI, and Maverick.

Respectfully Submitted,

ROUX ASSOCIATES, INC.

Glen Gordon, P.E.
Certifying Engineer for Roux Associates, Inc.
MA License No. 41819

Lawrence McTiernan,LSP
Project Principal

Table 1
ISRT Clean Soil Thresholds
in milligrams per kilogram (mg/kg)

Adapted from Table 02223-1

The following table is presented as the clean soil guideline for the Industri-Plex (I-Plex) Site. Metals which are naturally rock-forming compounds may vary from the guideline values on a case by case basis.

Tests	Proposed Threshold Levels for Clean Soil Used at I-Plex				
Volatile Organic (TCL)	Non-detectable (3)			EPA Method	8240
Acid/Base Neutrals (TCL)	Non-detectable (3)			EPA Method	3550/8270/8270
Pesticides/PCBs (TCL)	Non-detectable			EPA Method	3550/8080
Metals - Target Analyte List (TAL) (4)					
Aluminum	<	100,000	mg/kg	EPA Method	3050/6010
Antimony	<	10	mg/kg	EPA Method	3050/6010
Arsenic	<	25	mg/kg	EPA Method	3050/7060
Barium	<	500	mg/kg	EPA Method	3050/6010
Beryllium	<	1	mg/kg	EPA Method	3050/6010
Cadmium	<	10	mg/kg	EPA Method	3050/6010
Calcium	<	50,000	mg/kg	EPA Method	3050/6010
Chromium	<	23	mg/kg	EPA Method	3050/6010
Cobalt	<	20	mg/kg	EPA Method	3050/6010
Copper	<	50	mg/kg	EPA Method	3050/6010
Iron	<	70,000	mg/kg	EPA Method	3050/7420
Lead	<	87	mg/kg	EPA Method	3050/6010
Magnesium	<	10,000	mg/kg	EPA Method	3050/6010
Manganese	<	1,000	mg/kg	EPA Method	3050/6010
Mercury	<	1	mg/kg	EPA Method	3050/7470
Nickel	<	100	mg/kg	EPA Method	3050/6010
Potassium	<	10,000	mg/kg	EPA Method	3050/6010
Selenium	<	20	mg/kg	EPA Method	3050/7740
Silver	<	20	mg/kg	EPA Method	3050/6010
Sodium	<	4,000	mg/kg	EPA Method	3050/6010
Thallium	<	5	mg/kg	EPA Method	3050/7840
Vanadium	<	150	mg/kg	EPA Method	3050/6010
Zinc	<	200	mg/kg	EPA Method	3050/6010
Cyanide	<	10	mg/kg	EPA Method	9010
TPH (Total Petroleum Hydrocarbon)	<	200	mg/kg	EPA Method	418.1

Notes:

1) At any time the Trust may revise this list to include testing for additional constituents which may pose a health threat.

2) TCL = Target Compound List

3) Excludes common laboratory contaminants given in the EPA Region 1 Contract Laboratory Program Data Validation Functional Guidelines.

4) TAL Metals by Inductively Coupled Plasma (ICP) and Atomic Absorption (AA) Methods, Test 6010, except run the following constituents by the following methods: (As) 7060, (Pb) 7420, (SE) 7740, (Th) 7840, (Hg) 7470. The 7000's are "furnace and cold vapor AA" methods.

Table 2
Testing Methods for Soil and Geosynthetics
adapted from Golder's QAPP Table 1-1

7.2 TESTING METHODS	STANDARD	PRECONSTRUCTION FREQUENCY	CONSTRUCTION FREQUENCY
BACKFILL & FILL (Specification Section 02223)			
Backfill and fill tests will be performed by Professional Service Industries, Inc.			
Compacted Fill			
Gradation Test	ASTM D422	1/Source	1/5,000 CY
Plasticity Index	ASTM D4318	1/Source	1/5,000 CY
Standard Compaction	ASTM D698	1/Source	1/5,000 CY
Modified Compaction	ASTM D1557	1/Source	1/5,000 CY
Field Moisture/Density	ASTM D2922	Not Required	9/Lift or 1/100 LF
In-Place Methods	ASTM D1556 or D2167	Not Required	1/Day
Sand Bedding			
Gradation Test	ASTM D422	1/Source	1/5,000 CY
Carbonate Content	ASTM D3042	1/Source	Not Required
SUBANGULAR STONE (Specification Section 02233)			
Subangular stone tests will be performed by Professional Service Industries, Inc.			
AASHTO No. 2, 57, 67			
Gradation Test	ASTM D422	1/Source	1/1,000 CY
Carbonate Content	ASTM D3042	1/Source	Not Required
AASHTO No. 8			
Gradation Test	ASTM D422	1/Source	1/1,000 CY
Carbonate Content	ASTM D3042	1/Source	Not Required
Permeability Test	USCO EM1110-2-1906	1/Source	Not Required
IMPERMEABLE & PERMEABLE COVER FILL (Specification Section 02242)			
Impermeable and permeable cover fill test will be performed by Professional Service Industries, Inc. unless designated with **			
Cover Soil (Select Cover Fill)			
Gradation Test	ASTM D422	1/Source	1/2,000 CY
Plasticity Index	ASTM D4318	1/Source	1/5,000 CY
Direct Shear Test**	Section 02242	1/Source	1/2,000 CY
** Test to be performed by Golder Associates Ltd.			
Top Soil			
Gradation Test	ASTM D422	1/Source	1/2,000 CY
pH Test	ASTM D4972	1/Source	Not Required
Baker Soil Fertility Test**	Section 02242	1/Source	1/2,000 CY
** Test to be performed by Land Management Decisions, Inc.			
WETLANDS SEDIMENT REMEDIATION COVER SOILS (Specification Section 02243)			
Wetland sediment cover soil tests will be performed by Professional Service Industries, Inc. unless designated with **			
Wetland Gravel (Road Structural Fill: Section 02223)			
Gradation Test	ASTM D422	1/Source	1/5,000 CY
Wetland Topsoil (Topsoil Section 02937)			
Gradation Test	ASTM D422	1/Source	1/5,000 CY
pH Test	ASTM D4972	1/Source	1/5,000 CY
Organic Matter Content	Section 02937, Tbl 2	1/Source	1/5,000 CY
Soil Fertility Test**	Section 02937, Tbl 2	1/Source	1/5,000 CY
** Test to be performed by Land Management Decisions, Inc.			
STREAM SEDIMENT REMEDIATION COVER (Specification Section 02244)			
Stream sediment cover tests will be performed by Professional Service Industries, Inc.			
Grave /Cobble (Section 02271)			
Abrasion Test	ASTM C535	Not Required	Not Required
Freeze Thaw Test	AASHTO T103	Not Required	Not Required
Specific Gravity	ASTM C127	Not Required	Not Required
Gradation Test-Aggregate	ASTM C136	1/Source	Not Required

Table 2
Testing Methods for Soil and Geosynthetics
adapted from Golder's QAPP Table 1-1

7.2 TESTING METHODS	STANDARD	PRECONSTRUCTION FREQUENCY	CONSTRUCTION FREQUENCY
STONE RIPRAP (Specification Section 02271)			
Stone riprap tests will be performed by Professional Service Industries, Inc.			
Gravel/Cobble (d_{50}=3 inches) (Section 02271)			
Abrasion Test	ASTM C535	Not Required	Not Required
Freeze Thaw Test	AASHTO T103	Not Required	Not Required
Specific Gravity	ASTM C127	Not Required	Not Required
Gradation Test-Aggregate	ASTM C136	1/Source	Not Required
Streambed Sediment Filter and Gabion Rock (d_{50}=6 inches)			
Abrasion Test	ASTM C535	Not Required	Not Required
Freeze Thaw Test	AASHTO T103	Not Required	Not Required
Specific Gravity	ASTM C127	Not Required	Not Required
Gradation Test-Aggregate	ASTM C136	1/Source	Not Required
SUBBASE AND PAVEMENT (Specification Section 02575)			
Subbase and Pavement tests will be performed by Professional Service Industries, Inc.			
Graded Aggregate Base Course			
Gradation Test	AASHTO T11 & T27	1/Source	1/5,000 SY or 1 Day
Compacted Density	AASHTO T180 Method D	1/Source	1/5,000 SY or 1 Day
Abrasion Test*	AASHTO T96	1/Source	1/5,000 SY or 1 Day
Freeze Thaw Test*	AASHTO T103	1/Source	1/5,000 SY or 1 Day
(* as required by MDPW specifications)			
Binding and Wearing Asphalt Courses			
Extraction Test (Plant)	AASHTO T168	Not Required	1/500 Tons
Gradation Test (Plant)	AASHTO T11 or T27	Not Required	1/500 Tons
Density/Stability (Plant)	AASHTO T209, T245, T246, T247	Not Required	1/500 Tons
Max. Theoretical Density	ASTM D2041	Not Required	1/500 Tons
Max. Density - Marshall	AASHTO T209 or T245	Not Required	2/500 Tons
In place Density	ASTM D2950	Not Required	1/100 LF
In place Density (Core)	AASHTO T166	Not Required	1Core/500 SY
In place Thickness (Core)	AASHTO T166	Not Required	1 Core/500 SY
In place Smoothness Test	Section 02575	Not Required	1/100 LF
GEOTEXTILE (Specification Section 02595)			
Geotextile tests will be performed by Golder Construction Services, Inc.			
Non-woven, 8, 10, and 16 ounces/square yard			
Mass Per Unit Area	ASTM D5261	1/100,000 SF	Not Required
Grab Strength	ASTM D4632	1/100,000 SF	Not Required
Trapezoidal Tear Strength	ASTM D4533	1/100,000 SF	Not Required
Burst Strength	ASTM D3786	1/100,000 SF	Not Required
Puncture Strength	ASTM D4833	1/100,000 SF	Not Required
Thickness	ASTM D5199	1/100,000 SF	Not Required
Apparent Opening Size	ASTM D4751	1/100,000 SF	Not Required
GEOMEMBRANE (Specification Section 02597)			
Geomembrane tests will be performed by Golder Construction Services, Inc.			
Textured HDPE			
Thickness	ASTM D5199	1/100,000 SF	Not Required
Density	ASTM D1505	1/100,000 SF	Not Required
Minimum Tensile Properties:	ASTM D638	1/100,000 SF	Not Required
Tensile Strength, Yield			
Tensile Strength, Break			
Elongation at Yield			
Elongation at Break			
Tear Resistance	ASTM D1004 Die C	Not Required	Not Required
Low Temperature Brittleness	ASTM D746 Proc. B	Not Required	Not Required
Dimensional Stability	ASTM D1204	1/100,000 SF	Not Required
Environmental Stress Crack	ASTM D1693	Not Required	Not Required
Puncture Resistance	FTMS 101C Method 2065	Not Required	Not Required
Carbon Black Content	ASTM D1603	1/100,000 SF	Not Required
Carbon Black Dispersion	ASTM D3015	1/100,000 SF	Not Required
Shear Test	ASTM D4437 NSF Mod.	Not Required	1/500 LF
Peel Adhesion (Hot Wedge Fusion Weld)	ASTM D4437 NSF Mod.	Not Required	1/500 LF
Peel Adhesion (Fillet Extrusion Weld)	ASTM D4437 NSF Mod.	Not Required	1/500 LF

Table 2
Testing Methods for Soil and Geosynthetics
adapted from Golder's QAPP Table 1-1

7.2 TESTING METHODS	STANDARD	PRECONSTRUCTION FREQUENCY	CONSTRUCTION FREQUENCY
GEOCOMPOSITE (Specification Section 02598)			
Geocomposite tests will be performed by Golder Construction Services, Inc.			
Geocomposite (TEX-NET TN3002CN)			
Geocomposite Transmissivity @ 500 psf; Gradient = 1	ASTM D4716	1/100,000 SF	Not Required
Geocomposite Transmissivity @ 20,000 psf; Gradient = 1	ASTM D4716	1/100,000 SF	Not Required
Tensile Strength - Net only (prior to lamination)	ASTM D5035	Not Required	Not Required
Tensile Strength - Geotextile only (prior to lamination)	ASTM D4632	Not Required	Not Required
Geocomposite Peel Strength	ASTM D413	1/100,000 SF	Not Required
Density - Net only (prior to lamination)	ASTM D1505	Not Required	Not Required
Carbon Black Content - Net only (prior to lamination)	ASTM D1603	Not Required	Not Required
Thickness - Net only (prior to lamination)	ASTM D5199	Not Required	Not Required
Thickness - Geotextile only (prior to lamination)	ASTM D5199	Not Required	Not Required
Geotextile Mass/Unit Area	ASTM D5261	1/100,000 SF	Not Required
Apparent Opening Size - Geotextile only (prior to lamination)	ASTM D4751	Not Required	Not Required
GEOGRID (Specification Section 02599)			
Geocomposite tests will be performed by Golder Construction Services, Inc.			
Geocomposite (TEX-NET TN3002CN)			
Open Area	COE CW 02215-89	1/100,000 SF	Not Required
Thickness:	ASTM D5199	1/100,000 SF	Not Required
Ribs			
Junctions			
Long Term Design Load (MD)	ASTM D5262	Not Required	Not Required
Flexural Rigidity	ASTM D1388	1/100,000 SF	Not Required
Geogrid Rib Tensile Strength	GRI GG1	1/100,000 SF	Not Required
Junction Node Strength	GRI GG2	1/100,000 SF	Not Required
Strength			
Efficiency			
Density	ASTM D1248	1/100,000 SF	Not Required
Carbon Black Content	ASTM D1603	1/100,000 SF	Not Required
WETLAND MITIGATION (Specification Section 02937)			
Wetland sediment cover soil tests will be performed by Professional Service Industries, Inc. unless designated with **			
Wetland Cover Soil			
Gradation Test	ASTM D422	1/Source	1/Acre/Lift
Plasticity Index	ASTM D4318	1/Source	1/Acre/Lift
Standard Compaction	ASTM D698	1/Source	1/Source
Flexible Wall Perm Test **	ASTM D5084	1/Source	1/Acre/Lift
Field Moisture/Density	ASTM D2922	Not Required	1/10,000 SF
** Test will be performed by Golder Associates, Inc.			
CAST IN PLACE CONCRETE (Specification Section 03300)			
Cast in place concrete tests will be performed by Professional Service Industries, Inc.			
Compression Test Cylinders	ASTM C39	Not Required	4/Class/100 CY to
Making of Test Cylinders	ASTM C31	Not Required	4/Class/5,000 SF of
Testing of Aggregate	ASTM C33	Not Required	Concrete Place As

Notes:
QAPP = Quality Assurance Project Plan
ASTM = American Society for Testing and Materials
CY = cubic yard
LF = linear feet
AASHTO = American Association of State Highway and Transportation Officials
Tbl = Table
MDPW = Massachusetts Department of Public Works
SF = square foot
PSF = pounds per square foot

Table 3
Summary of Abbreviations
Property-Specific Cover Certification Reports
Industri-Plex Site

Mapping Location:

@	=	at
AAD	=	Atlantic Avenue Drainway
AL	=	Above Geotextile
AP	=	Above Pipe
BECO	=	Boston Edison Company right of way
BLDG	=	Building
BRD	=	Bradford
BSG	=	Below Subgrade
BTOB	=	Below Top of berm
CO	=	Company
COMM	=	Commerce (Way Extension)
DET	=	Detention Basin
E	=	East
EEOS	=	East End of Seam
ECHP	=	East Central Hide Pile
EXT	=	Extension
HUB	=	Hubbardston
MID	=	Middle
N	=	North
PLYM	=	Plymouth
PRES	=	Presidential (Way Extension)
REV	=	Revere
S	=	South
SEOS	=	South End of Seam
SG	=	Subgrade
STK	=	Stock (yard)
UGT	=	Under Ground Tank
UTIL	=	Utility
W	=	West
w/	=	with
WEOS	=	West End of Seam
WIL	=	Wilmington
WOB	=	Woburn

Cover Materials:

GB	=	Gravel Borrow (Subbase)
LL	=	Liquid Limit
MOIST	=	Optimum Moisture Content
NP	=	Non-Plastic
PCF	=	Pounds per Cubic Foot
PL	=	Plastic Limit
PSI	=	Pounds per Square Inch
PROC	=	Processed
SCRND	=	Screened
SD	=	Sand
SS	=	Site Soil
TRI	=	(Bardon) Trimount

INDUSTRI-PLEX SITE
OU-1 COVER CERTIFICATION REPORT
LOCUS OF TAX MAP LOT 10-1-8 (AKA LOT IC-17)
ATLANTIC AVENUE ASSOCIATES, INC.
RECORD DRAWINGS
WOBURN, MASSACHUSETTS
AUGUST 8, 2000

REFERENCE PLANS:

1. "REGIONAL TRANSPORTATION CENTER– WOBURN, MASSACHUSETTS" ALTERNATE COVER DESIGN– ISSUED FOR EPA/DEP APPROVAL. DATE ISSUED: MAY 14, 1995 LATEST ISSUE: JULY 26, 1996, BY VANASSE HANGEN BRUSTLIN, INC., WATERTOWN, MA

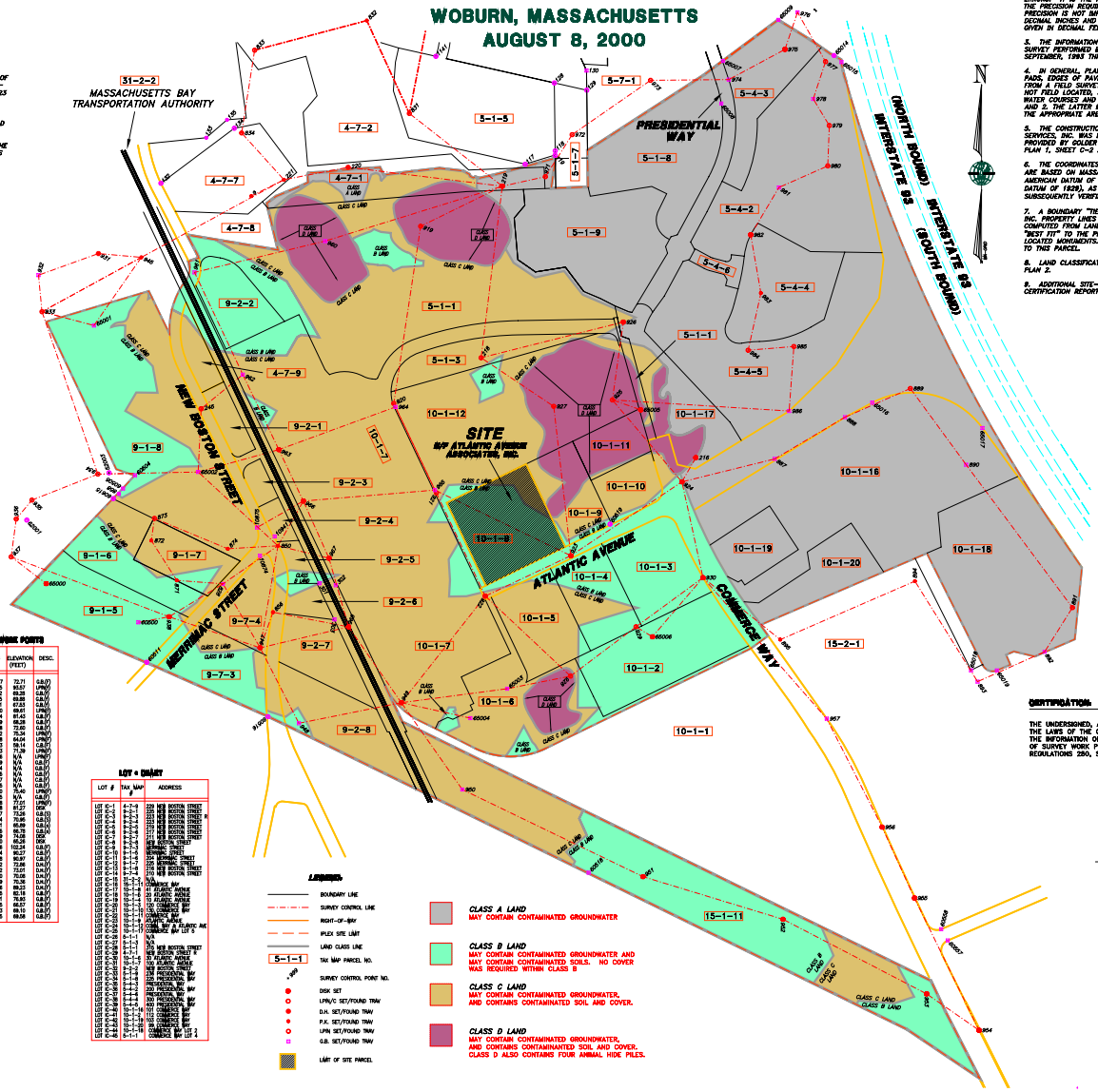
2. "INDUSTRIAL–PLEX SITE – WOBURN, MASSACHUSETTS – 100% DESIGN REPORT, PART I – REMEDIAL WORK FOR SOIL, SEDIMENTS AND AIR– VOLUME 7 OF 8", PREPARED BY GOLDER ASSOCIATES, MT. LAUREL, N.J.. APRIL 23, 1992.

3. "SUBDIVISION PLAN OF LAND IN WOBURN – PERFORMED BY DANA T. PERKINS – JANUARY 12, 1977", SCALE 1"=100'. CERT. OF TITLE NO. 151213 BOOK 886 PAGE 63, RECORDED AS PLAN NO.731(2) ON MAY 6 1977 AT SOUTH REGISTRY DISTRICT OF MIDDLESEX COUNTY.

4. "INDEX PLAN OF – LAND COURT SUBDIVISION – IN – WOBURN, MA" PREPARED FOR THE NORTHEAST REGIONAL TRANSPORTATION CENTER BY MASSACHUSETTS PORT AUTHORITY, DATED OCTOBER 21, 1996, SHEETS 1–8. LCC 7312.

5. "THE COMMONWEALTH OF MASSACHUSETTS – DEPARTMENT OF HIGHWAYS – PLAN AND PROFILE OF – ROUTE I–95 INTERCHANGE – IN THE CITY OF – WOBURN – MIDDLESEX COUNTY", SHEETS 18–23 OF 107, SCALE 1"=40', PREPARED BY VHB, INC. PROJECT NO. 072310.

6. "THE COMMONWEALTH OF MASSACHUSETTS – PLAN OF ROAD – IN THE CITY OF – WOBURN – MIDDLESEX COUNTY – ALTERED AND LAID OUT AS A STATE HIGHWAY – BY THE DEPARTMENT OF HIGHWAYS", SCALE 1" = 40' DATED MAY 21, 1987, ON FILE AT THE COMMONWEALTH OF MASSACHUSETTS, DEPARTMENT OF HIGHWAYS AS LAYOUT NO. 7378, PROJECT FILE NO. 072310.



NOTES:

1. THE OWNER OF RECORD FOR LOT 10-1-8 IS (NOW OR FORMERLY) ATLANTIC AVENUE ASSOCIATES, INC. C/O DAVID A. WELLES – 179 WESTLEDGE ROAD, WEST SHRSBURY CT. 06092. DEED REFERENCE TO PARCEL IS CERTIFICATE #153,647 BOOK 1049 PAGE 87, DATED SEPT. 26, 1988 AND FILED IN THE LAND REGISTRATION OFFICE OF THE SOUTH REGISTRY DISTRICT OF MIDDLESEX COUNTY.

2. ELEVATION RECORDS TABULATED ON THESE DRAWINGS WERE COMPILED FROM FIELD OBSERVATIONS COLLECTED BY ELECTRONIC TOTAL STATION AND DATA COLLECTION TECHNIQUES. ELEVATIONS ARE SHOWN TO ONE HUNDREDTH OF A FOOT FOR SIMPLICITY OF TABULATION AND TO REDUCE COMPOUNDING ROUNDING ERRORS. IT IS THE INTENTION OF THE SURVEY TO REFLECT ELEVATIONS ONLY TO THE PRECISION REQUIRED BY THE PROJECT SPECIFICATIONS. ADDITIONAL PRECISION IS NOT IMPLIED BY THE TABULATION. COVER DEPTHS ARE GIVEN IN DECIMAL INCHES AND CALCULATED BY MULTIPLYING THE ELEVATION DIFFERENCES GIVEN IN DECIMAL FEET BY 12.

3. THE INFORMATION CONTAINED HEREIN IS THE RESULT OF AN ON–SITE FIELD SURVEY PERFORMED BY MERIDIAN LAND SERVICES, INC. DURING THE PERIOD OF SEPTEMBER, 1999 THROUGH JANUARY, 2000.

4. IN GENERAL, PLAN GRAPHICS SUCH AS BUILDINGS, WALKWAYS, CONCRETE PADS, EDGES OF PAVEMENT, CURBING, DRAINAGE FEATURES, ETC. WERE LOCATED FROM A FIELD SURVEY BY THIS OFFICE. ADDITIONAL GRAPHIC REPRESENTATIONS, NOT FIELD LOCATED, SUCH AS NON–SEMBLANCE EDGES OF PAVEMENT, FENCE LINES, WATER COURSES AND ABUTTING DETAIL WERE TAKEN FROM REFERENCE PLANS 1 AND 2. THE LATTER MENTIONED DETAIL WILL BE REFERENCED ON THE PLAN WITHIN THE APPROPRIATE AREAS.

5. THE CONSTRUCTION SURVEY CONTROL NETWORK USED BY MERIDIAN LAND SERVICES, INC. WAS DERIVED ENTIRELY FROM THE EXISTING SITE CONTROL POINTS PROVIDED BY GOLDER ASSOCIATES AND VHB, INC., AS SHOWN ON REFERENCE PLAN 1, SHEET C–2 AND REFERENCE PLAN 2, SHEETS 11–1A THRU 11–1D.

6. THE COORDINATES AND ELEVATIONS OF THE EXISTING SITE CONTROL POINTS ARE BASED ON MASSACHUSETTS GRID COORDINATE SYSTEM/NAD–27 (NORTH AMERICAN DATUM OF 1927) AND NGVD–29 (THE NATIONAL GEODETIC VERTICAL DATUM OF 1929), AS STATED IN THE REFERENCE PLAN 2 NOTE 3 & WERE SUBSEQUENTLY VERIFIED BY THIS OFFICE VIA GPS (GLOBAL POSITIONING) IN 2001.

7. A BOUNDARY "TIE IN" SURVEY WAS PERFORMED BY MERIDIAN LAND SERVICES, INC. PROPERTY LINES SHOWN HEREON WERE COMPILED AND MATHEMATICALLY COMPUTED FROM LAND COURT CASE NUMBER 7312. THESE COMPUTED PLANS WERE "BEST FIT" TO THE PROJECT COORDINATE SYSTEM USING NUMEROUS FIELD LOCATED MONUMENTS. SEE REFERENCE PLAN #3 FOR BOUNDARY LINES PERTAINING TO THIS PARCEL.

8. LAND CLASSIFICATION LINES SHOWN HEREON WERE TAKEN FROM REFERENCE PLAN 2.

9. ADDITIONAL SITE–WIDE INFORMATION CAN BE FOUND IN THE MASTER COVER CERTIFICATION REPORT, INCLUDING, MASTER RECORD DRAWINGS.

CERTIFICATION:

THE UNDERSIGNED, A DULY REGISTERED PROFESSIONAL LAND SURVEYOR UNDER THE LAWS OF THE COMMONWEALTH OF MASSACHUSETTS, HEREBY CERTIFIES THAT THE INFORMATION ON THESE RECORD PLANS CONTAINED HEREIN IS THE RESULT OF SURVEY WORK PERFORMED IN CONFORMANCE WITH THE CODE OF MASSACHUSETTS REGULATIONS 250, SECTION 6.03.

PROFESSIONAL LAND SURVEYOR DATE

SURVEY CONTROL NETWORK POINTS

POINT #	NORTHING (FEET)	EASTING (FEET)	ELEVATION (FEET)	DESC.
9	556829.94	696197.41	88.93	PK/C(a)
11	554791.93	696324.79	93.29	MON(a)
117	554905.71	696605.05	119.44	LPIN(r)
118	554877.42	696614.58	120.14	LPIN(r)
119	554877.43	696713.51	126.79	LPIN(r)
120	556005.46	696613.05	95.27	C.B.(f)
138	555713.88	696740.29	115.61	LPIN(r)
139	555276.16	696860.59	117.47	LPIN(r)
140	555275.20	696859.55	118.61	C.B.(f)
152	554847.71	694915.95	78.43	LPIN(r)
153	555008.80	695126.18	96.01	P.K.(f)
154	555102.46	695256.34	96.55	LPIN(r)
155	555142.01	695222.55	95.28	P.K.(f)
157	555952.41	696264.79	90.59	C.B.(f)
216	553575.07	697806.19	72.34	DISK
218	554128.23	696420.64	91.30	LPIN(r)
219	554833.75	696496.27	113.01	DISK
220	554921.67	696794.06	73.06	D.H.(f)
221	554962.86	696496.32	96.95	P.K.(f)
246	553901.79	695702.81	70.74	PN/C(a)
301	552991.88	695775.71	67.70	C.B.(f)
302	552963.08	695726.35	68.00	C.B.(f)
303	552824.40	695720.62	69.62	C.B.(f)
761	555114.48	696995.21	58.42	C.B.(f)
762	555265.43	697111.80	57.42	C.B.(f)
764	555266.53	697111.80	57.50	C.B.(f)
765	555155.77	697325.27	54.70	C.B.(f)
766	555150.19	696806.56	56.99	PN/C(d)
828	552996.66	695304.98	72.48	MON(f)
831	555171.27	696947.05	52.14	PN/C(a)
832	555622.39	695670.60	56.06	P.K.(a)
833	555464.48	695703.07	76.24	PN/C(a)
834	555360.77	695203.39	56.82	PN/C(a)
850	553156.01	695495.74	65.79	P.K.(f)
857	554268.42	694914.00	73.19	PN/C(d)
868	553407.27	694721.18	73.66	P.K.(d)
871	553005.63	694989.09	75.27	P.K.(a)
872	553156.49	694971.47	74.35	P.K.(a)
873	553263.14	694886.21	73.74	PN/C(a)
874	553152.42	695235.83	72.96	P.K.(a)
887	553569.05	697762.19	74.67	C.B.(a)
888	553762.69	698362.16	75.46	C.B.(f)
889	553966.58	698391.10	74.41	PN/C(a)
890	553542.21	698464.64	72.87	C.B.(a)
891	553879.28	698142.49	69.34	PN/C(a)
892	552874.64	699013.67	69.56	C.B.(a)
893	552536.04	698702.70	69.67	C.B.(a)
894	553302.10	698412.19	69.40	MON(a)
895	552730.69	697997.70	67.50	MON(a)
919	554406.09	696729.90	106.02	PN/C(a)
921	553624.01	695905.76	78.40	PN/C(a)
922	553513.87	695625.19	71.72	PN/C(a)
923	553521.88	695433.28	71.72	DISK
923	553720.20	696116.40	72.78	DISK
924	553402.61	697337.71	69.39	DISK
925	553842.55	697509.22	94.98	PN/C(a)
926	554203.87	697500.39	78.00	DISK
927	553812.76	696737.39	107.69	PN/C(a)
928	552961.74	696628.28	38.15	PN/C(a)
929	552760.55	697119.09	71.76	PN/C(a)
930	553178.62	697628.04	69.02	DISK
931	554021.49	694226.27	87.39	D.H.(f)
932	554121.34	694334.31	101.39	D.H.(f)
933	554251.87	694354.50	90.95	PN/C(a)
934	554386.24	694317.98	90.35	PN/C(a)
935	554506.01	694311.91	91.03	PN/C(a)
936	552360.61	694245.09	61.03	PN/C(a)
937	552174.85	694221.08	67.94	PN/C(a)
938	552836.93	694553.72	80.60	DISK
943	554614.66	696797.90	N/A	C.B.(f)
945	554003.77	694525.96	74.68	P.K.(f)
947	552800.73	695776.15	65.52	DISK
948	552343.09	695555.77	63.57	C.B.(a)
949	552436.47	695430.92	71.73	DISK
950	553535.73	696313.53	68.40	C.B.(a)
951	551531.65	697611.14	65.87	DISK
952	551433.89	697930.32	73.66	DISK
953	551513.77	697930.32	73.66	DISK
954	550919.29	697639.73	63.45	DISK
955	551532.44	698410.23	63.71	DISK
956	551961.31	698260.16	65.21	DISK
957	552364.28	698005.18	67.73	C.B.(f)
960	554676.37	696477.26	96.32	C.B.(a)
961	554434.15	696271.84	90.91	C.B.(a)
962	553862.50	695265.87	79.76	C.B.(a)
963	553612.09	695422.70	78.81	DISK
964	553610.44	695421.71	79.47	C.B.(a)
965	553424.46	695196.34	79.67	C.B.(a)
966	553251.66	695000.34	74.67	C.B.(a)
967	553108.66	694855.30	74.68	DISK
968	552760.10	695795.11	73.69	DISK
971	554679.15	696685.61	128.11	PN/C(a)
972	555573.02	696822.49	125.79	PN/C(a)
973	555324.98	697186.40	117.15	PN/C(a)
974	555328.29	697548.61	98.63	C.B.(f)
975	555468.36	697935.00	92.45	DISK
976	555840.49	697867.72	72.09	C.B.(a)
977	555411.42	697867.77	95.47	PN/C(a)
978	555235.37	697940.64	70.49	C.B.(f)
979	555175.28	698015.18	67.78	PN/C(a)
980	554928.03	698395.18	60.83	PN/C(a)
981	554825.02	697781.82	76.05	DISK
982	554605.27	697661.98	76.05	DISK
983	554337.41	697539.98	76.28	MON(a)
984	554127.10	697535.98	76.18	MON(a)
985	554060.37	697800.98	75.15	PN/C(a)

SURVEY CONTROL NETWORK POINTS

POINT #	NORTHING (FEET)	EASTING (FEET)	ELEVATION (FEET)	DESC.
986	553791.19	697828.87	72.71	C.B.(f)
1141	556436.21	696190.95	90.57	LPIN(r)
10876	557118.50	695376.62	69.28	C.B.(f)
10878	557300.98	695361.95	69.88	C.B.(f)
10879	557300.98	695361.95	69.88	C.B.(f)
60001	553524.19	695695.61	67.51	C.B.(f)
60002	552817.04	694811.44	81.42	C.B.(f)
60003	553463.08	694795.89	68.26	C.B.(f)
60006	553431.74	694740.48	72.60	C.B.(f)
60011	552636.22	694800.13	75.34	LPIN(r)
60016	552373.96	695413.38	64.34	LPIN(r)
60018	551800.54	696023.21	59.14	C.B.(f)
60019	552366.42	696960.62	73.38	LPIN(r)
60020	552366.42	696960.62	73.38	LPIN(r)
60049	553444.47	697661.29	N/A	C.B.(f)
60051	550098.62	697563.34	N/A	C.B.(f)
60052	550113.64	697601.08	N/A	C.B.(f)
60057	551335.71	698044.07	N/A	C.B.(f)
60058	551358.23	698034.35	N/A	C.B.(f)
60059	553360.09	694995.50	N/A	LPIN(r)
60060	553360.09	694995.50	N/A	LPIN(r)
60061	553536.48	694294.18	77.01	LPIN(r)
60066	553360.73	694384.08	81.57	DISK
60067	554187.98	694604.57	75.26	C.B.(f)
60068	553604.43	695086.74	70.96	C.B.(f)
60069	552563.21	696021.21	65.69	C.B.(f)
60070	552366.69	696360.88	66.78	C.B.(f)
60071	552366.69	696360.88	66.78	C.B.(f)
60072	554774.13	697164.95	92.28	C.B.(f)
60077	555414.66	697623.06	102.54	C.B.(f)
60078	555577.23	697614.54	90.27	C.B.(f)
60079	555605.38	697779.98	90.97	C.B.(f)
60080	555605.38	697779.98	90.97	C.B.(f)
60081	555605.38	697779.98	90.97	C.B.(f)
60082	555762.94	697866.33	73.66	D.H.(f)
60083	555762.94	697866.33	73.66	D.H.(f)
60084	555762.94	697866.33	73.66	D.H.(f)
60085	555605.38	698036.86	69.33	D.H.(f)
60086	555605.38	698036.86	69.33	D.H.(f)
60087	553862.15	698071.86	82.18	C.B.(f)
60088	553829.73	698214.05	76.93	C.B.(f)
60089	553773.31	698235.06	64.67	C.B.(f)
60090	553846.51	698472.03	69.10	C.B.(f)
60091	552966.51	698760.15	69.08	C.B.(f)

LOT + OWNER

LOT #	TAX MAP #	ADDRESS
10-1-1	4-2-3	229 NEW BOSTON STREET
10-1-2	4-2-4	229 NEW BOSTON STREET
10-1-3	4-2-5	229 NEW BOSTON STREET
10-1-4	4-2-6	229 NEW BOSTON STREET
10-1-5	4-2-7	229 NEW BOSTON STREET
10-1-6	4-2-8	211 NEW BOSTON STREET
10-1-7	4-2-9	211 NEW BOSTON STREET
10-1-8	4-2-1	211 NEW BOSTON STREET
10-1-9	4-2-2	211 NEW BOSTON STREET
10-1-10	4-2-1	MERRIMAC STREET
10-1-11	4-2-1	MERRIMAC STREET
10-1-12	4-2-1	MERRIMAC STREET
10-1-15	4-2-1	204 MERRIMAC STREET
10-1-16	4-2-1	204 MERRIMAC STREET
10-1-17	4-2-1	204 NEW BOSTON STREET
10-1-18	4-2-1	210 NEW BOSTON STREET
10-1-19	4-2-1	N/A
10-1-20	4-2-1	N/A
15-2-1	4-2-1	275 NEW BOSTON STREET
15-1-11	4-2-1	NEW BOSTON STREET & COMMERCE WAY LOT 3
5-1-1	4-2-1	20 ATLANTIC AVENUE
5-1-2	4-2-1	20 ATLANTIC AVENUE
5-1-3	4-2-1	10 ATLANTIC AVENUE
5-1-4	4-2-1	10 ATLANTIC AVENUE
5-1-5	4-2-1	100 COMMERCE WAY
5-1-6	4-2-1	100 COMMERCE WAY
5-1-7	4-2-1	100 COMMERCE WAY
5-1-8	4-2-1	100 COMMERCE WAY
5-1-9	4-2-1	100 COMMERCE WAY
5-4-2	4-2-1	100 COMMERCE WAY
5-4-3	4-2-1	100 COMMERCE WAY
5-4-4	4-2-1	100 COMMERCE WAY
5-4-5	4-2-1	100 COMMERCE WAY
5-4-6	4-2-1	100 COMMERCE WAY
9-1-5	4-2-1	230 PRESIDENTIAL WAY
9-1-6	4-2-1	230 PRESIDENTIAL WAY
9-1-7	4-2-1	230 PRESIDENTIAL WAY
9-1-8	4-2-1	230 PRESIDENTIAL WAY
9-2-1	4-2-1	230 PRESIDENTIAL WAY
9-2-2	4-2-1	230 PRESIDENTIAL WAY
9-2-3	4-2-1	230 PRESIDENTIAL WAY
9-2-4	4-2-1	230 PRESIDENTIAL WAY
9-2-5	4-2-1	230 PRESIDENTIAL WAY
9-2-6	4-2-1	230 PRESIDENTIAL WAY
9-2-7	4-2-1	400 PRESIDENTIAL WAY
9-2-8	4-2-1	400 PRESIDENTIAL WAY
9-3-7	4-2-1	110 COMMERCE WAY
9-4-7	4-2-1	110 COMMERCE WAY
9-7-1	4-2-1	90 COMMERCE WAY
9-7-2	4-2-1	COMMERCE WAY LOT 2
9-7-3	4-2-1	COMMERCE WAY LOT 3
9-7-4	4-2-1	COMMERCE WAY LOT 4

LEGEND:

- BOUNDARY LINE
- SURVEY CONTROL LINE
- RIGHT–OF–WAY
- IPLEX SITE LIMIT
- LAND CLASS LINE
- 5-1-1 TAX MAP PARCEL NO.
- 1.499 SURVEY CONTROL POINT NO.
- DISK SET
- LPIN/C SET/FOUND TRAV
- D.H. SET/FOUND TRAV
- P.K. SET/FOUND TRAV
- LPIN SET/FOUND TRAV
- C.B. SET/FOUND TRAV
- LIMIT OF SITE PARCEL

CLASS A LAND
MAY CONTAIN CONTAMINATED GROUNDWATER

CLASS B LAND
MAY CONTAIN CONTAMINATED GROUNDWATER AND MAY CONTAIN CONTAMINATED SOILS. NO COVER WAS REQUIRED WITHIN CLASS B

CLASS C LAND
MAY CONTAIN CONTAMINATED GROUNDWATER, AND CONTAINS CONTAMINATED SOIL AND COVER.

CLASS D LAND
MAY CONTAIN CONTAMINATED GROUNDWATER, AND CONTAINS CONTAMINANTED SOIL AND COVER. CLASS D ALSO CONTAINS FOUR ANIMAL HIDE PILES.

RESTRICTED AREAS BY CLASSES OF LAND

CLASS OF LAND	DESCRIPTION
A	MAY CONTAIN CONTAMINATED GROUNDWATER
B	MAY CONTAIN CONTAMINATED GROUNDWATER, AND MAY CONTAIN CONTAMINATED SOILS. NO COVER WAS REQUIRED WITHIN CLASS B.
C	MAY CONTAIN CONTAMINATED GROUNDWATER, AND CONTAINS CONTAMINATED SOIL AND COVER.
D	MAY CONTAIN CONTAMINATED GROUNDWATER, AND CONTAINS CONTAMINATED SOIL AND COVER. CLASS D ALSO CONTAINS FOUR ANIMAL HIDE PILES.

GRAPHIC SCALE
200' 100' 0 200' 400' 600'

REV.	DATE	DESCRIPTION	DRN.	CKD.
1	9/20/00	FINAL SUBMISSION	TC	MJP
H	8/30/00	EPA COMMENTS OF 8/23/00	DRN.	MJP
G	8/18/00	EPA & DEP COMMENTS OF 8/10/00	TC	MJP
F	8/7/00	EPA & DEP COMMENTS OF 8/3/00	JF	CAL
E	8/1/00	EPA & DEP COMMENTS OF 7/26/00	JF	MJP
D	7/26/00	EPA & DEP COMMENTS OF 7/12/00	JF	MJP
C	6/14/00	DEP REVISIONS	JF	MJP
B	5/12/00	EPA REVISIONS	JF	MJP
A	8/8/00	ISSUE FOR REVIEW	JF	MJP

PROFESSIONAL LAND SURVEYOR

PROFESSIONAL ENGINEER

ROUX ASSOCIATES, INC.
Environmental Consulting & Management

MERIDIAN Land Surveying, Inc.
Land Development • Environmental • Construction Services
Serving Massachusetts, New Hampshire & Maine

Golder Associates
400 Commercial Street
Manchester, New Hampshire 03101
603-668-0880 FAX 603-668-1199

DIG SAFE
1-888-344-7233

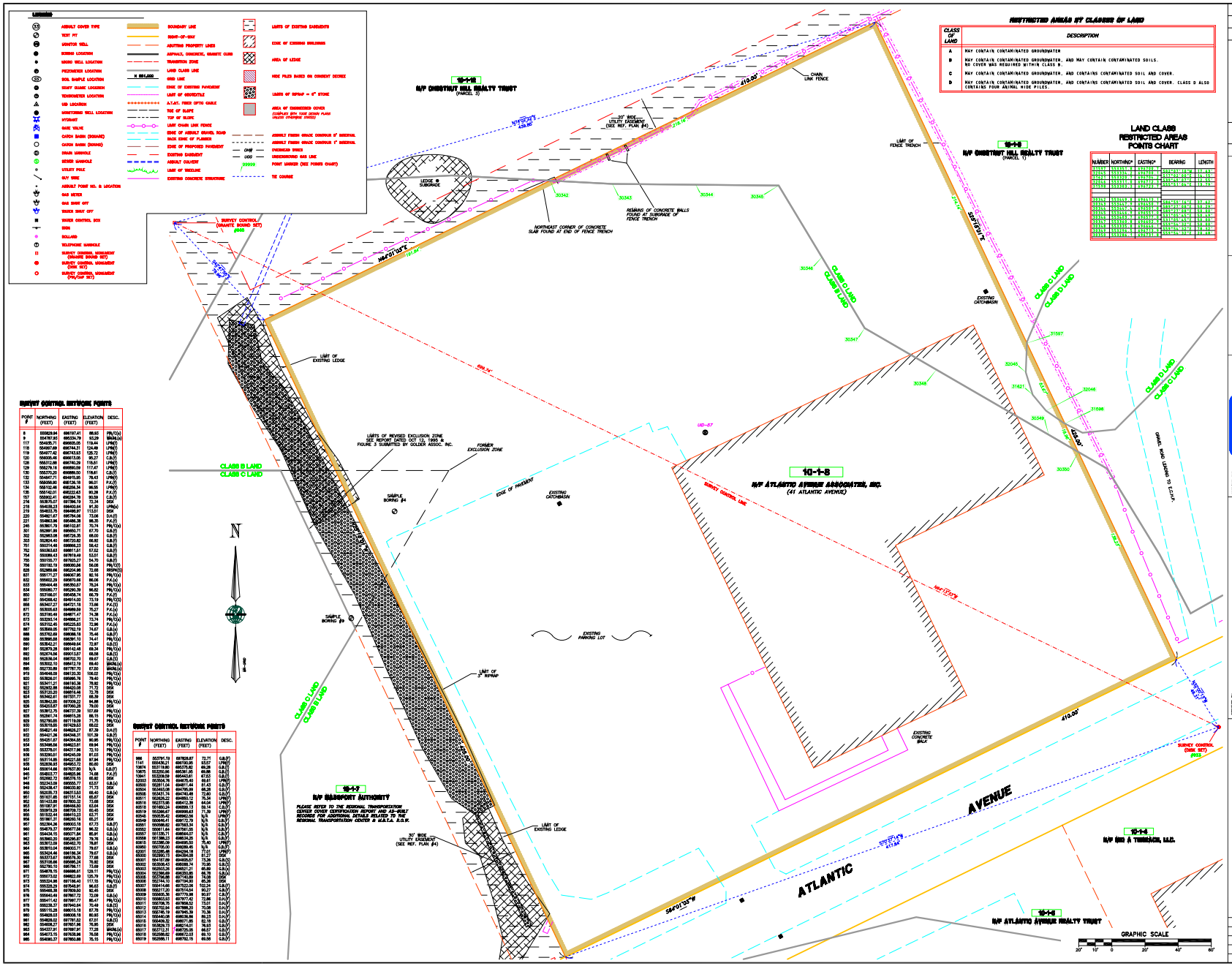
PROJECT RECORD (TAX MAP LOT 10-1-8)
N/F ATLANTIC AVENUE ASSOCIATES, INC.
INDUSTRI-PLEX SITE REMEDIAL TRUST
WOBURN, MASSACHUSETTS

SCALE: 1" = 200' AUGUST 8, 2000

DESIGNED BY: MJP
DRAFTED BY: MJP
CHECKED BY: JGK
FILE: 2900081F1.dwg
DO NOT SCALE DRAWING

B-11
SHEET NO.
PROJECT: 2900.00
SHEET 1 OF 5

Sep 24, 2009 – 4:06pm MJP Land Desktop 2004 – LD04
H:\Proj\2900\2900-08\2900.00-08\2900.00-08\B11\B-11.dwg

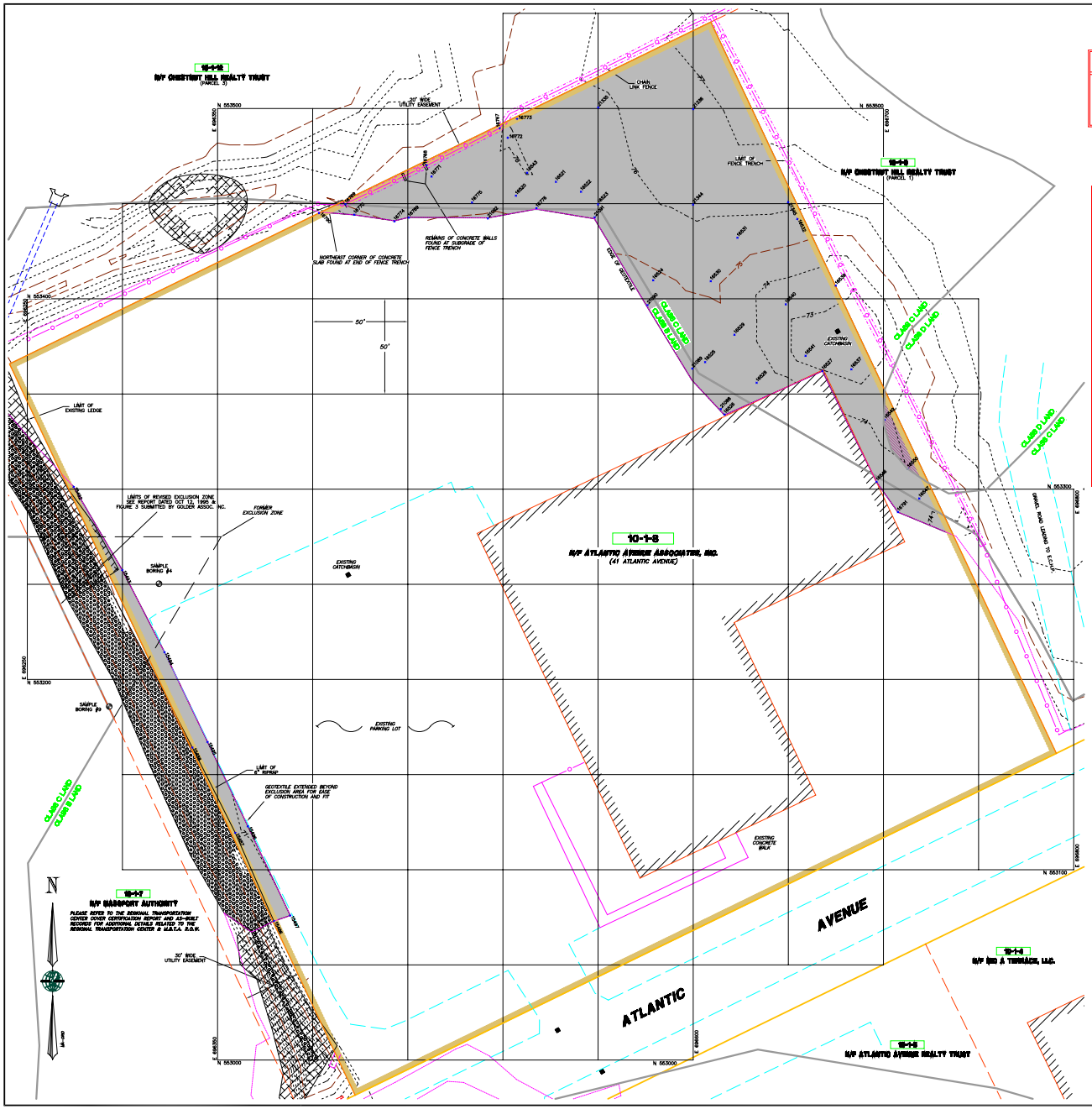


RESTRICTED AREAS BY CLASSES OF LAND

CLASS OF LAND	DESCRIPTION
A	MAY CONTAIN CONTAMINATED GROUNDWATER
B	MAY CONTAIN CONTAMINATED GROUNDWATER, AND MAY CONTAIN CONTAMINATED SOILS. NO COVER WAS REQUIRED WITHIN CLASS B.
C	MAY CONTAIN CONTAMINATED GROUNDWATER, AND CONTAINS CONTAMINATED SOIL AND COVER.
D	MAY CONTAIN CONTAMINATED GROUNDWATER, AND CONTAINS CONTAMINATED SOIL AND COVER. CLASS D ALSO CONTAINS FOUR ANIMAL HIDE PILES.

LAND CLASS RESTRICTED AREAS POINTS CHART

NUMBER	NORTHING*	EASTING*	BEARING	LENGTH
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]



RESTRICTED AREAS BY CLASSES OF LAND

CLASS OF LAND	DESCRIPTION
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MERIDIAN LAND SERVICES POINTS TABLE

Point Number	Northing	Easting	Subgrade Elevation Cov. Feet	Cover Grade Elev. Feet	Cover Depth Inches	Finish Grade Elev. Feet	Finish Grade Depth Inches	Total Depth Inches	Desc.
15486	553079.2	694379.4	69.57	69.61	12.48	70.97	7.12	21.60	TOB
15487	553119.2	694359.4	69.97	69.84	10.44	70.91	12.04	23.28	TOB
15488	553146.4	694336.7	69.87	69.82	11.28	70.75	11.28	23.40	TOB
15492	553301.3	694274.3	69.12	70.27	13.80	70.94	8a	21.84	PLNTR
15493	553257.9	694299.4	69.27	70.27	15.96	70.94	8a	23.88	PLNTR
15494	553214.5	694322.1	69.64	70.01	16.44	70.51	6.00	22.44	PLNTR
15495	553167.3	694344.7	69.80	70.13	15.84	70.63	6.96	22.80	PLNTR
15496	553123.4	694366.0	69.44	70.16	8.64	71.11	15.48	23.64	PLNTR
15497	553079.4	694387.3	69.54	70.11	6.96	70.91	4.32	11.28	PLNTR
16520	553434.9	694527.1	73.44	75.84	28.20	75.87	2.40	30.60	LIN-EXC
16521	553441.4	694527.7	73.43	75.82	28.68	75.87	0.48	29.28	LIN-EXC
16522	553434.4	694541.1	73.73	75.79	27.72	75.77	0.00	28.20	LIN-EXC
16523	553439.2	694550.9	73.83	75.19	16.32	75.48	6.92	21.24	LIN-EXC
16524	553449.8	694579.3	73.28	74.92	19.92	74.83	5.64	19.56	LIN-EXC
16525	553359.4	694684.3	72.51	73.75	15.00	73.99	2.88	17.76	LIN-EXC
16526	553339.8	694694.1	72.34	74.27	15.96	74.27	0a	15.96	LIN-EXC
16527	553362.0	694697.5	71.82	72.64	12.24	73.03	4.68	16.92	CONSTRUCTION
16528	553388.9	694703.3	71.93	73.79	16.80	73.79	0a	16.80	BR
16529	553388.9	694623.2	72.79	73.79	12.96	74.64	10.20	23.16	BR
16530	553408.6	694689.4	73.36	74.44	12.96	75.25	9.72	22.68	BR
16531	553432.2	694694.1	73.47	75.12	12.24	75.63	6.12	18.36	BR
16532	553441.7	694691.4	74.15	75.19	12.48	75.78	7.20	19.68	BR
16537	553343.2	694693.1	70.93	71.98	12.48	72.49	6.12	18.72	BR
16539	553486.7	694674.8	71.31	72.32	12.12	73.25	11.16	23.28	BR
16543	553397.1	694698.8	72.12	73.12	12.00	73.12	0a	12.00	BR
16541	553379.1	694696.8	72.71	73.45	12.48	73.58	1.56	13.92	BR
16542	553379.1	694696.8	72.71	73.45	12.48	73.58	1.56	13.92	BR
16546	553393.7	694676.2	73.15	73.75	8.28	74.34	7.32	7.68	LIN-EXC
16547	553295.2	694718.7	72.30	73.74	17.52	74.19	5.16	22.68	LIN-EXC
16549	553336.3	694703.2	72.43	73.14	12.72	73.66	7.32	19.44	B
16550	553319.7	694713.9	72.56	73.58	12.24	74.04	5.52	17.76	B
16747	553449.7	694498.1	69.36	75.37	79.32	75.97	7.20	86.52	CLOTCH
16748	553479.1	694449.9	68.56	75.29	80.76	75.81	6.24	93.00	CLOTCH
16749	553449.9	694449.9	68.32	74.44	63.84	75.37	6.24	69.60	CLOTCH
16774	553444.5	694422.3	72.47	74.24	21.96	74.58	3.48	25.44	TOB
16771	553444.5	694422.3	72.47	74.24	21.96	74.58	3.48	25.44	TOB
16772	553444.4	694502.1	73.49	75.45	22.68	74.94	5.04	30.48	TOB
16773	553444.4	694547.4	73.54	75.43	22.68	75.91	5.76	28.44	TOB
16774	553441.9	694563.1	73.57	74.87	19.20	75.14	6.84	25.68	E.EXC
16775	553459.8	694583.9	73.22	75.29	23.76	75.73	4.56	28.32	E.EXC
16776	553447.2	694577.9	72.51	74.95	25.44	75.42	4.56	30.00	E.EXC
16780	553443.3	694635.9	73.08	74.73	19.44	75.14	5.52	24.96	TRAN
16779	553443.3	694635.9	73.08	74.73	19.44	75.14	5.52	24.96	TRAN
16781	553287.1	694701.5	73.42	74.85	17.28	74.43	4.92	22.12	TRAN
16782	553287.1	694701.5	73.42	74.85	17.28	74.43	0a	17.28	TRAN
21989	553357.9	694599.1	72.94	73.44	6.96	74.00	4a	10.96	TRAN
21990	553396.0	694575.7	73.45	74.28	9.84	74.62	4a	11.64	TRAN
21991	553396.0	694575.7	73.45	74.28	18.84	75.27	3.72	22.56	TRAN
21992	553442.6	694572.4	73.54	74.33	6.48	74.71	4.56	11.04	TRAN
21335	553569.3	694688.9	74.43	75.37	16.32	75.98	7.20	23.52	GRID
21334	553569.3	694688.9	75.41	76.47	12.72	76.75	9.36	16.08	GRID
21340	553449.8	694688.1	74.43	75.14	12.36	75.77	7.20	21.36	GRID
21343	553449.8	694649.8	74.69	75.72	12.36	76.19	5.64	18.00	GRID

POINT DESCRIPTORS

A	AERO	HYD	HYDRANT
BEOP	BACK EDGE OF PLANTER	K	KOSTER
BLDG	BUILDING	LIN	LINE
BWOT	BOTTOM WALL	LW	LUMPTON WELL
BRK	BREAK-IN SLOPE	M	MONITOR WELL (NOT RP REALTY TRUST)
C&W	CONTOUR INTERVAL	PLNTR	PLANTER
CG	COVER GRADE	PC	POINT OF CURVATURE
CNNL	CHANNEL	POC	POINT ON CURVE
CL	CENTERLINE	PT	POINT OF TANGENCY
CLF	CHAIN LINK FENCE	PX	PX REALTY
CONT	CONTOURS	R	RADIUM
COR	CORNER	RD	ROAD
CB	CATCH BASIN	REM	REMEDIATION
CURB$_A$	ASPHALT CURB	RPRP	RIPRAP
CURB$_G$	GRANITE CURB	SG	SUBGRADE
D	DAGATA	SL	SLOPE
DTCH	DITCH	SNL	SNALE
E	EDGE OF	TOB	TOP OF BANK
E.C.	EDGE OF CONCRETE	TOE	TOE OF SLOPE
E.P.	EDGE OF PAVEMENT	TOP	TOP OF SLOPE
EX	EXCAVATION	TRAN	TRANSITION ZONE
EZ	EXCLUSION ZONE	UG	UNDERGROUND
FAB	FABRIC	UCR	NORTH UTILITY CORRIDOR
FG	FINISH GRADE	UP	UTILITY POLE
G	GENERAL POINT	WG	WATERGATE
GUY	GUY WIRE	RRBD	RAILROAD BED

LEGEND

BOUNDARY LINE	ASPHALT COVER TYPE
RIGHT-OF-WAY	TEMP PIN
ABUTTING PROPERTY LINES	MONITOR WELL
ASPHALT, CONCRETE, GRANITE CURB	HYDRANT
TRANSITION ZONE	GATE VALVE
LAND CLASS LINE	CATCH BASIN (ROUND)
N 694,000 GRID LINE	CATCH BASIN (SQUARE)
EDGE OF EXISTING PAVEMENT	DRAIN MANHOLE
LIMIT OF BITUMINOUS	SEWER MANHOLE
A.T.&T. FIBER OPTIC CABLE	UTILITY POLE
TOE OF SLOPE	GUY WIRE
TOP OF SLOPE	14000 ASPHALT POINT NO. & LOCATION
LIMIT CHAIN LINK FENCE	GAS METER
EDGE OF ASPHALT GRAVEL ROAD	GAS SHUT OFF
BACK EDGE OF PLANTER	WATER SHUT OFF
EDGE OF PROPOSED PAVEMENT	WATER CORBOXL BOX
EXISTING EASEMENT	SIGN
ASPHALT CULVERT	BOLLARD
LIMIT OF TREELINE	TELEPHONE MANHOLE
EXISTING CONCRETE SUBSURFACE	BORING LOCATION
ASPHALT FINISH GRADE CONTOUR 5' INTERVAL	MICRO WELL LOCATION
ASPHALT FINISH GRADE CONTOUR 1' INTERVAL	PIEZOMETER LOCATION
OHW OVERHEAD WIRES	SOIL SAMPLE LOCATION
UGO UNDERGROUND GAS LINE	SEWER CLEANOUT LOCATION
	TEMPERATURE LOCATION
LIMITS OF EXISTING EASEMENTS	UG LOCATION
EDGE OF EXISTING BUILDINGS	MONITORING WELL LOCATION
AREA OF LEDGE	HIDE PILES BASED ON CONSENT DECREE
AREA OF CHANGED COVER (COMPLIES WITH THE GROUP PLANT UNDER CHANGED COVER)	LIMITS OF RIPRAP = 6" STONE

GRAPHIC SCALE
20' 10' 0 20' 40' 60'

REV.	DATE	DESCRIPTION	DRN.	DSN.
I	9/20/06	FINAL SUBMISSION	TC	NEP
H	8/30/06	EPA COMMENTS OF 4/28/06	TC	NEP
G	8/17/07	EPA & DEP COMMENTS OF 8/7/07	JF	JGK
F	8/17/06	EPA & DEP COMMENTS OF 8/7/06	JF	JGK
E	6/21/06	EPA & DEP COMMENTS OF 6/12/06	JF	NEP
D	6/14/06	DEP REVISIONS	JF	JGK
C	5/16/06	EPA REVISIONS	JF	JGK
B	4/28/06	DEP REVISIONS	JF	NEP
A	8/8/05	ISSUE FOR REVIEW	JF	NEP

DESIGNED BY: NEP
DRAFTED BY: NEP
CHECKED BY: JGK
FILE: 2900B515.dwg
DO NOT SCALE DRAWING

PROFESSIONAL LAND SURVEYOR

PROFESSIONAL ENGINEER

ROUX ASSOCIATES, INC.
Environmental Consulting & Management

MERIDIAN
Land Surveyors, Inc.
Boston • New Hampshire • Maine • New Jersey

Golder Associates
Manchester, New Hampshire
400 Commercial Street
Manchester, NH 03101
603-669-3900 FAX 603-669-1199

PROJECT RECORD (TAX MAP LOT 10-1-8)

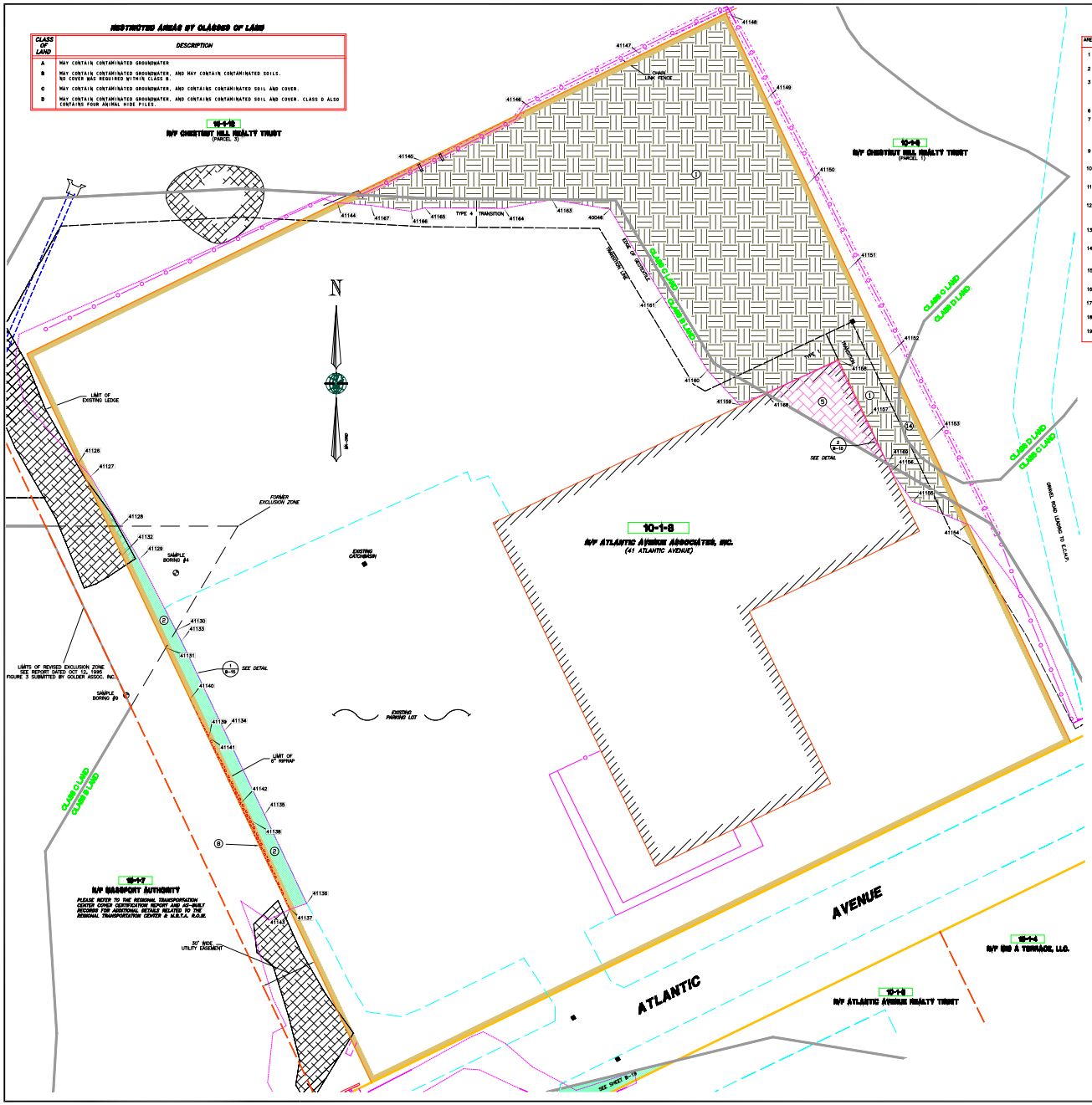
RECORD POINTS, TOPOGRAPHY & LIMITS OF ENGINEERED COVER

INDUSTRIA-PLEX SITE REMEDIAL TRUST
WOBURN, MASSACHUSETTS

SCALE: 1" = 20'
AUGUST 8, 2000

B-13
SHEET NO.
PROJECT: 2900.00
SHEET 3 OF 5

Sep 24, 2008 – 4:23pm – 4th Land Desktop 2004 – LD14
H:\Pro\2900\2900-4th\2900B515-AB-MULTI-D-HANDLL.\1



RESTRICTED AREAS BY CLASSES OF LAND

CLASS OF LAND	DESCRIPTION
A	MAY CONTAIN CONTAMINATED GROUNDWATER
B	MAY CONTAIN CONTAMINATED GROUNDWATER, AND MAY CONTAIN CONTAMINATED SOILS. NO COVER WAS REQUIRED WITHIN CLASS B.
C	MAY CONTAIN CONTAMINATED GROUNDWATER, AND CONTAINS CONTAMINATED SOIL AND COVER.
D	MAY CONTAIN CONTAMINATED GROUNDWATER, AND CONTAINS CONTAMINATED SOIL AND COVER. CLASS D ALSO CONTAINS FOUR ANIMAL HIDE PILES.

COVER TYPES (ENGINEERED)

AREA	ORIGINAL CONDITION	COVER TYPE
1	VARIES	ABOVE GRADE ENGINEERED PERMEABLE COVER
2	VARIES	AT GRADE ENGINEERED PERMEABLE COVER
3	PLANTER WITH GRASS SHRUBS, SMALL TREES	AT GRADE ENGINEERED PERMEABLE COVER
6	DRAINAGE SWALE	ENGINEERED COVER GRAVEL/COBBLE LINED
7	DRAINAGE SWALE	CONCRETE CULVERT (MENDON STREET, EAST HIDE PILE REMEDIATED SLOPE)
9	WETLANDS	ABOVE GRADE ENGINEERED PERMEABLE COVER (WETLANDS REMEDIATION)
10	WETLANDS	DREDGE SEDIMENT, PLACE PERMEABLE COVER (WETLANDS REMEDIATION)
11	EAST HIDE PILE	IMPERMEABLE COVER ENGINEERED (EAST HIDE PILE REMEDIATION)
12	VARIES	ABOVE GRADE ENGINEERED PERMEABLE COVER (EXTENT OF SOUTH HIDE PILE REMEDIATION)
13	SOUTH HIDE PILE	ABOVE GRADE ENGINEERED PERMEABLE COVER
14	EAST CENTRAL HIDE PILE	ABOVE GRADE ENGINEERED PERMEABLE COVER
15	DEPRESSION VEGETATION VARIES	AT GRADE ENGINEERED PERMEABLE COVER
16	RAILROAD LINES	ENGINEERED RAILROAD COVER
17	VARIES	PLACE TRENCH DRAIN
18	VARIES	GRAVEL ACCESS ROAD
19	CHROMIUM LAGOONS	FILL, ABOVE GRADE ENGINEERED PERMEABLE COVER

AREA	ORIGINAL CONDITION	COVER TYPE
20	CONCRETE FOUNDATION	CLEAN, CLEAN & PATCH
22	PAVED	REGRADE, ABOVE GRADE ENGINEERED ASPHALT
23	VARIES	PLACE CULVERT
24	CULVERT	EXTEND CULVERT
25	VARIES	SEE NOTE 4 (SHEET II-3D) (IN REFERENCE PLAN 2)
26	VARIES	ABOVE GRADE ENGINEERED ASPHALT COVER
27	VARIES	EXCAVATE, STORMWATER MANAGEMENT, ABOVE GRADE ENGINEERED COVER
28	DRAINAGE CHANNEL	DREDGE 16" SEDIMENT, PLACE GRAVEL/COBBLE LINING ENGINEERED COVER
29	EXISTING MDC SEWER SERVICE	RAISE MANHOLES
31	DRAINAGE SWALE	DREDGE 16", PLACE GRAVEL/COBBLE GROUNDWATER RECHARGE BASIN
32	VARIES	AT GRADE ENGINEERED COVER (GRAVEL SURFACE)
33	VARIES	ABOVE GRADE ENGINEERED COVER (GRAVEL SURFACE)
34	VARIES	GROUNDWATER TREATMENT PLANT
35	VEGETATION VARIES	AT GRADE ENGINEERED ASPHALT COVER
36	WEST HIDE PILE	ABOVE GRADE ENGINEERED PERMEABLE COVER
37	VARIES	GRAVEL/COBBLE LINED CREATED WETLAND STREAM

① & ⑭ ABOVE GRADE ENGINEERED PERMEABLE COVER

② AT GRADE ENGINEERED PERMEABLE COVER

COVER TYPE POINT CHART

NUMBER	NORTHING*	EASTING*
A1126	553308.3	694267.8
A1127	553301.2	694274.3
A1128	553275.0	694289.7
A1129	553273.4	694291.9
A1130	553279.4	694297.9
A1131	553210.9	694373.9
A1132	553259.4	694308.9
A1133	553214.3	694322.1
A1134	553167.1	694344.7
A1135	553122.9	694368.9
A1136	553079.8	694398.5
A1137	553072.3	694403.9
A1138	553119.4	694359.9
A1139	553164.2	694334.7
A1140	553183.8	694324.7
A1141	553163.8	694334.7
A1142	553128.3	694352.9
A1143	553447.1	694557.2
A1144	553447.5	694557.3
A1145	553447.5	694557.2
A1146	553523.5	694564.9
A1147	553543.4	694564.9
A1148	553580.2	694538.4
A1149	553555.2	694562.6
A1150	553349.9	694573.3
A1151	553344.8	694574.9
A1152	553319.4	694586.4
A1153	553275.9	694736.4
A1154	553287.9	694737.4
A1155	553303.7	694696.4
A1156	553332.4	694682.9
A1157	553362.9	694666.4
A1158	553357.2	694657.5
A1159	553357.2	694657.5
A1160	553396.0	694575.7
A1161	553447.1	694548.1
A1162	553447.2	694557.3
A1163	553447.5	694557.2
A1164	553443.8	694552.5
A1165	553443.8	694552.5
A1166	553443.8	694552.5
A1167	553344.8	694574.9
A1168	553344.8	694574.9
A1169	553397.1	694694.4

* HORIZONTAL POSITION REPRESENTED BY DATA LISTED ABOVE WAS DEVELOPED FROM VARIOUS SOURCES. (SEE NOTES 3 & 4 ON SHEET 1)

COVER TYPES (EQUIVALENT)

AREA	ORIGINAL CONDITION	EQUIVALENT COVER TYPE
4	PAVED	EQUIVALENT COVER
5	BUILDING	EQUIVALENT COVER
8	BEDROCK DRAINAGE SWALE	BLAST/EXCAVATE CHANNEL EQUIVALENT COVER
21	BEDROCK OUTCROP	GRIB & CLEAN EQUIVALENT COVER
30	STACK	EQUIVALENT COVER

⑤ BUILDING EQUIVALENT COVER

⑧ BLAST/EXCAVATE CHANNEL EQUIVALENT COVER

LEGEND

BOUNDARY LINE
RIGHT-OF-WAY
ABUTTING PROPERTY LINES
ASPHALT, CONCRETE, GRANITE CURB
TRANSITION ZONE
LAND CLASS LINE
N 991,000 GRID LINE
EDGE OF EXISTING PAVEMENT
LIMIT OF REMEDIATE
A.T.&T. FIBER OPTIC CABLE
TOE OF SLOPE
TOP OF SLOPE
LINE CHAIN LINK FENCE
EDGE OF ASPHALT GRAVEL ROAD
BACK EDGE OF PLANTER
EDGE OF PROPOSED PAVEMENT
EXISTING EASEMENT
ASPHALT CULVERT
LINE OF TREE LINE
EXISTING CONCRETE STRUCTURE
ASPHALT FINISH GRADE CONTOUR 5' INTERVAL
ASPHALT FINISH GRADE CONTOUR 1' INTERVAL
OVERHEAD WIRES
UGO UNDERGROUND GAS LINE
LIMITS OF EXISTING EASEMENTS
EDGE OF EXISTING BUILDINGS
AREA OF LEDGE
ASPHALT COVER TYPE
TEST PIT
MONITOR WELL
HYDRANT
GATE VALVE
CATCH BASIN (ENGLAND)
CATCH BASIN (ROUND)
DRAIN MANHOLE
SEWER MANHOLE
UTILITY POLE
GUY WIRE
ASPHALT POINT NO. & LOCATION
GAS METER
GAS SHUT OFF
WATER SHUT OFF
WATER CONTROL BOX
SIGN
BOLLARD
TELEPHONE MANHOLE
POINT MARKER (SEE POINTS CHART)
BORING LOCATION
MICRO WELL LOCATION
PIEZOMETER LOCATION
SOIL SAMPLE LOCATION
STORT SWAGE LOCATION
TOWERMETER LOCATION
VEG LOCATION
MONITORING WELL LOCATION

X — DETAIL/CROSS SECTION DESIGNATION
B-10 — SHEET No. WHERE DETAIL/CROSS SECTION IS PRESENTED

GRAPHIC SCALE
20' 10' 0 20' 40' 60'

REV.	DATE	DESCRIPTION			
			ST	DRN	MDP
			ST	DRN	MDP
I	8/30/06	FINAL SUBMISSION	ST	DRN	MDP
H	8/30/06	EPA COMMENTS OF 1/23/06	ST	CK	JGK
G	8/17/06	EPA & DEP COMMENTS OF 8/3/06	ST	CK	MDP
F	8/17/06	EPA & DEP COMMENTS OF 7/12/06	JF	CK	MDP
E	8/17/06	EPA & DEP COMMENTS OF 1/12/06	JF	CK	MDP
D	8/16/06	DEP REVISIONS	JF	CK	JGK
C	8/16/06	DEP REVISIONS	JF	CK	JGK
B	8/16/06	ISSUE FOR REVIEW	JF	CK	JGK
A	8/16/06	ISSUE FOR REVIEW	JF	CK	JGK

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PROFESSIONAL ENGINEER

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MERIDIAN
Land Surveyors, Inc.
Boston • New Hampshire • Maine • New Jersey

Golder Associates
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400 Commercial Street
Manchester, NH 03101
603-668-0880 FAX 603-668-1199

PROJECT RECORD (TAX MAP LOT 10-1-8)

COVER TYPES AND TRANSITIONS

INDUSTRI-PLEX SITE REMEDIAL TRUST
WOBURN, MASSACHUSETTS

SCALE: 1" = 20'
AUGUST 8, 2000

DESIGNED BY: MDP
DRAFTED BY: MDP
CHECKED BY: JGK
FILE: 2900081H.dwg
DO NOT SCALE DRAWING

B-14
SHEET No.
PROJECT: 2900.00
SHEET 4 OF 5

Sep 25, 2006 – 7:20am – 4th Land Survey 2004 – LD14
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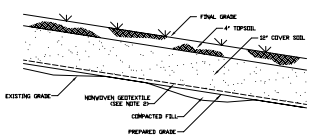
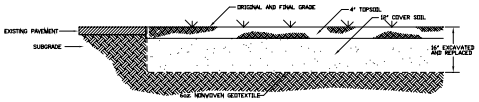
COVER TYPE

1 & 14 ABOVE GRADE ENGINEERED PERMEABLE COVER

(SEE NOTES 1, 3 & 4)
NOT TO SCALE



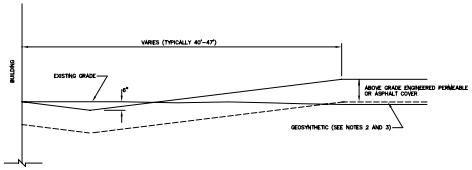


1 / B-15 TYPICAL AT GRADE ENGINEERED COVER AT EXISTING GRADE TIE-IN

NOT TO SCALE

TYPICAL TYPE 1 TRANSITION

NOT TO SCALE



LEGEND

X / B-15 — DETAIL/CROSS SECTION DESIGNATION
X / B-15 — SHEET No. WHERE DETAIL/CROSS SECTION IS PRESENTED

NOTES

1.) SEE SPECIFICATIONS FOR DETAILS AND MATERIALS USED.

2.) FOR SLOPES FLATTER THAN 25% A 16oz. NONWOVEN GEOTEXTILE WAS INSTALLED ON HIDE PILES AND A 6oz. NONWOVEN GEOTEXTILE WAS INSTALLED ELSEWHERE.

3.) FOR SLOPES 25% OR STEEPER, A GEOSYNTHETIC DRAIN WAS USED AS FOLLOWS:

a. ON HIDE PILES, A GEOCOMPOSITE DRAIN WAS EXTENDED FROM THE TOE OF SLOPE A DISTANCE EQUAL TO A 10 FOOT CHANGE IN ELEVATION. A 16oz. NONWOVEN GEOTEXTILE WAS USED ELSEWHERE AND FIELD SEWN WITH THE GEOCOMPOSITE.

b. IN AREAS OTHER THAN HIDE PILES, A 16oz. NONWOVEN GEOTEXTILE WAS USED THROUGHOUT.

4.) FOR SLOPES STEEPER THAN 33% A GEOGRID WAS PLACED DIRECTLY ABOVE THE GEOSYNTHETIC AND EXTENDED A DISTANCE OF 10 FEET BEYOND THE CREST OF THE SLOPE. FOR SLOPES 50% OR STEEPER A RIPRAP FACING WAS PLACED WITHOUT GEOGRID.

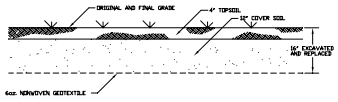
5.) VERTICAL EXAGGERATION OF GEOSYNTHETICS SCALE FOR VISUAL PURPOSES ONLY.

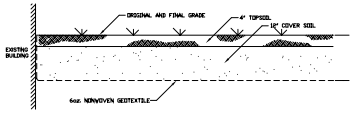
6.) PLEASE REFER TO THE REGIONAL TRANSPORTATION CENTER COVER CERTIFICATION REPORT AND AS-BUILT RECORDS FOR ADDITIONAL DETAILS RELATED TO THE REGIONAL TRANSPORTATION CENTER.

COVER TYPE

2 AT GRADE ENGINEERED PERMEABLE COVER

(PLANTERS WITH GRASS)
NOT TO SCALE



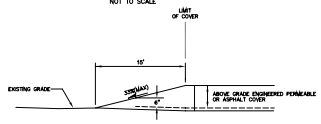


2 / B-15 TYPICAL AT GRADE ENGINEERED COVER AT BUILDING TIE IN

NOT TO SCALE

TYPICAL TYPE 4 TRANSITION

NOT TO SCALE



GRAPHIC SCALE

20' 10' 0 20' 40' 60'

REV.	DATE	DESCRIPTION	DRN.	CK.
-	9/20/06	FINAL SUBMISSION	TC	MJP
A	8/30/06	EPA COMMENTS OF 8/23/06	DRN.	MJP
B	10/27/06	EPA & DEP COMMENTS OF 10/10/06	TC	JK
C	8/17/07	EPA & DEP COMMENTS OF 8/3/07	JF	CJK
D	8/17/07	EPA & DEP COMMENTS OF 8/7/07	JF	MJP
E	9/21/08	EPA & DEP COMMENTS OF 9/12/08	JF	MJP
F	9/21/08	DEP REVISIONS	JF	MJP
G	9/16/09	DEP REVISIONS	JF	MJP
H	9/20/09	ISSUE FOR REVIEW	JF	MJP
A	8/30/00	ISSUE FOR REVIEW	JF	MJP

PROFESSIONAL LAND SURVEYOR

PROFESSIONAL ENGINEER

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400 Commercial Street
Malden, Massachusetts 02148
603-468-1060 FAX 603-468-1199

PROJECT RECORD (TAX MAP LOT 10-1-8)

DETAILS & TRANSITIONS

INDUSTRI-PLEX SITE REMEDIAL TRUST
WOBURN, MASSACHUSETTS

SCALE: 1" = NONE — AUGUST 8, 2000

DESIGNED BY: MJP
DRAFTED BY: MJP
CHECKED BY: JGK
FILE: 2900005R.dwg
DO NOT SCALE DRAWING

B-15
SHEET No.
PROJECT: 2900.00
SHEET 5 OF 5

Sep 25, 2009 - 3:32pm - dbh Land Desktop 2004 - LT04
H:\Proj\2900\5-Ind-Park\2900-IP-BUILT\2-PHASE1-1\

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION I
ONE CONGRESS STREET SUITE 1100
BOSTON, MASSACHUSETTS 02114-2023

October 8, 2008

Atlantic Avenue Associates, Inc.
(property owner of 41 Atlantic Avenue, Woburn, MA)
c/o David A. Welles
North Run
139 Otter Lane
Warren, VT 05674

Re: Industri-plex Superfund Site, Operable Unit 1: Final Property-Specific Cover Certification Report for 41 Atlantic Avenue, Woburn, MA (Tax Map 10-1-8).

Dear Atlantic Avenue Associates, Inc.:

Please find attached the property-specific final Cover Certification Report (CCR) for your property located at 41 Atlantic Avenue, Woburn, MA (Tax Map 10-1-8). This CCR documents the completion of a portion of the Remedial Action for soil, sediments, and air at the Industri-Plex Superfund Site, Operable Unit 1, Woburn, MA, in accordance with approved 100% Design Report, dated April 1992. The Remedial Action implemented on your property was required by the Consent Decree entered on April 24, 1989 by the United States District Court for the District of Massachusetts in the matter styled United States v. Stauffer Chemical Company et al., Civil Action No. 89-0195-MC, and Commonwealth of Massachusetts v. Stauffer Chemical Company et al., Civil Action No. 89-0196-MC.

The CCR contains detailed full-size Record Drawings illustrating the Remedial Action implemented on your property, such as the location of Engineered and/or Equivalent Covers which serve as barriers preventing contact to the underlying Contaminated Soils. The Record Drawings also illustrate the location of various land classifications designated on your property (i.e. Land Class A, B, C and/or D), which represent various conditions and restrictions. The details contained in the CCR, particularly the Record Drawings, will be useful towards ensuring the long protectiveness of the remedy and compliance with institutional controls (i.e. Grant of Environmental Restriction).

In addition to the CCR, you are also being provided:

1) a set of half-size Record Drawings; and

2) a compact disc containing electronic versions of the CCR, as well as electronic CAD files of the Record Drawings.

The half-size drawings will be useful towards your periodic inspection of the remedial action implemented on your property, as well as any consideration you may have towards implementing future intrusive work on the property that may affect the remedial action. If you elect to alter the remedial action on your property (e.g. Engineered or Equivalent Covers), then you will be required to prepare As Built Records. The As Built Records are engineering drawings and other records depicting the location and details of remedial action alterations, and Clean Corridors, as constructed on the property. EPA expects the As Built Records to include engineering drawings which are similar in detail and quality as the Record Drawings. The electronic CAD files provided in the attached compact disc can be utilized by the owner and/or their designated surveyor to effectively and efficiently alter the Record Drawings and prepare adequate As Built Records.

The next steps in the superfund process for this property will be the inauguration and recording of the Grant of Environmental Restrictions (Grant). A package will be sent to you regarding the inauguration requirements for your property.

If you should have any questions regarding this letter, please contact me at (617) 918-1323.

Sincerely,

Joseph F. LeMay, P.E.
Remedial Project Manager
Office Site Remediation and Restoration

cc: Bob Cianciarulo, EPA (letter)
David Peterson, EPA (letter)
Jennifer McWeeney, MassDEP
Andy Cohen, MassDEP (letter)
Tim Cosgrave, ISRT Coordinator (letter)
Carol Dickerson, SMC (letter)
Randy Cooper, Monsanto (letter)
Michael Leon, Nutter McClennen & Fish (letter)
Neil Thurber, M&E (letter)