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Engineers and
Scientists

November 30, 2017
Project 1701819

Stephen R. Pritchard, Chairman
Planning Board
Town of Scituate
600 Chief Judge Cushing Highway
Scituate, MA 02066

Dear Mr. Pritchard:

**Re: Second Response to Comments Regarding Remediation Plans
Seaside at Scituate by Toll Brothers
Scituate, Massachusetts**

GEI Consultants, Inc. prepared this letter to the Town of Scituate on behalf of Toll Brothers in response to the Town of Scituate Planning Board's request for modifications to the environmental remediation plans associated with the proposed Seaside at Scituate residential development. The modifications were requested by the Planning Board in response to comments provided by the Horsley Witten Group (HW) during the Planning Board meeting on November 9, 2017. We have attached a revised draft Release Abatement Measure Plan (RAM Plan) which reflects the modifications requested by the Planning Board.

In summary, we made the following modifications to the RAM Plan:

1. Executive Summary – We included language that the data collected by CHA Consulting, Inc. (CHA) will be reported to MassDEP on a new Release Notification Form once Toll Brothers takes ownership of the property and that the proposed RAM will be conducted under a new Release Tracking Number once issued by MassDEP.
2. Section 1.1 – We added text that clarified our agreement with CHA's opinion that lead and pyrene detected in groundwater by CHA were due sample matrix interference and not to actual site conditions.
3. Section 4.3.6 – We added text that an inspection would be conducted by the LSP-of-Record, or his representative, after the entire property is cleared to evaluate whether there is evidence of potential release to the environment in other portions of the property.
4. Section 6 – We added text that air monitoring would be conducted using the same procedures as described in the RAM Plan if additional contaminated areas at the property require excavation.

During the November 9, 2017 meeting, GEI and Toll Brothers agreed to provide a copy of the RAM Status Report that contains the results of additional investigation activities at the property to the Town prior to commencing the remediation work.


We trust that this letter and the attached draft RAM Plan addresses the concerns raised by the Planning Board regarding environmental conditions at the subject property. Please notify me or Scott Miccile of Toll Brothers if you have additional questions or comments.

Sincerely,

GEI CONSULTANTS, INC.



Catherine M. Malagida, P.G.
Project Geologist



James R. Ash, P.E., LSP
Senior Vice President

CMM/JRA:mrh
Attachment: Draft RAM Plan

MassDEP RTN 4-18143

DRAFT Release Abatement Measure Plan Modification

Former Scituate Proving Ground, 137 Hatherly Road,
Scituate, Massachusetts

Submitted to:

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup
Southeast Regional Office
20 Riverside Drive
Lakeville, MA 02347

Submitted by:

GEI Consultants, Inc.
400 Unicorn Park Drive
Woburn, MA 01801
781-721-4000

December X, 2017

Project 1701819

Catherine M. Malagrida, P.G.
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CMM/JRA:jj

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Executive Summary

On behalf of Toll Brothers, Inc. (Toll Brothers), GEI Consultants, Inc. (GEI) is submitting this Release Abatement Measure (RAM) Plan for the excavation and off-site disposal of soil, and management of groundwater at the Massachusetts Department of Environmental Protection (MassDEP) disposal site located at 137 Hatherly Road Street in Scituate, Massachusetts (the Site). MassDEP assigned Release Tracking Number (RTN) 4-18143 to the Site.

The Site consists of an approximately 15-acre portion of the 115-acre parcel of land known as the former Scituate Proving Grounds in Scituate, Massachusetts. The former Scituate Proving Grounds property (the Property) is bisected by Hatherly Road, with 65 acres located south of Hatherly Road and 50 acres located north of Hatherly Road. The Site is located within the 65-acre portion on the southern side of Hatherly Road and is part of the future location of the proposed Seaside at Scituate residential development.

Two releases have been reported for the Site. RTN 4-18143 was issued in April 2004 after an inspection of the Former Proving Grounds Property on behalf of MassDEP by Shaw Group, Inc. (Shaw) due to its listing as a Formerly Used Defense Site (FUDS). Shaw identified 14 Areas of Concern (AOCs) and conducted limited soil sampling activities at each AOC. Soil samples were analyzed for metals, extractable petroleum hydrocarbons (EPH), semi-volatile organic compounds (SVOCs) and explosives. Only petroleum constituents were detected above MassDEP Reportable Concentrations. It was concluded that the petroleum impacts originated from the usage and processing of white oils as a fiber lubricant by the George Goulston Company and not from former military usage. The white oil release was investigated and remediated by multiple consultants on behalf of the property owner between 2004 and 2011. A Permanent Solution with No Conditions (formally known as a Class A2 Response Action Outcome [RAO]) was submitted for the Site in December 2011. The Permanent Solution Statement documented that soil excavation activities effectively remediated the white oil release and a condition of No Significant Risk exists at the Site.

RTN 4-18656 was issued for a disposal area identified by Shaw as part of the inspection at the Former Proving Grounds Property in April 2004. In November 2005, GZA Environmental, Inc. (GZA) conducted remediation of the disposal area under an Immediate Response Action (IRA) Plan that included the removal of buried drums and the excavation and disposal of approximately 444 tons of soil. GZA collected post excavation soil and groundwater samples in the area of the excavation. The IRA was closed with an IRA Completion Report and RTN 4-18656 was linked to RTN 4-18143.

In January 2014, CHA Consulting, Inc. (CHA) performed an ASTM Phase II Environmental Site Assessment (ESA) subsurface investigation at the Property on behalf of Toll Brothers for property transfer negotiations. Based on the results of the subsurface investigations, CHA identified concentrations of volatile organic compounds (VOCs), SVOCs, volatile petroleum hydrocarbons (VPH), EPH, polyaromatic hydrocarbons (PAHs) and metals in soil in four AOCs that exceeded the applicable Massachusetts Contingency Plan (MCP) Reportable Concentration (RC) S-1 and/or Method 1 standards.

The MCP provides an exemption for reporting contaminant concentrations, that would otherwise require reporting, if a Permanent Solution Statement has been submitted for the site and the newly encountered contaminant conditions would not change the determinations made in the regulatory closure opinion (310 CMR 40.0317[17]). This exemption is applicable to the Site, and it is protective of human health because it relieves a Responsible Party from re-reporting conditions that are consistent with conditions that have already been reported and addressed under the MCP. It is GEI's opinion that the conditions encountered by CHA during the ASTM Phase II investigations meet the criteria for this exemption.

However, following its acquisition of the property, Toll Brothers is electing to submit a new Release Notification Form to MassDEP that presents the results of CHA's investigation. This will result in MassDEP's issuance of a new Release Tracking Number for the newly reported condition. This RAM Plan will be issued under the new RTN.

The RAM Plan includes the following activities:

- Excavation limits and disposal pre-characterization
- Soil excavation and off-site disposal.
- Air monitoring.
- Soil handling.
- Soil screening and additional characterization.
- Additional site assessment, if necessary.
- Dewatering and groundwater management.
- Abandonment of fresh and salt water supply wells.

1. Introduction

On behalf of Toll Brothers, Inc. (Toll Brothers), GEI Consultants, Inc. (GEI) is submitting this Release Abatement Measure (RAM) Plan for the excavation and off-site disposal of soil, and management of groundwater, at the Massachusetts Department of Environmental Protection (MassDEP) disposal site located at 137 Hatherly Road, Scituate, Massachusetts (the Site; Figs. 1 and 2), and assigned Release Tracking Number (RTN) 4-18143. This RAM Plan was prepared in accordance with the requirements of the Massachusetts Contingency Plan (MCP), 310 CMR 40.0440.

The original MassDEP RAM Transmittal Form (BWSC106) was submitted electronically and a copy is in Appendix A. The required public notice letters have been sent to the Chief Municipal Officer and Board of Health and copies are in Appendix B. A RAM Transmittal fee is not required because the Site has achieved a Permanent Solution.

1.1 Background

Two releases have been reported for the Site. RTN 4-18143 was issued in April 2004 after an inspection of the Former Proving Ground Property on behalf of MassDEP by Shaw Group, Inc. (Shaw) due to its listing as a Formerly Used Defense Site (FUDS). Shaw identified 14 Areas of Concern (AOCs) and conducted limited soil sampling activities in each area. Soil samples were analyzed for metals, extractable petroleum hydrocarbons (EPH), semi-volatile organic compounds (SVOCs) and explosives. Only petroleum constituents were detected above MassDEP Reportable Concentrations. It was concluded that the petroleum impacts originated from the usage and processing of white oils as a fiber lubricant by the George Goulston Company and not from former military usage. The white oil release was investigated and remediated by multiple consultants on behalf of the property owner between 2004 and 2011. As part of Phase IV activities, approximately 450 tons of white oil impacted soil was removed from the Site. A Permanent Solution with No Conditions (formally known as a Class A2 Response Action Outcome [RAO]) was submitted for the Site in December 2011. The Permanent Solution Statement documented that soil excavation activities effectively remediated the white oil release and a condition of No Significant Risk exists at the Site.

RTN 4-18656 was issued for a disposal area identified by Shaw as part of the inspection at the Former Proving Ground Property in April 2004. In November 2005, GZA Environmental, Inc. (GZA) conducted remediation of the disposal area under an Immediate Response Action (IRA) Plan that included the removal of buried drums and the excavation and disposal of approximately 444 tons of soil. GZA collected post excavation soil and

groundwater samples in the area of the excavation. The IRA was closed with an IRA Completion Report and RTN 4-18656 was linked to RTN 4-18143.

The disposal site boundaries for both RTNs are shown on Fig. 2.

In January 2014, CHA Consulting, Inc. (CHA) performed an ASTM Phase II Environmental Site Assessment (ESA) subsurface investigation at the Property on behalf of Toll Brothers for property transfer negotiations. The subsurface investigation activities included test pit excavation, soil boring advancement and groundwater monitoring well installation and collection of surficial soil, subsurface soil and groundwater samples. Based on the results of the subsurface investigations, CHA identified concentrations of volatile organic compounds (VOCs), SVOCs, volatile petroleum hydrocarbons (VPH), EPH, polyaromatic hydrocarbons (PAHs) and metals in soil in four AOCs that exceeded the applicable MCP Reportable Concentration (RC) RCS-1 and/or Method 1 standards. CHA identified concentrations of pyrene and lead in groundwater that exceeded the applicable MCP RCGW-2 and/or Method 1 standard, however, these detections were attributed to sample matrix interference and therefore, are not representative of Site conditions. Based on our review of the data and CHA's description of sample conditions, we agree that the concentrations of pyrene and lead identified by CHA were caused by sample matrix interference. Data tables summarizing the soil and groundwater results of the subsurface investigations are included in Appendix C and locations of the subsurface investigations are shown on the CHA figures included in Appendix D. The AOCs are shown on Fig. 3.

The RAM Plan includes the following activities:

- Excavation limits and disposal pre-characterization
- Soil excavation and off-site disposal.
- Air monitoring.
- Soil handling.
- Soil screening and additional characterization.
- Additional site assessment, if necessary.
- Dewatering and groundwater management.
- Abandonment of fresh and salt water supply wells.

These activities are discussed further in Section 4.

2. Contact Information (310 CMR 40.0444[1][a])

2.1 Responsibility for the RAM

Mr. David Bauer
Division President
Toll Brothers, Inc.
134 Flanders Road, Suite 275
Westborough, MA 01571
508-366-1440

2.2 Licensed Site Professional (LSP) for the RAM

James R. Ash, P.E., LSP
LSP No. 6581
GEI Consultants, Inc.
400 Unicorn Park Drive
Woburn, MA 01801
781-721-4018

3. Description of Release, Site Conditions, and Surrounding Receptors (310 CMR 40.0444[1][b])

3.1 Site History and Release Description

Based on a review of available historical sources, the Site was developed around 1918 for use as a military base. Between 1921 and the 1980s, the Site was occupied by the George Goulston Company for manufacturing of white oils. The Site was also used by several short-wave radio stations between 1927 and 1976. The historical use of the Site for the manufacturing of white oils is the primary source of releases at the Site.

3.2 Site Description

The Site consists of an approximately 15-acre portion of the 115-acre parcel of land known as the former Scituate Proving Grounds in Scituate, Massachusetts. The former Scituate Proving Grounds property (the Property) is bisected by Hatherly Road, with 65 acres located south of Hatherly Road and 50 acres located north of Hatherly Road. The Site is located within the 65-acre portion on the southern side of Hatherly Road and is part of the future location of the proposed Seaside at Scituate residential development (Fig. 2).

3.3 Surrounding Receptors

The Site is located in Scituate, Massachusetts. Potential human receptors include construction and utility workers under current and future uses, as well as residential occupants under future use. Possible trespassers are also potential human receptors during the planned excavation activities (from fugitive dust and/or direct contact).

Based on the MassGIS map, we have not identified any sensitive environmental receptors within 500 feet of the Site. The Site is not located within a MassDEP-approved Wellhead Protection Area (Zone II Area), MassDEP Interim Wellhead Protection Area (IWPA), or potentially productive aquifer (PPA), and no public water supplies or private drinking water wells are located within 500 feet of the Site.

Town records do not identify public supply or private drinking water wells at the Site. However, as part of its Phase II ESA, CHA stated that fresh and salt water supply wells were formerly located at the Site. The locations of the wells, if still present, were not identified by CHA. These wells will be decommissioned if they are located during the redevelopment effort. Additional information is provided in Section 4.3.9.

4. RAM Objectives, Plan, and Schedule (310 CMR 40.0444[1][c])

4.1 Objectives

The objective of this RAM Plan is to manage contaminated soil with concentrations greater than MCP RCS-1 or Method 1 standards in advance of a residential redevelopment of the Property. The RAM Plan has been developed to be protective of construction workers during direct contact with potentially contaminated soil, surrounding receptors, and future occupants at the proposed Seaside at Scituate development.

4.2 Project Description

The planned depth and extent of excavation at each AOC varies and are further described in Sections 4.2.1 through 4.2.4 below. Proposed areas of excavation are shown on Fig. 3.

4.2.1 AOC 1 – White Oil

AOC 1 is related to the former release of white oil identified adjacent to and west of the Main Building. Concentrations of EPH and target analytes were detected within the area above applicable RCS-1 and/or Method 1 S-1 standards in samples ENV-3, ENV-207, ENV-210 and ENV-212. Soil will be excavated to a depth of 4 feet within AOC 1 and the limits of excavation will include sample locations that exceed applicable RCS-1 and/or Method 1 S-1 standards. Based on our current estimate of extent, approximately 1,303 cubic yards of soil will be excavated from AOC 1.

4.2.2 AOC 2 – Lead and Polycyclic Aromatic Hydrocarbons (PAHs) in Shallow Soil

AOC 2 was delineated around the detection of lead and PAHs above applicable Reportable Concentrations (RCs) in shallow soil samples collected from the north side of Hatherly Road. This AOC is located outside the disposal site boundary (Fig. 3). Concentrations of EPH and target analytes were detected in two samples (CHA-103 and CHA-305), concentrations of lead were detected in three samples (CHA-102, CHA-103 and CHA-104) and concentrations of VOCs and SVOCs were detected in one sample (CHA-103) above applicable RCS-1 and/or Method 1 S-1 standards. CHA, their ASTM Phase II, opined that these detections are exempt from reporting under the MCP in accordance with 40.0317(8)(a) and 40.0317(9) and are attributable to wood ash and paint chips observed near the building foundations. GEI agrees that these detections are not reportable under the MCP and therefore an extension of the Site boundary is not warranted. However, soil will be excavated to a depth of 1 foot

within AOC 2 and the limits of excavation will include sample locations that exceed applicable RCS-1 and/or Method 1 S-1 standards. Based on our current estimate of extent, approximately 340 cubic yards of soil will be excavated from AOC 2.

4.2.3 AOC 3 - Aboveground Storage Tank (AST) behind Railroad Building

AOC 3 is related to the detection of EPH in shallow soil beneath one of two ASTs behind the Railroad Building. Concentrations of EPH and target compounds were detected in one soil sample collected near the northern of the two ASTs (Tank 2) above applicable RCS-1 and Method 1 S-1 standards. Soil will be excavated to a depth of 2 feet within AOC 3 and limits of excavation will include the sample location that exceeded applicable RCS-1 and Method 1 S-1 standards. Based on our current estimate of extent, approximately 11 cubic yards of soil will be excavated from AOC 3.

4.2.4 AOC 4 – Petroleum Impacted Soil on Northern Side of Sea Moss Building

AOC 4 is related to the detection of EPH in soil on the northern side of the Sea Moss Building. Concentrations of EPH and target compounds were detected in one soil sample (TP1011) above applicable RCS-1 standards. Soil will be excavated to a depth of 13 feet within AOC 4 and limits of excavation will include the sample location that exceeded applicable RCS-1 standards. Based on our current estimate of extent, approximately 48 cubic yards of soil will be excavated from AOC 4.

4.3 Planned RAM Activities

The planned RAM activities include the following:

4.3.1 Excavation limits and disposal pre-characterization

To pre-characterize the extent of excavation within the AOCs, soil samples will be collected from the limits of the proposed areas of excavation shown on Fig. 3 prior to mobilization of excavation equipment. The samples will be collected using Geoprobe drilling equipment or by hand auger, where appropriate. Samples will be submitted to a laboratory for chemical testing consistent with the Contaminants of Concern (COCs) at the specific AOC.

- AOC 1: Soil samples will be collected from the estimated extent of the excavation at a frequency of approximately one sample per 50- linear feet. Similarly, soil samples will be collected from the estimated bottom of the excavation on an approximately 50-foot grid pattern. The confirmatory samples will be analyzed for EPH with target compounds.

- AOC 2: Soil samples will be collected from the estimated extent of the excavation at a frequency of approximately one sample per 50- linear feet. Similarly, soil samples will be collected from the estimated bottom of the excavation on an approximately 50-foot grid pattern. The confirmatory samples will be analyzed for EPH with target compounds and lead. One sample will be collected from the vicinity of CHA-103 for VOCs, SVOCs, EPH with target compounds and lead.
- AOC 3: Due to the relatively small size of the proposed excavation (approximately 15 feet by 10 feet), samples will be collected from each of the four sides of the excavation and one from the bottom. The confirmatory samples will be analyzed for EPH with target compounds.
- AOC 4: Due to the relatively small size of the proposed excavation (approximately 10 feet by 10 feet), samples will be collected from each of the four sides of the excavation and one from the bottom. The confirmatory samples will be analyzed for EPH with target compounds.

If the samples collected from the currently estimated extent of the excavation exceed Method 1 standards, additional sampling may be warranted and the extent of the excavation will be adjusted as necessary. The extent of excavation will be predetermined based on the results of the proposed investigation described above and will allow a load-and-go excavation process. Excavation sidewall and bottom sampling will not be conducted during excavation activities.

During soil sampling program, soil within the proposed excavation area will also be sampled to pre-characterize the soil based on likely disposal facility requirements. Representative soil samples will be collected from each excavation area for disposal parameters including VOCs, SVOCs, total petroleum hydrocarbons (TPH), polychlorinated biphenyls (PCBs), Resource Conservation and Recovery Act (RCRA) 8 metals, ignitability, conductivity, corrosivity and reactive cyanide and sulfide at a frequency of one sample per 500 cubic yards. A minimum of one sample will be collected from each proposed excavation area. Several samples will be analyzed for pesticides and herbicides depending on the soil category and selected offsite disposal facility.

Results of the soil pre-characterization program will be documented in RAM Status Report No.1 and will include all data used to determine excavation extents and figures showing final extents of excavations that will be removed as part of RAM activities. The RAM Status Report will also include proposed soil disposal facilities.

4.3.2 Soil excavation and off-site disposal

Up to 2,000 cubic yards of soil may be excavated from the AOCs and disposed of off site as part of remediation. Management of soil as Remediation Waste is further described in Section 5.

4.3.3 Air monitoring

Continuous real-time air monitoring for particulates (dust) and total VOCs (TVOCs) will be conducted at the perimeter of the work area during all ground intrusive activities that result in management of contaminated soil. The system will consist of four perimeters, real-time air monitoring stations that transmit measurements to a data acquisition system. The system will include a paging system to notify the engineer of any exceedance of the alert level or action level. The four locations around the perimeter of the work area will continuously establish upwind background conditions even if wind direction changes. It is anticipated that the stations will be located at each of the four sides of the work area perimeter shown on Fig. 3, however final locations of stations will be selected based on contractor Site layout and one station will always be positioned to collect data representative of downwind conditions. Air monitoring procedures and the derivation of alert and action levels are further discussed in Section 6.

4.3.4 Soil handling

Soil excavated during the AOC excavations will be live loaded into trucks for offsite disposal. If temporary onsite soil stockpiling is necessary, the soil will be stockpiled on a 6-mil-thick, polyethylene barrier or other impervious surface and covered with a 6-mil-thick, polyethylene barrier. The stockpiles will be surrounded by haybale berms.

4.3.5 Soil screening and additional characterization

We will periodically screen material on site as it is excavated. The screening will consist of visual and olfactory observations combined with jar-headspace measurements of VOCs using a photo-ionization detector (PID). If we identify material during excavation as having characteristics inconsistent with those identified during previous investigations, the material will be stockpiled separately and characterized separately.

4.3.6 Additional site assessment, if necessary

Toll Brothers will arrange to have the remainder of the property inspected by the LSP of Record, or his representative, after clearing of vegetation has been completed. The results of that inspection will be reported in a future RAM Status Report or the RAM Completion Report, if appropriate. If drums, containers, or other evidence of hazardous material storage or use are identified in other portions of the property during the inspections or during the redevelopment process following the completion of the RAM, Toll Brothers will arrange to collect samples for chemical analysis to evaluate whether a release to the environment has occurred. The RAM Plan will be modified, if necessary, to include additional soil removal activities in other portions of the property.

4.3.7 Dewatering and groundwater management

Groundwater will likely be encountered during excavation of AOC 1 and AOC 4. Based on the approximate depths of the proposed excavations, groundwater is unlikely to be encountered in AOC 2 and AOC 3. If groundwater is encountered and dewatering of an excavation is required, the dewatering effluent will either be recharged on Site at a hydraulically upgradient location within the Site boundary or temporarily stored onsite and recharged back into the excavation. Groundwater management is further discussed in Section 5.

4.3.8 Abandonment of former fresh and saltwater supply wells

According to CHA, former fresh and saltwater supply wells historically existed at the Site. However, the locations of these wells were not determined during Phase I or Phase II investigations. If encountered during remediation, or during subsequent redevelopment efforts, Toll Brothers will arrange for the decommissioning of the wells by a licensed drilling subcontractor.

4.4 Schedule

The RAM activities will begin following approval of the project by the Town of Scituate.

5. Remediation Waste Management (310 CMR 40.0444[1][d])

5.1 Soil Excavation and Management

Based on our preliminary estimate of excavation extent, we estimate that up to 1,213 cubic yards of soil will be generated during the AOC excavations. In its Phase II report, CHA estimated approximately 1,000 cubic yards of soil would be generated from the AOC excavations. The actual extent and volume of soil requiring excavation will be determined during the proposed soil sampling and pre-characterization program. However, for this RAM Plan, we are requesting approval to manage up to 2,000 cubic yards of soil as Remediation Waste during the RAM. In accordance with 310 CMR 40.0442(5), a letter certifying that Toll Brothers has the financial resources to manage this volume of Remediation Waste is in Appendix E.

Soil excavated during the AOC excavations will be live loaded into trucks for offsite disposal. If temporary onsite soil stockpiling is necessary, the soil will be stockpiled on a 6-mil-thick, polyethylene barrier or other impervious surface and covered with a 6-mil-thick, polyethylene barrier. The stockpiles will be surrounded by haybale berms.

If the soil is a non-hazardous waste, it will be transported under a Bill of Lading (BOL) prepared by the LSP and handled as required by the MCP in 310 CMR 40.0030. In the unlikely event that the soil is a hazardous waste, it will be disposed of appropriately under a Department of Transportation (DOT) Uniform Hazardous Waste Manifest.

The trucks leaving the Site will include load covers to prevent accidental spillage of soil during transport. Rubber track mats will be used to prevent truck tires coming into contact with contaminated soil during live loading. The rubber track mats will also prevent truck tires tracking soil offsite.

5.2 Groundwater Management

Groundwater management may be necessary during excavation. Groundwater is present at depths ranging from approximately 1 to 15 feet below ground surface. The maximum depth of excavation is approximately 12 feet. If groundwater is encountered and dewatering of an excavation is required, the dewatering effluent will either be recharged on Site at a hydraulically upgradient location within the Site boundary or temporarily stored onsite in tanks and recharged back into the excavation after it is completed. These methods are consistent with management procedures described in the MCP.

6. Worker Protection and Environmental Monitoring (310 CMR 40.0444[1][e])

The contractors performing soil excavations will prepare and implement project Health and Safety Plans (HASPs) to protect Site workers from potentially contaminated material. GEI will prepare a HASP for the protection of its workers. Continuous real-time air monitoring for total VOCs (TVOCs) and particulates (dust) will be conducted at the perimeter of the AOC work areas and Property perimeter during all ground intrusive activities that result in management of contaminated soil.

Alert levels and action levels are contaminant concentrations that trigger implementation of measures to mitigate contaminant release conditions. The alert level provides an early warning of particulate concentrations approaching the action level. The alert level is intended to notify the project team and result in initiating mitigation response actions before the action level is reached. An alert level is a contaminant concentration that triggers mitigation response actions. An alert level does not suggest the existence of a health hazard, but serves instead as a screening tool to trigger measures to assist in minimizing potential off-Site transport of contaminants during ground intrusive remedial activities.

The maximum concentrations of volatile contaminants in soil are below the applicable Method 1 S-1 standards. Therefore, volatile contaminants are unlikely to result in a significant inhalation exposure pathway. However, as a conservative measure, TVOC monitoring will be performed. The perimeter action level for total VOCs has been set at 1 ppmV. The alert level has been set at 0.7 ppmV.

Site-specific alert levels and action levels were derived using exposure point concentrations (EPCs) calculated using representative soil sample results from across the Site. Ambient air concentrations (AACs) for PAHs in particulates were evaluated to protect nearby receptors from potential exposure to PAHs in dust. In accordance with “Real-Time Air Monitoring at Construction and Remediation Sites To Estimate Risks of Contaminated Dust Migration” (MassDEP 1997), AACs were developed for benzo(a)pyrene and naphthalene to be protective of “worst case” PAH compounds for the evaluation of carcinogenic effects and non-carcinogenic effects, respectively. AACs were also derived for extractable petroleum hydrocarbons (EPH) and lead, because the maximum concentration of these contaminants exceeded a Method 1 standard, and unlike for PAHs, a suitable surrogate compound is not available. Exposure to particulates for other analytes where the maximum concentration is below the Method 1 S-1 soil standards is unlikely to result in a significant exposure pathway, and therefore, AACs were not derived for those analytes. AACs were derived assuming a 4-week duration of intrusive soil activities, with work being performed for 5 days per week,

for 10 hours per day. Derivation calculations of site-specific alert levels and action levels are included in Appendix F.

In each case, the analyte-specific AAC is greater than the National Ambient Air Quality Standard (NAAQS) for PM₁₀ for a 24-hour average period (150 micrograms per cubic meter [ug/m³]). This standard is based on potential adverse health impacts due to the inhalation of particulates in this size range. Accordingly, as a conservative measure, the dust action level is set at 150 micrograms per cubic meter (ug/m³) and the alert level has been set at 100 ug/m³.

If the ambient air concentration of particulates at the downwind perimeter of the work area exceeds 100 ug/m³ above upwind background conditions for the 15-minute average, or if airborne dust is observed leaving the work area, then dust suppression techniques will be employed. The contractor will immediately implement mitigation control measures to abate the emissions and reduce levels to below the alert level. Work will continue with dust suppression techniques provided that the downwind particulate concentration does not exceed 150 ug/m³ above the upwind background conditions, and provided that no visible dust is migrating from the work area.

Baseline monitoring will be conducted for three days prior to remedial activities to establish pre-excavation concentrations of particulates. The baseline monitoring will be performed at real-time air monitoring stations for three days prior to excavation. One ambient air sample will also be collected prior to remediation activities to identify pre-excavation ambient air concentrations on a chemical-specific basis. Baseline monitoring will be performed during a time period that will be representative of the anticipated excavation schedule.

If conditions are encountered at other portions of the property that indicate a release of hazardous material to the environment has occurred that requires remediation under the MCP, the RAM Plan will be modified to include the additional areas, and the air monitoring procedures described in this section will be applied at the additional remediation areas.

7. Permits (310 CMR 40.0444[1][f])

Remediation Waste will be transported off the Site under BOLs or hazardous waste manifests. Toll Brothers will sign all BOLs and/or manifests as the generator in accordance with 310 CMR 40.0034 and 40.0035.

Wetland areas are located within the proposed Seaside at Scituate development area. Wetland areas have been identified within 100 feet of the AOCs. Permits have currently been filed with the Town to temporarily disturb and restore wetland areas that will be affected by excavation prior to and during construction.

8. Limitations

This report was prepared for the use of Toll Brothers, Inc., and MassDEP, exclusively. The conclusions presented in this report are based solely on the information reported in this document. Additional information regarding the Site not available to GEI at the time this report was prepared – may result in a modification of the findings above. The report has been prepared in accordance with generally accepted hydrogeological practices. No warranty, expressed or implied, is made.

9. References

CHA (2014). ASTM Phase II Environmental Site Assessment, Former Proving Grounds, Hatherly Road, Scituate, Massachusetts, April 21, 2014.

WE (2011). Class A-2 Response Action Outcome Statement, 50-Acres Between Tilden and Hatherly Roads (aka Former Scituate Proving Grounds), 137 Hatherly Road, Scituate, Massachusetts, December 21, 2011.

Figures

DRAFT

Appendix A

MassDEP Transmittal Form

DRAFT

Appendix B

Public Notice Letters

DRAFT

Appendix C

CHA Phase II Data Tables

DRAFT

Appendix D

CHA Phase II Figures

DRAFT

Appendix E

Letter Certifying Financial Resources

DRAFT

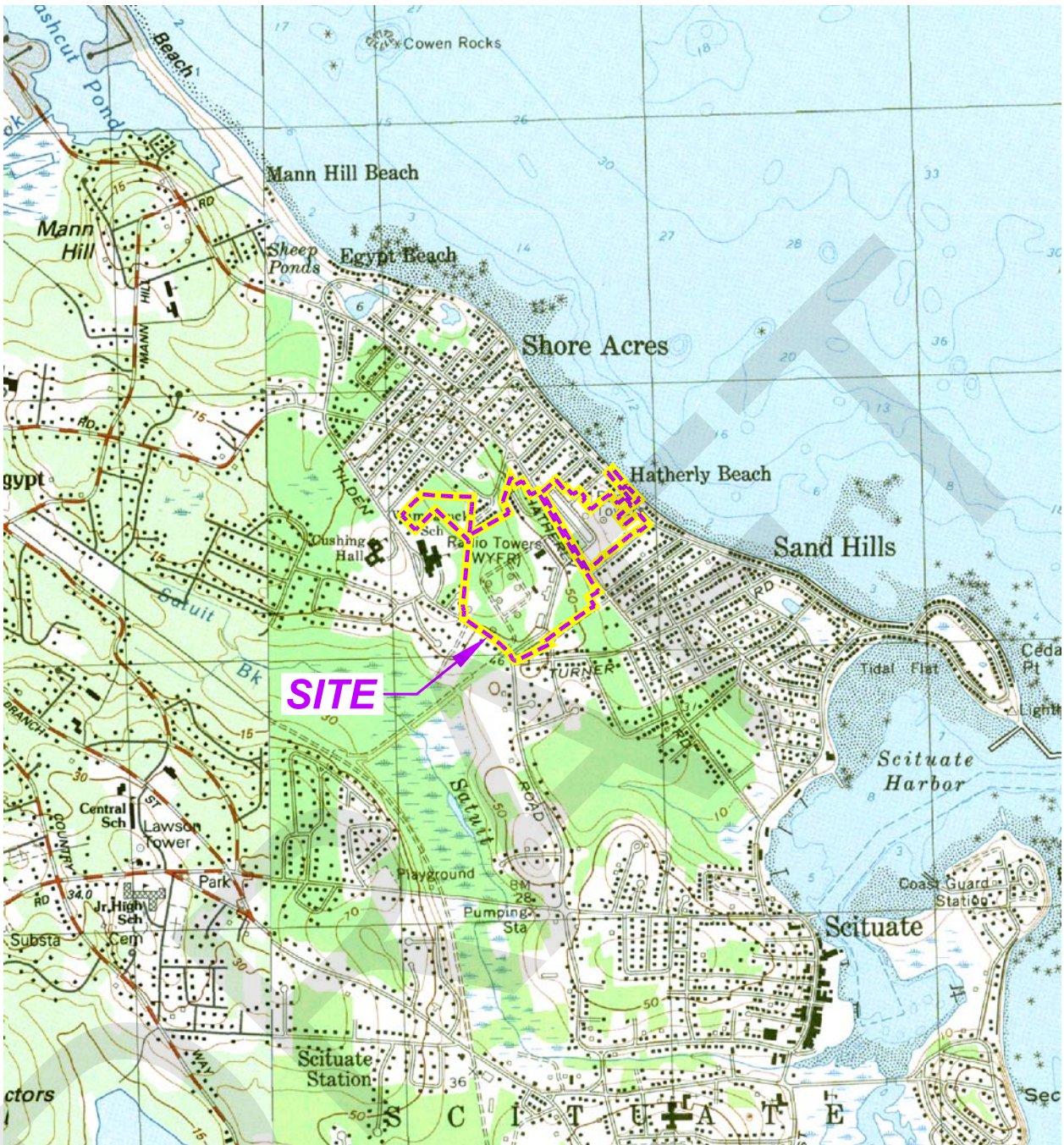
Appendix F

Derivation of Particulate AACs

DRAFT

Figures

DRAFT



DRAFT

This Image provided by MassGIS is from U.S.G.S. Topographic 7.5 X 15 Minute Series Scituate, MA Quadrangle, 1984. Datum is National Geodetic Vertical Datum of 1929 (NGVD29). Contour Interval is 3 Meters.



MASSACHUSETTS QUADRANGLE LOCATION

Release Abatement Measure Plan
Seaside at Scituate
Scituate, Massachusetts
Toll Brothers, Inc.
Westborough, Massachusetts



SITE LOCATION MAP



Project 1701819

October 2017

Fig. 1



LEGEND:

-  SITE BOUNDARY RTN 4-18143
-  SITE BOUNDARY RTN 4-18656

NOTES:

1. SITE BOUNDARY FOR RTN 4-18143 FROM "137 HATHERLY ROAD, SCITUATE, MASSACHUSETTS, SITE PLAN," PREPARED BY GZA GEOENVIRONMENTAL, INC. DATED 04-19-2005.
2. GOOGLE EARTH IMAGE DATED 5/10/2016
3. ALL LOCATIONS ARE APPROXIMATE.

DRAFT

Release Abatement Measure Plan
Seaside at Scituate
Scituate, Massachusetts



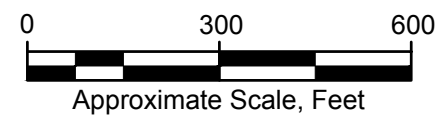
DEVELOPMENT PLAN

Toll Brothers, Inc.
Westborough, Massachusetts

Project 1701819



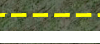


October 2017

Fig. 2





LEGEND:

-  ESTIMATED AREA OF PROPOSED EXCAVATION
-  CHA AREA OF CONCERN (AOC)
-  SITE BOUNDARY RTN 4-18143
-  SITE BOUNDARY RTN 4-18656
-  PROPOSED AIR MONITORING STATION

- NOTES:**
1. SITE BOUNDARY FOR RTN 4-18143 FROM "137 HATHERLY ROAD, SCITUATE, MASSACHUSETTS, SITE PLAN," PREPARED BY GZA GEOENVIRONMENTAL, INC. DATED 04-19-2005.
 2. GOOGLE EARTH IMAGE DATED 5/10/2016
 3. ALL LOCATIONS ARE APPROXIMATE.

DRAFT

Release Abatement Measure Plan
 Seaside at Scituate
 Scituate, Massachusetts
 Toll Brothers, Inc.
 Westborough, Massachusetts



AREAS OF PROPOSED EXCAVATION

Project 1701819 October 2017 Fig. 3

Appendix A

MassDEP Transmittal Form

DRAFT



RELEASE ABATEMENT MEASURE (RAM)
TRANSMITTAL FORM

Release Tracking Number

4 - 18143

Pursuant to 310 CMR 40.0444 - 0446 (Subpart D)

A. SITE LOCATION:

1. Site Name/Location Aid: 50 ACRES BETWEEN TILDEN & HATHERLY RD

2. Street Address: 137 HATHERLY RD

3. City/Town: SCITUATE 4. Zip Code: 020660000

5. Check here if the disposal site that is the source of the release is Tier Classified. Check the current Tier Classification Category.

a. Tier I

b. Tier ID

c. Tier II

B. THIS FORM IS BEING USED TO: (check all that apply)

1. List Submittal Date of Initial RAM Plan (if previously submitted):

(mm/dd/yyyy)

2. Submit an Initial Release Abatement Measure (RAM) Plan.

a. Check here if the RAM is being conducted as part of the construction of a permanent structure. If checked, you must specify what type of permanent structure is to be erected in or in the immediate vicinity of the area where the RAM is to be conducted.

b. Specify type of permanent structure: (check all that apply) i. School ii. Residential iii. Commercial

iv. Industrial v. Other Specify:

3. Submit a Modified RAM Plan of a previously submitted RAM Plan.

4. Submit a RAM Status Report.

5. Submit a Remedial Monitoring Report. (This report can only be submitted through eDEP, concurrent with a RAM Status Report.)

a. Type of Report: (check one) i. Initial Report ii. Interim Report iii. Final Report

b. Frequency of Submittal:

i. A Remedial Monitoring Report(s) submitted every six months, concurrent with a RAM Status Report.

ii. A Remedial Monitoring Report(s) submitted annually, concurrent with a RAM Status Report.

c. Number of Remedial Systems and/or Monitoring Programs:

A separate BWSC106A, RAM Remedial Monitoring Report, must be filled out for each Remedial System and/or Monitoring Program addressed by this transmittal form.

6. Submit a RAM Completion Statement.

7. Submit a Revised RAM Completion Statement.

8. Provide Additional RTNs:

a. Check here if this RAM Submittal covers additional Release Tracking Numbers (RTNs). RTNs that have been previously linked to a Primary Tier Classified RTN do not need to be listed here. This section is intended to allow a RAM to cover more than one unclassified RTN and not show permanent linkage to a Primary Tier Classified RTN.

b. Provide the additional Release Tracking Number(s) covered by this RAM Submittal.

9. Include in the RAM Plan or Modified RAM Plan a Plan for the Application of Remedial Additives near a sensitive receptor, pursuant to 310 CMR 40.0046(3).

(All sections of this transmittal form must be filled out unless otherwise noted above)



RELEASE ABATEMENT MEASURE (RAM)
TRANSMITTAL FORM

Release Tracking Number

4 - 18143

Pursuant to 310 CMR 40.0444 - 0446 (Subpart D)

C. RELEASE OR THREAT OF RELEASE CONDITIONS THAT WARRANT RAM:

1. Media Impacted and Receptors Affected: (check all that apply)
- | | | |
|---|---|---|
| <input type="checkbox"/> a. Paved Surface | <input type="checkbox"/> b. Basement | <input type="checkbox"/> c. School |
| <input type="checkbox"/> d. Public Water Supply | <input type="checkbox"/> e. Surface Water | <input type="checkbox"/> f. Zone 2 |
| <input type="checkbox"/> g. Private Well | <input type="checkbox"/> h. Residence | <input checked="" type="checkbox"/> i. Soil |
| <input type="checkbox"/> j. Ground Water | <input type="checkbox"/> k. Sediments | <input type="checkbox"/> l. Wetland |
| <input type="checkbox"/> m. Storm Drain | <input type="checkbox"/> n. Indoor Air | <input type="checkbox"/> o. Air |
| <input type="checkbox"/> p. Soil Gas | <input type="checkbox"/> q. Sub-Slab Soil Gas | <input type="checkbox"/> r. Critical Exposure Pathway |
| <input type="checkbox"/> s. NAPL | <input type="checkbox"/> t. Unknown | |
| <input type="checkbox"/> u. Others | Specify: _____ | |

2. Sources of the Release or TOR: (check all that apply)
- | | | |
|--|--|-------------------------------------|
| <input type="checkbox"/> a. Transformer | <input type="checkbox"/> b. Fuel Tank | <input type="checkbox"/> c. Pipe |
| <input type="checkbox"/> d. OHM Delivery | <input checked="" type="checkbox"/> e. AST | <input type="checkbox"/> f. Drums |
| <input type="checkbox"/> g. Tanker Truck | <input type="checkbox"/> h. Hose | <input type="checkbox"/> i. Line |
| <input type="checkbox"/> j. UST | Describe: _____ | <input type="checkbox"/> k. Vehicle |
| <input type="checkbox"/> l. Boat/Vessel | | |
| <input type="checkbox"/> m. Unknown | <input type="checkbox"/> n. Other: _____ | |

3. Type of Release or TOR: (check all that apply)
- | | | | |
|--|--|---|--------------------------------------|
| <input type="checkbox"/> a. Dumping | <input type="checkbox"/> b. Fire | <input type="checkbox"/> c. AST Removal | <input type="checkbox"/> d. Overfill |
| <input type="checkbox"/> e. Rupture | <input type="checkbox"/> f. Vehicle Accident | <input type="checkbox"/> g. Leak | <input type="checkbox"/> h. Spill |
| <input type="checkbox"/> i. Test Failure | <input type="checkbox"/> j. TOR Only | | |
| <input type="checkbox"/> k. UST Removal | Describe: _____ | | |
| <input checked="" type="checkbox"/> l. Unknown | <input type="checkbox"/> m. Other: _____ | | |

4. Identify Oils and Hazardous Materials Released: (check all that apply)
- | | |
|---|--|
| <input checked="" type="checkbox"/> a. Oils | <input type="checkbox"/> b. Chlorinated Solvents |
| <input type="checkbox"/> c. Heavy Metals | <input type="checkbox"/> d. Others |
| Specify: _____ | |

D. DESCRIPTION OF RESPONSE ACTIONS: (check all that apply, for volumes list cumulative amounts)

- | | |
|---|---|
| <input type="checkbox"/> 1. Assessment and/or Monitoring Only | <input type="checkbox"/> 2. Temporary Covers or Caps |
| <input type="checkbox"/> 3. Deployment of Absorbent or Containment Materials | <input type="checkbox"/> 4. Temporary Water Supplies |
| <input type="checkbox"/> 5. Structure Venting System/HVAC Modification System | <input type="checkbox"/> 6. Temporary Evacuation or Relocation of Residents |
| <input type="checkbox"/> 7. Product or NAPL Recovery | <input type="checkbox"/> 8. Fencing and Sign Posting |
| <input type="checkbox"/> 9. Groundwater Treatment Systems | <input type="checkbox"/> 10. Soil Vapor Extraction |
| <input type="checkbox"/> 11. Remedial Additives | <input type="checkbox"/> 12. Air Sparging |
| <input type="checkbox"/> 13. Active Exposure Pathway Mitigation System | <input type="checkbox"/> 14. Passive Exposure Pathway Mitigation System |
| <input type="checkbox"/> 15. Monitored Natural Attenuation | <input type="checkbox"/> 16. In-Situ Chemical Oxidation |



**RELEASE ABATEMENT MEASURE (RAM)
TRANSMITTAL FORM**

Release Tracking Number

4 - 18143

Pursuant to 310 CMR 40.0444 - 0446 (Subpart D)

D. DESCRIPTION OF RESPONSE ACTIONS (cont.): (check all that apply, for volumes list cumulative amounts)

17. Excavation of Contaminated Soils

a. Re-use, Recycling or Treatment

i. On Site

Estimated volume in cubic yards _____

ii. Off Site

Estimated volume in cubic yards _____

ii.a. Receiving Facility: TBD Town: _____ State: _____

ii.b. Receiving Facility: _____ Town: _____ State: _____

iii. Describe: _____

b. Store

i. On Site

Estimated volume in cubic yards _____

ii. Off Site

Estimated volume in cubic yards _____

ii.a. Receiving Facility: _____ Town: _____ State: _____

ii.b. Receiving Facility: _____ Town: _____ State: _____

c. Landfill

i. Cover

Estimated volume in cubic yards _____

Receiving Facility: _____ Town: _____ State: _____

ii. Disposal

Estimated volume in cubic yards _____

Receiving Facility: _____ Town: _____ State: _____

18. Removal of Drums, Tanks or Containers:

a. Describe Quantity and Amount: _____

b. Receiving Facility: _____ Town: _____ State: _____

c. Receiving Facility: _____ Town: _____ State: _____

19. Removal of Other Contaminated Media:

a. Specify Type and Volume: _____

b. Receiving Facility: _____ Town: _____ State: _____

c. Receiving Facility: _____ Town: _____ State: _____

20. Other Response Actions:

Describe: _____

21. Use of Innovative Technologies:

Describe: _____



**RELEASE ABATEMENT MEASURE (RAM)
TRANSMITTAL FORM**

Release Tracking Number

4 - 18143

Pursuant to 310 CMR 40.0444 - 0446 (Subpart D)

E. LSP SIGNATURE AND STAMP :

I attest under the pains and penalties of perjury that I have personally examined and am familiar with this transmittal form, 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 309 CMR 4.03(2), and (iii) the provisions of 309 CMR 4.03(3), to the best of my knowledge, information and belief,

> if Section B of this form indicates that a **Release Abatement Measure Plan** is being submitted, the response action(s) that is (are) the subject of this submittal (i) has (have) been developed in accordance with the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000, (ii) is (are) appropriate and reasonable to accomplish the purposes of such response action(s) as set forth in the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000 and (iii) comply(ies) with the identified provisions of all orders, permits, and approvals identified in this submittal;

> if Section B of this form indicates that a **Release Abatement Measure Status Report** and/or **Remedial Monitoring Report** is being submitted, the response action(s) that is (are) the subject of this submittal (i) is (are) being implemented in accordance with the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000, (ii) is (are) appropriate and reasonable to accomplish the purposes of such response action(s) as set forth in the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000 and (iii) comply (ies) with the identified provisions of all orders, permits, and approvals identified in this submittal;

> if Section B of this form indicates that a **Release Abatement Measure Completion Statement** is being submitted, the response action(s) that is (are) the subject of this submittal (i) has (have) been developed and implemented in accordance with the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000, (ii) is (are) appropriate and reasonable to accomplish the purposes of such response action(s) as set forth in the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000 and (iii) comply(ies) with the identified provisions of all orders, permits, and approvals identified in this submittal:

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.

1. LSP #: 6581

2. First Name: JAMES R 3. Last Name: ASH

4. Telephone: 7817214018 5. Ext.: _____ 6. Email: jash@geiconsultants.co

7. Signature: _____

8. Date: _____ 9. LSP Stamp: _____
(mm/dd/yyyy)





**RELEASE ABATEMENT MEASURE (RAM)
TRANSMITTAL FORM**

Release Tracking Number

4 - 18143

Pursuant to 310 CMR 40.0444 - 0446 (Subpart D)

F. PERSON UNDERTAKING RAM:

1. Check all that apply: a. change in contact name b. change of address c. change in the person undertaking response actions
2. Name of Organization: TOLL BROTHERS, INC
3. Contact First Name: _____ 4. Last Name: _____
5. Street: _____ 6. Title: _____
7. City/Town: _____ 8. State: _____ 9. ZIP Code: _____
10. Telephone: _____ 11. Ext.: _____ 12. Email: _____

G. RELATIONSHIP TO RELEASE OR THREAT OF RELEASE OF PERSON UNDERTAKING RAM:

Check here to change relationship

1. RP or PRP a. Owner b. Operator c. Generator d. Transporter
 e. Other RP or PRP Specify: _____
2. Fiduciary, Secured Lender or Municipality with Exempt Status (as defined by M.G.L. c. 21E, s. 2)
3. Agency or Public Utility on a Right of Way (as defined by M.G.L. c. 21E, s. 5(j))
4. Any Other Person Undertaking RAM Specify Relationship: _____

H. REQUIRED ATTACHMENT AND SUBMITTALS:

1. Check here if any Remediation Waste, generated as a result of this RAM, will be stored, treated, managed, recycled or reused at the site following submission of the RAM Completion Statement. You must submit a Phase IV Remedy Implementation Plan along with the appropriate transmittal form (BWSC108).
2. 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.
3. Check here to certify that the Chief Municipal Officer and the Local Board of Health have been notified of the implementation of a Release Abatement Measure.
4. Check here if any non-updatable information provided on this form is incorrect, e.g. Release Address/Location Aid. Send corrections to bwsc.edep@state.ma.us.
5. If a RAM Compliance Fee is required for this RAM, check here to certify that a RAM Compliance Fee was submitted to DEP, P. O. Box 4062, Boston, MA 02211.
6. Check here to certify that the LSP Opinion containing the material facts, data, and other information is attached.



**RELEASE ABATEMENT MEASURE (RAM)
TRANSMITTAL FORM**

Release Tracking Number

4 - 18143

Pursuant to 310 CMR 40.0444 - 0446 (Subpart D)

I. CERTIFICATION OF PERSON UNDERTAKING RAM:

1. I, _____, attest under the pains and penalties of perjury (i) that I have personally examined and am familiar with the information contained in this submittal, including any and all documents accompanying this transmittal form, (ii) that, based on my inquiry of those individuals immediately responsible for obtaining the information, the material information contained in this submittal is, to the best of my knowledge and belief, true, accurate and complete, and (iii) that I am fully authorized to make this attestation on behalf of the entity legally responsible for this submittal. I/the person or entity on whose behalf this submittal is made am/is aware that there are significant penalties, including, but not limited to, possible fines and imprisonment, for willfully submitting false, inaccurate, or incomplete information.

2. By: _____ 3. Title: _____
(Signature)

4. For: _____ 5. Date: _____
(Name of person or entity recorded in Section F) (mm/dd/yyyy)

6. Check here if the address of the person providing certification is different from address recorded in Section F.

7. Street: _____
8. City/Town: _____ 9. State: _____ 10. ZIP Code: _____
11. Telephone: _____ 12. Ext.: _____ 13. Email: _____

YOU ARE SUBJECT TO AN ANNUAL COMPLIANCE ASSURANCE FEE OF UP TO \$10,000 PER BILLABLE YEAR FOR THIS DISPOSAL SITE. YOU MUST LEGIBLY COMPLETE ALL RELEVANT SECTIONS OF THIS FORM OR DEP MAY RETURN THE DOCUMENT AS INCOMPLETE. IF YOU SUBMIT AN INCOMPLETE FORM, YOU MAY BE PENALIZED FOR MISSING A REQUIRED DEADLINE

Date Stamp (DEP USE ONLY:)



Appendix B

Public Notice Letters

DRAFT

DRAFT October xx, 2017
Project 1701819

Maura C. Curran, Chairman
Board of Selectman
600 Chief Justice Cushing Highway
Scituate, MA 02066

Dear Ms. Curran:

**Re: Release Abatement Measure Plan
Toll Brothers – Seaside at Scituate Development
137 Hatherly Road
Scituate, Massachusetts
MassDEP RTN 4-18143**

GEI Consultants, Inc. on behalf of Toll Brothers, Inc., is hereby notifying your office of a Release Abatement Measure (RAM) Plan prepared for the above-mentioned site. This notification is made in fulfillment of the public notice requirements of the Massachusetts Contingency Plan (MCP; 310 CMR 40.1403).

The work includes management of contaminated soil that will be encountered during construction of the proposed Seaside at Scituate development located at 137 Hatherly Road in Scituate, Massachusetts. The RAM activities will begin following approval of the project by the Town of Scituate.

The RAM Plan is on file with Massachusetts Department of Environmental Protection (MassDEP) Southeast Regional Office Service Center in Lakeville, Massachusetts.

Please contact me at 781.721.4018 or jash@geiconsultants.com, if you have any questions.

Sincerely,

GEI CONSULTANTS, INC.

James R. Ash, P.E., LSP
Senior Vice President

Catherine M. Malagrada, P.G.
Project Geologist

CMM/JRA:jam

c: Bureau of Waste Site Cleanup, MassDEP Southeast Regional Office
Scott Miccile (Toll Brothers)

DRAFT October xx, 2017
Project 1701819

Jennifer Keefe, MPH
Director
Board of Health
600 Chief Justice Cushing Highway
Scituate, MA 02066

Dear Ms. Keefe:

**Re: Release Abatement Measure Plan
Toll Brothers – Seaside at Scituate Development
137 Hatherly Road
Scituate, Massachusetts
MassDEP RTN 4-18143**

GEI Consultants, Inc. on behalf of Toll Brothers, Inc., is hereby notifying your office of a Release Abatement Measure (RAM) Plan prepared for the above-mentioned site. This notification is made in fulfillment of the public notice requirements of the Massachusetts Contingency Plan (MCP; 310 CMR 40.1403).

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The RAM Plan is on file with Massachusetts Department of Environmental Protection (MassDEP) Southeast Regional Office Service Center in Lakeville, Massachusetts.

Please contact me at 781.721.4018 or jash@geiconsultants.com, if you have any questions.

Sincerely,

GEI CONSULTANTS, INC.

James R. Ash, P.E., LSP
Senior Vice President

Catherine M. Malagrida, P.G.
Project Geologist

CMM/JRA:jam

c: Bureau of Waste Site Cleanup, MassDEP Southeast Regional Office
Scott Miccile (Toll Brothers)

Appendix C

CHA Phase II Data Tables

DRAFT

Table 1 Soil Analytical Data - EPH
Former Proving Grounds
Hatchery Road
Scituate, Massachusetts

Sample Identification: Site Name: 174/2004 174/2004 PID Reading (ppmv): 0 0	AOC-4 CS 75/21 (F'95) 174/2004 174/2004		AOC-1 CS 10/11 (F'95) 174/2004 174/2004		AOC-2 GM 105 (R52.5) 19/2014 19/2014		AOC-3 GM 105 (R52.5) 19/2014 19/2014		AOC-1 GM 105 (R52.5) 19/2014 19/2014		AOC-2 GM 105 (R52.5) 19/2014 19/2014		AOC-3 GM 105 (R52.5) 19/2014 19/2014		AOC-4 GM 105 (R52.5) 19/2014 19/2014		MCP Method 1 Standards S:GW2 S:GW3		Reportable Concentrations RCS-1
	CS 75/21 (F'95) 174/2004 174/2004	CS 10/11 (F'95) 174/2004 174/2004	GM 105 (R52.5) 19/2014 19/2014	GM 105 (R52.5) 19/2014 19/2014	GM 105 (R52.5) 19/2014 19/2014	GM 105 (R52.5) 19/2014 19/2014	GM 105 (R52.5) 19/2014 19/2014	GM 105 (R52.5) 19/2014 19/2014	GM 105 (R52.5) 19/2014 19/2014	GM 105 (R52.5) 19/2014 19/2014	GM 105 (R52.5) 19/2014 19/2014	GM 105 (R52.5) 19/2014 19/2014	GM 105 (R52.5) 19/2014 19/2014	GM 105 (R52.5) 19/2014 19/2014	GM 105 (R52.5) 19/2014 19/2014	GM 105 (R52.5) 19/2014 19/2014	GM 105 (R52.5) 19/2014 19/2014	GM 105 (R52.5) 19/2014 19/2014	
Extractable Petroleum Hydrocarbons (mg/kg)	<23	<22	<21	<23	<23	<24	<24	<24	<22	<23	<22	<22	<22	<23	<23	<23	<23	<23	1000
C15-C16 Aliphatics	<23	<22	<21	<23	<23	<24	<24	<24	<22	<23	<22	<22	<22	<23	<23	<23	<23	<23	1000
C17-C22 Aromatics	<23	<22	<21	<23	<23	<24	<24	<24	<22	<23	<22	<22	<22	<23	<23	<23	<23	<23	3000
2-Methylphenanthrene	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	1000
Acenaphthene	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	1000
Phenanthrene	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	1000
Acenaphthylene	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	1000
Fluorene	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	1000
Anthracene	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	1000
Fluoranthene	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	1000
Pyrene	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	1000
Benzo[a]anthracene	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	1000
Chrysene	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	1000
Benzo[b]fluoranthene	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	1000
Benzo[k]fluoranthene	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	1000
Benzo[e]pyrene	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	1000
Indeno[1,2,3-cd]pyrene	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	1000
Dibenz[a,h]anthracene	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	1000
Benzo[g,h,i]perylene	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	1000

Notes:
1. NS = No standard
2. Values above the laboratory detection limits and the laboratory detection limit (L) show
3. Bolded Values exceed MCP Method 1 Standards
4. MCP Method 1 Standards and Reportable Concentrations were taken from the June 26, 2009 MCP
5. Underlined = Exceeded MCP Reportable Concentrations
6. NTF=Not Tested

Table 2 Groundwater Analytical Data - EPH
Former Proving Grounds
Hatherly Road
Scituate, Massachusetts

Sample Identification: Depth to groundwater: Sample Date:	AOC 4		AOC 3		AOC 2		AOC 1							MCP Method 1 Standards		Reportable Concentrations
	C-2 14.55' 1/21/2014	C-4 7.95' 1/23/2014	C-5 5.39' 1/21/2014	C-6 2.50' 1/21/2014	C-7 9.03' 1/21/2014	C-8 5.85' 1/21/2014	C-9 0.91' 1/21/2014	C-10 8.61' 1/23/2014	C-11B 7.96' 1/23/2014	MW-11 4.86' 1/7/2014	MW-4 3.5' 1/7/2014	GW-2	GW-3	RC-GW2		
Extractable Petroleum Hydrocarbons (ug/l)																
C9-C18 Aliphatics	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	5000
C19-C36 Aliphatics	<100	<100	190	<100	<100	<100	120	<100	<100	<100	<100	<100	<100	<100	NS	50000
C11-C22 Aromatics	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	NS	50000
Naphthalene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	5000	5000
2-Methylnaphthalene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1000	1000
Acenaphthylene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	2000	2000
Acenaphthene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	40	40
Fluorene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	6000	6000
Phenanthrene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	40	40
Anthracene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	10000	10000
Fluoranthene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	30	30
Pyrene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	200	200
Benzo(a)anthracene	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	20	20
Chrysene	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	1000	1000
Benzo(b)fluoranthene	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	70	70
Benzo(k)fluoranthene	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	400	400
Benzo(e)pyrene	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	100	100
Indeno(1,2,3-cd)pyrene	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	500	500
Dibenzo(a,h)anthracene	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	100	100
Benzo(g,h,i)perylene	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	40	40
	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	20	20

Notes:

1. NS = No standard
2. < = not detected above the laboratory detection limits and the laboratory detection limit is shown
3. Bolded Values exceed MCP Method 1 Standards
4. MCP Method 1 Standards and Reportable Concentrations were taken from the June 26, 2009 MCP
5. Underlined = Exceeded MCP Reportable Concentrations
6. NT=Not Tested

Table 3 Soil Analytical Data - VPH
Former Proving Grounds
Hatherly Road
Scituate, Massachusetts

Sample Identification: Sample Date: PID Readings (ppmv):	AOC 2		AOC 1		AOC 4		MCP Method 1 Standards		Reportable Concentrations RCS-1
	CHA-103 (0-0.5') 1/9/2014 NT	CHA-105 (0.5-2.5') 1/9/2014 0.1	CHA-106 (0.6-2.6') 1/9/2014 0	ENV-3 (3'-4') 11/1/2013 1.1	ENV-3 (6') 11/1/2013 0	ENV-4 (2') 11/1/2013 2.1	TP-1011 (12'-13') 10/25/2013 72.8	TP-1011 (7'-8') 10/25/2013 50	
Volatile Petroleum Hydrocarbons (mg/kg)									
Adjusted C5-C8 Aliphatics(FID)	<38	<8.4	<8.7	<4.1	<4.0	<5.9	<4.4	<3.8	100
Adjusted C9-C12 Aliphatics(FID)	<38	<8.4	<8.7	<4.1	<4.0	<5.9	50	51	1000
C9-C10 Aromatics(PID)	<38	<8.4	<8.7	<4.1	<4.0	<5.9	33	24	100
Methyl-tert-butylether	<u><0.38</u>	<0.08	<0.09	<0.04	<0.04	<0.06	<0.04	<0.04	100
Benzene	<1.9	<0.42	<0.44	<0.21	<0.20	<0.29	<0.22	<0.19	30
Toluene	<1.9	<0.42	<0.44	<0.21	<0.20	<0.29	<0.22	<0.19	500
Ethylbenzene	<1.9	<0.42	<0.44	<0.21	<0.20	<0.29	<0.22	<0.19	500
m,p-Xylene	<1.9	<0.42	<0.44	<0.21	<0.20	<0.29	<0.22	<0.19	300
o-Xylene	<1.9	<0.42	<0.44	<0.21	<0.20	<0.29	<0.22	<0.19	300
Naphthalene	<1.9	<0.42	<0.44	<0.21	<0.20	<0.29	<0.22	<0.19	40

Notes:

1. NS = No standard
2. < = not detected above the laboratory detection limits and the laboratory detection limit is shown
3. Bolded Values exceed MCP Method 1 Standards
4. MCP Method 1 Standards and Reportable Concentrations were taken from the June 26, 2009 MCP
5. Underlined = Exceeded MCP Reportable Concentrations
6. NT=Not Tested

Table 4 Groundwater Analytical Data - VPH
Former Proving Grounds
Hatherly Road
Scituate, Massachusetts

Sample Identification: Depth to Water: Sample Date:	AOC 4		AOC 2		C-7	C-8	MW-11	MCP Method 1		Reportable Concentrations
	C-2	C-4	C-6	C-8				Standards	GW-2	
	14.55'	7.95'	2.50'	9.03'	5.85'	4.86'				
	1/21/2014	1/23/2014	1/21/2014	1/21/2014	1/21/2014	1/21/2014	1/21/2014			RC-GW2
Volatile Petroleum Hydrocarbons (ug/L)										
Adjusted C5-C8 Aliphatics(FID)	<100	<100	<100	<100	<1000	<100	<100	3,000	50,000	3,000
Adjusted C9-C12 Aliphatics(FID)	<100	<100	<100	<100	<1000	<100	<100	5,000	50,000	5,000
C9-C10 Aromatics(PID)	<100	<100	<100	<100	<1000	<100	<100	7,000	50,000	7,000
Methyl-tert-butylether	<5	<5	<5	<5	<50	<5	<5	50,000	50,000	5,000
Benzene	<5	<5	<5	<5	<50	<5	<5	2,000	10,000	2,000
Toluene	<5	<5	<5	<5	<50	<5	<5	50,000	40,000	40,000
Ethylbenzene	<5	<5	<5	<5	<50	<5	<5	20,000	5,000	5,000
m,p-Xylene	<5	<5	<5	<5	<50	<5	<5	9,000	5,000	5,000
o-Xylene	<5	<5	<5	<5	<50	<5	<5	9,000	5,000	5,000
Naphthalene	<5	<5	<5	<5	<50	<5	<5	1,000	20,000	1,000

Notes:

1. NS = No standard
2. < = not detected above the laboratory detection limits and the laboratory detection limit is shown
3. Bolded Values exceed MCP Method 1 Standards
4. MCP Method 1 Standards and Reportable Concentrations were taken from the June 26, 2009 MCP
5. Underlined = Exceeded MCP Reportable Concentrations
6. NT=Not Tested

Table 5 Soil Analytical Data - VOCs
Former Proving Grounds
Hatherly Road
Scituate, Massachusetts

Sample Identification: Sample Date: PID Readings (ppmv):	AOC 2	AOC 1		AOC 4		MCP Method 1 Standards		Reportable Concentrations
	CHA-103 (0-0.5')	ENV-3 (3'-4')	ENV-3 (6')	TP-1011 (12'-13')	TP-1011 (7'-8')	S-1/GW-2	S-1/GW-3	RCS-1
	1/9/2014	11/1/2013	11/1/2013	10/25/2013	10/25/2013			
PID Readings (ppmv):	NT	1.1	0	72.8	50			
Volatile Organic Compounds (mg/kg)								
1,1,1,2-Tetrachloroethane	<u><0.24</u>	<0.05	<0.04	<0.06	<0.06	0.1	7	0.1
1,1,1-Trichloroethane	<0.24	<0.05	<0.04	<0.06	<0.06	500	500	30
1,1,2,2-Tetrachloroethane	<u><0.24</u>	<u><0.05</u>	<u><0.04</u>	<u><0.06</u>	<u><0.06</u>	0.02	0.8	0.005
1,1,2-Trichloroethane	<u><0.24</u>	<0.05	<0.04	<0.06	<0.06	2	4	0.1
1,1-Dichloroethane	<0.24	<0.05	<0.04	<0.06	<0.06	5	500	0.4
1,1-Dichloroethene	<0.24	<0.05	<0.04	<0.06	<0.06	40	500	3
1,1-Dichloropropene	<0.24	<0.05	<0.04	<0.06	<0.06	NS	NS	NS
1,2,3-Trichlorobenzene	<0.24	<0.05	<0.04	<0.06	<0.06	NS	NS	NS
1,2,3-Trichloropropane	<0.24	<0.05	<0.04	<0.06	<0.06	NS	NS	100
1,2,4-Trichlorobenzene	<0.24	<0.05	<0.04	<0.06	<0.06	70	500	2
1,2,4-Trimethylbenzene	<0.24	<0.05	<0.04	0.38	<0.06	NS	NS	1000
1,2-Dibromo-3-Chloropropane	<0.49	<0.09	<0.08	<0.13	<0.13	NS	NS	10
1,2-Dibromoethane(EDB)	<u><0.24</u>	<0.05	<0.04	<0.06	<0.06	0.1	0.7	0.1
1,2-Dichlorobenzene	<0.24	<0.05	<0.04	<0.06	<0.06	30	300	9
1,2-Dichloroethane	<u><0.24</u>	<0.05	<0.04	<0.06	<0.06	0.1	10	0.1
1,2-Dichloropropane	<u><0.24</u>	<0.05	<0.04	<0.06	<0.06	0.1	10	0.1
1,3,5-Trimethylbenzene	<0.24	<0.05	<0.04	<0.06	<0.06	NS	NS	10
1,3-Dichlorobenzene	<0.24	<0.05	<0.04	<0.06	<0.06	40	100	1
1,3-Dichloropropane	<0.24	<0.05	<0.04	<0.06	<0.06	NS	NS	500
1,4-Dichlorobenzene	<0.24	<0.05	<0.04	<0.06	<0.06	4	50	0.7
1,4-Dioxane	<u><2.4</u>	<u><4.6</u>	<u><3.9</u>	NT	NT	6	70	0.2
2,2-Dichloropropane	<0.24	<0.05	<0.04	<0.06	<0.06	NS	NS	NS
2-Butanone(MEK)	<2.4	<0.46	<0.39	<0.65	<0.64	50	400	4
2-Chlorotoluene	<0.24	<0.05	<0.04	<0.06	<0.06	NS	NS	100
2-Hexanone	<2.4	<0.46	<0.39	NT	NT	NS	NS	100
4-Chlorotoluene	<0.24	<0.05	<0.04	<0.06	<0.06	NS	NS	NS
4-Methyl-2-pentanone(MIBK)	<u><2.4</u>	<u><4.6</u>	<0.39	NT	NT	50	400	0.4
Acetone	<2.4	<0.46	<0.39	NT	NT	50	400	6
Benzene	<0.24	<0.05	<0.04	<0.06	<0.06	30	30	2
Bromobenzene	<0.24	<0.05	<0.04	<0.06	<0.06	NS	NS	100
Bromochloromethane	<0.24	<0.05	<0.04	<0.06	<0.06	NS	NS	NS
Bromodichloromethane	<u><0.24</u>	<0.05	<0.04	<0.06	<0.06	0.1	20	0.1
Bromoform	<u><0.24</u>	<0.05	<0.04	<0.06	<0.06	1	200	0.1
Bromomethane	<u><1.2</u>	<0.23	<0.20	<0.32	<0.32	0.5	30	0.5
Carbon Disulfide	<1.2	<0.23	<0.20	NT	NT	NS	NS	100
Carbon Tetrachloride	<0.24	<0.05	<0.04	<0.06	<0.06	5	10	5
Chlorobenzene	<0.24	<0.05	<0.04	<0.06	<0.06	3	100	1
Chloroethane	<1.2	<0.23	<0.20	<0.32	<0.32	NS	NS	100
Chloroform	<0.24	<0.05	<0.04	<0.06	<0.06	0.3	400	0.3
Chloromethane	<1.2	<0.23	<0.20	<0.32	<0.32	NS	NS	100
cis-1,2-Dichloroethene	<0.24	<0.05	<0.04	<0.06	<0.06	0.4	100	0.3
cis-1,3-Dichloropropene	<u><0.24</u>	<u><0.05</u>	<u><0.04</u>	NT	NT	0.4	9	0.01
Dibromochloromethane	<u><0.24</u>	<u><0.05</u>	<u><0.04</u>	<u><0.06</u>	<u><0.06</u>	0.03	20	0.005
Dibromomethane	<0.49	<0.09	<0.08	<0.13	<0.13	NS	NS	500
Dichlorodifluoromethane	<1.2	<0.23	<0.20	<0.32	<0.32	NS	NS	1000
Diethyl ether	<1.2	<0.23	<0.20	NT	NT	NS	NS	100
Diisopropyl Ether (DIPE)	<1.2	<0.23	<0.20	NT	NT	NS	NS	100
Ethyl Tertiary Butyl Ether	<1.2	<0.23	<0.20	NT	NT	NS	NS	NS
Ethylbenzene	<0.24	<0.05	<0.04	<0.06	<0.06	500	500	40
Hexachlorobutadiene	<0.24	<0.05	<0.04	<0.06	<0.06	6	6	6
Isopropylbenzene	<0.24	<0.05	<0.04	<0.06	<0.06	NS	NS	1000
m,p-Xylene	<0.24	<0.05	<0.04	<0.06	<0.06	300	500	300
Methylene Chloride	<u>1.2</u>	<0.05	<0.04	0.06	0.06	20	200	0.1
MTBE	<u><0.24</u>	<0.05	<0.04	<0.06	<0.06	100	100	0.1
Naphthalene	0.57	<0.05	<0.04	0.19	<0.06	40	500	4
n-Butylbenzene	<0.24	<0.05	<0.04	0.1	<0.06	NS	NS	NS
n-Propylbenzene	<0.24	<0.05	<0.04	<0.06	<0.06	NS	NS	100
o-Xylene	<0.24	<0.05	<0.04	<0.06	<0.06	300	500	300
p-Isopropyltoluene	<0.24	<0.05	<0.04	0.07	<0.06	NS	NS	100
Sec-butylbenzene	<0.24	<0.05	<0.04	0.08	<0.06	NS	NS	NS
Styrene	<0.24	<0.05	<0.04	<0.06	<0.06	4	30	3
tert-Butylbenzene	<0.24	<0.05	<0.04	<0.06	<0.06	NS	NS	100
Tertiary Amyl Methyl Ether	<1.2	<0.23	<0.20	NT	NT	NS	NS	NS
Tetrachloroethene	<0.24	<0.05	<0.04	<0.06	<0.06	10	30	1
Tetrahydrofuran	<2.4	<0.46	<0.39	NT	NT	NS	NS	500
Toluene	<0.24	<0.05	<0.04	<0.06	<0.06	500	500	30
trans-1,2-Dichloroethylene	<0.24	<0.05	<0.04	<0.06	<0.06	1	500	1
trans-1,3-Dichloropropylene	<u><0.24</u>	<u><0.05</u>	<u><0.04</u>	NT	NT	0.4	9	0.01
Trichloroethene	<0.24	<0.05	<0.04	<0.06	<0.06	2	90	0.3
Trichlorofluoromethane	<0.24	<0.05	<0.04	<0.06	<0.06	NS	NS	1000
Vinyl Chloride	<0.24	<0.05	<0.04	<0.06	<0.06	0.6	0.6	0.6

Notes:

1. NS = No standard
2. < = not detected above the laboratory detection limits and the laboratory detection limit is shown
3. Bolded Values exceed MCP Method 1 Standards
4. MCP Method 1 Standards and Reportable Concentrations were taken from the June 26, 2009 MCP
5. Underlined = Exceeded MCP Reportable Concentrations
6. NT=Not Tested

Table 6 Groundwater Analytical Data - VOCs
Former Proving Grounds
Hatherly Road
Scituate, Massachusetts

Sample Identification: Depth to Water: Sample Date:	AOC 2					MCP Method 1 Standards		Reportable Concentrations
	C-2	C-6	C-7	C-8	MW-11	GW-2	GW-3	RC-GW2
	14.55'	2.50'	9.03'	5.85'	4.86'			
	1/21/2014	1/21/2014	1/21/2014	1/21/2014	1/21/2014			
Volatile Organic Compounds (ug/l)								
1,1,1,2-Tetrachloroethane	<1	<1	<1	<1	<1	10	50000	10
1,1,1-Trichloroethane	<1	<1	<1	<1	<1	4000	20000	4000
1,1,2,2-Tetrachloroethane	<1	<1	<1	<1	<1	9	50000	9
1,1,2-Trichloroethane	<1	<1	<1	<1	<1	900	50000	900
1,1-Dichloroethane	<1	<1	<1	<1	<1	1000	20000	1000
1,1-Dichloroethene	<1	<1	<1	<1	<1	80	30000	80
1,1-Dichloropropene	<1	<1	<1	<1	<1	NS	NS	NS
1,2,3-Trichlorobenzene	<1	<1	<1	<1	<1	NS	NS	NS
1,2,3-Trichloropropane	<2	<2	<2	<2	<2	NS	NS	10000
1,2,4-Trichlorobenzene	<1	<1	<1	<1	<1	2000	50000	2000
1,2,4-Trimethylbenzene	<1	<1	<1	<1	<1	NS	NS	100000
1,2-Dibromo-3-Chloropropane	<2	<2	<2	<2	<2	NS	NS	1000
1,2-Dibromoethane(EDB)	<1	<1	<1	<1	<1	2	50000	2
1,2-Dichlorobenzene	<1	<1	<1	<1	<1	2000	2000	2000
1,2-Dichloroethane	<1	<1	<1	<1	<1	5	20000	5
1,2-Dichloropropane	<1	<1	<1	<1	<1	3	50000	3
1,3,5-Trimethylbenzene	<1	<1	<1	<1	<1	NS	NS	1000
1,3-Dichlorobenzene	<1	<1	<1	<1	<1	2000	50000	2000
1,3-Dichloropropane	<1	<1	<1	<1	<1	NS	NS	50000
1,4-Dichlorobenzene	<1	<1	<1	<1	<1	200	8000	200
1,4-Dioxane	<100	<100	<100	<100	<100	6000	50000	6000
2,2-Dichloropropane	<1	<1	<1	<1	<1	NS	NS	NS
2-Butanone(MEK)	<10	<10	<10	<10	<10	50000	50000	50000
2-Chlorotoluene	<1	<1	<1	<1	<1	NS	NS	10000
2-Hexanone	<10	<10	<10	<10	<10	NS	NS	10000
4-Chlorotoluene	<1	<1	<1	<1	<1	NS	NS	NS
4-Methyl-2-pentanone(MIBK)	<10	<10	<10	<10	<10	50000	50000	50000
Acetone	<10	<10	<10	<10	<10	50000	50000	50000
Benzene	<1	<1	<1	<1	<1	2000	10000	2000
Bromobenzene	<1	<1	<1	<1	<1	NS	NS	10000
Bromochloromethane	<1	<1	<1	<1	<1	NS	NS	NS
Bromodichloromethane	<1	<1	<1	<1	<1	6	50000	6
Bromoform	<1	<1	<1	<1	<1	700	50000	700
Bromomethane	<1	<1	<1	<1	<1	7	800	7
Carbon Disulfide	<5	<5	<5	<5	<5	NS	NS	10000
Carbon Tetrachloride	<1	<1	<1	<1	<1	2	5000	2
Chlorobenzene	<1	<1	<1	<1	<1	200	1000	200
Chloroethane	<5	<5	<5	<5	<5	NS	NS	10000
Chloroform	<1	<1	<1	<1	<1	50	20000	50
Chloromethane	<5	<5	<5	<5	<5	NS	NS	10000
cis-1,2-Dichloroethene	<1	<1	<1	<1	<1	100	50000	100
cis-1,3-Dichloropropene	<1	<1	<1	<1	<1	10	200	5
Dibromochloromethane	<1	<1	<1	<1	<1	20	50000	20
Dibromomethane	<2	<2	<2	<2	<2	NS	NS	50000
Dichlorodifluoromethane	<5	<5	<5	<5	<5	NS	NS	100000
Diethyl ether	<5	<5	<5	<5	<5	NS	NS	10000
Diisopropyl Ether (DIPE)	<5	<5	<5	<5	<5	NS	NS	10000
Ethyl Tertiary Butyl Ether	<5	<5	<5	<5	<5	NS	NS	NS
Ethylbenzene	<1	<1	<1	<1	<1	20000	5000	5000
Hexachlorobutadiene	<0.5	<0.5	<0.5	<0.5	<0.5	1	3000	1
Isopropylbenzene	<1	<1	<1	<1	<1	NS	NS	100000
m,p-Xylene	<1	<1	<1	<1	<1	9000	5000	5000
Methylene Chloride	<5	<5	<5	<5	<5	10000	50000	10000
MTBE	<2	<2	<2	<2	<2	50000	50000	5000
Naphthalene	<1	<1	<1	<1	<1	1000	20000	1000
n-Butylbenzene	<1	<1	<1	<1	<1	NS	NS	NS
n-Propylbenzene	<1	<1	<1	<1	<1	NS	NS	10000
o-Xylene	<1	<1	<1	<1	<1	9000	5000	5000
p-Isopropyltoluene	<1	<1	<1	<1	<1	NS	NS	10000
Sec-butylbenzene	<1	<1	<1	<1	<1	NS	NS	NS
Styrene	<1	<1	<1	<1	<1	100	6000	100
tert-Butylbenzene	<1	<1	<1	<1	<1	NS	NS	10000
Tertiary Amyl Methyl Ether	<5	<5	<5	<5	<5	NS	NS	NS
Tetrachloroethene	<1	<1	<1	<1	<1	50	30000	50
Tetrahydrofuran	<10	<10	<10	<10	<10	NS	NS	50000
Toluene	<1	<1	<1	<1	<1	50000	40000	40000
trans-1,2-Dichloroethylene	<2	<2	<2	<2	<2	90	50000	90
trans-1,3-Dichloropropylene	<1	<1	<1	<1	<1	10	200	5
Trichloroethene	<1	<1	<1	<1	<1	30	5000	30
Trichlorofluoromethane	<1	<1	<1	<1	<1	NS	NS	100000
Vinyl Chloride	<1	<1	<1	<1	<1	2	50000	2

Notes:

1. NS = No standard
2. < = not detected above the laboratory detection limits and the laboratory detection limit is shown
3. Bolded Values exceed MCP Method 1 Standards
4. MCP Method 1 Standards and Reportable Concentrations were taken from the June 26, 2009 MCP
5. Underlined = Exceeded MCP Reportable Concentrations
6. NT=Not Tested

Table 7 Soil Analytical Data - SVOCs
Former Proving Grounds
Hatherly Road
Scituate, Massachusetts

Sample Identification: Sample Date: PID Readings (ppmv):	AOC 2		AOC 1		MCP Method 1 Standards		Reportable Concentrations
	CHA-103 (0-0.5')	ENV-205 1.5'	ENV-206 3'	ENV-206 3'	S-1/GW-2	S-1/GW-3	RCS-1
	1/9/2014	1/7/2014	1/7/2014	1/7/2014			
Semi-Volatile Organic Compounds (mg/kg)							
1,2,4-Trichlorobenzene	<5.1	<0.37	<0.37	<0.37	70	500	2
1,2-Dichlorobenzene	<5.1	<0.37	<0.37	<0.37	30	300	9
1,2-Diphenylhydrazine	<5.1	<0.37	<0.37	<0.37	NS	NS	50
1,3-Dichlorobenzene	<5.1	<0.37	<0.37	<0.37	40	100	1
1,4-Dichlorobenzene	<5.1	<0.37	<0.37	<0.37	4	50	0.7
2,4,5-Trichlorophenol	<5.1	<0.37	<0.37	<0.37	1000	600	4
2,4,6-Trichlorophenol	<5.1	<0.37	<0.37	<0.37	20	20	0.7
2,4-Dichlorophenol	<5.1	<0.37	<0.37	<0.37	60	40	0.7
2,4-Dimethylphenol	<5.1	<0.37	<0.37	<0.37	100	500	0.7
2,4-Dinitrophenol	<5.1	<0.37	<0.37	<0.37	50	50	3
2,4-Dinitrotoluene	<5.1	<0.37	<0.37	<0.37	2	2	0.7
2,6-Dinitrotoluene	<5.1	<0.37	<0.37	<0.37	NS	NS	100
2-Chloronaphthalene	<5.1	<0.37	<0.37	<0.37	NS	NS	1000
2-Chlorophenol	<5.1	<0.37	<0.37	<0.37	100	100	0.7
2-Methyl Phenol	<5.1	<0.37	<0.37	<0.37	NS	NS	500
2-Methyl-4,6-dinitrophenol	<5.1	<0.37	<0.37	<0.37	NS	NS	50
2-Methylnaphthalene	<5.1	<0.37	<0.37	<0.37	80	300	0.7
2-Nitrophenol	<5.1	<0.37	<0.37	<0.37	NS	NS	100
3 & 4-Methylphenols	<5.1	<0.37	<0.37	<0.37	NS	NS	500
3,3'-Dichlorobenzidine	<5.1	<0.37	<0.37	<0.37	1	1	1
4-Bromophenyl phenyl ether	<5.1	<0.37	<0.37	<0.37	NS	NS	100
4-Chloro-3-methylphenol	<5.1	<0.37	<0.37	<0.37	NS	NS	1000
4-Chloroaniline	<5.1	<0.37	<0.37	<0.37	100	3	1
4-Chlorophenyl phenyl ether	<5.1	<0.37	<0.37	<0.37	NS	NS	1000
4-Nitrophenol	<5.1	<0.37	<0.37	<0.37	NS	NS	100
Acenaphthene	<5.1	<0.37	<0.37	<0.37	1000	1000	4
Acenaphthylene	<5.1	<0.37	<0.37	<0.37	600	10	1
Acetophenone	<5.1	<0.37	<0.37	<0.37	NS	NS	1000
Aniline	<5.1	<0.37	<0.37	<0.37	NS	NS	1000
Anthracene	9.8	<0.37	<0.37	<0.37	1000	1000	1000
Azobenzene	<5.1	<0.37	<0.37	<0.37	NS	NS	NS
Benzidine	<5.1	<0.37	<0.37	<0.37	NS	NS	10
Benzo(a)anthracene	20	<0.37	<0.37	<0.37	7	7	7
Benzo(a)pyrene	20	<0.37	<0.37	<0.37	2	2	2
Benzo(b)fluoranthene	14	<0.37	<0.37	<0.37	7	7	7
Benzo(g,h,i)perylene	12	<0.37	<0.37	<0.37	1000	1000	1000
Benzo(k)fluoranthene	16	<0.37	<0.37	<0.37	70	70	70
Bis(2-Chloroethoxy)methane	<5.1	<0.37	<0.37	<0.37	NS	NS	500
Bis(2-chloroethyl)ether	<5.1	<0.37	<0.37	<0.37	0.7	0.7	0.7
Bis(2-Chloroisopropyl)Ether	<5.1	<0.37	<0.37	<0.37	0.7	3	0.7
Bis(2-ethylhexyl)phthalate	<5.1	<0.37	<0.37	<0.37	200	200	200
Butylbenzyl phthalate	<5.1	<0.37	<0.37	<0.37	NS	NS	100
Chrysene	22	<0.37	<0.37	<0.37	70	70	70
Dibenzo(a,h)anthracene	<5.1	<0.37	<0.37	<0.37	0.7	0.7	0.7
Dibenzofuran	<5.1	<0.37	<0.37	<0.37	NS	NS	100
Diethyl phthalate	<5.1	<0.37	<0.37	<0.37	200	300	10
Dimethyl phthalate	<5.1	<0.37	<0.37	<0.37	50	600	30
Di-n-butyl phthalate	<5.1	<0.37	<0.37	<0.37	NS	NS	50
Di-n-octyl phthalate	<5.1	<0.37	<0.37	<0.37	NS	NS	1000
Fluoranthene	46	<0.37	<0.37	<0.37	1000	1000	1000
Fluorene	<5.1	<0.37	<0.37	<0.37	1000	1000	1000
Hexachlorobenzene	<5.1	<0.37	<0.37	<0.37	0.7	0.7	0.7
Hexachlorobutadiene	<5.1	<0.37	<0.37	<0.37	6	6	6
Hexachlorocyclopentadiene	<5.1	<0.37	<0.37	<0.37	NS	NS	50
Hexachloroethane	<5.1	<0.37	<0.37	<0.37	3	9	0.7
Indeno(1,2,3-cd)pyrene	10	<0.37	<0.37	<0.37	7	7	7
Isophorone	<5.1	<0.37	<0.37	<0.37	NS	NS	100
Naphthalene	<5.1	<0.37	<0.37	<0.37	40	500	4
Nitrobenzene	<5.1	<0.37	<0.37	<0.37	NS	NS	500
N-nitrosodimethylamine	<5.1	<0.37	<0.37	<0.37	NS	NS	50
N-nitrosodi-n-propylamine	<5.1	<0.37	<0.37	<0.37	NS	NS	50
N-nitrosodiphenylamine	<5.1	<0.37	<0.37	<0.37	NS	NS	100
Pentachlorophenol	<5.1	<0.37	<0.37	<0.37	10	10	3
Phenanthrene	41	<0.37	<0.37	<0.37	500	500	10
Phenol	<5.1	<0.37	<0.37	<0.37	50	20	1
Pyrene	40	<0.37	<0.37	<0.37	1000	1000	1000

Notes:

1. NS = No standard
2. < = not detected above the laboratory detection limits and the laboratory detection limit is shown
3. Bolded Values exceed MCP Method 1 Standards
4. MCP Method 1 Standards and Reportable Concentrations were taken from the June 26, 2009 MCP
5. Underlined = Exceeded MCP Reportable Concentrations
6. NT=Not Tested

Table 8 Groundwater Analytical Data - SVOCs
Former Proving Grounds
Hatherly Road
Scituate, Massachusetts

Sample Identification: Depth to groundwater: Sample Date:	AOC 1		MCP Method 1 Standards		Reportable Concentrations
	MW-4	MW-11	GW-2	GW-3	RC-GW2
	3.5'	4.86'			
	1/7/2014	1/7/2014			
Semi-Volatile Organic Compounds (ug/L)					
Acenaphthene	<5	<5	NS	6000	6000
Acenaphthylene	<5	<5	10000	40	40
Anthracene	<5	<5	NS	30	30
Benzidine	<5	<5	NS	NS	1000
Benzo(a)anthracene	14	<1	NS	1000	1000
Benzo(b)fluoranthene	16	<1	NS	400	400
Benzo(k)fluoranthene	14	<1	NS	100	100
Benzo(g,h,i)perylene	14	<5	NS	20	20
Benzo(a)pyrene	18	<5	NS	500	500
Bis(2-chloroethyl)ether	<5	<5	NS	NS	NS
Bis(2-Chloroethoxy)methane	<5	<5	NS	NS	50000
Bis(2-Chloroisopropyl)Ether	<5	<5	100	50000	100
Bis(2-ethylhexyl)phthalate	<5	<5	NS	50000	50000
4-Bromophenyl phenyl ether	<5	<5	NS	NS	10000
Butylbenzyl phthalate	<5	<5	NS	NS	10000
2-Chloronaphthalene	<5	<5	NS	NS	100000
4-Chlorophenyl phenyl ether	<5	<5	NS	NS	100000
Chrysene	13	<2	NS	70	70
Dibenzo(a,h)anthracene	3	<0.5	NS	40	40
Di-n-butyl phthalate	<5	<5	NS	NS	5000
1,2-Dichlorobenzene	<5	<5	2000	2000	2000
1,3-Dichlorobenzene	<5	<5	2000	50000	2000
1,4-Dichlorobenzene	<5	<5	200	8000	200
3,3'-Dichlorobenzidine	<5	<5	NS	2000	2000
Diethyl phthalate	<5	<5	50000	9000	9000
Dimethyl phthalate	<5	<5	50000	50000	50000
2,4-Dinitrotoluene	<5	<5	20000	50000	20000
2,6-Dinitrotoluene	<5	<5	NS	NS	10000
Di-n-octyl phthalate	<5	<5	NS	NS	100000
1,2-Diphenylhydrazine	<5	<5	NS	NS	5000
Fluoranthene	40	<5	NS	200	200
Fluorene	<5	<5	NS	40	40
Hexachlorobenzene	<1	<1	1	6000	1
Hexachlorobutadiene	<0.6	<0.6	1	3000	1
Hexachlorocyclopentadiene	<5	<5	NS	NS	5000
Hexachloroethane	<5	<5	100	50000	100
Indeno(1,2,3-cd)pyrene	11	<0.5	NS	100	100
Isophorone	<5	<5	NS	NS	10000
Naphthalene	<5	<5	1000	20000	1000
Nitrobenzene	<5	<5	NS	NS	50000
N-nitrosodimethylamine	<5	<5	NS	NS	5000
N-nitrosodiphenylamine	<5	<5	NS	NS	10000
N-nitrosodi-n-propylamine	<5	<5	NS	NS	5000
Phenanthrene	5	<5	NS	10000	10000
Pyrene	<u>33</u>	<5	NS	20	20
1,2,4-Trichlorobenzene	<5	<5	2000	50000	2000
4-Chloro-3-methylphenol	<5	<5	NS	NS	100000
2-Chlorophenol	<5	<5	20000	7000	7000
2,4-Dichlorophenol	<5	<5	30000	2000	2000
2,4-Dimethylphenol	<5	<5	40000	50000	40000
2-Methyl-4,6-dinitrophenol	<5	<5	NS	NS	5000
2,4-Dinitrophenol	<5	<5	50000	20000	20000
2-Nitrophenol	<5	<5	NS	NS	10000
4-Nitrophenol	<5	<5	NS	NS	10000
Pentachlorophenol	<1	<1	NS	200	200
Phenol	<5	<5	50000	2000	2000
2,4,5-Trichlorophenol	<5	<5	50000	3000	3000
2,4,6-Trichlorophenol	<5	<5	5000	500	500
2-Methylnaphthalene	<5	<5	2000	20000	2000
2-Methylphenol	<5	<5	NS	NS	50000
3 & 4-Methylphenols	<5	<5	NS	NS	50000
Acetophenone	<5	<5	NS	NS	100000
Aniline	<5	<5	NS	NS	100000
Azobenzene	<5	<5	NS	NS	NS
4-Chloroaniline	<5	<5	50000	300	300
Dibenzofuran	<5	<5	NS	NS	10000

Notes:

1. NS = No standard
2. < = not detected above the laboratory detection limits and the laboratory detection limit is shown
3. Bolded Values exceed MCP Method 1 Standards
4. MCP Method 1 Standards and Reportable Concentrations were taken from the June 26, 2009 MCP
5. Underlined = Exceeded MCP Reportable Concentrations
6. NT=Not Tested

Table 9 Soil Analytical Data - Metals
Former Proving Grounds
Haberly Road
Schuane, Massachusetts

Sample Identification: Sample Date: PID Readings (ppmv): Metals (mg/kg)	AOC 2				AOC 2				AOC 2				MCP Method 1 Standards		Reportable Concentrations				
	CHA-101 (0-0.5) 1/9/2014 NT	CHA-102 (0-0.4) 1/9/2014 NT	CHA-103 (0-0.5) 1/9/2014 NT	CHA-104 (0-0.8) 1/9/2014 NT	CHA-301 (0.5) 2/4/2014 NT	CHA-302 (0.5) 2/4/2014 NT	CHA-303 (0.5) 2/4/2014 NT	CHA-304 (0.5) 2/4/2014 NT	CHA-305 (0.5) 2/4/2014 NT	CHA-305 (0.8) 2/4/2014 NT	CHA-307 (0.5) 2/4/2014 NT	CHA-308 (1) 2/4/2014 NT	CHA-308 (1.5) 2/4/2014 NT	CHA-309 (3) 2/4/2014 NT	CHA-311 (0.5) 2/4/2014 NT	CHA-312 (0-0.5) 2/4/2014 NT	CHA-313 (0-0.5) 2/4/2014 NT	5-1/GW2 5-1/GW-3	RCS-1
Antimony	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	20	20
Arsenic	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	1000	1000
Beryllium	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	1000	1000
Cadmium	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	2	2
Chromium	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	30	30
Lead	46	250	440	440	6.6	6.0	5.1	8.3	7.5	11	28	5.1	210	11	9.3	8.0	9.3	300	300
Mercury	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	20	20
Nickel	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	20	20
Selenium	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	400	400
Silver	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	100	100
Thallium	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	8	8
Vanadium	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	600	600
Zinc	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	2500	2500
Total Cyanide	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	100	100

NOTES:
1. NT = No Standard
2. - not detected below the laboratory detection limits and the laboratory detection limit is shown
3. Bolded Values exceed MCP Method 1 Standards.
4. MCP Method 1 Standards and Reportable Concentrations were taken from the June 26, 2009 MCF
5. Underscored = Exceeded MCP Reportable Concentrations
6. NT=Not Tested

Table 10 Groundwater Analytical Data - Metals
Former Proving Grounds
Hatherly Road
Scituate, Massachusetts

Sample Identification: Depth to Water: Sample Date:	AOC 2			AOC 1			MCP Method 1 Standards	Reportable Concentrations		
	C-2	C-6	C-7	C-8	C-9	MW-11				
	14.55' 1/21/2014	2.50' 1/21/2014	9.03' 1/21/2014	5.85' 1/21/2014	7.52' 2/3/2014	1.65' 2/3/2014			4.86' 1/21/2014	
Metals (mg/L)										
Antimony	<0.002	<0.002	NT	<0.002	NT	<0.002	NT	<0.002	NS	8
Arsenic	0.005	0.108	NT	0.036	NT	0.012	NT	<0.001	NS	0.9
Barium	0.055	0.438	NT	0.368	NT	0.802	NT	0.012	NS	50
Beryllium	<0.001	<0.001	NT	<0.001	NT	0.004	NT	<0.001	NS	0.2
Cadmium	0.0002	0.0006	NT	0.0006	NT	0.0002	NT	<0.0004	NS	0.004
Chromium	0.018	0.199	NT	0.14	NT	0.037	NT	0.066	NS	0.3
Lead	0.008	0.071	<0.001	0.074	<0.001	0.04	<0.001	0.04	NS	0.01
Mercury	<0.0005	<0.0005	NT	<0.0005	NT	<0.0005	NT	<0.0005	NS	0.02
Nickel	0.021	0.157	NT	0.089	NT	0.038	NT	0.053	NS	0.2
Selenium	<0.002	0.003	NT	<0.002	NT	<0.002	NT	<0.002	NS	0.1
Silver	<0.001	<0.001	NT	<0.001	NT	<0.001	NT	<0.001	NS	0.007
Thallium	<0.001	<0.001	NT	<0.001	NT	<0.001	NT	<0.001	NS	3
Vanadium	0.033	0.274	NT	0.146	NT	0.059	NT	0.092	NS	4
Zinc	0.056	0.473	NT	0.268	NT	0.13	NT	<0.020	NS	0.9
Total Cyanide	<0.01	<0.01	NT	<0.01	NT	<0.01	NT	<0.01	NS	0.03

Notes:

1. NS = No standard
2. < = not detected above the laboratory detection limits and the laboratory detection limit is shown
3. Bolded Values exceed MCP Method 1 Standards
4. MCP Method 1 Standards and Reportable Concentrations were taken from the June 26, 2009 MCP
5. Underlined = Exceeded MCP Reportable Concentrations
6. NT=Not Tested

Table 11 Soil Analytical Data - PCBs
Former Proving Grounds
Hatherly Road
Scituate, Massachusetts

Sample Identification: Sample Date: PID Readings (ppmv):	AOC 2		MCP Method 1		Reportable Concentrations
	CHA-103 (0-0.5') 1/9/2014 NT	S-1/GW-2	Standards		
			S-1/GW-2	S-1/GW-3	
PCBs (mg/kg)					
Aroclor-1016	<0.1	2	2	2	2
Aroclor-1221	<0.1	2	2	2	2
Aroclor-1232	<0.1	2	2	2	2
Aroclor-1242	<0.1	2	2	2	2
Aroclor-1248	<0.1	2	2	2	2
Aroclor-1254	<0.1	2	2	2	2
Aroclor-1260	<0.1	2	2	2	2
Aroclor-1262	<0.1	2	2	2	2
Aroclor-1268	<0.1	2	2	2	2

Notes:

1. NS = No standard
2. < = not detected above the laboratory detection limits and the laboratory detection limit is shown
3. Bolded Values exceed MCP Method 1 Standards
4. MCP Method 1 Standards and Reportable Concentrations were taken from the June 26, 2009 MCP
5. Underlined = Exceeded MCP Reportable Concentrations
6. NT=Not Tested

Table 12 Groundwater Analytical Data - PCBs
Former Proving Grounds
Hatherly Road
Scituate, Massachusetts

Sample Identification: Depth to Water: Sample Date:	AOC 2		C-7 9.03' 1/21/2014	C-8 5.85' 1/21/2014	MW-11 4.86' 1/21/2014	MCP Method 1 Standards		Reportable Concentrations
	C-2 14.55' 1/21/2014	C-6 2.50' 1/21/2014				GW-2	GW-3	
PCBs (ug/L)								
Aroclor-1016	<0.5	<0.5	<0.5	<0.5	<0.5	5	10	5
Aroclor-1221	<0.5	<0.5	<0.5	<0.5	<0.5	5	10	5
Aroclor-1232	<0.5	<0.5	<0.5	<0.5	<0.5	5	10	5
Aroclor-1242	<0.5	<0.5	<0.5	<0.5	<0.5	5	10	5
Aroclor-1248	<0.5	<0.5	<0.5	<0.5	<0.5	5	10	5
Aroclor-1254	<0.5	<0.5	<0.5	<0.5	<0.5	5	10	5
Aroclor-1260	<0.5	<0.5	<0.5	<0.5	<0.5	5	10	5
Aroclor-1262	<0.5	<0.5	<0.5	<0.5	<0.5	5	10	5
Aroclor-1268	<0.5	<0.5	<0.5	<0.5	<0.5	5	10	5

Notes:

1. NS = No standard
2. < = not detected above the laboratory detection limits and the laboratory detection limit is shown
3. Bolded Values exceed MCP Method 1 Standards
4. MCP Method 1 Standards and Reportable Concentrations were taken from the June 26, 2009 MCP
5. Underlined = Exceeded MCP Reportable Concentrations
6. NT=Not Tested

Table 13 Soil Analytical Data - Explosives
Former Proving Grounds
Hatherly Road
Scituate, Massachusetts

Sample Identification: Sample Date: PID Readings (ppmv):	AOC 2						Reportable Concentrations
	CHA-101 (0-0.5') 1/9/2014	CHA-102 (0-0.4') 1/9/2014	CHA-103 (0-0.5') 1/9/2014	CHA-104 (0-0.8') 1/9/2014	MCP Method 1 Standards		
	NT	NT	NT	NT	S-1/GW-2	S-1/GW-3	
Explosives (ug/kg)							RCS-1
2,6-diamino-4-nitrotoluene	<100	<99.8	<99.7	<100	NS	NS	NS
HMX	<100	<99.8	<99.7	<100	100,000	1,000,000	2,000
2,4-diamino-6-nitrotoluene	<100	<99.8	<99.7	<100	NS	NS	NS
RDX	<100	<99.8	<99.7	<100	8,000	8,000	1,000
Picric acid	<100	<99.8	325	<100	NS	NS	100,000
1,3,5-Trinitrobenzene	<100	<99.8	<99.7	<100	NS	NS	50,000
1,3-Dinitrobenzene	<100	<99.8	<99.7	<100	NS	NS	100,000
Nitrobenzene	<100	<99.8	262	<100	NS	NS	500,000
Tetryl	<100	<99.8	<99.7	<2,000	NS	NS	100,000
Nitroglycerin	<2,000	<2,000	<1990	<100	NS	NS	50,000
2,4,6-Trinitrotoluene	<100	<99.8	~47.7	<100	NS	NS	100,000
4-Amino-2,6-dinitrotoluene	<100	<99.8	281	<100	NS	NS	NS
2-Amino-4,6-dinitrotoluene	<100	<99.8	<99.7	<100	NS	NS	NS
2,6-Dinitrotoluene	<100	<99.8	<99.7	<100	NS	NS	100,000
2,4-Dinitrotoluene	<100	<99.8	<99.7	<100	2,000	2,000	700
2-Nitrotoluene	<100	<99.8	<99.7	<100	NS	NS	500,000
4-Nitrotoluene	<100	<99.8	<99.7	<100	NS	NS	500,000
3-Nitrotoluene	<100	<99.8	~1150	<100	NS	NS	500,000
PETN	<5,000	<4,990	<4990	<5,000	NS	NS	NS

Notes:

1. NS = No standard
2. < = not detected above the laboratory detection limits and the laboratory detection limit is shown
3. Bolded Values exceed MCP Method 1 Standards
4. MCP Method 1 Standards and Reportable Concentrations were taken from the June 26, 2009 MCP
5. Underlined = Exceeded MCP Reportable Concentrations
6. NT=Not Tested
7. ~ = Approximate

Table 14 Groundwater Analytical Data - Explosives
Former Proving Grounds
Hatherly Road
Scituate, Massachusetts

Sample Identification: Depth to Water: Sample Date:	AOC 2		C-7 9.03' 1/21/2014	C-8 5.85' 1/21/2014	MW-11 4.85' 1/9/2014	MCP Method 1 Standards		Reportable Concentrations
	C-2 14.55' 1/21/2014	C-6 2.50' 1/21/2014				GW-2	GW-3	
	RC-GW2							
Explosives (ug/L)								
2,6-diamino-4-nitrotoluene	<0.20	<0.20	<0.20	<0.20	<0.20	NS	NS	NS
HMX	<0.20	<0.20	<0.20	<0.20	<0.20	50,000	50,000	50,000
2,4-diamino-6-nitrotoluene	<0.20	<0.20	<0.20	<0.20	<0.20	NS	NS	NS
RDX	<0.20	<0.20	<0.20	<0.20	<0.20	50,000	50,000	50,000
Picric acid	<0.20	<0.20	<0.20	<0.20	<0.20	NS	NS	10,000
1,3,5-Trinitrobenzene	<0.20	<0.20	<0.20	<0.20	<0.20	NS	NS	5,000
1,3-Dinitrobenzene	<0.20	<0.20	<0.20	<0.20	<0.20	NS	NS	10,000
Nitrobenzene	<0.20	<0.20	<0.20	<0.20	<0.20	NS	NS	50,000
Tetryl	<0.20	<0.20	<0.20	<0.20	<0.20	NS	NS	10,000
Nitroglycerin	<4.00	<4.00	<4.00	<4.00	<4.00	NS	NS	5,000
2,4,6-Trinitrotoluene	<0.20	<0.20	<0.20	~0.044	<0.20	NS	NS	10,000
4-Amino-2,6-dinitrotoluene	<0.20	<0.20	<0.20	<0.20	<0.20	NS	NS	NS
2-Amino-4,6-dinitrotoluene	<0.20	<0.20	<0.20	<0.20	<0.20	NS	NS	NS
2,6-Dinitrotoluene	<0.20	<0.20	<0.20	~0.080	<0.20	NS	NS	10,000
2,4-Dinitrotoluene	<0.20	<0.20	<0.20	<0.20	<0.20	20,000	50,000	20,000
2-Nitrotoluene	<0.20	<0.20	<0.20	<0.20	~0.045	NS	NS	50,000
4-Nitrotoluene	<0.20	<0.20	<0.20	~0.13	<0.20	NS	NS	50,000
3-Nitrotoluene	<0.20	<0.20	<0.20	~0.099	~0.095	NS	NS	50,000
PETN	<10	<10	<10	~8.34	<10	NS	NS	NS
Perchlorate (mg/L)	0.00007	<0.00005	0.00067	0.00018	<0.00005	2	1	0.002

Notes:

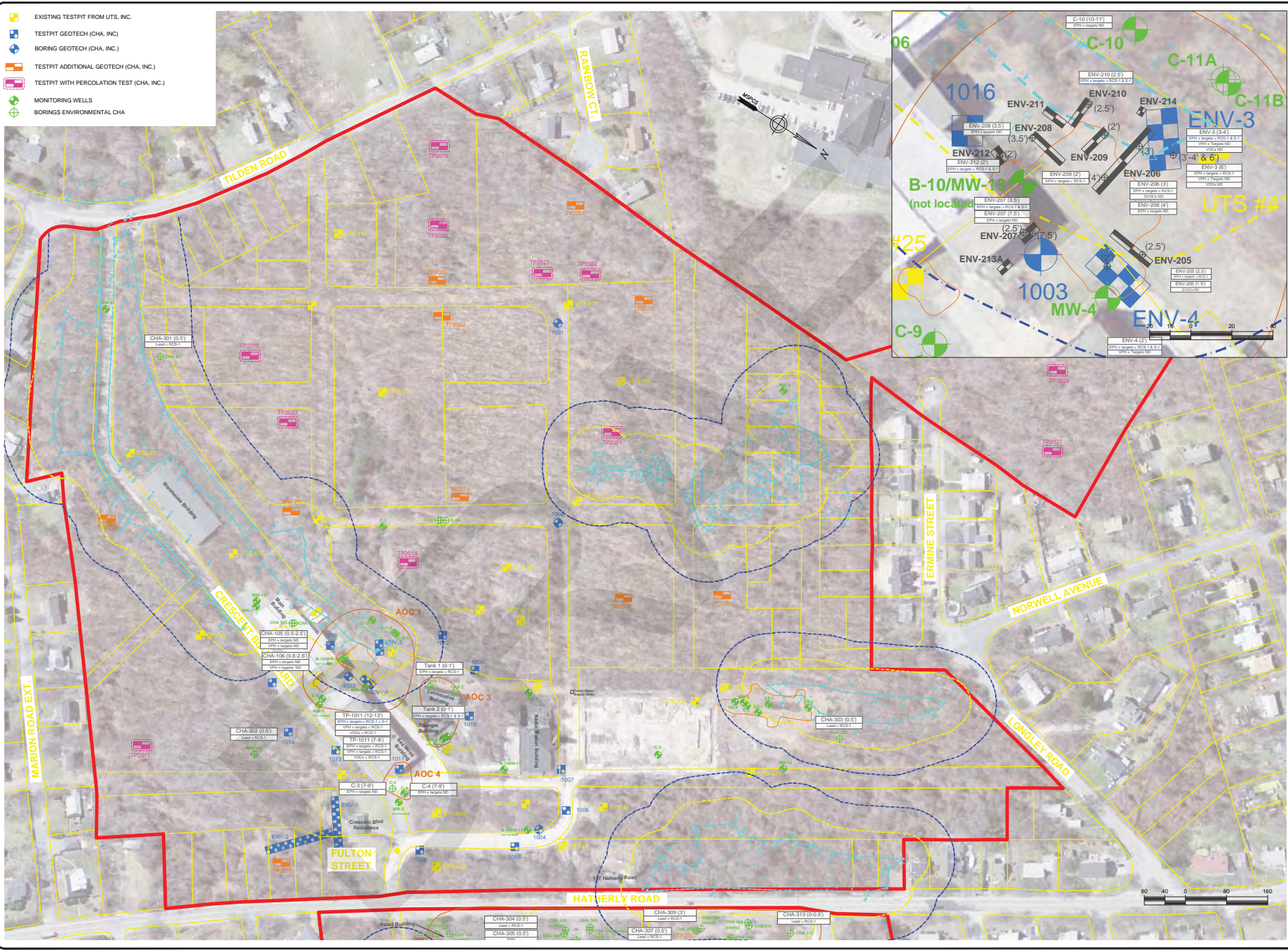
1. NS = No standard
2. < = not detected above the laboratory detection limits and the laboratory detection limit is shown
3. Bolded Values exceed MCP Method 1 Standards
4. MCP Method 1 Standards and Reportable Concentrations were taken from the June 26, 2009 MCP
5. Underlined = Exceeded MCP Reportable Concentrations
6. NT=Not Tested
7. ~ = Approximately

Appendix D

CHA Phase II Figures

DRAFT

FILE: F:\PROJECTS\OASIS\SCITUATE-TOLL BROTHERS\PLANS\SAMPLING PLANING
 Sheet: 2/12/2014 2:10:28 PM Project: 27434 User: G. Adams, Admins LastModified: 2007



Rev	By	Date	Description
1	WRL	1/14/14	WRL LMK 1/14/14
2	WRL	1/14/14	WRL LMK 1/14/14

Rev	By	Date	Description
1	WRL	1/14/14	WRL LMK 1/14/14
2	WRL	1/14/14	WRL LMK 1/14/14

TOLL BROTHERS
 250 GIBALTAR ROAD
 HORSHAM, PA 19044
Toll Brothers
America's Finest Homes

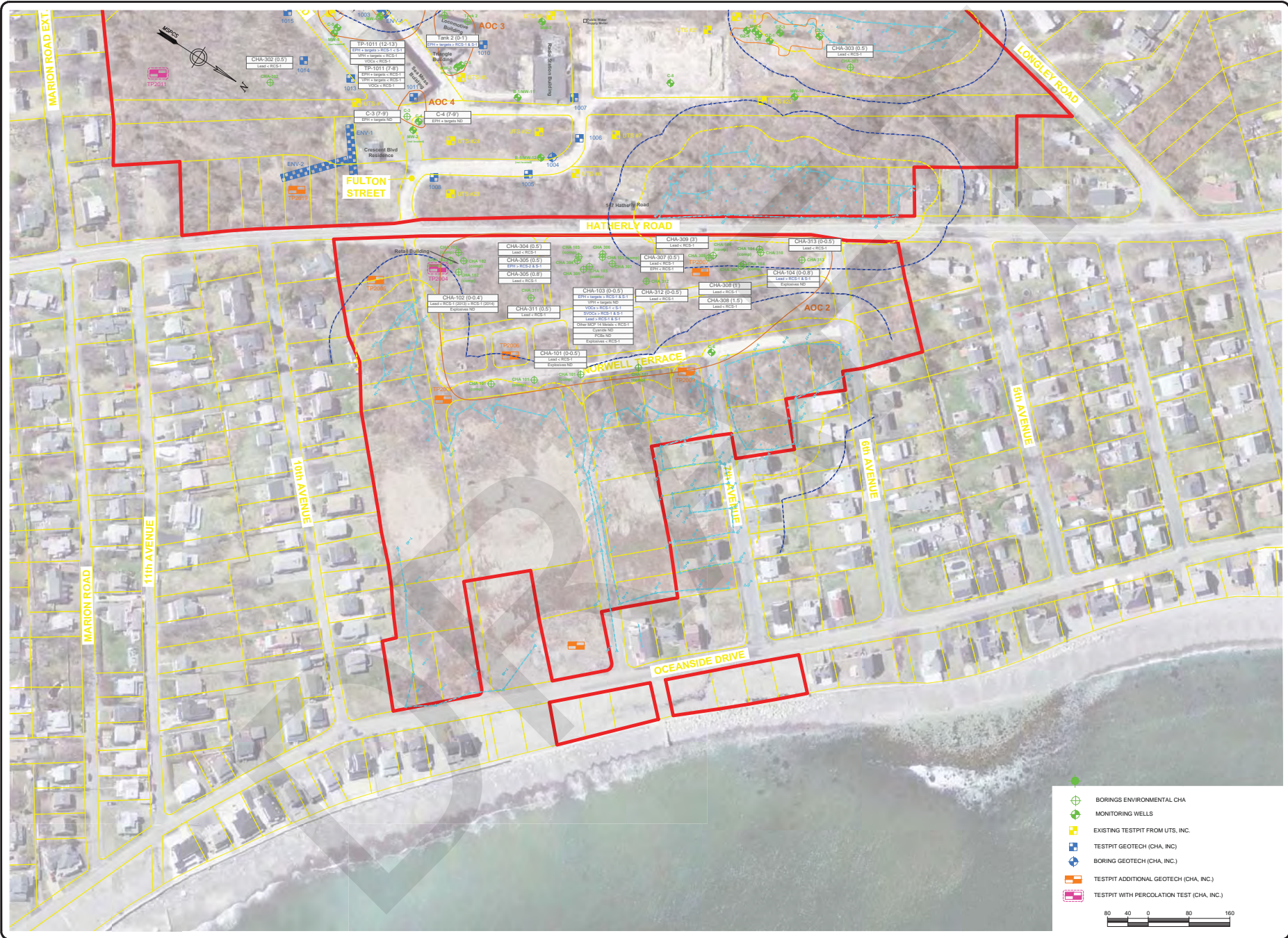
Design: G. Adams
 Drawing No: 27434
 Date: 2/12/2014
 Scale: 1"=30'

Checked: G.C.
 Drawn: G.C.
 Max: (711) 863-2000 • www.tollbrothers.com
 National Office
 10000 Market Street
 Suite 100
 Philadelphia, PA 19103
 Toll Brothers is an Equal Opportunity Employer

OCEANSIDE VILLAGE AT SCITUATE
 Site Plan - Soil Sampling Results Plan - West
 Issue Date: 1/19/14
 Project No.: 27434
 Scale: 1"=30'

Figure 2a

File: F:\PROJECTS\CHA\27434 - SCITUATE - TOLL BROTHERS\PLANS\SAMPLING PLANING
 Sheet: 2/12/2014 1:56:28 PM Project: 2/12/2014 1:07:00 PM User: gparsons, Source: Untitled.dwg, kg



- BORINGS ENVIRONMENTAL CHA
- MONITORING WELLS
- EXISTING TESTPIT FROM UTS, INC.
- TESTPIT GEOTECH (CHA, INC)
- BORING GEOTECH (CHA, INC.)
- TESTPIT ADDITIONAL GEOTECH (CHA, INC.)
- TESTPIT WITH PERCOLATION TEST (CHA, INC.)



Rev	By	Date	Submitted/Revised
1	MRH	10/14/14	
2	MRH	2/12/14	

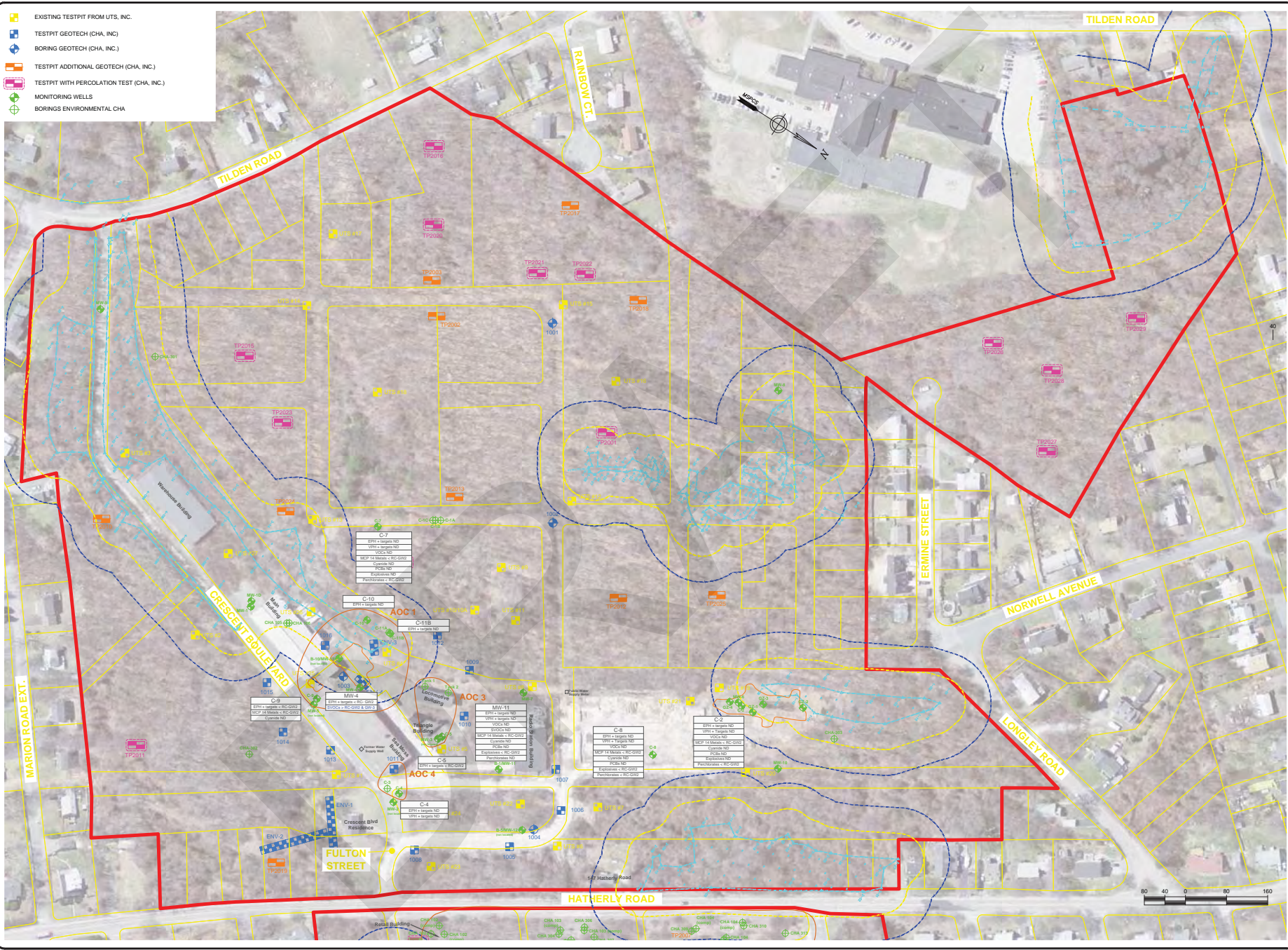
TOLL BROTHERS
 250 GIBRALTAR ROAD
 HORSHAM, PA 19044
Toll Brothers
America's Finest Home Builder

CHA
 Max: (291) 633-0330 • www.chainc.com
 1000 Northampton Ave., Northampton, PA 18064
 Drawing: size Drawn: size Checked: GC

OCEANSIDE VILLAGE AT SCITUATE
 Site Plan - Soil Sampling Results Plan - East
 Issue Date: 1/9/14 Project No.: 27434 Scale: 1"=40'

Figure 2b

FILE: F:\PROJECTS\OASIS\2434 - SITUATE - TOLL BROTHERS\PLANS\SAMPLING PLANING
 Sheet: 2/2/2014 2:10:28 PM Project: 2/2/2014 2:21:33 PM User: Colman, Amanda lastmodified: 2007



No.	Revised	By	Date
1		WPH	1/10/14
2		WPH	2/14/14

Submitted	Reviewed

TOLL BROTHERS
 250 GIBALTAR ROAD
 HORSHAM, PA 19044
Toll Brothers
 America's Finest Home Builder

Design: 02/07/14
 Drawing: 02/07/14
 Checked: GC
 Drawn: [Name]
 Scale: 1"=30'

OCEANSIDE VILLAGE AT SCITUATE
 Site Plan - Groundwater Sampling Results Plan - West
 Issue Date: 1/9/14
 Project No.: 27434

Figure 2c

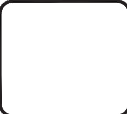
File: F:\PROJECTS\OASIS\27424 - SCITUATE - TOLL BROTHERS\PLANS\SAMPLING PLAN.DWG
 Saved: 2/12/2014 2:10:38 PM Project: 27424 User: G. Collins, merrill@tollbrothers.com



- BORINGS ENVIRONMENTAL CHA
- MONITORING WELLS
- EXISTING TESTPIT FROM UTS, INC.
- TESTPIT GEOTECH (CHA, INC)
- BORING GEOTECH (CHA, INC.)
- TESTPIT ADDITIONAL GEOTECH (CHA, INC.)
- TESTPIT WITH PERCOLATION TEST (CHA, INC.)



Rev	By	Date	Submitted/Revised
1	WPH	1/23/14	
2	WPH	2/12/14	



TOLL BROTHERS
 250 GIBRALTAR ROAD
 HORSHAM, PA 19044
Toll Brothers
 America's Luxury Home Builder

Engineering: G. Collins
 Max: (215) 333-2250 • www.tollbrothers.com
 Scituate, PA 02876
 Project No.: 27424

CHA

Designed: G. Collins
 Drawn: G. Collins
 Checked: G. Collins

OCEANSIDE VILLAGE AT SCITUATE
 Site Plan - Groundwater Sampling Results Plan - East
 Issue Date: 1/9/14
 Project No.: 27424
 Scale: 1"=40'

Figure 2d

Appendix E

Letter Certifying Financial Resources

DRAFT

October x, 2017

Department of Environmental Protection
Bureau of Waste Site Cleanup
Southeast Regional Office
20 Riverside Drive
Lakeville, MA 02347

Dear Sir or Madam:

**Re: Certification of Financial Resources
Release Abatement Measure Plan
Seaside at Scituate Development
137 Hatherly Road
Scituate, Massachusetts
MassDEP RTN 4-18143**

The purpose of this letter is to notify you that Toll Brothers, Inc. (Toll Brothers) have sufficient financial resources to conduct a Release Abatement Measure (RAM) requiring the management of greater than 1,500 cubic yards of excavated soil at the above-referenced site. The proposed RAM has requested management of up to 2,000 cubic yards of soil as remediation waste.

Licensed Site Professional (LSP) services, including information and opinions regarding the site conditions and RAM requirements, have been provided to Toll Brothers by GEI Consultants, Inc. of Woburn, Massachusetts. Based on GEI's information and opinions regarding the RAM requirements for the site, Toll Brothers have determined that they have sufficient financial resources to conduct the proposed RAM in the manner and time-frame specified in the Massachusetts Contingency Plan (MCP; 310 CMR 40.0000). This statement is provided in accordance with 310 CMR 40.0442(4).

If you have any further questions, please contact me at (508) 366-1440 or dbauer@tollbrothers.com.

Sincerely,

Toll Brothers, Inc.

David Bauer
Division President

Appendix F

Derivation of Particulate AACs

DRAFT

Appendix F - Derivation of Particulate AACs

Scituate	BAP		EXP1NC	EXP1C
			5.50E-06 m3/kg-day	5.09E-09 m3/kg-day
EXP1NC	Absorption through GI			
Respirable Dust Concentration (OHMsoil)	26 mg/kg	max soil		
Ventilation Rate VR)	3 L/min	1-2 year old light exertion		
Fraction PM10 Ingested	1.5 unitless			
Relative Absorption Factor (RAF)	1 unitless			
Exposure Frequency (EF)	1 events/day			
Exposure Duration (ED)	10 hours/event			
Exposure Period (EP)	20 days	4 weeks		
Conversion Factor 1 (C1)	1.00E-03 m3/L			
Conversion Factor 2 (C2)	60 min/hour			
Body Weight (BW)	10.8 kg	2-year old female child		
Averaging Period (AP)	20 days	4 weeks		
Conversion Factor 3 (C3)	1.00E+06 mg/kg			
Averaging Period Cancer (AP)	25550 days			
			EXP2NC	EXP2C
			5.20E-06 unitless	4.07E-06 ug/mg
EXP2NC	Absorption through lungs			
Respirable Dust Concentration (OHMsoil)	26 mg/kg	max soil		
Fraction PM10 Inhaled	0.5 unitless			
Exposure Frequency (EF)	1 events/day			
Exposure Duration (ED)	10 hours/event			
Exposure Period (EP)	20 days	4 weeks		
Conversion Factor 4 (C4)	4.00E-02 days/hour			
Conversion Factor 5 (C5)	1.00E-06 kg/mg			
Averaging Period (AP)	20 days	4 weeks		
Conversion Factor	1000 ug/mg			
Averaging Period Cancer (AP)	25550 days			
			Noncancer	Cancer
			Action Level	Action Level
			PM10 (mg/m3)	PM10 (mg/m3)
			623.70	24.03
Toxicity Values				
Oral RfD	3.00E-02 mg/kg-day			
Inhalation RfC	5.00E-02 mg/m3			
Slope Factor	7.30E+00 per mg/kg-day			
Unit Risk	1.10E-03 per ug/m3			
Hazard Index (HI)	0.2			
Excess Lifetime Cancer Risk (ELCR)	1.00E-06			

Appendix F - Derivation of Particulate AACs

Scituate	Naphthalene		EXP1NC	EXP1C
			6.25E-07 m3/kg-day	4.89E-10 m3/kg-day
EXP1NC	Absorption through GI			
Respirable Dust Concentration (OHMsoil)	2.5 mg/kg	max soil		
Ventilation Rate VR)	3 L/min	1-2 year old light exertion		
Fraction PM10 Ingested	1.5 unitless			
Relative Absorption Factor (RAF)	1 unitless			
Exposure Frequency (EF)	1 events/day			
Exposure Duration (ED)	10 hours/event			
Exposure Period (EP)	20 days	4 weeks		
Conversion Factor 1 (C1)	1.00E-03 m3/L			
Conversion Factor 2 (C2)	60 min/hour			
Body Weight (BW)	10.8 kg	2-year old female child		
Averaging Period (AP)	20 days	4 weeks		
Conversion Factor 3 (C3)	1.00E+06 mg/kg			
Averaging Period Cancer (AP)	25550 days			
			EXP2NC	EXP2C
			5.00E-07 unitless	3.91E-07 ug/mg
EXP2NC	Absorption through lungs			
Respirable Dust Concentration (OHMsoil)	2.5 mg/kg	max soil		
Fraction PM10 Inhaled	0.5 unitless			
Exposure Frequency (EF)	1 events/day			
Exposure Duration (ED)	10 hours/event			
Exposure Period (EP)	20 days	4 weeks		
Conversion Factor 4 (C4)	4.00E-02 days/hour			
Conversion Factor 5 (C5)	1.00E-06 kg/mg			
Averaging Period (AP)	20 days	4 weeks		
Conversion Factor	1000 ug/mg			
Averaging Period Cancer (AP)	25550 days			
			Noncancer	Cancer
Toxicity Values			Action Level	Action Level
Oral RfD	2.00E-02 mg/kg-day		PM10 (mg/m3)	PM10 (mg/m3)
Inhalation RfC	3.00E-03 mg/m3		1010.53	Not Calculated
Slope Factor	na per mg/kg-day			
Unit Risk	na per ug/m3			
Hazard Index (HI)	0.2			
Excess Lifetime Cancer Risk (ELCR)	1.00E-06			

Appendix F - Derivation of Particulate AACs

Scituate	Lead		EXP1NC	EXP1C
			1.10E-04 m3/kg-day	8.61E-08 m3/kg-day
EXP1NC	Absorption through GI			
Respirable Dust Concentration (OHMsoil)	440 mg/kg	max soil		
Ventilation Rate VR)	3 L/min	1-2 year old light exertion		
Fraction PM10 Ingested	1.5 unitless			
Relative Absorption Factor (RAF)	1 unitless			
Exposure Frequency (EF)	1 events/day			
Exposure Duration (ED)	10 hours/event			
Exposure Period (EP)	20 days	4 weeks		
Conversion Factor 1 (C1)	1.00E-03 m3/L			
Conversion Factor 2 (C2)	60 min/hour			
Body Weight (BW)	10.8 kg	2-year old female child		
Averaging Period (AP)	20 days	4 weeks		
Conversion Factor 3 (C3)	1.00E+06 mg/kg			
Averaging Period Cancer (AP)	25550 days			
			EXP2NC	EXP2C
			8.80E-05 unitless	6.89E-05 ug/mg
EXP2NC	Absorption through lungs			
Respirable Dust Concentration (OHMsoil)	440 mg/kg	max soil		
Fraction PM10 Inhaled	0.5 unitless			
Exposure Frequency (EF)	1 events/day			
Exposure Duration (ED)	10 hours/event			
Exposure Period (EP)	20 days	4 weeks		
Conversion Factor 4 (C4)	4.00E-02 days/hour			
Conversion Factor 5 (C5)	1.00E-06 kg/mg			
Averaging Period (AP)	20 days	4 weeks		
Conversion Factor	1000 ug/mg			
Averaging Period Cancer (AP)	25550 days			
			Noncancer	Cancer
Toxicity Values			Action Level	Action Level
Oral RfD	7.50E-04 mg/kg-day		PM10 (mg/m3)	PM10 (mg/m3)
Inhalation RfC	1.00E-03 mg/m3		0.85	Not Calculated
Slope Factor	na per mg/kg-day			
Unit Risk	na per ug/m3			
Hazard Index (HI)	0.2			
Excess Lifetime Cancer Risk (ELCR)	1.00E-06			

Appendix F - Derivation of Particulate AACs

Scituate	C9-C18 Aliphatic Fraction		EXP1NC	EXP1C
	Absorption through GI		8.50E-04 m3/kg-day	6.65E-07 m3/kg-day
Respirable Dust Concentration (OHMsoil)	3400 mg/kg	max soil		
Ventilation Rate VR)	3 L/min	1-2 year old light exertion		
Fraction PM10 Ingested	1.5 unitless			
Relative Absorption Factor (RAF)	1 unitless			
Exposure Frequency (EF)	1 events/day			
Exposure Duration (ED)	10 hours/event			
Exposure Period (EP)	20 days	4 weeks		
Conversion Factor 1 (C1)	1.00E-03 m3/L			
Conversion Factor 2 (C2)	60 min/hour			
Body Weight (BW)	10.8 kg	2-year old female child		
Averaging Period (AP)	20 days	4 weeks		
Conversion Factor 3 (C3)	1.00E+06 mg/kg			
Averaging Period Cancer (AP)	25550 days			
	Absorption through lungs		EXP2NC	EXP2C
Respirable Dust Concentration (OHMsoil)	3400 mg/kg	max soil	6.80E-04 unitless	5.32E-04 ug/mg
Fraction PM10 Inhaled	0.5 unitless			
Exposure Frequency (EF)	1 events/day			
Exposure Duration (ED)	10 hours/event			
Exposure Period (EP)	20 days	4 weeks		
Conversion Factor 4 (C4)	4.00E-02 days/hour			
Conversion Factor 5 (C5)	1.00E-06 kg/mg			
Averaging Period (AP)	20 days	4 weeks		
Conversion Factor	1000 ug/mg			
Averaging Period Cancer (AP)	25550 days			
	Toxicity Values		Noncancer	Cancer
Oral RfD	1.00E-01 mg/kg-day		Action Level	Action Level
Inhalation RfC	2.00E-01 mg/m3		PM10 (mg/m3)	PM10 (mg/m3)
Slope Factor	na per mg/kg-day		16.81	Not Calculated
Unit Risk	na per ug/m3			
Hazard Index (HI)	0.2			
Excess Lifetime Cancer Risk (ELCR)	1.00E-06			

Appendix F - Derivation of Particulate AACs

Scituate	C19-C36 Aliphatic Fraction		EXP1NC	EXP1C
	Absorption through GI		6.25E-03 m3/kg-day	4.89E-06 m3/kg-day
Respirable Dust Concentration (OHMsoil)	25000 mg/kg	max soil		
Ventilation Rate VR)	3 L/min	1-2 year old light exertion		
Fraction PM10 Ingested	1.5 unitless			
Relative Absorption Factor (RAF)	1 unitless			
Exposure Frequency (EF)	1 events/day			
Exposure Duration (ED)	10 hours/event			
Exposure Period (EP)	20 days	4 weeks		
Conversion Factor 1 (C1)	1.00E-03 m3/L			
Conversion Factor 2 (C2)	60 min/hour			
Body Weight (BW)	10.8 kg	2-year old female child		
Averaging Period (AP)	20 days	4 weeks		
Conversion Factor 3 (C3)	1.00E+06 mg/kg			
Averaging Period Cancer (AP)	25550 days			
	Absorption through lungs		EXP2NC	EXP2C
Respirable Dust Concentration (OHMsoil)	25000 mg/kg	max soil	5.00E-03 unitless	3.91E-03 ug/mg
Fraction PM10 Inhaled	0.5 unitless			
Exposure Frequency (EF)	1 events/day			
Exposure Duration (ED)	10 hours/event			
Exposure Period (EP)	20 days	4 weeks		
Conversion Factor 4 (C4)	4.00E-02 days/hour			
Conversion Factor 5 (C5)	1.00E-06 kg/mg			
Averaging Period (AP)	20 days	4 weeks		
Conversion Factor	1000 ug/mg			
Averaging Period Cancer (AP)	25550 days			
Toxicity Values			Noncancer	Cancer
Oral RfD	2.00E+00 mg/kg-day		Action Level	Action Level
Inhalation RfC	na mg/m3	RfC unassigned by	PM10 (mg/m3)	PM10 (mg/m3)
Slope Factor	na per mg/kg-day	MassDEP	Not Calculated	Not Calculated
Unit Risk	na per ug/m3			
Hazard Index (HI)	0.2			
Excess Lifetime Cancer Risk (ELCR)	1.00E-06			

Appendix F - Derivation of Particulate AACs

Scituate	C11-C22 Aliphatic Fraction		EXP1NC	EXP1C
EXP1NC	Absorption through GI		2.10E-03 m3/kg-day	1.64E-06 m3/kg-day
Respirable Dust Concentration (OHMsoil)	8400 mg/kg	max soil		
Ventilation Rate VR)	3 L/min	1-2 year old light exertion		
Fraction PM10 Ingested	1.5 unitless			
Relative Absorption Factor (RAF)	1 unitless			
Exposure Frequency (EF)	1 events/day			
Exposure Duration (ED)	10 hours/event			
Exposure Period (EP)	20 days	4 weeks		
Conversion Factor 1 (C1)	1.00E-03 m3/L			
Conversion Factor 2 (C2)	60 min/hour			
Body Weight (BW)	10.8 kg	2-year old female child		
Averaging Period (AP)	20 days	4 weeks		
Conversion Factor 3 (C3)	1.00E+06 mg/kg			
Averaging Period Cancer (AP)	25550 days			
EXP2NC	Absorption through lungs		1.68E-03 unitless	1.32E-03 ug/mg
Respirable Dust Concentration (OHMsoil)	8400 mg/kg	max soil		
Fraction PM10 Inhaled	0.5 unitless			
Exposure Frequency (EF)	1 events/day			
Exposure Duration (ED)	10 hours/event			
Exposure Period (EP)	20 days	4 weeks		
Conversion Factor 4 (C4)	4.00E-02 days/hour			
Conversion Factor 5 (C5)	1.00E-06 kg/mg			
Averaging Period (AP)	20 days	4 weeks		
Conversion Factor	1000 ug/mg			
Averaging Period Cancer (AP)	25550 days			
Toxicity Values			Noncancer Action Level PM10 (mg/m3)	Cancer Action Level PM10 (mg/m3)
Oral RfD	3.00E-02 mg/kg-day		1.93	Not Calculated
Inhalation RfC	5.00E-02 mg/m3			
Slope Factor	na per mg/kg-day			
Unit Risk	na per ug/m3			
Hazard Index (HI)	0.2			
Excess Lifetime Cancer Risk (ELCR)	1.00E-06			