



Release Abatement Measure Plan
62 Whittemore Avenue, Cambridge, MA
CAM 400 Sewer Improvements Project
Release Tracking Number 3-0277
March 10, 2011

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INTRODUCTION

Kleinfelder ▪ S E A is providing engineering design and construction support to the City of Cambridge, Massachusetts for the CAM 400 Sewer Improvements Project in Cambridge, Massachusetts. The CAM 400 project is being constructed to reduce the potential for sewer backup during periods of heavy rain and discharge of combined sewer overflows (CSO) to the Alewife Brook. The project area includes locations associated with the separation of storm and sewer lines in an area bounded to the south by Whittemore Avenue, to the west and north by Alewife Brook Parkway and Massachusetts Avenue, and to the east by Magoun Street. The General Contractor for the construction of CAM 400 is P. Gioioso & Sons, Inc. (PGS).

As part of the CAM 400 improvements, excavation will occur on the property of W.R. Grace & Co.-CONN (W. R. Grace) within the limits of an easement held by the City of Cambridge.

Under Release Tracking Number (RTN) 3-0277, W. R. Grace completed investigations and remedial actions to address a release of VOC's and oil and asbestos fibers in soil. A Class A-3 Response Action Outcome (RAO) for RTN 3-0277 was filed by W. R. Grace on March 13, 2006. As part of the RAO, an Activity and Use Limitation (AUL) restricting use and activities on the property was recorded by W. R. Grace (attached as Appendix A).

CAM 400 excavation and construction activities on W.R. Grace property are subject to the requirements of the AUL. Work on the W. R. Grace property that will require excavation below the existing protective cover includes installation of a new manhole structure, 40 linear feet (lf) of drain line, and a new pipe below an existing utility vault.

Pursuant to 310 CMR 40.1067, remedial actions conducted after submittal of a Class A-3 RAO must be conducted under a Release Abatement Measure (RAM) Plan.

Bureau of Waste Site Cleanup (BWSC) Transmittal Form BWSC-106 (Release Abatement Measure (RAM) Transmittal) was submitted electronically concurrent with this written Plan utilizing eDEP. Figure 1, Site Locus, indicates the project location. Figure 2, Site Sketch, indicates the general limits of the RAM activities in Sites # 1 and # 2 on the W. R. Grace property.

1. RESPONSIBLE PARTY INFORMATION

This RAM is being implemented by the City of Cambridge, Department of Public Works.

Contact: Mr. Owen O'Riordan
Assistant Commissioner for Engineering and City Engineer
Address: Department of Public Works
147 Hampshire Street
Cambridge, MA 02139
Tel.: 617-349-4800

2. UTILITY PROJECT DESCRIPTION

The CAM 400 project includes the separation of existing storm drain and sanitary sewer systems; the rehabilitation of existing drain and sewer pipe; the installation of new storm drain pipe and structures; the installation of new sanitary sewer pipe and structures; the relocation of existing water mains; and, surface improvements including curb, sidewalk and roadway construction / restoration.

Within the limits of the W. R. Grace property, work shall be conducted in two areas, designated as W.R. Grace & Co. - Conn Sites #1 and #2 as shown on Figure 2. At W.R. Grace & Co. - Conn Site # 1, the work includes the cured in place pipe (CIPP) lining of an existing 18 inch x 26 inch drain pipe for a distance of approximately 150 linear feet. The CIPP work does not require excavation to complete. Within Site 1 there is also a common manhole removal, which shall include excavation to install a new drain manhole, 40 linear feet of 24-inch diameter PVC drain pipe, and a 12-inch diameter drain connection to existing Grace lines.

At W.R. Grace & Co. - Conn Site # 2, work will be conducted within an existing combined sewer/drain concrete vault. In order to complete sewer/drain separation, modifications must be made inside the vault. As part of this task the concrete bottom of the vault will be saw-cut to create a 2.5' long by 2' wide trench. This will be hand dug to approximately 20-inches deep to allow for installation of a short section of new piping. The trench will be filled with concrete after pipe installation. Access to the vault will be through the existing top slab and following the flow modifications, a new cast-in-place wall and top slab with new manhole covers will be constructed. See Figure 3.

3. NATURE AND EXTENT OF CONTAMINATION

An area of 24 acres, consisting of 18 individual land parcels owned by W. R. Grace, is subject to an AUL recorded under RTN 3-0277. According to the AUL Opinion prepared by Haley & Aldrich (H&A) under contract to W. R. Grace, the Disposal Site was listed by Massachusetts Department of Environmental Protection (MassDEP) following the detection of volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), petroleum, and metals during subsurface investigations conducted in 1984 and 1985. Asbestos was added to the list of contaminants of concern in 1998 following completion of additional investigations. A total of 905 soil and split soil samples were collected by W. R. Grace to evaluate the extent of asbestos fibers in soil; 882 of these samples were submitted for laboratory analysis using polarized light microscopy (PLM) and/or transmission electron microscopy (TEM). According to H&A reports, the highest levels and most consistent detections of asbestos fibers in soil were located in areas where buildings had been located.

While the presence of asbestos fibers in soil or asbestos containing material has not been confirmed in the RAM area, the presence of such is assumed, and excavation and health and safety procedures are being conducted in a manner consistent with the requirements of the AUL and protective of public health.

Detailed information on the nature and extent of contamination is contained with Appendix A, Activity and Use Limitation, RTN 3-0277.

4. RELEVANT REGULATIONS

As noted above, the recording of the AUL and presumed presence of asbestos fibers in soil requires that the excavation and utility installations be conducted in accordance with the requirements of the Massachusetts Contingency Plan (MCP), 310 CMR 40.0000, the Public Involvement Plan, and the Cambridge Asbestos Protection Ordinance (APO), Chapter 8.61.

The AUL requires preparation of a Soil Management Plan by a Licensed Site Professional (LSP), and Health & Safety Plan by an LSP and a Certified Industrial Hygienist (CIH) when work is to be conducted that is likely to disturb soil below the Protective Cover. In certain instances, i.e., when work other than allowed by the AUL are planned, a Airborne Asbestos, Dust, and Odor Management Plan is also required. Work planned under this RAM Plan is allowed in the AUL in Section 1(vi): limited short term utility work. However, the Asbestos Soil Management Plan and the Hazardous Materials Health & Safety Plan prepared for this work include the actions that would be included in a separate Airborne Asbestos, Dust, and Odor Management Plan.

4.1. MCP PUBLIC INVOLVEMENT PLAN

RTN 3-0277 was also a Public Involvement Plan (PIP) Site and a final PIP was submitted to MassDEP in July 2006. While PIP requirements typically cease following the submittal of a Response Action Outcome (RAO) Statement, the AUL for RTN 3-0277 mandates that the PIP requirements remain in force in the event that certain activities, which includes the activities outlined in this RAM, occur. Specifically, the PIP requires preparation and public comment on a RAM Plan, an Asbestos Soil Management Plan (ASMP) and a Hazardous Materials Health & Safety Plan (HMH&SP). The ASMP and HMH&SP have been prepared by the Contractor; a 30-day public comment period on these documents was held and all comments were reviewed and considered prior to finalization of the HMH&SP and ASMP (attached to this report as Appendices B and C).

4.2. CAMBRIDGE ASBESTOS PROTECTION ORDINANCE

The Cambridge Asbestos Protection Ordinance (APO), Chapter 8.61, also applies to activities to be conducted under this RAM Plan. Any property found by the Cambridge Commissioner of Public Health to contain asbestos-contaminated soil or documented to the Commissioner's satisfaction to have been the site of past on-site handling, disposal, manufacturing or processing of asbestos are subject to the provisions of the Ordinance.

The Ordinance addresses soil intrusive activities that have the potential to release particulate matter into ambient air, and regulates excavation, grading, tilling or any other such activity that may cause the release of fugitive dust. Implemented under the direction of the Commissioner of Public Health, it requires particulate dust mitigation and assurance measures.

Of specific relevance to the implementation of the RAM is the APO requirement in 8.61.040.c(c) that mitigation measures (a) (iv) and/or (a) (v) must be implemented if "the proposed soil disturbance is in close proximity to residential areas or children's play areas, i.e. within 500 feet." 8.61.040.a.(iv) requires "covering the site with a layer of clean fill, which must be of sufficient depth such that the proposed disturbance of the soil would occur in and affect only that clean fill layer; 8.61.040.a.(v) requires "erecting a permanent or temporary

structure maintained at partial vacuum sufficient to contain all fugitive dust, with off gas from the evacuation system treated with HEPA filtration."

The APO also requires that a *Draft* Asbestos Soil Management Plan be prepared and submitted to the City for review by the Commissioner. Following the Commissioner's review, a Draft Decision on the ASMP is issued and a 20-day public comment period on the decision document and the Draft ASMP is held. This comment period was held concurrent with the PIP comment period; all comments were reviewed and considered prior to finalization of the attached ASMP.

5. OBJECTIVES

The objectives of the RAM are to:

- Manage the excavation of soils presumed to be impacted by asbestos fibers and, potentially, by other OHM in a manner that is protective of public health and the environment. This RAM Plan allows for management of up to 250 cy of soils;
- Re-use excavated soil to the extent feasible and practical based on geotechnical considerations; and
- Manage surplus soils in accordance with MassDEP and other applicable regulations and policy.

6. RAM PLAN

This Release Abatement Measure (RAM) Plan has been prepared in accordance with 310 CMR 40.0440 to serve as written notification to MassDEP that the City of Cambridge, Massachusetts Department of Public Works (DPW) intends to implement a RAM. The RAM is related to separation of sewer and storm drains within a City-held utility easement on property owned by W. R. Grace.

Work at the site will be performed in accordance with all applicable federal, state, and local regulations, including, but not limited to the Massachusetts Contingency Plan (MCP), local ordinances (including the APO), and OSHA regulations (including, but not limited to, 29 CFR 1910.1000, 29 CFR 1926, and CFR 1910.120), and other applicable state and federal regulations regarding health and safety.

A detailed Asbestos Soil Management Plan has been prepared for the Contractor by Environmental Management Partners (EMP) and Covino Environmental Associates, Inc. The ASMP was prepared by Scott D. Herzog, Certified Industrial Hygienist (CIH), Covino Associates, and by Timothy A. Toomey, LSP, Subsurface Remediation Technologies (SRT)m Rowley, MA, under contract to EMP, and reviewed for consistency with the MCP and the AUL requirements by LSPs for the City of Cambridge (Richard K. Quateman, LSP, CHMM) and for W. R. Grace (John Kastrinos, LSP, P.G., Haley & Aldrich). The ASMP is attached to this RAM Plan as Appendix B.

A detailed Hazardous Materials Health and Safety Plan (HMH&SP) has been prepared for the Contractor by Environmental Management Partners and Covino Environmental Associates, Inc. The HMH&SP was prepared by Scott D. Herzog, CIH, and Timothy Toomey, LSP, under contract to EMP, and reviewed for consistency with the MCP and the AUL requirements by

the LSPs for the City of Cambridge and for W. R. Grace as named above. The HMH&SP is attached to this RAM Plan as Appendix C.

6.1. SOIL MANAGEMENT

In accordance with 8.61.040.a.(v) of the APO, excavation for the installation of utility upgrades will be conducted under negative air enclosures.

Site 1

Site 1 includes the installation of 40 linear feet of new piping and a new manhole structure. An excavator and critical construction materials will be staged in the exclusion zone on the easement prior to the commencement of work and an enclosure constructed around them. The airtight enclosure will be constructed in a way that covers the entire perimeter of the excavation. The enclosure will be constructed of heavy-duty plastic sheeting supported by rigid scaffolding or other framing. The enclosure will be designed to be weather-resistant and will use one or more layers of flame and smoke resistant sheeting. The dimensions of the enclosure will be 30 feet in width, 20 feet in height and 50 feet in length. The enclosure will be designed with two entrances to permit entry of personnel and equipment. Negative air pressure will be maintained utilizing air filtration devices fitted with high efficiency particulate air (HEPA) filters. See the attaches Asbestos Soil Management Plan and HMH&SP for greater detail on the enclosure operations.

Excavated soils will be temporarily placed at the edge of the excavation (within the enclosure) during excavation. If soils are staged on unpaved areas the underlying area will be excavated to a depth of six inches (6") following removal of the stockpiled soils to ensure that underlying soils are not impacted by residue asbestos fibers that could potentially be present in subsurface soils.

Surplus soils remaining after backfilling of the trench will be placed in lined roll-off containers that will be brought into the enclosure. The lining will be draped over the side of the containers prior to loading to minimize the potential for soils to fall onto the outside of the container during loading.

The containers will be sealed and decontaminated prior to being removed from the enclosure. It is anticipated that the containers will be removed from the loading area and onto transport trucks using a steel cable on the truck, keeping the transport trucks out of the work area. While it is not anticipated that the trucks used to load the containers will come in contact with soils, they will be inspected to ensure that tires are clean of dirt that may be present on the ground within the enclosure. If evidence of soil is observed, the tires will be cleaned using a high pressure washer before leaving the enclosures.

Following backfill within existing materials to within six inches of the bottom of the previously existing grade (assuming the soil is geotechnically suitable) the excavation and any other excavated area will be backfilled with six-inches (6") of imported clean soil. If the existing soil is geotechnically unsuitable, additional clean fill will be used as required to restore the pre-existing grade. Contract specifications require that soil proposed for import and use for backfill be analyzed for the potential presence of OHM and these results submitted to the City of Cambridge and the City's LSP for review; imported soils must be approved by the LSP. The results will also be furnished to Grace and their LSP for review and approval.

Site 2

Site 2 requires installation of a new pipe and connections below the concrete bottom of an existing utility vault. Based on discussions with the Contractor, the bottom of the vault will be cut with a hand held cut-off saw and the trench necessary for installation of the pipe will be hand dug. Following pipe installation the vault bottom will be resealed with concrete. Prior to the start of work an enclosure will be constructed over or within the utility vault. Negative air pressure will be maintained utilizing HEPA air filtration units. The volume of soil to be generated through trench digging is anticipated to fit within one or two 5-gallon plastic buckets. The bucket(s) will be sealed and decontaminated prior to removal from the containment at the completion of work. The surplus soil shall be disposed of as asbestos waste.

See the attached Asbestos Soil Management Plan and Health and Safety Plan for details on the enclosure operations.

6.2. GROUNDWATER MANAGEMENT

Groundwater is not anticipated to be encountered during utility installations. In the event that groundwater is encountered it will be managed in accordance with applicable U.S. Environmental Protection Agency (EPA) and MassDEP regulations, including the requirements of the National Pollution Discharge Elimination System (NPDES).

Based on the presumed presence of asbestos fibers in soil, groundwater collected for construction dewatering would be filtered prior to discharge to capture asbestos fibers potentially present in sediment. Solids collected by the filters would be consolidated with the surplus soil and disposed of as an asbestos waste; containers used for the surplus soils will be sealed and decontaminated prior to being removed from the enclosure.

6.3. SITE RESTORATION

In accordance with the AUL obligations, the existing Protective Cover shall be restored to a condition equal to that in place prior to the start of work and in accordance with the Asbestos Soil Management Plan.

7. HEALTH & SAFETY PLAN

A detailed Hazardous Materials Health & Safety Plan has been prepared for the Contractor by Environmental Management Partners and Covino Environmental Associates, Inc. As noted above, the HMH&SP was prepared by Scott D. Herzog, CIH, and Timothy Toomey, and reviewed for consistency with the MCP and the AUL requirements by LSPs for the City of Cambridge and for W. R. Grace. The HMH&SP documents methods to protect workers and the public during construction activities on the W. R. Grace property. As part of this work, air monitoring within the enclosures and surrounding the enclosures will be conducted. This program is summarized in this RAM Plan; for additional details on the air monitoring program and other actions being taken to protect worker and public health, please refer to the attached HMH&SP in Appendix B. Note that the HMH&SP satisfies the requirements of an Airborne Asbestos, Dust and Odor Management Plan referenced in the AUL

The HMH&SP indicates the following general precautions to be taken during utility installation:

- Construction of a 30 x 50 foot enclosure prior to soil excavation in Site 1 and an appropriately sized enclosure in Site 2;
- Venting of enclosures with HEPA filter controls;
- Dust control and air monitoring within the enclosures;
- Odor control;
- Dust control and perimeter air monitoring;
- Contingency plans for work stoppage based on review of air monitoring data;
- Misting/Adequately wetting of site soils;
- Placement of excess soil into lined and covered roll-off containers prior to removal from the structure(s);
- Removal of covered roll-off containers within 48 hours of date of generation; and
- Backfilling trench with site soil and placement of six inches of imported clean fill and asphalt pavement for final cover in Site 1 and backfilling of the trench with concrete in Site 2.

When excavation within the enclosure is conducted workers will wear Level C personal protective equipment (PPE) – half face respirator. Changes in the PPE level may be recommended by the CIH based on the results of air monitoring data collected from within each enclosure.

7.1. ENCLOSURE VENTING

Each enclosure will be maintained under a pressure differential and vented using air filtration devices fitted with HEPA filters. The venting system will be designed to exchange sufficient air to allow normal working conditions with respect to emissions from construction equipment within the enclosure. The air filtration devices will be cleaned and have new HEPA filters installed and sealed before arrival at the work area. The air filtration devices will be sealed to the enclosure and will vent air outside the enclosure. Additional air filtration devices may be installed based on the results of air testing inside the enclosure, as well as visual indicators (smoke and odor associated with construction equipment located within the enclosure).

A manometer will be installed at each entrance to the enclosure to insure the pressure differential between the inside of the enclosure and the outside is maintained. The goal will be to maintain a pressure differential of 0.02 inches water gauge at all times when personnel are working in the enclosure. A pressure differential will be maintained throughout the construction period and until post excavation clearance is conducted within the enclosure(s).

7.2. DUST CONTROL

Water will be used inside the enclosure to control the potential for airborne dust. A fire hose and fogging nozzle(s) will be located inside the enclosure. The soil will be adequately wetted to control dust generation during excavation and before being either backfilled into the excavation(s) or loaded into lined roll-off containers. The containers will be sealed, covered, and decontaminated prior to be removed from the enclosure.

At the conclusion of each working day any stockpiled soil and any open trench will be securely covered with polyethylene sheeting to minimize the potential for off-hours disturbance of soils.

7.3. AIR MONITORING

Dust monitoring will be performed hourly using a TSI Dust-Trak respirable particulate monitor or equivalent when soil intrusive activities are underway in the enclosure. Measurements will also be collected upwind, downwind and crosswind of the enclosure. In the event two consecutive hourly readings for respirable particulate at the perimeter of the enclosure exceed 75 micrograms per cubic meter of air (75 $\mu\text{g}/\text{m}^3$) a dust suppression program will be implemented as discussed in the HMH&SP. In the event any two hourly readings in a twenty-four hour period for respirable particulate exceed 150 $\mu\text{g}/\text{m}^3$ (National Ambient Air Quality standard) shall result in a temporary stoppage of work and a review of the dust control practices.

Continuous asbestos monitoring will be performed in and around the perimeter of the enclosure including samples on the upwind, downwind and side-wind sides within 50 feet of the enclosure. The samples will be collected in accordance with NIOSH Method 7400 using 0.8 micron MCE filters. The samples will be collected open-face at breathing zone height for a minimum of two hours. The samples will be analyzed on site by an inspector licensed by DOS in the Commonwealth of Massachusetts. The analyst shall be a successful participant in the Asbestos Analyst Registry (AAR). The samples will be analyzed using phase contrast microscopy using standard counting rules. In the event two consecutive samples within a twenty-four hour period exceed 0.01 fibers per cubic centimeter (f/cc), site activities will temporarily stop and the dust control program reviewed. Work may recommence when containment measures deemed sufficient by the Commissioner to prevent further exceedances have been implemented.

8. REMEDIATION WASTE MANAGEMENT

All surplus excavated soil and fill material will be characterized prior to disposal. The characterization requirements may vary depending on the site selected to receive soil for disposal. At this time, excess soil is anticipated to be disposed of at the Waste Management, Inc. (WMI) Turnkey Landfill located in Rochester, New Hampshire.

Because the soil will be excavated from an industrial/urban setting, the WMI operating permit requires that the soil be analyzed for fill characteristics including total petroleum hydrocarbons (TPH), polychlorinated biphenyls (PCBs), volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), RCRA 8 metals, pH, flashpoint, reactivity and corrosivity. Due to an agreement between PGS, the City and W.R. Grace that the soil will be assumed to contain asbestos fibers, WMI will not require any additional site specific sampling and analysis of the excess soil for its asbestos fiber concentration.

Characterization samples will be collected from the roll-off containers while they are within the negative air enclosure and prior to sealing of the containers.

Soil will be tracked using either a Bill of Lading (BOL) or an asbestos shipping manifest. Soil will be transported to the landfill within 48-hours following the completion of the excavation. All protective gear, decontamination fluids (for both personnel and equipment), and other

disposal materials will be disposed of in accordance with the asbestos soil management plan and applicable regulations. Soiled personal protective equipment will be collected and placed in drums for later disposal.

9. IMPLEMENTATION SCHEDULE

Work under this RAM at the W. R. Grace property is scheduled to begin on or after March 1, 2011 and be completed within two weeks.

The table below summarizes the anticipated RAM schedule.

Initiation of RAM Activities	March 2011
Completion of RAM activities	March 31, 2011
RAM Completion Report	Within 120 days of completion of RAM activities.

10. PERMITS

In accordance with the requirements of the Cambridge Asbestos Protection Ordinance, the Asbestos Soil Management Plan has been reviewed and will be approved by the Commissioner of Health, City of Cambridge, MA prior to RAM implementation.

An Asbestos Notification Form (ANF-001) has also been submitted to MassDEP by the Contractor for excavation of soils presumed to be impacted by asbestos.

No other approvals or permits are required to conduct the work.

11. REPORTING

A RAM Completion Report will be prepared and submitted to MassDEP within 60-days of completion of RAM activities. The report will document activities at the site and will include:

- A succinct summary of information and data pertaining to the discovery, location and evaluation of encountered contamination, and of all response actions undertaken;
- Documentation on the management of Remediation Waste, Remedial Additives and/or Remedial Wastewater managed at the site; and
- Details on any proposed or ongoing active or passive remedial systems that will remain in place at the site.

If a RAM Completion Report is not submitted to MassDEP within 120-days following initiation of RAM activities, a RAM Status Report will be submitted prior to the RAM Completion Report.

12. PUBLIC INVOLVEMENT REQUIREMENTS

In accordance with the requirements of 310 CMR 40.1400, the Chief Municipal Officer and the Commissioner of Public Health of the City of Cambridge have been notified of the intent of the City of Cambridge to implement this RAM Plan. The public notification also includes notification that Site workers are anticipated to be wearing Level C personal protective

FIGURES

equipment (PPE) while within the enclosures. Copies of the notification letters are provided as Appendix D.

As noted above, the AUL for RTN 3-0277 requires that the public be provided the opportunity to comment on a draft of the RAM Plan. A public comment period on this RAM Plan was held between January 28 and March 2, 2011. All comments received during this period reviewed and considered prior to finalizing this RAM Plan.

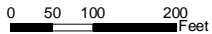
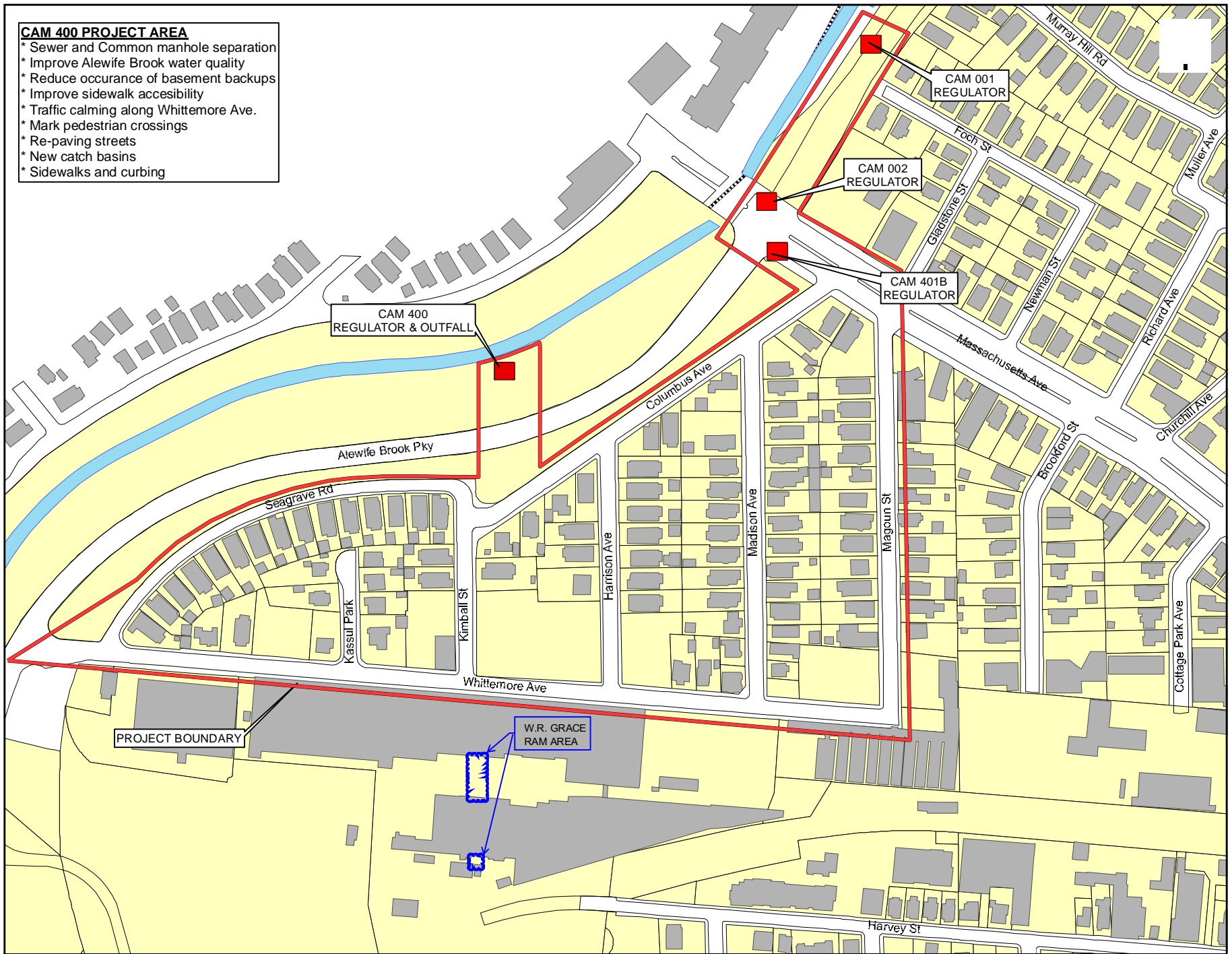
13. LICENSED SITE PROFESSIONAL

The LSP responsible for overseeing the work for this RAM is:

Richard K. Quateman
LSP License No. 7716
Kleinfelder • S E A Consultants, Inc.
215 First Street, Suite 320
Cambridge, MA 02142
Telephone: 617.497.7800

CAM 400 PROJECT AREA

- * Sewer and Common manhole separation
- * Improve Alewife Brook water quality
- * Reduce occurrence of basement backups
- * Improve sidewalk accessibility
- * Traffic calming along Whittemore Ave.
- * Mark pedestrian crossings
- * Re-paving streets
- * New catch basins
- * Sidewalks and curbing



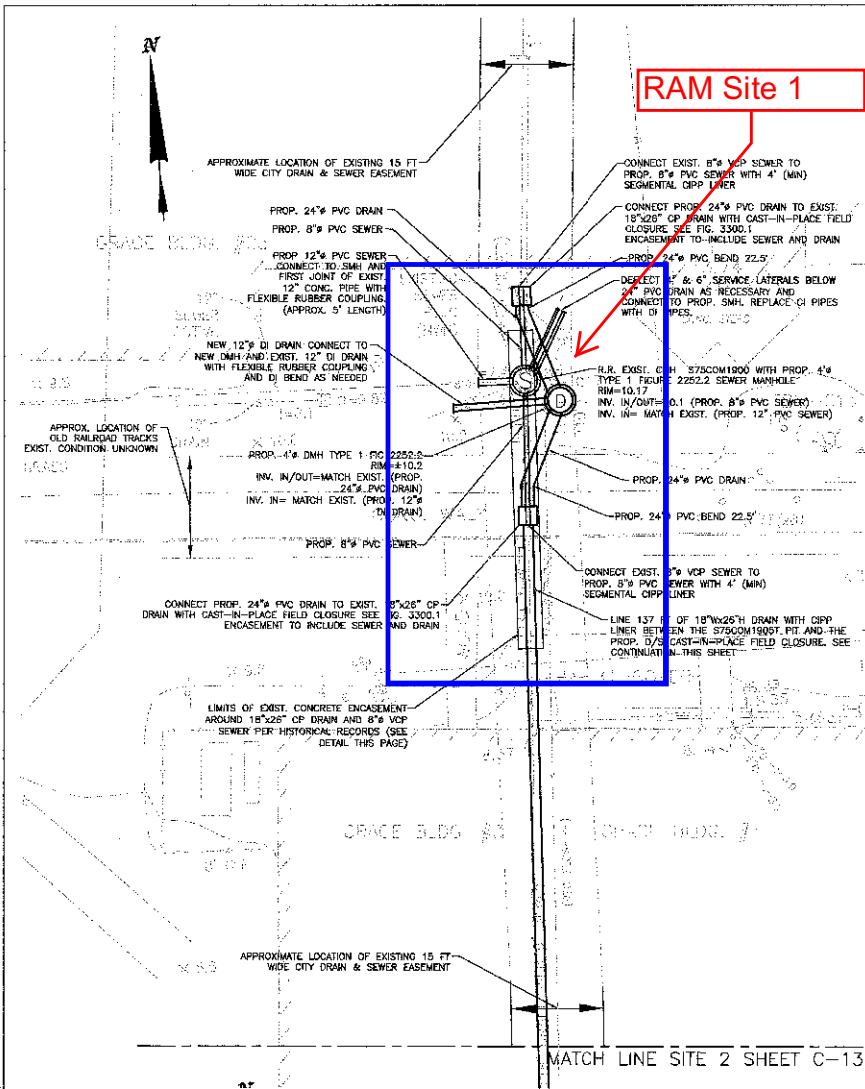
CAM 400 SEWER SEPARATION/ FLOATABLES CONTROL PROJECT AREA

CITY OF CAMBRIDGE, MA

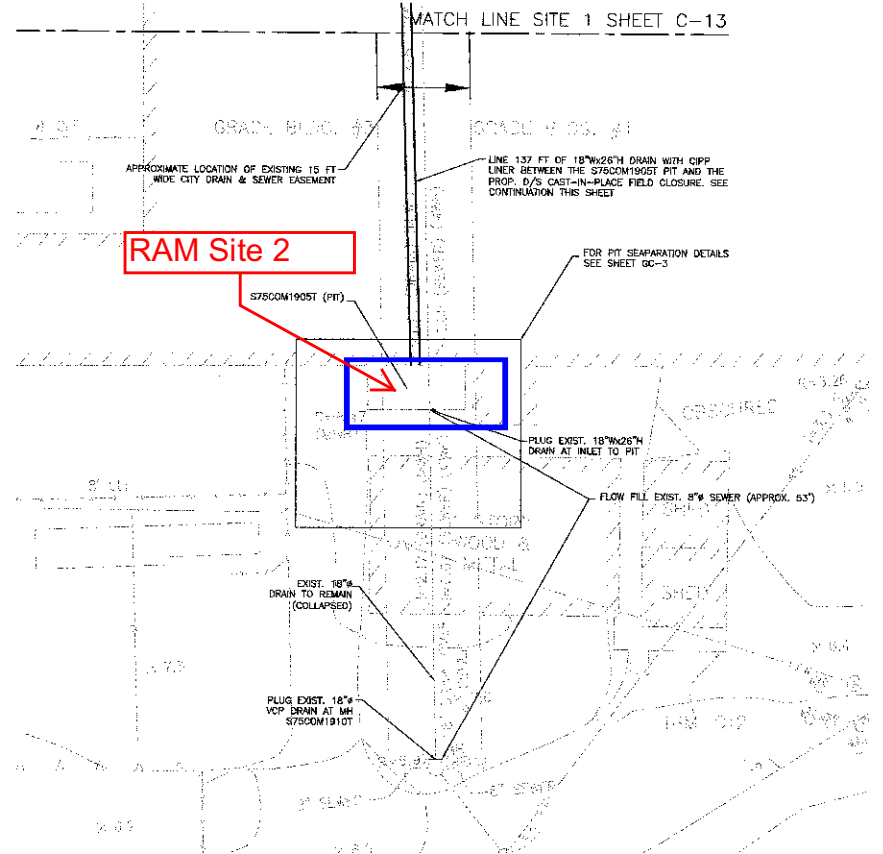
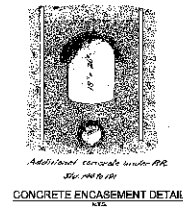
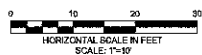
SEA

SEA CONSULTANTS INC.
Sewer & Stormwater Solutions





WR GRACE PROPERTY SITE 1
PLAN



WR GRACE PROPERTY SITE 2
PLAN

CONFORMED SET

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**FIGURE 2
SITE SKETCH**



Scale	1"=10'			
Date	JANUARY 15, 2010			
Job No.	1006790			
Designed by	AMF			
Drawn by	AMF			
Checked by	CHC	No.	Description	Date
Approved by	WCP		REVISIONS	



CITY OF CAMBRIDGE, MA ALEWIFE BROOK FLOATABLES CONTROL (CONTRACT 4) AND CAM 400 SEWER SEPARATION PROJECT (CONTRACT 13)
GRACE PROPERTY PLAN

Sheet No. C-13
File No.

W.R. Grace
RAM Site 2

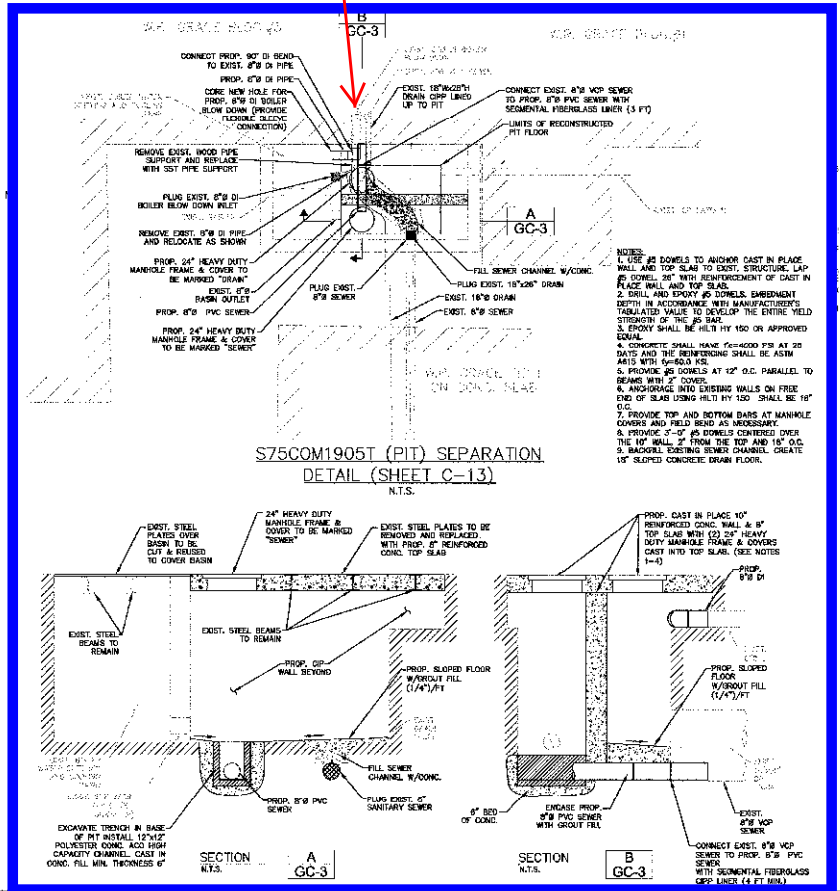


FIGURE 3 - Site 2
Sewer Separation
Engineering Detail

V:\SR02\020\Cambridge\Contract 4 & 13\Sheet\DWGSET_GENERAL_CIVIL.dwg, 1/12/2010 2:14:38 PM

<p>S E A SEA CONSULTANTS INC. CAMBRIDGE, MASSACHUSETTS CONCORD, NEW HAMPSHIRE ROCKY HILL, CONNECTICUT AUGUSTA, MAINE FRANKLIN, MASSACHUSETTS</p>	<p>MWH BOSTON MASSACHUSETTS</p>	<p>Scale: AS NOTED Date: JANUARY 16, 2010 Job No.: 10WGR0 Designed by: AMF Drawn by: AMF Checked by: DHC Approved by: WCF</p>	<p>City of Cambridge THE WORKS</p>	<p>CITY OF CAMBRIDGE, MA ALEWIFE BROOK FLOATABLES CONTROL (CONTRACT 4) AND CAM 400 SEWER SEPARATION PROJECT (CONTRACT 13) GENERAL CIVIL - STRUCTURE DETAILS CONTINUED</p>	<p>Sheet No. File No.</p>
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APPENDIX A

Activity & Use Limitation RTN 3-0277

D102

102



The Commonwealth of Massachusetts

Secretary of the Commonwealth

State House, Boston, Massachusetts 02133

William Francis Galvin
Secretary of the
Commonwealth



2006 00039877

February 13, 2006

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Page: 1 of 102 03/06/2006 03:44 PM

TO WHOM IT MAY CONCERN:

I hereby certify that according to the records of this office,

ALEWIFE LAND CORPORATION

is a domestic corporation organized on **March 4, 1985**, under the General Laws of the Commonwealth of Massachusetts.

I further certify that there are no proceedings presently pending under the Massachusetts General Laws Chapter 156D section 14.21 for said corporation's dissolution; that articles of dissolution have not been filed by said corporation; that, said corporation has filed all annual reports, and paid all fees with respect to such reports, and so far as appears of record said corporation has legal existence and is in good standing with this office.



In testimony of which,
I have hereunto affixed the
Great Seal of the Commonwealth
on the date first above written.

Secretary of the Commonwealth

Processed By: jbm

Sherin and Lodgen LLP
101 Federal Street
Boston, MA 02110
Attn: Peter Friedenberg, Esq.

*Dup in Lo Reg



CLERK'S CERTIFICATE


I, Michael B. Cohan, Clerk of Alewife Land Corporation, a Massachusetts corporation (the "Company"), hereby certify that:

1. The following person holds the position in the Company set forth after his name:

W. Brian McGowan: President

2. W. Brian McGowan is authorized to execute, acknowledge and deliver on behalf of the Company, Activity and Use Limitations concerning certain parcels of land in Cambridge, Massachusetts owned by the Company, together with such other instruments or documents as may be necessary or desirable in connection therewith.

IN WITNESS WHEREOF, I have hereunder executed this Certificate this 17th day of February, 2006.


Clerk

Sherin and Lodgen LLP
101 Federal Street
Boston, MA 02110

Att: Peter Friedenberg, Esq

100

Form 1075

NOTICE OF ACTIVITY AND USE LIMITATION

M.G.L. c. 21E, § 6 and 310 CMR 40.0000

Disposal Site Name: W.R. Grace & Co.-Conn.

DEP Release Tracking No.(s): 3-0277

This Notice of Activity and Use Limitation ("Notice") is made as of this 16th day of February, 2006, by Alewife Land Corporation, with an address of c/o W.R. Grace & Co.-Conn., 62 Whittemore Avenue, Cambridge, Massachusetts, 02140 (together with its successors and assigns, collectively "Owner").

WITNESSETH:

WHEREAS, Alewife Land Corporation is the owner in fee simple of certain parcel(s) of land located in Cambridge, Middlesex County, Massachusetts with the buildings and improvements thereon ("Property");

WHEREAS, said parcel(s) of land, which are more particularly bounded and described in Exhibit A, attached hereto and made a part hereof ("Property"), are subject to this Notice of Activity and Use Limitation. The Property is shown in part as "Parcel B, Area = 291,407± S.F., 6.690 Acres" on a plan entitled "Plan of Land Owned by Alewife Land Corporation, 1 Alewife Center, Cambridge, Massachusetts," dated October, 1999, prepared by URS Greiner Woodward-Clyde, Inc., recorded in the Middlesex County South District Registry of Deeds as Plan No. 1218 of 1999, in Book 30804, Page 571, and in part as "W.R. Grace & Co., Area = 9.824 Acres" on a plan entitled "Plan of Land in Cambridge, Massachusetts," dated January 14, 1988, prepared by HMM Engineers Inc., recorded in the Middlesex County South District Registry of Deeds as Plan No. 625 of 1989, in Book 19877, Page 518;

WHEREAS, the Property comprises part of a disposal site as the result of a release of oil and/or hazardous material. Exhibits B-1 and B-2 are sketch plans showing the relationship of the Property subject to this Notice of Activity and Use Limitation to the boundaries of said disposal site existing within the limits of the Property and to the extent such boundaries have been established. Exhibits B-1 and B-2 are attached hereto and made a part hereof; and

WHEREAS, one or more response actions have been selected for the portion of the Disposal Site in accordance with M.G.L. c. 21E ("Chapter 21E") and the Massachusetts Contingency Plan, 310 CMR 40.0000 ("MCP"). Said response actions are based upon (a) the restriction of human access to and contact with oil and/or hazardous material in soil and/or groundwater, and/or (b) the restriction of certain activities occurring in, on, through, over or under the Property. The basis for such restrictions is set forth in an Activity and Use Limitation Opinion ("AUL Opinion"), dated February 13, 2006 (which is attached hereto as Exhibit C and made a part hereof);

NOW, THEREFORE, notice is hereby given that the activity and use limitations set forth in

WHITTEMORE AVENUE & ALEWIFE BROOK PARKWAY
CAMBRIDGE

BOOK 16152 PAGE 384
MARGINAL REFERENCE REQUESTED

Sherin and Lodgen LLP
101 Federal Street
Boston, MA 02110
Attn: Peter Friedenberg, Esq.

MARGINAL REFERENCE REQUESTED
BOOK 19877 PAGE 527

said AUL Opinion are as follows:

1. Activities and Uses Consistent with the AUL Opinion. The AUL Opinion provides that a condition of No Significant Risk to health, safety, public welfare or the environment exists for any foreseeable period of time (pursuant to 310 C.M.R. 40.0000) so long as any of the following activities and uses occur on the Property:

- (i) Use of existing buildings for office, industrial, retail, commercial, and research and development (“R&D”);
- (ii) Existing uses of un-built areas for paved parking, paved public walkways, and open space;
- (iii) Existing grounds-keeping activities, including but not limited to installation of signs and fence posts, cutting and raking of grass areas, and maintenance and resurfacing of parking lots, sidewalks, and driveways;
- (iv) Maintenance of the Protective Cover as hereinafter described;
- (v) Response actions conducted in accordance with the applicable provisions of Chapter 21E;
- (vi) Limited short term, as defined in DEP policy, or emergency utility work in accordance with applicable federal, state, and local laws, ordinances, and regulations, including without limitation the Cambridge Asbestos Protection Ordinance;
- (vii) Such other activities or uses not identified in Paragraph 2 as being Activities and Uses Inconsistent with the AUL; and
- (viii) Such other activities and uses which, in the Opinion of a Licensed Site Professional, shall present no greater risk of harm to health, safety, public welfare, or the environment than the activities and uses set forth in this paragraph. Such opinion of a Licensed Site Professional shall be rendered final only after completion of any public involvement activities required by the Public Involvement Plan, in accordance with the Obligations and Conditions below.

2. Activities and Uses Inconsistent with the AUL Opinion. Activities and uses which are inconsistent with the objectives of this Notice of Activity and Use Limitation, and which, if implemented at the Property, may result in a significant risk of harm to health, safety, public welfare or the environment or in a substantial hazard, are as follows:

- (i) Any use other than the Permitted Activities and Uses identified in Paragraph 1 above;

- (ii) Use of the Property as a residence, school, nursery, daycare, recreational area, and/or such use at which a child's day-long presence is likely;
- (iii) Active recreational uses, such as athletic fields or playgrounds, involving more than casual contact with the existing ground;
- (iv) Activities that may cause degradation or destruction of the Protective Cover as defined in the Obligations and Conditions section; and
- (v) Use of on-site soils for cultivation of fruits or vegetables destined for human consumption.

3. Obligations and Conditions Set Forth in the AUL Opinion. If applicable, obligations and/or conditions to be undertaken and/or maintained at the Property to maintain a condition of No Significant Risk as set forth in the AUL Opinion are as follows:

- (i) Maintain the existing top six (6) inches of surface soil, and existing: pavement and concrete slabs, pavement and concrete slab sub-base materials, structures, topsoil/loam, landscaping or the like (hereinafter the "Protective Cover"). In the event the Protective Cover is degraded or removed, reinstall a Protective Cover to prevent exposure of underlying soil in a timely fashion;
- (ii) Prepare a Soil Management Plan ("SMP") prior to the commencement of activities that are likely to disturb the soil below the Protective Cover. The SMP must be prepared by a Licensed Site Professional ("LSP") in accordance with the Massachusetts Contingency Plan ("MCP") and, if applicable, the Cambridge Asbestos Protection Ordinance, and submitted for public review and comment in accordance with the provisions of the 27 December 1995 (or subsequent revisions) Public Involvement Plan ("PIP"). At a minimum, the SMP must describe the soil excavation, handling, storage, transport, and disposal procedures, as well as the engineering controls and air monitoring procedures, necessary to ensure that the potential impact of fugitive asbestos fibers and volatile emissions to workers, nearby residents, and other receptors in the vicinity are taken into account to ensure compliance with applicable standards;
- (iii) Prepare a Health and Safety Plan ("HASP") prior to the commencement of activities that involve the removal or disturbance of the Protective Cover and/or activities that are likely to disturb the soil below the Protective Cover. The HASP must be prepared by an LSP and a Certified Industrial Hygienist ("CIH") and control future exposures to groundwater. It must be submitted for public review and comment in accordance with the provisions of the 27 December 1995 (or subsequent revisions) PIP;
- (iv) Implement the Protective Cover Monitoring Plan ("PCMP") attached to the AUL Opinion. The PCMP describes methods for verifying that the cover

materials continue to function in a manner which prevents incidental exposure or direct contact with subsurface soils, as well as methods for restoring such integrity, if compromised through erosion or other unplanned disturbances to the Protective Cover. On-site workers should be informed of the requirements of the PCMP, and the PCMP must be available at the Property at all times. Inspections are to be conducted monthly for the first year and quarterly thereafter. The PCMP requires that logs of the inspection and any response actions completed thereafter be filed with the DEP and placed in the current public document repositories;

- (v) The owner shall provide copies of the PCMP and the cover inspection reports to any purchaser of all or a portion of the Property as part of the sale of the Property;
- (vi) In the event that activity intruding into surface soil other than permitted activities and use as provided herein ("Intrusive Activity") is undertaken, implement an Airborne Asbestos, Dust, and Odor Management and Monitoring Plan. The plan shall be developed by a CIH and an LSP, and it must comply with applicable Best Management Practices, the Cambridge Asbestos Protection Ordinance, if applicable, and applicable state and federal regulations. The plan shall require that any such activity must be carried out in a manner that prevents the liberation of asbestos fibers and/or dust into the ambient air in excess of applicable standards (OSHA, EPA, DEP, or other applicable standards) and prevents any potential odors from creating a nuisance condition, as these conditions may be defined by applicable regulations of the City of Cambridge, the Commonwealth of Massachusetts, and the federal government. It is envisioned that the plan would require utilization of proactive wetting of the exposed soil and handling techniques that would minimize the potential for dust generation. It is also envisioned that the plan would require the use of excavation techniques and/or odor suppressants intended to mitigate potential odors. The plan would also include a procedure(s) to monitor the level of dust, asbestos fibers, and odors in the air during the Intrusive Activities to confirm compliance with the plan. The plan would also contain a provision requiring that the intrusive activity would be stopped and the area secured if the monitoring indicates that the level of asbestos fibers, dust, or odors in the air are in excess of applicable limits. This plan shall be submitted for public review and comment in accordance with the provisions of the 27 December 1995 (or subsequent revisions) PIP;
- (vii) In the event that occupied structures are constructed at the Property, an LSP shall evaluate the potential risks associated with migration of volatile compounds from the subsurface into indoor air and the inhalation of these compounds inside such structures. If a condition of "No Significant Risk" cannot be demonstrated, such measures as excavation of contaminated soils or the inclusion of engineered controls (i.e., impermeable vapor barrier and/or

sub-slab venting) shall be implemented to provide a condition of "No Significant Risk";

- (viii) Provide a draft of any proposed changes to this AUL or any monitoring plans that are developed for public comment, in accordance with the provisions of the 27 December 1995 (or subsequent revisions) PIP; and
- (ix) All activities that may disrupt the Protective Cover shall comply with the applicable requirements of the Cambridge Asbestos Protection Ordinance in effect at the time of the disruption.

4. Proposed Changes in Activities and Uses. Any proposed changes in activities and uses at the Property which may result in higher levels of exposure to oil and/or hazardous material than currently exist shall be evaluated by an LSP who shall render an Opinion, in accordance with 310 CMR 40.1080 *et seq.*, as to whether the proposed changes will present a significant risk of harm to health, safety, public welfare or the environment. Any and all requirements set forth in the Opinion to meet the objective of this Notice shall be satisfied before any such activity or use is commenced.

5. Violation of a Response Action Outcome. The activities, uses and/or exposures upon which this Notice is based shall not change at any time to cause a significant risk of harm to health, safety, public welfare, or the environment or to create substantial hazards due to exposure to oil and/or hazardous material without the prior evaluation by an LSP in accordance with 310 CMR 40.1080 *et seq.*, and without additional response actions, if necessary, to achieve or maintain a condition of No Significant Risk or to eliminate substantial hazards.

If the activities, uses, and/or exposures upon which this Notice is based change without the prior evaluation and additional response actions determined to be necessary by an LSP in accordance with 310 CMR 40.1080 *et seq.*, the owner or operator of the Property subject to this Notice at the time that the activities, uses and/or exposures change, shall comply with the requirements set forth in 310 CMR 40.0020.

6. Incorporation Into Deeds, Mortgages, Leases, and Instruments of Transfer. This Notice shall be incorporated either in full or by reference into all future deeds, easements, mortgages, leases, licenses, occupancy agreements or any other instrument of transfer, whereby an interest in and/or a right to use the Property or a portion thereof is conveyed.

Owner hereby authorizes and consents to the filing and recordation and/or registration of this Notice, said Notice to become effective when executed under seal by the undersigned LSP, and recorded and/or registered with the appropriate Registry(ies) of Deeds and/or Land Registration Office(s).

WITNESS the execution hereof under seal this 16th day of February, 2006.

ALEWIFE LAND CORPORATION

By: W B McGowan
W. Brian McGowan
President

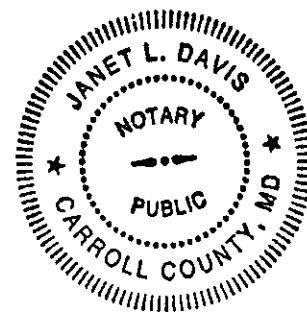
STATE OF MARYLAND

COUNTY OF Howard, ss

On this 16 day of February, 2006, before me, the undersigned notary public, personally appeared W. Brian McGowan, proved to me through satisfactory evidence of identification, which was a Virginia driver's license, to be the person whose name is signed on the preceding or attached document, and acknowledged to me that he signed it voluntarily for its stated purpose as President of Alewife Land Corporation.

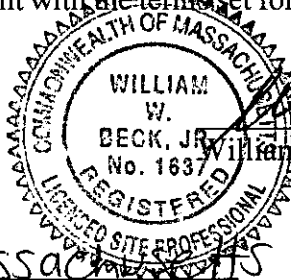
[Notary Seal/Stamp]

Janet L. Davis
Notary Public
My commission expires: 9-1-06



The undersigned LSP hereby certifies that he executed the aforesaid Activity and Use Limitation Opinion attached hereto as Exhibit C and made a part hereof and that in his Opinion this Notice of Activity and Use Limitation is consistent with the terms set forth in said Activity and Use Limitation Opinion.

Date: 1 MARCH 2006



William W. Beck, Jr.
William W. Beck, Jr., LSP

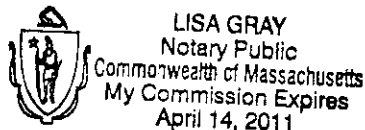
STATE OF Massachusetts

COUNTY OF Suffolk, ss

On this 1st day of March, 2006, before me, the undersigned notary public, personally appeared William W. Beck, Jr., proved to me through satisfactory evidence of identification, which was New Hampshire driver's license, to be the person whose name is signed on the preceding or attached document, and acknowledged to me that he signed it voluntarily for its stated purpose.

[Notary Seal/Stamp]

Lisa Gray
Notary Public
My commission expires: _____



Upon recording, return to:
Sherin and Lodgen LLP
101 Federal Street, 30th Floor
Boston, Massachusetts 02110
Attn: Peter Friedenberg, Esq.

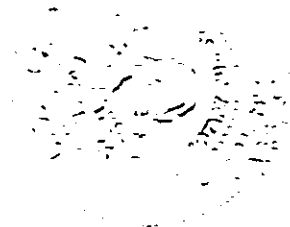


EXHIBIT A TO
NOTICE OF ACTIVITY AND USE LIMITATION

Description of the Property

Those certain parcels of land located in Cambridge, Middlesex County, Massachusetts more particularly bounded and described as follows:

FIRST PARCEL

The certain parcel of land located (in part registered and in part unregistered) in Cambridge, Middlesex County, Massachusetts, shown as "W.R. Grace & Co., Area = 9.824± Acres" on a plan entitled "Plan of Land in Cambridge, Massachusetts," dated January 14, 1988, prepared by HMM Engineers Inc., recorded with Middlesex South District Registry of Deeds as Plan No. 625 of 1989, in Book 19877, Page 518, and more particularly bounded and described as follows:

Beginning at a point on the Easterly sideline of Alewife Brook Parkway, said beginning point being on the Southerly boundary of land now or formerly of Alewife Land Corporation as shown on said plan;

Thence running S 85°-36'-19" E by said land now or formerly of Alewife Land Corporation fifty-nine and fifty-nine hundredths (59.59) feet to a point;

Thence turning and running S 85°-35'-45" E still by said land now or formerly of Alewife Land Corporation four hundred fifty-seven and thirty-nine hundredths (457.39) feet to a point;

Thence turning and running S 02°-01'-14" E by land now or formerly of the City of Cambridge four hundred twenty-nine and thirty-eight hundredths (429.38) feet to a point;

Thence turning and running S 34°-20'-46" E one hundred sixty-six and seventeen hundredths (166.17) feet to a point;

Thence turning and running S 81°-46'-40" E seventeen and sixty-five hundredths (17.65) feet to a point;

Thence turning and running S 00°-52'-34 E eighty-one and forty-four hundredths (81.44) feet to a point;

Thence turning and running S 31°-49'-27" E twenty-nine and forty-eight hundredths (29.48) feet to a point;

Thence turning and running S 04°-31'-52" W one hundred and ninety-six hundredths (100.96) feet to a point;

Thence turning and running N 84°-52'-23" W one hundred thirteen and six hundredths (113.06) feet to a point;

Thence turning and running S 37°-14'-02" W nineteen and sixty-three hundredths (19.63) feet to a point;

Thence turning and running S 06°-05'-52" E still by land now or formerly of said City of Cambridge two hundred fifty-six and twenty-three hundredths (256.23) feet to a point on the Northerly sideline of Rindge Avenue;

Thence turning and running N 83°-19'-53" W by said Northerly sideline of Rindge Avenue two hundred forty-eight and thirty-six hundredths (248.36) feet to an angle point.

Thence turning and running N 06°-40'-07" E ten and no hundredths (10.00) feet to an angle point;

Thence turning and running N 75°-55'-07" W by said Northerly sideline of Rindge Avenue seventy-seven and fifty-one hundredths (77.51) feet to an angle point;

Thence turning and running N 83°-19'-53" W still by said Northerly sideline of Rindge Avenue sixty and no hundredths (60.00) feet to a point;

Thence turning and running N 01°-21'-07" E by two parcels of land now or formerly of Lehigh Investment Trust five hundred sixteen and seventy-eight hundredths (516.78) feet to a point;

Thence turning and running N 77°-26'-19" W still by land now or formerly of said Lehigh Investment Trust one hundred fifty-one and forty-three hundredths (151.43) feet to a point;

Thence turning and running by a curve to the left of eight thousand, six hundred thirty-one and seventy-nine hundredths (8,631.79) radius still by land now or formerly of said Lehigh Investment Trust one hundred twenty-four and seventy-four hundredths (124.74) feet to a point on the Easterly sideline of Alewife Brook Parkway;

Thence turning and running N 89°-37'-29" E by land now or formerly of the Massachusetts Bay Transportation Authority two hundred six and no hundredths (206.00) feet to a point;

Thence turning and running N 56°-29'-35" E sixty-six and ninety-seven hundredths (66.97) feet to a point;

Thence turning and running N 00°-22'-31" W ninety-three and seventy-three one hundredths (93.73) feet to a point;

Thence turning and running S 89°-37'-29" W still by land now or formerly of said Massachusetts Bay Transportation Authority two hundred sixty-nine and sixty hundredths (269.60) feet to a point on the Easterly sideline of Alewife Brook Parkway;

Thence turning and running N 11°-45'-03" W by said Easterly sideline of Alewife Brook Parkway two hundred six and ninety hundredths (206.90) feet to an angle point;

Thence turning and running N 73°-42'-27" E still by said Easterly sideline of Alewife Brook Parkway fifteen and no hundredths (15.00) feet to the point of beginning.

The above described premises include the following lots of registered land, to wit:

Lots A and B as shown on Land Court Plan 5542B;

Lot 3 as shown on Land Court Plan 18496B;

Lot 5 as shown on Land Court Plan 18496C; and

Lot 18 as shown on Land Court Plan 24288D.

For title to said registered land, see Certificate of Title 185580 in Registration Book 1058, Page 30. See also deed recorded with Middlesex South District Registry of Deeds in Book 19877, Page 527, and filed with Middlesex South Registry District of the Land Court as Document No. 800848.

SECOND PARCEL

That certain parcel of land (in part registered and in part unregistered) located on Whittemore Avenue in Cambridge, Middlesex County, Massachusetts shown as "Parcel B, Area = 291,407± S.F., 6.690 Acres" on a plan entitled "Plan of Land Owned by Alewife Land Corporation, 1 Alewife Center, Cambridge, Massachusetts," dated October, 1999, by URS Greiner Woodward-Clyde, Inc. recorded with Middlesex South District Registry of Deeds as Plan No. 1218 of 1999 in Book 30804, Page 571, and more particularly bounded and described as follows:

Beginning at a point on the Easterly sideline of Alewife Brook Parkway, said beginning point being the Southwesterly corner of said parcel;

Thence running N 14°-06'-09" W by said Easterly sideline of Alewife Brook Parkway three hundred ten and ninety-two hundredths (310.92) feet to a point;

Thence turning and running by a curve to the right having a radius of six hundred twenty-seven and seventy-four hundredths (627.74) feet, three hundred fifteen and seventy-one hundredths (315.71) feet to a point at the Westerly boundary of "Parcel A" as shown on said plan;

Thence turning and running by a curve to the left having a radius of one hundred twenty-five and no hundredths (125.00) feet still by said Parcel A, one hundred one and forty-eight hundredths (101.48) feet to a point;

Thence turning and running by a curve to the left having a radius of one thousand, nine hundred fifty-one and twenty-five hundredths (1,951.25) feet still by said Parcel A, two hundred forty-eight and fourteen hundredths (248.14) feet to a point;

Thence turning and running N 04°-38'-21" E still by said Parcel A, six and seventy-one hundredths (6.71) feet to a point;

Thence turning and running N 88°-16'-09" E still by said Parcel A, eight and eighty-four hundredths (8.84) feet to a point;

Thence turning and running N 04°-37'-30" E still by said Parcel A, thirty-one and ninety-four hundredths (31.94) feet to a point on the Easterly boundary of said Parcel A

Thence turning and running S 85°-01'-50" E by land now or formerly of W.R. Grace & Co.-Conn., two hundred sixty-eight and ninety-two hundredths (268.92) feet to a point;

Thence turning and running S 03°-51'-56" W by said land now or formerly of W.R. Grace & Co.-Conn., two hundred fifty-six and fifty-one hundredths (256.51) feet to a point;

Thence turning and running S 10°-25'-00" E by said land now or formerly of W.R. Grace & Co.-Conn., twenty-one and ninety-four hundredths (21.94) feet to a point;

Thence turning and running S 10°-25'-01" E by said land now or formerly of W.R. Grace & Co.-Conn., two hundred thirty-four and nine hundredths (234.09) feet to a point on the Northerly boundary of land now or formerly of the City of Cambridge;

Thence turning and running S 73°-36'-56" W by said land now or formerly of the City of Cambridge, five and no hundredths (5.00) feet to a point;

Thence turning and running S 02°-01'-14" E by said land now or formerly of the City of Cambridge, thirty-three and thirty-six hundredths (33.36) feet to a point on the Northerly boundary of land now or formerly of Alewife Land Corporation;

Thence turning and running N 85°-35'-45" W by said land now or formerly of Alewife Land Corporation, four hundred fifty-seven and thirty-nine hundredths (457.39) feet to a point;

Thence turning and running N 85°-36'-19" W by said land now or formerly of Alewife Land Corporation, fifty-nine and fifty-nine hundredths (59.59) feet to the point of beginning.

The above described premises include the following lots of registered land, to wit:

Lots 53 and 54 as shown on Land Court Plan 5236P;

Lot 17 as shown on Land Court Plan 24288D; and

Lot 4 as shown on Land Court Plan 18496C.

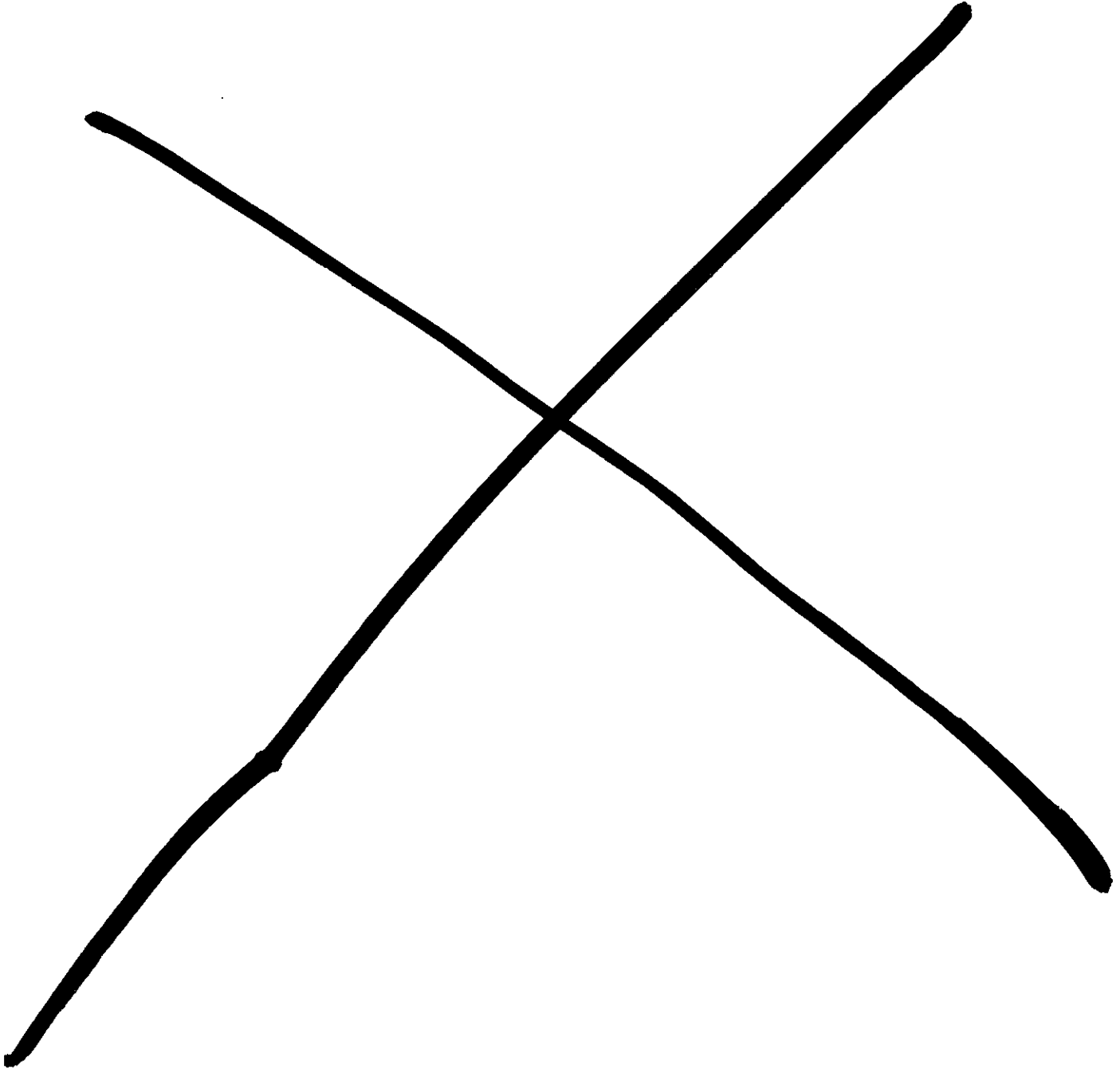
For title of Alewife Land Corporation to said registered land, see Certificate of Title 173484.

For title of Alewife Land Corporation, also see deed recorded with Middlesex South District Registry of Deeds in Book 16152, Page 284, and registered with Middlesex South Registry District of the Land Court as Document No. 681120.

EXHIBITS B-1 AND B-2 TO
NOTICE OF ACTIVITY AND USE LIMITATION

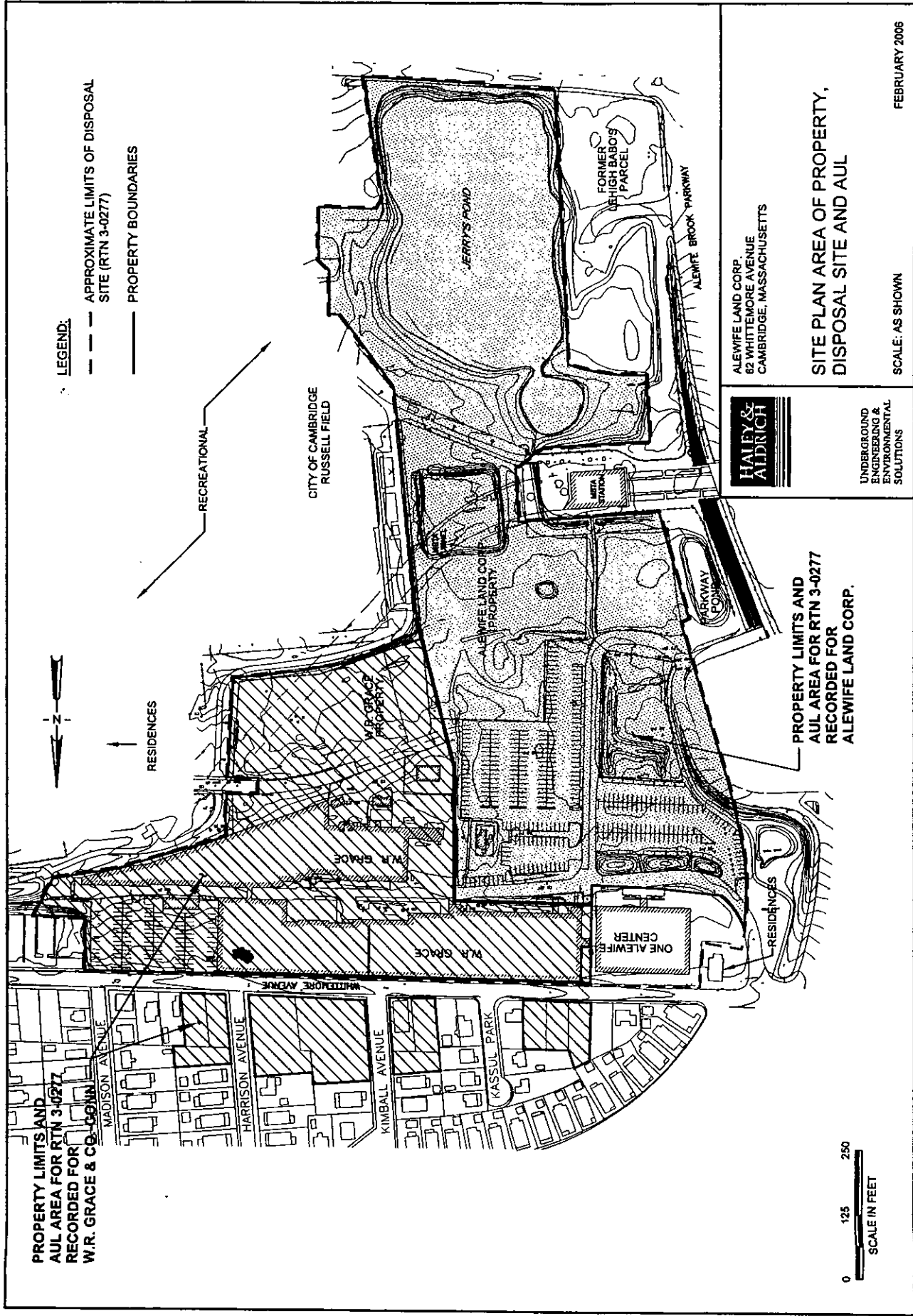
Plans Showing Relationship of Property to the Disposal Site

[See attached plans]



10063-066 A228

PROPERTY LIMITS AND
AUL AREA FOR RTN 3-0277
RECORDED FOR
W.R. GRACE & CO. CONN



UNDERGROUND
ENGINEERING &
ENVIRONMENTAL
SOLUTIONS

ALEWIFE LAND CORP
82 WHITMORE AVENUE
CAMBRIDGE, MASSACHUSETTS

SITE PLAN AREA OF PROPERTY,
DISPOSAL SITE AND AUL

SCALE: AS SHOWN

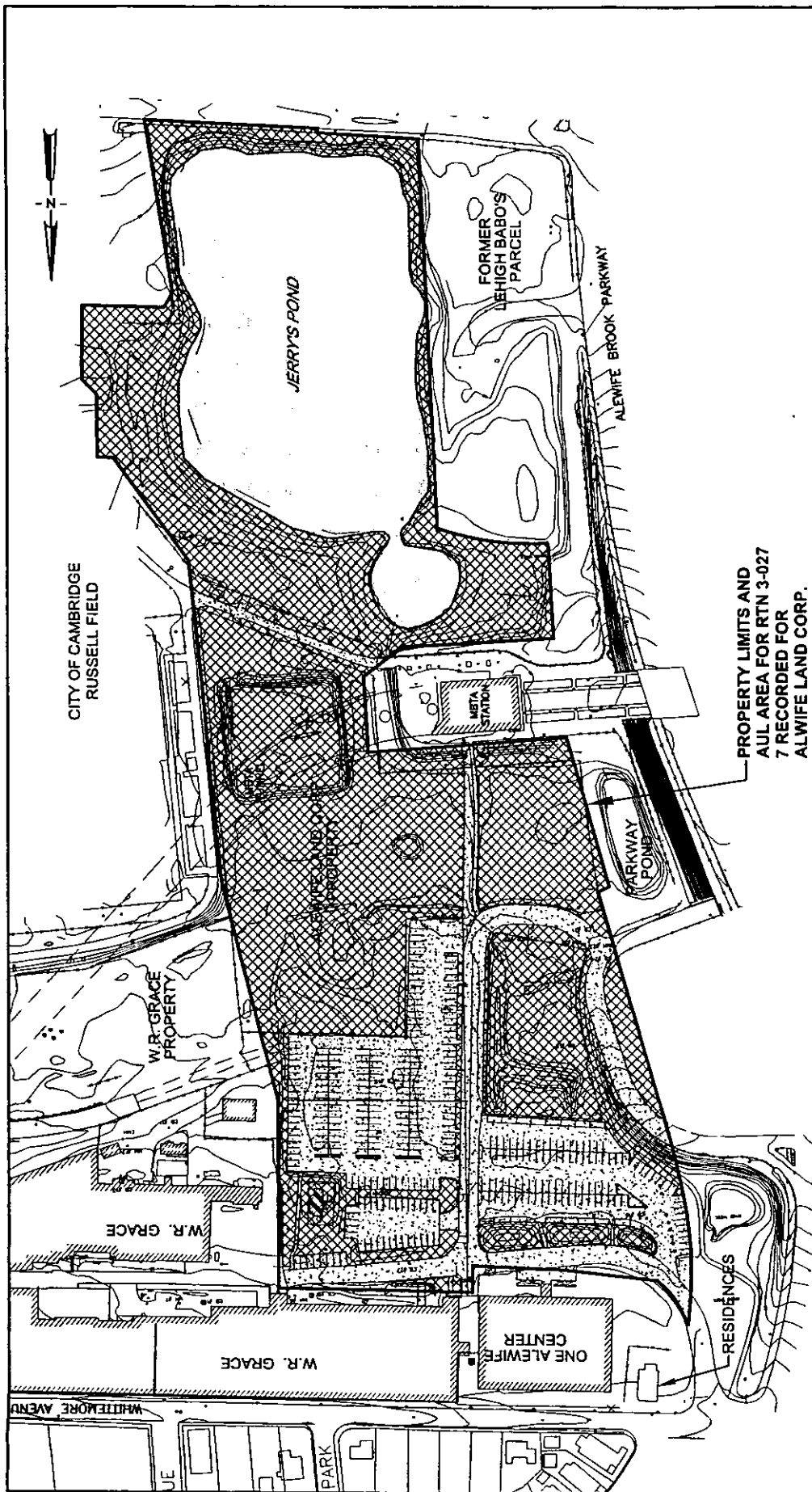
FEBRUARY 2006

PROPERTY LIMITS AND
AUL AREA FOR RTN 3-0277
RECORDED FOR
ALEWIFE LAND CORP.

0 125 250
SCALE IN FEET

EXHIBIT B-1

10063-066 A224



ALEWIFE LAND CORP.
62 WHITMORE AVENUE
CAMBRIDGE, MASSACHUSETTS
RTN 3-0277

SKETCH PLAN AREA
PROTECTIVE COVER MATERIALS

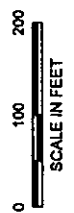
UNDERGROUND
ENGINEERING &
ENVIRONMENTAL
SOLUTIONS

FEBRUARY 2008

SCALE: AS SHOWN

EXHIBIT B-2

- LEGEND:
- EXISTING STRUCTURE
 - PAVEMENT AND CONCRETE WALKS
 - EXISTING LANDSCAPING, GRASS FIELD, WETLAND OR OTHERWISE VEGETATED AREA
 - EXISTING WATER BODY



PROPERTY LIMITS AND
AUL AREA FOR RTN 3-027
7 RECORDED FOR
ALEWIFE LAND CORP.

EXHIBIT C TO
NOTICE OF ACTIVITY AND USE LIMITATION

Activity and Use Limitation Opinion

[See attached]

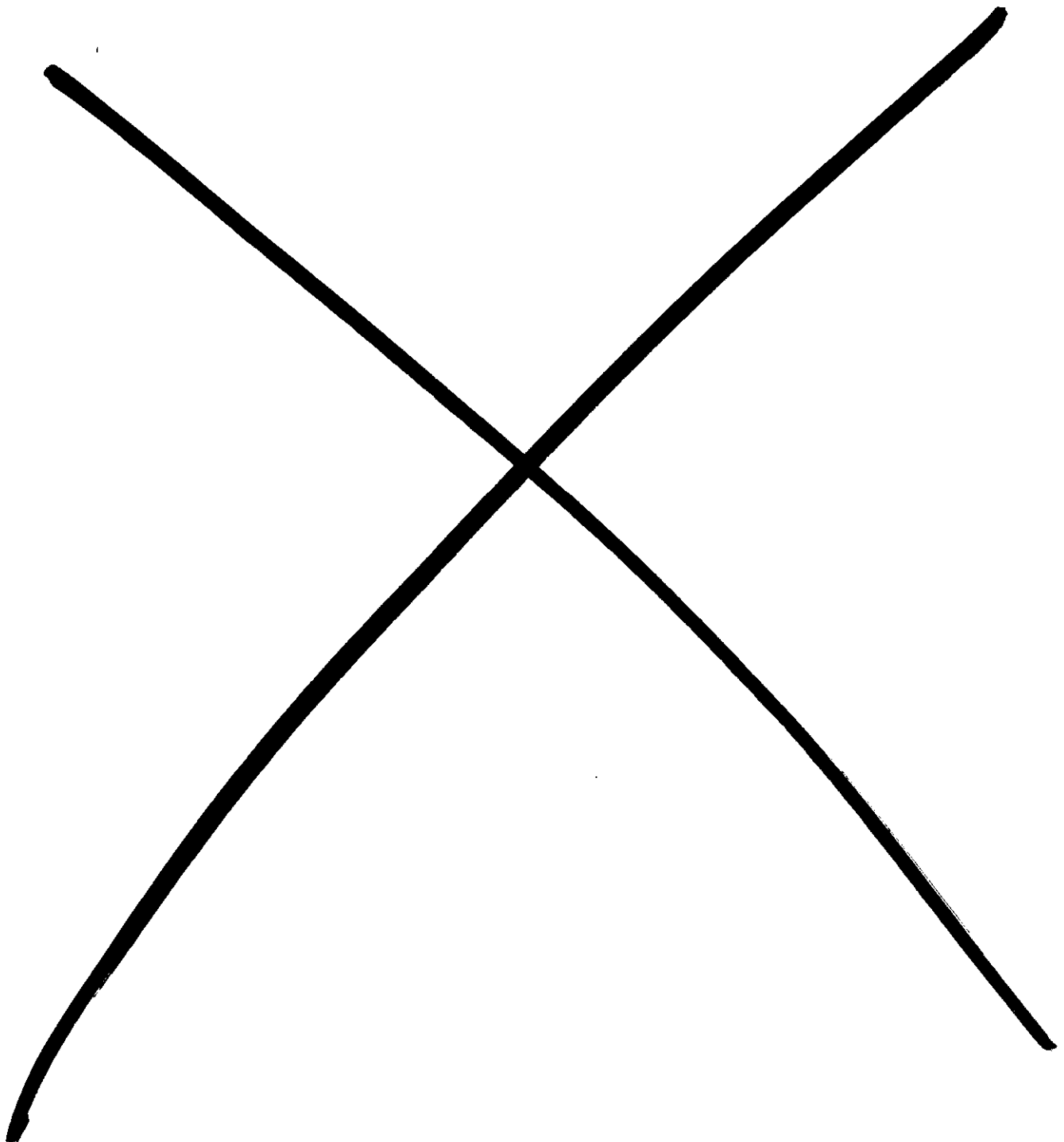


EXHIBIT C**ACTIVITY AND USE LIMITATION OPINION**

Portion of W.R. Grace & Co.-Conn. Disposal Site
Cambridge, Massachusetts

INTRODUCTION

In accordance with the requirements of 310 CMR 40.1074, this Activity and Use Limitation (AUL) Opinion has been prepared for a portion of the W.R. Grace Disposal Site with an address at 62 Whittemore Avenue in Cambridge, Middlesex County, Massachusetts, 02140. The W.R. Grace Disposal Site consists of 25 acres of land partially bounded by Whittemore Avenue to the north; Harvey Street and Russell Field to the east; Rindge Avenue to the south; and the Alewife Brook Parkway and a residence to the west (herein referred to as the "Disposal Site").

The area subject to this AUL (herein referred to as the "Property") consists of 25.6 acres, and is comprised of twenty-two (22) individual parcels of land. A portion of the area subject to the AUL consists of a portion of the Disposal Site listed by the Massachusetts Department of Environmental Protection (DEP) under RTN 3-0277. The portion of the Disposal Site subject to this AUL consists of eighteen (18) of the parcels of land and is comprised of twenty-four (24) acres of land. The remaining one (1) acre parcel of land included in the Disposal Site, known as One Alewife Center, is subject to a separate AUL which was previously recorded on 28 October 1999. The owner of the parcels included in the Property is either W.R. Grace & Co.-Conn. or the Alewife Land Corporation as identified in the table below.

Owner	Parcel(s)	Total Size, Acres	Type
W.R. Grace & Co.-Conn.	20	8.1	Unregistered and Registered
Alewife Land Corporation	2	17.5	Unregistered and Registered

The area subject to this AUL Opinion consists of the Property as described above. An AUL is being recorded separately at the Middlesex County South Registry of Deeds for each of the land owners identified above, both with the same AUL Opinion. A portion of the area subject to the AUL consists of a portion of the Disposal Site listed by the Massachusetts Department of Environmental Protection (DEP) under RTN 3-0277. Plans showing the relationship of the Property covered by this AUL to the boundary of the Disposal Site (RTN 3-0277) are attached as Exhibits B-1 and B-2 to the AUL.

This AUL Opinion is submitted in support of a Class A-3 Response Action Outcome (RAO) Statement and associated DEP Form 1075, "Notice of Activity and Use Limitation" for the Oil and Hazardous Materials (OHM) at the Disposal Site. An AUL is a deed restriction that imposes conditions on land use (allowable and restricted site uses, and obligations) considered necessary to ensure No Significant Risk (NSR) to human health under an RAO and a risk characterization supporting that RAO.

The required contents of an AUL are specified at 310 CMR 40.1074(2), and Form 1075 must be used in its preparation. The only material that can be inserted in that form relates to the description and ownership of the affected property, the activities and uses that are consistent or inconsistent with the AUL Opinion, and the obligations and conditions set forth in that opinion. Because the AUL format does not provide a vehicle for addressing public concerns that have been raised with respect to the Property and the Disposal Site, this AUL Opinion contains a more detailed account of the Disposal Site history and risk characterization than is usually

found in such a document. In addition, the AUL addresses a new policy recently issued by the Massachusetts DEP that for the first time regulates asbestos as a contaminant in soil under the Massachusetts Contingency Plan (MCP).

DESCRIPTION OF DISPOSAL SITE

The Disposal Site is listed by the Massachusetts DEP under RTN 3-0277. W.R. Grace & Co.-Conn. (Grace) is the listed potentially responsible party. The Disposal Site comprises approximately 25 acres of land in total, of which 24 acres are included within the Property, as well as an adjacent 1 acre parcel (One Alewife Center). Approximately thirty-five percent (35%) of the Disposal Site is covered by buildings (4 acres or 169,300 ft²) or pavement (5.4 acres or 234,715 ft²). Jerry's Pond is located adjacent to Rindge Avenue on the southern portion of the Disposal Site. It occupies approximately 4 acres. The remaining area of the Disposal Site consists of approximately 12 acres of vegetation. The vegetated areas, including the area surrounding Jerry's Pond, occupy approximately fifty percent (50%) of the Disposal Site and are surrounded by fencing to control access.

DISPOSAL SITE HISTORY

In the 1900s, two sets of Boston and Maine Railroad tracks ran through the Disposal Site from roughly east to west. In 1919, the Dewey and Almy Chemical Company ("Dewey & Almy") commenced operations at the Disposal Site and began constructing buildings for their rubber product manufacturing processes. At that time, the Dix Lumber Company operated on the Disposal Site south of the Boston & Maine tracks. Over the years, a total of 46 buildings have occupied the Disposal Site. Most of these buildings were covered with asbestos cement siding. The majority of the buildings historically located within the Boston & Maine Railroad tracks on Dewey & Almy property were constructed prior to 1949, and the remaining buildings were constructed by 1955.

Grace acquired Dewey & Almy in 1954. The Dewey & Almy property included land from the south side of Whittemore Avenue to just north of Jerry's Pond. From 1954 to 1965, Grace also acquired the following properties to achieve the current Property size:

- Jerry's Pond
- Parcel of land between Jerry's Pond and Russell Field Park
- Portion of lot now known as Parcel A (One Alewife Center)
- Lot south of the Boston & Maine Railroad tracks that was formerly operated by Dix Lumber Company

During the 1960s and 1970s, Grace's Cambridge facility was used as a headquarters and research facility for the company's four new divisions, three of which were moved to Grace's Lexington facility in 1976. The demolition of unused manufacturing buildings at the Disposal Site began around 1976 and continued to 1981. The current configuration of buildings on the Property remains the same as that in 1981. Grace had ceased all manufacturing and processing at this location by 1983, and the Boston & Maine railroad tracks were subsequently removed from service.

The Massachusetts Bay Transit Authority (MBTA) constructed the Red Line extension through the Disposal Site from the late 1970s through the mid-1980s. This included the construction of train line tunnels and an entrance structure along an easement granted by Grace.

Three one to three-story mixed-use buildings (consisting of a number of older buildings which have since been inter-connected) owned by Grace are now situated on the Property. The area immediately surrounding the buildings is landscaped, covered with crushed stone or paved for walkways, access roads or parking.

REGULATORY COMPLIANCE HISTORY OF DISPOSAL SITE

The Disposal Site was initially listed with the DEP after the detection of volatile and semi-volatile organics, petroleum products, and metals during evaluations of subsurface and hydrogeological conditions for the Alewife Center Master Plan Study conducted in 1984 and 1985, and in subsequent investigations conducted in the 1990s. After reviewing the results of subsurface and hydrogeological evaluations conducted in 1984 and 1985, the Department of Environmental Quality Engineering (DEQE) issued a Notice of Responsibility (NOR) on 9 February 1987, notifying Grace that the DEQE had determined that a release of oil or hazardous materials (OHM) had occurred at the Disposal Site. DEQE assigned Release Tracking Number 3-0277 to the Property and One Alewife Center property (as it is now known) and required additional investigations.

The redesign of the MCP in 1993 allowed for the transitioning of disposal sites listed in the "old" system to the "new" system within a timeframe set forth in the regulations. The Disposal Site was listed as a Confirmed, Non-Priority Disposal Site without a Waiver, according to the 1993 Transition List of "Confirmed Disposal Sites and Locations to be Investigated". In compliance with the Transitions Provisions of the MCP, Haley & Aldrich submitted a Tier II Classification for the Disposal Site on 4 August 1995.

In October 1996 when a new tier classification was completed, the Disposal Site was reclassified as Tier IC under the MCP, and it was later granted a Tier IC permit with an effective date of 13 February 1997. The Tier IC permit allowed for continuing oversight of the Disposal Site by a Licensed Site Professional (LSP), with certain activities requiring DEP approval. The Tier IC permit was effective for 5 years and expired on 13 February 2002. Two permit extensions have been issued for the Site since February 2002. The current permit (Permit No. 118529) expires in March 2006.

Asbestos was added to the list of contaminants of concern at the Disposal Site in 1998, following the completion of two voluntary field programs at the Disposal Site to investigate for the presence of asbestos in soil. Based on the findings of those investigations, a second RTN (RTN 3-17014) was assigned to the Disposal Site in June 1998. In July 1999, RTN 3-17014 was closed by the DEP and the compliance obligations for that RTN were incorporated into existing compliance obligations under RTN 3-0277.

In 1999, the one-acre One Alewife Center property, located at the northwest corner of the Disposal Site, was sold by W.R. Grace to the New Boston Alewife Limited Partnership. On 28 October 1999, and prior to the sale of the Property, an AUL was recorded for the One Alewife Center property at the Middlesex Registry of Deeds. The purpose of the AUL was to mitigate unforeseen potential exposures to contaminants, and to maintain a condition of "No Significant Risk" at the One Alewife Center portion of the Disposal Site.

REASON FOR ACTIVITY AND USE LIMITATION

Oil and Hazardous Material (OHM)

Two subsurface exploration programs, conducted at the Disposal Site in November 1986 and October 1987, provided environmental information on soil and groundwater in the area of building sites being proposed at that time. The data from these two reports identified certain volatile and semi-volatile organics (VOCs), petroleum products, and metals in soil and groundwater. Supplemental soil investigations were completed at the Disposal Site to evaluate the extent of the petroleum contamination by new analytical methods. These investigations include a Total Petroleum Hydrocarbon (TPH) evaluation conducted in 1995 and an Extractable Petroleum Hydrocarbons (EPH) evaluation in 1999.

Since 1998, Grace has voluntarily conducted periodic groundwater monitoring for VOCs and naphthalene in groundwater. The levels of contaminants (mainly VOCs and naphthalene compounds) identified in groundwater continue to be below the applicable MCP risk limits.

The Disposal Site was subject to industrial use from the early 1920s, when Dewey & Almy began operations, until 1983 when Grace ceased all manufacturing and processing operations at that location. The Dewey and Almy facility originally manufactured materials used as can sealing compounds, drum and pail cover gaskets, and bottle cap gaskets. The primary raw material was processed rubber. Specific compounds manufactured by Dewey & Almy at the Disposal Site include naphthalene sulfonate (trade name DAXAD), a dispersant known as TDA made from calcium lignosulfonate (by-product of the paper-making industry), and Soda Sorb® (a lime based material used as a carbon dioxide absorbent).

Based on the historic use of the Disposal Site, the chemical contaminants of concern at the Disposal Site consist of naphthalene, numerous polyaromatic hydrocarbons ("PAHs") and phenols, VOCs, petroleum compounds, and metals in soil. The highest contaminant concentrations are associated with former facility operations which were generally located in the area now occupied by the paved parking lots and/or the vegetated area to the northeast of the MBTA entrance structure. In particular, during the time DAXAD was manufactured at the Disposal Site, several lagoons were used as settling ponds and sources of cooling water. Contaminated material associated with such activities was previously removed from the Disposal Site by the MBTA in conjunction with the construction of the Red Line extension. Also during the Dewey & Almy years, petroleum products which included unspecified quantities of fuel oil, diesel, and No. 2 fuel oil, heavy fuel oil, light oil, white oil, and gasoline were stored on-site in nine underground storage tanks (USTs) and four above ground storage tanks (ASTs). In general, the capacity of the tanks ranged from 1,000 gallons to 10,000 gallons, with the exception of one 54,000 gallon fuel oil above ground storage tank (AST) formerly located northeast of the MBTA entrance structure. A majority of the tanks were located near the former buildings (now parking lots and vegetated areas) and were most likely used for heating oil. The known ASTs and USTs have been removed from the Disposal Site.

An Enhanced In-situ Bioremediation remedial program was implemented at the Disposal Site from 2001 to 2003 in the area of the highest concentrations of Extractable Petroleum Hydrocarbons (EPH). Bioremediation successfully reduced EPH levels in soil to acceptable levels under the MCP in the vegetated area immediately to the east of the path from the Property's parking lots to the MBTA entrance structure.

Asbestos

Asbestos was added to the list of contaminants of concern at the Disposal Site in 1998, following the completion of two voluntary field exploration programs at the Disposal Site to investigate the presence of asbestos in soil. Since May 1998, a total of 905 soil and split soil samples have been collected by Grace, the Alewife Study Group, and the City of Cambridge. Of the 882 samples analyzed, 856 samples (COC-33; Grace-745; ASG-78) were analyzed using the EPA Region 1 protocol combined with PLM (using EPA Method 600/R-93-116) and 49 samples were analyzed using TEM (EPA 600/R-93-116-Chatfield Semi-Quantitative). Details of the investigation and testing are available in the various reports submitted to the DEP that address the evaluation of asbestos in soil.

The highest levels of asbestos fibers and the most consistent detections of asbestos fibers in soil have been found in those areas of the Disposal Site where buildings were formerly located. The overwhelming fiber type identified at the Disposal Site is chrysotile, which is the most common form of asbestos used in building materials and friction products.

Risk Characterization

In accordance with the MCP, the risks to human health, safety, public welfare, and the environment have been characterized for contaminated soil, groundwater, surface water, and ambient air at the Disposal Site and adjacent properties. Current conditions at the Disposal Site consist of commercial property uses and transient activities associated with the MBTA entrance structure.

Current risks are estimated for the following receptors:

- residents of all ages adjacent to the Disposal Site
- adult office workers on-site (including exposure as children visiting the site prior to working as office workers on-site);
- transient persons (MBTA subway users, pedestrians, and trespassers, including children) during any construction work carried out on-site
- adult utility workers

While no other use of the Disposal Site is expected for the foreseeable future, the risk assessment considered a hypothetical future use scenario involving large scale excavation of contaminated soil in order to be conservative and consistent with previous risk characterizations. The scope and size of the scenario that was evaluated is not likely to occur due to existing local and state regulations related to zoning, wetlands, and flood plains. Therefore, this scenario is likely to overestimate risk.

Future risks were evaluated for the following future receptors:

- residents of all ages adjacent to the Disposal Site
- adult office workers on-site during construction and for long-term occupancy of buildings on site (including exposure as children visiting the site prior to working as office workers on the site)
- transient persons (MBTA subway users, pedestrians, and trespassers, including children) during any construction work carried out on-site
- adult utility workers
- children visiting the Disposal Site (e.g. to retail stores) after construction.
- adult construction workers on-site (during construction)

For both current and future conditions, visitors and transient users of the Disposal Site (children and adults) are considered implicitly because risks would be less for them as compared to the risk for a resident adjacent to the Disposal Site, or to a utility worker or future construction worker, all of whose risks are explicitly evaluated.

Exposure scenarios evaluated quantitatively in the analysis are inhalation of airborne asbestos and incidental ingestion of asbestos in soil; inhalation of vapors emanating from soil; inhalation and ingestion of contaminants in fugitive dust; as well as dermal contact during recreational and hypothetical construction activities.

Several potential exposure scenarios were excluded from evaluation under the risk characterization. In order to exclude these exposure scenarios from evaluation, the potential exposures must be eliminated through the use of an AUL, as provided under 310 CMR 40.1012(2). The excluded scenarios are as follows:

- future residential use
- exposure to groundwater(direct contact)
- future use as schools, playgrounds, day care centers, etc.
- active recreational uses in unpaved areas
- vapor intrusion into hypothetical future new buildings.

Under current conditions of use (commercial property), the risk characterization concluded that there is a condition of No Significant Risk (NSR) to human health for all receptors evaluated for potential exposures associated with both asbestos and OHM. In addition, the risk characterization concluded that a condition of NSR exists for Public Safety, Public Welfare, and the Environment due to:

- the limited exposure of environmental receptors to site-related contaminants,
- the absence of conditions that may negatively affect the surrounding community, and
- the absence of any significant risks to safety that could be identified under current conditions.

As noted earlier, for the foreseeable future, the Disposal Site is expected to continue to be used in a manner consistent with its current use as a commercial facility. In this case, risk estimates remain the same or decrease if the soil remains undisturbed or if disturbed soil is covered with clean soil. However, to be conservative and consistent with previous risk characterizations, the risk assessment considered a hypothetical future use scenario involving large-scale excavation of contaminated soil (containing asbestos and OHM) that then remains on the surface. In the hypothetical event that the property is subject to development scale excavation, a specific evaluation of risk to identify exposure pathways and contaminants of concern warranting management should be undertaken.

The risk characterization concluded the following:

- The incremental cancer risk estimates for the adjacent residents, office workers, and hypothetical construction workers potentially exposed to soil at the Disposal Site exceed DEP's guidelines for achieving a condition of No Significant Risk due to an assumed presence of asbestos in the exposed soil.
- Exposure of environmental receptors to site-related contaminants is limited, and thus the Disposal Site poses No Significant Risk to the environment.
- Potential odors generated during the excavation of naphthalene-contaminated soils could potentially create a nuisance condition, and thus a condition of No Significant Risk to public welfare could not be achieved without mitigating efforts.
- A condition of No Significant Risk to safety exists at the Disposal Site in the future (even during large-scale construction) with one exception. If small-scale excavations were to be completed over a short period of time in the most contaminated areas of the Disposal Site, then there is the potential for the hypothetical construction worker to be exposed to vapors from naphthalene in soils which might exceed the OSHA PEL for an 8 hour day. However, a condition of No Significant Risk to Safety can be achieved through compliance with the Obligations and Conditions set forth below.

Achieving an RAO for the Disposal Site is not feasible under the MCP criteria without implementation of AULs on the Property and the 1 acre One Alewife Center parcel. Areas of the Disposal Site containing higher levels of contamination are shown on the Figure entitled Limits of Disposal Site provided in the RAO. This AUL, in conjunction with the One Alewife Center AUL, is considered appropriate to address unforeseen potential exposures and to maintain a condition of "No Significant Risk" at all areas of the Disposal Site. The AUL for the Property manages potential exposures to soil assumed to represent potential future risks associated with potential exposure to asbestos or petroleum and naphthalene. It also manages the exposures not evaluated in the risk characterization and addresses concerns expressed by neighborhood residents. The permitted uses are consistent with the current and reasonably foreseeable uses of the Property (i.e., office, industrial, or retail). Furthermore, identification in the AUL of activities and uses inconsistent with the AUL Opinion and of the Obligations and Conditions set forth in the AUL Opinion provides a means for maintaining the assumptions of the risk assessment which rely upon elimination of certain exposure pathways to achieve a level of "No Significant Risk" as required by applicable MCP criteria.

A primary obligation of the AUL is maintenance of the "Protective Cover" (the existing top 6 inches of cover material, as defined further below). The property owner must implement the Protective Cover Monitoring Plan ("PCMP") attached to this AUL. The Plan should describe methods for verifying that the cover materials continue to function in a manner which prevents incidental exposure of, or casual direct contact with, subsurface soils, and for making timely repairs if proper functioning of the cover is compromised. On-site workers should be informed of the requirements of the PCMP, which must be available on-site at all times. In the event of property redevelopment, improvements to the composition and thickness of the Protective Cover should be incorporated into the development plans to comply with the applicable requirements of the DEP in effect at the time.

Based on the above-described risk characterizations, the current status of the Massachusetts environmental regulations as they relate to this Site, and the significant public concern, permitted activities and uses, inconsistent activities and uses, and obligations and conditions to maintain a level of "No Significant Risk" are as follows:

PERMITTED ACTIVITIES AND USES

The AUL Opinion provides that a condition of No Significant Risk to health, safety, public welfare or the environment exists for any foreseeable period of time (pursuant to 310 CMR 40.0000) so long as any of the following activities and uses occur on the Property:

- (i) Use of existing buildings for office, industrial, retail, commercial, and research and development (R&D);
- (ii) Existing uses of un-built areas for paved parking, paved public walkways, and open space;
- (iii) Existing grounds-keeping activities, including but not limited to installation of signs and fence posts, cutting and raking of grass areas, and maintenance and resurfacing of parking lots, sidewalks, and driveways;
- (iv) Maintenance of the Protective Cover as hereinafter described;
- (v) Response actions conducted in accordance with the applicable provisions of Chapter 21E;
- (vi) Limited short term, as defined in DEP policy, or emergency utility work in accordance with applicable federal, state, and local laws, ordinances, and regulations, including without limitation the Cambridge Asbestos Protection Ordinance;
- (vii) Such other activities and uses not identified in this Opinion as being Activities and Uses Inconsistent with the AUL; and
- (viii) Such other activities and uses which, in the Opinion of a Licensed Site Professional, shall present no greater risk of harm to health, safety, public welfare, or the environment than the activities and uses set forth in this paragraph. Such opinion of a Licensed Site Professional shall be rendered final only after completion of any public involvement activities required by the Public Involvement Plan, in accordance with the Obligations and Conditions below.

ACTIVITIES AND USES INCONSISTENT WITH THE AUL OPINION

The following activities and uses are inconsistent with the AUL Opinion, and, if implemented at the Property, may result in a significant risk of harm to health, safety, public welfare or the environment or in a substantial hazard:

- (i) Any use other than the Permitted Activities and Uses identified above in the AUL Opinion;
- (ii) Use of the Property as a residence, school, nursery, daycare, recreational area, and/or such use at which a child's day-long presence is likely;
- (iii) Active recreational uses, such as athletic fields or playgrounds, involving more than casual contact with the existing ground;
- (iv) Activities that may cause degradation or destruction of the Protective Cover as defined in the Obligations and Conditions section; and
- (v) Use of on-site soils for cultivation of fruits or vegetables destined for human consumption.

OBLIGATIONS AND CONDITIONS

If applicable, obligations and/or conditions to be undertaken and/or maintained at the Property to maintain a condition of No Significant Risk as set forth in the AUL Opinion are as follows:

- (i) Maintain the existing top six (6) inches of surface soil, and existing: pavement and concrete slabs, pavement and concrete slab sub-base materials, structures, topsoil/loam, landscaping or the like (hereinafter the "Protective Cover"). In the event the Protective Cover is degraded or removed, reinstall a Protective Cover to prevent exposure of underlying soil in a timely fashion.
- (ii) Prepare a Soil Management Plan (SMP) prior to the commencement of activities that are likely to disturb the soil below the Protective Cover. The SMP must be prepared by a Licensed Site Professional (LSP) in accordance with the Massachusetts Contingency Plan (MCP) and, if applicable, the Cambridge Asbestos Protection Ordinance, and submitted for public review and comment in accordance with the provisions of the 27 December 1995 (or subsequent revisions) Public Involvement Plan (PIP). At a minimum, the SMP must describe the soil excavation, handling, storage, transport, and disposal procedures, as well as the engineering controls and air monitoring procedures, necessary to ensure that the potential impact of fugitive asbestos fibers and volatile emissions to workers, nearby residents, and other receptors in the vicinity are taken into account to ensure compliance with applicable standards.
- (iii) Prepare a Health and Safety Plan (HASP) prior to the commencement of activities that involve the removal or disturbance of the Protective Cover and/or activities that are likely to disturb the soil below the Protective Cover. The HASP must be prepared by an LSP and a Certified Industrial Hygienist (CIH) and control future exposures to groundwater. It must be submitted for public review and comment in accordance with the provisions of the 27 December 1995 (or subsequent revisions) PIP.
- (iv) Implement the Protective Cover Monitoring Plan (PCMP) attached to this AUL Opinion. The PCMP describes methods for verifying that the cover materials continue to function in a manner which prevents incidental exposure or direct contact with subsurface soils, as well as methods for restoring such integrity, if compromised through erosion or other unplanned disturbances to the Protective Cover. On-site workers should be informed of the requirements of the PCMP, and the PCMP must be available at the Property at all times. Inspections are to be conducted monthly for the first year and quarterly thereafter. The PCMP requires that logs of the inspection and any response actions completed thereafter be filed with the DEP and placed in the current public document repositories.
- (v) The owner shall provide copies of the PCMP and the cover inspection reports to any purchaser of all or a portion of the Property as part of sale of the Property.
- (vi) In the event that activity intruding into surface soil other than permitted activities and use as provided herein (Intrusive Activity) is undertaken, implement an Airborne Asbestos, Dust, and Odor Management and Monitoring Plan. The plan shall be developed by a CIH and an LSP, and it must comply with applicable Best Management Practices, the Cambridge Asbestos Protection Ordinance, if applicable, and applicable state and federal regulations. The plan shall require that any such activity must be carried out in a manner that prevents the liberation of asbestos fibers and/or dust into the ambient air in excess of

applicable standards (OSHA, EPA, DEP, or other applicable standards) and prevents any potential odors from creating a nuisance condition, as these conditions may be defined by applicable regulations of the City of Cambridge, the Commonwealth of Massachusetts, and the federal government. It is envisioned that the plan would require utilization of proactive wetting of the exposed soil and handling techniques that would minimize the potential for dust generation. It is also envisioned that the plan would require the use of excavation techniques and/or odor suppressants intended to mitigate potential odors. The plan would also include a procedure(s) to monitor the level of dust, asbestos fibers, and odors in the air during the Intrusive Activities to confirm compliance with the plan. The plan would also contain a provision requiring that the intrusive activity would be stopped and the area secured if the monitoring indicates that the level of asbestos fibers, dust, or odors in the air are in excess of applicable limits. This plan shall be submitted for public review and comment in accordance with the provisions of the 27 December 1995 (or subsequent revisions) PIP.

- (vii) In the event that occupied structures are constructed at the Property, an LSP shall evaluate the potential risks associated with migration of volatile compounds from the subsurface into indoor air and the inhalation of these compounds inside such structures. If a condition of "No Significant Risk" cannot be demonstrated, such measures as excavation of contaminated soils or the inclusion of engineered controls (i.e., impermeable vapor barrier and/or sub-slab venting) shall be implemented to provide a condition of "No Significant Risk".
- (viii) Provide a draft of any proposed changes to this AUL or any monitoring plans that are developed for public comment, in accordance with the provisions of the 27 December 1995 (or subsequent revisions) PIP.
- (ix) All activities that may disrupt the Protective Cover shall comply with the applicable requirements of the Cambridge Asbestos Protection Ordinance in effect at the time of the disruption.

LSP OPINION

The Activity and Use Limitation Opinion presented herein was prepared by William W. Beck, Jr., Senior Vice President, Haley & Aldrich, Inc. It is this LSP's opinion that a condition of No Significant Risk to health, safety, public welfare, or the environment exists at the Property and the Disposal Site for any foreseeable period of time, as defined by 310 CMR 40.1005, provided that the above requirements are met and maintained.

Signature:

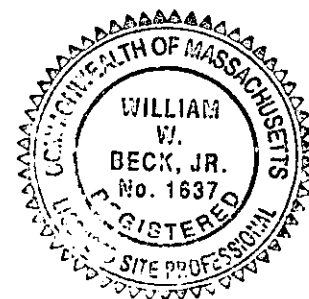
William W. Beck, Jr.

Seal:

Date:

13 FEBRUARY 2006

William W. Beck, Jr.
Senior Vice President
Haley & Aldrich, Inc.
License Number: 1637



**PROTECTIVE COVER MONITORING PLAN ("PCMP")
W.R. GRACE & CO. PROPERTIES
62 WHITTEMORE AVENUE AND 134 ALEWIFE BROOK
PARKWAY
CAMBRIDGE, MASSACHUSETTS
RTNS 3-0277 AND 3-3411**

Prepared by

**Haley & Aldrich, Inc.
Boston, Massachusetts**

Prepared for

**W.R. Grace & Co.-Conn.
Cambridge, Massachusetts**

**File No. 10063-066
March 2006**

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1. INTRODUCTION

1.1 Purpose

This Protective Cover Monitoring Plan provides a plan for monitoring and maintaining the existing "Protective Cover" for the properties which comprise the W.R. Grace Site and the Former Lehigh Metals and Babo's Site in Cambridge, Massachusetts (herein referred to as the "Properties"). As described further below, the Protective Cover at the Properties includes the existing top 6 inches of surface soil, pavement and concrete slabs, pavement and concrete slab sub-base materials, structures, topsoil/loam, landscaping or the like which are currently serving to limit potential future exposure of asbestos fibers identified in the subsurface at the Site.

The Protective Cover Monitoring Plan ("PCMP") is designed to accomplish the following objectives:

- a) describe methods to be used to verify that the cover materials continue to function in a manner which prevents incidental exposure of the subsurface soils;
- b) document the existing conditions observed at the Properties, which provide the protective system in place at the ground surface (the top layer of the protective cover) to protect against degradation of the Protective Cover through wind and water erosion;
- c) outline the process for assuring that timely repairs be made to restore the function of the Protective Cover, in the event the Protective Cover is compromised; and
- d) provide procedures for notifying the community and the Massachusetts Department of Environmental Protection (DEP) of the results of the Protective Cover monitoring and maintenance activities.

In accordance with the Activity and Use Limitations (AULs) recorded for the W.R. Grace Site and the Former Lehigh Metals and Babo's Site in March 2006 and described further below, it is the responsibility of the Properties owners to engage an LSP to implement this program. If ownership of the Properties changes, the AULs require that the new Properties owner continue to implement the PCMP. A copy of the AUL Opinions for the Properties located at 62 Whittemore Avenue and 134 Alewife Brook Parkway are provided in Appendix A.

1.2 Background Information

The W.R. Grace Disposal Site (W.R. Grace Site) consists of 25-acres of land with an address of 62 Whittemore Avenue in Cambridge, Massachusetts (Project Locus, Figure 1). The Site is partially bounded by Whittemore Avenue to the north; Harvey Street and Russell Field to the east; Rindge Avenue to the south; and the Alewife Brook Parkway and a residence to the west. The Site is listed by the DEP as a Disposal Site under RTN 3-0277. The Disposal Site includes eighteen (18) parcels occupying twenty-four (24) acres of land currently under the control of W.R. Grace & Co. with an address of 62 Whittemore Avenue in Cambridge, Massachusetts and a one (1) acre parcel of land, known as One Alewife Center which is currently occupied by a 3-story office building.

As described in the Response Action Outcome (RAO) for the Site, achieving an RAO without implementation of an AUL was not considered feasible, and therefore AULs have been prepared. Although not required by the MCP, the AULs for the W.R. Grace Site extends to four (4) parking lot parcels located to the north of Whittemore Avenue, consisting of a total of approximately 1.6 acres (as shown on Figure 2), since these parcels are under ownership of W.R. Grace & Co.-Conn. An AUL was previously recorded on 28 October 1999 for the 1-acre One Alewife Center parcel.

The Former Lehigh Metals and Babo's Disposal Site (Lehigh/Babo's Site) consists of 2.2 acres of land with an address of 134 Alewife Brook Parkway. The Site is listed by the DEP as a Disposal Site under RTN 3-3411. The Lehigh/Babo's Site is partially bounded by Alewife Brook Parkway to the west; Jerry's Pond and the MBTA Station to the north; Jerry's Pond to the east; and Rindge Avenue to the south.

The Lehigh/Babo's Site was transitioned into the 1993 MCP as a site requiring No Further Action using a Consultant of Record Statement. This property is currently not considered a part of the W.R. Grace Disposal Site, but is property owned by W. R. Grace and is contiguous to the W.R. Grace Disposal Site. While there is no MCP requirement for an AUL to be placed on the Lehigh/Babo's parcel, the AUL is being extended to limits of the property owned by W. R. Grace in North Cambridge for consistency of conditions as they apply to the property and to address concerns of the City of Cambridge.

A copy of the AUL for the One Alewife Center parcel is provided in Appendix B. The AULs for the remaining Properties was recorded in March 2006.

The purpose of the AULs is to manage potential exposures to soil and groundwater assumed to represent potential future risks associated with potential exposure of asbestos or to petroleum and naphthalene in soil. The AULs also manage exposures not evaluated in the risk characterization and concerns expressed by neighborhood residents.

The "Permitted Activities and Uses" of the Properties (as they are referred to in the AULs) are consistent with the current and reasonably foreseeable uses of the Properties (i.e., office, industrial, or retail). The AULs consider the following activities and uses inconsistent with the AULs and prohibits:

- (i) Any changes in currently Permitted Activities and Uses;
- (ii) Use of on-site soils for cultivation of fruits or vegetables destined for human consumption;

The AULs also place the following obligations on the owners of the properties:

- (iii) Maintain the existing top 6 inches of surface soil, pavement and concrete slabs, pavement and concrete slab sub-base materials, structures, topsoil/loam, landscaping or the like (called the "Protective Cover") and in the event the Protective Cover is degraded or removed, requires that a Protective Cover be reinstalled to prevent exposure of underlying soil.
- (iv) Develop a Protective Cover Monitoring Plan ("PCMP") to monitor the Protective Cover for consistency with the requirements of the AULs (described above). The PCMP must be prepared by a Licensed Site Professional.
- (v) Require that any changes to the AULs be put forward in draft for public comment, in accordance with the provisions of the existing Public Involvement Plan.

The restrictions and obligations of the March 2006 AULs, in conjunction with the 1999 One Alewife Center AUL, are considered appropriate for unforeseen potential exposures and to maintain a condition of "No Significant Risk" at the W.R. Grace Disposal Site under the MCP.

2. SUMMARY OF EXISTING CONDITIONS

The W.R. Grace Site is currently occupied by three 1- to 3-story mixed-use buildings (an amalgamation of numerous older buildings which have since been inter-connected) owned by W.R. Grace & Co.-Conn and the 3-story One Alewife Center building owned by New Boston Fund.

The remaining area of the W.R. Grace Site surrounding the buildings is landscaped, covered by vegetation and/or gravel, or paved for access roads or parking. Approximately thirty-five (35%) percent of the W.R. Grace Site is covered by buildings (4-acres or 169,000 ft²) or pavement (5.4-acres or 235,000 ft²). Jerry's Pond is located adjacent to Rindge Avenue on the southern portion of the W.R. Grace Site. It occupies approximately 4-acres. The remaining vegetated areas, including the area surrounding Jerry's Pond, occupy approximately fifty (50) percent of the W.R. Grace Site and are surrounded by fencing to control access. The existing site cover conditions are represented on Figure 2, Site Cover Plan.

The parking lots located to the north of Whittemore Avenue consist of four (4) parcels, consisting of approximately 1.6 acres. The parking lot parcels are currently occupied by one (1) 2,040 ft² warehouse/storage building and the remaining area consists of paved parking.

The Lehigh/Babo's Site consists of approximately 2.2 acres located to the west of Jerry's Pond and is covered with vegetation.

To more simply document the conditions in the various areas, the Properties have been divided into eight areas. The limits of the eight areas (1 through 8) were selected based on physical site features and/or based on the different types of cover present in each area. These are similar to, but slightly different than the "zone" created during the asbestos sampling program. Due to physical site features, it made sense to break the Properties into "Areas". The northern portion of the Properties is occupied by a series of inter-connected buildings. For the purposes of this Memo and the PCMP, the buildings have been grouped together into three distinct complexes: One Alewife Center (Complex A), the series of buildings along Whittemore Avenue (Complex B), and the southernmost series of buildings (Complex C).

Existing site conditions and the eight areas are depicted on Figure 2, Site Cover Plan and on Figure 3, Site Orthophoto. Photographs representative of the existing ground surface cover in each of the areas are included in Appendix C. These photographs were taken on 24 August 2005 and 2 February 2006 and will be used as "baseline conditions" for comparison to future walk overs.

The following is a description of each area and the existing ground surface protective system which is in place on top of the 6-inch protective cover in that area:

- Area 1: Area 1 is comprised of the buildings, the paved parking areas, and the formally landscaped areas surrounding the buildings. Area 1 also includes the asphalt and/or concrete paved areas behind building Complex C. In general the pavement and concrete in these areas is in good condition and will simply require routine maintenance. The landscaping in this area generally consists of thick grass, mulch, mounded landscaped areas, and topsoil. (Photos A1-1 to A1-8)
- Area 2: Area 2 is located directly south of building Complex C, adjacent to the Harvey Street entrance. This fenced area is used for storage of snow removed from the parking lots in the winter months. In the summer months it is unused. The ground surface in this area consists of a mix of weeds, gravel, and sand (from winter snow storage). (Photos A2-1 to A2-4).

- Area 3: Area 3 consists of the fenced area to the west of the paved parking lots, along the western edge of the site. This area is comprised of a grass cover, with the exception of the paved roadway which connects the W.R. Grace Site to Alewife Brook Parkway. A partially rock lined drainage culvert also runs through this area (Photo A3-1 to A3-3).
- Area 4: Area 4 is situated between Russell Field and the paved pathways to the MBTA station. This area is fenced on all sides and is currently unused. The vegetative cover in this area consists of primarily weeds and other overgrown vegetation. In a few areas the cover consists of sparsely vegetated sand, gravel, and miscellaneous asphalt, brick, and concrete debris. Included within the limits of Area 4 are the berms of the former land farming treatment cells, as well as some additional mounded soil piles (remnants of the MBTA tunnel construction). (Photos A4-1 to A4-5)
- Area 5: Area 5 consists primarily of Jerry's Pond and the associated wetlands and overgrown vegetation. A paved pathway which connects the MBTA station to Russell Field is also present in Area 5. (Photos A5-1 to A5-3)
- Area 6: Area 6 consists of the 1-acre One Alewife Center Property. This area is primarily occupied by the 23,000 square foot One Alewife Center building (Complex A). The landscaping in this area generally consists of thick grass, mulch, mounded landscaped areas, and topsoil.
- Area 7: Area 7 consists of the 2.2-acre property located at 134 Alewife Brook Parkway. This area is covered with vegetation. (Photos A7-1 to A7-3)
- Area 8: Area 8 consists of the 4 parking lot parcels located north of Whittemore Avenue. This area consists of 1- 2,040 ft² warehouse/storage building and the remaining area consists of paved parking. (Photos A8-1 to A8-4)

3. PROTECTIVE COVER MONITORING PROGRAM

Protective Cover monitoring will be performed at the Properties to verify compliance with the AUL and that the Protective Cover continues to function in a manner which prevents incidental exposure of subsurface soils. Additionally, the monitoring program will inspect the ground surface cover (top layer of protective cover) which serves to prevent the degradation of the Protective Cover through wind and water erosion. Through the monitoring program, the LSP will verify that site conditions have not changed sufficiently to alter the conclusion that the condition of "No Significant Risk" to human health, welfare, safety, and the environment exists at the W.R. Grace Site. If the Protective Cover is compromised, through erosion or other means, this plan provides procedures to ensure timely repairs be made to restore the protective function of the ground surface cover and/or the Protective Cover.

3.1 Notification

On-site workers likely to cause or observe breaches in the Protective Cover, particularly maintenance and landscaping personnel, shall be informed of the requirements of the PCMP and the PCMP must be available at the property at all times.

3.2 Inspection

Inspection of the Protective Cover will be performed under the oversight of an LSP who is familiar with the regulatory history of the Properties, including the assumptions and methodology used in Risk Characterization, and the content and purpose of the AUL. Inspections are to be conducted monthly for the first year and quarterly thereafter, if the monthly inspections indicate it is appropriate to do so. Additionally, inspections will be conducted if there is a breach in the Protective Cover as a result of a major storm or significant erosion.

Inspections will assess whether conditions at the Properties comply with AUL requirements, through visual observation of the ground surface at the property to verify that material below the Protective Cover is not exposed and that no cultivation of plants for human consumption is taking place in any area of the Properties. The Properties will be walked so that the entire properties are observed making note of surface erosion in landscaped and grassed areas and significant potholes in paved areas. Photographs will be taken of areas where AUL requirements have been compromised. These areas will be identified on a site plan. Copies of the site plan and photographs will be submitted to the owner. The owner will address these compromises by repairing them or identifying and informing those responsible for gardening, that it is not allowed on-site. If cultivation of plants for human consumption is documented, edibles will be removed from the gardening plots.

3.3 Documentation

These inspections and any response actions completed will be documented and filed with the DEP and placed in the current public document repositories. A report shall be placed in the repositories which includes the inspection report, the photographs, a copy of the annotated site plan, and a narrative of the monitoring activities, as well as information regarding maintenance or repair activities (if required). Examples of the inspection report for the Protective Cover monitoring inspections are included in Appendix D.

The purpose of the report is to document any changes in site conditions and to verify that site conditions have not changed sufficiently to alter the conclusion that the condition of "No Significant Risk" to human health, welfare, safety, and the environment exists at the W.R. Grace Site. If changes in site conditions are observed which result in less than 6 inches of protective cover

material and/or the presence of debris, the LSP shall oversee the restoration of the protective cover as outlined below in Section 3.4. Changes in site conditions may include:

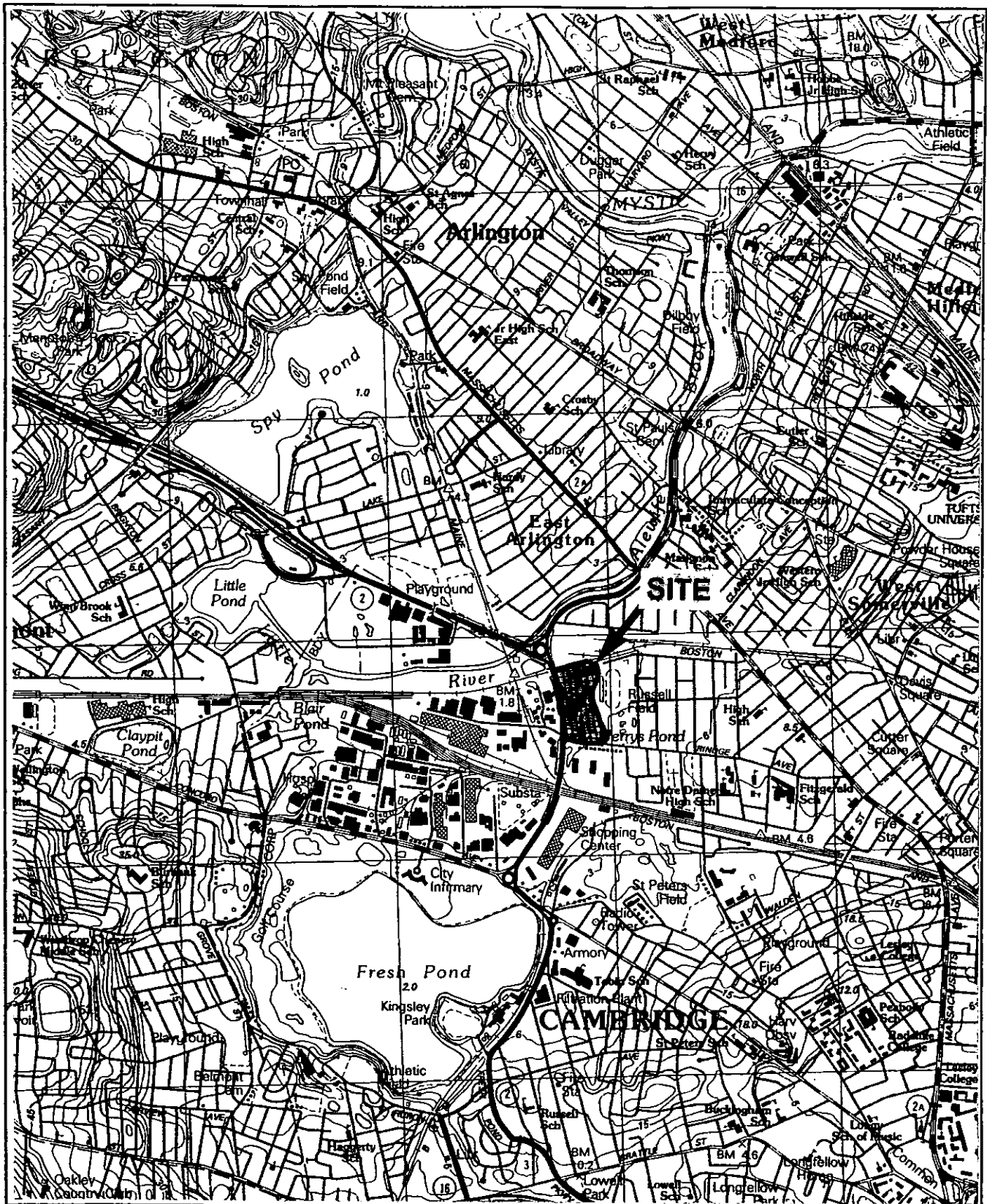
- Erosion or other damage to the ground surface which results in, or likely to result in the near future, materials below the Protective Cover (to 6 inches) to be exposed at the ground surface.
- Debris and/or other material which may be present in the subsurface is observed to have worked its way up to the ground surface from freeze-thawing.

3.4 Maintenance and Repairs

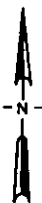
If changes in site conditions are observed during the site inspections that are indicative of damage or loss to the Protective Cover, the following actions to effect repair/restore the Protective Cover will be completed with LSP oversight.

- Complete information about the area needing repair on the inspection log and detail the area on a plan.
- Notify W.R. Grace of the observations made during the inspection requiring repairs.
- Replace cover with clean fill or material equivalent to previously existing cover material to restore cover to previous grade with a minimum cover thickness of 6 inches. This shall be completed within 30 days of notification to LSP.
- Conduct an inspection of the area following repair/restoration.
- Document the activities in the subsequent monitoring report to be submitted to DEP and placed in public repositories.

If changes in site conditions are observed during a site inspection which, in the opinion of the LSP, could pose a condition of "Significant Risk" to human health, welfare, safety, and the environment the LSP shall inform the City of Cambridge of planned restoration activities.



SITE COORDINATES: 42°23'46"N 71°08'24"W



U.S.G.S. QUADRANGLE: BOSTON NORTH, MA



UNDERGROUND
ENGINEERING &
ENVIRONMENTAL
SOLUTIONS

W. R. GRACE & CO. - CONN.
62 WHITTEMORE AVENUE
CAMBRIDGE, MASSACHUSETTS

PROJECT LOCUS

APPROXIMATE SCALE: 1:25,000

MARCH 2006

10063-066 A196

FIGURE 1

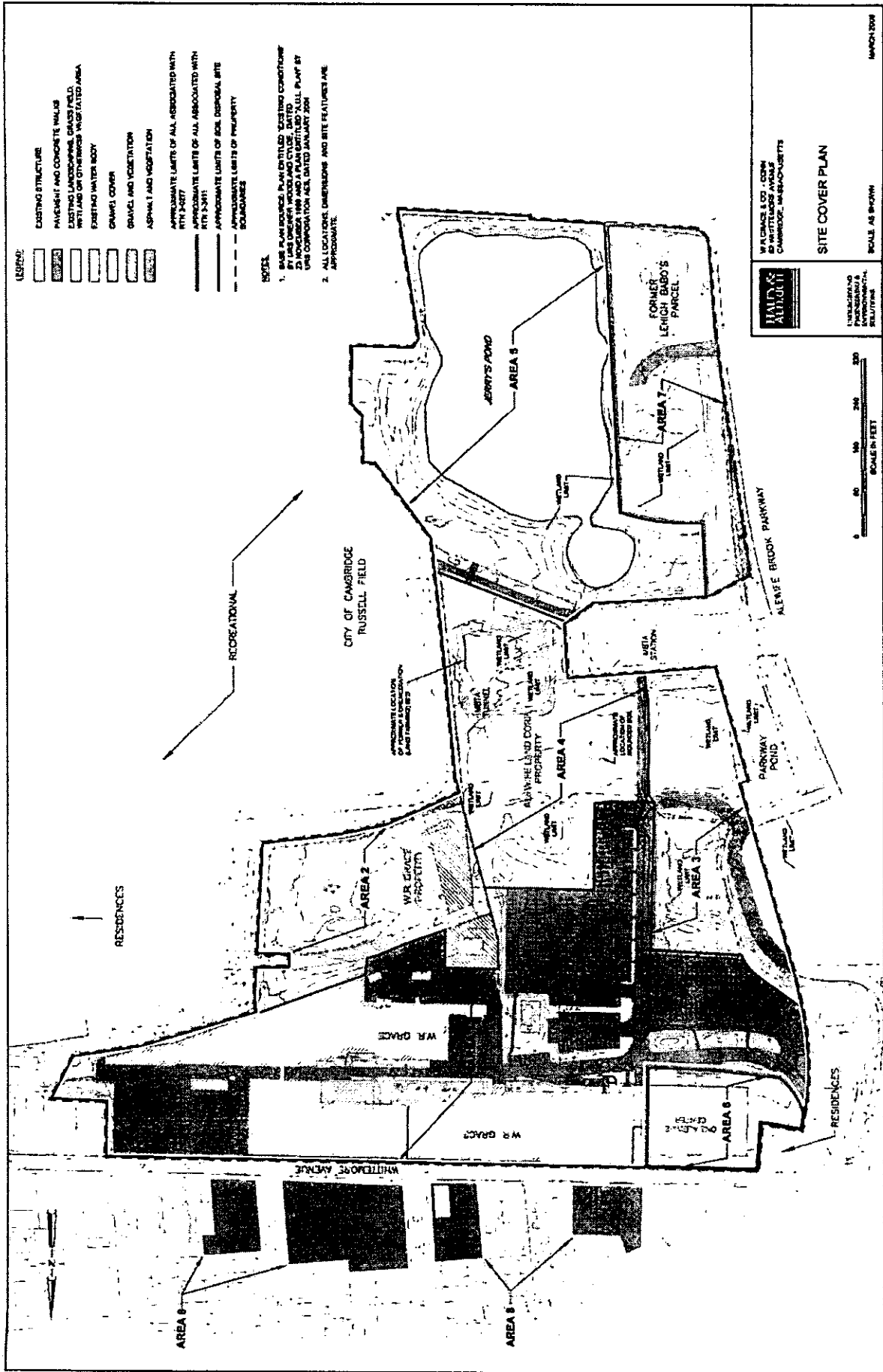


FIGURE 2



LEGEND

INSPECTION PHOTOGRAPHS
24 AUGUST 2005 & 02 FEBRUARY 2008

— DIRECTION OF PHOTOGRAPHY

▲ PHOTO NUMBER

- EXISTING STRUCTURE
- AREA OF INTEREST
- EXISTING WATER BODY
- APPROXIMATE LIMITS OF AUL

NOTES

1 ALL LOCATIONS, DIMENSIONS AND SITE FEATURES ARE APPROXIMATE

2 1/2 METER RESOLUTION ORTHOPHOTOGRAPHY FLOWN IN 2001 OBTAINED FROM THE OFFICE OF GEOGRAPHIC AND ENVIRONMENTAL INFORMATION (MASSGIS), COMMONWEALTH OF MASSACHUSETTS EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS



UNDERGROUND
ENGINEERING
ENVIRONMENTAL
SOLUTIONS

W.R. GRACE, L.C.D. - CONNY
60 WHITMORE AVENUE
PROTECTIVE COVER MONITORING PLAN
CAMBRIDGE, MASSACHUSETTS

SITE ORTHOPHOTO

SCALE AS SHOWN

MARCH 2008

FIGURE 3

APPENDIX A

**Activity and Use Limitation Opinions
62 Whittemore Avenue and
134 Alewife Brook Parkway
Cambridge, Massachusetts**

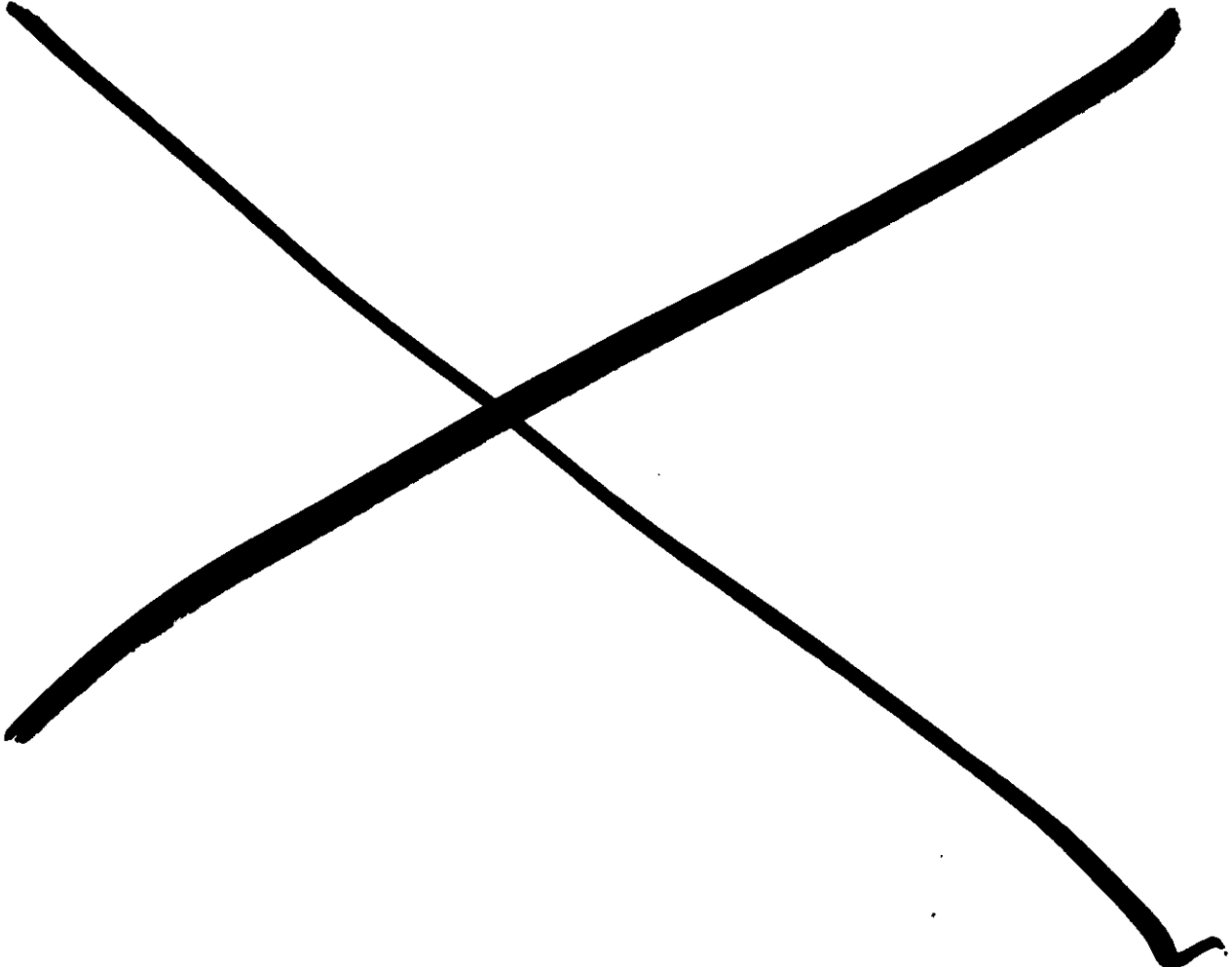


EXHIBIT C

ACTIVITY AND USE LIMITATION OPINION
 Portion of W.R. Grace & Co.-Conn. Disposal Site
 Cambridge, Massachusetts

INTRODUCTION

In accordance with the requirements of 310 CMR 40.1074, this Activity and Use Limitation (AUL) Opinion has been prepared for a portion of the W.R. Grace Disposal Site with an address at 62 Whittemore Avenue in Cambridge, Middlesex County, Massachusetts, 02140. The W.R. Grace Disposal Site consists of 25 acres of land partially bounded by Whittemore Avenue to the north; Harvey Street and Russell Field to the east; Rindge Avenue to the south; and the Alewife Brook Parkway and a residence to the west (herein referred to as the "Disposal Site").

The area subject to this AUL (herein referred to as the "Property") consists of 25.6 acres, and is comprised of twenty-two (22) individual parcels of land. A portion of the area subject to the AUL consists of a portion of the Disposal Site listed by the Massachusetts Department of Environmental Protection (DEP) under RTN 3-0277. The portion of the Disposal Site subject to this AUL consists of eighteen (18) of the parcels of land and is comprised of twenty-four (24) acres of land. The remaining one (1) acre parcel of land included in the Disposal Site, known as One Alewife Center, is subject to a separate AUL which was previously recorded on 28 October 1999. The owner of the parcels included in the Property is either W.R. Grace & Co.-Conn. or the Alewife Land Corporation as identified in the table below.

Owner	Parcel(s)	Total Size, Acres	Type
W.R. Grace & Co.-Conn.	20	8.1	Unregistered and Registered
Alewife Land Corporation	2	17.5	Unregistered and Registered

The area subject to this AUL Opinion consists of the Property as described above. An AUL is being recorded separately at the Middlesex County South Registry of Deeds for each of the land owners identified above, both with the same AUL Opinion. A portion of the area subject to the AUL consists of a portion of the Disposal Site listed by the Massachusetts Department of Environmental Protection (DEP) under RTN 3-0277. Plans showing the relationship of the Property covered by this AUL to the boundary of the Disposal Site (RTN 3-0277) are attached as Exhibits B-1 and B-2 to the AUL.

This AUL Opinion is submitted in support of a Class A-3 Response Action Outcome (RAO) Statement and associated DEP Form 1075, "Notice of Activity and Use Limitation" for the Oil and Hazardous Materials (OHM) at the Disposal Site. An AUL is a deed restriction that imposes conditions on land use (allowable and restricted site uses, and obligations) considered necessary to ensure No Significant Risk (NSR) to human health under an RAO and a risk characterization supporting that RAO.

The required contents of an AUL are specified at 310 CMR 40.1074(2), and Form 1075 must be used in its preparation. The only material that can be inserted in that form relates to the description and ownership of the affected property, the activities and uses that are consistent or inconsistent with the AUL Opinion, and the obligations and conditions set forth in that opinion. Because the AUL format does not provide a vehicle for addressing public concerns that have been raised with respect to the Property and the Disposal Site, this AUL Opinion contains a more detailed account of the Disposal Site history and risk characterization than is usually

found in such a document. In addition, the AUL addresses a new policy recently issued by the Massachusetts DEP that for the first time regulates asbestos as a contaminant in soil under the Massachusetts Contingency Plan (MCP).

DESCRIPTION OF DISPOSAL SITE

The Disposal Site is listed by the Massachusetts DEP under RTN 3-0277. W.R. Grace & Co.-Conn. (Grace) is the listed potentially responsible party. The Disposal Site comprises approximately 25 acres of land in total, of which 24 acres are included within the Property, as well as an adjacent 1 acre parcel (One Alewife Center). Approximately thirty-five percent (35%) of the Disposal Site is covered by buildings (4 acres or 169,300 ft²) or pavement (5.4 acres or 234,715 ft²). Jerry's Pond is located adjacent to Rindge Avenue on the southern portion of the Disposal Site. It occupies approximately 4 acres. The remaining area of the Disposal Site consists of approximately 12 acres of vegetation. The vegetated areas, including the area surrounding Jerry's Pond, occupy approximately fifty percent (50%) of the Disposal Site and are surrounded by fencing to control access.

DISPOSAL SITE HISTORY

In the 1900s, two sets of Boston and Maine Railroad tracks ran through the Disposal Site from roughly east to west. In 1919, the Dewey and Almy Chemical Company ("Dewey & Almy") commenced operations at the Disposal Site and began constructing buildings for their rubber product manufacturing processes. At that time, the Dix Lumber Company operated on the Disposal Site south of the Boston & Maine tracks. Over the years, a total of 46 buildings have occupied the Disposal Site. Most of these buildings were covered with asbestos cement siding. The majority of the buildings historically located within the Boston & Maine Railroad tracks on Dewey & Almy property were constructed prior to 1949, and the remaining buildings were constructed by 1955.

Grace acquired Dewey & Almy in 1954. The Dewey & Almy property included land from the south side of Whittemore Avenue to just north of Jerry's Pond. From 1954 to 1965, Grace also acquired the following properties to achieve the current Property size:

- Jerry's Pond
- Parcel of land between Jerry's Pond and Russell Field Park
- Portion of lot now known as Parcel A (One Alewife Center)
- Lot south of the Boston & Maine Railroad tracks that was formerly operated by Dix Lumber Company

During the 1960s and 1970s, Grace's Cambridge facility was used as a headquarters and research facility for the company's four new divisions, three of which were moved to Grace's Lexington facility in 1976. The demolition of unused manufacturing buildings at the Disposal Site began around 1976 and continued to 1981. The current configuration of buildings on the Property remains the same as that in 1981. Grace had ceased all manufacturing and processing at this location by 1983, and the Boston & Maine railroad tracks were subsequently removed from service.

The Massachusetts Bay Transit Authority (MBTA) constructed the Red Line extension through the Disposal Site from the late 1970s through the mid-1980s. This included the construction of train line tunnels and an entrance structure along an easement granted by Grace.

Three one to three-story mixed-use buildings (consisting of a number of older buildings which have since been inter-connected) owned by Grace are now situated on the Property. The area immediately surrounding the buildings is landscaped, covered with crushed stone or paved for walkways, access roads or parking.

REGULATORY COMPLIANCE HISTORY OF DISPOSAL SITE

The Disposal Site was initially listed with the DEP after the detection of volatile and semi-volatile organics, petroleum products, and metals during evaluations of subsurface and hydrogeological conditions for the Alewife Center Master Plan Study conducted in 1984 and 1985, and in subsequent investigations conducted in the 1990s. After reviewing the results of subsurface and hydrogeological evaluations conducted in 1984 and 1985, the Department of Environmental Quality Engineering (DEQE) issued a Notice of Responsibility (NOR) on 9 February 1987, notifying Grace that the DEQE had determined that a release of oil or hazardous materials (OHM) had occurred at the Disposal Site. DEQE assigned Release Tracking Number 3-0277 to the Property and One Alewife Center property (as it is now known) and required additional investigations.

The redesign of the MCP in 1993 allowed for the transitioning of disposal sites listed in the "old" system to the "new" system within a timeframe set forth in the regulations. The Disposal Site was listed as a Confirmed, Non-Priority Disposal Site without a Waiver, according to the 1993 Transition List of "Confirmed Disposal Sites and Locations to be Investigated". In compliance with the Transitions Provisions of the MCP, Haley & Aldrich submitted a Tier II Classification for the Disposal Site on 4 August 1995.

In October 1996 when a new tier classification was completed, the Disposal Site was reclassified as Tier IC under the MCP, and it was later granted a Tier IC permit with an effective date of 13 February 1997. The Tier IC permit allowed for continuing oversight of the Disposal Site by a Licensed Site Professional (LSP), with certain activities requiring DEP approval. The Tier IC permit was effective for 5 years and expired on 13 February 2002. Two permit extensions have been issued for the Site since February 2002. The current permit (Permit No. 118529) expires in March 2006.

Asbestos was added to the list of contaminants of concern at the Disposal Site in 1998, following the completion of two voluntary field programs at the Disposal Site to investigate for the presence of asbestos in soil. Based on the findings of those investigations, a second RTN (RTN 3-17014) was assigned to the Disposal Site in June 1998. In July 1999, RTN 3-17014 was closed by the DEP and the compliance obligations for that RTN were incorporated into existing compliance obligations under RTN 3-0277.

In 1999, the one-acre One Alewife Center property, located at the northwest corner of the Disposal Site, was sold by W.R. Grace to the New Boston Alewife Limited Partnership. On 28 October 1999, and prior to the sale of the Property, an AUL was recorded for the One Alewife Center property at the Middlesex Registry of Deeds. The purpose of the AUL was to mitigate unforeseen potential exposures to contaminants, and to maintain a condition of "No Significant Risk" at the One Alewife Center portion of the Disposal Site.

REASON FOR ACTIVITY AND USE LIMITATION

Oil and Hazardous Material (OHM)

Two subsurface exploration programs, conducted at the Disposal Site in November 1986 and October 1987, provided environmental information on soil and groundwater in the area of building sites being proposed at that time. The data from these two reports identified certain volatile and semi-volatile organics (VOCs), petroleum products, and metals in soil and groundwater. Supplemental soil investigations were completed at the Disposal Site to evaluate the extent of the petroleum contamination by new analytical methods. These investigations include a Total Petroleum Hydrocarbon (TPH) evaluation conducted in 1995 and an Extractable Petroleum Hydrocarbons (EPH) evaluation in 1999.

Since 1998, Grace has voluntarily conducted periodic groundwater monitoring for VOCs and naphthalene in groundwater. The levels of contaminants (mainly VOCs and naphthalene compounds) identified in groundwater continue to be below the applicable MCP risk limits.

The Disposal Site was subject to industrial use from the early 1920s, when Dewey & Almy began operations, until 1983 when Grace ceased all manufacturing and processing operations at that location. The Dewey and Almy facility originally manufactured materials used as can sealing compounds, drum and pail cover gaskets, and bottle cap gaskets. The primary raw material was processed rubber. Specific compounds manufactured by Dewey & Almy at the Disposal Site include naphthalene sulfonate (trade name DAXAD), a dispersant known as TDA made from calcium lignosulfonate (by-product of the paper-making industry), and Soda Sorb® (a lime based material used as a carbon dioxide absorbent).

Based on the historic use of the Disposal Site, the chemical contaminants of concern at the Disposal Site consist of naphthalene, numerous polyaromatic hydrocarbons ("PAHs") and phenols, VOCs, petroleum compounds, and metals in soil. The highest contaminant concentrations are associated with former facility operations which were generally located in the area now occupied by the paved parking lots and/or the vegetated area to the northeast of the MBTA entrance structure. In particular, during the time DAXAD was manufactured at the Disposal Site, several lagoons were used as settling ponds and sources of cooling water. Contaminated material associated with such activities was previously removed from the Disposal Site by the MBTA in conjunction with the construction of the Red Line extension. Also during the Dewey & Almy years, petroleum products which included unspecified quantities of fuel oil, diesel, and No. 2 fuel oil, heavy fuel oil, light oil, white oil, and gasoline were stored on-site in nine underground storage tanks (USTs) and four above ground storage tanks (ASTs). In general, the capacity of the tanks ranged from 1,000 gallons to 10,000 gallons, with the exception of one 54,000 gallon fuel oil above ground storage tank (AST) formerly located northeast of the MBTA entrance structure. A majority of the tanks were located near the former buildings (now parking lots and vegetated areas) and were most likely used for heating oil. The known ASTs and USTs have been removed from the Disposal Site.

An Enhanced In-situ Bioremediation remedial program was implemented at the Disposal Site from 2001 to 2003 in the area of the highest concentrations of Extractable Petroleum Hydrocarbons (EPH). Bioremediation successfully reduced EPH levels in soil to acceptable levels under the MCP in the vegetated area immediately to the east of the path from the Property's parking lots to the MBTA entrance structure.

Asbestos

Asbestos was added to the list of contaminants of concern at the Disposal Site in 1998, following the completion of two voluntary field exploration programs at the Disposal Site to investigate the presence of asbestos in soil. Since May 1998, a total of 905 soil and split soil samples have been collected by Grace, the Alewife Study Group, and the City of Cambridge. Of the 882 samples analyzed, 856 samples (COC-33; Grace-745; ASG-78) were analyzed using the EPA Region 1 protocol combined with PLM (using EPA Method 600/R-93-116) and 49 samples were analyzed using TEM (EPA 600/R-93-116-Chatfield Semi-Quantitative). Details of the investigation and testing are available in the various reports submitted to the DEP that address the evaluation of asbestos in soil.

The highest levels of asbestos fibers and the most consistent detections of asbestos fibers in soil have been found in those areas of the Disposal Site where buildings were formerly located. The overwhelming fiber type identified at the Disposal Site is chrysotile, which is the most common form of asbestos used in building materials and friction products.

Risk Characterization

In accordance with the MCP, the risks to human health, safety, public welfare, and the environment have been characterized for contaminated soil, groundwater, surface water, and ambient air at the Disposal Site and adjacent properties. Current conditions at the Disposal Site consist of commercial property uses and transient activities associated with the MBTA entrance structure.

Current risks are estimated for the following receptors:

- residents of all ages adjacent to the Disposal Site
- adult office workers on-site (including exposure as children visiting the site prior to working as office workers on-site);
- transient persons (MBTA subway users, pedestrians, and trespassers, including children) during any construction work carried out on-site
- adult utility workers

While no other use of the Disposal Site is expected for the foreseeable future, the risk assessment considered a hypothetical future use scenario involving large scale excavation of contaminated soil in order to be conservative and consistent with previous risk characterizations. The scope and size of the scenario that was evaluated is not likely to occur due to existing local and state regulations related to zoning, wetlands, and flood plains. Therefore, this scenario is likely to overestimate risk.

Future risks were evaluated for the following future receptors:

- residents of all ages adjacent to the Disposal Site
- adult office workers on-site during construction and for long-term occupancy of buildings on site (including exposure as children visiting the site prior to working as office workers on the site)
- transient persons (MBTA subway users, pedestrians, and trespassers, including children) during any construction work carried out on-site
- adult utility workers
- children visiting the Disposal Site (e.g. to retail stores) after construction.
- adult construction workers on-site (during construction)

For both current and future conditions, visitors and transient users of the Disposal Site (children and adults) are considered implicitly because risks would be less for them as compared to the risk for a resident adjacent to the Disposal Site, or to a utility worker or future construction worker, all of whose risks are explicitly evaluated.

Exposure scenarios evaluated quantitatively in the analysis are inhalation of airborne asbestos and incidental ingestion of asbestos in soil; inhalation of vapors emanating from soil; inhalation and ingestion of contaminants in fugitive dust; as well as dermal contact during recreational and hypothetical construction activities.

Several potential exposure scenarios were excluded from evaluation under the risk characterization. In order to exclude these exposure scenarios from evaluation, the potential exposures must be eliminated through the use of an AUL, as provided under 310 CMR 40.1012(2). The excluded scenarios are as follows:

- future residential use
- exposure to groundwater(direct contact)
- future use as schools, playgrounds, day care centers, etc.
- active recreational uses in unpaved areas
- vapor intrusion into hypothetical future new buildings.

Under current conditions of use (commercial property), the risk characterization concluded that there is a condition of No Significant Risk (NSR) to human health for all receptors evaluated for potential exposures associated with both asbestos and OHM. In addition, the risk characterization concluded that a condition of NSR exists for Public Safety, Public Welfare, and the Environment due to:

- the limited exposure of environmental receptors to site-related contaminants,
- the absence of conditions that may negatively affect the surrounding community, and
- the absence of any significant risks to safety that could be identified under current conditions.

As noted earlier, for the foreseeable future, the Disposal Site is expected to continue to be used in a manner consistent with its current use as a commercial facility. In this case, risk estimates remain the same or decrease if the soil remains undisturbed or if disturbed soil is covered with clean soil. However, to be conservative and consistent with previous risk characterizations, the risk assessment considered a hypothetical future use scenario involving large-scale excavation of contaminated soil (containing asbestos and OHM) that then remains on the surface. In the hypothetical event that the property is subject to development scale excavation, a specific evaluation of risk to identify exposure pathways and contaminants of concern warranting management should be undertaken.

The risk characterization concluded the following:

- The incremental cancer risk estimates for the adjacent residents, office workers, and hypothetical construction workers potentially exposed to soil at the Disposal Site exceed DEP's guidelines for achieving a condition of No Significant Risk due to an assumed presence of asbestos in the exposed soil.
- Exposure of environmental receptors to site-related contaminants is limited, and thus the Disposal Site poses No Significant Risk to the environment.
- Potential odors generated during the excavation of naphthalene-contaminated soils could potentially create a nuisance condition, and thus a condition of No Significant Risk to public welfare could not be achieved without mitigating efforts.
- A condition of No Significant Risk to safety exists at the Disposal Site in the future (even during large-scale construction) with one exception. If small-scale excavations were to be completed over a short period of time in the most contaminated areas of the Disposal Site, then there is the potential for the hypothetical construction worker to be exposed to vapors from naphthalene in soils which might exceed the OSHA PEL for an 8 hour day. However, a condition of No Significant Risk to Safety can be achieved through compliance with the Obligations and Conditions set forth below.

Achieving an RAO for the Disposal Site is not feasible under the MCP criteria without implementation of AULs on the Property and the 1 acre One Alewife Center parcel. Areas of the Disposal Site containing higher levels of contamination are shown on the Figure entitled Limits of Disposal Site provided in the RAO. This AUL, in conjunction with the One Alewife Center AUL, is considered appropriate to address unforeseen potential exposures and to maintain a condition of "No Significant Risk" at all areas of the Disposal Site. The AUL for the Property manages potential exposures to soil assumed to represent potential future risks associated with potential exposure to asbestos or petroleum and naphthalene. It also manages the exposures not evaluated in the risk characterization and addresses concerns expressed by neighborhood residents. The permitted uses are consistent with the current and reasonably foreseeable uses of the Property (i.e., office, industrial, or retail). Furthermore, identification in the AUL of activities and uses inconsistent with the AUL Opinion and of the Obligations and Conditions set forth in the AUL Opinion provides a means for maintaining the assumptions of the risk assessment which rely upon elimination of certain exposure pathways to achieve a level of "No Significant Risk" as required by applicable MCP criteria.

A primary obligation of the AUL is maintenance of the "Protective Cover" (the existing top 6 inches of cover material, as defined further below). The property owner must implement the Protective Cover Monitoring Plan ("PCMP") attached to this AUL. The Plan should describe methods for verifying that the cover materials continue to function in a manner which prevents incidental exposure of, or casual direct contact with, subsurface soils, and for making timely repairs if proper functioning of the cover is compromised. On-site workers should be informed of the requirements of the PCMP, which must be available on-site at all times. In the event of property redevelopment, improvements to the composition and thickness of the Protective Cover should be incorporated into the development plans to comply with the applicable requirements of the DEP in effect at the time.

Based on the above-described risk characterizations, the current status of the Massachusetts environmental regulations as they relate to this Site, and the significant public concern, permitted activities and uses, inconsistent activities and uses, and obligations and conditions to maintain a level of "No Significant Risk" are as follows:

PERMITTED ACTIVITIES AND USES

The AUL Opinion provides that a condition of No Significant Risk to health, safety, public welfare or the environment exists for any foreseeable period of time (pursuant to 310 CMR 40.0000) so long as any of the following activities and uses occur on the Property:

- (i) Use of existing buildings for office, industrial, retail, commercial, and research and development (R&D);
- (ii) Existing uses of un-built areas for paved parking, paved public walkways, and open space;
- (iii) Existing grounds-keeping activities, including but not limited to installation of signs and fence posts, cutting and raking of grass areas, and maintenance and resurfacing of parking lots, sidewalks, and driveways;
- (iv) Maintenance of the Protective Cover as hereinafter described;
- (v) Response actions conducted in accordance with the applicable provisions of Chapter 21E;
- (vi) Limited short term, as defined in DEP policy, or emergency utility work in accordance with applicable federal, state, and local laws, ordinances, and regulations, including without limitation the Cambridge Asbestos Protection Ordinance;
- (vii) Such other activities and uses not identified in this Opinion as being Activities and Uses Inconsistent with the AUL; and
- (viii) Such other activities and uses which, in the Opinion of a Licensed Site Professional, shall present no greater risk of harm to health, safety, public welfare, or the environment than the activities and uses set forth in this paragraph. Such opinion of a Licensed Site Professional shall be rendered final only after completion of any public involvement activities required by the Public Involvement Plan, in accordance with the Obligations and Conditions below.

ACTIVITIES AND USES INCONSISTENT WITH THE AUL OPINION

The following activities and uses are inconsistent with the AUL Opinion, and, if implemented at the Property, may result in a significant risk of harm to health, safety, public welfare or the environment or in a substantial hazard:

- (i) Any use other than the Permitted Activities and Uses identified above in the AUL Opinion;
- (ii) Use of the Property as a residence, school, nursery, daycare, recreational area, and/or such use at which a child's day-long presence is likely;
- (iii) Active recreational uses, such as athletic fields or playgrounds, involving more than casual contact with the existing ground;
- (iv) Activities that may cause degradation or destruction of the Protective Cover as defined in the Obligations and Conditions section; and
- (v) Use of on-site soils for cultivation of fruits or vegetables destined for human consumption.

OBLIGATIONS AND CONDITIONS

If applicable, obligations and/or conditions to be undertaken and/or maintained at the Property to maintain a condition of No Significant Risk as set forth in the AUL Opinion are as follows:

- (i) Maintain the existing top six (6) inches of surface soil, and existing: pavement and concrete slabs, pavement and concrete slab sub-base materials, structures, topsoil/loam, landscaping or the like (hereinafter the "Protective Cover"). In the event the Protective Cover is degraded or removed, reinstall a Protective Cover to prevent exposure of underlying soil in a timely fashion.
- (ii) Prepare a Soil Management Plan (SMP) prior to the commencement of activities that are likely to disturb the soil below the Protective Cover. The SMP must be prepared by a Licensed Site Professional (LSP) in accordance with the Massachusetts Contingency Plan (MCP) and, if applicable, the Cambridge Asbestos Protection Ordinance, and submitted for public review and comment in accordance with the provisions of the 27 December 1995 (or subsequent revisions) Public Involvement Plan (PIP). At a minimum, the SMP must describe the soil excavation, handling, storage, transport, and disposal procedures, as well as the engineering controls and air monitoring procedures, necessary to ensure that the potential impact of fugitive asbestos fibers and volatile emissions to workers, nearby residents, and other receptors in the vicinity are taken into account to ensure compliance with applicable standards.
- (iii) Prepare a Health and Safety Plan (HASP) prior to the commencement of activities that involve the removal or disturbance of the Protective Cover and/or activities that are likely to disturb the soil below the Protective Cover. The HASP must be prepared by an LSP and a Certified Industrial Hygienist (CIH) and control future exposures to groundwater. It must be submitted for public review and comment in accordance with the provisions of the 27 December 1995 (or subsequent revisions) PIP.
- (iv) Implement the Protective Cover Monitoring Plan (PCMP) attached to this AUL Opinion. The PCMP describes methods for verifying that the cover materials continue to function in a manner which prevents incidental exposure or direct contact with subsurface soils, as well as methods for restoring such integrity, if compromised through erosion or other unplanned disturbances to the Protective Cover. On-site workers should be informed of the requirements of the PCMP, and the PCMP must be available at the Property at all times. Inspections are to be conducted monthly for the first year and quarterly thereafter. The PCMP requires that logs of the inspection and any response actions completed thereafter be filed with the DEP and placed in the current public document repositories.
- (v) The owner shall provide copies of the PCMP and the cover inspection reports to any purchaser of all or a portion of the Property as part of sale of the Property.
- (vi) In the event that activity intruding into surface soil other than permitted activities and use as provided herein (Intrusive Activity) is undertaken, implement an Airborne Asbestos, Dust, and Odor Management and Monitoring Plan. The plan shall be developed by a CIH and an LSP, and it must comply with applicable Best Management Practices, the Cambridge Asbestos Protection Ordinance, if applicable, and applicable state and federal regulations. The plan shall require that any such activity must be carried out in a manner that prevents the liberation of asbestos fibers and/or dust into the ambient air in excess of applicable standards (OSHA, EPA, DEP, or other applicable standards) and prevents any potential odors from creating a

nuisance condition, as these conditions may be defined by applicable regulations of the City of Cambridge, the Commonwealth of Massachusetts, and the federal government. It is envisioned that the plan would require utilization of proactive wetting of the exposed soil and handling techniques that would minimize the potential for dust generation. It is also envisioned that the plan would require the use of excavation techniques and/or odor suppressants intended to mitigate potential odors. The plan would also include a procedure(s) to monitor the level of dust, asbestos fibers, and odors in the air during the Intrusive Activities to confirm compliance with the plan. The plan would also contain a provision requiring that the intrusive activity would be stopped and the area secured if the monitoring indicates that the level of asbestos fibers, dust, or odors in the air are in excess of applicable limits. This plan shall be submitted for public review and comment in accordance with the provisions of the 27 December 1995 (or subsequent revisions) PIP.

- (vii) In the event that additional occupied structures are constructed at the Property, an LSP shall evaluate the potential risks associated with migration of volatile compounds from the subsurface into indoor air and the inhalation of these compounds inside such structures. If a condition of "No Significant Risk" cannot be demonstrated, such measures as excavation of contaminated soils or the inclusion of engineered controls (i.e., impermeable vapor barrier and/or sub-slab venting) shall be implemented to provide a condition of "No Significant Risk".
- (viii) Provide a draft of any proposed changes to this AUL or any monitoring plans that are developed for public comment, in accordance with the provisions of the 27 December 1995 (or subsequent revisions) PIP.
- (ix) All activities that may disrupt the Protective Cover shall comply with the applicable requirements of the Cambridge Asbestos Protection Ordinance in effect at the time of the disruption.

LSP OPINION

The Activity and Use Limitation Opinion presented herein was prepared by William W. Beck, Jr., Senior Vice President, Haley & Aldrich, Inc. It is this LSP's opinion that a condition of No Significant Risk to health, safety, public welfare, or the environment exists at the Property and the Disposal Site for any foreseeable period of time, as defined by 310 CMR 40.1005, provided that the above requirements are met and maintained.

Signature:

William W. Beck, Jr.

Seal:

Date:

13 FEBRUARY 2006

William W. Beck, Jr.
Senior Vice President
Haley & Aldrich, Inc.
License Number: 1637



EXHIBIT C

ACTIVITY AND USE LIMITATION OPINION Former Lehigh Metals and Babo's Disposal Site Cambridge, Massachusetts

INTRODUCTION

In accordance with the requirements of 310 CMR 40.1074, this Activity and Use Limitation (AUL) Opinion has been prepared for the Former Lehigh Metals and Babo's Site (Lehigh/Babo's Site) with an address at 134 Alewife Brook Parkway in Cambridge, Middlesex County, Massachusetts, 02140. The Lehigh/Babo's Site consists of 2.2 acres of land partially bounded by Alewife Brook Parkway to the west; Jerry's Pond and the MBTA Station to the north; Jerry's Pond to the east; and Rindge Avenue to the south (herein referred to as the "Disposal Site").

The parcel of land subject to this AUL consists of 2.2 acres, comprised of two (2) individual parcels of land, owned by the Alewife Land Corporation, a wholly-owned subsidiary of W.R. Grace & Co.-Conn. (hereinafter the "Property"). The area subject to the AUL consists of the Disposal Site listed by the Massachusetts Department of Environmental Protection (DEP) under RTN 3-3411. A plan showing the relationship of the Property covered by this AUL to the boundary of the Disposal Site (RTN 3-3411) is attached as Exhibit B to the AUL.

DESCRIPTION OF DISPOSAL SITE

The Disposal Site is listed by the Massachusetts DEP under RTN 3-3411. W.R. Grace & Co.-Conn. (Grace) is the listed potentially responsible party. The Disposal Site comprises approximately 2.2 acres of land in total and consists of undeveloped vegetated land.

DISPOSAL SITE HISTORY

Early land use in the vicinity of the site was principally for pastures. During the early 1800's, a race course, presumably for horses was constructed in the vicinity of the site. By 1854, brick yards were developed south of Rindge Avenue and by 1860 Jerry's Pit (the present day Jerry's Pond) had been dug for brick clay. During the late 1800's a small building was located in the central portion of the site and a larger structure was located at the southeastern corner of the site. By 1916, the Alewife Brook Parkway was constructed just west of the site. Buildings at the site were razed by 1929.

Two buildings were located on this property, the Lehigh Metals building and the Big Burger Drive-In, both built in 1956. Lehigh Metals occupied the majority of their building from 1956 through 1985, and used the space primarily as warehouse space for storage of metal fasteners and hardware products. At times, other companies had occupied the Lehigh Metals building, primarily from the mid-1960s until building demolition in the late 1980s, including the Cambridge Machine Company, United Research, Inc., deHartt, Inc. (electronic research), and Micro Tek Electronics. The Big Burger Drive-In was converted to a Kelly's Restaurant in the 1960s and Babo's Restaurant at a later date. These buildings were subsequently razed later in 1988.

Haley & Aldrich, Inc. (Haley & Aldrich) conducted an Oil and Hazardous Material Site Evaluation in 1987 which included a limited subsurface exploration, soil sample screening, and groundwater chemical analysis program. Results of the evaluation indicated elevated concentrations of polynuclear aromatic compounds (PAHs) in fill soils. The compounds were

attributed to ash and cinders deposited in site fill soils which were believed to have been created as a result of brick manufacturing processes. The Massachusetts Department of Environmental Quality Engineering (DEQE) assigned DEQE Site Number 3-3411 as a result under the Massachusetts General Laws (MGL) Chapter 21E.

REGULATORY COMPLIANCE HISTORY OF DISPOSAL SITE

In 1987 Alewife Land Corporation purchased the 2-acre property located between Jerry's Pond and the Alewife Brook Parkway. The Lehigh Metals and Babo's Restaurant parcel was assigned DEQE Site Number 3-3411 as a result of a report prepared for the Site, under the Massachusetts General Laws (MGL) Chapter 21E, in conjunction with the Alewife Land Corporation purchase of the Site in 1987. This report was submitted to the DEP in 1987.

The Lehigh/Babo's Site was transitioned into the 1993 MCP as a site requiring No Further Action using a Consultant of Record Statement, dated 1 August 1995. This property is currently not considered a part of the Grace Disposal Site, but is property owned by Alewife Land Corporation and is contiguous to the Disposal Site.

REASON FOR ACTIVITY AND USE LIMITATION

While there is no MCP requirement for an AUL to be placed on the Lehigh/Babo's parcel, the AUL is being extended to limits of the property owned by W. R. Grace and its subsidiary, Alewife Land Corporation, in North Cambridge for consistence of conditions as they apply to the property and to address concerns of the City of Cambridge.

PERMITTED ACTIVITIES AND USES

The AUL Opinion provides that a condition of No Significant Risk to health, safety, public welfare or the environment exists for any foreseeable period of time (pursuant to 310 CMR 40.0000) so long as any of the following activities and uses occur on the Property:

- (i) Existing uses of un-built areas for paved parking, paved public walkways, and open space;
- (ii) Existing grounds-keeping activities, including but not limited to installation of signs and fence posts, cutting and raking of grass areas, and maintenance and resurfacing of parking lots, sidewalks, and driveways;
- (iii) Maintenance of the Protective Cover as hereinafter described;
- (iv) Response actions conducted in accordance with the applicable provisions of Chapter 21E;
- (v) Limited short term, as defined in DEP policy, or emergency utility work in accordance with applicable federal, state, and local laws, ordinances, and regulations, including without limitation the Cambridge Asbestos Protection Ordinance;
- (vi) Such other activities and uses not identified in this Opinion as being Activities and Uses Inconsistent with the AUL; and
- (vii) Such other activities and uses which, in the Opinion of a Licensed Site Professional, shall present no greater risk of harm to health, safety, public welfare, or the environment than the activities and uses set forth in this paragraph. Such opinion of a Licensed Site Professional shall be rendered final only after completion of any public involvement activities required by the Public Involvement Plan, in accordance with the Obligations and Conditions below.

ACTIVITIES AND USES INCONSISTENT WITH THE AUL OPINION

The following activities and uses are inconsistent with the AUL Opinion, and, if implemented at the Property, may result in a significant risk of harm to health, safety, public welfare or the environment or in a substantial hazard:

- (i) Any use other than the Permitted Activities and Uses identified above in the AUL Opinion;
- (ii) Use of the Property as a residence, school, nursery, daycare, recreational area, and/or such use at which a child's day-long presence is likely;
- (iii) Active recreational uses, such as athletic fields or playgrounds, involving more than casual contact with the existing ground;
- (iv) Activities that may cause degradation or destruction of the Protective Cover as defined in the Obligations and Conditions section;and
- (v) Use of on-site soils for cultivation of fruits or vegetables destined for human consumption.

OBLIGATIONS AND CONDITIONS

If applicable, obligations and/or conditions to be undertaken and/or maintained at the Property to maintain a condition of No Significant Risk as set forth in the AUL Opinion are as follows:

- (i) Maintain the existing top six (6) inches of surface soil, and existing: pavement and concrete slabs, pavement and concrete slab sub-base materials, structures, topsoil/loam, landscaping or the like (hereinafter the "Protective Cover"). In the event the Protective Cover is degraded or removed, reinstall a Protective Cover to prevent exposure of underlying soil in a timely fashion.
- (ii) Prepare a Soil Management Plan (SMP) prior to the commencement of activities that are likely to disturb the soil below the Protective Cover. The SMP must be prepared by a Licensed Site Professional (LSP) in accordance with the Massachusetts Contingency Plan (MCP) and, if applicable, the Cambridge Asbestos Protection Ordinance, and submitted for public review and comment in accordance with the provisions of the 27 December 1995 (or subsequent revisions) Public Involvement Plan (PIP). At a minimum, the SMP must describe the soil excavation, handling, storage, transport, and disposal procedures, as well as the engineering controls and air monitoring procedures, necessary to ensure that the potential impact of fugitive asbestos fibers and volatile emissions to workers, nearby residents, and other receptors in the vicinity are taken into account to ensure compliance with applicable standards.
- (iii) Prepare a Health and Safety Plan (HASP) prior to the commencement of activities that involve the removal or disturbance of the Protective Cover and/or activities that are likely to disturb the soil below the Protective Cover. The HASP must be prepared by an LSP and a Certified Industrial Hygienist (CIH) and control future exposures to groundwater. It must be submitted for public review and comment in accordance with the provisions of the 27 December 1995 (or subsequent revisions) PIP.
- (iv) Implement the Protective Cover Monitoring Plan (PCMP) attached to this AUL Opinion. The PCMP describes methods for verifying that the cover materials continue to function in a manner which prevents incidental exposure or direct contact with subsurface soils, as well as methods for restoring such integrity, if compromised through erosion or other unplanned disturbances to the Protective Cover. On-site workers should be informed of the requirements of the PCMP, and the PCMP must be available at the Property at all times. Inspections are to be conducted monthly for the first year and quarterly thereafter. The PCMP requires that logs of the inspection and any response actions completed thereafter be filed with the DEP and placed in the current public document repositories.
- (v) The owner shall provide copies of the PCMP and the cover inspection reports to any purchaser of all or a portion of the Property as part of sale of the Property.
- (vi) In the event that activity intruding into surface soil other than permitted activities and use as provided herein (Intrusive Activity) is undertaken, implement an Airborne Asbestos, Dust, and Odor Management and Monitoring Plan. The plan shall be developed by a CIH and an LSP, and it must comply with applicable Best Management Practices, the Cambridge Asbestos Protection Ordinance, if applicable, and applicable state and federal regulations. The plan shall require that any such activity must be carried out in a manner that prevents the liberation of asbestos fibers and/or dust into the ambient air in excess of applicable standards (OSHA, EPA, DEP, or other applicable standards) and prevents any potential odors from creating a nuisance condition, as these conditions may be defined by applicable regulations of

the City of Cambridge, the Commonwealth of Massachusetts, and the federal government. It is envisioned that the plan would require utilization of proactive wetting of the exposed soil and handling techniques that would minimize the potential for dust generation. It is also envisioned that the plan would require the use of excavation techniques and/or odor suppressants intended to mitigate potential odors. The plan would also include a procedure(s) to monitor the level of dust, asbestos fibers, and odors in the air during the Intrusive Activities to confirm compliance with the plan. The plan would also contain a provision requiring that the intrusive activity would be stopped and the area secured if the monitoring indicates that the level of asbestos fibers, dust, or odors in the air are in excess of applicable limits. This plan shall be submitted for public review and comment in accordance with the provisions of the 27 December 1995 (or subsequent revisions) PIP.

- (vii) In the event that occupied structures are constructed at the Property, an LSP shall evaluate the potential risks associated with migration of volatile compounds from the subsurface into indoor air and the inhalation of these compounds inside such structures. If a condition of "No Significant Risk" cannot be demonstrated, such measures as excavation of contaminated soils or the inclusion of engineered controls (i.e., impermeable vapor barrier and/or sub-slab venting) shall be implemented to provide a condition of "No Significant Risk".
- (viii) Provide a draft of any proposed changes to this AUL or any monitoring plans that are developed for public comment, in accordance with the provisions of the 27 December 1995 (or subsequent revisions) PIP.
- (ix) All activities that may disrupt the Protective Cover shall comply with the applicable requirements of the Cambridge Asbestos Protection Ordinance in effect at the time of the disruption.

LSP OPINION

The Activity and Use Limitation Opinion presented herein was prepared by William W. Beck, Jr., Senior Vice President, Haley & Aldrich, Inc. It is this LSP's opinion that a condition of No Significant Risk to health, safety, public welfare, or the environment exists at the Property and the Disposal Site for any foreseeable period of time, as defined by 310 CMR 40.1005, provided that the above requirements are met and maintained.

Signature:

William W. Beck, Jr.

Seal:

Date:

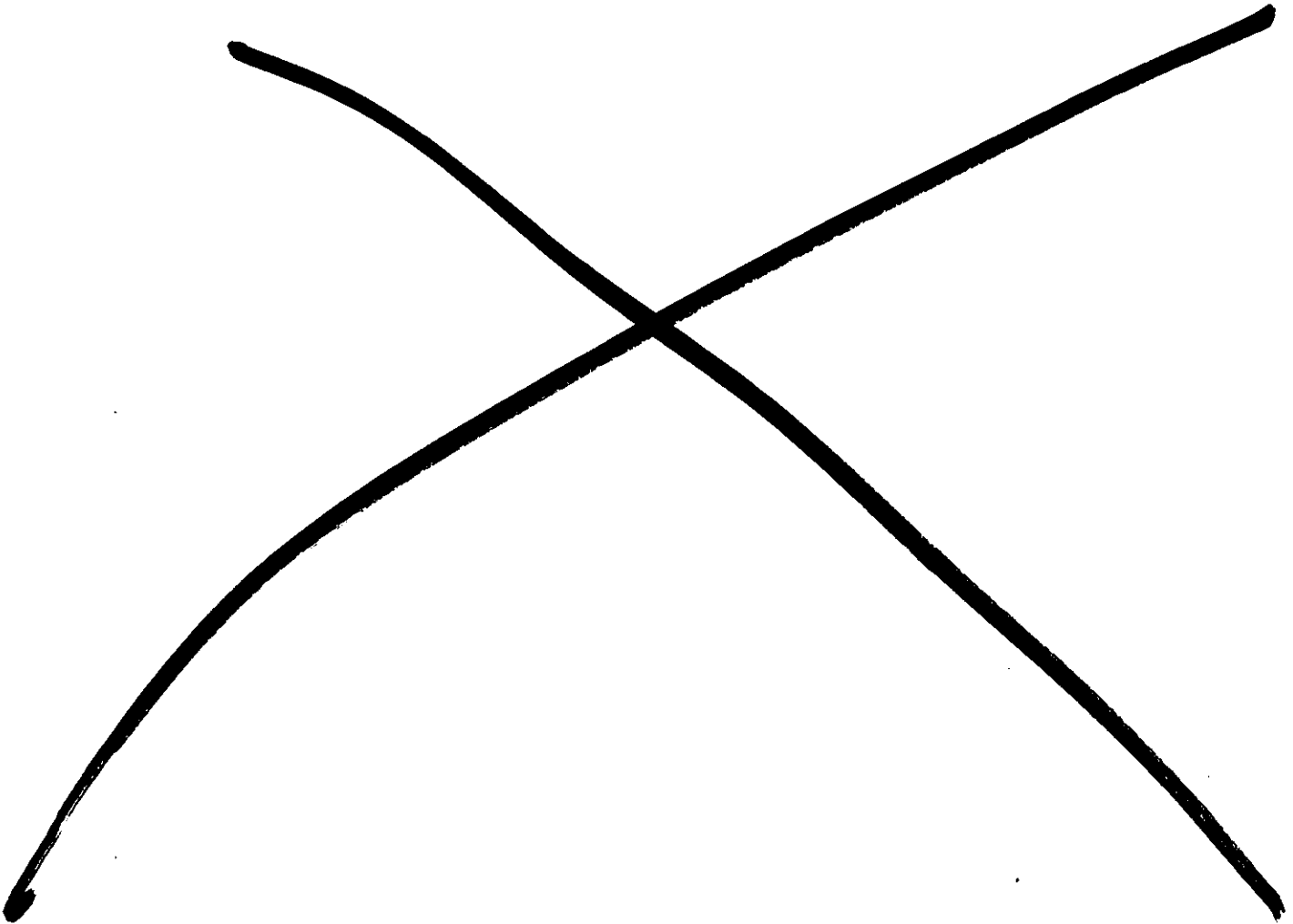
13 FEBRUARY 2006

William W. Beck, Jr.
Senior Vice President
Haley & Aldrich, Inc.
License Number: 1637



APPENDIX B

**Activity and Use Limitations
One Alewife Center
Cambridge, Massachusetts**



RECEIVED

NOV 3 1999

Haley & Aldrich, Inc.

MCDERMOTT, WILL & EMERY

A Partnership Including
Professional Corporations
28 State Street
Boston, MA 02109-1775
617-535-4000
Facsimile 617-535-3800
http://www.mwe.com

Peter Friedenberg
Attorney at Law
pfriedenberg@mwe.com
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Boston
Chicago
London
Los Angeles
Miami
Moscow
Newport Beach
New York
St. Petersburg
Silicon Valley
Vilnius
Washington, D.C.

November 1, 1999

Wesley E. Stimpson
Senior Vice President
Haley & Aldrich, Inc.
465 Medford Street, Suite 2200
Boston, MA 02129-1400

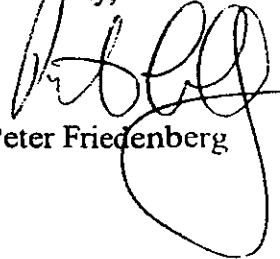
Re: One Alewife Center: AUL

Dear Wes:

Enclosed please find a copy of the Notice of Activity and Use Limitation which was recorded with the Middlesex South District Registry of Deeds as Instrument No. 483 at 11:53 a.m. on October 28, 1999 and filed for registration with the Middlesex South Registry District of the Land Court as Document No. 1122417 at 11:29 a.m. on October 28, 1999. The plan was recorded with Middlesex South District Registry of Deeds as Plan No. 1218 on October 28, 1999.

Thank you for your continued assistance on this matter.

Sincerely,


Peter Friedenberg

PF/tbm
Encls.

10/28/99 Document No. 1122417 at 11:29 am

10/28/99 Pdcn NO. 1218 Inst# 482 at 11:53

10/28/99 Instrument No. 483 at 11:53 am

CLERK'S CERTIFICATE

I, O. Mario Favorito, Clerk of Alewife Land Corporation, a Massachusetts corporation (the "Company"), hereby certify that:

1. The following person holds the position in the Company set forth after his name:

John R. Wardzel: Vice President

2. John R. Wardzel is authorized to execute, acknowledge and deliver on behalf of the Company, an Activity and Use Limitation concerning certain parcels of land in Cambridge, Massachusetts owned by the Company, together with such other instruments or documents as may be necessary or desirable in connection therewith.

IN WITNESS WHEREOF, I have hereunto executed this Certificate this 27th day of October, 1999.

O. Mario Favorito
Clerk

Form 1075NOTICE OF ACTIVITY AND USE LIMITATION
M.G.L. c. 21E, § 6 and 310 CMR 40.0000

Disposal Site Name: W.R. Grace & Co. Conn.
 DEP Release Tracking No. (s): 3-0277 and 3-17014

This Notice of Activity and Use Limitation ("Notice") is made as of this 27th day of October, 1999, by Alewife Land Corporation, with an address of 62 Whittemore Avenue, Cambridge, Massachusetts 02140, together with its successors and assigns (collectively "Owner").

WITNESSETH:

WHEREAS, Alewife Land Corporation, of Cambridge, Middlesex County, Massachusetts, is the owner in fee simple of that certain parcel of land located in Cambridge, Middlesex County, Massachusetts (the "Property");

WHEREAS, said parcel of land (the "Property") is subject to this Notice of Activity and Use Limitation. The Property is shown as "Parcel A" on a plan entitled "Plan of Land Owned by Alewife Land Corporation, 1 Alewife Center, Cambridge, Massachusetts", dated October 1999, prepared by URS Greiner Woodward Clyde, recorded herewith;

WHEREAS, the Property comprises part of a disposal site as the result of a release of oil and/or hazardous material. Exhibit B is a sketch plan showing the relationship of the Property subject to this Notice of Activity and Use Limitation to the boundaries of said disposal site (to the extent such boundaries have been established). Exhibit B is attached hereto and made a part hereof; and

WHEREAS, one or more response actions have been selected for the portion of the Disposal Site in accordance with M.G.L. c.21E ("Chapter 21E") and the Massachusetts Contingency Plan, 310 CMR 40.0000 ("MCP"). Said response actions are based upon (a) the restriction of human access to and contact with oil and/or hazardous material in soil and/or groundwater, and/or (b) the restriction of certain activities occurring in, on, through, over or under the Property. The basis for such restrictions is set forth in an Activity and Use Limitation Opinion ("AUL Opinion"), dated October 26, 1999, (which is attached hereto as Exhibit C and made a part hereof);

NOW, THEREFORE, notice is hereby given that the activity and use limitations set forth in said AUL Opinion are as follows:

1. Permitted Activities and Uses Set Forth in the AUL Opinion. The AUL Opinion provides that a condition of No Significant Risk to health, safety, public welfare or the environment exists for any foreseeable period of time (pursuant to 310 CMR 40.0000) so long as any of the following activities and uses occur on the Property:

(i) Office, industrial, retail, or commercial uses including similar establishments with associated parking open to the public;

(ii) Landscaping and grounds keeping activities, including but not limited to planting of trees and shrubs, cutting and raking grassy areas, and maintenance and resurfacing of parking lots, sidewalks, and driveways, provided these activities do not meet the definition of "intrusive activity." The definition of "intrusive activity" as it is used in this document is excavation that extends beyond existing topsoil/loam, landscaping, or concrete/asphalt (and associated engineered fill);

(iii) Excavation associated with limited short term or emergency utility work, provided that such work is conducted in accordance with the soil and wastewater management procedures set forth at 310 CMR 40.0030 and under the airborne asbestos management and monitoring plan required under Paragraph 3(iii) below;

(iv) Excavation associated with potential future construction provided that such work is conducted in accordance with the soil and wastewater management procedures set forth at 310 CMR 40.0030, applicable worker health and safety practices pursuant to 310 CMR 40.0018, and under the airborne asbestos management and monitoring plan required under Paragraph 3(iii) below;

(v) Activities and uses which are not identified in this Opinion as being inconsistent with maintaining a condition of No Significant Risk; and

(vi) Such other activities or uses which, in the Opinion of an LSP, shall present no greater risk of harm to health, safety, public welfare or the environment than the activities and uses set forth in this Paragraph.

2. Activities and Uses Inconsistent with the AUL Opinion. Activities and uses which are inconsistent with the objectives of this Notice of Activity and Use Limitation, and which, if implemented at the Property, may result in a significant risk of harm to health, safety, public welfare or the environment or in a substantial hazard, are as follows:

(i) Residential purposes;

(ii) School as defined by 310 CMR 40.0006, kindergarten, day care center, or similar use;

(iii) Active recreational uses, such as athletic fields or playgrounds, involving more than casual contact with the ground; and

(iv) Use of on-site soils for cultivation of fruits or vegetables destined for human consumption.

3. Obligations and Conditions Set Forth in the AUL Opinion. If applicable, obligations and/or conditions to be undertaken and/or maintained at the Property to maintain a condition of No Significant Risk as set forth in the AUL Opinion shall include the following:

(i) Maintain the existing concrete slabs/structures, topsoil/loam, landscaping or the like (hereinafter the "Protective Cover") to prevent long-term direct exposure to underlying subsurface soils. In the event the Protective Cover is degraded or removed, a surface cover of equal protective function shall be reinstalled to prevent changes in exposure to the underlying soils.

(ii) Implement a health and safety plan pursuant to 310 CMR 40.0018 developed by a Certified Industrial Hygienist or similar knowledgeable and trained professional, to be used in conjunction with the airborne asbestos management and monitoring plan, for excavation associated with construction or other major intrusive activities which are likely to involve more than incidental exposure of, or casual direct contact with, the subsurface soils to protect health and safety of on-site workers, visitors to the property and the general public. Excavated materials and dewatering effluent shall be managed in accordance with the soil and groundwater management procedures set forth at 310 CMR 40.0030; and

(iii) Implement an airborne asbestos management and monitoring plan. The plan shall be developed by a Certified Industrial Hygienist or similarly knowledgeable and trained professional. The plan shall require that any intrusive activity into the soil at the Property be done in a manner that prevents the liberation of asbestos particles into the air. It is envisioned that the plan will utilize proactive wetting of the exposed soil. The plan shall also include a procedure to monitor the level of asbestos in the air during certain intrusive activities to confirm that the management plan is successful. The management plan shall also contain a provision that indicates the intrusive activity will be stopped and the area secured if the monitoring plan indicates the level of asbestos in the air exceeds acceptable limits.

4. Proposed Changes in Activities and Uses. Any proposed changes in activities and uses at the Property which may result in higher levels of exposure to oil and/or hazardous material than currently exist shall be evaluated by an LSP who shall render an Opinion, in accordance with 310 CMR 40.1080 *et seq.*, as to whether the proposed changes will present a

significant risk of harm to health, safety, public welfare or the environment. Any and all requirements set forth in the Opinion to meet the objective of this Notice shall be satisfied before any such activity or use is commenced.

5. Violation of a Response Action Outcome. The activities, uses and/or exposures upon which this Notice is based shall not change at any time to cause a significant risk of harm to health, safety, public welfare, or the environment or to create substantial hazards due to exposure to oil and/or hazardous material without the prior evaluation by an LSP in accordance with 310 CMR 40.1080 *et seq.*, and without additional response actions, if necessary, to achieve or maintain a condition of No Significant Risk or to eliminate substantial hazards.

If the activities, uses, and/or exposures upon which this Notice is based change without the prior evaluation and additional response actions determined to be necessary by an LSP in accordance with 310 CMR 40.1080 *et seq.*, the owner or operator of the Property subject to this Notice at the time that the activities, uses, and/or exposures change, shall comply with the requirements set forth in 310 CMR 40.0020.

6. Incorporation Into Deeds, Mortgages, Leases, and Instruments of Transfer. This Notice shall be incorporated either in full or by reference into all deeds, easements, mortgages, leases, licenses, occupancy agreements or any other instrument of transfer, whereby an interest in and/or a right to use the Property or a portion thereof is conveyed.

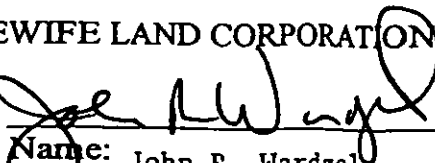
Owner hereby authorizes and consents to the filing and recordation and/or registration of this Notice, said Notice to become effective when executed under seal by the undersigned LSP, and recorded and/or registered with the appropriate Registry(ies) of Deeds and/or Land Registration Office(s).

WITNESS the execution hereof under seal this 27th day of October, 1999.

OWNER:

ALEWIFE LAND CORPORATION

By:



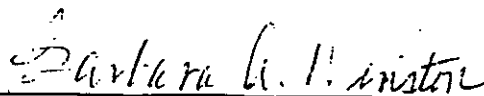
Name: John R. Wardzel
Title: Vice President

COMMONWEALTH OF MASSACHUSETTS

Middlesex, ss

October 27, 1999


Then personally appeared the above named John R. Wardzel and acknowledged the foregoing to be his/her free act and deed before me,



Notary Public: Barbara A. Winston
My Commission Expires: 01-26-01

The undersigned LSP hereby certifies that he executed the aforesaid Activity and Use Limitation Opinion attached hereto as Exhibit C and made a part hereof and that in his Opinion this Notice of Activity and Use Limitation is consistent with the terms set forth in said Activity and Use Limitation Opinion.

Date: October 28, 1999


Wesley E. Stimpson, LSP

[LSP SEAL]




COMMONWEALTH OF MASSACHUSETTS

Suffolk County ss

October 28th, 1999

Then personally appeared the above named Wesley E. Stimpson, and acknowledged the foregoing to be his free act and deed before me,


Notary Public: ELIZABETH A. LAFAVRE
My Commission Expires: 12/25/03

Upon recording, return to:

Alewife Land Corporation
62 Whittemore Avenue
Cambridge, MA 02140
Attention: Legal Department

ELIZABETH A. LAFAVRE
Notary Public
My Commission Expires Dec. 25, 2003

**EXHIBIT A TO
NOTICE OF ACTIVITY AND USE LIMITATION**

Description of the Property

A certain parcel of land in Cambridge, Middlesex County, Massachusetts, shown as "Parcel A" on a plan of land entitled "Plan of Land Owned by Alewife Land Corporation, 1 Alewife Center, Cambridge, Massachusetts", Scale 1 = 40', dated October 1999, prepared by URS Greiner Woodward Clyde, which plan is to be recorded with the Middlesex County South District Registry of Deeds herewith, which parcel of land is more particularly bounded and described according to said plan as follows:

Beginning at a point at the northwest corner of Parcel A, at the intersection of the easterly boundary of land now or formerly of Catherine L. Kennedy and the southerly sideline of Whittemore Avenue:

Thence running S 04°-37'-30" W for a distance of eighty-seven and 34/100 (87.34) feet;

Thence turning and running northwesterly by a curved line having a radius of one thousand eight hundred sixty-eight and 75/100 (1868.75) feet, for a distance of eighty and 61/100 (80.61) feet, said last two bounds being by said land now or formerly of Catherine L. Kennedy;

Thence turning and running southeasterly by a curved line having a radius of five hundred twenty-five and 88/100 (525.88) feet, for a distance of two and 87/100 (2.87) feet;

Thence turning and running southeasterly by a curved line having a radius of one hundred twenty-five and 00/100 (125.00) feet, for a distance of one hundred one and 48/100 (101.48) feet;

Thence turning and running southeasterly by a curved line having a radius of one thousand nine hundred fifty one and 25/100 (1951.25) feet, for a distance of two hundred forty-eight and 14/100 (248.14) feet;

Thence turning and running N 04°-38'-21" E for a distance of six and 71/100 (6.71) feet;

Thence turning and running N 88°-16'-09" E for a distance of eight and 84/100 (8.84) feet, said last five bounds being by other land of Alewife Land Corporation;

Thence turning and running N 04°-37'-30" E for a distance of one hundred seventy-four and 81/100 (174.81) feet, in part by other land of Alewife Land Corporation and in part by land now or formerly of W. R. Grace & Co.-Conn.;

Thence turning and running N 85°-22'-30" W for a distance of two hundred twenty-two and 24/100 (222.24) feet along the southerly sideline of Whitemore Avenue to the point of beginning.

The above-described premises include the following lots of registered land, to wit:

Lots 18,19, 20, 21 and 22 as shown on Land Court Plan 5236G, more particularly described in Certificate of Title 173484 in Registration Book 997, Page 134; and

Lot 48 as shown on Land Court Plan 5236N, more particularly described in Certificate of Title 173484 in Registration Book 997, Page 134.

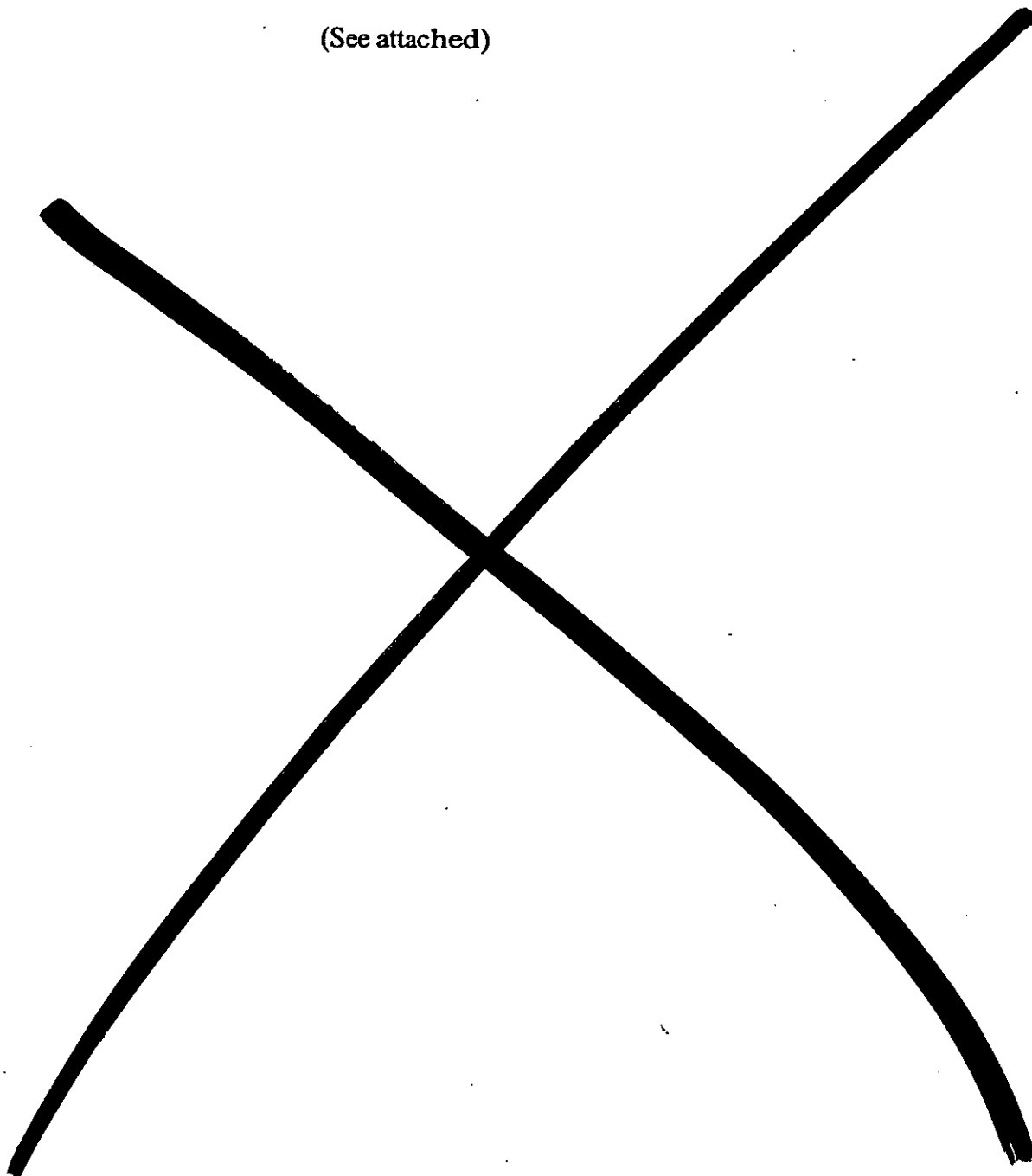
For Owner's title to said registered land, see Certificate of Title 173484.

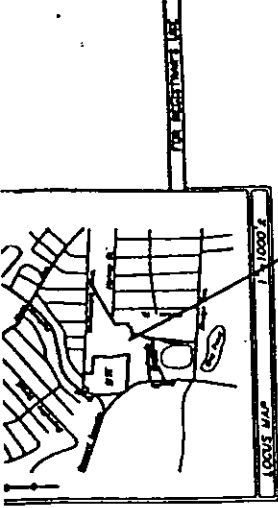
For Owner's title, also see deed from W. R. Grace Land Corporation dated April 22, 1985 and recorded with said Deeds in Book 16152, Page 284.

EXHIBIT B TO
NOTICE OF ACTIVITY AND USE LIMITATION

Sketch Plan

(See attached)





Limit of Disposal Site

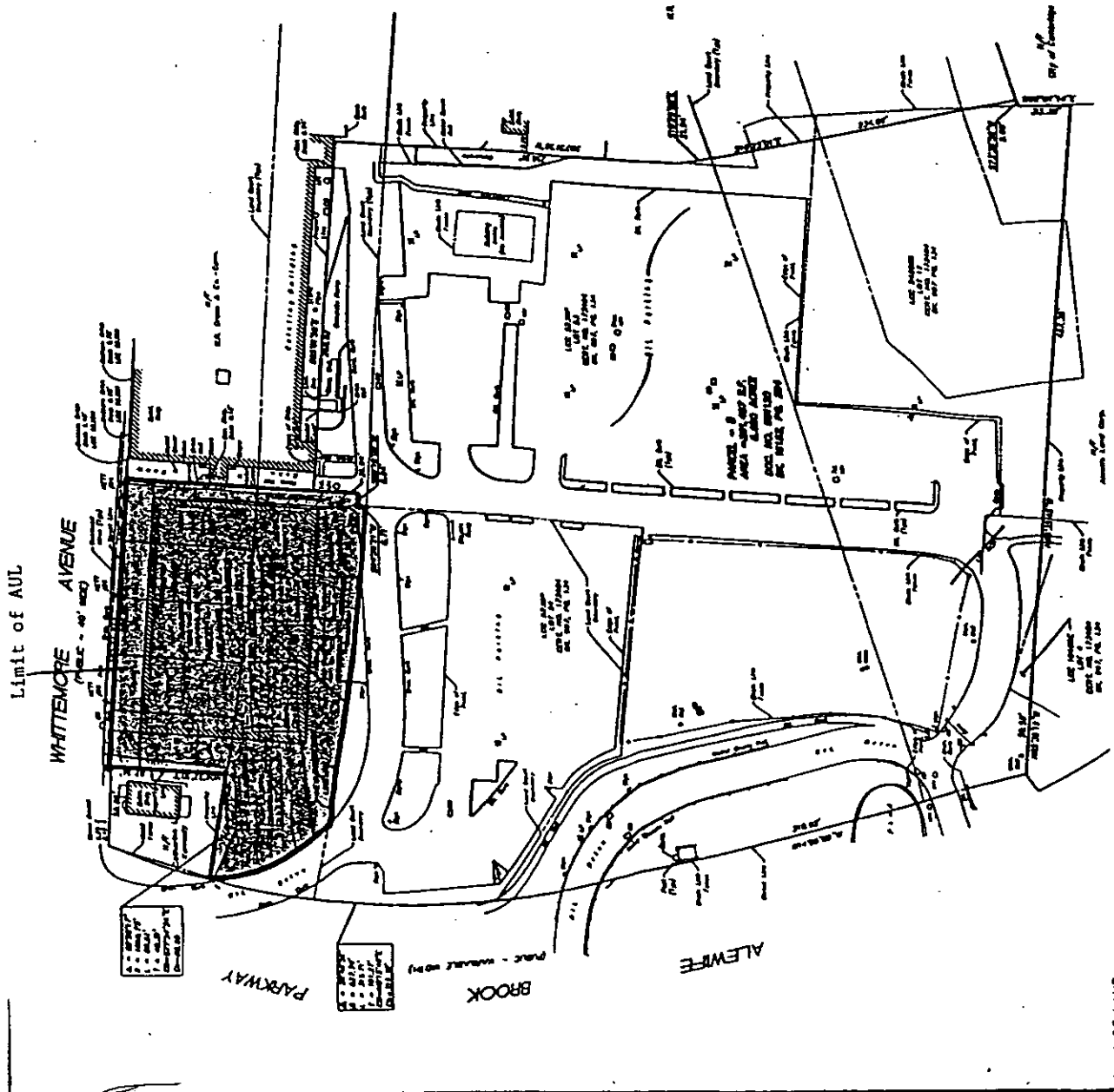
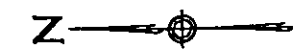
1. The disposal site is the minimum as determined by the plan as shown on the plan.
2. The disposal site is the minimum as determined by the plan as shown on the plan.
3. The disposal site is the minimum as determined by the plan as shown on the plan.
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7. The disposal site is the minimum as determined by the plan as shown on the plan.
8. The disposal site is the minimum as determined by the plan as shown on the plan.
9. The disposal site is the minimum as determined by the plan as shown on the plan.
10. The disposal site is the minimum as determined by the plan as shown on the plan.

URS Greiner Woodward Clyde	
Project No.	URS-GWC-001
Client	Alewife Land Corporation
Site	1 Alewife Center, Cambridge, MA
Scale	1" = 100'
Date	10/26/97
Drawn by	J. [Name]
Checked by	[Name]
Approved by	[Name]

I HEREBY CERTIFY THE FOLLOWING:

1. THAT THIS PLAN COMPLIES TO THE TECHNICAL PROCEDURES AND TECHNICAL STANDARDS FOR THE PRACTICE OF LAND SURVEYING IN THE COMMONWEALTH OF MASSACHUSETTS.
2. THAT THIS PLAN COMPLIES TO THE RULES AND REGULATIONS OF THE BOARD OF REGISTRY OF PROFESSIONAL LAND SURVEYORS IN THE COMMONWEALTH OF MASSACHUSETTS.

DATE: 10-26-97
 J. [Name]
 PROFESSIONAL LAND SURVEYOR REG. NO. 11111



PLAN OF LAND OWNED BY ALEWIFE LAND CORPORATION 1 ALEWIFE CENTER CAMBRIDGE, MASSACHUSETTS

EXHIBIT C TO
NOTICE OF ACTIVITY AND USE LIMITATION

Activity and Use Limitation Opinion

(See attached)

U33527019AULFORM.04
10/27/99

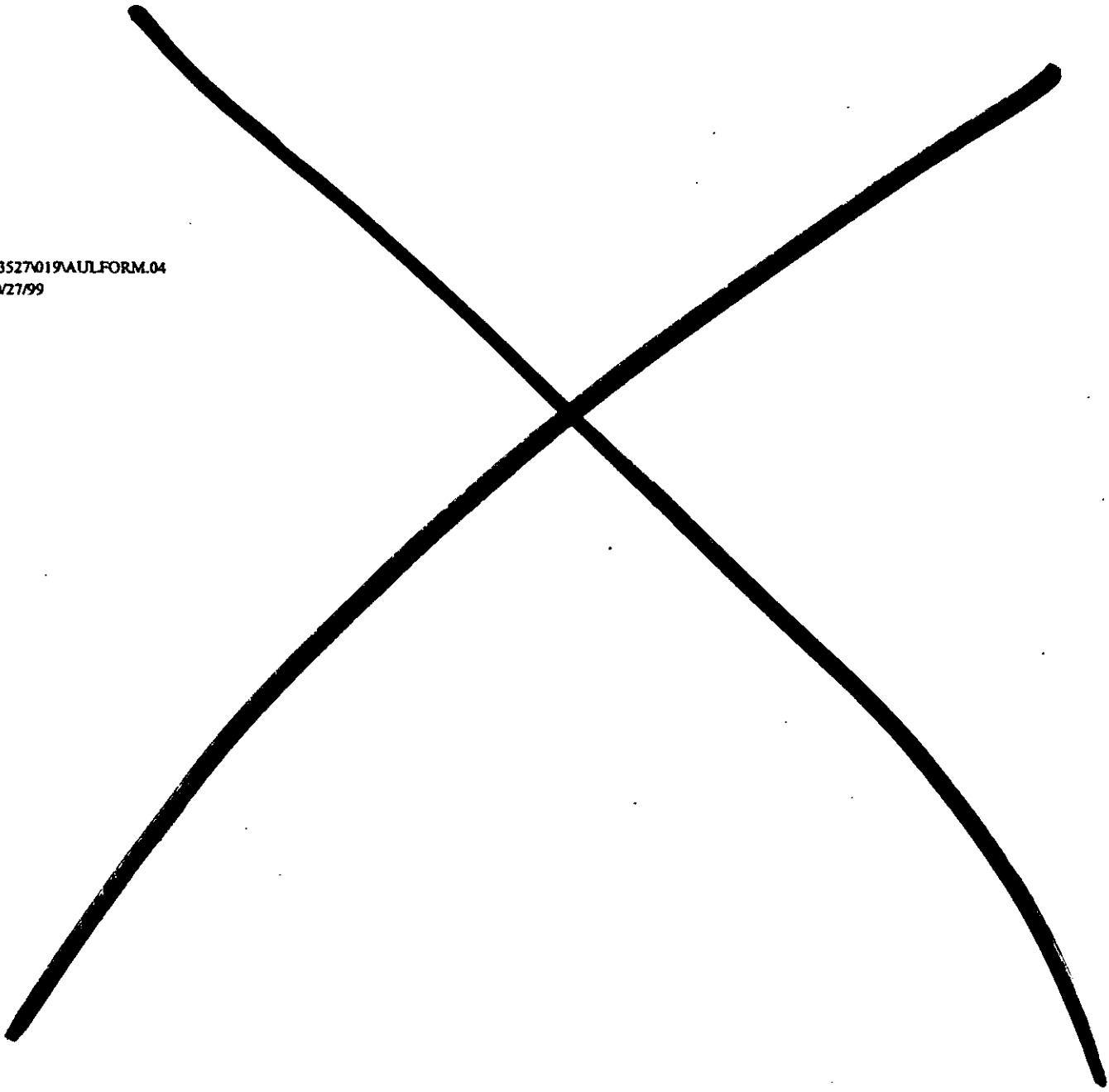


EXHIBIT C**ACTIVITY AND USE LIMITATION OPINION**Property Subject to AUL

The area subject to this Activity and Use Limitation Opinion consists of the property currently owned by Alewife Land Corporation, shown as Parcel A on a plan dated October, 1989, entitled: "Plan of Land Owned by Alewife Land Corporation," and filed with the Middlesex South District Registry of Deeds herewith, Exhibit A Form 1075 (the Subdivision Plan).

In accordance with the Massachusetts Contingency Plan (MCP) at 310 CMR 40.1056(2)(g) and 40.1074(1)(b), this document constitutes an Activity and Use Limitation Opinion (AUL Opinion) for the Property. This AUL opinion is submitted in support of a Response Action Outcome (RAO) Statement, to be prepared and associated Notice of Activity and Use Limitation, Form 1075, dated October 29, 1989 for linked DEP Release Tracking Nos. 3-0277 and 3-17014.

Disposal Site Description

The site comprises approximately 1.036 acres of land with 23,000 sq. ft. of building coverage, located on Whittemore Avenue in Cambridge, Massachusetts (the "One Alewife Property"). The entire property is subject to this AUL. The site is currently occupied by a four-story office building. The area surrounding the building is landscaped or paved for access roads or parking.

Site History

The property currently owned by Alewife Land Corporation is located in the northwest corner of a 27-acre parcel owned by W.R. Grace & Co.-Conn. or one of its subsidiary companies. The property is included as part of a disposal site listed by the Massachusetts Department of Environmental Protection (DEP) under linked RTNs 3-0277 and 3-17014. The site addressed by RTNs 3-0277 and 3-17014 is currently listed as a Tier IC disposal site in Phase III of the MCP. W.R. Grace & Co.-Conn. is the listed potentially responsible party.

The W.R. Grace disposal site is listed with the DEP as a result of volatile and semi-volatile organics, petroleum products, metals and asbestos found to exist in the environment during evaluations of subsurface and hydrogeological conditions for the Alewife Center Master Plan Study conducted in 1984 and 1985, and in subsequent investigations conducted in the 1990s.

Reason for Activity and Use Limitation

As part of the environmental studies for the Grace site, a site-specific Risk Characterization was completed by Meta Systems, Inc. in May 1988. Several addenda to this Risk Characterization were subsequently produced by Cambridge Environmental, Inc. in order to respond to DEP comments and to conform to the MCP (implemented in 1993). These addenda include: "Addenda to Health Risk Assessment for the W.R. Grace & Co. Property, Cambridge, Massachusetts," dated 10 August 1989; letter to DEP, dated 2 October 1989; letter to DEP dated 9 January 1990; and letter to W.R. Grace dated 16 November 1994. The risk

Activity and Use Limitation Opinion
Alewife Land Corporation
RTNs 3-0277 and 3-17014
Page 2

characterization considered current and foreseeable future use of the site at the time of the studies, which included the current building, and concluded that a condition of no significant risk existed. Potential uncontrolled exposures to existing soil and groundwater, however, were not considered in the risk characterizations.

Studies in support of the Response Action Outcome (RAO) Opinion for the One Alewife Property have evaluated the uncontrolled exposure scenario by comparing average levels of contamination present at the property to MCP Method I standards. Levels of some contamination in the soil exceed these standards and therefore a potential risk may exist for uncontrolled future use of the property.

In 1998 an evaluation for the presence of asbestos in soil was conducted on the entire Grace site, including the portion of the property currently owned by Alewife Land Corporation. Asbestos was detected in one split sample (11% asbestos) collected from 0.5 to 4 feet below ground surface and analyzed by the Alewife Study Group. A landscaped area (topsoil and sod) overlies the contaminated soil, which is considered potentially accessible for current site use.

Exposures to airborne asbestos can be prevented with a management plan developed to be utilized in the event of future disturbance to the soil at the property resulting from intrusive activities. The plan would direct that all intrusive activities be conducted in a wet environment to prevent potential liberation of asbestos particles, and work be implemented in a manner to control potential airborne asbestos concentrations during soil disturbing activities.

The AUL is considered appropriate for unforeseen potential exposures and to maintain a condition of "No Significant Risk" at the site. The AUL manages potential exposures to soils assumed to represent potential future risks associated with potential asbestos present in the soil and uncontrolled future use. The permitted uses are consistent with the current and reasonably foreseeable uses of the property (i.e., office, industrial, or retail). Furthermore, the inconsistent uses and obligations under the AUL provide a means for maintaining assumptions of the risk assessment which relied upon elimination of certain exposure pathways to achieve a level of "No Significant Risk". Achieving an RAO without implementation of an AUL is not considered feasible according to DEP criteria.

Based on the above described risk characterizations, permitted activities and uses, inconsistent activities and uses, and obligations and conditions to maintain a level of "No Significant Risk" are as follows:

Permitted Activities and Uses

- (i) Office, industrial, retail, or commercial uses including similar establishments with associated parking open to the public;
- (ii) Landscaping and grounds keeping activities, including but not limited to planting of trees and shrubs, cutting and raking grassy areas, and maintenance and resurfacing of parking lots, sidewalks, and driveways, provided these activities do not meet the definition of "intrusive activity." The definition

Activity and Use Limitation Opinion
 Alewife Land Corporation
 RTNs 3-0277 and 3-17014
 Page 3

of intrusive activity as it is used in this document is excavation that extends beyond existing topsoil/loam, landscaping, or concrete/asphalt (and associated engineered fill);

- (ii) Excavation associated with limited short term or emergency utility work, provided that such work is conducted in accordance with the soil and wastewater management procedures given at 310 CMR 40.0030 and under the airborne asbestos management and monitoring plan;
- (iii) Excavation associated with potential future construction provided that such work is conducted in accordance with the soil and wastewater management procedures given at 310 CMR 40.0030, applicable worker health and safety practices pursuant to 310 CMR 40.0018, and under the airborne asbestos management and monitoring plan;
- (iv) Activities and uses which are not identified in this Opinion as being inconsistent with maintaining a condition of No Significant Risk; and
- (v) Such other activities and uses which, in the Opinion of an LSP, shall present no greater risk of harm to health, safety, public welfare, or the environment than the activities and uses set forth in this paragraph.

Inconsistent Activities and Uses

- (i) Residential purposes;
- (ii) School as defined by 310 CMR 40.0006, kindergarten, day care center, or similar use;
- (iii) Active recreational uses, such as athletic fields or playgrounds, involving more than casual contact with the ground; and
- (iv) Use of on-site soils for cultivation of fruits or vegetables destined for human consumption.

Obligations and Conditions

- (i) Maintain the existing concrete slabs/structures, topsoil/loam, landscaping or the like (hereinafter the "Protective Cover") to prevent long-term direct exposure to underlying subsurface soils. In the event the Protective Cover is degraded or removed, a surface cover of equal protective function shall be reinstalled to prevent changes in exposure to the underlying soils.
- (ii) Implement a health and safety plan pursuant to 310 CMR 40.0018 developed by a Certified Industrial Hygienist or similar knowledgeable and trained professional, to be used in conjunction with the airborne asbestos management and monitoring plan, for excavation associated with construction or other major intrusive activities which are likely to involve more than incidental exposure of, or casual direct contact with, the subsurface soils to protect health and safety of on-site workers, visitors to the

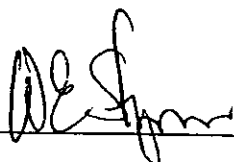
Activity and Use Limitation Opinion
Alewife Land Corporation
RTNs 3-0277 and 3-17014
Page 4

property and the general public. Excavated materials and dewatering effluent shall be managed in accordance with the soil and groundwater management procedures pursuant to 310 CMR 40.0030.

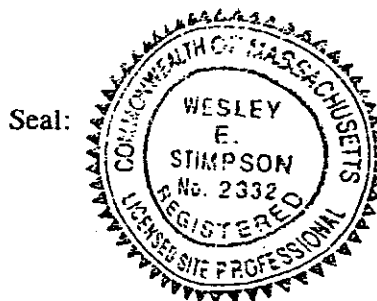
- (iii) Implement an airborne asbestos management and monitoring plan. The plan shall be developed by a Certified Industrial Hygienist or similarly knowledgeable and trained professional. The plan shall require that any intrusive activity into the soil at the One Alewife Property be done in a manner that prevents the liberation of asbestos particles into the air. It is envisioned that the plan will utilize proactive wetting of the exposed soil. The plan shall also include a procedure to monitor the level of asbestos in the air during certain intrusive activities to confirm that the management plan is successful. The management plan shall also contain a provision that indicates the intrusive activity will be stopped and the area secured if the monitoring plan indicates the level of asbestos in the air exceeds acceptable limits.

LSP Signature

The Activity and Use Limitation Opinion presented herein was prepared by Wesley E. Stimpson, Senior Vice President, Haley & Aldrich, Inc.

Signature: 

Date: 26 October 1999
License Number: 2332





Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC-114

ACTIVITY & USE LIMITATION (AUL) OPINION FORM

Release Tracking Number

Pursuant to 310 CMR 40.1070 - 40.1084 (Subpart J)

3

277

COMPLETE THIS FORM AND ATTACH AS AN EXHIBIT TO THE AUL DOCUMENT TO BE RECORDED AND/OR REGISTERED WITH THE REGISTRY OF DEEDS AND/OR LAND REGISTRATION OFFICE.

A. LOCATION OF DISPOSAL SITE AND PROPERTY SUBJECT TO AUL:

Disposal Site Name: W.R. Grace & Co. -Conn.Street: 62 Whittemore Avenue Location Aid: _____City/Town: Cambridge ZIP Code: 02140-0000Address of property subject to AUL, if different than above. Street: One Alewife CenterCity/Town: Cambridge ZIP Code: 02140-0000

B. THIS FORM IS BEING USED TO: (check one)

- Provide the LSP Opinion for a Notice of Activity and Use Limitation, pursuant to 310 CMR 40.1074 (complete all sections of this form).
- Provide the LSP Opinion for an Amended Notice of Activity and Use Limitation, pursuant to 310 CMR 40.1081(4) (complete all sections of this form).
- Provide the LSP Opinion for a Termination of a Notice of Activity and Use Limitation, pursuant to 310 CMR 40.1083(3) (complete all sections of this form).
- Provide the LSP Opinion for a Grant of Environmental Restriction, pursuant to 310 CMR 40.1071. (complete all sections of this form).
- Provide the LSP Opinion for an Amendment of Environmental Restriction, pursuant to 310 CMR 40.1081(3) (complete all sections of this form).
- Provide the LSP Opinion for a Release of Environmental Restriction, pursuant to 310 CMR 40.1083(2) (complete all sections of this form).

C. LSP OPINION:

I test under the pains and penalties of perjury that I have personally examined and am familiar with this submittal, including any and all documents accompanying this submittal. In my professional opinion and judgment based upon application of (i) the standard of care in 309 CMR 4.02(1), (ii) the applicable provisions of 309 CMR 4.02(2) and (3), and (iii) the provisions of 309 CMR 4.03(5), to the best of my knowledge, information and belief,

- > if Section B indicates that a Notice of Activity and Use Limitation is being registered and/or recorded, the Activity and Use Limitation that is the subject of this submittal (i) is being provided in accordance with the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000 and (ii) complies with 310 CMR 40.1074(1)(b);
- > if Section B indicates that an Amended Notice of Activity and Use Limitation is being registered and/or recorded, the Activity and Use Limitation that is the subject of this submittal (i) is being provided in accordance with the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000 and (ii) complies with 310 CMR 40.1080(1) and 40.1081(1);
- > if Section B indicates that a Termination of a Notice of Activity and Use Limitation is being registered and/or recorded, the Activity and Use Limitation that is the subject of this submittal (i) is being provided in accordance with the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000 and (ii) complies with 310 CMR 40.1083(3)(a);
- > if Section B indicates that a Grant of Environmental Restriction is being registered and/or recorded, the Activity and Use Limitation that is the subject of this submittal (i) is being provided in accordance with the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000 and (ii) complies with 310 CMR 40.1071(1)(b);
- > if Section B indicates that an Amendment to a Grant of Environmental Restriction is being registered and/or recorded, the Activity and Use Limitation that is the subject of this submittal (i) is being provided in accordance with the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000 and (ii) complies with 310 CMR 40.1080(1) and 40.1081(1);
- > if Section B indicates that a Release of Grant of Environmental Restriction is being registered and/or recorded, the Activity and Use Limitation that is the subject of this submittal (i) is being provided in accordance with the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000 and (ii) complies with 310 CMR 40.1083(3)(a).

I am aware that significant penalties may result, including, but not limited to, possible fines and imprisonment, if I submit information which I know to be false, inaccurate or materially incomplete.

- Check here if the Response Action(s) on which this opinion is based, if any, are (were) subject to any order(s), permit(s) and/or approval(s) issued by DEP or EPA. If the box is checked, you MUST attach a statement identifying the applicable provisions thereof.

SECTION C IS CONTINUED ON THE NEXT PAGE.



Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC-114

ACTIVITY & USE LIMITATION (AUL) OPINION FORM

Release Tracking Number

Pursuant to 310 CMR 40.1070 - 40.1084 (Subpart J)

3

277

LSP OPINION: (continued)

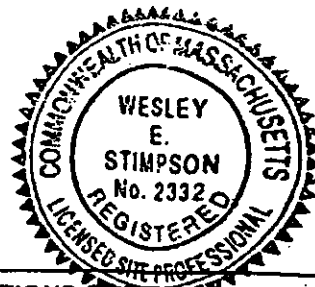
LSP Name: Wesley E. Stimpson LSP #: 2332 Stamp:

Telephone: 617-886-7395 Ext.: _____

FAX: 617-886-7695

LSP Signature: _____

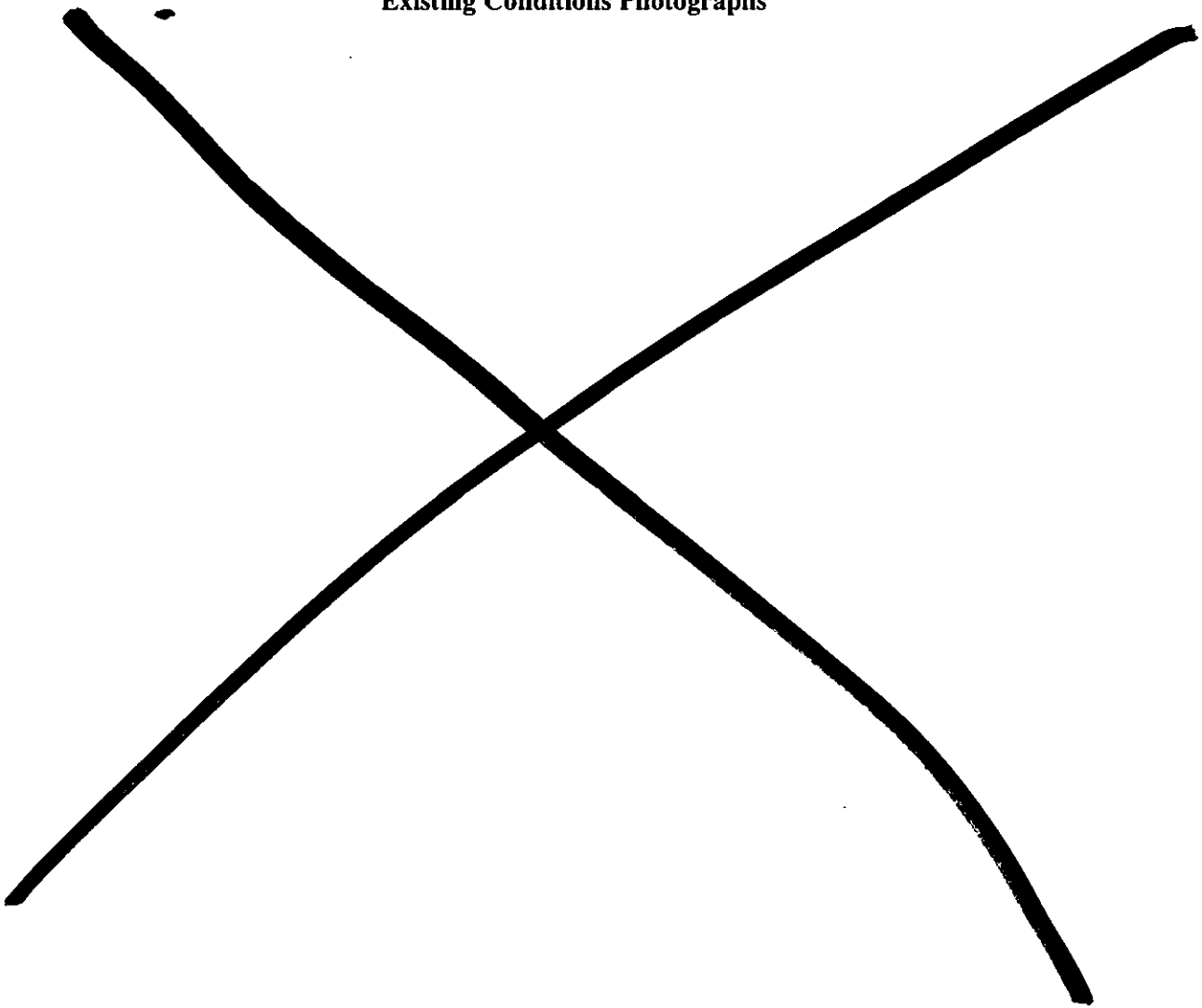
Date: 26 OCTOBER 1999



YOU MUST COMPLETE ALL RELEVANT SECTIONS OF THIS FORM OR DEP MAY FIND THE DOCUMENT TO BE INCOMPLETE.

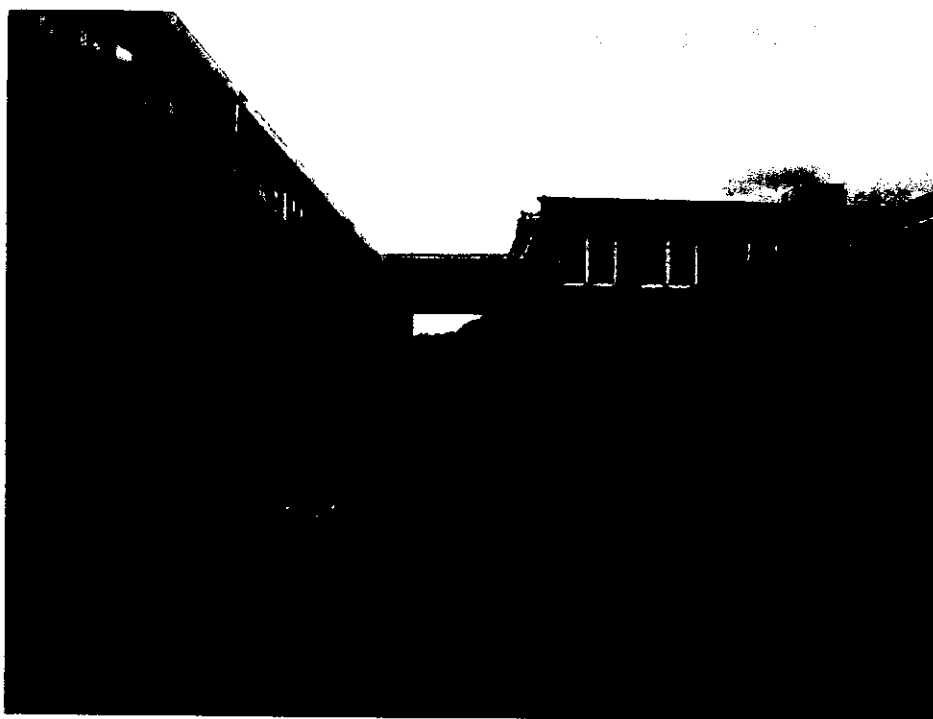
APPENDIX C

Existing Conditions Photographs





A1 - 1



A1 - 2

Haley & Aldrich, Inc.

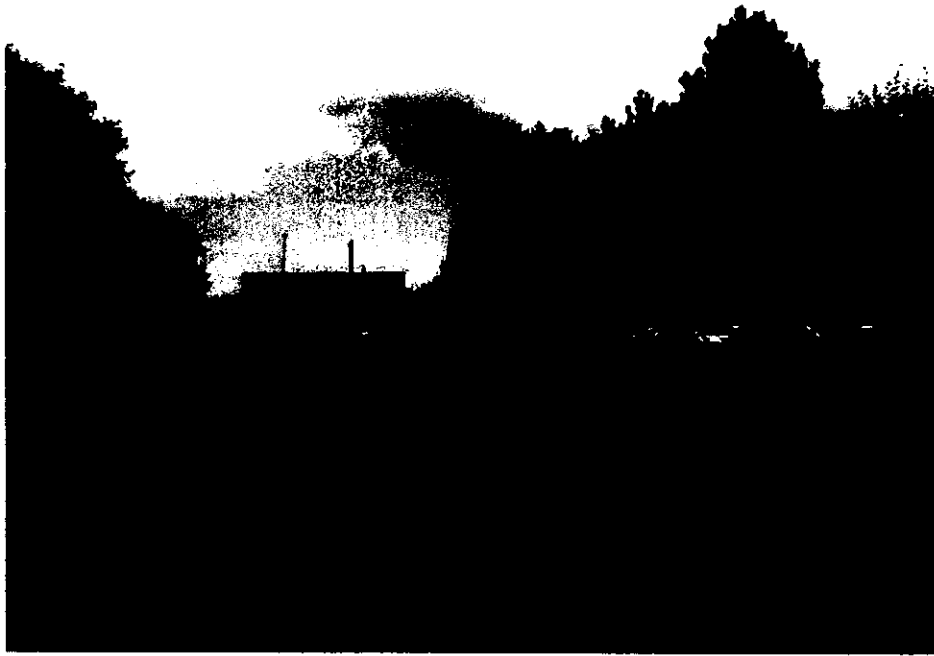


A1 - 3



A1 - 4

W.R. Grace
Protective Cover Monitoring Plan



A1 - 5



A1 - 6

Haley & Aldrich, Inc.



A1 - 7



A1 - 8



A2 - 1



A2 - 2

Haley & Aldrich, Inc.

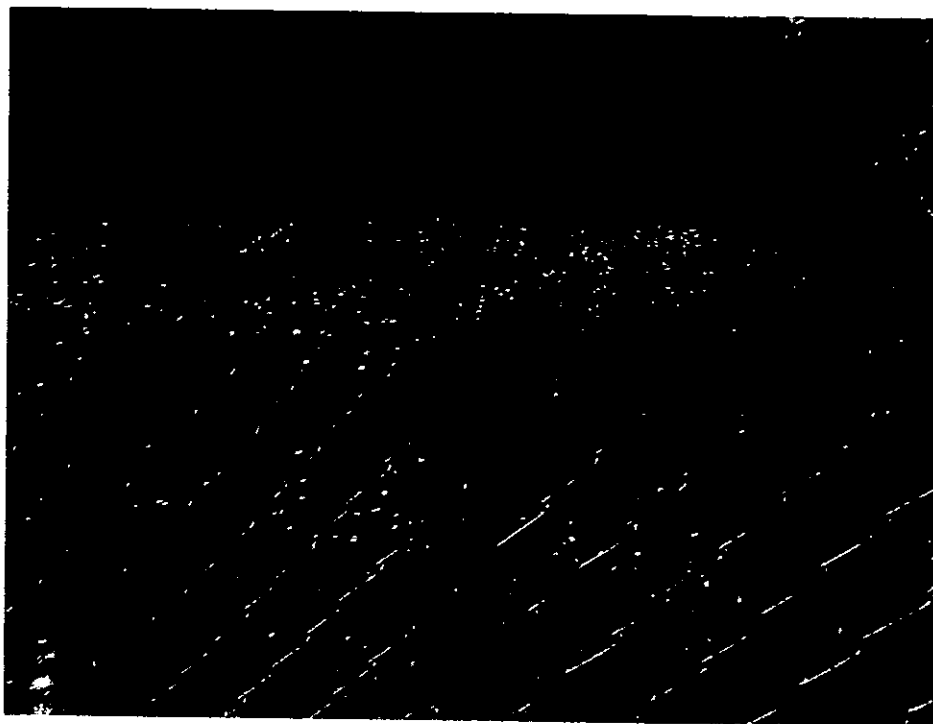


A2 - 3



A2 - 4

Haley & Aldrich, Inc.



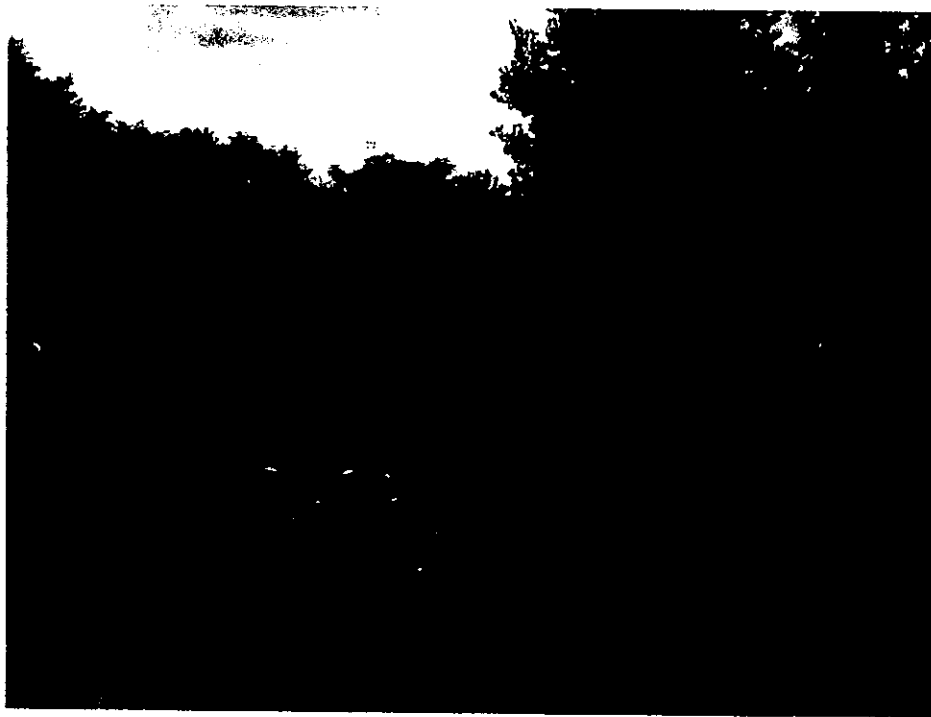
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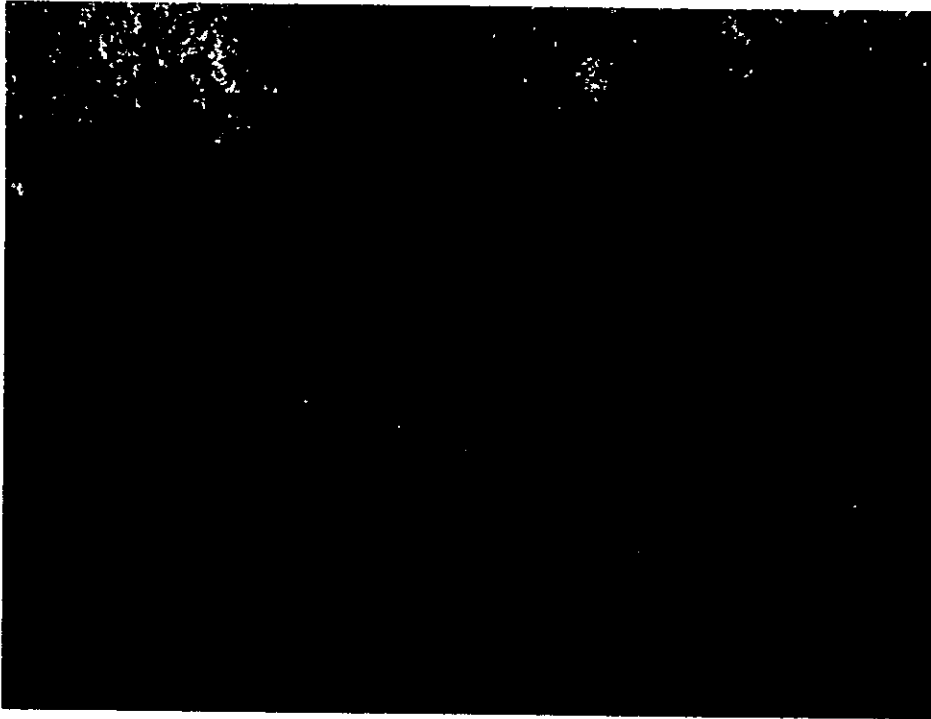
A3 - 2



A3 - 3



A4 - 1



A4 - 2



A4 - 3



A4 - 4



A4 - 5

Haley & Aldrich, Inc.



A5 - 1



A5 - 2



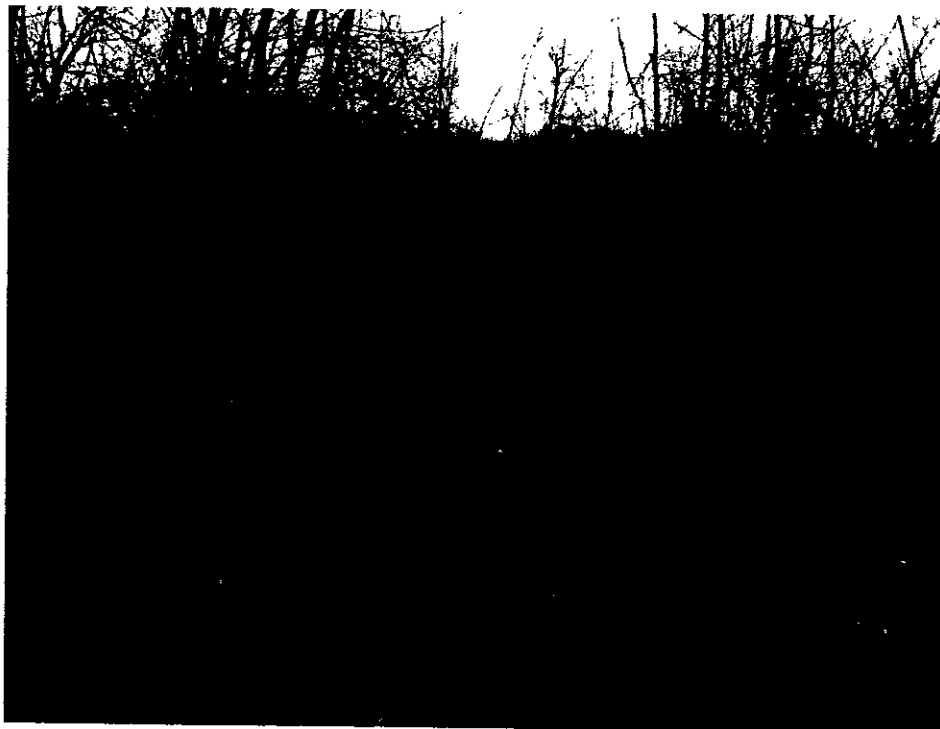
A5 - 3



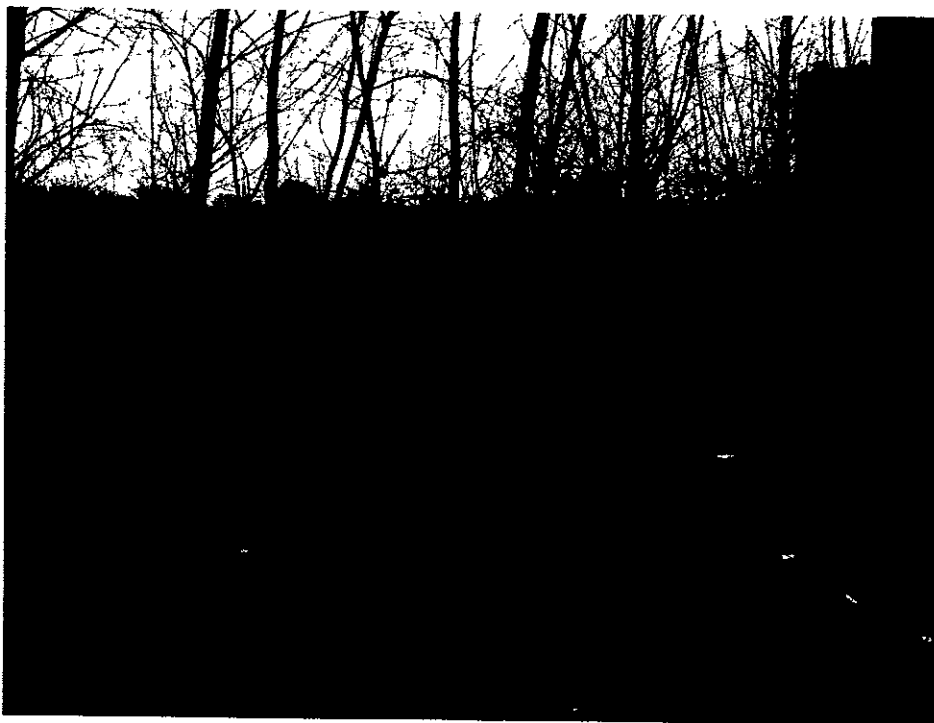
A7 - 1

Haley & Aldrich, Inc.

W.R. Grace
Protective Cover Monitoring Plan



A7 - 2



A7 - 3

Haley & Aldrich, Inc.



A8 - 1



A8 - 2

Haley & Aldrich, Inc.



A8 - 3

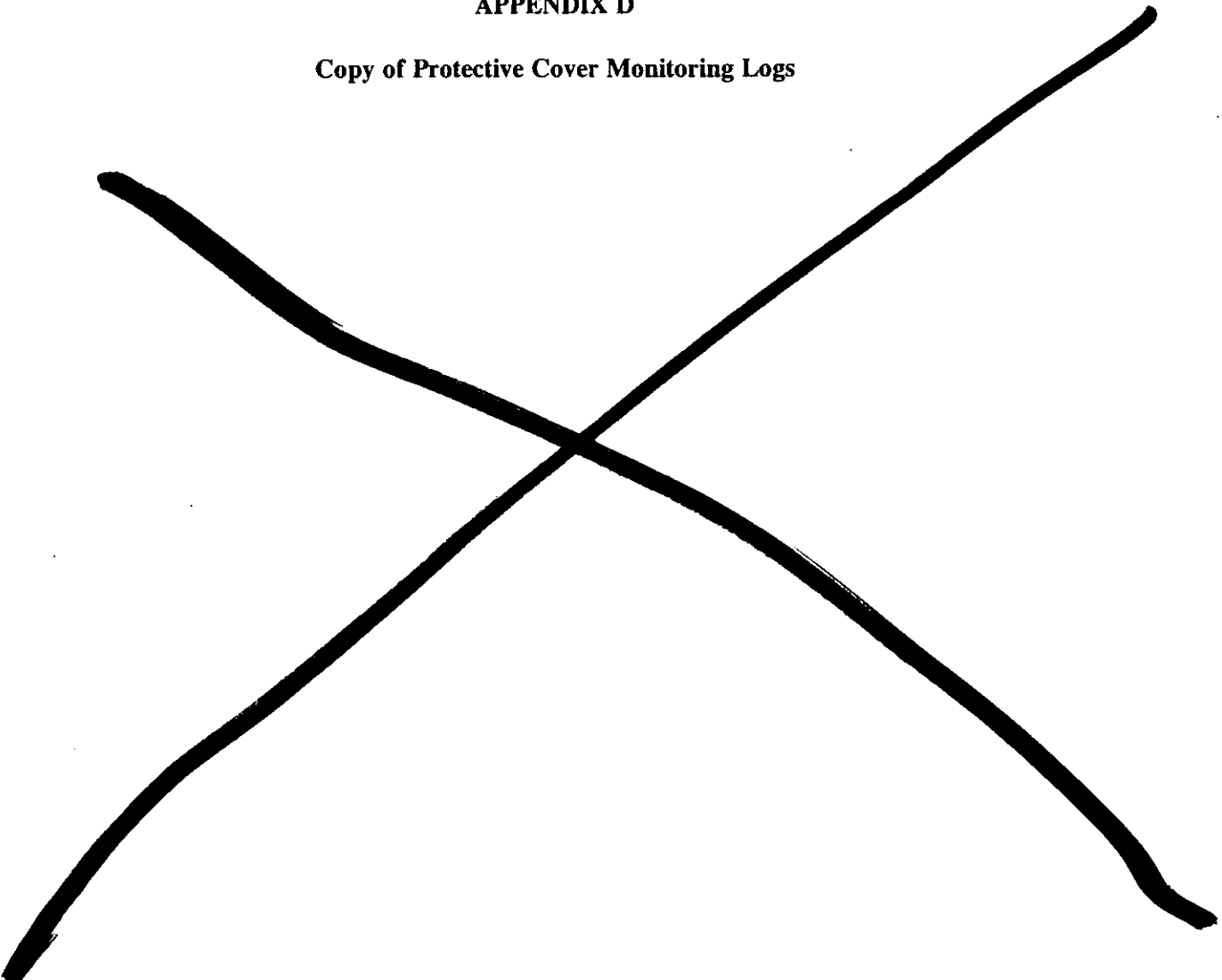


A8 - 4

Haley & Aldrich, Inc.

APPENDIX D

Copy of Protective Cover Monitoring Logs



PROTECTIVE COVER MONITORING PLAN INSPECTION REPORT

Project	W.R. Grace & Co.	Report No.	00
Location	62 Whittemore Avenue, One Alewife Center, 134 Alewife Brook Parkway	Date	
Address	Cambridge, Massachusetts	Page	1 of 6
Client	W.R. Grace & Co.	File No.	10063-066
Weather		Temperature	___°
Field Rep.			

1. Protective Cover Surface Observations:

Describe general condition of landscape (distressed, normal/consistent with baseline conditions, etc.): _____

Area 1 Conditions:

Yes	No
-----	----

Is Protective Cover in Area 1 observed to be in same conditions compared to "baseline conditions"? If no, describe change(s) in conditions: _____

Yes	No
-----	----

Are there bare spots, signs of erosion, or large potholes in pavement? (If yes, attach photographs and figure showing location and extent): Describe eroded area or areas of potholes: _____

Other Observations: _____

Area 2 Conditions:

Yes	No
-----	----

Is Protective Cover in Area 2 observed to be in same conditions compared to "baseline conditions"? If no, describe change(s) in conditions: _____

Yes	No
-----	----

Are there bare spots, signs of erosion? (If yes, attach photographs and figure showing location and extent): Describe eroded area or areas of potholes: _____

Other Observations: _____

PROTECTIVE COVER MONITORING PLAN INSPECTION REPORT

Project	W.R. Grace & Co.	Report No.	00
Location	62 Whittemore Avenue, One Alewife Center, 134 Alewife Brook Parkway	Date	
Address	Cambridge, Massachusetts	Page	2 of 6
Client	W.R. Grace & Co.	File No.	10063-066
Weather		Temperature	___°
Field Rep.			

Area 3 Conditions:

<table border="1"> <tr> <td style="width: 50px;">Yes</td> <td style="width: 50px;">No</td> </tr> </table>	Yes	No	Is Protective Cover in Area 3 observed to be in same conditions compared to "baseline conditions"? If no, describe change(s) in conditions: _____ _____ _____
Yes	No		

<table border="1"> <tr> <td style="width: 50px;">Yes</td> <td style="width: 50px;">No</td> </tr> </table>	Yes	No	Are there bare spots, signs of erosion? (If yes, attach photographs and figure showing location and extent): Describe eroded area or areas of potholes: _____ _____ _____
Yes	No		

Other Observations: _____

Area 4 Conditions:

<table border="1"> <tr> <td style="width: 50px;">Yes</td> <td style="width: 50px;">No</td> </tr> </table>	Yes	No	Is Protective Cover in Area 4 observed to be in same conditions compared to "baseline conditions"? If no, describe change(s) in conditions: _____ _____ _____
Yes	No		

<table border="1"> <tr> <td style="width: 50px;">Yes</td> <td style="width: 50px;">No</td> </tr> </table>	Yes	No	Are there bare spots, signs of erosion? (If yes, attach photographs and figure showing location and extent): Describe eroded area or areas of potholes: _____ _____ _____
Yes	No		

Other Observations: _____

PROTECTIVE COVER MONITORING PLAN INSPECTION REPORT

Project	W.R. Grace & Co.	Report No.	00
Location	62 Whittemore Avenue, One Alewife Center, 134 Alewife Brook Parkway	Date	
Address	Cambridge, Massachusetts	Page	3 of 6
Client	W.R. Grace & Co.	File No.	10063-066
Weather		Temperature	___°
Field Rep.			

Area 5 Conditions:

<input type="checkbox"/> Yes <input type="checkbox"/> No	Is Protective Cover in Area 5 observed to be in same conditions compared to "baseline conditions"? If no, describe change(s) in conditions: _____ _____ _____
--	---

<input type="checkbox"/> Yes <input type="checkbox"/> No	Are there bare spots, signs of erosion? (If yes, attach photographs and figure showing location and extent): Describe eroded area or areas of potholes: _____ _____ _____
--	---

Other Observations: _____

Area 6 Conditions:

<input type="checkbox"/> Yes <input type="checkbox"/> No	Is Protective Cover in Area 6 observed to be in same conditions compared to "baseline conditions"? If no, describe change(s) in conditions: _____ _____ _____
--	---

<input type="checkbox"/> Yes <input type="checkbox"/> No	Are there bare spots, signs of erosion, or large potholes in pavement? (If yes, attach photographs and figure showing location and extent): Describe eroded area or areas of potholes: _____ _____ _____
--	--

Other Observations: _____

PROTECTIVE COVER MONITORING PLAN INSPECTION REPORT

Project	W.R. Grace & Co.	Report No.	00
Location	62 Whittemore Avenue, One Alewife Center, 134 Alewife Brook Parkway	Date	
Address	Cambridge, Massachusetts	Page	4 of 6
Client	W.R. Grace & Co.	File No.	10063-066
Weather		Temperature	___°
Field Rep.			

Area 7 Conditions:

Yes | No
 Is Protective Cover in Area 7 observed to be in same conditions compared to "baseline conditions"? If no, describe change(s) in conditions: _____

Yes | No
 Are there bare spots or signs of erosion? (If yes, attach photographs and figure showing location and extent): Describe eroded area or areas of potholes: _____

Other Observations: _____

Area 8 Conditions:

Yes | No
 Is Protective Cover in Area 8 observed to be in same conditions compared to "baseline conditions"? If no, describe change(s) in conditions: _____

Yes | No
 Are there signs of erosion or large potholes in pavement? (If yes, attach photographs and figure showing location and extent): Describe eroded area or areas of potholes: _____

Other Observations: _____

PROTECTIVE COVER MONITORING PLAN INSPECTION REPORT

Project	W.R. Grace & Co.	Report No.	00
Location	62 Whittemore Avenue, One Alewife Center, 134 Alewife Brook Parkway	Date	
Address	Cambridge, Massachusetts	Page	5 of 6
Client	W.R. Grace & Co.	File No.	10063-066
Weather		Temperature	___°
Field Rep.			

2. Cultivation of Plants

Yes	No	Were there any signs of cultivation of plants for human consumption observed on the property? If yes, describe and shown location on plan: _____
-----	----	---

3. Interview with Owner Representative

Name of Owner's Representative interviewed: _____

Note: anything unusual noted during the period, any special care needed, observations during storms, was any repair conducted, etc.: _____

4. Maintenance/Repair Actions to be Taken

Yes	No	Were changes in the Protective Cover noted during the inspection that require actions to be taken to maintain and/or repair the Cover? If yes, describe: _____
-----	----	--

5. Other Comments:

**HALEY &
ALDRICH**

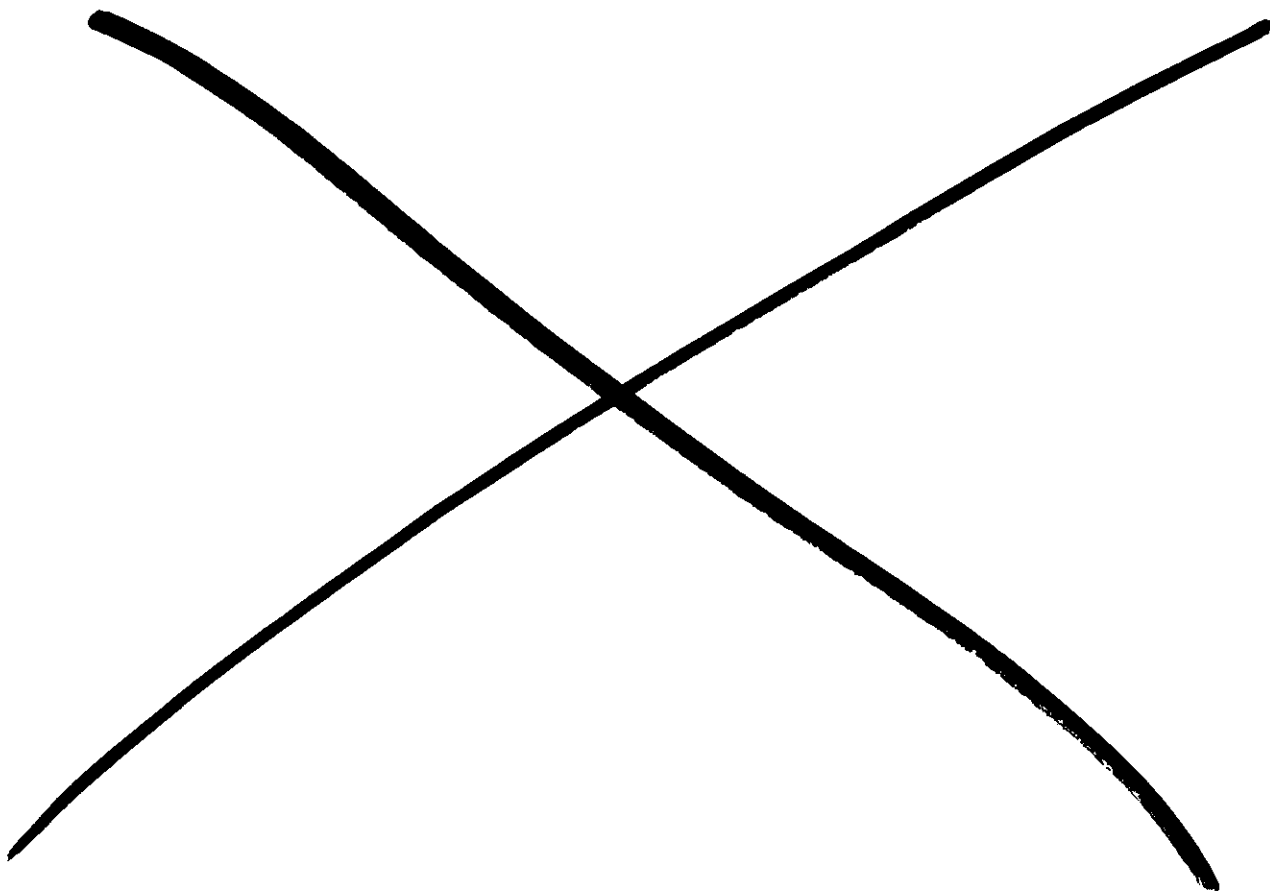
PROTECTIVE COVER MONITORING PLAN INSPECTION REPORT

Project	W.R. Grace & Co.	Report No.	00
Location	62 Whittemore Avenue, One Alewife Center, 134 Alewife Brook Parkway	Date	
Address	Cambridge, Massachusetts	Page	6 of 6
Client	W.R. Grace & Co.	File No.	10063-066
Weather		Temperature	___°
Field Rep.			

- ATTACHMENTS:**
- Figure 1: PCMP - Site Orthophoto
 - (Check off attachments) Photographs (List and note photo location/orientation on figure)
 - _____
 - _____

APPENDIX E

Documentation Log of Protective Cover Maintenance Activities



PROTECTIVE COVER MONITORING PLAN MAINTENANCE LOG

Project	W.R. Grace & Co.	Report No.	00
Location	62 Whittemore Avenue & One Alewife Center	Page	1 of 1
Address	Cambridge, Massachusetts	File No.	10063-066
Client	W.R. Grace & Co.		

1. Maintenance Repair Actions Needed

Description of area that was identified during inspection that requires repair: _____

Inspection Report No: _____ Date of Inspection: _____

2. Actions Taken to Complete Maintenance/Repair

Description of action taken (describe and attach sketch plan of area): _____

Date(s) of Work: _____ Field Representative: _____

Contractor(s) (if used): _____

3. Inspection of Maintenance/Repairs

LSP Name: _____ Date of LSP Inspection: _____

Yes	No
-----	----

Have repair actions restored conditions of Protective Cover?

Comments: _____

ATTACHMENTS: Figure 1: Sketch of Area of Repairs

(Check off attachments) Photographs (List and note photo location/orientation on figure)



Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC113A

ACTIVITY & USE LIMITATION (AUL) OPINION FORM

Pursuant to 310 CMR 40.1056 & 40.1070 - 40.1084 (Subpart J)

Release Tracking Number

3 - 277

A. DISPOSAL SITE LOCATION:

1. Disposal Site Name: W.R. Grace & Co.-Conn.

2. Street Address: 62 Whittemore Avenue

3. City/Town: Cambridge

4. ZIP Code: 02140-1623

B. THIS FORM IS BEING USED TO: (check one)

1. Provide the LSP Opinion for a **Notice of Activity and Use Limitation**, pursuant to 310 CMR 40.1074.
2. Provide the LSP Opinion for an **Evaluation of Changes in Land Uses/Activities and/or Site Conditions after a Response Action Outcome Statement**, pursuant to 310 CMR 40.1080. Include BWSC113A as an attachment to BWSC113. Section A and C do not need to be completed.
3. Provide the LSP Opinion for an **Amended Notice of Activity and Use Limitation**, pursuant to 310 CMR 40.1081(4).
4. Provide the LSP Opinion for a **Partial Termination of a Notice of Activity and Use Limitation**, pursuant to 310 CMR 40.1083(3).
5. Provide the LSP Opinion for a **Termination of a Notice of Activity and Use Limitation**, pursuant to 310 CMR 40.1083(1)(d).
6. Provide the LSP Opinion for a **Grant of Environmental Restriction**, pursuant to 310 CMR 40.1071.
7. Provide the LSP Opinion for an **Amendment of a Grant of Environmental Restriction**, pursuant to 310 CMR 40.1081(3).
8. Provide the LSP Opinion for a **Partial Release of a Grant of Environmental Restriction**, pursuant to 310 CMR 40.1083(2).
9. Provide the LSP Opinion for a **Release of a Grant of Environmental Restriction**, pursuant to 310 CMR 40.1083(1)(c).
10. Provide the LSP Opinion for a **Confirmatory Activity and Use Limitation**, pursuant to 310 CMR 40.1085(4).

(Unless otherwise noted above, all sections of this form (BWSC113A) must be completely filled out, printed, stamped, signed with black ink and attached as an exhibit to the AUL Document to be recorded and/or registered with the Registry of Deeds and/or Land Registration Office.)

C. AUL INFORMATION:

1. Is the address of the property subject to AUL different from the disposal site address listed above?

a. No b. Yes If yes, then fill out address section below.

2. Street Address: _____

3. City/Town: _____

4. ZIP Code: _____

APPENDIX C

Asbestos Soil Management Plan **for the Excavation of Soil and Hazardous Materials**



300 Wildwood Avenue • Woburn, Massachusetts 01801
Tel 781.933.2555 • Fax 781.932.9402 • email: mail@covinoinc.com

ASBESTOS SOIL MANAGEMENT PLAN
For the
EXCAVATION OF SOIL AND HAZARDOUS MATERIALS
SEPARATION OF COMBINED SEWER OVERFLOW
W.R.GRACE & CO.-CONN
62 WHITTEMORE AVENUE
CAMBRIDGE, MASSACHUSETTS

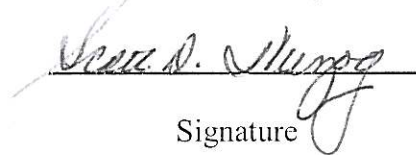
Prepared for

ENVIRONMENTAL MANAGEMENT PROFESSIONALS
94 SAWYER LANE
MARSHFIELD, MASSACHUSETTS 02050

Prepared by:

SCOTT D. HERZOG, CIH
COVINO ENVIRONMENTAL ASSOCIATES, INC.
CERTIFIED INDUSTRIAL HYGIENIST

Certificates #1685, 2104


Signature

Timothy A. Toomey LSP, CGP

License # 2891


Signature

Covino Project Number 10.01508

March 7, 2011

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Attachment 1 Work Area Project Drawings

SECTION 1 - INTRODUCTION

1.1 Introduction

The purpose of this site-specific Asbestos Soil Management Plan is to describe the procedures and protocols necessary for protecting site workers and the general public from hazards associated with fugitive dust and the excavation, handling, storage, transportation and disposal of soils potentially containing asbestos fibers and other hazardous materials which may be encountered during separation of an existing combined storm water/sanitary sewer manhole behind Building 23 of the W.R. Grace & Co.-CONN (W.R. Grace) facility, located at 62 Whittemore Avenue, Cambridge, Massachusetts. See Attachment 1: *Work Area Project Drawing*. The construction activity on the W.R. Grace property is being performed as a part of the City of Cambridge DPW CAM 400 Sewer Separation/Alewife Floatables Control Project, a larger upgrade of the entire sewer system that serves the Alewife area, to reduce the potential for sewer backup during periods of heavy, rain and discharge of combined sewer overflows (CSO) to the Alewife Brook. The General Contractor for the project is P. Gioioso & Sons, Inc. (PGS). Environmental Management Professionals, Inc. (EMP) is the environmental consultant for the project.

1.11 Definitions

Adequately Wet – Sufficiently mixed or penetrated with water to completely prevent the release of particulate material into the ambient air.

Asbestos fiber-contaminated soil - Soil that has been shown by certified laboratory analysis to contain at least 1% asbestos fibers using the “Protocol for Screening Sediment and Soil Samples for Asbestos”. This includes all soil within thirty-five (35) feet of a sampling location where asbestos fibers are identified.

Soil-Disturbing Activity – Excavation, grading, tilling or any other activity that may cause the release of fugitive dust.

Activity & Use Limitation (AUL) – The purpose of an AUL is to narrow the scope of exposure assumptions used to characterize risk to human health from a release pursuant to 310 CMR 40.0900 by specifying activities and uses that will be prohibited and allowed at the disposal site in the future.

1.2 General Project Information

This Soil Management Plan has been prepared in accordance with Section 02082 of the CAM 400 Project Specifications, the Obligations and Conditions stipulated in the existing Activity and Use Limitation (AUL) Opinion under RTN 3-0277 including the associated Public Involvement Plan (PIP) dated July 2006, the City of Cambridge Asbestos Protection Ordinance Chapter 8.61, and the applicable state and federal regulations.

The work area associated with this document is located within, and limited, to an existing 15-foot wide easement held by the City of Cambridge on land that is owned by WR Grace & Co.-CONN. Although all soil intrusive work will take place within the easement, other activities that are not subject to the above mentioned ordinance and environmental restrictions including: staging, storage of construction related materials as well as site access, will require the utilization of the land abutting the easement which is owned and controlled by W.R. Grace.

The site activities covered under this plan include site mobilization, the construction of a tented and vented enclosure, removal and replacement of existing asphalt, excavation of soil to accommodate a new drain manhole, the replacement of an existing combined sewer manhole, installation of new sewer and drain line segments, installation of a new sewer invert, soil characterization sampling and testing, reuse and/or disposal of soil, backfilling and compaction.

The designated areas of the project have been identified as W.R. Grace & Co. - Conn Sites #1 and #2 as shown on Figures 1 and 2. At W.R. Grace & Co. - Conn Site # 1, the work includes the

CIPP (invert) lining of the existing 18 inch x 26 inch drain pipe for a distance of approximately 150 linear feet. The CIPP work does not require any excavation; however, there is also a common manhole removal, which includes excavation to install a new drain manhole and 40 linear feet of 24-inch PVC drain pipe and a 12-inch drain connection to existing Grace lines. Due to the sequencing of the work, which includes daily excavation and backfill of completed portions of the utility installation, it is anticipated that no more than ten to fifteen feet of trench will be open at any given time.

At W.R. Grace & Co. - Conn Site # 2, there is an existing combined sewer/drain vault and sewer/drain separation will be performed by making modifications inside the existing vault. As part of this task the concrete bottom of the vault will be saw-cut to create a 2.5' long by 2' wide trench. This will be hand excavated to approximately 20-inches deep to allow for installation of a short section of new piping. The trench will be filled with concrete after pipe installation. Access to the vault will be through the existing top slab and following the flow modifications, a new cast-in-place wall and top slab with new manhole covers will be constructed. For Site 2, a tented, vented enclosure maintained under a pressure differential will be installed within or over the vault (the dimensions of which are 15.5' x 7') for the period the trench is being dug and until it is filled with concrete.

All hand tools utilized within the enclosure shall remain in the enclosure for the duration of intrusive work. At the end of each work day, hand tools shall be brush cleaned to remove visible dirt and debris. Brushed soils shall be directed onto the soil stockpile(s).

Unless some unknown condition is encountered during construction PGS estimates that the work in Sites 1 & 2 covered under this plan will be completed in 5-7 days.

As previously stated, the work area associated with activities covered by this plan is located behind Building 23 at 62 Whittemore Avenue, Cambridge, Massachusetts. The W.R. Grace property is bound by Whittemore Avenue to the north, to the west by Alewife Parkway (MA

Route 3A), to the south by Russell Field and Harvey Street, and to the east by Magoun Street. The site has been occupied by W.R. Grace for many years.

1.3 Hazardous Materials Health & Safety Plan

A Hazardous Materials Health & Safety Plan (HMH&SP) has been prepared for this project. This plan will be available for public review and comment prior to commencement of activities that involve the removal or disturbance of the Protective Cover and /or activities that are likely to disturb the soil below the Protective Cover. All persons entering the site shall be familiar with the Plan and acknowledge that they have had an opportunity to review the Plan. This Plan includes the establishment of work zones, preparation of a decontamination area, training, use of personal protective equipment and respiratory protection and monitoring to be performed to assure the safety of site personnel, visitors to the property and the general public.

1.4 City of Cambridge Asbestos Protection Ordinance Chapter 8.61

Any property found by the Commissioner to contain asbestos-contaminated soil or documented to the Commissioner's satisfaction to have been the site of past on-site handling, disposal, manufacturing or processing of asbestos shall be subject to the provisions of the Ordinance. City of Cambridge Asbestos Protection Ordinance (CAO) addresses soil intrusive activities that have the potential to release particulate matter into ambient air. The ordinance covers excavation, grading, tilling or any other such activity that may cause the release of fugitive dust. The ordinance is implemented under the direction of the City of Cambridge Commissioner of Health and requires particulate dust mitigation and assurance measures.

1.5 Activity & Use Limitations (AUL)

In accordance with the requirements of 310 CMR 40.1074, an AUL has been developed and placed on the disposal site located at 62 Whittemore Avenue in Cambridge, MA. The AUL was submitted in support of a Class A-3 Response Action Outcome (RAO) under Release Tracking Number 3-0277 to address the Oil and Hazardous Materials (OHM) on the site.

The AUL contains specific "Obligations and Conditions" to prepare plans to notify and protect construction workers, W.R. Grace employees and the general public in the event that intrusive

activities into subsurface soil occurs on the property. The plans will require that any such activity will be carried out in a manner that prevents the liberation of asbestos fibers and/or dust into the ambient air in excess of the applicable standards and prevents any potential odors from creating a nuisance condition.

Although there is no specific information confirming the presence of asbestos fibers in soil within the easement, the utility work behind Building 23 is being conducted in a manner consistent with the requirements of the AUL and CAO. This soil management plan complies with the requirements of the CAO and AUL for dust mitigation, air monitoring, and contingency planning.

Precautions to be implemented during utility installation covered under this plan include but are not limited to the following:

- Construction of a 30ft x 50ft enclosure prior to soil excavation in Site 1 and an appropriately sized enclosure in Site 2;
- Venting of enclosures with HEPA filter controls;
- Dust control and air monitoring within the enclosures;
- Dust control and perimeter air monitoring;
- Contingency plans for work stoppage based on review of air monitoring data;
- Misting/Adequately wetting of site soils;
- Placement of excess soil into lined and covered roll-off containers prior to removal from the structure(s);
- Removal of covered roll-off containers within 48 hours of date of generation; and
- Backfilling trench with site soil and placement of six inches of imported clean fill and asphalt pavement for final cover in Site 1 and backfilling of the trench with concrete in Site 2.

1.6 Release Abatement Measure (RAM) Plan

Prior to the start of work, and in accordance with the requirements of the Massachusetts Contingency Plan (MCP), 310 CMR 40.0000, the City of Cambridge will prepare and submit to the Massachusetts Department of Environmental Protection (MassDEP) a RAM Plan detailing the work to be conducted. The RAM Plan shall incorporate the requirements of and include as appendices this Asbestos Soil Management Plan and the site-specific Hazardous Materials Health and Safety Plan (HMH&SP).

SECTION 2: SOIL CHARACTERIZATION

2.1 Background

The Contractor's Environmental Professional shall characterize all excavated soil and fill material prior to disposal. The characterization requirements may vary depending on the site selected to receive soil for disposal. At this time it is anticipated that all excess soil generated from work activities covered by this plan will be transported in sealed roll-off containers and disposed of at the Waste Management, Inc. (WMI) Turnkey Landfill located in Rochester, New Hampshire. Because the soil will be excavated from an industrial/urban setting, WMI operating permit requires that the soil be analyzed for urban fill characteristics including total petroleum hydrocarbons, PCB's, volatile organic compounds, semi-volatile organic compounds, 8 RCRA metals, Ph, flashpoint, reactivity and corrosivity. Due to an agreement between PGS, the City and W.R. Grace that the soil will be assumed to contain asbestos fibers, WMI will not require any additional site specific sampling and analysis of the excess soil for its asbestos fiber concentration.

2.2 Soil Management Practices

The Contractor shall implement, maintain, supervise and be responsible for all soil management practices during the course of the work covered under this plan. The Contractor's Environmental Professional shall be present during all field screening, segregating, handling and characterization of excess soil excavated from the easement.

The soil management practices for this site include:

- The construction of a secure enclosure appropriately sized and maintained without impeding construction related activities;
- Misting/wetting down soil as it is removed to prevent release of particulates into the air. An adequate number of misting nozzles shall be used as necessary to ensure continuous wetting of the soil;
- Supervising decontamination procedures;

- Ensuring that soil that cannot be reused on site shall be loaded directly into containers sealed, placarded as ACM and removed for off-site disposal within 48 hours of generation;
- Implementing an air-monitoring program to monitor airborne particulate and fibers in the enclosures and within a 50' perimeter from each enclosure ; and
- Provide an LSP Opinion that a final cover consisting of a six-inch clean fill layer and asphalt has been applied to disturbed areas within the easement in order to maintain a condition of No Significant Risk in accordance with the existing AUL.

SECTION 3: ASBESTOS SOIL MANAGEMENT PLAN

In accordance with CAO and AUL, an Asbestos Soil Management Plan must be prepared and implemented to prevent fugitive dust, which may contain asbestos fibers, from being generated and/or escaping during any soil soil-disturbing activity on the W.R. Grace & Co.-CONN property.

3.1 Enclosure for Soil Excavation

An excavator and critical construction materials will be staged in the exclusion zone on the easement prior to the commencement of work and an enclosure constructed around them.

The airtight enclosure will be constructed in a way that covers the entire perimeter of the excavation. The enclosure will be constructed of heavy-duty plastic sheeting supported by rigid scaffolding or other framing. The enclosure will be designed to be weather-resistant and will use one or more layers of 6-mil flame and smoke resistant sheeting. The dimensions of the enclosure will be 30 feet in width, 20 feet in height and 50 feet in length. The enclosure will be designed to permit entry of personnel and equipment.

Weather forecasts shall be monitored during the construction period. In the event of high wind or storm warnings, the Contactor shall evaluate the need to cease work for the duration of that event(s).

A three-chamber decontamination (DECON) area will be constructed at one end of the enclosure to permit employees to enter/exit the enclosure and to provide tools and supplies. All employees entering the enclosure shall pass through the DECON station as discussed in the HMM&SP. A personnel login board will be maintained at the front of the enclosure. All personnel shall sign in on the log prior to entering the enclosure. The enclosure for Site 2 will have one entry point as heavy equipment will not be required for the excavation within the vault.

An additional DECON area will be constructed at the opposite end of the enclosure for Site 1 to allow for the delivery of construction materials such as precast manholes, drain and sewer pipe as well for the delivery and removal of secured roll-off containers for excess soil disposal. Portable equipment will be brought in through the DECON for use within the enclosure and then decontaminated prior to leaving the enclosure. All roll-off containers used for transportation of surplus soils shall be sealed and exterior surfaces decontaminated prior to their exiting the enclosure. Decontamination procedures are set forth in the HMM&SP.

Worker entrance to the enclosure will be secured using a lockable solid wood or plywood door. The enclosure shall be adequately secured when personnel are not working in the enclosure.

Emergency exits shall be planned in the event that the main entrance becomes blocked by fire or smoke. The emergency exits shall be clearly marked. A utility knife will be stored at each emergency exit in the event evacuation is required.

3.2 Venting of Enclosures

The enclosures will be maintained under a pressure differential and vented using a minimum of two 2,000 cubic feet per minute air filtration devices with HEPA filters. This will provide approximately 8 air changes per hour within the enclosure. The air filtration devices will be cleaned and have new HEPA filters installed and sealed before arrival at the site. The air filtration devices will be sealed to the enclosure and will vent air outside the enclosure. Additional air filtration devices will be installed based on the results of air testing inside the enclosure, as well as visual indicators (smoke and odor).

A manometer will be installed at each entrance to the enclosure to insure the pressure differential between the inside of the enclosure and the outside is maintained. The goal will be to maintain a pressure differential of 0.02 inches water gauge at all times when personnel are working in the enclosure. The pressure differential of 0.02 inches was chosen as it is the industry standard for such enclosures.

During non-working hours, the enclosure shall be sealed. Areas of open trench and exposed soils within the closure shall be securely covered..

3.3 Security

The enclosure will be locked and secured at the end of the workday. The site is on the W.R. Grace property and facility security will periodically conduct their rounds to make certain the work site is secure.

3.4 Dust Control

Water will be used inside the enclosure to keep down the release of particulate. A fire hose and fogging nozzle will be located inside the enclosure. Water will be applied as needed to prevent visible dust generation within the enclosure. Water will be further used to ensure soils are adequately wet before being loaded into roll-off containers. The roll-off container liners shall be draped over the sides to each container to minimize the potential for soils to come into contact with the outsides of the container.

Vehicle wheels shall be inspected for visible soil; wheels shall be decontaminated as necessary using high pressure water and/or brushes prior to exiting the enclosure.

If needed, a dedicated water truck will be used to wet down surfaces outside the enclosure for general dust control. The truck will also wet down active roadways outside the enclosure as needed.

Any soil stockpiled within the enclosure at the end of a work day shall be covered with poly sheeting. Any open trench(es) within the enclosure shall be covered at the end of each working day.

If soil is stockpiled directly on unpaved surfaces, soil below the stockpile shall be excavated to a depth of six inches (6") below the pre-existing surface and replaced with clean soil.

All roll-off containers used for transport of surplus soil shall be lined with two, 10-mil liners prior to loading. The liners shall be prefabricated with chemically-bonded or heat-welded seams and shall be sized to fit the cargo area of the container being used. After the asbestos-fiber containing soils are loaded into a lined transport vehicle but prior to the vehicle leaving the enclosure, the liners shall be sealed over the loads using spray glue/duct tape.

3.5 Dust and Asbestos Monitoring

Monitoring will be performed in and around the perimeter of the enclosure and in an area fifty feet outward from the enclosure. Baseline measurements will be collected for PM-10 particulate and asbestos fibers prior to the start of soil intrusive activities.

3.5.1 Dust Monitoring

Dust monitoring will be performed hourly when soil intrusive activities are underway in the enclosure using a TSI Dust-Trak respirable particulate monitor or equivalent. Measurements will also be collected upwind, downwind and crosswind of the enclosure. In the event two consecutive hourly readings for respirable particulate at the perimeter of the enclosure exceed 75 micrograms per cubic meter of air ($75 \mu\text{g}/\text{m}^3$) a dust suppression program will be implemented as discussed in the HMM&SP. In the event any two hourly readings in a twenty-four hour period for respirable particulate exceed $150 \mu\text{g}/\text{m}^3$ (National Ambient Air Quality standard) shall result in a temporary stoppage of work and a review of the dust control practices.

3.5.2 Asbestos Monitoring

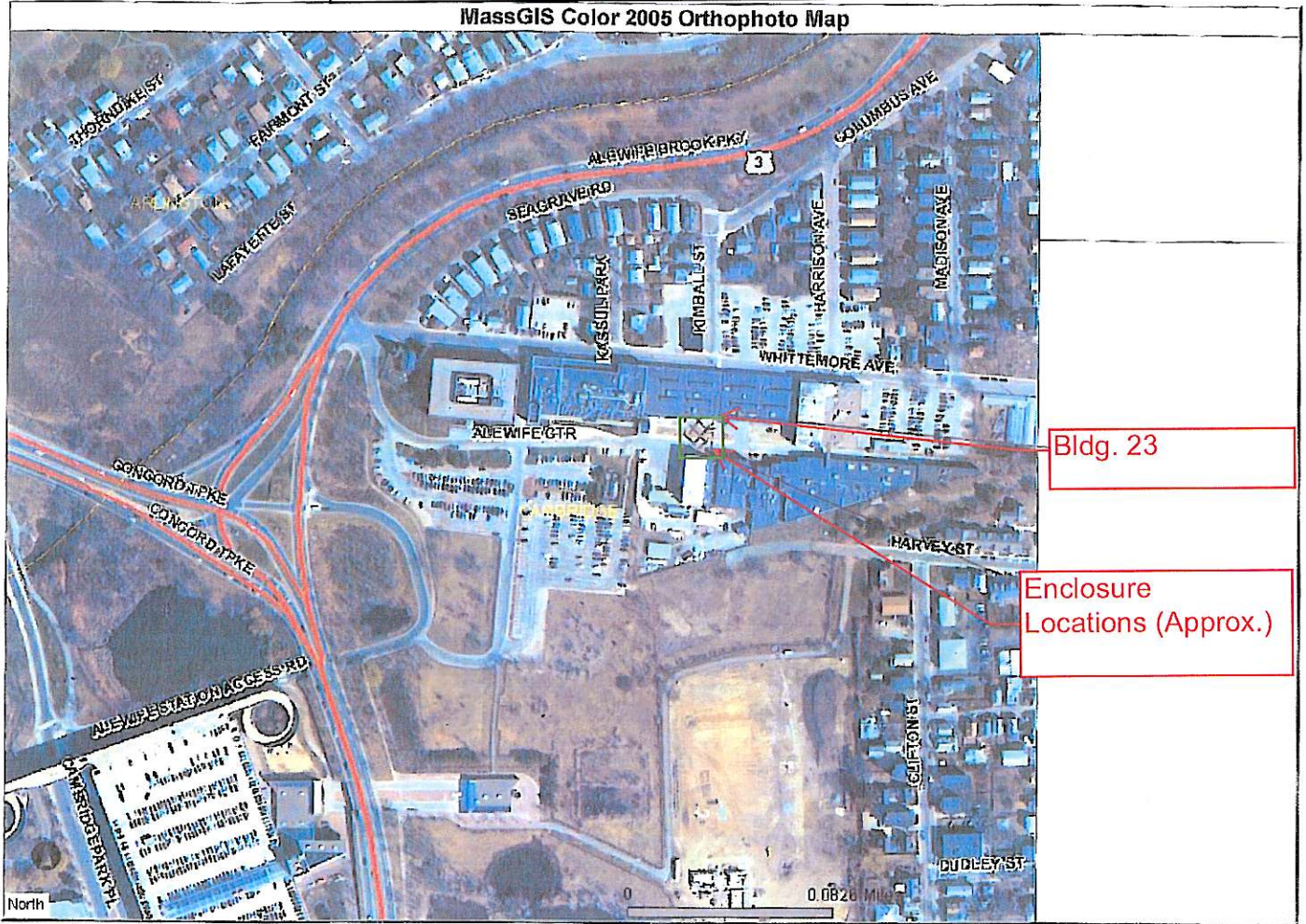
Continuous monitoring will be performed in and around the perimeter of the enclosure on open sides (not on the building side) within 50 feet of the enclosure. The samples will be collected in accordance with NIOSH Method 7400 using 0.8 micron MCE filters. The samples will be collected open-face at breathing zone height for a minimum of two hours.

The samples will be analyzed on site by an inspector licensed by DOS in the Commonwealth of Massachusetts. The analyst shall be a successful participant in the Asbestos Analyst Registry (AAR). The samples will be analyzed using phase contrast microscopy using standard counting rules.

In the event two consecutive samples within a twenty-four hour period exceed 0.01 f/cc, site activities will temporarily stop and the dust control program reviewed. Work may recommence when containment measures deemed sufficient by the Commissioner to prevent further exceedances have been implemented.

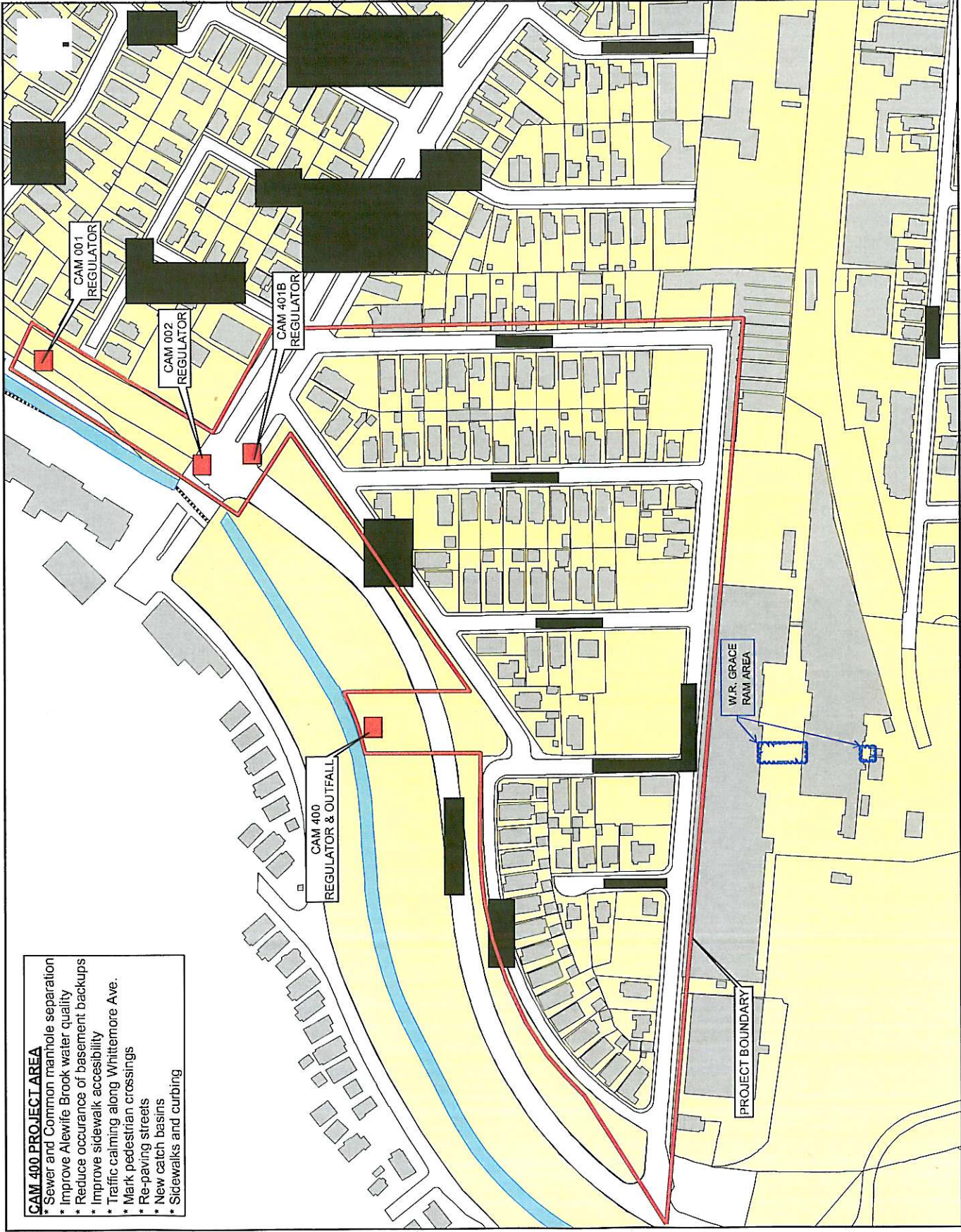
Figure 1
Site Location

MassGIS Color 2005 Orthophoto Map



Bldg. 23

Enclosure
Locations (Approx.)



- CAM 400 PROJECT AREA**
- * Sewer and Common manhole separation
 - * Improve Alewife Brook water quality
 - * Reduce occurrence of basement backups
 - * Improve sidewalk accessibility
 - * Traffic calming along Whittemore Ave.
 - * Mark pedestrian crossings
 - * Re-paving streets
 - * New catch basins
 - * Sidewalks and curbing



S E A
S.E.A. CONSULTING, INC.
Sewer & Stormwater Services

CAM 400 SEWER SEPARATION/ FLOATABLES CONTROL PROJECT AREA
CITY OF CAMBRIDGE, MA





300 Wildwood Avenue
Woburn, MA 01801
Tel: 781.933.2555
Fax 781.932.9402
email: mail@covoinc.com

Covino Project 10.01508

Client:
Environmental Management
Professionals
94 Sawyer Lane
Marsfield, Massachusetts

Site:
Building 23
WR Grace & Co.
Cambridge, Massachusetts

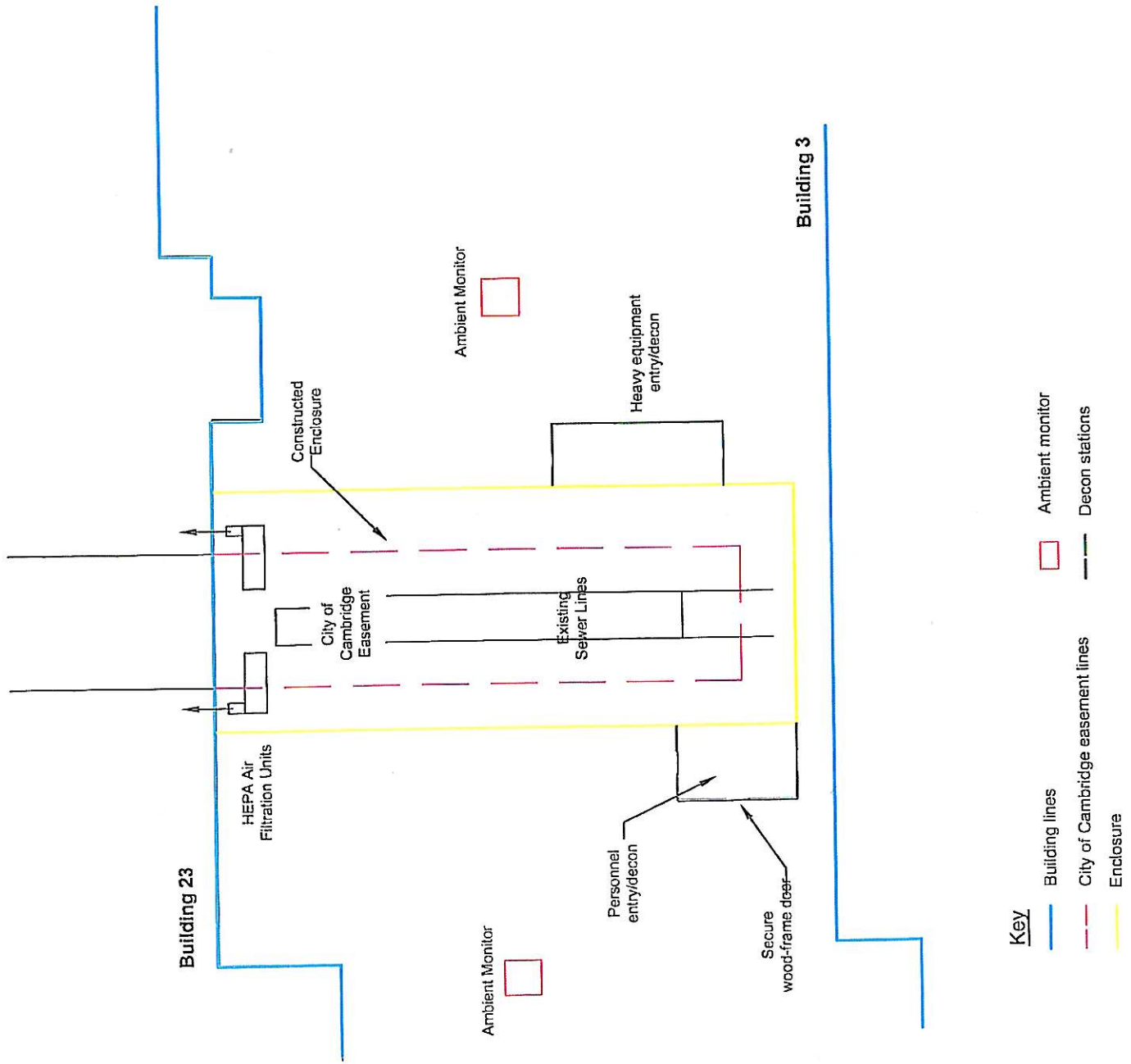
Sewer Separation

January 6, 2010

Sketch 1

NOT TO SCALE

Date: 01.07.11 Edited by: ALM



Building 3



300 Wildwood Avenue
Woburn, MA 01801
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email: mail@covinoinc.com

Covino Project 10.01508

Client:
Environmental Management
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94 Sawyer Lane
Marshfield, Massachusetts

Site:
Building 3
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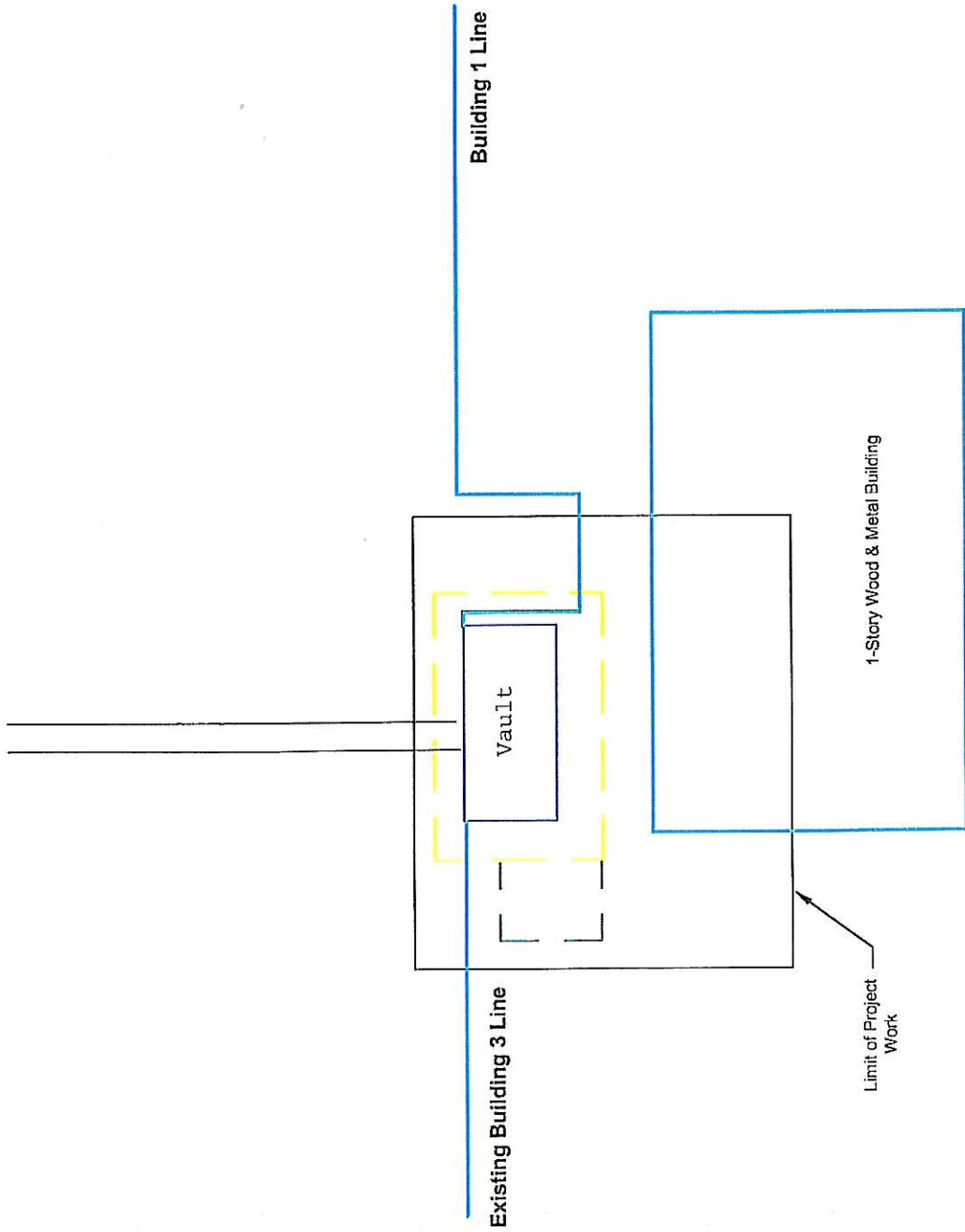
Sewer Separation

January 6, 2010

Figure 2

NOT TO SCALE

Date: 01.07.11 Edited by: ALM



- Key**
- Building lines
 - Pit
 - Enclosure
 - Decon stations

APPENDIX B

Hazardous Materials Health & Safety Plan for the Excavation of Soil and Hazardous Materials



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HAZARDOUS MATERIALS HEALTH AND SAFETY PLAN
for the
EXCAVATION OF SOIL AND HAZARDOUS MATERIALS
SEPARATION OF COMBINED SEWER OVERFLOW
W.R.GRACE & CO. - CONN
62 WHITTEMORE AVENUE
CAMBRIDGE, MASSACHUSETTS

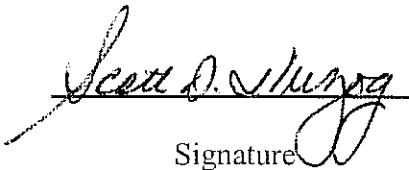
Prepared for

ENVIRONMENTAL MANAGEMENT PROFESSIONALS
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Prepared by:

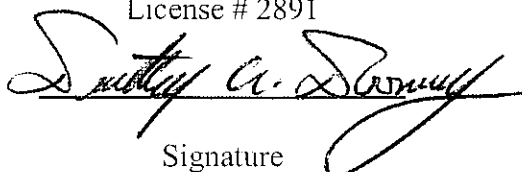
SCOTT D. HERZOG, CIH
COVINO ENVIRONMENTAL ASSOCIATES, INC.
CERTIFIED INDUSTRIAL HYGIENIST

Certificates #1685, 2104


Signature

Timothy A. Toomey LSP, CGP

License # 2891


Signature

Covino Project Number 10.01508

March 7, 2011

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SECTION 1 - INTRODUCTION

1.1 Introduction

The purpose of this site-specific Hazardous Materials Health and Safety Plan (HMH&SP) is to establish in detail the procedures and protocols necessary for protecting site workers, on-site personnel, visitors and the general public from hazards associated with site activities during the excavation of soils and hazardous materials and site preparation for separation of an existing combined storm water/sanitary sewer manhole. The project is being performed as a part of CAM 400 Sewer Separation/Alewife Floatables Control Project, a larger upgrade of the entire sewer system that serves the Alewife area, to reduce the potential for sewer backup during periods of heavy rain, and discharge of combined sewer overflows (CSO) to the Alewife Brook. The site of this phase of the project is behind Building 23 of W.R. Grace & Co - Conn, located at 62 Whittemore Avenue, Cambridge, Massachusetts. The project lines for the overall CAM 400 project are bounded by Whittemore Avenue to the south, to the west and north by Alewife Parkway (MA Route 3A) and to the east by Magoun Street. The excavation portion of the project will be performed behind Building 23. The project lines for the excavation are bounded by W.R. Grace & Co. - Conn buildings on the north, east and south sides and a paved roadway and parking for Alewife Center on the west side. The location of Building 23 is shown on the MassGIS Color Orthophotomap in the appendices.

The General Contractor for the project is P. Gioioso & Sons. Environmental Management Professionals is the construction manager for the project. The Licensed Site Professional (LSP) for the Contractor is Tim Toomey of Subsurface Remediation Technologies, Rowley, MA. The LSP for the City of Cambridge is Richard K. Quateman of Kleinfelder ▪ S E A, Cambridge, MA. The LSPs will be responsible for protecting public health, safety and the environment by ensuring that the Contractor's work complies with the requirements of the Site Response Action Outcome (RAO) and Activity and Use Limitation. The LSPs will also be required to report releases of oil or hazardous materials (OHM), or other unanticipated conditions encountered during the work. The LSPs will also assist in managing surplus materials that require off-site transport and disposal.

The project entails excavation to install one drain manhole, replace an existing combined sewer manhole, and install approximately 40' of new sewer and drain line segments. The process also includes the installation of a CIPP sewer invert liner for a section of the line going out to the manhole. The excavation portion of this project is located within an existing 15-foot wide easement that is owned by the City of Cambridge on W.R. Grace & Co. - Conn property. The soil intrusive work will take place within the boundaries of the easement, although staging, storage and site access will require that activities be performed –outside of the easement. The existing site is a partially paved portion of the property directly behind Building 23. Emergency access to the site will be through the roadway behind Building 23.

The site activities covered under this HMM&SP include site mobilization/demobilization, excavation of asphalt, excavation of soil, digging one sewer manhole, replacing a second sewer manhole, installation of a sewer invert, on-site stockpiling, and soil testing and disposal.

The work is performed in accordance with the requirements of the Activity and Use Limitation (AUL), the requirements of the Massachusetts Contingency Plan (MCP) and the City of Cambridge Asbestos Ordinance. The plan will be submitted for review under the W.R. Grace & Co. - Conn Public Involvement Plan (PIP). The work is performed under Massachusetts DEP Release Tracking Numbers 3-0000277, 3-0017014 and 3-26100. The project is located at 62 Whittemore Avenue, Cambridge, Massachusetts. See Figure 1.

The designated areas of the project have been identified as W.R. Grace & Co. - Conn Sites #1 and #2 as shown on Figures 2 and 3. At W.R. Grace & Co. - Conn Site # 1, the work includes the CIPP (invert) lining of the existing 18 inch x 26 inch drain pipe for a distance of approximately 150 linear feet. The CIPP work does not require any excavation; however, there is also a common manhole removal, which includes excavation to install a new drain manhole and 40 linear feet of 24-inch PVC drain pipe and a 12-inch drain connection to existing Grace lines. At W.R. Grace & Co. - Conn Site # 2, there is an existing combined sewer/drain vault and sewer/drain separation will be performed by making modifications inside the existing vault. As part of this task the

concrete bottom of the vault will be saw-cut to create a 2.5' long by 2' wide trench. This will be hand excavated to approximately 20-inches deep to allow for installation of a short section of new piping. The trench will be filled with concrete after pipe installation. Access to the vault will be through the existing top slab and following the flow modifications, a new cast-in-place wall and top slab with new manhole covers will be constructed.

All work on Site 1 and the trench excavation within the vault in Site 2 will be completed as a Release Abatement Measure (RAM) in accordance with the Massachusetts Contingency Plan (MCP) and must also meet the requirements of the City of Cambridge Asbestos Protection Ordinance and the Activity and Use Limitations (AUL) which have been recorded on the property (RTN 3-0277). All soil excavation activities, including placement of stone and pipe, will therefore be performed within a tented, vented enclosure maintained under a pressure differential. The dimensions of the enclosure for Site 1 are approximately 40 feet wide by 20 feet high by 50 feet in length. The Contractor anticipates that no more than 10 to 12 linear feet of the excavation will be open at any one time. The excavation will be covered as the work progresses through the length of the enclosure. For Site 2, a tented, vented enclosure maintained under a pressure differential will be installed within or over the vault (the dimensions of which are 15.5' x 7') for the period the trench is being dug and until it is filled with concrete. Site activities for other portions of the project do not involve soil excavation and are not subject to City of Cambridge Asbestos Protection Ordinance or the AUL for the property.

The site activities covered under this HMM&SP include site mobilization/demobilization, excavation of asphalt, excavation of soil, digging one sewer manhole, replacing a second sewer manhole, installation of new sewer and drain lines, installation of the 2.5' pipe section within an existing sewer/drain vault, on-site stockpiling, soil testing, and disposal of soil.

There has been extensive site history and site characterization data on the W.R. Grace & Co. - Conn site as well as adjacent sites presented and used in the preparation of this HMM&SP. A review of environmental issues associates with the CAM 400 site was prepared by SEA

Consultants, dated October 20, 2009 on behalf of the City of Cambridge. Under RTN 3-0277, a Class A-3 Response Action Outcome (RAO) was filed by W.R. Grace on March 13, 2006 to address a release of VOC's and oil and asbestos fibers in soil. Since VOC, oil, and asbestos fibers in soil may be encountered during the work the following requirements govern the work being performed:

Cambridge Asbestos Protection Ordinance requires dust mitigation measures, an asbestos soil management plan and a contingency plan based on dust and asbestos air sampling measurements. The plan is made available for public review and comment for 20 days.

Activity and Use Limitation requires:

- 1) Soil Management Plan prepared by a LSP to cover excavation, handling, storage, transport, disposal, engineering controls and air monitoring for asbestos fibers in soil and VOCs, for work activities that are likely to disturb the soil below the Protective Cover.
- 2) Health & Safety Plan prepared by LSP and a Certified Industrial Hygienist (CIH) for activities that are likely to remove or disturb the Protective Cover and/or disturb the soil below the Protective Cover, and to control future exposures to groundwater as applicable.
- 3) Airborne Asbestos Dust and Odor Management plan prepared by CIH and LSP and includes:
 - a. methods to prevent liberation of asbestos fibers and dust and to prevent any potential odors from creating a nuisance condition;
 - b. utilize wetting and handling techniques to minimize dust generation;
 - c. use excavation techniques and odor suppressants to mitigate odors; and
 - d. monitoring for dust, asbestos fibers, and odors in the air with provisions to stop work if levels exceed applicable standards/limits.
- 4) The above mentioned plans are to be submitted for public review in accordance with the W.R. Grace & Co. - Conn Public Involvement Plan (PIP) which has a public review period of 30 days.

This Site-Specific Hazardous Materials Health and Safety Plan has been prepared in accordance with the OSHA Hazardous Waste and Emergency Response (HAZWOPER) rule as well as City of Cambridge Project Specifications Section 02082 and City of Cambridge Asbestos Protection Ordinance Chapter 8.61, the AUL recorded for the property, and state and federal regulations on handling of oils and hazardous materials. This version of the HMH&SP is submitted for review as a public comment review draft as required by AUL following the Public Involvement Plan (PIP) for the W.R. Grace site. This HMH&SP addresses all required air monitoring for intrusive activities required by the AUL and CAO. The Soil Management Plan required by the AUL and CAO is also being provided for public comment under separate cover.

Site characterization has been performed on W.R. Grace & Co.- Conn property. Based on the overall property assessment which is summarized in the appendices to the AUL, it is anticipated that the potential exists to encounter asbestos fibers as well as oils and hazardous materials (OHM) typical of developed industrial sites. Previously, a test boring program had been performed under the direction of SEA on rights-of-way of public roadways that were in proximity to the W.R. Grace & Co. - Conn site. Eight borings were advanced. Although the data was not from the W.R. Grace & Co - Conn site, Covino reviewed the results to obtain general background information as a part of the development of this HMH&SP, as the data could be predictive of conditions on the W.R. Grace & Co.- Conn site and is used for reference purposes only. The advancement of the borings was used to determine the extent of fill and the presence of potentially contaminated soils in the work area. SEA reported the presence of metals, semi-volatile organic compounds and petroleum hydrocarbons, but only SVOC's were present at concentrations above RCS-1 limits.

P. Gioioso & Sons is the General Contractor for the project and will hire all of the contractors and subcontractors directly for performance of the work. Each subcontractor and their employees involved with soil intrusive activities is responsible for complying with OSHA regulations and shall provide their own HMH&SP consistent with the plan. It does not address issues associated with general construction safety except to the extent that site workers may be exposed to soil and

groundwater in the course of their work. The scope is limited to the potential for exposure to asbestos fibers as well as oils and hazardous materials as specified in 29 CFR 1910.120 and 29 CFR 1926.65 (Hazardous Waste Operations and Emergency Response). The HMMH&SP shall be implemented during all site activities.

1.2 Statement of Safety and Health Policy

This HMMH&SP is intended to provide site-specific procedures to address known hazardous conditions and potentially hazardous conditions that may be encountered at the site. Site activities in conjunction with this project may pose unique safety, chemical, and/or physical hazards that require specialized expertise to address. The Emergency Response section of the HMMH&SP addresses hazards that have not been identified or anticipated.

This HMMH&SP addresses topics required by OSHA 29 CFR 1910.120(b)(4) and 1926.65(b)(4).

The objectives of this document include but are not limited to:

- Statement of Safety and Health Policy
- Site Description and Contamination Characterization
- Safety and Health Risk Analysis and Activity Hazard Analysis
- Regulations
- Staff Organization/Administration
- Hazard Communication Training
- Medical Surveillance
- Exposure Monitoring
- Health and Safety Equipment
- Standard Operating Procedures
- Identification and evaluation of potential and unanticipated hazards
- Definition of levels of protection required for certain work activities
- Establishment of work zones
- Formation of emergency action plans
- Development of personnel training
- Development of decontamination procedures (personal and equipment)
- Heat and Cold Stress
- Emergency Equipment and First Aid Requirements
- Spills Enclosure Program
- Logs, Reports and Recordkeeping

- Inspections and Audits
- Permit Required Confined Space Entry Program

P. Gioioso & Sons views the HMMH&SP as an important document that is necessary to the success of the site work. Every effort has been made to insure that the HMMH&SP will be in compliance with the requirements of the AUL, the City of Cambridge Asbestos Ordinance and applicable federal, state and local regulations and is consistent with the requirements of the specifications.

The purpose and intent of the HMMH&SP is to protect workers from exposure to oils and hazardous materials and to ensure that the site work is conducted in a safe manner. The on-going program will be directed at recognizing and dealing with the specific hazards at the site as needed to protect employees.

Along with site personnel safety, a second major objective is to perform site operations in such a manner as to minimize the possibility of fire, explosion, or any unplanned or sudden release of hazardous waste contaminants into the environment that could adversely affect local receptors. The HMMH&SP has been developed to meet these essential objectives and ensure the safe execution of this project.

The HMMH&SP is a dynamic document and will be constantly reviewed and modified throughout the duration of the project at the site work, to ensure flexibility and adaptability as changes occur and new situations develop. These changes will be reviewed and/or accepted by the Project Manager and the Certified Industrial Hygienist from Covino Environmental Associates (Covino). Any changes to the plan may necessitate additional training.

Standard Operating Procedures (SOPs) may be attached to this HMMH&SP for preventing accidents and protecting personnel from occupational illness for all operations having significant accident potential. These procedures are required to be read and observed by all workers, on-site personnel and visitors to the site. These SOPs are generic in nature and may be modified to fit the

specific needs of this project. They are included for general reference only and are not a specific requirement of this HMH&SP.

Maintaining effective communication is important to assuring the safe completion of the project. P. Gioioso & Sons will notify the City of Cambridge and if appropriate, W.R. Grace & Co.-Conn orally and in writing as quickly as possible should any unforeseen safety hazard or condition becomes evident during the performance of the work.

1.3 Applicable Regulatory Requirements

The site specific HMH&SP shall be consistent with the requirements of:

1. Occupational Safety and Health Administration (OSHA) Standards and Regulations contained in Title 29, Code of Federal Regulations, Parts 1910 and 1926 (29 CFR 1910 and 1926) including amendments as stated in Federal Register March 6, 1989: 9294-9336 (Final Rule, 29.CFR 1910.120 "Hazardous Waste Operations and Emergency Response").
2. United States Environmental Protection Agency (EPA) Standard Operating Safety Guidelines, Office of Emergency and Remedial Response, Hazardous Response Support Division. Revised November 1984.
3. National Institute of Occupational Safety and Health NIOSH/OSHA/USCG/EPA Occupational Safety and Health Guidance (OSHG) Manual for Hazardous Site Activities, October 1985, Department of Health and Human Services (DHHS), NIOSH Publ. No. 85-115.
4. Massachusetts Department of Environmental Protection Laws, Regulations and Policies:
 - a) WSC-94-400 "Interim Remediation Waste Management Policy for Petroleum Contaminated Soils"
 - b) WSC 00-425 "Construction Activities in Contaminated Areas"
 - c) BWP 94-037 "Reuse and Disposal of Contaminated Soils at Landfills"
 - d) COMM-97-001 "Reuse and Disposal of Contaminated Soil at Massachusetts Landfills"
 - e) WSC-130-91 "Short Term Measures Policy"
 - f) WSC-401-91 "Policy for Investigation, Assessment, and Remediation of Petroleum Releases"
 - g) WSC-89-004 "Minimum Standards for Analytical Data for Remedial Response Actions Under MGL 21(e)"

- h) 310 CMR 30.00 - The Commonwealth of Massachusetts Hazardous Waste Regulations.
 - i) 310 CMR 40.00 - The Commonwealth of Massachusetts Contingency Plan
 - j) 310 CMR 7.15 – Air Quality (Asbestos)
 - k) 453 CMR 6.00 – Training and Certification
5. 454 CMR Commonwealth of Massachusetts Construction Industry Rules and Regulations.
6. OSHA Construction Asbestos Standard 29 CFR 1926.1101
7. Other federal regulations, codified in the Code of Federal Regulations, and consensus standards developed by ANSI and ACGIH are referenced in the HMM&SP. These include:
- a) ACGIH: (2009) Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices.
 - b) ANSI Z358.1 (1990) Emergency Eyewash and Shower Equipment
 - c) 29 CFR 1904: Recording and Reporting Occupational Safety and Health Injuries and Illnesses.
 - d) 29 CFR 1910: General Industry Standards
 - e) 29 CFR 1926: Construction Industry Standards
 - f) 29 CFR 1926.65 Hazardous Waste Operations and Emergency Response
 - g) 40 CFR 260-270 EPA Hazardous Waste Regulations
 - h) 49 CFR 172 Department of Transportation Hazardous Materials Tables, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements.(For transporters of hazardous waste).
8. City of Cambridge Asbestos Regulations – Chapter 8.61
9. Activity and Use Limitation MGL c21E, 310 CMR 40.0000 for the W.R. Grace & Co. - Conn property

1.4 Definitions

The following definitions shall be used throughout this Hazardous Materials Health and Safety Plan.

1. On-site Personnel - Personnel employed by P. Gioioso & Sons, any subcontractor hired by P. Gioioso & Sons, and any employee of the Owner, Owner's representative, state or local regulatory authorities.
2. Contractor/Subcontractor Personnel - Any employees hired by a contractor or subcontractor for this project. The contractor or subcontractors involved with soil intrusive activities shall develop their own HMH&SP specific for the site activities they will be performing.
3. Owner – City of Cambridge Department of Public Works
4. Property Owner - W.R. Grace & Co. - Conn
5. Visitor - Anyone other than On-site Personnel.
6. Site Safety and Health Officer (SSHO)- The designated “competent person” responsible for overseeing site safety activities for P. Gioioso & Sons or their personnel. P. Gioioso & Sons or their designee will provide an SSHO to implement this plan. The SSHO will be on site during all work performed within the enclosure.
7. Site - For the purpose of the HMH&SP, the site shall be all the area within the project limits as defined by the Site Plan.
8. Monitoring - The use of direct or indirect reading field instrumentation to provide information regarding the levels of gases and vapors or other airborne contaminants which are or may be released during site activities. Monitoring is conducted to evaluate employee exposures to toxic materials as well as off-site migration of airborne contaminants. Perimeter air monitoring will be performed within 50 feet of the enclosure. Refer to Section 6 of the HMH&SP.
9. Physician - A licensed Physician with experience in the practice of occupational medicine.
10. Certified Industrial Hygienist - A person certified by the American Board of Industrial Hygiene (ABIH). The CIH will be Mr. Scott D. Herzog of Covino Environmental Associates.
11. Licensed Hazardous Waste Site Cleanup Professional (LSP) - A Licensed Site Professional is an individual licensed by the Commonwealth of Massachusetts, Department of Environmental Protection (DEP) to provide environmental direction

regarding hazardous materials on listed sites. The LSP designation is given to individuals based on their experience and qualifications in the environmental field. The LSP for the Contractor is Tim Toomey of Subsurface Remediation Technologies, Rowley, MA. The LSP representing the City of Cambridge is Richard K. Quateman of Kleinfelder ▪ S E A , Cambridge, MA.

1.5 Minimum Requirements

This HMH&SP shall include the following subjects:

- a. Site Description and Evaluation
- b. Names of key personnel for site safety and health
- c. Health and Safety Assessment and Risk Analysis for each site task
- d. Training & Education
- e. Personal Protective Equipment
- f. Medical Surveillance
- g. Air Monitoring
- h. SOP's, Engineering Controls
- i. Site Control Measures
- j. Personnel Hygiene and Decontamination
- k. Logs, Reports, and Housekeeping
- l. Emergency Equipment and First Aid
- m. Emergency Response Plan
- n. Heat/Cold Stress Monitoring
- o. Vapor Control
- p. Fire/Explosion
- q. Temporary Facilities
- r. Site Control
- s. Action Levels and Responses

SECTION 2 - ORGANIZATION AND SAFETY RESPONSIBILITY

2.1 Introduction

Implementation of the comprehensive safety and health program is a key management responsibility. The HMH&SP will include a listing of health/safety personnel, and a description of their specific responsibilities for implementation of the program. Clear lines of authority, consistent with good operating policies and procedures, have been established for enforcing safety compliance. The qualifications of the site safety and health personnel are included in the appendices.

2.2 Line Management/Chain-of-Command

P. Gioioso & Sons will serve as the General Contractor for this phase of the project.

Mr. Mario Romania of P. Gioioso & Sons will be the Project Manager. The Project Manager has overall accountability for contractual issues on this project, for the selection of subcontractors and for scheduling and timetable for work. The Project Manager also has overall accountability for implementation of the HMH&SP by P. Gioioso and subcontractor employees.

Mr. Sam Doolan of P. Gioioso & Sons will be the Project Superintendent. The Superintendent has accountability for day-to-day operations at the site, for activities of the subcontractors, for implementation of the HMH&SP by P. Gioioso employees and subcontractors, to conduct periodic safety meetings and to investigate accidents and near misses on the site.

2.3 Site Safety and Health Officer (SSHO)

The Site Safety and Health Officer (SSHO) responsibilities for this project will be provided by P. Gioioso & Sons. **Mr. Sam Doolan** of P. Gioioso will serve as the SSHO and will provide safety on-site for P. Gioioso & Sons personnel. A SSHO from Covino Environmental Associates will be the alternate in the event the SSHO is not available. Contact information is found at Section 9 of this HMH&SP.

The experience of the SSHO shall include work at Level D and Modified Level D sites; specialized training in personal and respiratory protective equipment, program implementation, and use of air monitoring instrumentation and methodology; a working knowledge of Federal and state safety and health regulations; current certification in first aid and cardio-pulmonary resuscitation; and 40 hour OSHA HAZWOPER training, current refresher certificates, and medical monitoring approval in addition to supervisory training.

The SSHO will monitor work locations for employee health and safety purposes, as well as document any employee exposures and/or substance releases that may occur through the course of this project. The SSHO is trained and experienced to be proficient in the proper use and limitations of all equipment that he may be utilizing. The SSHO is responsible for operating the equipment, assisting in implementing the HMH&SP and performing any other duties assigned to him. The SSHO is also to be empowered to deny access to the site or restrict the presence of any persons (under his control), and also has the authority to cease activities on-site if and when conditions present uncontrollable risks to site personnel and off-site receptors. The SSHO shall also be responsible for coordinating, conducting and documenting any required training activities, performing and maintaining record keeping duties, and carrying out any other duties specified by site management.

The SSHO will be the main contact for any on-site emergency situation. Except in an emergency, the SSHO may modify the approved HMH&SP only after consultation and concurrence of the CIH and P. Gioioso & Sons.

The SSSHO will be familiar with all matters pertinent to this project and shall assist and represent the CIH in implementation of the HMMH&SP as required. This includes field supervision; maintaining contamination control zones; enforcing safe work practices and decontamination procedures; ensuring proper use of personal protective equipment; and communicating modified safety requirements to site personnel.

2.4 Certified Industrial Hygienist (CIH)

The CIH for this project will be **Scott D. Herzog**, CIH of Covino. Mr. Herzog has been certified by the ABIH as a Certified Industrial Hygienist. The duties of the CIH will be to develop, implement, and oversee the Health and Safety program, and the HMMH&SP. This plan includes a description for an on-site air-monitoring program, conducting initial site-specific training, and providing continued support for all health and safety activities as required. The CIH will be responsible for directing and approving any changes to the HMMH&SP with concurrence of P. Gioioso & Sons or their designated representatives.

The CIH will be available to be on site at the beginning of construction activities, at the start-up of each new task or operation, to attend meetings and as needed throughout the project for consultation as requested by the client.

2.5 Preconstruction Safety Conference

Prior to the start of soil intrusive work, the Contractor shall conduct a safety conference to discuss the hazards anticipated on the site, training on hazard recognition, response to emergencies, explanation of site activities, purchasing safety supplies, identifying safety personnel, decontamination procedures, levels of PPE required, air monitoring activities, and other topics relevant to the safety of site workers. The safety conference will apply to all P. Gioioso employees and their subcontractors. Attendance at safety meetings shall be mandatory.

2.6 Training and Site Briefing/Education

The SSHO or his designee will present a safety briefing to inform employees, contractors, subcontractors, and visitors who will be performing work in or entering the Exclusion Zones (EZ) or Contaminant Reduction Zones (CRZ) during field operations. This briefing will cover the special hazards and procedures to control these hazards. All prime and subcontractor employees, Project Engineer's representatives and visitors shall complete this briefing before working in identified portions of the site. A copy of training records for all workers completing this training shall be kept by P. Gioioso & Sons and submitted with the HMMH&SP.

The SSHO shall keep records of training for all site personnel and site visitors. Copies of the training records for all workers associated with the project will be made available upon request. All workers and visitors shall sign a daily log before entering the CRZ or EZ. The locations of the CRZ and EZ areas are identified by the limits of the excavation(s) and enclosure(s). A copy of the records will become a part of the permanent project documentation.

Sections 02082 and 01108 of the Project Specifications establish the following qualifications for work that involves disturbance of soil under the protective cover.

All personnel of Gioioso & Sons or their subcontractors shall receive 40 hours of hazardous waste operations training in accordance with 29 CFR 1910.120 or appropriate training as asbestos abatement workers and supervisors.

All personnel of P. Gioioso & Sons or their subcontractors shall receive a minimum of two hours of site-specific asbestos-related training (general awareness) for all persons involved in operations conducted within areas where asbestos fibers are presumed to be present:

P. Gioioso & Sons employees and subcontractor employees that do not perform soil intrusive activities or are working outside the limits of the work area, including office personnel, fence installation and truck drivers who remain in vehicles do not have to be licensed as abatement workers/supervisors. Workers within the area where ACM is presumed to be present but who do not perform intrusive work in contaminated soil will receive at a minimum, two hours of asbestos general awareness training.

2.6.1. Training Requirements

This plan will go into effect at any time when performing soil intrusive activities that disturb the protective layer or other site activities that are covered under the AUL; when employees are exposed or have the potential to be exposed to a hazardous material at concentrations which exceed an applicable OSHA standard; in the event of a release or an emergency situation occurs such as encountering unanticipated drums, storage tanks or pockets of petroleum contaminated soils; in areas where the level of VOC's exceeds 1 ppm above the background for a period of ten minutes continuously, in areas where there is visible evidence of asbestos fibers, oils or hazardous materials or other indicators that employees may be exposed to elevated levels of degradation products from fill or other chemicals. **It is anticipated that most or all of the work for the project will be performed at Level D or Modified Level D. Soil excavation and other activities within the enclosure until the protective cover is restored will be performed using Level C. The length of the soil excavation work within the enclosure is expected to be five days. A decision to upgrade PPE above Level C represents a change in condition at the site.**

In addition to training for oils and hazardous materials, Massachusetts requires all workers on active public construction sites to attend a ten-hour, one-day construction safety course. This focuses on general construction site safety and is separate from training to deal with oils and hazardous materials.

All P. Gioioso & Sons personnel or their subcontractors and subcontractor employees who will be entering any of the EZ or CRZ areas will be required to provide proof of having received training which meets the initial 40-hour and current annual 8-hour refresher training for

hazardous waste site workers as described in 29 CFR 1910.120 and 29 CFR 1926.65. This initial training includes the three days of supervised on-site training. All site personnel are required to have Hazard Communication Training which meets the OSHA Construction Industry requirements detailed in 29 CFR 1926.59. Proof of this training for each worker will be provided as necessary.

Workers who will be incidental to the site work, such as individuals working in project trailers or those who work in Support Zones and who will not be coming into contact with excavated or removed soil from the site do not require Hazard Communication training but will be required to attend a site safety briefing from the SSHO. Drivers of trucks hauling dirt from the site do not require Hazard Communication training provided they remain in their trucks and demonstrate that they have received Hazard Communication training during the previous twelve-month period.

2.6.2. Site Safety and Health Briefing

P. Gioioso & Sons personnel covered by this HMH&SP will be required to read and understand this document. It is the responsibility of the CIH to ensure that site personnel understand the materials presented in the HMH&SP. Prior to any on-site activity involving a disturbance of the protective Cover, all on-site personnel and visitors will be required to attend a site safety and health briefing from the SSHO or other designated, qualified person. This is applicable to all on-site personnel located within the Exclusion, Contaminant Reduction, and Support Zones who are involved with site work, and all visitors who will enter either the Exclusion or Contamination Reduction Zones. Periodic updates will be undertaken by the SSHO when operational or site conditions change or when designated refreshers are so warranted. The topics to be covered by the training include the entire contents of the HMH&SP with emphasis on emergency procedures, areas of restricted access, methods of decontamination, asbestos awareness and general safety.

A brief daily safety "tailgate" meeting will be held for all on-site personnel and shall be conducted by the SSHO or his designee. Notes of the subjects covered and a list of those attendees at the daily meeting will be maintained for the documentation package.

2.7 Medical Surveillance

All affected on-site personnel shall provide evidence of a medical examination when required which meets the requirements of 29 CFR 1910.120(f) and 29 CFR 1926.65(f). Medical examinations are required by OSHA once the HMH&SP goes into effect for the following employees involved in hazardous waste operations:

- 1.) All employees who are exposed to hazardous substances or health hazards at or above the permissible exposure limits or, if there is no permissible exposure limit, above the published exposure levels for these substances, without regard to the use of respirators for 30 days or more per year;
- 2.) All employees who wear a respirator for 30 days or more per year; or
- 3.) All employees who are injured or develop signs and symptoms related to overexposure from an emergency incident involving hazardous substances or health hazards.

These employees shall have a medical examination within the last twelve months prior to the start of the project. They shall have medical examination following any recordable illness or injury. The physician must provide a written opinion that an employee can return to work without restrictions following an OSHA recordable illness or injury.

The CIH shall detail, in conjunction with the Physician, the scheduling of examinations, certification of fitness to use respiratory protection, and compliance with OSHA RPP and PPE requirements. The results will be evaluated by a board-certified physician to determine if the employees are physically fit for the work to be performed, including the use of respirators.

The physician will specify the content of the exams, the need for additional tests and frequency using the guidelines of the referenced documentation. The following areas should be addressed in the examination: complete medical and occupational history (initial only), general physical exam including evaluation of all organ systems, pulmonary function testing including FVC and

FEV_{1.0}, blood chemistry screening profile (i.e. SMAC 20/25), urinalysis with microscopic examination, eye exam and visual acuity, audiometric testing, chest x-ray (as directed by the physician), electrocardiogram (as directed by the physician), cardiac stress test (as directed by the physician), and biological monitoring (as directed by the physician).

2.7.1 Arsenic/Lead/Chromium/Cadmium/Mercury

P. Gioioso & Sons employees or their subcontractor workers will be involved in the machine and occasionally hand excavation of soil and fill. Site characterization data from a proximate public right-of-way indicates the potential exists for the presence of arsenic, lead, cadmium, chromium and mercury. These metals were found in varying concentrations but in all cases were detected above the laboratory reporting limits but below RCS-1 limits. These metals are typical of developed industrial areas. The final standard for lead in the construction industry requires initial medical surveillance consisting of biological monitoring to include blood lead and ZPP level only where employees are exposed to or have the potential for exposure to lead at concentrations at or above the action level.

In Covino's opinion, based on the concentrations of metals reported in the soil, the size of the project, known documentation of the property use for fill, the duration of the project and Covino's experience at other sites where comparable levels of lead have been found, the potential for P. Gioioso & Sons employees to be exposed to lead and other metals above regulated levels is considered to be low during soil excavation in contaminated areas and very low during all remaining site activities. Personal monitoring of employees during soil excavation activities **is not** required to meet the requirements of the "initial determination" under the OSHA Lead standard given the elevated levels of lead measured on the site.

Full-shift personal breathing zone samples should be collected for P. Gioioso & Sons employees in the event they engage in intrusive work that has the potential to exceed the OSHA standard for lead of 50 micrograms per cubic meter of air ($\mu\text{g}/\text{M}^3$), as a time-weighted average (TWA) exposure or 5 $\mu\text{g}/\text{M}^3$ for cadmium. These individuals are not required to have specific medical monitoring as defined by the "initial determination" requirement in 29 CFR 1926.62(m) unless

exposures exceed the Action Level for lead. Medical surveillance will be made available to employees in the event they are exposed to lead above the Action Level more than 30 days each year.

P. Gioioso & Sons employees and their subcontractors may have contact with soil. OSHA has a Construction Industry standard, 29CFR 1926.62 and a General Industry standard, 29 CFR 1910.1025 for lead. Other metals are covered under Construction industry standards.

2.7.2 Semi-Volatile Organic Compounds

P. Gioioso & Sons employees or their subcontractors may contact SVOC's present in historically filled soils. SVOC's were reported in all samples at concentrations above lab reporting limits. Of these only acenaphthalene was present at concentrations above RCS-1 in one boring, and benzo(a)pyrene was reported present at levels above S-1 in three of the eight borings. Typically, these materials pose a greater risk by skin contact than by inhalation. Based on Covino's experience at other sites where comparable levels of SVOC's have been found, the potential for P. Gioioso & Sons employees to be exposed to SVOC's is very low.

2.7.3 Asbestos-Containing Materials (ACM)

P. Gioioso & Sons employees or their subcontractors may encounter asbestos-containing fibers or asbestos containing materials in soil throughout the site while excavating soil and fill. An Activity and Use Limitation to protect public health due to the potential presence of asbestos fibers in soil is in effect over the area in which the utility work on W.R. Grace & Co. - Conn property is to be conducted. All soil excavation work within the enclosure is performed as if it was asbestos fiber-contaminated. Smaller pieces of ACM may be present in the soil and may cause fibers to be released as the excavation proceeds. Exposure to ACM may cause diseases including asbestosis and mesothelioma.

2.7.4 Petroleum Hydrocarbons

There is a potential for the presence of petroleum hydrocarbons in soil due to its urban nature. No specific data exists on the presence of petroleum hydrocarbons in the soil to be excavated.

2.7.5 Polychlorinated Biphenyls

No PCB's were detected above the laboratory reporting limits in the soil samples collected by SEA from within public rights-of-way proximate to the W.R. Grace & Co. - Conn property. Public records of environmental conditions on the W.R. Grace & Co. - Conn property do not indicate that PCB's are present.

2.8 Emergency Medical Care

Emergency medical care services are available at Somerville Hospital. Somerville Hospital is located at 230 Highland Avenue, Somerville, Massachusetts. The telephone number is (617) 591-4500. The hospital is located approximately two miles from the project site. The hospital should be notified about the potential hazards associated with the site. Ambulance services are available twenty-four hours per day, by contacting the City of Cambridge Emergency Medical Services. The emergency telephone number is 9-1-1. Massachusetts has an enhanced 911 system that identifies the location from any land-based telephone. Any employees who are seriously injured on site should be transported to the hospital by EMS personnel.

Section 8.10 contains information regarding emergency transport to the hospital. A map showing the emergency route to the hospital is shown on Figure 4. A copy of the map and directions will be kept in each Supervisor's vehicles.

Once the Plan is in effect, at least one person trained in Red Cross First Aid/CPR/Universal Precautions for Bloodborne Pathogens or the equivalent will be available on-site at all times when workers are present. Documentation of current training shall be posted in the project trailer.

The SSHO is currently trained in First Aid, CPR, and Universal Precautions. A fully stocked and equipped first aid kit capable of treating minor injuries and first responder treatment will be maintained on site at all times in the project trailer.

2.9 Accident Reporting and Recordkeeping

The Contractor will immediately notify the City of Cambridge and will evaluate whether to notify W.R. Grace & Co.-Conn of any accident/incident. Within two working days of any reportable accident, the Contractor will complete and submit an Illness/Injury Accident Report. If the illness or injury is recordable as defined by OSHA, such illness or injury will be recorded on the OSHA 300 log for the project.

Note the OSHA Recordkeeping regulations require that all accidents involving a fatality or three or more persons sent to the hospital for treatment from a single event must be reported to the Area Office of OSHA within eight (8) hours following the accident, or notification of the accident.

2.10 Site Emergency Equipment

The Contractor will provide ANSI approved portable eyewash units in accordance with ANSI Z358.1, a portable first aid kit, and 10 pound dry chemical fire extinguishers of sufficient quantity for MWRA with a minimum rating of 2A:10B:10C in the following locations:

- Project trailer
- Supervisor's vehicles

The locations of this safety equipment shall be marked with a sign, and workers informed in the "tailgate" meetings, when the location of the safety equipment is changed. Any safety equipment required for confined space entry will be brought to the project trailer if it is needed on a project site. This equipment includes safety harnesses, wristlets, retrieval lines, a tripod (required for entering manholes or other utilities with fixed openings), air horns, and two-way radios.

2.11 Daily Safety Inspections

The SSHO or designee will conduct daily safety inspections of the site to determine compliance with the HMMH&SP on the site. The designated areas have been identified as **Sites 1 and 2. Site 1 is the only area where soil excavation will take place.** These inspections will be systematic and will follow good safety and health procedures. The SSHO will conduct a minimum of two visual inspections per day during work activities. The SSHO will advise the Project Supervisor of any unsafe acts or actions observed, and will record observations in a daily log book and present these findings at the subsequent daily safety briefing. These inspections will become a part of the permanent project record.

2.12 Safety Responsibility

The ultimate responsibility for the health and safety of the individual employee rests with the employee himself, and his or her colleagues. Each employee is responsible for exercising the utmost care and good judgment in protecting his or her own health and safety as well as that of fellow employees and the general public which might be affected by site activities. Should any employee observe a potentially unsafe condition or situation, it is the responsibility of that employee to immediately bring the observed condition to the attention of the appropriate health and safety personnel as designated above.

Should any employee find himself or herself in a potentially hazardous situation the employee shall immediately discontinue the hazardous procedure(s) and either personally effect appropriate preventative or corrective measures, or immediately notify the Project Manager or SSHO of the nature of the hazard. In the event of an immediately dangerous or life-threatening situation, the employee always has "stop work" authority.

Extenuating circumstances such as budget or time constraints, equipment breakdown, changing or unexpected conditions, etc., never justify unsafe work practices or procedures. In fact, under

stressful circumstances, all project personnel must be mindful of the temptation to consciously or unconsciously compromise health and safety standards, and must be especially safety conscious.

2.13 Site Security

The general contractor is responsible for maintaining security on the job site. This includes limiting access to authorized individuals, and managing traffic flow to prevent accidents. The work area is located behind Grace Building 23. Alewife Brook Parkway has heavy vehicular traffic at all times, however the site activities will not be impacted by the traffic. The area around the project is largely residential. There is automobile traffic on Seagrave Road and Columbus Avenue as well as the side streets off these two streets. All access to/from the site for workers and trucks will be through Magoun Street to Whittemore Avenue. Access to the enclosure will be secured and protected by a lockable rigid enclosure on the decon station. All employees should consider themselves responsible for construction-related security or otherwise securing the access to the enclosure when leaving the site at the conclusion of the work day. W.R. Grace & Co.-Conn security will periodically check the enclosure during non-working hours as a part of their normal rounds. Any damage to or forced entry into the enclosure will be reported to P. Gioioso & Sons. Contact information is available in Section 9.

The City of Cambridge and W.R. Grace & Co.-Conn will be notified regarding the nature and schedule of the project, so that site access and security may be assured during non-working hours. The names and emergency telephone numbers will be available for personnel during off-shift hours.

2.14 Noise, Dust & Odor Control

Control of noise and dust on and off the site will be critical to the success of this project. A dust control and an odor control program will be implemented during this project. A perimeter monitoring program will be established in accordance with the AUL and City of Cambridge Asbestos Ordinance to document that the controls in place are effective. Work will be halted if

visible emissions are observed from the enclosure as a result of this work. Visible emissions from non-suspect sources such as vehicle exhaust or road dust will not be considered cause for work stoppage. Refer to Section 6 for further details.

2.15 Subcontractor Support

Each contractor and subcontractor hired by P. Gioioso & Sons has a contractual obligation to perform their work utilizing safe methods and to comply with the Health and Safety Plan for this project, OSHA regulations, and all other applicable federal, state and local requirements.

SECTION 3 - SITE CHARACTERIZATION AND ANALYSIS

3.1 Site Information

Information regarding the characterization of the overall CAM 400 site has been reviewed in preparation for this HMH&SP. Although the data was not from the W.R. Grace & Co. - Conn site, Covino reviewed the results to obtain general background information as a part of the development of this HMH&SP, as the data could be predictive of conditions on the W.R. Grace & Co. - Conn site and is used for reference purposes only.

This HMH&SP was prepared for site excavation activities performed during the initial phase of this project to address the potential for the presence of asbestos fibers and other contaminated materials that may be present in the soil.

3.1.1 Asbestos-Containing Materials

Previous testing has identified the presence of asbestos fibers in soil on W.R. Grace & Co- Conn property. P. Gioioso & Sons employees or their subcontractors may encounter asbestos-containing materials throughout the site while excavating soil and fill. An Activity and Use Limitation to protect public health due to the potential presence of asbestos fibers in soil is in effect over the area in which the utility work is to be conducted. All soil excavation work within the enclosure is performed as if it was asbestos-contaminated.

3.1.2 Lead

Lead is more hazardous by inhalation than by ingestion but is toxic by both routes. If ingested or inhaled, lead causes irritation to the skin, eyes and respiratory tract. Lead is a neurotoxin and affects the central nervous system, kidneys, blood and reproductive systems. The symptoms of lead poisoning include abdominal pain and spasm, nausea, vomiting and headache. Lead is a cumulative poison. The maximum measured concentration of lead was below the S-1 limit for lead of 300 mg/kg.

3.1.3 Chromium

Chromium is toxic by inhalation and ingestion. Chromium causes sinusitis, nasal septum, allergic and irritation dermatitis and respiratory irritation. The highest concentration of chromium present was below the S-1 standard of 30 mg/kg.

3.1.4 Cadmium

Cadmium is toxic by inhalation and ingestion. Cadmium is a cumulative toxin and accumulates in the liver and kidneys as well as in muscles and bones. There is evidence that cadmium causes cancer in animals, and it is classified as a "probable" human carcinogen. The highest concentration of cadmium was below the S-1 standard of 2 mg/kg.

In addition, other metals were also reported at concentrations below S-1 limits. These included barium, zinc and mercury.

3.1.5 Petroleum Hydrocarbons and VOC's

Sampling was performed for total petroleum hydrocarbons but not for volatile petroleum hydrocarbons (VPH). The levels of TPH in the borings were all typically below S-1 levels. Naphthalene was detected in one boring at a concentration below the S-1 standard of 4 mg/kg. No other VOC's were detected above the lab reporting limits. No elevated PID readings were reported except in one boring where a reading of 14.1 parts per million was measured.

3.1.6 PCB's

No detectable levels of PCB's including the entire panel of Aroclor compounds were reported in the samples. The S-1 standard for total PCB's is 2.0 mg/kg. .

3.1.7 Polycyclic Aromatic Hydrocarbons

Low levels of several PAH compounds were measured throughout the CAM 400 site. Only benzo(a) pyrene and acenaphthalene were present in concentrations above the respective S-1 limits. Other PAH's were present at levels below S-1 limits.

In summary, contaminated soil containing asbestos fibers as well as the potential for other hazardous materials including metals, SVOC's and petroleum hydrocarbons will be anticipated during soil excavation. The use of engineering controls, dust mitigation and PPE in selected areas and work practices will be used to reduce the potential for employee exposure.

Levels of PPE are defined in Section 5. The use of engineering controls will limit potential for nuisance odors in the work area and at the property line.

3.2 Physical Hazards

Review of the site location reveals that there are physical hazards that exist at the site that are or may be of concern, include but are not limited to:

1. Potential pedestrian and vehicle traffic (including struck by other vehicles) in the vicinity of the project site.
2. Operation of heavy machinery, including excavators, trenchers, and trucks.
3. Proper use of trench boxes or other trenching techniques.
4. Excavation stability from inflow of groundwater, and soil stability.
5. Entry into permit-required confined spaces.
6. Lockout/Tagout especially in the event "hot taps" are required for utilities support.
7. Exposure to temperature extremes and noise.
8. Electrical shock from overhead or buried power lines.
9. Falls from elevated levels.

Caution should be exercised when near heavy machinery on the site. The entire area is a hard hat, safety glasses and safety shoe area. Hard hats shall be non-conductive and shall meet the specifications of ANSI Z89.1, "Protective Headwear for Industrial Workers". Reflective safety vests will be used by all workers doing utility work in or near active heavy equipment on site and

when working on public roadways. Safety shoes will conform to ANSI standards. Workers will be advised of all known hazards at the site prior to startup and thereafter as needed.

Employees will be encouraged to be observant of site safety and health hazards and to report them directly to the SSHO or to the SSHO through their supervisor. Other potential hazards that could cause injuries or illnesses include slips, trips, falls, bumps, cuts, pinch points, falling objects, and crushing injuries, typical of every construction-related job site.

The location of all underground utilities, including electrical lines; natural gas lines; water and sewer lines; and telephone lines must be identified and clearly marked before starting excavation work. These should be coordinated through DIGSAFE and the City of Cambridge. The toll-free DIGSAFE telephone number for New England is (888) DIG-SAFE.

3.3 Chemical Health Hazards

Site workers should always be alert for unrecognized or previously undiscovered or unanticipated hazards. Potential hazards include:

- Inhalation of potentially toxic vapors including components of gasoline and total petroleum hydrocarbons; contact with underground storage tanks or buried drums.
- Inadvertent ingestion of potentially toxic substances via hand to mouth contact or deliberate ingestion of food, or tobacco products inadvertently contaminated with potentially toxic materials;
- Dermal exposure to substances which may effect the skin directly or which may exhibit other toxic effects via percutaneous (skin) absorption;

Based upon historical experience, the potential routes of exposure to hazardous compounds are through dermal contact, inhalation or ingestion. The risk of exposure by any route of contact is considered low to low-moderate for the entire project.

Exposure via ingestion can be controlled effectively by the use of personal protective equipment such as gloves, boots, and disposable coveralls, good personal hygiene habits, and a ban on smoking, eating and drinking in the contaminated areas. Employees will be required to wash

their hands before eating, drinking or smoking. Soap, water and disposable towels will be provided at wash stations.

Similarly, dermal exposure can be virtually eliminated by good personal hygiene, the use of gloves and appropriate personal protective clothing, and conscientious personal decontamination procedures. All soil and water should be treated as if it was contaminated and the contaminants are capable of being absorbed through intact skin.

Air monitoring within the exclusion zone will be performed for the protection of employees by the SSHP for P. Gioioso & Sons or their designee. Ambient air monitoring at the perimeter of the work zone will be conducted by the SSHO for P. Gioioso & Sons in accordance with the City of Cambridge ordinance, Chapter 8.61.040 and the AUL. Perimeter air samples will be collected to document the control measures implemented. In the event ACM is identified in the perimeter air samples at a concentration that exceeds 0.01 fibers/cubic centimeter (f/cc) of air, work on the excavation shall be halted and the controls reviewed. The Contractor will notify the City of Cambridge and W.R. Grace & Co. - Conn in the event air sampling at the perimeter of the Exclusion Zone exceeds 0.01 f/cc of air. **It is anticipated that most or all work for the project will be performed in Level D or Modified Level D. All work inside the enclosure will be performed in Level C until the protective cover has been restored. A decision to upgrade PPE above Level C constitutes a change in condition.**

3.4 Unanticipated Hazards

The following conditions and situations are not anticipated at this site and therefore safety procedures appropriate to them are not included in this HMM&SP: The need to handle or open drums or containers which may contain hazardous substances; encountering underground storage tanks or buried drums; unanticipated releases; activities requiring personal protective equipment more extensive than Level C; field work in non-illuminated areas during periods of darkness, and work during periods of severe weather and/or high wind.

If any of these conditions are encountered, all work will be suspended, the area will be marked off and the SSHO will immediately contact the City of Cambridge, W.R. Grace & Co. -Conn, and the CIH in order to define a proper response.

3.5 Confined Space Entry

Entry into permit-required confined spaces may be anticipated by P. Gioioso & Sons personnel or by the subcontractors during this project. The project does entail excavation of soils to a depth up to 6 to 8 feet for placement of new lines with connections to existing utilities. The excavation will be largely by powered machine and occasionally by hand. The Contractor will utilize appropriate trench boxes or trenching techniques as described in Section 3.6. The soil is described as soft and consists largely of sand. The potential for sidewall collapse is moderate and ACM is assumed to be present in soils to be excavated. Once the contaminated soil has been removed, then only an engulfment or entrapment potential should be considered as a condition for determining the need for an Entry Permit. Based on the work description, it is not likely that work in Permit-Required Confined Spaces will be required, however the topic is addressed in the event it becomes necessary.

3.5.1 Entry Permits

In all situations where trenching exceeds five feet in depth and where there is a potential for a hazardous atmosphere, employees are required to use the procedures described in SOP#4, Confined Space Entry Procedures, located in the Appendix. It is unlikely this condition will be encountered on this site since the maximum depth of excavation is anticipated to be largely below six feet. If entry to a permit-required confined space is required, this will constitute a change in condition. All employees who may be required to enter a permit-required confined space shall have been trained in Confined Space Entry, in compliance with the OSHA requirements. This section describes and addresses compliance with the OSHA standard, "Permit-Required Confined Spaces"

Prior to entering a Permit-Required Confined Space, an Entry Permit shall be issued by the Entry Supervisor. This permit will outline the requirements for PPE, air monitoring, emergency backup, egress equipment, lockout/tagout requirements, and any special circumstances. The entry permit will be re-issued on a daily basis, and will be valid only for that day. The SSHO shall serve as the entry supervisor for this project. Air monitoring, using a four-gas meter and a VOC meter shall be used to check air quality prior to and intermittently throughout the entry period.

The permit will be canceled at the conclusion of the task or at the end of the day whichever comes first. In the event a task lasts longer than one day, a new permit will be issued for each succeeding day. The completed permit will be retained for a minimum of one year beyond the end of the calendar year in which it was issued. (Dec.31, 2011 for permits issued through the end of 2010).

The entry supervisor will determine all PPE and rescue equipment to be used in conjunction with the entry. An attendant will remain outside the excavation and will maintain visual communication with the entrant(s) at all times.

3.6 Shoring and Trenching

In the event any walls and faces of any of the excavations are more than four feet deep, they shall be properly supported using "a trench box or lateral bracing system of soldier piles and sheeting as indicated by the dimensions of the opening, and the degree of soil stability". All trenching and excavation work shall be performed only by trained individuals. It is planned to have a trench box system at the perimeter of the excavated soil.

A stairway, ladder or ramp or other means of egress shall be provided to limit lateral travel to 25 feet to reach a point of egress, in accordance with 29 CFR 1926.651(c)(2).

3.7 Site Inspections by the SSHO

At least twice each shift during field operations in Exclusion and Contaminant Reduction Zones once the Plan is in effect, the SSHO shall visually inspect the enclosure where activities by P. Gioioso & Sons or their subcontractors are underway for compliance with this Plan. Deficiencies in compliance will be corrected upon discovery and noted in the daily site log and reviewed in the subsequent daily safety briefing. This log will become a part of the documentation package at the completion of the project.

3.8 Hazard Analysis/Risk Assessment

A limited hazard analysis and risk assessment is presented by task. The objective is to identify and plan for hazards that might be encountered in this project, and do not include emergency planning for remote events. The assessment also defines the appropriate control measures to minimize the risk to on-site employees, as well as to the general public.

Hazard Analysis/Risk Assessment

TASK	HAZARD CODES	CONTROLS	EMPLOYEE RISK	PUBLIC RISK
Mobilization/ Demobilization	4, 6, 7, 9,10	Traffic control, Motor vehicle safety	Low	Low
Install Perimeter Fence	7, 9, 10	Motor vehicle safety, safe machine work practices	Low	Low
Erect enclosure	4, 7, 9, 14	Safe machine work practice, Motor vehicle safety, PPE, dust control	Low-Moderate	Low
Soil excavation	1, 2, 3, 4, 5, 7, 9, 11	Safe machine work practices, PPE, dust control	Low-Moderate	Low
CIPP Work (Invert)	1, 2, 3, 7, 9	PPE, Respiratory Protection	Low-Moderate	Low

TASK	HAZARD CODES	CONTROLS	EMPLOYEE RISK	PUBLIC RISK
Removal and replacement of PVC lines	4, 5, 6, 7, 9, 11, 13	PPE, Respiratory Protection, Confined Space procedures, dust control	Moderate	Low
Manhole connection work	4, 5, 6, 7, 9, 11, 12, 13	Safe machine work practice, Motor vehicle safety, PPE, dust control	Low-Moderate	Low-Moderate
Trenching/Shoring	1, 2, 3, 4, 5, 7, 8, 9, 11, 13	Trench/Shoring system, safe machine work practices, motor vehicle safety, PPE, dust control	Low-Moderate	Low-Moderate
Soil sampling and analysis	1, 2, 3	PPE, air monitoring program	Low - Moderate	Low
Stockpiling of soil inside enclosure.	1, 4, 7, 9, 10	Safe machine work practices, dust suppression, truck covers, air monitoring program, truck decon program, traffic control	Low - Moderate	Low
Groundwater treatment (If needed) - performed by subcontractor	1, 2, 3, 4, 6, 7, 9, 13	PPE, safe machine work practices, air monitoring, GFCI protection, truck decon	Low - Moderate	Low

Key To Hazards:

- 1 - Inhalation of Vapors or Dust
- 2 - Ingestion of contaminated soil
- 3 - Skin Penetration/Absorption of Toxic Chemicals
- 4 - Heavy Machinery Operation (Accidents, Crushed by, Struck by)
- 5 - Confined Space Entry
- 6 - Exposure to Temperature Extremes
- 7 - Exposure to Noise
- 8 - Electrical Shock
- 9 - Slips, Trips, Falls, Other Miscellaneous Construction Accidents
- 10 - Pedestrian Accident (Motor Vehicle)

- 11 - Trenching/Shoring Hazards
- 12 - Contact with Underground Tanks, Utility Lines
- 13 - Lockout/Tagout
- 14 - Contact with rodents, poison ivy, snakes, ticks etc.

SECTION 4 - SITE CONTROL

Site control zones will be established in order to contain contamination within the smallest area possible. The SSHO will ensure that each employee has the proper personal protective equipment for the area or zone in which he or she is to perform work. Only authorized persons will be permitted access to Exclusion and Contamination Reduction Zones. All entrance to these areas will be restricted by means of regulated personnel flow. And only trained, authorized employees are authorized to enter. The purpose of this site-specific Health and Safety Plan (HMH&SP) is to establish in detail the procedures and protocols necessary for protecting of workers and the general public from potential hazards associated with contaminated soil encountered during the excavation, backfilling, handling, analysis, and disposing of excavated soils.

This section shall define the work zone delineations, site communication, and site access control measures to be employed.

4.1 Exclusion Zone (EZ)

The Exclusion Zones (contamination work zones) is the area(s) where lead, chromium, cadmium and other metals, SVOC's, petroleum hydrocarbons and asbestos fiber contamination may exist. These areas have been designated as Site 1 and Site 2..

The Exclusion Zone shall include and encompass areas designated for soil excavation associated with the handling of contaminated soils fully contained within the enclosure, commonly referred to as the Hot Line.

The tented enclosure for Site 1 will be designed with two separate entry points -- one for employees and a second for heavy equipment and roll-offs for soil. Each will be designed with a decon area. The enclosure for Site 2 will have one entry point as heavy equipment will not be required for the excavation within the vault.

Special precautions will be taken to insure that pedestrians and non-essential persons are not allowed near the excavation equipment during the excavation and trenching operations. Caution tape and/or traffic cones will be used to delineate the travel lanes for personnel, trucks and heavy equipment. The enclosure will be secured with a lockable door and a rigid frame around the decon areas for non-work hours. No eating or smoking is allowed anywhere within the area of the Site.

The required protective equipment for use by personnel working in or entering any Exclusion Zone or Contaminant Reduction Zone is specified in Section 5. Access to the Exclusion Zone or Contaminant Reduction Zone is restricted to On-Site and Contractor personnel who are wearing the proper personal protective equipment and who have received the required site training and medical clearance. All workers will sign in the log book in the Support Zone prior to entering the Exclusion Zone.

4.2 Contamination Reduction Zones (CRZ)

The CRZ is a buffer zone between the Exclusion Zone and the Support Zone, and is located at the interface of the two zones. Personnel, equipment and vehicle decontamination stations such as washing stations will be located in this area and will be marked by barrier tape or similar means. The CRZ serves as an area to decontaminate personnel, equipment, and vehicles prior to entering the support zone. If necessary, clothing change facilities for reusable PPE shall be located in the contamination reduction zone. The CRZ will be a zone extending approximately 20 feet beyond the EZ on one or more sides as required for site access. All access to the EZ shall be through the CRZ.

4.3 Support Zone (Non-Contaminated)

This is the area outside of the Contaminant Reduction Zone, where there is no potential for contact with contaminants. The Support Zone contains the following: work rest area, support

operations, radio communications, transportation, and storage facilities. The support zone is located outside the limits of the designated exclusion zones, and away from areas designated as contaminated soil handling. Eating and drinking of fluids are permitted only in this area and only after site workers have properly decontaminated themselves. A description of the decon process and location is found in Section 7.

4.4 Dust and Odor Controls

Air monitoring and dust and odor control programs are being implemented for this project; the air monitoring program is described in Section 6.0.

A dust and odor suppressant program will be in effect as a part of the HMM&SP. In the event odors are encountered during soil excavation, stop operations temporarily and apply odor suppressant foams or other chemicals on the exposed surface. Products such as Earthbind® or the equivalent are useful for dust suppression and soil stabilization. The roll-offs will be loaded with soil, covered, sealed and decontaminated within the enclosure.

Water mists, calcium chloride and other recognized dust suppression techniques will be implemented in the event other controls are not effective. The contractor will notify the CIH who will conduct additional monitoring as needed, using a more sensitive monitoring technique. If visible dust is observed outside the enclosure, work will be temporarily halted. Visible emissions from non-suspect sources such as vehicle exhaust or road dust will not be considered grounds for work stoppage.

All roll-offs, excavators and other heavy equipment used inside the Site 1 enclosure and all hand tools used for excavation within the Site 2 enclosure will be cleaned, decontaminated and visually inspected by the SSHO before leaving the enclosure. Trucks and support vehicles that remain outside the enclosure do not have to be decontaminated since they will not come into contact with soil from within the enclosure.

Indications of "overt" contamination as defined by Massachusetts DEP include but are not limited to the following:

- 1) staining or unusual color to the soil;
- 2) unusual or blackish color to trench or excavation water;
- 3) visible sheen or rainbow on top of the groundwater entering the trench or excavation;
- 4) smells of gasoline, oils, or solvents coming from the soils or water;
- 5) buried drums, tanks, or suspicious structures;
- 6) excavate contains DNAPL or percent levels of oils or hazardous materials.
- 7) signs or symptoms of hydrogen sulfide or reactive cyanide exposure.

Personnel, vehicles and equipment used during the handling of soils, and hazardous chemicals and materials shall be decontaminated before leaving the EZ using work site procedures contained in the HMM&SP.

4.5 Site Communication

The active work site is a small one and there will be considerable heavy equipment working on site. This creates the potential for accidents, especially as the equipment moves on and off the site and trucks carrying soil need to exit the site. It is critical to maintain two-way communication on site at all times, to protect the safety of on-site employees, and to expedite the decision making process, in the event contamination is encountered. All requests for emergency services will take place through the Contractor. W.R. Grace & Co – Conn will be notified of any requests for emergency services to that appropriate security arrangements may be made to protect facility employees.

The job supervisor(s) will carry a two-way radio or cellular telephone and will be in continuous contact with the site personnel in the event emergency services are required.

Verbal communication and hand signals may be used to communicate among workers on the site. Compressed air horns could also be used to play an integral part in the communication

process. They should be used to signal evacuation of a work site in the event of an emergency situation such as a spill, release, uncontrolled fire, or explosion. In addition, visual and voice or radio communications must be maintained at all times while working on-site.

The following signals will be used to indicate an emergency situation:

- One long blast repeated three times at five second intervals - Man down
- Three short blasts repeated three times at five second intervals - Evacuate site
- Alternating short and long blasts - All clear

The evacuation area and rally point will be located just outside Building 23 at the perimeter of the Alewife Center parking lot. This area will be posted with a sign and a yellow flag. In the event of an emergency when evacuation is ordered, ALL P. Gioioso & Sons employees and subcontractor employees will cease work and will meet at the rally point.

4.6 Signs

The Contractor shall post warning signs designed to provide guidance and direction to on-site personnel and visitors. The signs at the job trailer or Supervisor's vehicle shall be posted in locations approved by the Project Engineer, and should be large enough to visibly see from a reasonable distance.

Visitor Signs:	Signs shall be posted directing all visitors to the project trailer.
No Smoking:	No smoking signs shall be posted in areas of high visibility immediately adjacent to the Exclusion Zones.
Asbestos:	Asbestos caution signs shall be posted on the outside of the enclosure by the personnel and equipment entry points.

4.7 Engineering Controls

Special engineering controls are anticipated for this project. There are plans to use continuous forced ventilation of the tented enclosure during site activities and soil excavation to remove

vehicle exhaust and provide safe working conditions. All equipment within the enclosure will be diesel-powered and will be equipped with appropriate functioning tailpipe scrubbers and/or catalytic converters. No gasoline-powered equipment will be permitted within the enclosure. At a minimum, the enclosure ventilation will be provided by two 2,000 cubic feet per minute exhaust blowers with HEPA filtration. This will provide a minimum of eight to ten air changes per hour inside the enclosure. Temporary heating may be required based on ambient weather conditions during site activities. Dust suppression in the form of light water sprays, foams, dust suppressants, and calcium chloride will be implemented as required to control dusting during truck loading activities and excavation.

Alternatively, intrusive activities may be reduced or curtailed under high wind or heavy rain conditions, which in the opinion of the SSHO may pose a safety hazard to the workers, or nearby members of the community. Weather forecasts shall be monitored during the construction period. In the event of high wind or storm warnings, the Contactor shall evaluate the need to cease work for the duration of that event(s).

4.8 Site Control Measures

Solid waste and contaminated materials encountered shall be managed in a manner that ensures the protection of health, safety, public welfare and the environment. The intent is to re-use most of the soil on-site. A six-inch cap of clean soil will be placed on top in accordance with the AUL. W.R. Grace & Co - Conn will be the generator of any soil requiring disposal from the enclosure and shall approve the disposal location and sign Bills of Lading (BOL) or manifests used for tracking soil shipments. If Bills of Lading are used for soil shipment, The City's LSP shall sign and stamp the BOL as the LSP-of-Record for the MCP Release Abatement Measure (RAM) Plan to be submitted to MassDEP by the City for Post-Response Action Outcome (RAO) Statement excavation activities. Debris deemed unsuitable and/or surplus by the Owner's Representative shall be removed and disposed off-site.

4.8.1 Access and Egress Patterns

Specific movement patterns of both project personnel and equipment through designated site zones shall be maintained during routine operations at the project site. The following movement pattern will be utilized to assure compliance with this plan and the movement shall be monitored by the SSHO or other project management personnel.

Access Procedure

1. All site personnel are to log in at project trailer prior to proceeding on-site.
2. Access to the exclusion zone and decontamination reduction zone shall be limited to on-site, contractor personnel and approved visitors. Visitors shall be restricted to the Support Zone, unless approved by the Project Manager and the SSHO. These personnel shall have proper protective equipment and provide proof of training.
3. All personnel shall proceed to the exclusion zone through designated entrance locations that are clearly marked.
4. Access of routine personnel shall be monitored by the SSHO or other on-site project management personnel.
5. All equipment will have access to the exclusion zone through appropriate equipment routes.

Exiting Procedure

1. All personnel shall exit the exclusion zone through the designated personnel decontaminated reduction zone.
2. Prior to proceeding from the CRZ to the support zone all personnel are required to undergo designated decontamination activity.
3. Once decontamination is complete, site personnel may proceed to the support zone prior to leaving the site. Do not reenter the EZ or CRZ.
4. All equipment on-site shall proceed from the exclusion zone to the CRZ and undergo appropriate decontamination prior to proceeding to exiting the enclosure.
5. Adherence to these specific exiting procedures shall be monitored by the SSHO or other appropriate project supervisory personnel.

4.8.2 Operation Procedures

The following procedures shall be maintained during routine activity associated with the site control procedures:

1. A copy of this HMMH&SP shall be maintained on-site.
2. All personnel shall be instructed in the contents of the plan.

3. Proper delineation of site control zones will be maintained and signs placed in visible locations.
4. Copies of access and egress procedures will be posted on the project bulletin board located at the command center.
5. Access and exiting routes are contained in this report for both equipment and personnel. They shall also be posted on the project bulletin board located in the support zone.
6. Any modifications to the plan including delineation of work zone boundaries shall be approved prior to implementation and all personnel shall be briefed in the modification prior to implementation.

SITE OPERATING PROCEDURES/SAFETY GUIDELINES

The following general work practice guidelines are intended to prevent injuries and adverse health effects. These guidelines represent the minimum standard procedures for reducing potential risks associated with the project and are to be followed by all site workers at all times.

- ** All safety equipment and protective equipment shall be worn at all times in designated areas, by all persons, in conformance with the HMM&SP.
- ** Always observe the buddy system. Never enter or exit site alone, and never work alone in an isolated area. Never wander off by yourself.
- ** Always maintain a line-of-sight.
- ** Practice contamination avoidance. Never sit down or kneel, never lay equipment on the ground, avoid obvious sources of contamination such as puddles, and avoid unnecessary contact with on-site objects.
- ** No eating, drinking, or smoking outside the designated Support zone.
- ** In the event Personal Protective Equipment is ripped or torn, work shall stop and it shall be removed and replaced as soon as possible.
- ** Be alert to any unusual changes in your own condition; never ignore warning signs. Notify SSIHO as to suspected exposures or accidents.
- ** A vehicle will be readily available exclusively for emergency use at all times when workers are on site. All personnel going on-site shall be familiar with the most direct route to the nearest hospital.
- ** In the event of direct skin contact, the affected area shall be washed immediately with soap and water.

- ** Note wind direction. Personnel shall remain upwind whenever possible during on-site activities.
- ** Never climb over or under refuse or obstacles.
- ** Hands and face must be thoroughly washed before eating, drinking, etc.
- ** Any modifications to this safety plan MUST be approved by the SSHO and the CIH.

SECTION 5 - PERSONAL PROTECTIVE EQUIPMENT

5.1 Introduction

Personal protective equipment (PPE) is the major method used to minimize potential employee exposure to site contamination. The levels of protection for on-site personnel have been based on OSHA requirements. All P. Gioioso & Sons personnel and their contractors on-site shall have their own personal safety equipment which will be used according to the direction of the SSHO. All contractors and subcontractors are required to provide their own PPE in accordance with their site-specific HMH&SP. All PPE shall be kept cleaned and maintained in a proper manner. Personnel will have been trained in the proper use and maintenance of PPE. It is the responsibility of the Contractor to supply and maintain all required PPE in a usable fashion.

At a minimum, all P. Gioioso & Sons employees and visitors will be required to have ANSI-approved hardhats, steel toe safety shoes or boots and safety glasses whenever on active work sites. Additional PPE as prescribed in this plan shall be worn on-site at all times. Loose sleeves, cuffs, loose clothing, ties, or other objects that may become entangled in machinery are not permitted. Reflective vests will be used whenever working in or around automotive or truck traffic. Never walk within the swing radius of equipment and make certain the operator/helper see you and know where you are.

OSHA has implemented a standard on personal protective equipment, 29 CFR 1910.132. This standard defines approved types of PPE for eye and face protection, head, and foot protection. The appropriate types of PPE shall be designated for the hazards of the particular task. All PPE shall comply with the appropriate ANSI designation as referenced in the standard.

Based on the information provided in the site characterization reports, controls will be implemented to reduce the potential for personnel to be exposed to contaminants at levels above the OSHA Permissible Exposure Limits (PELs), ACGIH Threshold Limit Values (TLVs), or encounter conditions that are Immediately Dangerous to Life and Health (IDLH). The greatest

potential for exposure will be inhalation of dust containing lead, chromium and cadmium as well as dust containing these and other metals and ACM that may be released to the air as the soil material is excavated.

Based on concentrations of metals in the soil and the potential for ACM, the site is generally considered to have a very low to low hazard evaluation. Contingencies have been made to upgrade the site if necessary. It is anticipated that most if not all of the work by P. Gioioso & Sons personnel will be performed at Level D or Modified Level D, given the site activities and the hazards at the site. All activities within the tented enclosure will use Level C from the start of intrusive activities until the protective cover is restored. The length of soil excavation is expected to be five days.

PPE for all remaining work outside of the tented enclosure will be set at Level D in all clean areas and in support locations and Modified Level D in areas where skin contact with hazardous materials may occur. These include areas where "overt" contamination is identified. For purposes of worker protection within the context of this HMM&SP, this will occur either when indicated on the Air Monitoring Plan (Page 42) for action on Upgrade/Downgrade; or when visible contamination is observed as defined in this plan by DEP criteria (visual or olfactory) during soil-intrusive work.

The following criteria may be used as guidelines for making this determination in soil samples: VPH samples which exceeded 100 mg/kg, TPH samples which exceeded 1,000 mg/kg or lead levels exceed 300 mg/kg. In addition, if levels of VOC's exceed 10 ppm for a period of ten minutes continuous, if levels of airborne dust exceed 0.25 mg/m^3 for ten minutes, if asbestos fiber levels inside the enclosure exceed 0.1 f/cc or if visible dust is observed from work or other activities performed within an asbestos-regulated area, then this may also be trigger for Upgrade/Downgrade. If any conditions requiring protection above Level C, work will be stopped and the HMM&SP will be reviewed by the Project Manager and the CIH to reflect the more critical requirements of this level of work is prepared. **Any work performed using a PPE Level**

above Level C will be considered a change in condition. The Owner or Owner's representative will be notified as soon as practical.

5.2 Description of the Levels of Protection

The following is a brief description of levels of protection to be used by site personnel:

- Level D:
- Work Clothes
 - Safety Shoes with Outer Rubber Slush Boots (for water)
 - Gloves
 - Hard Hat
 - Safety Glasses w/ side shields
 - Reflective Vest (in high traffic areas and after dusk)
- Modified Level D:
- Tyvek or dust-resistant cloth coveralls - Dry work and areas of low contamination
 - Outer Rubber Slush Boots
 - Outer Chemically Resistant Gloves - Butyl/Neoprene
 - Hard Hat
 - Safety Shoes
 - Safety Glasses w/ side shields or goggles
 - Reflective Vest (in high traffic areas and after dusk)
- Level C:
- Half -face respirator with organic vapor/P-100 cartridges
 - Tyvek uncoated disposable coveralls
 - Outer Rubber Boots
 - Outer Chemically Resistant Gloves - Butyl/Neoprene
 - Hard Hat
 - Safety Shoes
 - Safety Glasses w/ side shields or goggles
 - Reflective Vest (in high traffic areas and after dusk)

5.3 Preliminary Minimum Protection Level for Workers by Site Activity

P. Gioioso & Sons personnel or their subcontractors will be performing most of these activities. The following represents the recommended minimum levels of PPE to be utilized while performing these tasks:

Mobilization/Demobilization.....	Level D
Fence Installation.....	Level D
Enclosure Construction.....	Level D
CIPP Work.....	Modified Level D
Excavation and Handling of Fill/Natural Soils by Contractor (clean).....	Level D
Excavation, loading of asbestos-contaminated soils,.....	Level C
laying pipe, backfilling soil inside enclosure	
Soil stockpiling of imported clean soil and handling clean fill	Level D
on-site by Contractor.	
Soils sampling and analysis (by Contractor)	Level D

5.4 Action Levels for Upgrade/Downgrade of Level of Protection

The action levels for the upgrade or downgrade of worker personal protective equipment have been based upon information published by the American Conference of Governmental Industrial Hygienists (ACGIH), the Occupational Safety and Health Administration (OSHA), and the United States Environmental Protection Agency (US EPA). The action levels are based upon established Permissible Exposure Limits (OSHA), Threshold Limit Values (ACGIH), and Short-Term Exposure Limits (ACGIH). The action levels have been established for each work activity/contaminant present.

5.4.1 ACM

The OSHA PEL for asbestos on a construction site is 0.1 fibers per cubic centimeter (f/cc). Personal samples will be collected for workers involved with asbestos abatement activities. In the event samples for asbestos are greater than 0.1f/cc, employees will be required to use half-face air purifying respirators at a minimum when performing soil excavation work inside the tented, ventilated enclosure.

5.4.2 Total Volatile Organics

The action level of 10 ppm sustained for ten minutes will be used for upgrade and downgrade of PPE using a level of total volatile organic compounds. In the event TPH is encountered, a level of 0.5 ppm for benzene will also be used as an upgrade/downgrade, based on one-half of the PEL for benzene.

The upper level of 250 ppm for VOCs for air-purifying respirators was established using five times the TLV for toluene. The level of 5 ppm for benzene is also based on 5 times the TLV for that compound. If levels for TVOC's exceed 250 ppm, or for benzene, 5 ppm for five minutes, then all work will cease, and the workers shall leave the work area, until additional assessment is made in conjunction with the CIH. If the level of protection will be upgraded above Level C, all work will temporarily cease and the CIH will be notified. Additional engineering controls will be implemented. This will not be performed until the HMM&SP is reviewed and amended to reflect the change in site conditions and controls.

5.4.3 Lead/Chromium/Cadmium &Particulates

Levels of lead, arsenic, chromium and cadmium in soils may be present, based on extrapolation of data from nearby properties. The concentrations are generally very low so it is unlikely that respiratory protection will be required in this project. In the event that airborne dust levels are elevated, half-face air-purifying respirators equipped with HEPA (P-100) filters and organic vapor cartridges will provide a high level of protection, where Level C is required. HEPA, now called (P-100) filters by definition, remove 99.97 percent of all particulates greater than 0.3 microns in size, and the organic vapor cartridges remove volatile organic compounds up to 1000 ppm in concentration. Airborne dust will be substantially larger sized particles. The protection factor afforded by the respirator will vary from individual to individual based on their ability to fit the respirator, and properly donning the respirator in use. Fit protection factors in excess of 10 are normally associated with half-face air purifying respirators.

Periodic visual observations and monitoring for total suspended particulate will be used as a surrogate measurement for lead, arsenic and cadmium exposures during excavation of fill. A limit based on a measurement of total suspended particulate of 0.25 mg/M^3 in the breathing zone is suitable to protect employees from exposures to lead and other metals. Using an estimated maximum value of lead of 600 mg/kg , twice the S-1 limit for lead in soil, at a dust limit of 0.25 mg/M^3 will be used as the criteria to upgrade protection to Level C, and a limit of 0.25 mg/M^3 will be used to implement dust suppression measures. The calculations are as follows:

$$\text{TSP Reading: } 0.6 \text{ mg/kg} \times 10^{-3} \times 0.25 \text{ mg/M}^3 \times 1,000 \text{ } \mu\text{g/mg} = 0.15 \text{ } \mu\text{g/M}^3. (< 1 \% \text{ of AL for lead})$$

5.5 Respiratory Protection

It is unlikely respiratory protection may be required for on-site personnel exposed to suspected hazardous contaminants through inhalation. Initially, excavation activities are assigned a protection level of Modified D or Level C, based on the job responsibility and the contamination present within the soils. This may be up or downgraded, based on initial monitoring results. In the unlikely event that volatile organic compounds are determined to be present at levels requiring an upgrade, then half-face respirators will be used.

If upgrading the site above Level C is necessary, all work will be stopped temporarily, and the HMM&SP will be reviewed. All employees who are required to wear air purifying respiratory equipment will be required to show proof of medical examination to the SSHO that indicates that the employee is capable of wearing such a device. Proof of initial and periodic training and qualitative or quantitative fit testing for use of air purifying respirators is also necessary.

5.6 Standard Operating Procedures for Respirators

In the event air contaminants are detected at levels requiring an upgrade, a half-face respirator with HEPA (P-100) filters and organic vapor/P-100 cartridges will be used. Respirators shall be cleaned daily according to procedures prescribed by the manufacturer. Cartridges will be used and replaced at least daily, or at any time if breakthrough is detected while in use. Negative and positive pressure fit checks will be performed daily by each individual respirator wearer upon donning the respirator. The following checks shall be performed on a daily basis in addition to the above:

- Exhalation Valve - pull off plastic cover and check valve for debris or for tears in the neoprene valve (which could cause leakage). Also check valve cover for tightness.
- Inhalation Valves (two) - screw off cartridges and visually inspect neoprene valves for tears. Make sure that the inhalation valves and cartridge receptacle gaskets are in place.
- Make sure a protective lens cover is attached to the lens. Lenses are expensive to replace and should be protected at all times.
- Make sure you have the right cartridge. Cartridges are not interchangeable among respirators.
- Make sure that the face piece harness is not damaged. The serrated portion of the harness can fragment which will prevent proper face seal adjustment.
- Make sure the speaking diaphragm retainer ring is hand tight (if applicable).

A detailed description of the respirator program is contained in SOP Number 2 attached to this HIMH&SP.

SECTION 6 - AIR MONITORING INSTRUMENTATION

6.1 Introduction

The following is a listing of on-site monitoring instrumentation that will be employed during the course of the site work for the determination of the level of protection to be worn by the site workers. Personnel who will be operating this instrumentation shall be fully trained and experienced in its use and operation. Monitoring within the enclosure and at the perimeter of the enclosure will be performed by the SSHO for P. Gioioso or their designee.

6.2 Site Monitoring Equipment for Employee and General Public Protection

- Photoionization Detector with 10.2 eV probe .
- Total Suspended Particulates (Dust-Trak or equivalent) - Used as needed for perimeter measurements and exclusion zone in breathing zone.
- Sample pumps for asbestos fibers

The photoionization monitor may be an H-Nu Model PI-101, Thermo Environmental Instruments OVM Model 580 B, Mini-RAE or the equivalent. The PID should be equipped with a 10.2 eV lamp to maximize sensitivity for TPH compounds. As an alternative, a Flame Ionization Detector (FID) may be used on site, however it is not recommended.

At a minimum exposure monitoring and air sampling during "Exclusion Zone" activities shall be performed in the breathing zone of the worker and at the upwind and downwind limits of the Exclusion Zone, and recorded at the following frequencies:

Total Organic Vapors: Surveyed and recorded at least every 60 minutes whenever measurements at the perimeter of the work area exceed 1 ppm above background for ten minutes, or 10 ppm for ten minutes in the excavation.

Total Particulates: Surveyed and recorded at least every 60 minutes and whenever measurements exceed 0.25 mg/M^3 within the enclosure or 0.075 mg/M^3 at the perimeter to the enclosure.

6.3 Air Monitoring Plan

6.3.1 Sampling for Asbestiform Fibers

Air monitoring for asbestos fibers will be performed within the enclosure for employee protection and air monitoring will be performed around the perimeter of the exclusion zone will be performed to assure the effectiveness of the controls in place.

Personal samples will be collected on individuals working within the enclosure. The personal samples will be collected by the SSHO or designated representative for P. Gioioso. The samples will be collected by drawing air through 25 mm mixed cellulose ester membranes using personal sampling pumps. The samples will be collected at flow rates of 2.0 to 2.5 liters per minute for the entire shift. Personal samples will be brought to an asbestos laboratory licensed in the Commonwealth of Massachusetts where they will be analyzed using phase contrast microscopy in accordance with NIOSH Method 7400.

Perimeter air samples will be collected in accordance with Section 2082 of the Specifications. Area air samples will be collected up to 50 feet from the boundary of the enclosure. The samples will be collected by drawing air through 25 mm mixed cellulose ester membranes at a flow rate of 8 to 10 liters per minute for a minimum period of two hours. The samples will either be analyzed on site or at an asbestos laboratory licensed in the Commonwealth of Massachusetts where they will be analyzed using phase contrast microscopy in accordance with NIOSH Method 7400. The analyst performing the analysis shall be on the Asbestos Analyst Registry.

In the event any two exclusion zone perimeter samples in a twenty-four hour period exceed 0.01 f/cc, the industrial hygienist for P. Gioioso will notify the City of Cambridge and W.R. Grace & Co. - Conn. All work will temporarily stop until the sampling is repeated. The work practices in use will be reviewed to make certain the best available practices are being implemented. Work will resume once the cause has been identified and corrected.

6.3.2 Sampling for Dust

Measurements will be collected for airborne dust periodically throughout the day when soil intrusive activities are underway within the enclosure. In addition, monitoring and increased soil wetting is required when there is visual evidence of dust. This monitoring will be performed visually and using direct-reading instrumentation. A meter capable of measuring total suspended particulates, such as a Dust-Trak or equivalent shall be used to measure airborne particulate levels. Work will be halted if visible dust is observed from work or other activities performed within an asbestos-regulated area. The general contractor will perform monitoring for airborne dust around the perimeter of the exclusion zone.

A level of 0.25 mg/M^3 is established for work within the enclosure. The limit is based on the use of particulate as a surrogate for metals and is described in Section 5.4.3. A level of 0.075 mg/M^3 is used for perimeter monitoring and is based on one-half of the National Ambient Air Quality Standard of 0.15 mg/M^3 for a twenty-four hour average concentration. If the dust level is exceeded and the source is from activity within the enclosure, work will be temporarily stopped until the dust suppression activities are reviewed. If the source is determined to be from non-work related activities (i.e. passing traffic or ambient conditions), no corrective actions will be required.

6.3.3 Sampling for VOC's

Monitoring for VOCs is performed with a 10.2 eV photoionization detector (PID) to measure total volatile organic compounds during excavation of fill during soil intrusive activities. The results of the monitoring will be used to implement engineering and work practice controls and to make upgrade and downgrade decisions in the level of required PPE.

A level of 10 ppm for a period of ten minutes will be used for activities inside the enclosure. A level of 1 ppm above the background for a period of ten minutes will be used for perimeter monitoring. Monitoring will also be performed in the event that odor complaints are received from abutters.

Given the potential for lead, chromium and cadmium exposure and the potential for ACM in the fill material, the data on the concentrations in the soil and the potential for employee exposure, it is Covino's professional opinion that risk to P. Gioioso & Sons employees is very low to low. It is Covino's opinion that the collection of full-shift breathing zone samples for lead, chromium and cadmium to comply with the "initial determination" requirements of 29 CFR 1926.62 OSHA Construction Lead and the chromium and cadmium standards is not required.

6.4 Calibration

When an instrument is used to monitor airborne concentrations of a known substance, it should be calibrated to that specific substance at a concentration comparable to the action levels or concentrations anticipated in the field. Since this is rarely the case, an instrument is typically calibrated in the field with a gas that is representative of the instrument's response to the widest variety of substances. In the case of the PIDs, isobutylene is typically used. The dust monitors are calibrated at the factory. Typically, no field calibration of the dust meters is required.

The direct reading air monitoring instruments used at the site must be returned to the factory and calibrated and checked out on an annual basis. The calibration must also be checked in the field at least two (2) times per day, including the beginning and ending of the shift, to establish a frame of reference and to verify that the instrument is working properly. The results of the calibration will be noted in the daily log.

6.5 Recording Air Monitoring Data

All particulate concentrations detected above the action levels at the exclusion zone and work zone boundary shall be recorded. The location, date, time, monitoring device, calibration data, and weather conditions (temperature, wind speed and direction) shall all be recorded on monitoring log sheets. Copies of all monitoring log sheets shall be included in the weekly report to the Engineer upon request. A summary of the sampling data, including the actions taken, and their effectiveness shall be included in the weekly report as well.

Information gathered during the air monitoring program shall be used by the SSHO to determine appropriate measures to be taken to protect employees, contractors and subcontractors during:

1. Soil excavation, trenching and removal
2. Soil stockpiling
3. Soil classification
4. Soil transport and removal

6.6 Air Monitoring Responsibilities

The CIH has established air monitoring strategies and sampling frequency to characterize and quantify any airborne release and transport of contaminants during soil excavation. These strategies and protocols address appropriate air monitoring for volatile organic compounds in the active work zones of the site and at the active site perimeter. The program is part of the HMM&SP. Monitoring will be performed by the SSHO for P. Gioioso & Sons or their designee

6.7 Prework Baseline Monitoring

Prior to commencement of work, the SSHO should establish and document a baseline concentration for asbestos fibers at the property line and at the perimeter of the exclusion zone. This establishes the contribution from non-project related sources such as automotive traffic, and local commerce that may impact on the project area. Since the work site is within a quarter-mile of Routes 2/3/16, a major commercial thoroughfare, the potential exists that background ACM and particulate levels may be elevated.

Air Monitoring Plan

Notes:

1. The duration of the monitoring measurements will be continuous.
2. All measurements will be taken in the breathing zone of the workers.
3. Readings for upgrade and downgrade decisions will be for a continuous 5 minute period.

Possible	Measuring	Initial Level	Level	Action
Soil Excavation Stockpiling/Reuse Sampling	TPH PID	Level D Modified D	>Background and < 10 ppm	Maintain at Level D or Modified D. At 5 ppm TVOC, start benzene monitoring
			>10 ppm and <250 ppm	Stop Work, Upgrade to Level C
			>250 ppm	Stop Work and Evacuate
Inside enclosure	Total Susp. Particulates Visual and/or Dust Trak	Level D	> Background < 0.25 mg/M ³	Maintain at Level D or Modified D.
			> 0.25 mg/M ³	Stop Work. Upgrade to Level C.
Perimeter	Total Susp. Particulates		> 0.075mg/M ³	Initiate Dust Suppression Program
Intrusive work Inside enclosure	ACM Personal Sampling	Level D	> 0.1 f/cc	Stop work and upgrade to Level C
Perimeter ¹	ACM Area Sampling	Level D	> 0.01 f/cc	Stop work and evaluate
Perimeter ¹	VOC's Area Sampling	Level D	> 1 ppm/10 min	Stop work and evaluate
Inside enclosure	VOC's PID	Level D/C	> 10 ppm/10 min	Stop work and upgrade to Level C (unless already at Level C for excavation)

1. Perimeter is defined herein as fifty feet (50') outside of the enclosure.

SECTION 7 - DECONTAMINATION

7.1 Introduction

Appropriate decontamination activities will be conducted whenever site workers have completed performing soil intrusive activities in the area(s) where contamination is known to exist, and where exposure to this contamination could cause risk to health of on-site workers in the absence of PPE defined for that area. Soil excavation will be limited to the vented enclosures. The excavator, roll-offs and all equipment used within the Site 1 enclosure and hand excavation tools within the Site 2 enclosure will be decontaminated and visually inspected by the SSHO before it is removed. Trucks and other vehicles that remain outside the enclosures do not require decontamination because they do not come into contact with soil from the excavation. The excavation will have a layer of crushed stone on top of the new lines. The trench in Site 2 will be backfilled with concrete. Decontamination water will be re-directed into the excavation using berms and similar measures. If decontamination water inadvertently falls on unpaved areas the top six inches of soil in that area will be removed and replaced with clean soil. If soils are stockpiled on unpaved surfaces, the top six inches of soil in that area shall be excavated following stockpile removal and replaced with clean soil.

\ The sign in/sign out record shall have a category to reflect that all equipment used in the Exclusion Zone has been decontaminated.

7.2 Personnel Decontamination

Decontamination procedures will be followed by all personnel leaving the Exclusion Zone. Under no circumstances (except emergency evacuation) will personnel be allowed to leave the site prior to decontamination. A three-chambered decontamination facility will be used as a personnel decontamination station. A potable water wash station will be available for washing hands and face. Designated locations will be identified for decontamination of personnel and equipment using portable barriers or stanchions, and barrier tape.

When worn, disposable items (i.e., Tyvek or dust-resistant cloth coveralls, inner gloves, and overboots) will be changed on a daily basis as required unless there is a reason to change sooner. Respirator cartridges will be changed daily, unless more frequent changes are deemed appropriate, such as breakthrough.

Portable wash down facilities such as water buckets, sprayers, hoses or other designated equipment will be available in the decontamination area for wash down and cleaning of personnel and equipment. All personnel will wash their face and hands before leaving the site. Given the short duration of the project, and the time of year, it is not anticipated that a wash facility will be required for employee decontamination. Portable bathrooms and wash stations will be provided by the General Contractor as described in Section 8.7 in this document, and in accordance with OSHA regulations on Sanitary Facilities.

If non-disposable equipment (i.e., boots, gloves, respirators, etc.) are visibly contaminated, they should be washed before leaving the contamination reduction zone for the next site. This water will be discharged back to the ground unless otherwise directed with guidance from the LSP. Workers are to segregate and store their personal protective equipment separate from their personal clothing. In no circumstances are workers allowed to take from the site or wear home any contaminated clothing or equipment.

7.3 Small Equipment Decontamination

Small equipment will be protected from contamination as much as possible by covering the instruments with plastic (to the extent feasible) without hindering operation of the unit. Contaminated equipment will be cleaned as needed. The units will be checked, standardized, recharged as necessary for the next day's operation, and then prepared with new protective coverings. Hand tools including shovels and buckets will be pressure washed and inspected by the SSHO before removal.

7.4 Heavy Equipment Decontamination

All equipment that shall enter the designated exclusion zone will be required to undergo decontamination prior to exiting from the enclosure. All decontamination activity will be undertaken at the location designated within the Site Control Plan. Care shall be exercised when loading lined roll-offs to prevent spillage of soil on the ground. The rolloffs will be lined off-site and delivered to the site with the plastic overlapping the outsides of the rolloff. Once filled, the plastic on the roll-offs will be pulled over the top of the soil, sealed with spray adhesive and taped. The outside of the roll-offs will be cleaned and washed, and the wash water discharged as described above. The roll-offs will be stored adjacent to the enclosure for a period not to exceed 48 hours prior to removal. The excavator will be first brushed to remove caked on soil and then pressure washed until visibly clean.

7.5 Disposal of Decontaminated Materials

All protective gear, decontamination fluids (for both personnel and equipment), and other disposal materials will be disposed of in accordance with the soil management plan and applicable regulations. Soiled personal protective equipment will be collected and placed in drums for later disposal.

SECTION 8 - EMERGENCY/CONTINGENCY PLANNING

8.1 Emergency/Contingency Plan

This section identifies the emergency contingency planning undertaken for operations at the site, and includes further information to be used under emergency conditions such as emergency telephone numbers, routes to emergency medical facilities and emergency signals.

8.2 Evacuation

Withdrawal Upwind - When conditions which endanger the safety or health of workers warrant moving away from the work site, the crew will relocate upwind at a distance of approximately 100 feet or farther, as indicated by site monitoring instruments. W.R. Grace & Co – Conn will be notified for the protection of facility employees in the event of an evacuation. The side of the Alewife Center parking lot will be used as the rally point for the Contractor employees in the event evacuation is ordered. This area will be discussed as safety meetings and marked with a sign and a yellow flag. In the event of withdrawal, the SSHO and a member of the crew (the buddy system must be used) may return to the work site to determine if the condition noted is transient or persistent.

If persistent levels of air contaminants remain, an alarm should be sounded to notify personnel of the situation and the need to leave the site. The site management will be notified of conditions. This alarm will be given using both a compressed air horn and portable radios, using a pre-arranged signal or tone, or message as described in the HMM&SP:

The following signals will be used to indicate an emergency situation:

- One long blast repeated three times at five second intervals - Man down
- Three short blasts repeated three times at five second intervals - Evacuate site
- Alternating short and long blasts - All clear

When site access is restricted, thus hindering escape, the crew may be instructed to evacuate the site rather than move upwind, especially if withdrawal upwind moves the crew away from escape routes. The Contractor and/or subcontractors will have designated "counters" with the responsibility to account for all employees and visitors in the event of an evacuation.

Site Evacuation - When conditions warrant site evacuation, the work party will proceed upwind of the work site and notify the SSHO, security force, and field office of site conditions. The Project Manager, Site Foreman or SSHO have authority to order an evacuation of the site.

In the event that an emergency condition is identified, the Contractor shall notify the City of Cambridge Fire Department utilizing 911. The Fire Department shall have jurisdiction for providing communications to the greater community.

8.3 Chemical Release

In the event of any spill, release or discovery of soil, water or groundwater contamination, notice should be given to Somerville Hospital (See Section 8.9), W.R. Grace & Co - Conn and the Project Engineer as soon as possible after such discovery to insure the safety of those working on the site as well as for making proper notification for regulatory reporting requirements. Any such required reporting to MADEP should be made by W.R. Grace & Co - Conn as the Property Owner or their designated LSP with the exception that, any release caused by the contractor must be reported by the contractor or the contractor's LSP to the DEP within the timeframe provided under the MCP.

8.4 Emergency Medical Treatment/First Aid

First aid will be rendered to any person injured on-site, as appropriate by any individual trained in First Aid/CPR. At least one trained person will be on site at all times during soil excavation work. First aid kits will be kept in the project trailer and in a Supervisor's vehicle. Following initial treatment, the injured person will then be transported for further examination and/or

treatment. The preferred transport method is a professional emergency transportation service; however, when this is not readily available or would result in excessive delay, other transport is authorized. Under no circumstances will injured persons transport themselves to a medical facility for emergency treatment.

If an injury occurs in an Exclusion Zone area, provisions for decontamination of the victim will be made. However, life-threatening conditions may preclude normal decontamination procedures. In such cases, arrangements will be made with the medical facility and transporter to provide for the situation.

8.5 Heat Stress

SOP #3 deals with the signs, symptoms and first aid for heat stress victims. Monitoring for heat stress should begin whenever the work area temperature exceeds 70° F. All employees will be trained in recognition of the signs and symptoms of heat stress and will be required to do proper monitoring whenever they feel it is necessary. Any employee who feels that they are suffering the effect of heat stress shall inform the SSHO immediately.

P. Gioioso & Sons employees shall follow the recommendations for monitoring requirements, and suggested work/rest schedules for heat stress found in the ACGIH-02, TLV Booklet (2008). For workers who wear semi-permeable or impermeable clothing (i.e. Saranex or PVC coated Tyvek), the technical guidelines in NIOSH Publication 85-115 shall be observed. The project is scheduled to start in the Fall of 2010, and site activities will continue for about eighteen months. Given the duration of the contract, the level of PPE for most tasks and an opportunity for acclimatization, heat stress is not likely to become a significant issue on this project.

The procedures for monitoring heat stress shall be to measure the radial heart rate (pulse) during a 30 second interval at the beginning of a rest period. If the heart rate exceeds 110 beats per minute, shorten the next work cycle by one-third, while keeping the rest period the same length. If the heart rate exceeds 110 beats per minute at the beginning of the next rest period, shorten the following work cycle by one-third. Continue monitoring and shortening work cycles until the

heart rate is less than 110 beats per minute. Fluids will be available in the Support Zone for employees to maintain fluid intake during warm work periods.

8.6 Cold Stress

SOP #3 deals with the signs, symptoms and first aid for cold stress victims. Monitoring for cold stress should begin whenever the work area temperature drops below 50° F. Employees should be aware of the symptoms of cold stress and frost bite. If any signs or symptoms appear, report it immediately. The project is scheduled to start in the Fall of 2010, and site activities will continue for about eighteen months. Cold stress is not likely to become an issue for this project. In the event of extreme cold conditions, procedures to monitor and avoid cold stress shall be followed in accordance with the current TLV's for Cold Stress as recommended by ACGIH. This includes the use of layered clothing, periodic breaks in a heated area, and the use of warm non-alcoholic beverages.

8.7 Illumination

Site operations will not be permitted without adequate lighting: a least 5 foot candles is required for work on the site. Therefore, unless provisions are made for artificial light, downrange operations must halt in time to permit personnel and equipment to exit the Exclusion Zone and proceed through decontamination before dusk. Equally, operations will not begin in the morning until lighting is adequate.

8.8 Sanitation

Provisions have been made for temporary sanitation facilities for the work force. At a minimum, the provision of toilet facilities will meet the requirements of 29 CFR 1910.120(n), which includes one facility for less than 20 employees, or one toilet and one urinal for every 40 employees, up to 200; then one of each for every 50 employees. Facilities shall be provided to allow employees to wash hands and face with soap and water at breaks, end of shift and when using sanitary facilities.

8.9 Emergency Information

EMERGENCY RESPONSE

Primary

EMERGENCY NUMBERS

AMBULANCE	9 - 1 - 1 (City of Cambridge)
POLICE DEPARTMENT	9 - 1 - 1 (City of Cambridge)
FIRE DEPARTMENT	9 - 1 - 1 (City of Cambridge)
HOSPITAL	Somerville Hospital (Cambridge Health Alliance) 230 Highland Avenue (Emergency Department) Somerville, MA
HOSPITAL CONTACT:	(617) 591-4500 (Main Number)

EMERGENCY ROUTES TO From site, head west on Whittemore Avenue toward Kimball Street. Take 1st **RIGHT** on Kimball Street. Take 1st **RIGHT** on Columbus Avenue. Continue 0.2 miles. Turn **RIGHT** on Massachusetts Avenue. Continue 1.0 mile. Turn **LEFT** on Beech Street. Continue 0.1 miles. Turn **RIGHT** on Elm Street. Immediate turn **LEFT** on Willow Avenue. Turn **RIGHT** on Highland Avenue. Continue 0.5 miles. Follow signs for Emergency Department. Travel Time 8 minutes.

OTHER EMERGENCY NUMBERS

DEP: Northeast - Wilmington	PHONE: (978) 694-3200
DEP Emergency Telephone	PHONE: (888) 304-1133
MASSACHUSETTS STATE POLICE Troop H-4 - 250 Leverett Circle, Boston	PHONE: (617) 727-6780
Massachusetts Poison Control	PHONE: (800) 222-1222
City of Cambridge Dept. of Public Works	PHONE: (617) 349-4800

W.R. Grace & Co.-CONN – David Croce	PHONE 617.498-4416
City of Cambridge Inspectional Services	PHONE: (617) 349-6100
P. Gioioso & Sons – Mario Romania	CELL: (617) 592-3791 OFFICE: (617) 364-5800
P. Gioioso & Sons – Sam Doolan	CELL: (617) 592-3782 OFFICE: (617) 364-5800
EMP – Ted Patch	CELL: (781) 254-8364 OFFICE: (781) 834-3822
Covino Environmental, Inc. CIH - Scott Herzog	PHONE: (781) 933-2555 CELL : (978) 460-1904 EMERGENCY: (781) 933-2555 and follow directions to leave emergency page.
Bruno Cardarelli, Kleinfelder • S E A Chief Resident Engineer	CELL: (617) 799-4374
DIGSAFE	(888) DIG-SAFE

PROCEDURES FOR HANDLING PERSONNEL WITH EXCESSIVE EXPOSURE TO CHEMICALS OR CONTAMINATED SOIL

Decontamination will be done at a location that is convenient to the area where the Emergency Response actions are occurring, in an upwind location. The decision to decontaminate a victim is based on the type and severity of the illness or injury and the nature of the contaminant. For some emergency victims, immediate decontamination may be an essential part of life-saving first aid. For others, decontamination may aggravate the injury or delay life-saving treatment. If decontamination does not interfere with essential treatment, it will be performed and will include a wash, rinse and/or cut off of protective clothing and equipment.

If decontamination cannot be done, the victim will be wrapped in blankets, plastic or rubber to reduce contamination of other personnel. Emergency and off-site medical personnel will be

alerted to potential contamination. A site person familiar with the incident and the chemicals will be sent if available.

Fire/Explosion

Upon notification of a fire or explosion on-site, all personnel will evacuate the site, immediately proceed upwind to the agreed upon evacuation location. The City of Cambridge Fire Department and W.R. Grace & Co – Conn shall be alerted along with the Project Manager. Upon their arrival, the senior responding officer for the Fire Department shall assume the role of incident commander. All P. Gioioso & Sons personnel shall take directions from the incident commander and assist with any given directions.

Personal Protective Equipment Failure

If any site personnel experience a failure or alteration of protective equipment that affects the protection factor, that person and his/her buddy shall immediately leave the exclusion zone. Re-entry shall not be permitted until the equipment has been repaired or replaced.

Other Equipment Failure

If any other equipment on-site fails to operate properly, the SSHO shall be notified to determine the effect of this failure on continuing operations on-site. If the failure affects the safety of on-site personnel or prevents completion of the tasks, all personnel shall leave the exclusion zone until the situation is evaluated and appropriate actions taken.

In all situations, when an on-site emergency results in evacuation of the exclusion zone, all personnel shall not re-enter until:

1. The conditions resulting in the emergency have been corrected.
2. The hazards have been reassessed.
3. The Site Safety Plan has been reviewed.
4. All site personnel have been briefed on any changes in the HMM&SP.

SECTION 9 - RECORDKEEPING, LOGS, AND REPORTS

9.1 General Requirements

All required records, logs and forms will be maintained according to the appropriate regulations. This includes all safety inspection reports, site entry log, accident/incident reports, monitoring log, medical certifications, first aid/CPR, 40 hour training, current 8-hour refresher training, current 8-hour supervisor training, hazard communication training, air monitoring results, etc.

All exposure and medical monitoring records will be maintained according to OSHA 29 CFR 1910.20 (Access to Records), 29 CFR 1910.120 (Hazardous Waste Operations and Emergency Response) and 29 CFR 1926.

All personnel conducting activities that may involve direct contact with asbestos fibers, including soils, loading trucks and sealing filled truck lining will have at minimum, 32 hours of asbestos abatement worker's training and be certified by the Massachusetts DOS as abatement workers. All removal activities will be overseen by a DOS-certified abatement supervisor.

9.2 Daily Safety Inspection Logs

The daily safety inspection log will include as a minimum:

1. Date
2. Area (site specific) checked
3. Employees in a particular area
4. * Equipment being utilized by employees
5. Protective clothing being worn by employees
6. Protective devices being used
7. Contractor's Personnel
8. Visitors
9. Designated State and Federal Representatives
10. Air Monitoring Data
11. Site Safety and Health Officer signature and date

9.3 Other Reports

Other reports to be maintained by the SSHO include a weekly report detailing the monitoring results, actions taken, and the results of those actions; minutes of required safety meetings; and a phase-out report to be prepared at the conclusion of the project. All reports will be maintained in duplicate by P. Gioioso & Sons .

STANDARD OPERATING PROCEDURE
NUMBER 1
Personal Protective Equipment Program

Standard Operating Procedure
Personal Protective Equipment Program

I. PURPOSE

To provide minimum requirements for protection of employees, visitors and contractors from injury or ill health through the proper selection and use of Personal Protective Equipment (PPE).

II. PROGRAM RESPONSIBILITIES

- A. The Site Safety and Health Officer is the personal protective equipment administrator and has the responsibility to:
1. Coordinate the program.
 2. Insure that annual training is conducted.
 3. Review the program annually.
- B. Supervisors are responsible for informing workers of the personal protective equipment requirements within their department/area. The supervisor will also ensure that workers have been instructed in the proper donning, wearing, removal and the cleaning or disposal procedures for such equipment, and that the worker has understood the instructions. The supervisor will provide additional instructions as needed, and will strictly enforce site rules related to PPE use.
- C. Workers are responsible for properly donning, wearing, removing, cleaning, and disposing of the required protective equipment.
- D. The Site Health and Safety Officer (SSHO) is responsible for ensuring that Contractors provide their own protective equipment as specified in this Program.
- E. The SSHO is responsible for maintaining the site PPE inventory control program.
- F. The Project Manager and SSHO are responsible for the purchase of PPE, including respiratory protection.

III. GENERAL REQUIREMENTS

- A. Employees shall only use personal protective equipment supplied by the company.
- B. Visitors will be supplied with the appropriate personal protective equipment.
- C. Personal protective equipment requirements are posted in the site specific Health and Safety Plan.

- D. Disposal of PPE and cleaning of reusable PPE is governed by the procedures specified in the Respirator Program.
- E. Written procedures governing the safe use of PPE that might be required in an emergency are contained in this Standard Operating Procedure. These plans also contain the training requirements for emergency PPE.

IV. CHEMICAL PROTECTIVE CLOTHING

- A. Selection of Chemical Protective Clothing (CPC) will be based on the following:
- Manufacturers' instructions and degradation, penetration permeation data
 - Published literature such as the ACGIH Guidelines Selection of Chemical Protective Clothing
- Selected clothing will be contained in the HMH&SP.

V. PPE INSPECTION

- A. Respirators will be inspected in accordance with the Respiratory Protection Program.
- B. Other PPE should be inspected prior to use by the wearer. Inspection considerations should include: obvious signs of contamination; tears and holes; proper function of closures; seams, etc. Sample PPE inspection checklists are found in Standard Operating Procedure 2.
- C. PPE stored for emergency use should be inspected monthly.

VI. STORAGE

Storage of PPE at the site will follow the following general guidelines.

- A. Boots are decontaminated and stored on a boot rack at the hot line to dry.
- B. Disposable protective clothing may be stored before use at the hot line. However, a covering or other method should be provided to prevent contamination. Disposable clothing articles are placed in waste containers at the hot line after being removed. Disposable clothing is not to be reused.
- C. Respirators are stored in accordance with the Respiratory Protection Program. They should not be stored in the open air in contaminated areas.
- D. Reusable PPE should be stored in accordance with manufacturer's instructions to prevent equipment failure.
- E. Potentially contaminated coveralls worn under disposable coveralls, are stored in containers in a separate area from street clothing.

VII. WORK MISSION DURATION

Since the work mission durations vary from site to site and task to task, it will be the responsibility of the Project Manager and the SSHO to maintain adequate supplies of PPE and breathing air to accomplish the work mission and comply with this program.

STANDARD OPERATING PROCEDURE

NUMBER 2

Respiratory Protection Program

AIR PURIFYING RESPIRATORY PROTECTION

RESPIRATOR TRAINING OUTLINE

- A. Training of respirator wearers in the use, field maintenance, capabilities and limitations of respirators is given initially upon employment to all employees whose work will require the use of respirators, or where an employee changes into a job classification which requires respiratory protection. Retraining is given at least annually thereafter. No employee is allowed to wear a respirator in a work situation until he or she has been trained.
- B. Each employee is trained as follows:
1. Instruction in the nature of the respiratory hazards, and what may happen if the respirator is not used properly.
 2. An explanation of the engineering and administrative control measures being used and why respirators are needed to provide protection.
 3. Instruction in the selection, use, sanitary care, maintenance, proper storage, and limitations of each applicable respirator type.
 4. Demonstrations and practice in proper fitting, wearing, adjusting, and checking the face-to-face piece seal of each applicable respiratory type.
 5. An opportunity to handle the respirator and to wear it in a safe atmosphere for an adequate period of time to ensure familiarity with the characteristics of the respirator.
 6. An opportunity to wear the respirator in a test atmosphere (such as atmospheres generated by smoke tubes or isoamyl acetate) to demonstrate that the respirator protects the worker.
 7. Instructions in how to recognize and cope with emergency situations requiring respiratory protection.
 8. An explanation of the requirement for a self-contained breathing device for work in unknown concentrations and immediately dangerous to life or health (IDLH) atmospheres, and for fire fighting.
 9. An explanation of the medical surveillance program as it relates to the use of respiratory protective equipment.
 10. An explanation of the requirements for maintaining the respirator gas-tight seal, including beard and facial hair policies; and the policy prohibiting the use of contact lenses while wearing respirators.

- C. Records of the training given each individual are placed in the employees training record file.

Respirator Fit Test Form

Employee Name		
Respirator Type (1)		
Face Piece (2)		
Make, Model		
Size		
Cartridge Used		
Test (3)		
Normal Breathing		
Deep Breathing		
Side to Side		
Up and Down		
Speaking		
Bending		
Jogging		
Normal Breathing		
Sensitive to Smoke		
Pass (P) or Fail (F)		

Comments: _____

Person Conducting Fit Test: _____ Date: _____

(1) Respirator Type: AP (air purifying); SA/SCBA (supplied air with SCBA escape bottle); SCBA (self-contained breathing apparatus)

(2) Face Piece: F (full face); H (half mask)

(3) Test: IS (irritant smoke); QN (quantitative)

Monthly Written Respiratory Protection Program Evaluation

11 Points of 29 CFR 1910.134

- 1. There are written standard operating procedures governing the selection and use of respirators.
- 2. Respirators are selected on the basis of hazards to which the worker is exposed.
- 3. Approved or accepted respirators are used when they are available.
- 4. The user is instructed and trained in the proper use of respirators and their limitations.
- 5. Where practical, the respirators are assigned to individual workers for their exclusive use.
- 6. There are regular inspection and evaluations to determine the continued effectiveness of the program.
- 7. Persons will not be assigned to tasks requiring the use of respirators unless it has been determined that they are physically able to perform the work and use the equipment; i.e., medically qualified.
- 8. Respirators will be regularly cleaned and disinfected.
- 9. Respirators will be stored in a convenient, clean and sanitary location.
- 10. Respirators used routinely will be inspected during cleaning.
- 11. Appropriate surveillance of work area conditions and degree of employee exposure or stress will be maintained.

Reviewed by: _____ Date of Review: _____

STANDARD OPERATING PROCEDURE

NUMBER 3

First Aid for the Identification of Heat Exhaustion or

Heat Stroke, and Hypothermia

IDENTIFICATION AND TREATMENT OF HEAT EXHAUSTION OR HEAT STROKE

1. Heat Exhaustion

A. Symptoms: Usually begins with muscular weakness, dizziness, nausea, and a staggering gait. Vomiting is frequent. The bowels may move involuntarily. The victim is very pale, his skin is clammy, and he may perspire profusely. The pulse is weak and fast, breathing is shallow. The victim may faint unless he lies down. This may pass, but sometimes it persists and, while heat exhaustion is generally not considered life-threatening, death could occur.

B. First Aid: Immediately remove the victim to the decontamination area in a shady or cool area with good air circulation. Remove all protective outer wear. Call a physician. Treat the victim for shock. (Make the victim lie down, raise feet 6-12 inches, maintain body temperature but loosen all clothing.) If the victim is conscious, it may be helpful to give sips of water. Transport victim to a medical facility.

2. Heat Stroke

A. Symptoms: This is the most serious of heat casualties due to the fact that the body excessively overheats. Body temperatures often are between 107-110° F. The victim will have a red face and may not be breathing. First there is often pain in the head, dizziness, nausea, depression, and a dryness of the skin and mouth. Unconsciousness follows quickly and death is imminent if exposure continues. The attack will usually occur suddenly. Heat stroke is always serious.

B. First Aid: Immediately evacuate the victim to a cool and shady area in the Decontamination Reduction Zone. Remove all protective outer wear and all personal clothing. Lay the victim on his back so that the head and shoulders are slightly elevated. It is imperative that the body temperature be lowered immediately. This can be accomplished by applying cold wet towels, ice bags, etc., to the head and groin. Sponge off the bare skin with cool water or rubbing alcohol, if available, or even place in a tub of cool water. The main objective is to cool without chilling. Give no stimulants. Transport the victim to a medical facility as soon as possible.

IDENTIFICATION AND TREATMENT OF FROSTBITE

Frostbite is a localized injury, resulting from a freezing of tissue. It is most common to the fingers and toes due to reduced circulation in the extremities and on the face and ears as they are most commonly exposed (uncovered) to the weather.

For frostbite to occur, there must be subfreezing temperatures. It is most prevalent in very cold temperatures or when cold temperatures are extenuated by the wind (wind chill).

A. Symptoms

1. Pre-Frostbite - Affected area feels painfully cold, but usually flushed (red-rosy) in color.
2. First Degree Frostbite (frost nip - Crystallization in superficial tissues. Affected area no longer feels cold, and is completely numb. Skin coloration is a small P. Gioioso & Sonsor grayish-yellow waxy patch. Immediate treatment will completely reverse the condition with no ill effects.
3. Second Degree (Deep) Frostbite - A deep freezing of the fluids in the underlying soft tissues. Symptoms and treatment are the same as for above. Usually results in a death of tissue, blistering, black skin, loss of toes, etc., with possible complications from gangrene.

B. First Aid

1. Cover and protect the affected part
2. Provide extra clothes
3. Bring indoors as soon as possible
4. Give warm drink
5. Re-warm frozen part quickly by immersing in warm water (if thawed and refrozen, warm at room temperature)
6. Do not rub - causes tissue death
7. Do not apply direct heat

8. Do not break blisters
9. Do not allow to walk after feet thaw
10. Discontinue warming as soon as part becomes flushed
11. Exercise thawed part
12. Separate fingers and toes with sterile gauze
13. Elevate frostbitten parts
14. Seek medical attention because of chance of infection, or gangrene.

C. Treatment

For all frostbite - rapid re-warming (thawing) as soon and as quickly as possible is the preferred treatment. Do not warm tissue that will only be refrozen, or warm feet if they are to be walked upon. Second degree frostbite requires medical attention and the victim should not be re-exposed to the cold.

D. Prevention

1. Fatigue, cigarettes, alcohol, lack of food and drink, clothing which restricts circulation, and any other factors which reduce circulation will contribute to frostbite.
2. Properly insulate all body parts. Extreme cold may require a face mask. Use insulated gloves and boots.
3. Winds and wetness will accentuate frostbite. Keep dry and do not expose skin to the wind.
4. Be observant of each other. Look at ears, rosy cheeks, etc. Often the victim does not realize he has frostbite.

IDENTIFICATION AND TREATMENT OF HYPOTHERMIA

Hypothermia is a systematic lowering of the body temperature. Extreme cases (core temperature below 90° F) result in death of the victim. Hypothermia is the most common cause

of death for persons involved in outdoor wilderness sport activities. It does not require freezing temperatures and, in fact, can occur in ambient temperatures as high as 70° F. Wind and wetness greatly accentuate hypothermia due to the enhanced cooling. Typical hypothermia conditions are a rainy, windy day with 50° F air temperatures.

A. Symptoms

1. First Stage: goose bumps, shivering, feeling chilly
2. Second Stage: violent shivering, blue lips, pale complexion, feeling extremely cold
3. Third Stage: no longer feel cold, lack of coordination, mild unresponsiveness, drowsiness, stumbling
4. Fourth Stage: failing eyesight, victim barely responsive, cannot speak, barely able to or cannot walk.
5. Fifth Stage: coma and rapid death

B. Treatment

For all levels - remove wet, frozen or restrictive clothing. Dry the victim. Re-warming should be via an external heat source which completely envelopes the victim - a warm vehicle, a warm room, a sauna, a tub of warm water, by placing the victim in a sleeping bag with another person(s), etc. - and not a source of radiant heat which will warm only one side of the victim. Be prepared to administer CPR. Do not give the victim alcohol.

1. First Stage: Put on hat, shirt, additional clothing, wind breaker, etc. Eat and drink. Exercise on tense muscles.
2. Second Stage: Same as above, only more so. Warm drinks and re-warm if possible.

NOTE: In hypothermia beyond second stage, the victim can no longer warm himself and must have an external heat source.

3. Third Stage: Re-warming, warm food and drink.
4. Fourth Stage: Remove wet or cold clothing and gradually re-warm victim so that blood trapped in extremities is re-warmed before it is circulated back into inner body to prevent afterdrop. Afterdrop is a further lowering of the body core temperature which results from recirculation of cold blood. Avoid hot, radiant heat sources which will warm surface blood before inner blood has been warmed. Do not give warm drinks which fool the body internally into feeling it is warm. Fourth stage hypothermia victims are best treated by supervised, experienced medical help, as complications can cause death. Place victim in warm vehicle and evacuate immediately to a medical facility.
5. Fifth Stage: Gradual re-warming, but requires sophisticated medical help to prevent death from aftershock (a recirculation of chilled blood causing heart fibrillation).

C. Prevention

1. Wear proper clothing which will insulate the body, keep it dry and break the wind.
2. Cover the head, neck, wrists, and ankles in particular, as heat loss is most prevalent from these points.
3. Eat and drink warm fluids. Avoid eating snow.
4. Keep active to raise body temperature.
5. Avoid fatigue, alcohol, smoking and drugs.
6. Be aware of team members' condition and note symptoms.

STANDARD OPERATING PROCEDURE

NUMBER 4

Confined Space Entry Policy

CONFINED SPACE ENTRY PROCEDURES

A. Confined Space Classification

OSHA has recently implemented the "Permit-Required Confined Space Entry" Standard. This regulation establishes a series of requirements for spaces which meet the definition of a permit-required confined space. In this project, trenches or excavations in excess of five feet in depth which will be entered by employees, meet the definition of a confined space. For each of these spaces, if there is a potential for exposure to an oxygen-deficient, toxic, or combustible environment, or if there is the potential for entrapment or engulfment due to soil stability, or rain, that space meets the definition of a permit-required confined space.

Entry into confined spaces may be required by subcontractor employees. Utility work is a major portion of this project. Manhole entry into new and existing utilities will be required throughout the project. It is not anticipated that entry by J. H. Welch & Sons personnel will be required. Employees have been trained and in the event entry is required for inspection, it will be performed in conjunction with the subcontractor.

Entry to this space requires the issuance of an entry permit, along with a series of requirements for training, supervision of the entry, and preparation for a rescue, should one be required. Prior to entry, the trench or excavation must also be properly trenched, shored, or benched to prevent spillage of dirt into the hole where workers are present.

B. Entry Procedures

Team Size - A minimum of three workers is required for each confined space activity (two entry and one standby; or one entry, one rescue, and one standby).

The one entry/one rescue/one standby arrangement should only be used when the confined space is relatively small and/or the entry person will be in the line of sight at all times. In this instance, the rescue person acts as the second person in the "buddy system."

The two entry/one standby arrangement is used when the area of the confined space is larger, and the tasks may take the worker away from the entryway. Again, care must be taken with this arrangement because the standby person cannot enter the confined space and attempt rescue unless adequately protected (i.e., respiratory and dermal) and replaced by another qualified standby person.

This number of workers is the minimum buddy for these activities and, in most cases, should only be used for relatively nonhazardous confined spaces. Additional crew may be needed if entering a permit-required confined space. Additional crew could include rescue, decontamination, and line-of-sight personnel.

C. General Entry Procedures

The following steps must be taken when entering a confined space:

1. Inspect all pieces of equipment to ensure they are in good working order. **DO NOT ENTER CONFINED SPACE WITH DEFECTIVE EQUIPMENT.**
2. Conduct a background check to identify all potential hazards that may be encountered in the confined space. Determine if there is a potential for fire/explosion hazards, as well as a potential for a toxic or oxygen-deficient atmosphere.
3. Before entry, the atmosphere inside the confined space must be tested. An attempt should be made to test the atmosphere without opening the entryway (i.e., through a vent line or a small opening). If the entryway must be opened to test and only low levels are expected in the confined space, crack open entryway, test breathing zone first, and then test the confined space. If potentially high levels are expected in the breathing zone, respiratory protection should be worn prior to opening the entryway cover.
4. If explosive, toxic, or oxygen-deficient atmosphere is detected, purge or ventilate the confined space prior to entry. Retest the atmosphere three times at 5-minute intervals. A person can enter the confined space without respiratory protection only if all three test results are below the Permissible Exposure Limit/Threshold Limit Value (PEL/TLV), 10 per cent of the LEL, and above 19.5 per cent oxygen (all three conditions must be met).

(NOTE: Any downward deflection of the readings on the oxygen meter from background (i.e., 20.9 per cent) should be viewed as a potential for an IDLH atmosphere. Unless contaminants are known to be nontoxic, do not enter the confined space without respiratory protection if the oxygen level is below background.)

5. Blank, double block and bleed, or otherwise isolate, lockout, and tag all chemical, physical, and/or electrical hazards wherever possible. Reduce all forms of energy to a zero energy state.
6. If using an air-purifying respirator or if an IDLH and/or explosive atmosphere exists, air monitoring must be on a continuous basis. If respiratory protection is not used and there is potential for atmospheric conditions to change due to work practices or conditions, air monitoring should be done periodically. In all these cases, a 5-minute escape pack must be used.
7. Record all results of the tests for hazardous conditions including the location, time, date, weather (if applicable), and readings on the PID, combustible gas meter, oxygen deficiency meter, Drager tubes, and any other equipment.
8. Wear appropriate clothing for site conditions, as determined by the Site Safety and Health Officer (SSHO).
9. A safety belt or harness with lifeline must be worn if hazardous conditions exist, although good safety precautions dictate their use regardless of "existing" conditions. If the

diameter of the entryway is less than 18 inches, the wrist-type harness must be used and special provisions made if a supplied air respirator is necessary.

10. One person (standby) must remain at the entryway at all times and must keep continuous contact with the person entering the confined space. Contact can be maintained by line-of-sight, listening for sounds, the safety line, and/or radio. The standby person must not enter the confined space unless another trained person is available to act as standby, and he/she is equipped with adequate respiratory and dermal protection. (In most cases, respiratory protection would be an airline respirator or SCBA.)
11. Do not smoke when working in or near confined spaces and do not take flash-lighted photographs when explosive gases are known or suspected to be present.
12. Do not rely on permanent ladders because they are often in poor condition. If they must be used, be sure of footing. Inspect permanent ladders for deterioration before entering and while descending. Try each step with one foot, while standing on the step above. When in doubt, use a portable ladder of adequate height to reach 3 feet above opening or a rope ladder, or lower the entry person using the tripod. If a portable ladder is used, it should be tied off, if possible; otherwise, it should be held in place by the standby person.
13. Do not work without adequate lighting. Use only "explosion-proof" lights or hand lamps.
14. The entry person must not remain in the confined space if he/she becomes even slightly drowsy, faint, dizzy, or otherwise uncomfortable. Many of the gases that cause the most problems are odorless, tasteless, and invisible.

D. MANHOLE/SEWER ENTRY

There are no reported plans to enter manholes or sewers as a part of this project. The following information is included in the event the scope changes to include such activities. The Plan should be reviewed at that point, prior to any entry to a manhole or sewer. When preparing to enter a manhole/sewer, the following safety measures must be taken:

1. Inspect all pieces of equipment to ensure they are all in good working order. **DO NOT ENTER CONFINED SPACE WITH DEFECTIVE EQUIPMENT.**
2. Park the vehicle near the manhole (do NOT leave the vehicle running). If the manhole is in the street, it is best to park so as to detour oncoming traffic around the manhole. The vehicle's emergency flashers and portable yellow warning beacon must be ON. The vehicle serves as protection from oncoming traffic, can be used to store emergency equipment (e.g., SCBA and first aid kit), and can be used in an extreme emergency to slowly pull an injured person from the confined space if a tripod with hoist attachment is unavailable or inoperative.
3. Erect portable barricades or cones around the manhole and in front of the vehicle to see that traffic is adequately diverted and to prevent pedestrians from falling in. Reflective vests should be worn so that workers are visible to approaching traffic.

4. If there are openings large enough to admit sampling tubes, test for the presence of explosive and toxic gases before removing each manhole cover. Otherwise, raise one side of the cover using the cover hook or pick, prop it slightly open, and conduct the tests.
5. If toxic or explosive gases are detected in the sewer, report this immediately to the local Fire Department and/or Department of Public Works.
6. Record the results of tests for hazardous conditions, including location, manhole number (if applicable), time and date, weather (if applicable), and the readings on the PID, combustible gas meter, oxygen deficiency meter, and Drager tube.
7. Remove manhole covers with a cover hook or pick; do not improvise. Be careful of fingers and toes; the cover is usually heavy and difficult to handle. Unless the cover is extremely heavy, it is safer for only one worker to handle it.
8. Test the atmosphere; if a toxic, flammable, or oxygen-deficient atmosphere exists, ventilate the sewer. Depending on the hazard, ventilation can be accomplished in a variety of ways: for example, (1) remove and vent the adjoining upstream and downstream manhole covers, as soon as possible, and well in advance of entering the manhole (high hazard); and (2) vent the manhole in which entry will occur (very low hazard). If a blower is used, it is desirable to establish a flow of air in the sewer, in one manhole and out another. Ensure that the air intake is well away from automobile exhaust, and combustible and/or toxic atmospheres. Appropriate traffic control measures must be taken by barricading or otherwise marking the open manholes.
9. After ventilating, test for explosive and toxic gases and oxygen deficiency in the manhole at ground level and at the bottom; record results. If entering the sewer itself, make the same tests at the manholes at either end. If ventilation is necessary, monitor the atmosphere in the manhole while work progresses, or continue operation of the blower. Continuous monitoring (i.e., equipment ON during entire entry) is imperative because conditions within the sewer may change rapidly. Do not enter a manhole while there is an oxygen deficiency without a pressure-demand, air-supplied breathing apparatus. If the oxygen level is lower than 20.9 per cent of background, caution must be taken because an IDLH atmosphere may exist.
10. When entering manholes or tanks, wear hardhats, protective clothing, and unless inappropriate, respiratory protection and safety belt or harness with lifeline. If the manhole is less than 18 inches in diameter, a wrist-type harness must be used and special provisions made if air-supplied respirators are necessary. When working in manholes greater than 12 feet deep, in the sewer itself, or where potential exists for gases to appear unexpectedly, a 5-minute emergency egress air supply is required (unless the time required to don the emergency respirator is greater than what would be needed to exit the manhole.)
11. At least one person (i.e., standby) must remain at the manhole at all times and must keep continuous contact with the person entering the sewer. Contact can be maintained by line-of-sight, listening for sounds, and the safety line and/or radio. The standby person must not enter the manhole unless another trained person is available to act as standby and has adequate respiratory and dermal protection available. (in most cases, respiratory

protection will be an airline respirator or SCBA). The standby/rescue person should be suited up (but not yet on air) before the work crew enters the confined space.

12. Do not smoke when working in or near manholes. Do not take flash-lighted photographs when explosive gases are known or suspected to be present.
13. Do not rely on the manhole ladders because they are often in poor condition. If they must be used, be sure of footing. Inspect manhole ladders for deterioration before entering and while descending. Try each step with one foot, while standing on the step above. When in doubt, use a portable or rope ladder of adequate height to reach 3 feet above the manhole opening, or lower the entry person using the tripod. If a portable ladder is used, it should be tied off if possible; otherwise, it should be held in place by the standby person.
14. Do not work without adequate lighting. Use only "explosion-proof" lights or hand lamps in the manhole or sewer.
15. The entry person must not remain in the manhole or sewer if he/she becomes even slightly drowsy, faint, dizzy, or otherwise uncomfortable. Remember that carbon monoxide, carbon dioxide, methane, and hydrogen sulfide, which cause the most trouble, are odorless (hydrogen sulfide has a distinct odor only during initial exposure), tasteless, and invisible.

STANDARD OPERATING PROCEDURE

NUMBER 5

Underground Utilities

UNDERGROUND UTILITIES

Underground utilities pose hazards to workers involved in drilling, excavation, soil vapor contaminant analysis, and other invasive operations. These hazards include electrical hazards, explosion, chemical exposure, asbestos exposure and asphyxiation, as well as costly and annoying hazards associated with damaging communication, sewer, water, and/or irrigation lines.

The estimated location of underground installations, including sewer, telephone, fuel, electric, water lines, or other underground installations that reasonable may be expected to be encountered during invasive work shall be determined prior to the start of any invasive work. This may be determined by contacting appropriate utilities, contacting a utility clearance service, using site maps and prominent site features, using a pipe and cable locator, etc. Buried utilities encountered during invasive operations must be protected while digging to prevent risks to site personnel and damage to the utilities. The Contractor must request and received an assessment of the site from DIGSAFE. The telephone number for DIGSAFE in Massachusetts is (888) DIGSAFE.

QUALIFICATIONS OF CIH AND SSO

Scott D. Herzog
Senior Consultant/Business Development

Covino Environmental Associates, Inc.
300 Wildwood Avenue Woburn, MA
Phone: 781.933.2555 Fax: 781.932.9402

EDUCATION

West Virginia College of Graduate Studies/West Virginia University
M.S. Chemical Engineering, 1978

Northeastern University
B.S. Chemical Engineering, 1974

CERTIFICATIONS

Certified Industrial Hygienist, Comprehensive Practice, # 1685, American Board of Industrial Hygiene (1979)

Certified Industrial Hygienist, Engineering Aspects, # 2104, American Board of Industrial Hygiene (1982)

PROFESSIONAL EXPERIENCE

Mr. Herzog has over 35 years of comprehensive environmental health and safety experience serving both public and private sector clients. As a Senior Consultant, Mr. Herzog develops and implements regulatory compliance programs for clients. He also conducts third-party audits of company programs, directs process safety and risk management activities and provides expert witness testimony in areas of his expertise. He serves as a technical consultant to identify new, emerging environmental health and safety issues.

Mr. Herzog conducts industrial hygiene exposure assessments, indoor air quality evaluations, noise surveys, microbial assessments and inspections of HVAC systems. He specializes in the design of engineering controls and local exhaust ventilation. Mr. Herzog works with clients including property managers and insurance companies to evaluate water and smoke-damaged properties. He develops Health & Safety plans for construction sites and provides expert direction in site remediation and emergency response.

Previously, Mr. Herzog was a Vice President/Senior Project Manager with OccuHealth, Inc. and a Senior Project Manager with Certified Engineering/Levine Fricke Recon (now LFR). Prior to entering consulting, Mr. Herzog was a senior industrial hygienist with Olin Corporation, United Technologies and Union Carbide.

HIGHLIGHTS OF EXPERIENCE

Conducted initial asbestos surveys in over 100 schools in Massachusetts under AHERA.

Conducted asbestos surveys in over 200 buildings involved in litigation throughout the United States and Canada.

Performed mold assessments in over 100 commercial properties and residences to determine causation of mold growth and water damage.

Provided health and safety support following a black water release in a major hospital in southeast Massachusetts.

Provided industrial hygiene support for manufacturing and research facilities. Evaluated and coordinated safety, hygiene and occupational health concerns as well as development of audit programs.

Developed and implemented a third-party key findings audit for eight dairy products plants in New England.

Assisted in the development of dispersion modeling techniques and environmental impact studies to assess the need for engineering controls.

Developed Site-Specific Health and Safety Plans for over 100 construction sites in New England.

ADDITIONAL TRAINING

Health & Safety Aspects of Nanotechnology

PCB's in Building Materials, 2008

Biosafety & Biosecurity: Minimizing Risks in the Laboratory, 2009

All Day Technical Industrial Hygiene Conferences, 2001 – Current

Indoor Air Quality Association Technical Workshops, 2004 - Current

PROFESSIONAL AFFILIATIONS

American Industrial Hygiene Association 1974-Current

American Academy of Industrial Hygiene 1979-Current

American IAQ Council 2001-Current

Member, Indoor Air Quality Association 2007-Current

AIAQC/IAQA New England Chapter Director 2002-Current

Chair and Member-AIHA Workplace Environmental Exposure Limits Committee (1982-1989)

Member, AIHA Indoor Air Quality Committee (1985-1987)

AIHA New England Chapter President-Elect/President 2001-2002

AIHA Connecticut River Valley President-Elect/President 1984-85

PRESENTATIONS/PUBLICATIONS

“Emergency Response Planning in Healthcare Facilities” - Soc. Hospital Engineers

“Moisture, Building Structures & Mold”– Presentations to ARS Technical Seminar, ASSE

“Vapor Intrusion: Determining Remediation Levels”, Environmental Business Council, 2009

“Engineering Controls for Copper and Brass Alloys” – Industrial Hygiene Aspects of Plant Operations, Wiley Interscience, 1987

“How Healthy Is Your Office?” – Connecticut Architect/Specifier, 1990

“Confined Space Entry For Sewer Invert Operations” - AIHCE

Technical papers on industrial hygiene recordkeeping, respirator cartridge testing/evaluation, QA sampling for ethylene oxide - AIHCE

MATERIAL SAFETY DATA SHEETS

International Chemical Safety Cards

ICSC: 0014

CHRYSOTILE

CHRYSOTILE Serpentine chrysotile White asbestos $Mg_6Si_4H_8O_{18} / Mg_6(Si_4O_{10})(OH)_8$ Molecular mass: 554 CAS # 12001-29-5 RTECS # CI16478500 ICSC # 0014 UN # 2590 (white asbestos)			
TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Not combustible.		In case of fire in the surroundings: all extinguishing agents allowed.
EXPLOSION			
EXPOSURE		PREVENT DISPERSION OF DUST! AVOID ALL CONTACT!	
• INHALATION	Cough.	Breathing protection. Closed system and ventilation.	
• SKIN		Protective clothing.	Remove contaminated clothes. Rinse skin with plenty of water or shower.
• EYES			First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
• INGESTION		Do not eat, drink, or smoke during work. Wash hands before eating.	Rinse mouth.
SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING	
Evacuate danger area! Consult an expert! Sweep spilled substance into sealable containers; if appropriate, moisten first to prevent dusting. Carefully collect remainder, then remove to safe place (extra personal protection: complete protective clothing including self-contained breathing apparatus).	Well closed.	Use dust-proof packaging. UN Hazard Class: 9 UN Packing Group: III	
SEE IMPORTANT INFORMATION ON BACK			
ICSC: 0014	Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities © IPCS CEC 1993		

International Chemical Safety Cards

ICSC: 0014

CHRYSOTILE

MSDS Number: L2347 * * * * * Effective Date: 09/15/09 * * * * * Supercedes: 07/05/07

MSDS Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865



24 Hour Emergency Telephone: 800-858-2151
CHEMTREC: 1-800-12-9380

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3897

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers should be used only in the event of direct contact with problems involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-552-2537) for assistance.

LEAD METAL

1. Product Identification

Synonyms: Granular lead, pigment metal; C.I. 77575
CAS No.: 7439-92-1
Molecular Weight: 207.19
Chemical Formula: Pb
Product Codes:
J.T. Baker: 2256, 2266
Mallinckrodt: 5668

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Lead	7439-92-1	95 - 100%	Yes

3. Hazards Identification

Emergency Overview

POISON! DANGER! MAY BE FATAL IF SWALLOWED OR INHALED. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. NEUROTOXIN. AFFECTS THE GUM TISSUE, CENTRAL NERVOUS SYSTEM, KIDNEYS, BLOOD AND REPRODUCTIVE SYSTEM. POSSIBLE CANCER HAZARD. MAY CAUSE CANCER BASED ON ANIMAL DATA. Risk of cancer depends on duration and level of exposure.

SAF-T-DATA^(tm) Ratings (Provided here for your convenience)

Health Rating: 3 - Severe (Cancer Causing)
Flammability Rating: 3 - Severe (Flammable)
Reactivity Rating: 1 - Slight

Contact Rating: 2 - Moderate (Life)

Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES

Storage Color Code: Red (Flammable)

Potential Health Effects

Inhalation:

Lead can be absorbed through the respiratory system. Local irritation of bronchia and lungs can occur and, in cases of acute exposure, symptoms such as metallic taste, chest and abdominal pain, and increased lead blood levels may follow. See also Ingestion.

Ingestion:

POISON! The symptoms of lead poisoning include abdominal pain and spasms, nausea, vomiting, headache. Acute poisoning can lead to muscle weakness, "lead line" on the gums, metallic taste, definite loss of appetite, insomnia, dizziness, high lead levels in blood and urine with shock, coma and death in extreme cases.

Skin Contact:

Lead and lead compounds may be absorbed through the skin on prolonged exposure; the symptoms of lead poisoning described for ingestion exposure may occur. Contact over short periods may cause local irritation, redness and pain.

Eye Contact:

Absorption can occur through eye tissues but the more common hazards are local irritation or abrasion.

Chronic Exposure:

Lead is a cumulative poison and exposure even to small amounts can raise the body's content to toxic levels. The symptoms of chronic exposure are like those of ingestion poisoning; restlessness, irritability, visual disturbances, hypertension and gray facial color may also be noted.

Aggravation of Pre-existing Conditions:

Persons with pre-existing kidney, nerve or circulatory disorders or with skin or eye problems may be more susceptible to the effects of this substance.

4. First Aid Measures

Inhalation:

Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Ingestion:

Induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention.

Skin Contact:

Immediately flush skin with plenty of soap and water for at least 15 minutes. Remove contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Thoroughly clean shoes before reuse.

Eye Contact:

Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

5. Fire Fighting Measures

Fire:

Not considered to be a fire hazard. Powder/dust is flammable when heated or exposed to flame.

Explosion:

Not considered to be an explosion hazard.

Fire Extinguishing Media:

Use any means suitable for extinguishing surrounding fire. Do not allow water runoff to enter sewers or

waterways.

Special Information:

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode. Can produce toxic lead fumes at elevated temperatures and also react with oxidizing materials.

6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Sweep up and containerize for reclamation or disposal. Vacuuming or wet sweeping may be used to avoid dust dispersal. US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Isolate from incompatible substances. Areas in which exposure to lead metal or lead compounds may occur should be identified by signs or appropriate means, and access to the area should be limited to authorized persons. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:

For lead, metal and inorganic dusts and fumes, as Pb:

-OSHA Permissible Exposure Limit (PEL): 0.05 mg/m³ (TWA)

For lead, elemental and inorganic compounds, as Pb:

-ACGIH Threshold Limit Value (TLV): 0.05 mg/m³ (TWA), A3 animal carcinogen

ACGIH Biological Exposure Indices (BEI): 30 ug/100ml, notation B (see actual Indices for more information).

For lead, inorganic:

-NIOSH Recommended Exposure Limit (REL): 0.1 mg/m³ (TWA)

Ventilation System:

A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

Personal Respirators (NIOSH Approved):

If the exposure limit is exceeded and engineering controls are not feasible, a half-face high efficiency particulate respirator (NIOSH type N100 filter) may be worn for up to ten times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. A full-face piece high efficiency particulate respirator (NIOSH type N100 filter) may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. If oil particles (e.g. lubricants, cutting fluids, glycerine, etc.) are present, use a NIOSH type R or P filter. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. **WARNING:** Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

Skin Protection:

Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

Eye Protection:

Use chemical safety goggles and/or full face shield where dusting or splashing of solutions is possible. Maintain

eye wash fountain and quick-drench facilities in work area.

Other Control Measures:

Eating, drinking, and smoking should not be permitted in areas where solids or liquids containing lead compounds are handled, processed, or stored. See OSHA substance-specific standard for more information on personal protective equipment, engineering and work practice controls, medical surveillance, record keeping, and reporting requirements. (29 CFR 1910.1025).

9. Physical and Chemical Properties

Appearance:

Small, white to blue-gray metallic shot or granules.

Odor:

Odorless.

Solubility:

Insoluble in water.

Density:

11.34

pH:

No information found.

% Volatiles by volume @ 21C (70F):

0

Boiling Point:

1740C (3164F)

Melting Point:

327.5C (622F)

Vapor Density (Air=1):

No information found.

Vapor Pressure (mm Hg):

1.77 @ 1000C (1832F)

Evaporation Rate (BuAc=1):

No information found.

10. Stability and Reactivity

Stability:

Stable under ordinary conditions of use and storage.

Hazardous Decomposition Products:

Does not decompose but toxic lead or lead oxide fumes may form at elevated temperatures.

Hazardous Polymerization:

Will not occur.

Incompatibilities:

Ammonium nitrate, chlorine trifluoride, hydrogen peroxide, sodium azide, zirconium, disodium acetylide, sodium acetylide and oxidants.

Conditions to Avoid:

Heat, flames, ignition sources and incompatibles.

11. Toxicological Information

Toxicological Data:

Investigated as a tumorigen, mutagen, reproductive effector.

Reproductive Toxicity:

Lead and other smelter emissions are human reproductive hazards. (Chemical Council on Environmental Quality; Chemical Hazards to Human Reproduction, 1981).

Carcinogenicity:

LEAD METAL

EPA / IRIS classification: Group B2 - Probable human carcinogen, sufficient animal evidence.

Ingredient	---NTP Carcinogen---		IARC Category
	Known	Anticipated	
Lead (7439-92-1)	No	No	2B

12. Ecological Information

Environmental Fate:

When released into the soil, this material is not expected to leach into groundwater. This material may bioaccumulate to some extent.

Environmental Toxicity:

No information found.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste facility. Although not a listed RCRA hazardous waste, this material may exhibit one or more characteristics of a hazardous waste and require appropriate analysis to determine specific disposal requirements. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Not regulated.

15. Regulatory Information

Ingredient	-----\Chemical Inventory Status - Part 1\-----			
	TSCA	EC	Japan	Australia
Lead (7439-92-1)	Yes	Yes	Yes	Yes

Ingredient	-----\Chemical Inventory Status - Part 2\-----			
	Korea	DSL	--Canada-- NDSL	Phil.
Lead (7439-92-1)	Yes	Yes	No	Yes

Ingredient	-----\Federal, State & International Regulations - Part 1\-----			
	-SARA 302-		-----SARA 313-----	
	RQ	TPQ	List	Chemical Catg.
Lead (7439-92-1)	No	No	Yes	No

Ingredient	-----\Federal, State & International Regulations - Part 2\-----		
	CERCLA	-RCRA- 261.33	-TSCA- 8(d)
Lead (7439-92-1)	10	No	No

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
 SARA 311/312: Acute: Yes Chronic: Yes Fire: No Pressure: No
 Reactivity: No (Pure / Solid)

WARNING:

THIS PRODUCT CONTAINS CHEMICALS KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER AND BIRTH DEFECTS OR OTHER REPRODUCTIVE HARM.

Australian Hazchem Code: None allocated.

Poison Schedule: S6

WHMIS:

This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

16. Other Information

NFPA Ratings: Health: 3 Flammability: 1 Reactivity: 0

Label Hazard Warning:

POISON! DANGER! MAY BE FATAL IF SWALLOWED OR INHALED. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. NEUROTOXIN. AFFECTS THE GUM TISSUE, CENTRAL NERVOUS SYSTEM, KIDNEYS, BLOOD AND REPRODUCTIVE SYSTEM. POSSIBLE CANCER HAZARD. MAY CAUSE CANCER BASED ON ANIMAL DATA. Risk of cancer depends on duration and level of exposure.

Label Precautions:

- Do not get in eyes, on skin, or on clothing.
- Do not breathe dust.
- Keep container closed.
- Use only with adequate ventilation.
- Wash thoroughly after handling.

Label First Aid:

If swallowed, induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse. In all cases, get medical attention.

Product Use:

Laboratory Reagent.

Revision Information:

No Changes.

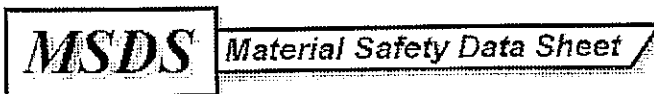
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Prepared by: Environmental Health & Safety

Phone Number: (314) 654-1600 (U.S.A.)

MSDS Number: C0132 * * * * * Effective Date: 11/21/08 * * * * * Supersedes: 02/16/06



From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865



24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300
National Response in Canada
CANUTEC: 613-996-6666
Outside U.S. And Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-562-2537) for assistance.

CADMIUM OXIDE

1. Product Identification

Synonyms: None
CAS No.: 1306-19-0
Molecular Weight: 128.41
Chemical Formula: CdO
Product Codes: 1234

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Cadmium Oxide	1306-19-0	99 - 100%	Yes

3. Hazards Identification

Emergency Overview

DANGER! CONTAINS CADMIUM. CANCER HAZARD. AVOID CREATING DUST. CAN CAUSE LUNG AND KIDNEY DISEASE. CAN CAUSE CANCER. Risk of cancer depends upon duration and level of exposure. MAY BE FATAL IF SWALLOWED OR INHALED. MAY CAUSE IRRITATION TO SKIN AND EYES. AFFECTS BLOOD AND PROSTATE. MAY AFFECT THE REPRODUCTIVE SYSTEM.

SAF-T-DATA^(tm) Ratings (Provided here for your convenience)

Health Rating: 3 - Severe (Cancer Causing)
Flammability Rating: 0 - None
Reactivity Rating: 0 - None
Contact Rating: 3 - Severe (Life)
Lab Protective Equip: GOGGLES; LAB COAT; PROPER GLOVES
Storage Color Code: Blue (Health)

Potential Health Effects

Inhalation:

Cadmium absorption is most efficient via respiratory tract. Inhalation of dust may produce irritation, headache, metallic taste and/or cough. Severe exposures may produce shortness of breath, chest pain, and flu-like symptoms with weakness, fever, headache, chills, sweating, nausea and muscular pain. Can cause pulmonary edema, liver and kidney damage and death. Symptoms from inhalation may be delayed for as much as 24 hours.

Ingestion:

Toxic. Ingested cadmium salts may cause severe and sometimes fatal poisonings. Symptoms can include severe nausea, vomiting, diarrhea, abdominal pains, choking, dizziness, and salivation. Kidney and liver dysfunction may occur. Although as little as 10 - 20 mg of soluble cadmium salts have produced severe toxic symptoms when ingested, death probably requires several hundred mg by oral route.

Skin Contact:

May cause irritation with redness and pain.

Eye Contact:

May cause irritation, redness and pain.

Chronic Exposure:

Chronic exposure to cadmium, even at relatively low concentrations, may result in kidney damage, anemia, pulmonary fibrosis, emphysema, perforation of the nasal septum, loss of smell, male reproductive effects, and an increased risk of cancer of the lung and of the prostate. Decrease in bone density, renal stones, and other evidence of disturbed calcium metabolism may be observed.

Aggravation of Pre-existing Conditions:

Persons with pre-existing skin disorders, eye problems, blood disorders, prostate problems, or impaired liver, kidney or respiratory function may be more susceptible to the effects of the substance.

4. First Aid Measures

Inhalation:

Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:

Induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately.

Skin Contact:

Wipe off excess material from skin then immediately flush skin with plenty of soap and water for at least 15 minutes. Remove contaminated clothing and shoes. Get medical attention immediately. Wash clothing before reuse. Thoroughly clean shoes before reuse.

Eye Contact:

Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

Note to Physician:

See 29 CFR 1910.1027, Appendix A for additional treatment information.

5. Fire Fighting Measures

Fire:

Not considered to be a fire hazard.

Explosion:

Not considered to be an explosion hazard.

Fire Extinguishing Media:

Use any means suitable for extinguishing surrounding fire.

Special Information:

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode. If involved in a fire, this material can emit very toxic fumes of cadmium.

6. Accidental Release Measures

Ventilate area of leak or spill. Keep unnecessary and unprotected people away from area of spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Pick up and place in a suitable container for reclamation or disposal, using a method that does not generate dust. Do not flush to the sewer. US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Wear special protective equipment (Sec. 8) for maintenance break-in or where exposures may exceed established exposure levels. Wash hands, face, forearms and neck when exiting restricted areas. Shower, dispose of outer clothing, change to clean garments at the end of the day. Avoid cross-contamination of street clothes. Wash hands before eating and do not eat, drink, or smoke in workplace. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:

-OSHA Threshold Limit Value (PEL):

5 ug/m³ of Cadmium (TWA), 2.5 ug/m³ (Action Level)

-ACGIH Threshold Limit Value (TLV) :

0.01 mg/m³ total dust, 0.002 mg/m³ respirable fraction for cadmium and compounds, as Cd;

listed as A2, suspected human carcinogen.

Ventilation System:

A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

Personal Respirators (NIOSH Approved):

If the exposure limit is exceeded and engineering controls are not feasible, a half-face high efficiency particulate respirator (NIOSH type N100 filter) may be worn for up to ten times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. A full-face piece high efficiency particulate respirator (NIOSH type N100 filter) may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. If oil particles (e.g. lubricants, cutting fluids, glycerine, etc.) are present, use a NIOSH type R or P filter. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres. See OSHA 1910.1027 for additional respirator information. Where respirators are required, you must have a written program covering the basic requirements in the OSHA respirator standard. These include training, fit testing, medical approval, cleaning, maintenance, cartridge change schedules, etc. See 29CFR1910.134 for details.

Skin Protection:

Wear protective gloves and clean body-covering clothing.

Eye Protection:

Use chemical safety goggles. Maintain eye wash fountain and quick-drench facilities in work area.

Other Control Measures:

Eating, drinking, and smoking should not be permitted in areas where solids or liquids containing cadmium compounds are handled, processed, or stored. See OSHA substance-specific standard for more information on personal protective equipment, engineering and work practice controls, medical surveillance, record keeping, and reporting requirements. (29 CFR 1910.1027).

9. Physical and Chemical Properties

Appearance:

Fine, brown crystals or powder.

Odor:

Odorless.

Solubility:

Insoluble in water.

Density:

8.15

pH:

No information found.

% Volatiles by volume @ 21C (70F):

0

Boiling Point:

1559C (2838F) Sublimes.

Melting Point:

950C (1742F) crystals decompose; < 1426C (< 2598F) powder.

Vapor Density (Air=1):

No information found.

Vapor Pressure (mm Hg):

1.3 mbar @ 1000C

Evaporation Rate (BuAc=1):

No information found.

10. Stability and Reactivity

Stability:

Stable under ordinary conditions of use and storage.

Hazardous Decomposition Products:

Toxic cadmium oxide fumes may be formed at high temperatures (> 900C).

Hazardous Polymerization:

Will not occur.

Incompatibilities:

Explodes when heated with magnesium. Cadmium dust presents a fire/explosion hazard if reacted with oxidizing agents, metals, hydrogen azide, zinc, selenium, or tellurium.

Conditions to Avoid:

Dusting and incompatibles.

11. Toxicological Information

Toxicological Data:

Oral rat LD50: 72 mg/kg; inhalation mouse LC50: 250 mg/m³/2-hour; Investigated as a tumorigen, mutagen, reproductive effector.

Reproductive Toxicity:

Reproductive effects recorded on humans. May cause teratogenic effects.

-----\Cancer Lists\-----

Ingredient	---NTP Carcinogen---		IARC Category
	Known	Anticipated	
Cadmium Oxide (1306-19-0)	Yes	No	1

12. Ecological Information

Environmental Fate:
No information found.
Environmental Toxicity:
No information found.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste facility. Although not a listed RCRA hazardous waste, this material may exhibit one or more characteristics of a hazardous waste and require appropriate analysis to determine specific disposal requirements. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Domestic (Land, D.O.T.)

Proper Shipping Name: CADMIUM COMPOUND, N.O.S. (CADMIUM OXIDE)
Hazard Class: 6.1
UN/NA: UN2570
Packing Group: III
Information reported for product/size: 500G

International (Water, I.M.O.)

Proper Shipping Name: CADMIUM COMPOUND, N.O.S. (CADMIUM OXIDE)
Hazard Class: 6.1
UN/NA: UN2570
Packing Group: III
Information reported for product/size: 500G

International (Air, I.C.A.O.)

Proper Shipping Name: CADMIUM COMPOUND, N.O.S. (CADMIUM OXIDE)
Hazard Class: 6.1
UN/NA: UN2570
Packing Group: III
Information reported for product/size: 500G

15. Regulatory Information

-----\Chemical Inventory Status - Part 1\-----

CADMIUM OXIDE

Ingredient	TSCA	EC	Japan	Australia
Cadmium Oxide (1306-19-0)	Yes	Yes	Yes	Yes

-----\Chemical Inventory Status - Part 2\-----

Ingredient	Korea	DSL	NDSL	Phil.
Cadmium Oxide (1306-19-0)	Yes	Yes	No	Yes

-----\Federal, State & International Regulations - Part 1\-----

Ingredient	-SARA 302- RQ	TPQ	-----SARA 313----- List	Chemical Catg.
Cadmium Oxide (1306-19-0)	100	100*	No	Cadmium comp

-----\Federal, State & International Regulations - Part 2\-----

Ingredient	CERCLA	-RCRA- 261.33	-TSCA- 8(d)
Cadmium Oxide (1306-19-0)	1	No	No

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
 SARA 311/312: Acute: Yes Chronic: Yes Fire: No Pressure: No
 Reactivity: No (Pure / Solid)

WARNING:
 THIS PRODUCT CONTAINS A CHEMICAL(S) KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER.

Australian Hazchem Code: 2X
Poison Schedule: S6

WHMIS:
 This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

16. Other Information

NFPA Ratings: Health: 3 Flammability: 0 Reactivity: 0

Label Hazard Warning:
 DANGER! CONTAINS CADMIUM. CANCER HAZARD. AVOID CREATING DUST. CAN CAUSE LUNG AND KIDNEY DISEASE. CAN CAUSE CANCER. Risk of cancer depends upon duration and level of exposure. MAY BE FATAL IF SWALLOWED OR INHALED. MAY CAUSE IRRITATION TO SKIN AND EYES. AFFECTS BLOOD AND PROSTATE. MAY AFFECT THE REPRODUCTIVE SYSTEM.

Label Precautions:
 Do not breathe dust.
 Do not get in eyes, on skin, or on clothing.
 Keep container closed.
 Do not enter storage areas unless adequately ventilated.
 Use only with adequate ventilation.
 Wash thoroughly after handling.

Label First Aid:
 If swallowed, induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of contact, wipe off excess material from skin then immediately flush eyes or skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse. In all cases get medical attention immediately.

Product Use:
 Laboratory Reagent.

Revision Information:

MSDS Section(s) changed since last revision of document include: 3.

Disclaimer:

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Prepared by: Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

International Chemical Safety Cards

ICSC: 0013

ARSENIC

ARSENIC
 Grey arsenic
 Metallic arsenic
 As
 Atomic mass: 74.9

CAS # 7440-38-2
 RTECS # CG0525000
 ICSC # 0013
 UN # 1558
 EC # 033-001-00-X

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Combustible. Gives off irritating or toxic fumes (or gases) in a fire.	NO open flames. NO contact with strong oxidizers. NO contact with hot surfaces.	Powder, water spray, foam, carbon dioxide.
EXPLOSION	Risk of fire and explosion is slight if in the form of fine powder or dust when exposed to hot surfaces or flames.	Prevent deposition of dust; closed system, dust explosion-proof electrical equipment and lighting.	
EXPOSURE		AVOID ALL CONTACT!	IN ALL CASES CONSULT A DOCTOR!
• INHALATION	Cough. Diarrhoea. Shortness of breath. Sore throat. Vomiting. Weakness. Grey skin.	Closed system and ventilation.	Fresh air, rest. Artificial respiration if indicated. Refer for medical attention.
• SKIN	Redness.	Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse skin with plenty of water or shower.
• EYES	Redness.	or eye protection in combination with breathing protection if powder.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
• INGESTION	Diarrhoea. Nausea. Sore throat. Unconsciousness. Vomiting (further see Inhalation).	Do not eat, drink, or smoke during work. Wash hands before eating.	Rinse mouth. Induce vomiting (ONLY IN CONSCIOUS PERSONS!). Refer for medical attention.
SPILLAGE DISPOSAL		STORAGE	PACKAGING & LABELLING
Evacuate danger area! Sweep spilled substance into sealable containers. Carefully collect remainder, then remove to safe place. Do NOT let this chemical enter the environment (extra personal protection: complete protective clothing including self-contained breathing apparatus).		Provision to contain effluent from fire extinguishing. Separated from strong oxidants, acids, halogens, food and feedstuffs. Well closed. Keep in a well-ventilated room.	Do not transport with food and feedstuffs. T symbol R: 23/25 S: (1/2-)20/21-28-45 UN Hazard Class: 6.1 UN Packing Group: II Marine pollutant.
SEE IMPORTANT INFORMATION ON BACK			

ICSC: 0013

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International Chemical Safety Cards

ARSENIC

ICSC: 0013

I M P O R T A N T A R S E N I C	PHYSICAL STATE; APPEARANCE: ODOURLESS, BRITTLE, GREY, METALLIC-LOOKING CRYSTALS.	ROUTES OF EXPOSURE: The substance can be absorbed into the body by inhalation of its aerosol, through the skin and by ingestion.
	PHYSICAL DANGERS:	INHALATION RISK: Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly.
	CHEMICAL DANGERS: Upon heating, toxic fumes are formed. Reacts violently with strong oxidants and halogens causing fire and explosion hazard. Reacts with nitric acid, hot sulfuric acid. Toxic arsine gas may be formed in contact with acid or acidic substances and certain metals, such as galvanized or light metals.	EFFECTS OF SHORT-TERM EXPOSURE: The substance irritates the eyes, the skin and the respiratory tract. The substance may cause effects on the circulatory system, nervous system, kidneys and gastrointestinal tract, resulting in convulsions, kidney impairment, severe hemorrhage, losses of fluids, and electrolytes, shock and death. Exposure may result in death. The effects may be delayed. Medical observation is indicated.
	OCCUPATIONAL EXPOSURE LIMITS (OELs): TLV: ppm; 0.01 mg/m ³ (as TWA) A1 (ACGIH 1994-1995).	EFFECTS OF LONG-TERM OR REPEATED EXPOSURE: Repeated or prolonged contact with skin may cause dermatitis. Repeated or prolonged contact may cause skin sensitization. The substance may have effects on the mucous membranes, skin, kidneys, liver, resulting in neuropathy, pigmentation disorders, perforation of nasal septum and tissue lesions. This substance is carcinogenic to humans.
PHYSICAL PROPERTIES	Sublimation point: 613°C Relative density (water = 1): 5.7	Solubility in water: none
ENVIRONMENTAL DATA	The substance is toxic to aquatic organisms. It is strongly advised not to let the chemical enter into the environment because it persists in the environment.	
NOTES		
The substance is combustible but no flash point is available in literature. Depending on the degree of exposure, periodic medical examination is indicated. Do NOT take working clothes home. Refer also to cards for specific arsenic compounds, e.g., Arsenic pentoxide (ICSC # 0377), Arsenic trichloride (ICSC # 0221), Arsenic trioxide (ICSC # 0378), Arsine (ICSC # 0222).		
ADDITIONAL INFORMATION		
ICSC: 0013		ARSENIC
© IPCS, CEC, 1993		
IMPORTANT LEGAL NOTICE:	Neither the CEC or the IPCS nor any person acting on behalf of the CEC or the IPCS is responsible for the use which might be made of this information. This card contains the collective views of the IPCS Peer Review Committee and may not reflect in all cases all the detailed requirements included in national legislation on the subject. The user should verify compliance of the cards with the relevant legislation in the country of use.	

International Chemical Safety Cards

ICSC: 0029

CHROMIUM

CHROMIUM
 Chrome
 (powder)
 Cr (metal)
 Atomic mass: 52.0

CAS # 7440-47-3
 RTECS # GB4200000
 ICSC # 0029

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Combustible if in very fine powder. Gives off irritating or toxic fumes (or gases) in a fire.	No open flames if in powder form.	In case of fire in the surroundings: all extinguishing agents allowed.
EXPLOSION	Finely dispersed particles form explosive mixtures in air.	Prevent deposition of dust; closed system, dust explosion-proof electrical equipment and lighting.	
EXPOSURE		PREVENT DISPERSION OF DUST! STRICT HYGIENE!	
• INHALATION	Cough.	Local exhaust or breathing protection.	Fresh air, rest.
• SKIN	Redness.	Protective gloves.	Remove contaminated clothes. Rinse skin with plenty of water or shower. Refer for medical attention.
• EYES	Redness.	Face shield.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
• INGESTION		Do not eat, drink, or smoke during work.	Rinse mouth.
SPILLAGE DISPOSAL		STORAGE	PACKAGING & LABELLING
Vacuum spilled material. Carefully collect remainder, then remove to safe place (extra personal protection: P2 filter respirator for harmful particles).		Fireproof. Separated from strong oxidants.	
SEE IMPORTANT INFORMATION ON BACK			
ICSC: 0029		Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities © IPCS CEC 1993	

International Chemical Safety Cards

ICSC: 0029

CHROMIUM

I	PHYSICAL STATE; APPEARANCE:	ROUTES OF EXPOSURE:
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M P O R T A N T D A T A	STEEL GREY LUTROUS METAL. PHYSICAL DANGERS: Dust explosion possible if in powder or granular form, mixed with air. CHEMICAL DANGERS: Reacts violently with strong oxidants such as hydrogen peroxide, causing fire and explosion hazard. Reacts with diluted hydrochloric and sulfuric acids. Incompatible with alkalis and alkali carbonates. OCCUPATIONAL EXPOSURE LIMITS (OELs): TLV: ppm; 0.5 mg/m ³ (as TWA) (ACGIH 1994-1995).	The substance can be absorbed into the body by inhalation of its aerosol and by ingestion. INHALATION RISK: Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly when dispersed. EFFECTS OF SHORT-TERM EXPOSURE: EFFECTS OF LONG-TERM OR REPEATED EXPOSURE: Repeated or prolonged contact may cause skin sensitization.	
	PHYSICAL PROPERTIES	Boiling point: 2642°C Melting point: 1900°C	Relative density (water = 1): 7.14 Solubility in water: none
	ENVIRONMENTAL DATA		
	NOTES		
	Explosive limits are unknown in literature. Depending on the degree of exposure, periodic medical examination is indicated.		
	ADDITIONAL INFORMATION		
	ICSC: 0029		CHROMIUM
	© IPCS, CEC, 1993		
	IMPORTANT LEGAL NOTICE:	Neither the CEC or the IPCS nor any person acting on behalf of the CEC or the IPCS is responsible for the use which might be made of this information. This card contains the collective views of the IPCS Peer Review Committee and may not reflect in all cases all the detailed requirements included in national legislation on the subject. The user should verify compliance of the cards with the relevant legislation in the country of use.	

MSDS Safety Information

FSC: 9150
 MSDS Date: 05/10/1992
 MSDS Num: BWGBW
 LIIN: 00N056507
 Product ID: PETROLEUM HYDROCARBONS AND ADDITIVES
 MFN: 01
 Responsible Party
 Cage: 06550
 Name: INGERSOL-RAND CO
 Address: 2724 6TH AVE S
 Box: 24046
 City: SEATTLE WA 98124-0046
 Info Phone Number: 206-624-0466
 Emergency Phone Number: 615-672-0321
 Proprietary Ind: Y
 Published: Y

Contractor Summary

Cage: 06550
 Name: INGERSOL-RAND CO
 Address: 2724 6TH AVE S
 City: SEATTLE WA 98124-0046
 Phone: 206-624-0466

Ingredients

Name: *** PROPRIETARY ***

Health Hazards Data

LD50 LC50 Mixture: NONE SPECIFIED BY MANUFACTURER.
 Route Of Entry Inds - Inhalation: YES
 Skin: NO
 Ingestion: YES
 Carcinogenicity Inds - NTP: NO
 IARC: NO
 OSHA: NO

Effects of Exposure: CHLOROCARBON MATLS HAVE PRDCE SENSIT OF MYOCARDIUM TO EPINEPHRINE IN LAB ANIMALS & COULD HAVE SIMILAR EFT IN HUMANS. ADRENOMIMETICS (EG, EPINEPHRINE) MAY BE CONTRA-INDICATED EXCEPT FOR LIFE-SUSTAINING USES IN HUMANS ACUTELY/CHRONICALLY EXPOS TO CHLOROCARBONS (FP N). INGEST: HARMFUL/FATAL IF SWALLOWED. (EFTS OF OVEREXP)

Explanation Of Carcinogenicity: NOT RELEVANT

Signs And Symptions Of Overexposure: HLTH HAZ: INHAL: IRRIT OF RESP TRACT, DIZZ, NAUS, LT HEAD, HDCH, LOSS OF COORDINATION. CIRCULATORY DEPRESS HAS BEEN REPORTED. EYES: MAY CAUSE IRRIT & CONJ. SKIN: RPTD/PRLNG CNTCT MAY CAUSE DEFAT TYPE OF DERM. INHAL OF TRICHLOROETHANE HAS BEEN KNOWN TO CAUSE CIRCULATORY DEPRESS. SINCE PROD CONTAINS 1,1,1 (SUPDAT)

Medical Cond Aggravated By Exposure: NONE SPECIFIED BY MANUFACTURER.

First Aid: INGEST: IF A LARGE VOLUME OF THIS MATERIAL IS SWALLOWED, GIVE A LARGE AMOUNT OF WATER. DO NOT INDUCE VOMITING. CALL MD IMMEDIATELY. INHAL: REMOVE TO FRESH AIR; GIVE ARTIFICIAL RESPIRATION IF NECESSARY. CALL MD IMMEDIATELY. EYES: IRRIGATE IMMEDIATELY WITH CLEAN, COOL WATER FOR AT LEAST 15 MINUTES. CALL MD IMMEDIATELY. SKIN: WASH AFFECTED AREA WITH SOAP & WATER. REMOVE CLOTHING & LAUNDER.

Handling and Disposal

Spill Release Procedures: ABSORB SPILLS WITH ABSORBENT CLAY, DIATOMACEOUS EARTH

OR OTHER SUITABLE MATERIAL. KEEP OUT OF SEWERS AND WATERCOURSES. IF SPILLED INTO A WATERCOURSE, CALL THE COAST GUARD TOLL FREE NO: 1-800-424-8802.
Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.
Waste Disposal Methods: DISPOSE OF AT AN APPROVED WASTE OR DISPOSAL SITE IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL LAWS AND REGULATIONS.
Handling And Storage Precautions: AVOID CONTACT WITH SKIN. AVOID INHALATION OF VAPOR AND MIST. DO NOT STORE OR HANDLE NEAR HIGH HEAT OR STRONG OXIDIZERS.
Other Precautions: NO SMOKING IN AREA OF USE. DO NOT USE IN THE GENERAL VICINITY OF ARC WELDING, OPEN FLAMES OR HOT SURFACES. HEAT AND/OR UV RADIATION MAY CAUSE THE FORMATION OF HCL AND/OR PHOSGENE (FP N).

=====
Fire and Explosion Hazard Information
=====

Flash Point Method: COC
Flash Point Text: SUPDAT
Extinguishing Media: CARBON DIOXIDE FOAM, DRY CHEMICAL FOAM, SAND, EARTH, WATER FOG.
Fire Fighting Procedures: WEAR NIOSH/MSHA APPROVED PRESSURE DEMAND SCBA AND FULL PROTECTIVE EQUIPMENT (FP N).
Unusual Fire/Explosion Hazard: THERMAL DECOMP PRODS MAY INCL HCL & PHOSGENE (FP N). TOX FUMES GIVEN OFF AT 932F (500C). THIS PROD IS AVAIL IN SPRAY CANS & AS SUCH, CNTNRS MAY EXPLODE.

=====
Control Measures
=====

Respiratory Protection: NONE REQUIRED UNDER ORDINARY CONDITIONS OF USE. NIOSH/MSHA APPROVED RESPIRATOR APPROPRIATE FOR EXPOSURE OF CONCERN (FP N).
Ventilation: NO SPECIAL REQUIREMENT UNDER ORDINARY CONDITIONS OF USE AND WITH ADEQUATE VENTILATION.
Protective Gloves: IMPERVIOUS GLOVES (FP N).
Eye Protection: ANSI APPRVD CHEM WORKERS GOGGLES (FP N).
Other Protective Equipment: NONE REQUIRED.
Work Hygienic Practices: REMOVE OIL SOAKED CLTHG & LAUNDRER BEFORE REUSE. WASH SKIN THORO W/SOAP & WATER AFTER HNDLG. KEEP AWAY FROM FOOD & FEED.
Supplemental Safety and Health: USERS OF "L" VERSION OF SHOULD CONSULT "LR" VERSION FOR ADDITIONAL INFO (FP N). FL PT: PRESS OF NON-FLAMM SOLV MODIFIES FL PT AS DETERMINED BY COC. EFTS OF OVEREXP: TRICHLOROETHANE, USE OF EPHINE PHRINE/SIMILAR ACTING DRUGS SHOULD BE AVOIDED. USE OF THESE DRUGS MAY CAUSE MYOCARDIAL IRRITABILITY. UNDER NO

=====
Physical/Chemical Properties
=====

B.P. Text: >600F,>316C
Vapor Pres: <0.1
Spec Gravity: 0.9
Solubility in Water: NEGLIGIBLE
Appearance and Odor: YELLOW COLOR; SWEET SMELLING ODOR.
Percent Volatiles by Volume: 20

=====
Reactivity Data
=====

Stability Indicator: YES
Stability Condition To Avoid: HIGH HEAT AND HIGH ENERGY IGNITION SOURCES.
Materials To Avoid: STRONG OXIDIZERS, CAUSTIC SODA, CAUSTIC POTASH, SODIUM-POTASSIUM ALLOYS.
Hazardous Decomposition Products: HYDROGEN CHLORIDE, TRACES OF PHOSGENE, CARBON MONOXIDE, OXIDES OF ANTIMONY & NITROGEN, COF*2.
Hazardous Polymerization Indicator: NO
Conditions To Avoid Polymerization: NOT RELEVANT

=====
Toxicological Information
=====

=====
Ecological Information
=====

=====
MSDS Transport Information
=====

=====
Regulatory Information
=====

=====
Other Information
=====

=====
HAZCOM Label
=====

Product ID: PETROLEUM HYDROCARBONS AND ADDITIVES

Cage: 06550

Company Name: INGERSOL-RAND CO

Street: 2724 6TH AVE S

City: SEATTLE WA

Zipcode: 98124-0046

Health Emergency Phone: 615-672-0321

Label Required IND: Y

Date Of Label Review: 12/28/1994

Status Code: C

Label Date: 12/28/1994

Origination Code: G

Eye Protection IND: YES

Skin Protection IND: YES

Signal Word: WARNING

Respiratory Protection IND: YES

Health Hazard: Moderate

Contact Hazard: Slight

Fire Hazard: None

Reactivity Hazard: None

Hazard And Precautions: ACUTE: INHALATION OF VAPORS MAY CONTRIBUTE TO THE OCCURRENCE OF IRREGULAR HEARTBEAT (FP N). INGESTION: HARMFUL/FATAL IF SWALLOWED. VOMITING CAN CAUSE ASPIRATION INTO LUNGS WHICH MAY RESULT IN CHEMICAL PNEUMONIA. INHALATION: IRRITATION OF RESPIRATORY TRACT, DIZZINESS, NAUSEA, LIGHT HEADEDNESS, HEADACHE, LOSS OF COORDINATION. CIRCULATORY DEPRESSION. EYES: MAY CAUSE IRRITATION & CONJUNCTIVITIS. SKIN: REPEATED/PROLONGED CONTACT MAY CAUSE DEFATTING TYPE OF DERMATITIS. CHRONIC: NONE LISTED BY MANUFACTURER.

=====
Disclaimer (provided with this information by the compiling agencies): This information is formulated for use by elements of the Department of Defense. The United States of America in no manner whatsoever expressly or implied warrants, states, or intends said information to have any application, use or viability by or to any person or persons outside the Department of Defense nor any person or persons contracting with any instrumentality of the United States of America and disclaims all liability for such use. Any person utilizing this instruction who is not a military or civilian employee of the United States of America should seek competent professional advice to verify and assume responsibility for the suitability of this information to their particular situation regardless of similarity to a corresponding Department of Defense or other government situation.

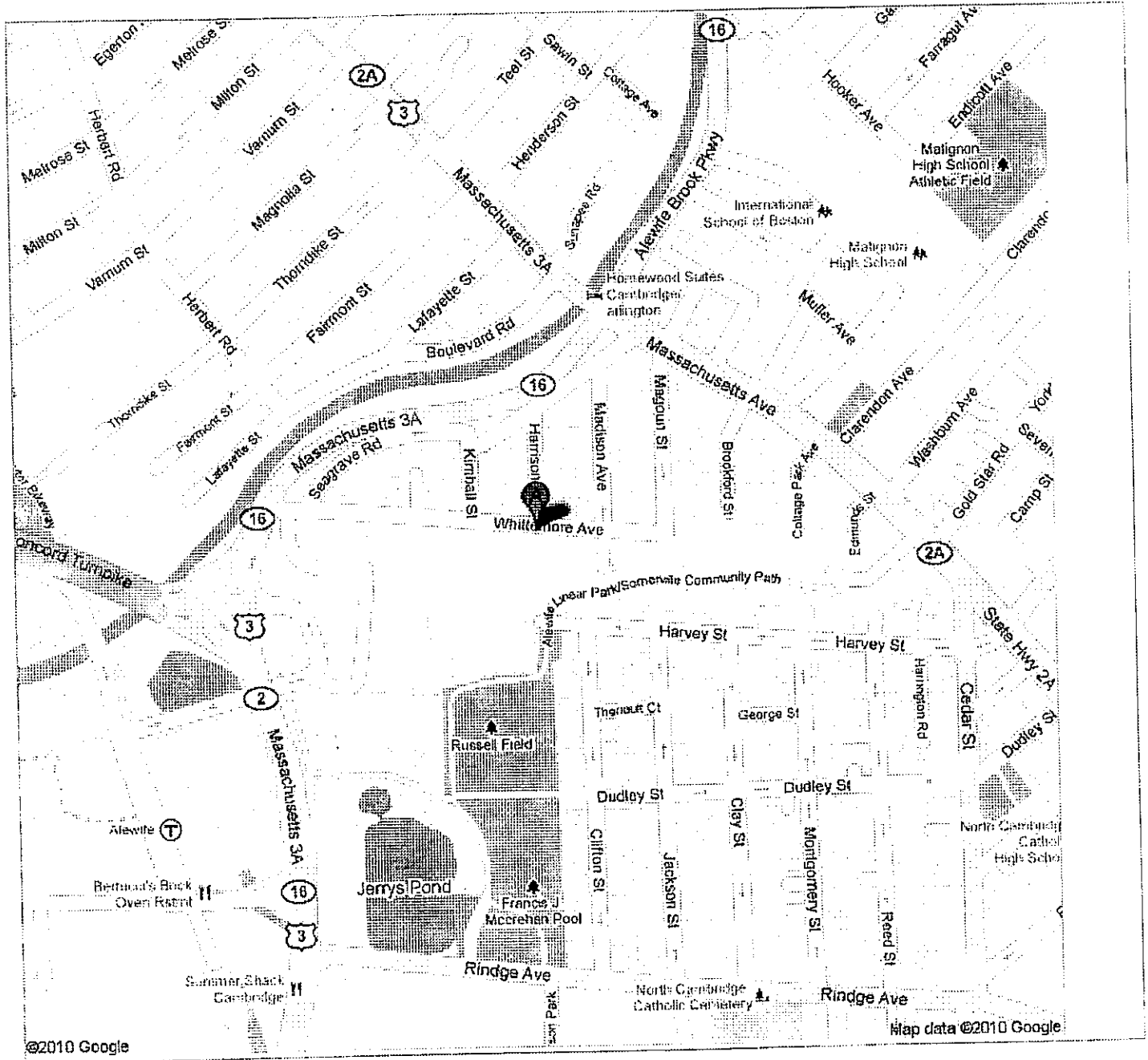

LOCATION OF SITE/DIRECTIONS TO HOSPITAL

DRAFT



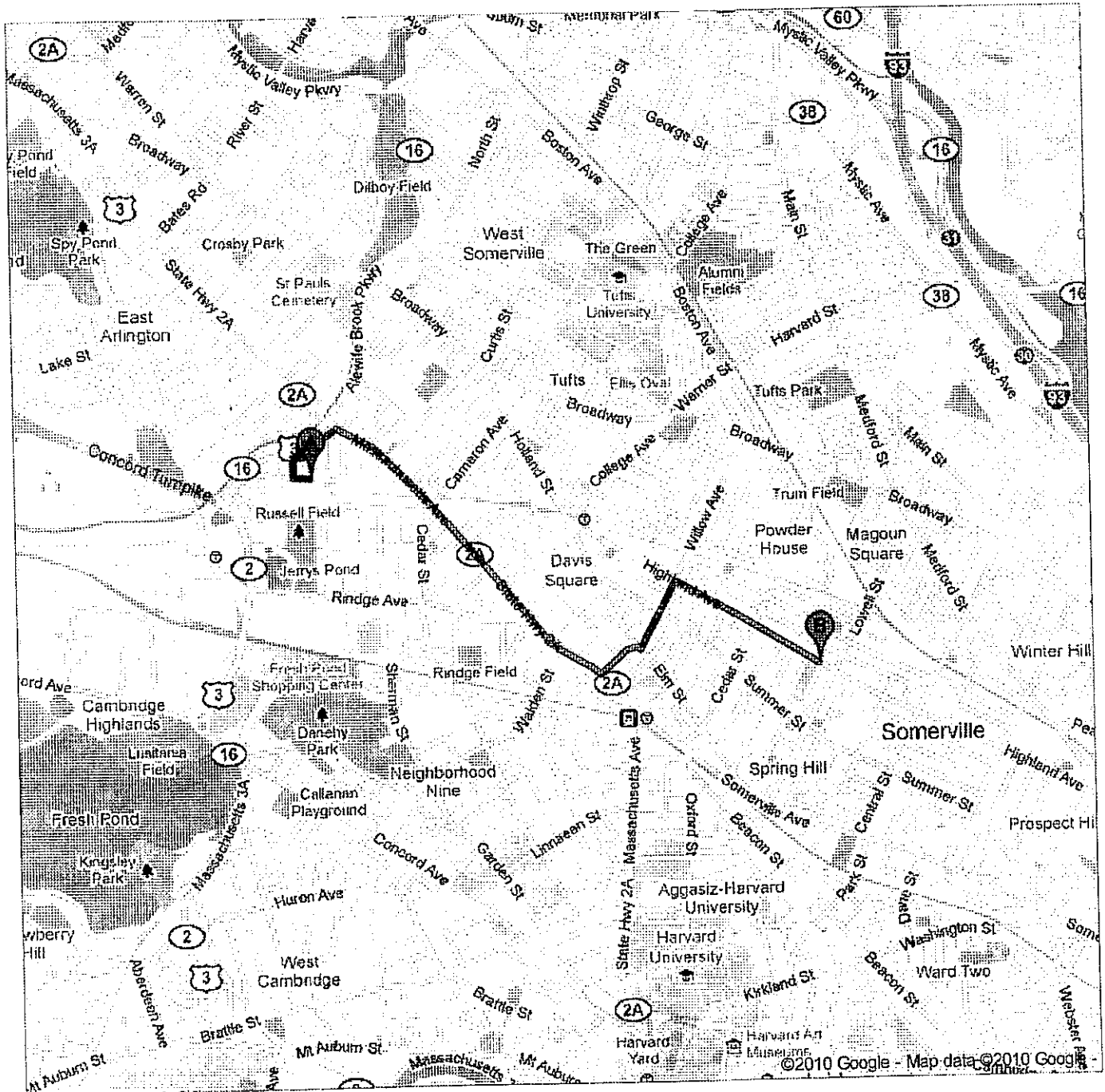
Address 62 Whittemore Ave
Cambridge, MA 02140


Get Google Maps on your phone
Text the word "GMAPS" to 466453













Directions to 230 Highland Ave, Somerville, MA 02143
2.1 mi - about 9 mins
ROUTE TO EMERGENCY HOSPITAL



 62 Whittemore Ave, Cambridge, MA 02140

-
1. Head west on **Whittemore Ave** toward **Kimball St**
go 256 ft
total 256 ft
 -  2. Take the 1st right onto **Kimball St**
go 295 ft
total 0.1 mi
 -  3. Take the 1st right onto **Columbus Ave**
go 0.2 mi
total 0.3 mi
 -  4. Turn right at **Massachusetts Ave**
About 3 mins
go 1.0 mi
total 1.3 mi
 -  5. Turn left at **Beech St**
About 1 min
go 0.1 mi
total 1.4 mi
 -  6. Turn right at **Elm St**
go 43 ft
total 1.4 mi
 -  7. Turn left at **Willow Ave**
About 2 mins
go 0.2 mi
total 1.7 mi
 -  8. Turn right at **Highland Ave**
Destination will be on the right
About 2 mins
go 0.5 mi
total 2.1 mi

 230 Highland Ave, Somerville, MA 02143

These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.

Map data ©2010 Google

Directions weren't right? Please find your route on maps.google.com and click "Report a problem" at the bottom left.

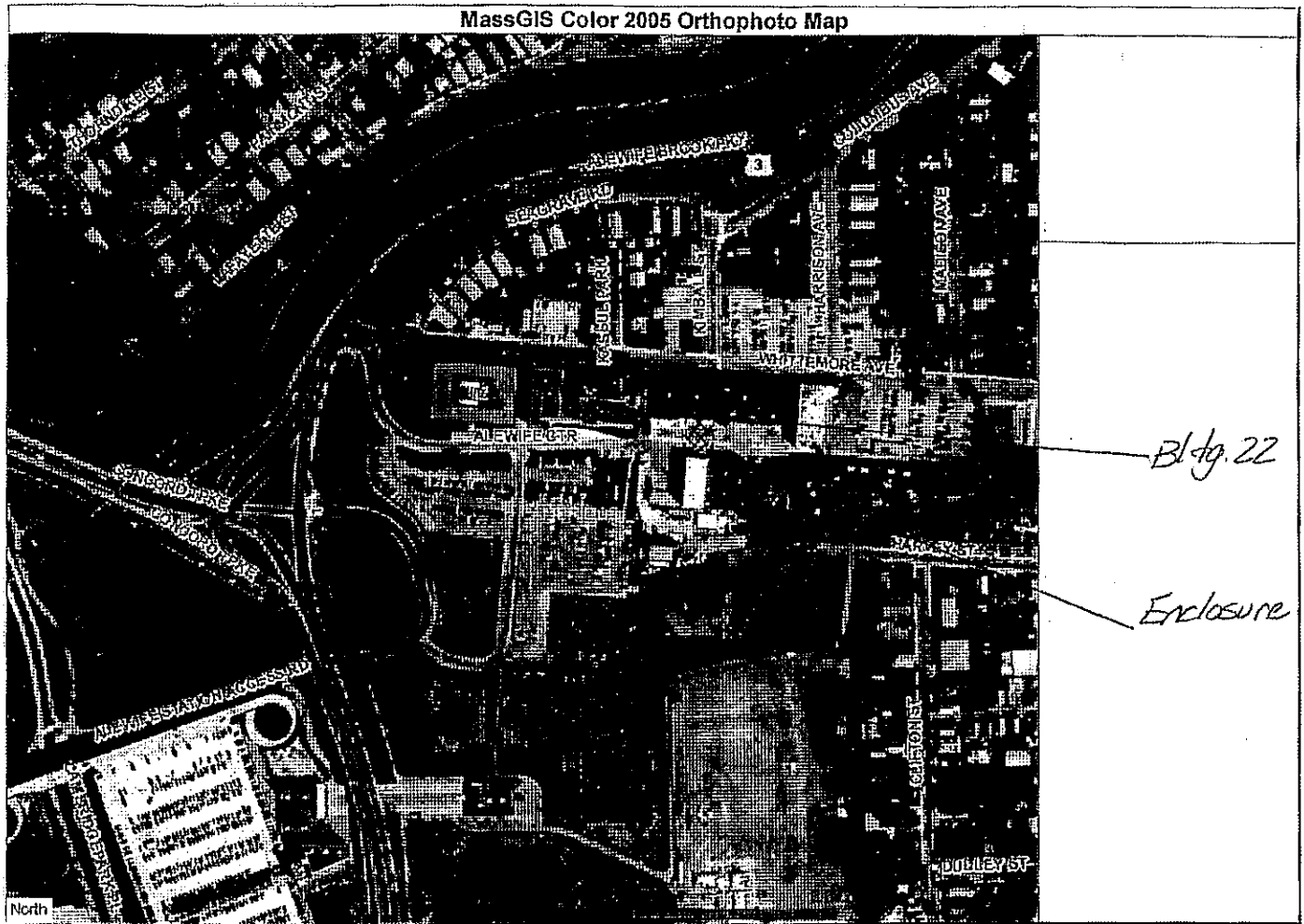
SITE SAFETY SIGN-IN SHEET

DRAFT

PROJECT LOCATION/DESIGN OF ENCLOSURE

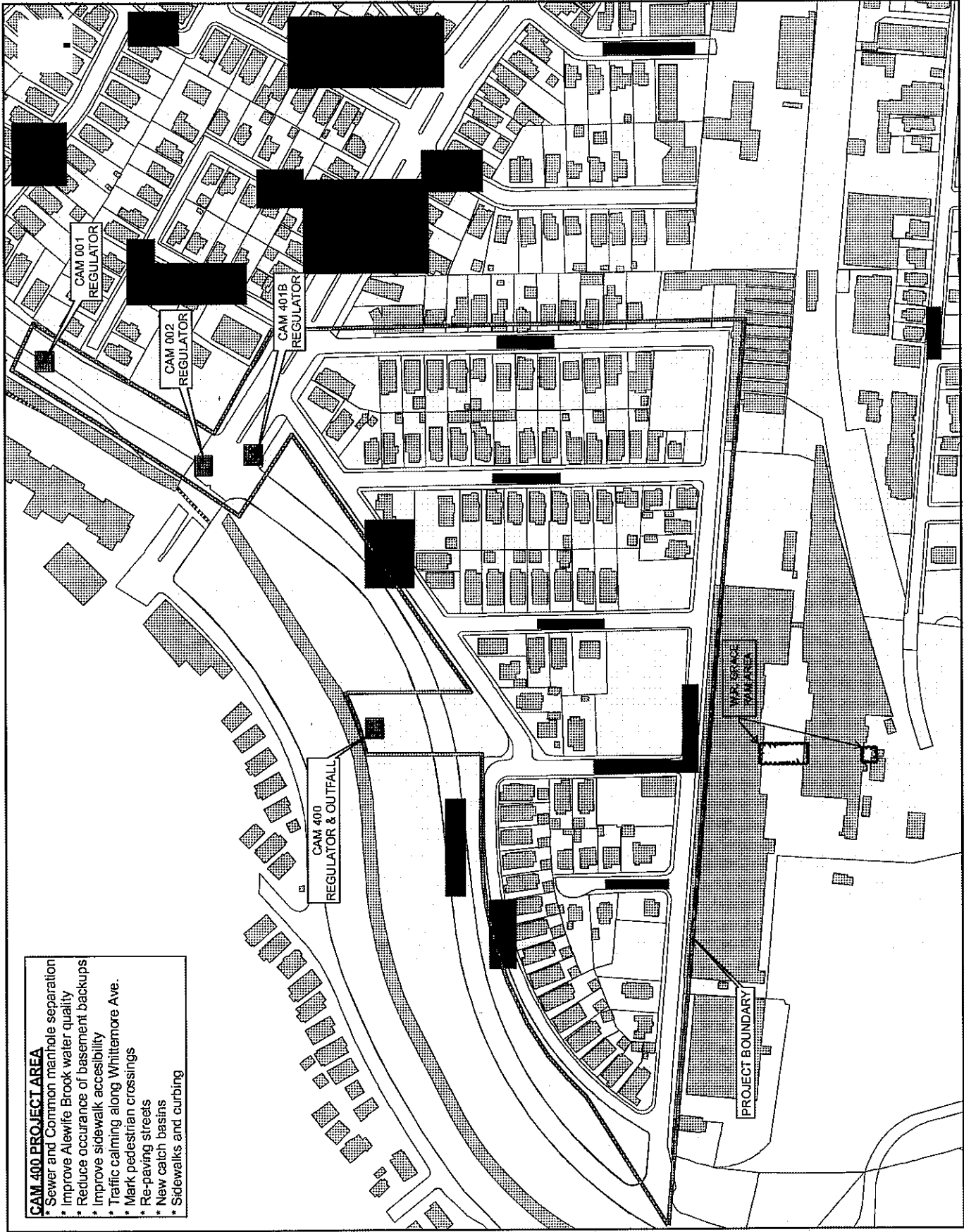
DRAFT

LOCATION OF SITE



~~XXX~~ - Location of the tented enclosure

LOCATION OF SITE/DIRECTIONS TO HOSPITAL



- CAM 400 PROJECT AREA**
- * Sewer and Common manhole separation
 - * Improve Alewife Brook water quality
 - * Reduce occurrence of basement backups
 - * Improve sidewalk accessibility
 - * Traffic calming along Whittemore Ave.
 - * Re-paving streets
 - * New catch basins
 - * Sidewalks and curbing



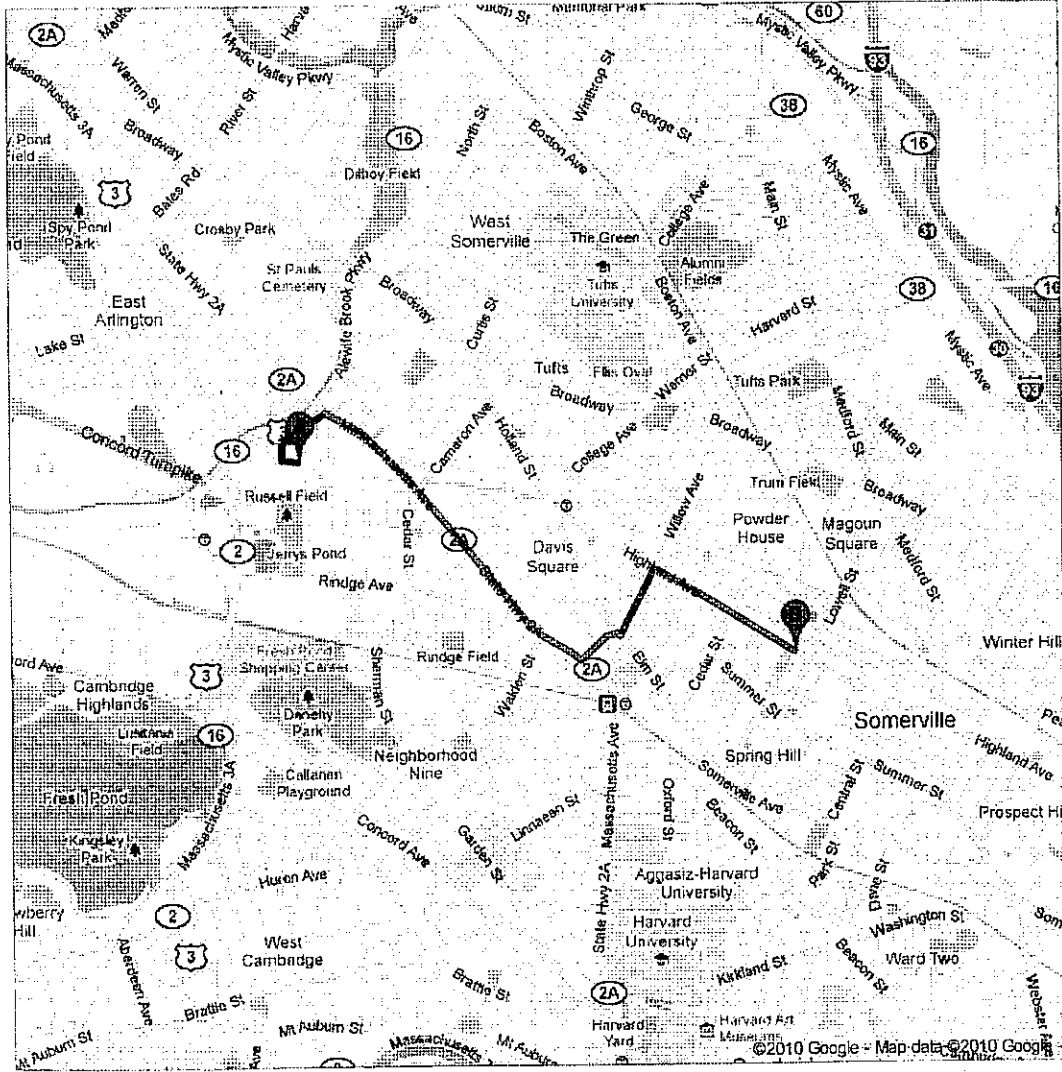
S E A
 S E A CONSULTANTS INC.
 100 STATE STREET
 CAMBRIDGE, MA 02142


CAM 400 SEWER SEPARATION/ FLOATABLES CONTROL PROJECT AREA
 CITY OF CAMBRIDGE, MA













Directions to 230 Highland Ave, Somerville, MA 02143
2.1 mi – about 9 mins
ROUTE TO EMERGENCY HOSPITAL



 62 Whittemore Ave, Cambridge, MA 02140

-
- | | |
|--|---------------------------|
| 1. Head west on Whittemore Ave toward Kimball St | go 256 ft
total 256 ft |
|  2. Take the 1st right onto Kimball St | go 296 ft
total 0.1 mi |
|  3. Take the 1st right onto Columbus Ave | go 0.2 mi
total 0.3 mi |
|  4. Turn right at Massachusetts Ave
About 3 mins | go 1.0 mi
total 1.3 mi |
|  5. Turn left at Beech St
About 1 min | go 0.1 mi
total 1.4 mi |
|  6. Turn right at Elm St | go 43 ft
total 1.4 mi |
|  7. Turn left at Willow Ave
About 2 mins | go 0.2 mi
total 1.7 mi |
|  8. Turn right at Highland Ave
Destination will be on the right
About 2 mins | go 0.5 mi
total 2.1 mi |

 230 Highland Ave, Somerville, MA 02143

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Directions weren't right? Please find your route on maps.google.com and click "Report a problem" at the bottom left.

SITE SAFETY SIGN-IN SHEET

PROJECT LOCATION/DESIGN OF ENCLOSURE

Figure 1
Site Location

MassGIS Color 2005 Orthophoto Map



Bldg. 23

Enclosure
Locations (Approx.)



300 Wildwood Avenue
 Woburn, MA 01801
 Tel: 781.933.2555
 Fax 781.932.9402
 email: mail@covinoinc.com

Covino Project 10.01508

Client:
 Environmental Management
 Professionals
 94 Sawyer Lane
 Marshfield, Massachusetts

Site:
 Building 23
 WR Grace & Co.
 Cambridge, Massachusetts

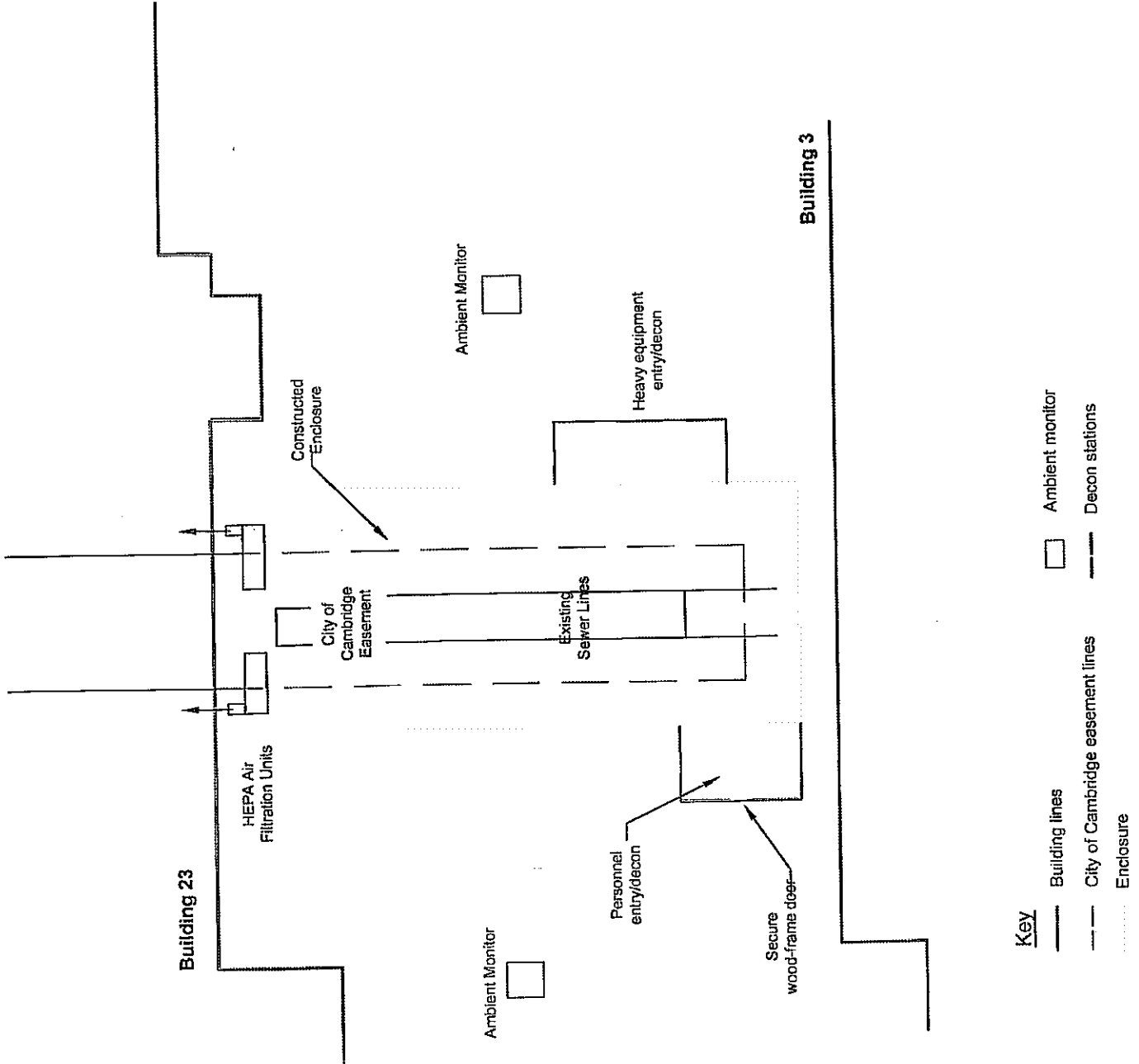
Sewer Separation

January 6, 2010

Sketch 1

NOT TO SCALE

Date: 01.07.11 Edited by: ALM



- Key**
- Building lines
 - - - City of Cambridge easement lines
 - Enclosure
 - Ambient monitor
 - Decon stations



300 Wildwood Avenue
Woburn, MA 01801
Tel: 781.933.2555
Fax 781.932.9402
email: mail@covinoinc.com

Covino Project 10.01508

Client:
Environmental Management
Professionals
94 Sawyer Lane
Marshfield, Massachusetts

Site:
Building 3
WR Grace & Co.
Cambridge, Massachusetts

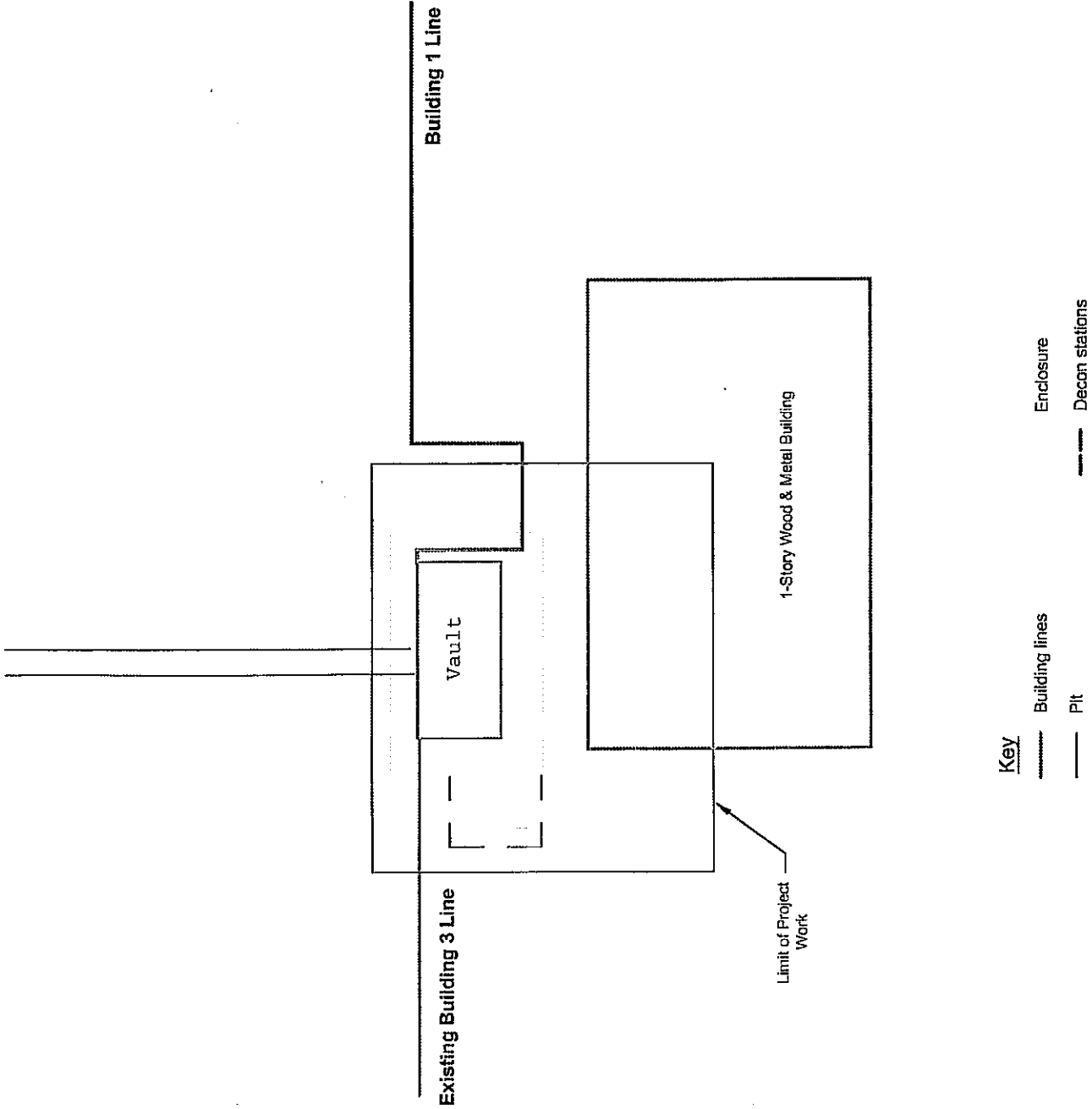
Sewer Separation

January 6, 2010

Figure 2

NOT TO SCALE

Date: 01.07.11 Edited by: ALM



APPENDIX D

Public Notification Letters

February 28, 2011

Robert W. Healy, City Manager
Cambridge City Hall, 2nd Floor
795 Massachusetts Avenue
Cambridge, MA 02139

Mr. Sam Lipson
Director of Environmental Health
Cambridge Public Health Department
119 Windsor Street, Ground Level
Cambridge, MA 02139

RE: Notice of Release Abatement Measure
Notice of Level C Personal Protective Equipment
CAM 400 Sewer Improvements Project
MassDEP Release Tracking Number (RTN) 3-0277
62 Whittemore Avenue, Cambridge, MA
W.R. Grace & Co.-CONN Property
KLF/SEA Reference No.: 2008288.01-A

Dear Messer's Healy and Lipson:

This letter is transmitted as required in the Massachusetts Contingency Plan (MCP), 310 CMR 40.0000 to inform you of the intent of the City of Cambridge Department of Public Works (DPW) to conduct a Release Abatement Measure (RAM) Plan on the property of W. R. Grace & Co-CONN (W.R. Grace). The planned construction activity on the W.R. Grace property is being performed as a part of the City of Cambridge DPW CAM 400 Sewer Separation/Alewife Floatables Control Project, a larger upgrade of the entire sewer system that serves the Alewife area, to reduce the potential for sewer backup during periods of heavy, rain and discharge of combined sewer overflows (CSO) to the Alewife Brook.

The work to be conducted consists of the excavation of a 40 foot long trench to install two new manhole structures and associated piping. It also includes a small excavation inside an existing concrete vault to install a trench measuring approximately 2.5 feet long and 2 feet wide.

An Activity and Use Limitation (AUL) recorded by W. R. Grace encompasses the area in which the work is to be conducted. The AUL addresses the potential for the presence of asbestos fibers in soil and establishes conditions to ensure ongoing protection of public health and the environment. The MCP, in 310 CMR 40.1067, requires that excavation of soils within an area covered by an AUL be conducted as a Release Abatement Measure (RAM) Plan. This RAM will be implemented assuming that asbestos fibers are present in subsurface soils.

Accordingly, this work will be conducted within temporary containment structures to be placed over each planned work area. The structures will be maintained at a partial vacuum to contain any fugitive dust during soil excavation and handling and piping and structure installation. Exhaust from the vacuum system will be treated with HEPA filtration. Perimeter air monitoring surrounding the containment area will be conducted to ensure the efficacy of the containment system. The precautions being taken, particularly the temporary containment structures, exceed the state standards for containment, but are intended to comply with the strictest interpretation of the Cambridge Asbestos Protection Ordinance.

Robert W. Healy, City Manager
Sam Lipson, Director of Environmental Health
February 28, 2011
Page 2



The MCP also requires that you be notified if work on a residential property is to be conducted by workers wearing respirators (Levels A, B, and C personal protective equipment (PPE)). While the W.R. Grace work is not a residential property, the work will be conducted in proximity to a residential neighborhood; we are providing this notification as an additional courtesy so that you will be aware that workers within the enclosures are anticipated to be wearing Level C PPE. This is a conservative precaution to ensure worker safety.

Should you have any questions regarding the CAM 400 project or the work specifically to be conducted on the property of W.R. Grace, please do not hesitate to contact us or Ms. Catherine Daly Woodbury at the City DPW (617-349-4818).

Respectfully yours,

KLEINFELDER/S E A CONSULTANTS

A handwritten signature in blue ink that reads 'R. K. Quateman'. The signature is written in a cursive style with a long, sweeping underline.

Richard K. Quateman, LSP, CHMM
Principal Scientist

cc: Ms. Catherine Daly Woodbury, City of Cambridge DPW
Mr. Michael Cunningham, Kleinfelder · S E A
file