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INDUSTRIAL

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New England – Region 1
5 Post Office Square, Suite 100
Boston, Massachusetts 02109-3912

Ms. Jennifer McWeeney
Project Manager
Massachusetts Department of Environmental Protection
One Winter Street
Boston, Massachusetts 02108

Subject:
Final *Sediment Construction Summary and Final Sediment Remedial Action Report* ("Completion Report")
W.R. Grace Superfund Site, Acton, Massachusetts

Date:
June 12, 2012

Contact:
Jeffrey S. Holden

Phone:
860.533.9906

Email:
jeffrey.holden@arcadis-us.com

Our ref:
B0078800.0000

Dear Mr. Golden and Ms. McWeeney:

On behalf of Remedium Group, Inc., a subsidiary of W. R. Grace & Co., enclosed please find a Final *Sediment Construction Summary and Final Sediment Remedial Action Report* ("Completion Report") for the referenced site. This report addresses two specific sediment-related post-construction submittal requirements under the Remedial Design/Remedial Action Statement of Work (RD/RA SOW):

- Sediment Construction Summary Report (SOW Section VII.B.6)
- Final Sediment Remedial Action Report (SOW Section VII.B.9)

The enclosed document addresses USEPA comments regarding the March 2012 *Draft Sediment Remedial Action Report*, which were provided in a letter to ***de maximis, inc***. dated May 17, 2012. A summary of the USEPA comments, including an indication of how each was addressed in the enclosed final document, is attached to this letter.

As required by Section IX of the SOW, three copies are being provided to the USEPA and one copy (electronic only) to the Massachusetts Department of Environmental Protection. An electronic version (Word file) of the text has been separately submitted to the USEPA.

SDMS DocID 517500

Please feel free to contact me at 860.533.9906 or Mr. Thor Helgason of ***de maximis, inc***. (781.642.8775) with any questions regarding this submittal.

Sincerely,

ARCADIS U.S., Inc.

Jeffrey S. Holden, P.E., LSP
Principal Engineer

Copies:
Thor Helgason, P.E., ***de maximis, inc.***
Robert Medler, Remedium*
Lydia Duff, W.R. Grace*
Barbara Weir, AECOM
Mark Gravelding, P.E., ARCADIS
Lynne Gardner, Remedium*

(* electronic copy only)

ARCADIS

RESPONSES TO USEPA COMMENTS ON THE DRAFT SEDIMENT CONSTRUCTION SUMMARY AND FINAL SEDIMENT REMEDIAL ACTION REPORT

SPECIFIC COMMENTS

Comment #1 - Section 2 Background Information*. This section should include a statement concerning the fact the institutional controls/deed restrictions were not implemented because they were not needed for Sinking Pond or the North Lagoon Wetlands. No wastes were left in place (or capped) that would [preclude] unrestricted use due to the fact that the short and long term clean up goals were achieved. The sediment clean up goals is protective of both human health and the environment.*

Response: Text was added to Section 2.3 to clarify that no sediment-specific institutional controls or deed restrictions were implemented because no wastes were left in place that would preclude foreseeable future use and short- and long-term clean up goals were achieved in these areas.

Comment #2 - Section 2.3 Summary of Remedial Design*. Section 2.3 States that "components of the Remedial Design for the North lagoon and Sinking Pond were presented in the 100% Design Report (ARCADIS 2011)". The Final version of the 100% Design Report received by EPA is dated September 2010. Revised Technical Specifications and Construction Drawings were provided at the Pre-construction meeting held June 23rd 2011; however a revised 100% Design Report was not provided to EPA in March of 2012 but to the bidders. De maximis incorporated the comments (of the September 2011, EPA 100% Design Conditional Approval Letter) into the final bid documents.*

Response: The chronology leading up to the March 2011 final version of the 100% Design Report is described in Section 1.1 of the Completion Report. No change was made to Section 2.3 as a result of this comment.

Comment #3 - Section 2.4 Chronology of Events. *This tabular chronology table should also include the following applicable milestones:*

- *Mobilization and construction of the remedy*
- *Demobilization*

Response: The table in Section 2.4 was modified to include the additional milestones.

Comment #4 - Section 2.4 Chronology of Events. *The table should indicate that all of the events are related to Operable Unit 3.*

Response: Section 2.4 was modified to address this comment.

Comment #5 - Section 3.1.1 Submittals. *Components of the Contractor's Operation Plan were submitted following mobilization; however the text indicates that the Plan was submitted prior to mobilization. Please revise the text in the final RA.*

Response: Section 3.1.1 was revised to indicate that certain components of the Contractor's Operations Plan were required prior to mobilization, while others were accepted after mobilization but prior to commencing the activities addressed by the specific component of the Plan.

Comment #6 - Section 3.1.4 Water Management and Treatment*. Based on discussions and observations made during field oversight visits it was documented by AECOM field personnel that the pretreatment system initially consisted of a different configuration and was later changed to the configuration presented (50 micron and 25 micron bag filter in series) in this Section. Please revise the text in the final RA.*

Response: The Section 3.1.4 was modified to address this comment.

Comment #7 - Section 3.1.6 Sinking Pond Excavation and Dredging. *It should be indicated how removal beneath temporary discharge pipes within the inlet area was achieved, as these were in-place prior to remediation within this area.*

Response: Section 3.1.6 was modified to address this comment.

Comment #8 - Section 3.1.6 Sinking Pond Excavation and Dredging. *It is stated that "Confirmatory Sampling was performed at pre-determined locations within Sinking Pond at least three days after dredging was completed in a given area." There was at least one instance where this was not the case, such that sampling was completed sooner than three days following dredging activities. Please revise the text in the final RA.*

Response: Section 3.1.6 was modified to address this comment.

Comment #9 - Section 3.1.12 Sinking Pond Excavation and Dredging*. The report states that "consistent with the Contractor's survey control plan submittal, pre-construction and post-excavation bathymetric surveys conducted in Sinking Pond consisted of the use of pole shot methods taken at approximate 10 foot spacing." This is consistent with the method employed for baseline and final surveys; however it differs from the initially proposed method outlined in the 100% Design Report – Technical Specification Section 01 32 23 Survey Control Part 1.01 B. The rationale for modifying the initial approach should be presented in this report. Please revise the text in the final RA.*

Response: Additional information was included in Section 3.1.12 to indicate that the survey approach used in Sinking Pond differed from the approach specified in the 100% Design Report because the Contractor proposed and justified an alternative approach in their Survey Work Plan, and this alternate approach was conditionally accepted by the Engineer.

Comment #10 - As Built Drawing 4 Temporary Facilities Details. *Dimensions of the Decontamination area were modified during construction and this should be documented on Drawing 4, Detail 3 mark-ups.*

Response: The Decontamination Area was constructed per the dimensions specified in Design Drawing 4, Detail 3. At one point during the construction of this area the liner was compromised prompting the Contractor to issue a Request for Information (RFI). However, the RFI was subsequently withdrawn as the liner was repaired and the area built to design dimensions. No change was made as a result of this comment.

Comment #11 - General Item. *Exhibit 2-5 entitled "Recommended Remedial Action Report Contents" of the EPA guidance document Close Out Procedures for National Priorities List Sites (EPA, May 2011) indicates that the Remedial Action Report should include "contact information (names addresses, phone numbers and contract/reference data) for all major design and remediation contractors, EPA oversight contractors, and respective RPM and project managers for EPA, the state and PRPs as applicable." This information has not been included. Please revise the text in the final RA.*

Response: The contact information requested in this comment is provided under separate cover.

Imagine the result

DRAFT

W.R. Grace & Co. – Conn

Final Sediment Construction Summary and Final Sediment Remedial Action Report

W.R. Grace Superfund Site – Operable Unit 3
Acton-Concord, Massachusetts

June 2012

Final Sediment Construction Summary and Final Sediment Remedial Action Report

DISCLAIMER: This document is a DRAFT document prepared by W. R. Grace under a government Consent Decree. This document has not undergone formal review by the U.S. Environmental Protection Agency and Massachusetts Department of Environmental Protection. The opinions, findings, and conclusions expressed are those of the author and not those of the U.S. Environmental Protection Agency and Massachusetts Department of Environmental Protection.

W.R. Grace Superfund Site
Operable Unit 3
Acton-Concord, Massachusetts

Prepared for:
W.R. Grace & Co. – Conn

Prepared by:
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Tel 860 645 1084
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Our Ref.:
B0078800.0000

Date:
June 2012

ARCADIS

ENGINEERING CERTIFICATION

I, Mark Gravelding, am currently a registered professional engineer licensed by Massachusetts, I had primary direct responsibility for implementation of the sediment remedial program activities for W.R. Grace Superfund Site Operable Unit 3, and I certify to the best of my knowledge and ability that the Final Sediment Remedial Design Report (ARCADIS, 2011) was implemented and that construction activities were completed in substantial conformance with the U.S. Environmental Protection Agency (USEPA)-approved Final Sediment Remedial Design Report (ARCADIS, 2011) and the field modifications set forth within this report.

I certify to the best of my knowledge and ability that the data submitted to the USEPA with this DRAFT Sediment Construction Summary and Final Remedial Action Report demonstrates that the remediation requirements set forth in the Final Sediment Remedial Design Report (ARCADIS, 2011) have been or will be achieved.

I certify to the best of my knowledge and ability that all information and statements in this certification form are true.

I, Mark Gravelding, of ARCADIS of New York, 6723 Towpath Road, Syracuse, NY 13214-0066, am certifying as the Engineer-of-Record and I have been authorized and designated by W.R. Grace to sign this certification for the site.

42983	6/12/2012	
MA Professional Engineer #	Date	Signature

ENGINEERING CERTIFICATION **i**

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Acronyms

CAM	MassDEP Compendium of Analytical Methods
CMR	Code of Massachusetts Regulations
cy	cubic yards
DAC	D.A. Collins Environmental
EPH	Extractable Petroleum Hydrocarbons
ft	feet
GWTS	Landfill Area groundwater treatment system
HASP	Health and Safety Plan
HDPE	High Density Polyethylene
LSP	Licensed Site Professional
MassDEP	Massachusetts Department of Environmental Protection
MCP	Massachusetts Contingency Plan
mg/kg	milligrams per kilogram
NAD 83	North American Datum of 1983
NGVD 29	National Geodetic Vertical Datum of 1929
NTU	nephelometric turbidity units
OU-3	Operable Unit 3
PCBs	polychlorinated biphenyls
PEC	Probable Effects Concentration
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QC	Quality Control
RA	remedial action
RAO	response action objective

RCS-1	MCP Reportable Concentration per 310 CMR 40.0361
RD	remedial design
RFI	Request for Information
ROD	September 2005 Record of Decision
RPD	Relative Percent Difference
SCDR	Sediment Concept Design Report
SCQAPP	Sediment Construction Quality Assurance Project Plan
SDCMP	Sediment Demonstration of Compliance and Maintenance Plan
SDP	Sediment Dewatering Pad
SEL	Severe Effects Level
SOW	Statement of Work
UCL	upper confidence limit
USEPA	United States Environmental Protection Agency
VPH	Volatile Petroleum Hydrocarbons
W.R. Grace	W.R. Grace & Co. – Conn
100% Design Report	Final (100%) Sediment Remedial Design Report

1. Introduction

1.1 Purpose and Scope

The W.R. Grace Superfund Site (the site) is located in Acton and Concord Massachusetts. The Record of Decision (ROD) for Operable Unit 3 (OU-3) at the site was issued by the United States Environmental Protection Agency (USEPA) in September 2005. An associated Remedial Design/Remedial Action Statement of Work (RD/RA SOW) was issued by the USEPA in August 2006. Among other things, the ROD and SOW identify the remedial approach and implementation requirements for sediment remediation activities in two areas of the site: Sinking Pond and the North Lagoon Wetland.

On behalf of W.R. Grace & Co. – Conn (W.R. Grace), sediment remedial design activities were implemented between 2007 and 2010. A Final (100%) Sediment Remedial Design Report (100% Design Report) was submitted in September 2010 and conditionally approved by the USEPA – following opportunity for review and comment by the Massachusetts Department of Environmental Protection (MassDEP) – in a letter dated September 30, 2010. USEPA's approval conditions were subsequently incorporated into a revised 100% Design Report (dated March 2011) that was used in support of the Remediation Contractor selection process. The selected contractor mobilized to the site in June 2011 and implemented the sediment remedial construction activities between June and November 2011. A pre-final inspection of the completed sediment construction activities (per SOW Section VII.B.4) was conducted at the site on November 17, 2011, and was attended by representatives of USEPA, MassDEP, W.R. Grace, and their respective contractors. Based on the observed site conditions, the USEPA issued an Operational and Functional Determination on January 10, 2012. Accordingly, sediment remedial activities were determined to be complete and the "pre-final" inspection served as the final inspection (SOW Section VII.B.5).

Having completed the sediment remedial action construction activities, this report addresses two specific post-construction submittal requirements under the SOW:

- Sediment Construction Summary Report (SOW Section VII.B.6)
- Final Sediment Remedial Action Report (SOW Section VII.B.9)

The Sediment Construction Summary Report component documents the completion of the physical construction activities associated with the sediment remedial activities. The Final Sediment Remedial Action Report component documents that the sediment-related performance standards have been met. As further discussed below, the ROD and SOW provided for both short-term and long-term cleanup goals for sediments at the site. Because W.R. Grace's 100% remedial design targeted – and its implementation achieved – the long-

term cleanup goals, the SOW-specified sediment Performance Standards (Section 2.2.2) have been met. Accordingly, this report includes the requisite components of both documents. It has also been developed in consideration of applicable provisions of the following:

- Massachusetts Contingency Plan (MCP) Phase IV As-Built Construction Report (31 CMR 40.0875)
- USEPA Guidance titled "Close Out Procedures for National Priorities List Sites" (USEPA 2011)

A draft version of this Completion Report was submitted to the USEPA in March 2012. USEPA comments on that draft version were provided to ***de maximis, inc.*** on May 17, 2012. This final version incorporates revisions addressing USEPA comments on the prior draft. The "DRAFT" header is retained per the requirements of Section IX.B of the SOW pending final USEPA approval.

1.2 Project Organization

Implementation of the sediment remedial action at the site was a collaboration among various parties. The following table identifies the primary companies/agencies involved and their respective roles.

Company / Agency	Role
USEPA	Lead regulatory oversight
AECOM	USEPA oversight contractor
MassDEP	Regulatory oversight (State)
Remedium Group, Inc.	Responsible for overall project implementation on behalf of W.R. Grace
de maximis, inc. (de maximis)	Project Coordinator for W.R. Grace / Remedium
ARCADIS	Engineering Design and Remedial Action Quality Assurance
D.A. Collins Environmental (DAC)	Remediation Contractor
Thew Associates Land Surveyors	Survey Subcontractor to DAC

1.3 Document Format

The remainder of this report is organized as follows:

- *Section 2 – Background Information:* summarizes pertinent background information regarding the site and the sediment remedial action.
- *Section 3 – Summary of Remedial Action Implementation:* describes the implementation of the remedial action components at the site.
- *Section 4 – Final Inspection and Certification:* summarizes the results of the pre-final remedial action inspection; summarizes the operation, maintenance and monitoring activities as described in the Sediment Demonstration of Compliance and Maintenance Plan (SDCMP).
- *Section 5 – References.*

Various tables, figures, and drawings are also included at the end of this report, and references to these items are cited within the text where appropriate. In particular several attachments are provided that document various components of the remedial action:

- *Attachment A – Submittal Register*: summarizes the various contractor submittals reviewed in conjunction with the remedial action.
- *Attachment B – Pre-Construction Meeting Minutes*: presents the meeting minutes from the pre-construction meeting conducted at the site on June 23, 2011.
- *Attachment C – Construction Drawings*: includes copies of the final Design Drawings annotated to indicate changes from the 100% Design Report.
- *Attachment D – Post-Construction Survey Drawings and Survey Control Tables*: presents the final post-construction survey drawings for North Lagoon Wetland and Sinking Pond stamped by a licensed surveyor.
- *Attachment E – ClamVision Reports*: includes figures generated by ClamVision (the Contractor's global positioning system-based dredge control program) documenting excavation activities in Sinking Pond.
- *Attachment F – Planting Restoration Summary*: summarizes the plantings installed as part of the restoration activities in North Lagoon Wetland and Sinking Pond.
- *Attachment G – Off-Site Waste Disposal Documentation*: presents copies of the completed Bills of Lading for disposed materials from North Lagoon Wetland and Sinking Pond.

- *Attachment H – Paint Filter Test Log*: summarizes the paint filter tests conducted for amended sediment samples prior to off-disposal.
- *Attachment I – 95% ProUCL Calculations*: presents the 95% ProUCL statistical evaluations performed on the confirmatory samples from Sinking Pond to document achievement of the performance standard.
- *Attachment J – Laboratory Data*: presents laboratory data reports for analyses of waste characterization samples, imported materials (i.e. topsoil used in restoration activities, sandy silt used for permanent check dam), and confirmatory samples from Sinking Pond.
- *Attachment K – Turbidity Monitoring Log*: summarizes the turbidity measurements taken during construction activities at Sinking Pond.
- *Attachment L – Requests for Information*: includes copies of the Request for Information (RFI) submittals from the Contractor and their corresponding responses.

2. Background Information

2.1 Site Location and Setting

The W.R. Grace (Acton Plant) Superfund Site covers approximately 260 acres in Acton and Concord, Massachusetts, and is bordered by residential properties on the northwest, east and west, and industrial properties to the south and northeast. Natural borders include the Fort Pond Brook (northwest) and the Assabet River (southeast). The site includes building foundations, former lagoons, a capped industrial landfill and roadways associated with a former industrial complex. The undeveloped portions of the site include steep to moderate slopes with a combination of forested uplands and wetlands. Several surface-water bodies are located on and around the site, including Sinking Pond, North Lagoon Wetland, Turtle Pond, Muskrat Pond, the Assabet River and Fort Pond Brook. Figure 1 presents an overall view of the site location and surrounding features.

The Remedial Action (RA) summarized herein is specific to two areas of the site: Sinking Pond and North Lagoon Wetland. Sinking Pond is a kettle pond located in the southwestern portion of the site that does not have an outlet, and receives discharges from the Landfill Area groundwater treatment system (GWTS) and stormwater runoff from surrounding areas. North Lagoon Wetland is a wetland area between the former North Lagoon and the perennial stream Fort Pond Brook (Wetlands Preservation Inc. 2007) (Figure 1).

2.2 Summary of Requirements

The ROD (USEPA 2005) sets forth the selected remedy for Operable Unit 3 (OU-3) at the site. The ROD and RD/RA SOW (USEPA 2006) define the response action(s) to be undertaken by W.R. Grace to address groundwater, sediment and surface-water impacts at the site. Sediment remedial action undertaken and summarized in this report applies to Sinking Pond and North Lagoon Wetland areas where sediment remediation was required under the ROD (USEPA 2005), and consistent with Section VII.B of the RD/RA SOW and the 100% Design Report (ARCADIS 2011).

This report addresses requirements of Section VII.B.6 and VII.B.9 of the RD/RA SOW for Sediment Construction Summary and Final Sediment Remedial Action Reports, as well as substantive requirements of the MCP Phase IV, and the USEPA Guidance document titled “Close Out Procedures for National Priorities List Sites” (USEPA 2011). No amendments to the ROD, significant differences from the ROD, or technical impracticability waivers were identified during the implementation of the remedial action summarized in this report.

2.2.1 Response Action Objectives

The Response Action Objectives (RAOs) for sediment for the protection of human health and the environment, as set forth in the ROD (Page 47), are as follows:

- control discharge of treated effluent groundwater to prevent unacceptable impacts to sediment and surface water in Sinking Pond.
- protect future residents from exposure to sediment in Sinking Pond and North Lagoon Wetland that poses an excess cancer risk above 10^{-4} to 10^{-6} or a hazard index of 1.
- prevent exposure to contaminants in sediment that presents an unacceptable risk to the environment.

These RAOs were developed to mitigate, restore and/or prevent existing and future potential threats to human health and the environment and are based on the current and reasonably anticipated future land use.

2.2.2 Sediment Cleanup Levels

The sediment cleanup levels specified in the Section IV (Performance Standards) of the RD/RA SOW are summarized in the following tables.

Sediment Cleanup Levels for the Protection of Human Health for Sinking Pond & North Lagoon Wetlands [(1)]

Location	Chemical Name	Sediment Cleanup Level (mg/kg)
Sinking Pond	Arsenic	42
North Lagoon Wetland	Arsenic	28

[(1)]Applies only to sediment that is accessible to humans.

Sediment Cleanup Levels for the Protection of Ecological Receptors for Sinking Pond & North Lagoon Wetlands

Location	Chemical Name	Area	Sediment Cleanup Level (mg/kg)
Sinking Pond	Arsenic	Sediment with elevated arsenic, copper, iron, and manganese concentrations in the Inlet and within the pond where the ground slope is relatively shallow (defined as areas SPBK-1 through SPBK-4 on ROD Figure 13) and that is consistently covered by less than twelve-feet of water. [1, 2]	42[a]
Sinking Pond	Arsenic	Sediment with elevated arsenic, copper, iron, and manganese concentrations within the pond but outside the areas specified above that is consistently covered by less than twelve feet of water. [1,3]	42[a]
North Lagoon Wetland	Arsenic	Sediment 0-12 inches in depth with elevated arsenic concentrations.	28
North Lagoon Wetland	Manganese	Sediment 0-12 inches in depth with elevated manganese concentrations.	2,030

(1) Sediment located between an elevation of 144.5 feet NGVD (maximum surface water elevation observed in the pond) and 128 feet NGVD (twelve feet below the minimum surface water elevation) will be evaluated.

(2) Short-term goal is to remediate areas with arsenic greater than 730 mg/kg or where the four chemicals of concern (arsenic, copper, iron, and manganese) exceed their Probable Effects Concentration (PEC) or Severe Effects Level (SEL) within the areas defined. Arsenic PEC=33 mg/kg, copper PEC=149 mg/kg, iron SEL=43,766 mg/kg, and manganese SEL=1,100 mg/kg.

(3) Short-term goal is to identify areas with arsenic greater than 730 mg/kg and the following three metals: copper, iron, and manganese exceed their PEC or SEL and then to evaluate the need to remediate such areas based on risks, feasibility and implementability. Copper PEC=149 mg/kg, iron SEL= 43,766 mg/kg and manganese SEL=1,100 mg/kg.

(a) Compliance will be met by long term monitoring to demonstrate a trend in sediment arsenic concentrations toward the maximum background concentration of 42 mg/kg within the top two inches of sediment.

As indicated in the tables above, the cleanup goal for both human accessible and ecological areas of Sinking Pond is 42 mg/kg arsenic. However, the ecological-based cleanup levels provide for a short-term cleanup level that is based on an arsenic concentration of 730 mg/kg arsenic, plus consideration of three other metals, provided that a trend of reducing arsenic concentrations in surficial sediment is subsequently demonstrated through monitoring. As indicated in the 100% Design Report, W.R. Grace developed a remedial design that was intended to achieve the long-term goal of 42 mg/kg arsenic throughout the applicable portion of the pond such that subsequent monitoring of a reducing trend toward 42 mg/kg arsenic would not be necessary.

2.3 Summary of Remedial Design

The components of the Remedial Design for North Lagoon and Sinking Pond were presented in the 100% Design Report (ARCADIS 2011) and are summarized below by area. Implementation of the Remedial Design is further discussed in Section 3 of this report.

Note that Part 1 Section D of the ROD indicated that institutional controls would be required in the event that excavated sediments were covered or capped on site rather than disposed off site. As further discussed herein, excavated sediments were disposed off site, and remedy implementation resulted in achievement of remedial objectives as confirmed by post-excavation survey verification in North Lagoon Wetland (see Section 3.1.5 of this report), and confirmatory sampling results in Sinking Pond (see Section 3.1.7 of this report). Accordingly, no material was left within the target sediment remediation areas that warrants implementation of deed restrictions or otherwise precludes foreseeable future uses of these areas.

2.3.1 North Lagoon Wetland

North Lagoon Wetland target removal limits were developed to meet the ROD-specified sediment cleanup levels for this area. Specifically, the design evaluated and identified portions of the North Lagoon Wetland requiring removal and replacement such that post-removal concentrations of arsenic and manganese in the top 1 foot of sediment for the entire North Lagoon Wetland area would be at or below the associated cleanup levels (28 mg/kg arsenic and 2,030 mg/kg manganese) based on statistical evaluation using USEPA's ProUCL software. The design further provided that the residual concentrations within three specific sub-areas (sedge marsh, channel and wooded swamp (Attachment C Drawing 7) would also individually meet the cleanup levels.

The in-situ sediment removal volume for North Lagoon was estimated to be approximately 1,750 cubic yards (cy). The ROD and the RD/RA SOW indicate that cleanup levels in North Lagoon Wetland are applicable to the top 1 foot of sediment. Post-excavation survey was performed to confirm a minimum of 1 foot of sediment removal was achieved throughout the removal area, and that a minimum of one foot of clean backfill was subsequently replaced into the area. As a result, confirmatory sampling was not necessary in this area.

The general implementation approach for North Lagoon Wetland included:

1. Perform pre-construction survey of existing site elevations in the sedge marsh, interconnecting channel, and wooded swamp of the North Lagoon Wetland.

2. Site preparation, including placement of erosion and sedimentation controls, construction of access roads, and clearing vegetation.
3. Install a hydraulic barrier along the border of wooded swamp with Fort Pond Brook to separate the work area from the brook and protect the work area in the event of flooding.
4. Excavate the top 1 foot of impacted soil/sediment within the target removal areas.
5. Perform post-excavation survey to verify attainment of a minimum of 1 foot excavation.
6. Backfill excavated areas to approximate pre-construction elevations with clean backfill soils.
7. Perform post-backfill survey to verify fill thicknesses and document post-construction elevations.
8. Restore vegetation as specified in the Remedial Design Technical Specifications.

2.3.2 Sinking Pond

The selected remedial approach for Sinking Pond – as described in the 100% Design Report – included removal of soil/sediment within the inlet portion of the pond, and within the limits of the pond extending from the high water mark (elevation 144.5 feet) to the thermocline (as defined by elevation 128 feet) (Attachment C, Drawing 5). These limits were developed based on statistical evaluation of the Sinking Pond characterization data. With a target removal depth of 1 foot in the majority of the removal area and 2 feet in one discrete area (with a total target volume of 4,980 in-situ cy), the design objective was to target a post-removal condition that meets the long-term cleanup goal for the pond (42 mg/kg arsenic) rather than meeting the SOW-stated short-term goals for the non-human-accessible portions of the pond and then implementing a monitoring program to demonstrate a trend toward 42 mg/kg arsenic. As described in the 100% Design Report, achievement of the target concentration of 42 mg/kg arsenic in the applicable portion of the pond is based on a statistical evaluation using USEPA's ProUCL software, and does not require that each point be below this target value. Rather, the 95% upper confidence limit for the mean – as determined using the ProUCL software – must be below the target concentration when considering:

1. Only the human accessible portion of the pond, and
2. The entire portion of the pond between the thermocline (elevation 128 feet) and the high water mark (elevation 144.5 feet).

The design also called for restoration of the inlet area, the banks between the current water level and the historical high water level, plus other areas adjacent to the pond affected by the remedy implementation.

Recognizing the inherent limitations and complexities of sediment dredging, the design also included contingency measures in the event that removal to the target limits did not achieve the long-term cleanup goal. Such measures included additional dredging where feasible, placement of a sand cover, and/or other appropriate measures to be determined in consultation with USEPA based on the site conditions and post-removal confirmation sample data following removal to the initial limits. As further discussed in Section 3, the target objective was achieved such that contingent additional measures (apart from limited additional dredging) were not necessary during remedy implementation.

The design approach divided Sinking Pond into 5 sediment removal areas. Area 1 represented the Inlet, and the targeted portion of Sinking Pond was divided into Areas 2 through 5. Each area was separated by turbidity barriers so that, after dredging, an area could be allowed to settle and perform confirmatory sampling while dredging continued in a subsequent area. Post-removal survey and confirmatory sampling were performed following removal in each area and evaluated to determine the need for and feasibility of additional removal.

The general implementation approach for Sinking Pond included:

1. Perform pre-construction bathymetric and topographic survey of existing elevations in Sinking Pond.
2. Clear vegetation in the upland excavation zones and haul roads, and remove waterborne obstructions (fallen trees, former pump house and pipe components, etc.).
3. Install temporary bypass pipes to convey flow from existing pipes discharging to the Inlet of Sinking Pond to a point in Sinking Pond below the thermocline elevation.
4. Install a turbidity curtain in Sinking Pond no more than 50 feet from the lower limit of excavation at elevation 128 ft NGVD.
5. Install a temporary check dam between the Inlet and Sinking Pond.
6. Working within a given area (Areas 1-5), excavate the top 1 foot of impacted sediment within the target removal area (and top 2 feet of impacted sediment in a specific portion of the pond adjacent to the Inlet as shown on Attachment C Drawing 5).
7. Perform daily turbidity monitoring during waterborne dredging operations in Sinking Pond.
8. Perform post-excavation survey to document the removal depth.
9. Perform confirmatory sampling following dredging operations in each area.

10. Perform additional removal in specific areas based on the results of initial confirmatory sampling, followed by re-sampling within the additional removal areas.
11. Backfill excavated upland areas with a minimum of 6 inches of clean backfill soils.
12. Remove temporary check dam and install permanent check dam.
13. Perform post-backfill survey of final post-construction elevations.
14. Remove turbidity curtain following completion of waterborne activities.
15. Restore vegetation as specified in the Remedial Design Technical Specifications.

2.4 Chronology of Events

Consistent with Exhibit 2-5 of the USEPA Guidance titled "Close Out Procedures for National Priorities List Sites" (USEPA 2011), a chronology of major events for the sediment remedial action related to Operable Unit 3 is presented in the table below.

Event	Date
Record of Decision signed by USEPA	September 2005
Remedial Design/Remedial Action Statement of Work issued by USEPA	August 2006
Sediment Pre-Design Work Plan submitted	June 2007
Sediment Pre-Design Results Report submitted	April 2008
Sediment Concept Design Report submitted	June 2009
Draft 100% Design Report submitted	September 2010
USEPA Conditional Approval of 100% Design	September 2010
Final (100%) Sediment Remedial Design Report included with contractor bid package	March 2011
Remedial Action Mobilization & Site Preparation	June 2011
Remedy Construction	June – November 2011
Pre-Construction Meeting	June 2011
Draft Sediment Demonstration of Compliance and Maintenance Plan submitted by ARCADIS	November 2011
Pre-Final/Final Inspection of the Sediment Remedial Action	November 2011
Demobilization	December 2011
Sediment Operational & Functional Determination Letter by USEPA	January 2012

3. Summary of Remedial Action Implementation

3.1 Remedial Action Implementation

Sediment remedial action construction activities were implemented between June 2011 and November 2011. Construction activities were performed by D.A. Collins Environmental (DAC) and its subcontractors, with construction quality control and management provided by de maximis, construction quality assurance provided by ARCADIS, and regulatory review/oversight provided by the USEPA, AECOM and MassDEP. The following subsections describe the various key components of remedial action implementation.

3.1.1 Submittals

The Technical Specifications of the design (Attachment B of the 100% Design Report) required the Contractor to provide various submittals for review and approval, and outlined the approach for submittal review and approval. Submittals can generally be categorized in two groups: pre-mobilization submittals and other submittals. Pre-mobilization submittals were required from the Contractor prior to mobilizing to the site to start construction activities. Their purpose was to document the Contractor's understanding of the work scope and allow the project team to confirm that the Contractor's methods and approach are suitable and consistent with the project goals. Required pre-mobilization submittals for this project included:

- Contractor's Operations Plan
- Health and Safety Plan
- Construction Schedule
- Water Treatment Plan

For project expediency, the Contractor prepared various components of the Contractor's Operations Plan separately and submitted them as separate submittals. Key components were required prior to mobilization, while others were accepted after mobilization but before commencing the work associated with the specific component. The specific timing of submittals is indicated in the submittal register (Attachment A).

Other submittals over the course of the project included items such as survey results, analytical data, schedules, daily reports, material/product information, and other information supporting the remedy implementation.

In general, ARCADIS reviewed the plans and submittals for compliance with the 100% Design Report and returned the submittals and review comments back to the Contractor stamped as either Reviewed, Reviewed & Noted, Resubmit, or Rejected. Submittals marked as “Resubmit” or “Rejected” were revised by the Contractor and issued as a resubmittal to be reviewed under the same process as the first submittal. Submittals and their review status were tracked in a submittal register, the final version of which is provided in Attachment A.

One of USEPA’s approval conditions for the 100% Design Report was that certain submittals be provided to the USEPA and MassDEP for review following review and approval by the W.R. Grace project team. The specific submittals requested by USEPA for review are noted in the submittal register with blue shading in the “USEPA Approval” column. The register also indicates the date at which USEPA (conditionally) approved the submittal. In general, any comments provided as part of USEPA’s were for informational purposes, such that written responses to the comments from the W.R. Grace project team would not be required. In cases where a response was required, it was specifically requested by the USEPA and subsequently provided by W.R. Grace’s project team.

Analytical data for backfill materials were provided for USEPA review and approval prior to use at the site. For each batch of analytical data for topsoil materials, the date of USEPA approval is also recorded on the submittal register.

3.1.2 Pre-Construction Meeting

A pre-construction meeting was held at the site with representatives from USEPA, MassDEP, AECOM, de maximis, ARCADIS, and DAC on June 23, 2011. Minutes from this meeting are provided in Attachment B.

3.1.3 Mobilization and Site Preparation

Mobilization and site preparation activities commenced on June 13, 2011, and included the following activities:

- Installation of site access and security controls.
- Marking existing work-area groundwater monitoring wells with high visibility flagging to minimize the potential for inadvertent damage during construction activities.
- Set up of decontamination trailer and area specific decontamination zones.
- Installation of erosion and sedimentation controls.
- Pre-construction surveys at both North Lagoon Wetland and Sinking Pond.

- Delineation of excavation limits in North Lagoon Wetland.
- Clearing of vegetation to access excavation zones and haul roads.
- Construction of haul roads and an at-grade crossing of the MBTA railroad tracks.
- Grubbing and vegetation clearing inside excavation areas.
- Construction of the sediment dewatering pad.
- Setup of several frac tanks for the temporary storage of impacted water from the sediment dewatering pad.
- Setup of filtration bag system for the treatment of impacted water stored in frac tanks.
- Delineation of excavation limits in Sinking Pond.
- Construction of a temporary bulkhead adjacent to the northern perimeter of Sinking Pond (Figure 2 and Attachment C, Drawing 5) to be used for loading and off-loading operations associated with the sediment dredging.
- Removal of debris and obstructions from Sinking Pond.

Security controls installed during remedial activities included temporary security chain-link fencing, access gates, signage, and high visibility fencing around excavation areas. A chain-link security fence with gates was also erected at the access road leading to the Massachusetts Bay Transportation Authority railroad crossing. Institutional controls installed as part of the security controls included signage and high visibility fencing around excavation zones in the North Lagoon Wetland and Sinking Pond. A sign-in/sign-out sheet was maintained on site by the Contractor for all on-site personnel and visitors to sign in upon entering the site and sign out upon leaving. Temporary controls were removed following completion of the sediment removal and site restoration activities.

3.1.4 Water Management and Treatment

Erosion and sedimentation diversion methods were used to minimize the amount of stormwater runoff entering excavated areas in North Lagoon Wetland. Diversion methods included a combination of hay bales, silt fences and/or silt logs around the perimeter of the excavation zone. Along the interface of the removal area of North Lagoon Wetland and Fort Pond Brook a temporary hydraulic control barrier was installed to protect this area from potential flooding during excavation. The barrier consisted of a 3.75 feet high by 300 feet long, 45-mil reinforced polyethylene panel supported by a wooden frame. The bottom one foot of the barrier panel was anchored in place below the sediment surface resulting in a 2.75 feet high barrier above the ordinary high water mark. The hydraulic barrier was reinforced and extended higher in one particular area where a topographic depression existed at the

interface of the North Lagoon Wetland and Fort Pond Brook. Hay bales were placed on the excavation side of the barrier and were removed to excavate the sediment beneath and up to the barrier. New hay bales were replaced after excavation was completed to provide erosion and sedimentation control along the barrier.

Impacted water generated during remedial activities resulted primarily from equipment cleaning activities and precipitation that contacted impacted materials in the sediment dewatering and decontamination pads. Submersible water pumps were used to collect impacted water from the decontamination pad and berm around the sediment dewatering pad and transferred to onsite storage and frac tanks. Initially, water was treated through a filtration system consisting of two 100 micron filter bag in series into the new Landfill Area groundwater treatment system (GWTS). The filtration system was modified six days later to a 50 micron filter bag followed by a 25 micron filter bag and remained in this configuration for the remainder of the remedial action. In total, approximately 225,400 gallons of impacted water were collected as part of the sediment remediation activities and; the water was treated and discharged as part of the GWTS operations.

Two temporary bypass pipes were installed from the existing outfalls at the Sinking Pond Inlet into the center of the pond to divert flow discharging into the Inlet area during construction activities in that area. The pipes were temporarily relocated to allow for excavation and topsoil placement in the areas where the pipes overlaid the work limits. The pipes were removed upon completion of topsoil placement and prior to installation of the permanent check dam in the Inlet of the pond.

3.1.5 North Lagoon Wetland Excavation

Excavation in the North Lagoon Wetland was performed in three areas in the following sequence from south to north, starting at sedge marsh, followed by the channel, and wooded swamp from west to east. Limits of excavation as identified in the 100% Design Report were delineated by the survey subcontractor prior to initiating excavation activities (Attachment C Drawing 7). A long-stick excavator was mounted over temporary swamp mats for excavation inside the wetland area. During excavation, preliminary grade verification was performed by the Contractor foreman using a total station to measure differences in elevation before and after excavation. Confirmatory post-excavation survey verification was performed by the survey subcontractor following the completion of excavation in each area to verify that a minimum of one foot sediment removal was achieved. Any portions identified by the surveyor with less than 1 foot removal were excavated to the required depth by the Contractor. Excavated materials was loaded onto lined off-road dump trucks and transferred to the sediment dewatering pad for management. Based on the confirmatory post-excavation survey data provided in Attachment D, the estimated total volume of sediment excavated from North

Lagoon Wetland was 2,040 cy compared to the 1,750 cy estimated in the 100% Design Report (see Table 1).

3.1.6 Sinking Pond Excavation and Dredging

Remedial activities in Sinking Pond began with land-based excavation in Area 1 (Inlet), followed by waterborne dredging in the pond in the following sequence: Area 3, Area 4, Area 2 and Area 5 (Figure 2). This sequence allowed the sediment removal activity to generally start at the furthest point and work toward the bulkhead area.

A long-stick excavator was used to remove the top 1 foot of soil in the Inlet and the area where the permanent check dam would be installed. The Contractor provided preliminary grade verification as removal progressed. A temporary hydraulic control structure was installed across the temporary bypass pipes in the location of the proposed permanent check dam. The temporary hydraulic control structure consisted of a row of silt fence with staked hay bales on either side of the silt fence, with additional sand bags added to provide support underneath each bypass pipe (see Section 3.2.4). The remainder of the Inlet was then excavated using the long-stick excavator and transferred directly into lined dump-trucks for transfer to the sediment dewatering pad. When excavating the Inlet, the area east of the previously installed bypass piping was excavated first, and then the pipes were adjusted slightly to the east so that the soil beneath the pipes and further west within the Inlet could be accessed for removal.

Sinking Pond sediment removal activities were performed using a mechanical dredge mounted on a floating barge. Excavated sediment was transferred onto mini-scows with three open top roll-off containers. The roll-off containers had small openings on the side walls (scupper holes) that allowed free water to drain back to the removal area before the scow was subsequently transferred to the bulkhead. Once the roll-off containers were filled, the mini-scow was moved to the bulkhead while the other was moved next to the barge-mounted dredge. A land-based excavator staged at the bulkhead transferred the sediment from the roll-off containers onto lined dump-trucks for management at the sediment dewatering pad.

During waterborne dredging operations, target removal limits were monitored through the use of Cable Arm ClamVision software. The dredge operator was able to have a real time view of the barge and bucket positions through a dedicated ClamVision screen. ClamVision uses GPS to obtain the dredge's horizontal positioning and a reference elevation to obtain depth of bucket bites. ClamVision color coded reports were provided by the Contractor to the construction team on the day following dredging operations (copies are provided in Attachment E). These were used as one line of evidence – in combination with survey data (Section 3.1.12) and post-removal confirmation sampling (Section 3.1.7) – to confirm that

sediment was removed consistent with the design objectives. Confirmatory sampling was performed at pre-determined locations within Sinking Pond at least three days after dredging was completed in a given area. One exception occurred following re-dredging portions of Areas 2 and 5. Specifically, in order to minimize further delays to restoration activities in Sinking Pond following the final re-dredging, confirmatory samples in the re-dredged areas were collected immediately following completion of dredging activities. Note also that a portion of the re-dredge areas extended above the water line, such that post-dredge settling of that location was not relevant.

As further discussed in Section 3.1.7, statistical evaluation of the resulting data prompted additional removal within a portion of Sinking Pond in Areas 2 and 5 adjacent to the Inlet. Specifically, an additional 1 foot of removal was performed within the area shown on Figure 2 (approximately 1,720 square yards). A portion of the additional removal was achieved from shore using the long-stick excavator and the remainder was performed using the barge-mounted dredge. To accommodate the additional removal, turbidity barriers around the re-dredge area and between Areas 2 and 3 and Areas 4 and 5 were left in place to protect previously dredged and sampled areas. Survey verification and confirmation sampling performed following this additional removal indicated that the remedial objective for the pond was achieved.

The total excavated sediment volume for each Sinking Pond area was estimated using the average depth of removal obtained from the final post-excavation survey (Attachment D), and includes the portion of the Inlet area that required 2 feet of removal and the re-dredging volumes. As shown in Table 1 the total volume of excavated sediment for the entire Sinking Pond was 8,100 cy. This exceeds the design volume estimate (4,980 cy) as a result of the following:

- The inherent need to overdredge based on the configuration of the dredge bucket so that the minimum cuts would target the planned removal thickness.
- Additional navigational dredging performed by the Contractor to allow access by the barge-mounted equipment and scows into all required removal areas.
- W.R. Grace's decision to target additional removal in Areas 2 and 5 based on the results of initial confirmatory samples (representing approximately 600 cy).

3.1.7 Sinking Pond Confirmatory Sampling

Consistent with the approach described in the 100% Design Report, confirmatory sampling was conducted in Sinking Pond following the progression of dredging operations. Samples were collected immediately following completion and verification of excavation to target limits

in Area 1 (which was performed "in the dry" such that a settling period was not needed prior to sampling). In Areas 2 through 5, samples were collected a minimum of three days after the completion of dredging and placement of turbidity curtains around the area. Discrete grab samples consisting of the top 12 inches of sediment were collected at each of the 76 sample locations as shown on Figure 2. Locations above the water mark were sampled using either a hand auger or core driver; locations below the water line were sampled using a core driver. Field duplicates, laboratory matrix spike (MS) and MS duplicate samples were also collected at frequency of one every 20 samples. All samples were submitted to Test America Laboratories Inc. in Westfield, Massachusetts for analysis of arsenic using USEPA SW846 Method 6010B. Sample collection dates and analytical results are shown on Table 2.

Analytical results for all samples in Areas 1, 3 and 4 showed arsenic concentrations below the target sediment cleanup level of 42 mg/kg following initial dredging. Six locations (including two locations in Area 2 and four locations in Area 5) indicated arsenic results greater than 42 mg/kg. Based on the statistical evaluation approach described in the 100% Design Report, individual sample results indicating arsenic concentrations greater than 42 mg/kg would not necessarily trigger an additional response measure at a given location. However, statistical evaluation of the 76 locations indicated that the target objective (i.e., a ProUCL-based 95% upper confidence level of the mean below 42 mg/kg arsenic) was not achieved due to certain concentrations of the initial post-removal samples in Areas 2 and 5.

Based on the location of the samples exceeding the target cleanup level in the initial confirmation samples, W.R. Grace elected to perform additional dredging in an effort to achieve the arsenic-based cleanup level. As a conservative measure, the re-dredge area encompassed all six of the initial confirmatory sampling locations that had arsenic concentrations greater than 42 mg/kg. As indicated above, an additional foot of removal was targeted encompassing the six locations and extending radially to the nearest sampling locations that had concentrations below 42 mg/kg (or to the thermocline elevation, where appropriate).

Once the initial dredging was completed, additional samples were collected at the six original confirmatory sampling locations within the re-dredged area. All of the samples, except for the sample at location 16 and its duplicate, had arsenic concentrations below 42 mg/kg. Based on the revised dataset for the 76 confirmatory sample locations, the 95% UCL was below 42 mg/kg arsenic for both human accessible areas and the entire applicable portion of Sinking Pond (Pro-UCL-based 95% UCLs of 12 and 14 mg/kg, respectively). Accordingly, the target objective for Sinking Pond was achieved and restoration activities commenced.

Analytical results for the confirmatory samples are summarized in Table 2 and the laboratory analytical reports are included in Attachment J. The statistical evaluation documenting the final ProUCL calculations is included in Attachment I.

3.1.8 Water Quality / Turbidity Monitoring

In accordance with the 100% Design Report, surface water quality monitoring was performed in Sinking Pond to assess the effectiveness of the waterborne turbidity curtain in Sinking Pond. Monitoring was performed by measuring turbidity levels using an in situ turbidity meter YSI 6820. This initially included a round of monitoring to assess background turbidity levels prior to the deployment of boats or equipment associated with the dredging operations. As indicated in Attachment K, background readings were initially collected at six locations and two depth intervals on June 29, 2011. The average reading was 1.19 nephelometric turbidity units (NTU), which was established as the background level for the pond.

During active construction activities, turbidity levels were monitored at a station established no further than 100 feet from the turbidity curtain associated with the Area (i.e., Areas 2 through 5) within which sediment removal was occurring. During each monitoring event, turbidity readings were taken at two depth intervals within the water column, targeting mid-depths above and below the thermocline (128 feet NGVD). Turbidity levels for each day were averaged together, combining both sampling events and depth intervals, and compared to the following performance standards specified in the 100% Design Report:

Turbidity Performance Standard[1]	Response Action
> 25 < 50 NTU	Early Warning Level: This turbidity level will prompt visual inspection of current work activities and engineering controls.
> 50 < 100 NTU	Action Level: This turbidity level will prompt an evaluation of probable cause and implementation of BMPs and/or operational changes, as appropriate.
> 100 NTU	Stop Work Level: This turbidity level will prompt a temporary cease of sediment removal activities until the turbidity level is less than 100 NTU.

1. The Turbidity Performance Standards reflect increases above the background value.

A log of daily turbidity readings taken during remedial activities at Sinking Pond is presented in Attachment K. As indicated on the log, none of the turbidity performance standards were triggered at any point during the project.

3.1.9 Handling of Excavated/Dredged Materials

Soil/sediment removed from both the North Lagoon Wetland and Sinking Pond work areas were loaded into lined dump trucks and transported to the sediment dewatering pad for processing. As shown on Drawing 2 and 3 in Attachment C, the sediment dewatering pad was located atop a former building foundation near the site access point. A laborer at the loading area would inspect the dump truck prior to departing for the sediment dewatering pad to verify that no impacted material had the potential to fall off during transport. At the sediment dewatering pad, sediment was mixed with Portland cement and temporarily stockpiled to remove excess water. Impacted vegetative material (e.g., root balls removed from excavation areas) was not amended with Portland and was stockpiled separate from the sediment. Sediment and vegetative piles were covered with plastic tarpaulins at the end of each work day and during rain events to minimize infiltration from precipitation. Paint Filter Liquids Tests (USEPA SW-846 Method 9095B) were conducted on material stockpiles in the field at a target frequency of one test per 100 tons of stabilized sediment. Results of the Paint Filter Test are presented in Attachment H and demonstrate that all of the materials tested passed the paint filter test. Upon confirmation of passing the paint filter test, stabilized material was loaded into lined trailer trucks and covered with the truck's tarpaulin before leaving the site.

As discussed in Section 3.1.4, water accumulating in the sediment dewatering pad (i.e., water draining from the stockpiled materials and direct precipitation into the pad area) was removed, containerized, and transported for treatment and discharge at the operating groundwater treatment facility.

3.1.10 Offsite Transportation and Disposal

Waste generated during remedial activities and their corresponding disposal facilities are listed below:

- Impacted sediment, vegetation and other impacted solid waste streams were disposed at Waste Management Turnkey Recycling and Environmental Enterprises in Rochester, New Hampshire.
- Non-impacted vegetative materials were disposed at the RJ Cobb in Bellingham, Massachusetts, and Clear Summit Earth Materials in Lancaster, Massachusetts.
- Turbidity curtain from Sinking Pond was disposed at the Devens Recycling Center in Devens, Massachusetts.

Final disposed waste amounts are summarized by area and receiving facility in Table 3.

Regarding the excavated soil/sediment, the Contractor collected waste characterization samples prior to initiating removal activities in the North Lagoon Wetland and Sinking Pond areas. Characterization samples were collected at a target frequency of one per 500 tons of anticipated removal from each area. This resulted in collection of 5 characterization samples from the North Lagoon Wetland and 20 samples from the Sinking Pond areas. These samples were analyzed for toxicity characteristic leaching procedure, volatile organic compounds, semi-volatile organic compounds, chlorinated pesticides, chlorinated herbicides, and polychlorinated biphenyls. The analytical results (included in Attachment J) were subsequently used as a basis for waste profiling with the disposal facility and for Massachusetts Contingency Plan Bills of Lading used for transport of the materials to the disposal facility. The characterization data confirmed prior assessments (GeoTrans 2005b) that the sediment was not a characteristic or listed waste under the Resource Conservation and Recovery Act.

In accordance with 310 CMR 40.0030, Bills of Lading were used for shipment of North Lagoon Wetland and Sinking Pond sediments from the site to the disposal facility. Completed Bills of Lading were submitted to the MassDEP on October 7, 2011 (North Lagoon Wetland materials) and November 30, 2011 (Sinking Pond materials); copies are included in Attachment G. As shown on those forms, the total mass of material disposed from the North Lagoon Wetland was 2,392.21 tons and the total from Sinking Pond was 9,506.62 tons. Note that these volumes include not only the excavated soil/sediment, but also stabilization agent, vegetation roots, truck liners, incidental debris, and staging pad materials that were disposed along with the targeted materials.

Loaded trucks leaving the site were covered and cleared of any external accumulations by the Contractor and visually inspected prior to departure.

3.1.11 Site Restoration

Site restoration activities were initiated following completion of soil/sediment removal activities in each area. Restoration activities generally included:

- Backfill of excavated areas within the North Lagoon Wetland with topsoil to establish pre-removal topographic conditions.
- Placement of topsoil in the excavated portions of Sinking Pond between the water line and the historical high water mark (elevation 144.5), and in adjacent staging and support areas.
- Placement of seed, mulch, plant species, and erosion control fabric in general accordance with the design specifications (further discussed below).

- Removal and restoration of temporary haul roads used for construction.
- Removal of the temporary at-grade railroad crossing.

Earthen materials used as part of restoration activities (e.g., topsoil used for backfill and sandy silt used for constructing the permanent check dam between the Inlet and Sinking Pond) were subject to characterization sampling as described in Section 3.3.1.3 prior to being approved for use at the site.

Erosion and sedimentation controls used during the construction activities were not removed as part of the site restoration. Due to the time of the year at which the restoration occurred, vegetative growth was not fully re-established at the time of demobilization. As a result, erosion and sedimentation controls were left in place until sufficient growth is established during the 2012 growing season (see Section 4.1).

Additional details regarding key area-specific restoration measures are further discussed in the following subsections.

3.1.11.1 North Lagoon Wetland

Following excavation activities, the long-stick excavator was cleaned and used to backfill the excavated portions of the sedge marsh, channel and wooded swamp with a minimum of 12 inches of topsoil to pre-construction grades but no more than 0.10 foot above the pre-construction grade as confirmed by the post-backfill survey data presented in Attachment D. Restored ancillary disturbed areas included haul roads through wooded and non-wooded areas. Haul roads were restored by removing stone and non-woven geotextile used for their construction and re-placing the native topsoil that was removed and stockpiled when the haul roads were constructed.

As indicated in the limits for seed application on Attachment C Drawing 11, Sedge Marsh Seed Mix was broadcast over the excavated portions of sedge marsh area, and Wetland Seed Mix was broadcast over the excavated portions of the channel and wooded swamp. The Upland Seed Mix was used over remaining restored upland areas. The Upland Seed Mix was supplemented with oats *(avena sativa)* and annual rye *(lolium multiflorum)* as a temporary cover based on the later timing of the year when seeding occurred. The seeded area in the channel was covered with the biodegradable double net straw/coconut erosion control blanket. Trees and shrubs were planted inside the excavation area of wooded swamp as well as in wooded portions of the restored haul roads and upland areas. The tree and shrub planting summary is included in Attachment F.

The hydraulic barrier along the border of wooded swamp with Fort Pond Brook in North Lagoon Wetland was left in place to provide erosion protection from potential flooding events to the restored portion of wooded swamp. The barrier is scheduled to be removed in the spring of 2012 as part of the post-construction monitoring and maintenance activities once vegetation has been established (see Section 4.1).

3.1.11.2 Sinking Pond

Disturbed portions of Sinking Pond banks from the edge of water to the upper limit of removal were backfilled and graded with a minimum of 6 inches of topsoil and blended with bordering contours. Topsoil backfilling activities were conducted primarily using the mechanical dredge staged on the floating dock and mini-scows used to hold topsoil. The dredge and roll-off containers on the mini-scows were cleaned upon confirmation that dredging activities were finalized and prior to initiating topsoil placement. For upland areas where the dredge could not reach, a land-based excavator was used to complete topsoil placement; this was limited to the Inlet, bulkhead, and material loading area. Following topsoil placement, two types of seed mix were broadcast based on the limits for seed application and woody plantings as shown on Attachment C Drawing 8. The seeded area was covered with the biodegradable double net straw/coconut erosion control blanket. Flexterra HP-FGM erosion control media was applied in lieu of the erosion control blanket for the steep slope portions in Sinking Pond Areas 3 and 4, as further discussed in Section 3.2.6. In addition to seeding, disturbed upland areas were planted with trees and shrubs.

Consistent with ROD requirements (Part II, Section L Page 71), the Inlet was restored to a lower ground elevation and with a permanent check dam to support an enhanced shallow marsh wetland of submerged and floating-leaved aquatic vegetation. The wetland portion of the Inlet restoration area was backfilled with 6 inches of topsoil followed by the planting of wetland plugs. Based on field conditions the restoration subcontractor recommended that the upland banks surrounding the Inlet wetland be moved upland to facilitate the survival of trees and shrubs that otherwise would have been submerged in water if left in the specified locations as originally shown in the Attachment C Drawing 9. The planting summary is included in Attachment F. The channel bed downstream of the existing outfalls up to the limit of the Inlet wetland was lined with non-woven geotextile followed by stone to provide erosion protection from the GWTS discharge. Upland areas above the stone were backfilled and graded with a minimum of 6 inches of topsoil and blended with bordering contours and channel stone.

A permanent check dam was installed between the Inlet and Sinking Pond as a hydraulic control structure to reduce speed of water entering the pond as well as to retain sufficient water for the restored Inlet wetland. The main body of the check dam was built using sandy

silt and compacted in place. A layer of textured liner was placed on the sandy silt body followed by a layer of non-woven geotextile, 6 inches of sandy silt and another layer of non-woven geotextile. The check dam structure was reinforced with D_{50} 6-inch stone. Stone on top of the check dam was placed to form a 10 feet wide by 6 inch deep flow channel for overflow water. The construction of the check dam was modified slightly from the design specifications, as noted in Section 3.2.4.

3.1.12 Survey Control and Documentation

Topographic and bathymetric surveys at North Lagoon and Sinking Pond were conducted by the Contractor's survey subcontractor (Thew Associates). Survey was conducted using the horizontal State Plane Massachusetts North American Datum of 1983 (NAD 83) and the National Geodetic Vertical Datum of 1929 (NGVD 29). Surveys conducted during remedial activities included:

- Pre-construction surveys to establish and demarcate the sediment removal limits in North Lagoon Wetland and Sinking Pond and the pre-removal surface grades.
- Post-excavation surveys to confirm the final removal limits.
- Post-construction surveys to verify achievement of the specified final topsoil grades at North Lagoon Wetland and Sinking Pond.

The bathymetric survey approach employed during the remedial activities in Sinking Pond was modified from the single beam bathymetric survey approach specified in the 100% Design Report Technical Specification Section 01 32 23 (Attachment B of the 100% Design Report). Given the water depths in the portion of the pond subject to survey, the inability to survey shallow areas with single beam acoustic method, and the presence of debris (i.e., fallen trees) in shallow areas, it was determined that the use of pole shot method was the preferred survey technique for the target sediment removal areas. The Contractor's survey work plan submittal was approved by the Engineer upon confirmation from the surveyor that the rod length was long enough to measure water depths within the removal area even under high water levels and following removal to target depths. This was consistent with design-level data and avoided complications of integrating acoustic and pole shot survey data.

Consistent with the Contractor's survey work plan submittal, pre-construction and post-excavation bathymetric surveys conducted in Sinking Pond consisted of the use of pole shot methods taken at approximate 10 foot spacing. A 6-in disc was used on the bottom of the survey rod to minimize potential bias due to rod penetration into the sediment layer. In general, each round of survey was completed at the same survey control to facilitate direct comparison of the removal depths and restoration thicknesses relative to the prior condition.

The resulting survey control data – including original ground surface, post-removal depth, and restored grade (where appropriate) – are summarized in Attachment D.

During the post-excavation bathymetric survey in Sinking Pond, the surveyor cited issues with re-establishing the precise coordinates of prior elevation measurements due to difficulty working from a boat for locations below the water line. This was documented in RFI 006 (Section 3.2), which requested that the waterborne horizontal tolerance be increased to 0.33 feet. In resolving this RFI, it was determined in consultation with the USEPA that when a survey control measurement varied from the prior measurement location by more than 0.33 feet, CADD modeling was used to assess the removal depth rather than direct comparison between the original and post-removal elevation measurements. This was based on the fact that, due to the steep slopes within the excavated pond bottom, minor deviations between the pre- and post-removal survey locations could have an effect on the calculated removal thickness. Further, the direction of the effect (i.e., whether the actual removal was more or less than the measured elevations indicated) would vary depending on the relative position of the two measurements along the sloped bank. The CADD modeling was able to account for the difference in location between the two measurements, and calculate the actual removal thickness at the exact location corresponding to the initial measurement. In instances where CADD-based calculations of removal thickness were required, the calculated value is noted in the survey control tables of Attachment D.

As discussed above, the target removal depth in Sinking Pond was 1 foot in most areas and 2 feet in one discrete area near the Inlet. Survey control tables in Attachment D indicate measured removal thicknesses at certain survey control locations were less than 1 foot (all locations within the 2-foot removal area were removed to greater than 2 feet as shown in Table 1 and the survey data summary table in Attachment D). This is attributable to two factors. First, certain of the control points were established at locations that fell below the thermocline elevation. While some incidental removal did occur below the thermocline, removal below the thermocline was not required and no effort was made to achieve a minimum of 1-foot removal at those control points. Second, the removal thicknesses targeted in the 100% Design Report were predictions of the depth of removal necessary to achieve the target cleanup levels based on use of the modeling scenario in the 100% Design Report. The 1-foot and 2-foot removal depths were not ROD-specified criteria. While a few discrete locations above the thermocline show removal of slightly less than 1 foot, confirmatory sampling data was used as the primary indicator of compliance with the ROD-specified cleanup levels. This was discussed with and approved by the USEPA during communications with de maximis, ARCADIS and AECOM on October 7, 2011.

The survey data included in Attachment D was also used to determine average removal and, where applicable, backfill thicknesses for comparison to the target values from the 100% Design Report. Those values are summarized in Table 1.

Post-construction drawings for North Lagoon Wetland and Sinking Pond were provided by the Contractor at the completion of the work. Copies of the drawings are included in Attachment D.

3.2 Modifications to the Remedial Design

Certain minor modifications relative to the approved design were implemented in the course of the work. In general, modifications are noted on the Construction Drawings (Attachment C) and/or documented via Requests for Information (RFIs) submitted by the Contractor over the course of the work. RFIs were subsequently evaluated and resolved among W.R. Grace, ARCADIS, DA Collins, and the regulatory agencies, as necessary. In total, eight RFIs were submitted over the course of the work. Copies of the RFI's are included in Attachment L and the subject of each is summarized in the following table.

RFI Number	Description
RFI 001	The Contractor requested clarification for survey control points 7, 8, 9 and 10 in North Lagoon Wetland, which fell on the north side of the Fort Pond Brook when staked. Upon confirmation that the appropriate survey coordinate system was used by the surveyor and that all other control points were correctly located, the discrepancy was attributed to the aerial-based interpretation of the brook boundary. The removal boundaries in this location were established along the top-of-bank on the south side of the brook consistent with the design intent and the other control points in this area.
RFI 002	The Contractor requested the use of silt logs as an alternate erosion and sedimentation control product to silt fence in areas of North Lagoon Wetland and Sinking Pond where silt fence installation was not practical and/or difficult, such as in heavily vegetated and rooted areas. The alternate product was approved in consultation with USEPA.
RFI 003	A revision to the Sediment Dewatering Pad was proposed by the Contractor that consisted of installing a liner system on top of the asphalt layer of the pad. The revision is further discussed below.
RFI 004	RFI 004 was submitted to address a substitution from the 40 mil HDPE liner that was originally included in RFI 003 for a 60 mil liner that was more readily available. The thicker liner was approved for use.

RFI Number	Description
RFI 005	RFI 005 requesting a modification to the construction of the temporary water control structure between the Inlet and Sinking Pond by installing silt fencing and staked hay bales. The temporary control structure is further discussed below.
RFI 006	During the post-excavation survey in Sinking Pond the surveyor expressed difficulty in locating waterborne pre-construction survey points within the 0.1 foot tolerance that was specified in the Contractor's survey plan submittal. The Contractor issued RFI 006 requesting that the horizontal tolerance be increased from 0.1 feet to 0.33 feet and using other methods for calculating the removal depth between survey control points. Section 3.1.12 provides further details regarding the resolution of RFI 006.
RFI 007	The Contractor had difficulty locating a clay material that met the geotechnical, analytical and acceptable source requirements to construct the permanent check dam at Sinking Pond as originally designed. RFI 007 requested the use of alternate materials. The proposed permanent check dam design is further discussed below.
RFI 008	The Contractor requested the use of an alternate erosion control material for the steeper slope portions of Area 3 and 4 in Sinking Pond. The RFI was approved by the Engineer with the recommendation of using a Flexterra High Performance-Flexible Growth Medium (Flexterra HP-FGM) as a more robust product compared to the Hydro Blanket Bonded Fiber Matrix recommended in the RFI. The alternative slope stabilization approach is further discussed below.

Most modifications were minor, and necessary based on field conditions. Certain key modifications are noted as follows:

- **Sediment Dewatering Pad** – In the Material Transport and Sediment Stabilization Plan, the Contractor proposed an alternative design for the sediment dewatering pad than was specified in the 100% Design Report. The intent of the alternative design was to provide a more durable work surface (asphalt) while reducing the amount of pad material subject to offsite disposal at the completion of the work. The alternate design was initially approved by the Engineer subject to testing to confirm that the HDPE liner integrity would not be affected by the placement of the asphalt working surface. However, in reviewing the Material Transport and Sediment Stabilization Plan, the USEPA objected to the alternate design. Because the liner and asphalt had already been placed, the Contractor proposed an approach in RFI 003 that included the placement of a non-woven geotextile over the asphalt surface of the pad, followed by a second HDPE liner, non-woven geotextile, and 6 inches of dense grade stone. RFI 004 subsequently requested that the 40 mil HDPE liner included in RFI 003 be substituted for a more readily available 60 mil liner. RFIs 003 and 004 were reviewed and approved for construction by the Engineer, W.R. Grace project team and USEPA and the pad was constructed accordingly.

- **Haul/access road locations** – The location/layout of access roads used during remedial activities was modified from those proposed on the 100% Design Report based on site conditions and Contractor-specified work approach. The revised layout took advantage of existing paths that minimized tree removal in wooded areas, and provided grades better suited to truck access for sediment transport and equipment delivery operations. The access roads were temporary features and did not constitute a significant design modification that would have affected the overall outcome of the remedy implementation. Upon completion of remedial activities all access roads were removed and restored in-kind according to pre-construction conditions. Attachment C shows approximate locations of the access road used during the remedial action.
- **Sinking Pond removal limits based on pre-construction survey** – A minor modification was issued by ARCADIS following the review of the pre-construction topographic and bathymetric survey for Sinking Pond, to address updated removal limits illustrated on the 100% Design Report Drawing #5. Consistent with the approved remedial design, the removal limits were still based on removal between the historical high water mark of the pond (elevation 144.5 ft NGVD 29) and the elevation of the thermocline (defined as elevation 128 ft NGVD 29). However, the topographic and bathymetric contours used for the design drawing varied slightly to those of the pre-construction survey and thus the extent of the removal limits were updated to reflect the pre-construction topography and bathymetry. Other minor modifications made in the revised 100% Design Report Drawing #5 (see Attachment C) included control points and coordinates of the confirmatory sediment sample locations and other locations and limits that were not previously demarcated.
- **Temporary and permanent check dams between Inlet and Sinking Pond** – The 100% Design Report called for a temporary water control structure and, subsequently, a permanent check dam between the Inlet and Sinking Pond. The primary purpose of the temporary structure was to prevent water in the pond from inundating the Inlet so that the Inlet area excavations could be performed in the dry. Because Sinking Pond water levels were low and the bypass piping system diverted flows around the Inlet, RFI 005 requested a modification to the temporary water control structure. The Engineer approved modification consisted of installing a silt fence across the temporary bypass pipes and across the location of the proposed permanent check dam. A row of staked hay bales was also installed on either side of the silt fence, with additional sand bags added to provide support underneath each bypass pipe. This approach was inspected and ultimately approved by USEPA oversight personnel.

  The 100% Design Report specified that the permanent water control structure consist of a clay berm lined with non-woven geotextile and covered with 6-inch D_{50} stone. The Contractor could not locate a suitable clay material meeting the geotechnical and

analytical requirements, and issued RFI 007 requesting the use of alternate materials for the construction of the permanent check dam. RFI 007 proposed using a sandy silt material in lieu of the clay to form the berm, lined with a 40 mil HDPE liner, followed by a layer of non-woven geotextile, 6 inches of sandy silt, a layer of non-woven geotextile, and 6 inches of D_{50} stone cover. The proposed alternative check dam was approved and constructed following excavation of the Inlet and removal of the temporary water control structure and bypass pipes. A sketch documenting the alternative design is included with RFI 007 (Attachment L).

- **Erosion control for Sinking Pond slopes** – The 100% Design Report called for an erosion control blanket over restored seeded banks of Sinking Pond. This blanket was installed in most areas of the pond perimeter. However, due to particularly steep bank slopes in a portion of the shoreline adjacent to removal Area 3 and 4 (southern portion of the pond), the restoration subcontractor suggested the use of an alternate hydraulically applied erosion control material. The proposed material is better suited for erosion control in these steeper areas. This modification was detailed in RFI 008. The RFI was approved by the Engineer with the recommendation of using instead the Flexterra High Performance-Flexible Growth Medium (Flexterra HP-FGM) as a more robust product compared to the Hydro Blanket Bonded Fiber Matrix proposed in the RFI. Prior to applying the Flexterra HP-FGM a section of the erosion control blanket was applied along the interface of the water level and the bottom of the bank to provide additional erosion control in this section of the bank that was potentially subject to wave action, changing water levels, and ice formation.

3.3 Construction Quality Assurance / Quality Control

The Sediment Construction Quality Assurance Project Plan (SCQAPP) was included as Appendix D to the 100% Design Report and managed performance of the remedial activities through design and documented construction Quality Assurance / Quality Control (QA/QC) methodologies applied in the field and in the laboratory to confirm that the work performed was in conformance with the 100% Design Report and Technical Specifications. Consistent with the SCQAPP and other common practice, QA/QC measures implemented during the remedial action included the following:

- document submittal and review process (see Section 3.1.1 and Attachment A)
- field observation/inspection performed by USEPA oversight personnel, Engineer and other project personnel to observe construction activities for consistency with project objectives and design
- topographic/bathymetric surveys to verify and document achievement of the soil/sediment removal limits and final grades (see Section 3.1.12)

- sampling and laboratory analysis of select fill materials to demonstrate compliance with the 100% Design Report and Technical Specifications as part of the submittal review process (see Section 3.1.1 and Section 3.3.2)
- sampling and laboratory analysis of confirmatory samples to confirm attainment of sediment cleanup levels (see Section 3.1.7)
- providing analytical results to USEPA, MassDEP and the USEPA oversight contractor for review following review and approval by the Engineer
- routine daily documentation of site activities by the Construction Manager, Engineer's Representative, and Contractor personnel, including the use of consistent forms for documentation
- project coordination meetings among the W.R. Grace project team and the regulatory and oversight agencies (and documentation thereof), including:
    - Preconstruction Meeting (June 23, 2011)
    - weekly progress meetings to provide an update on the progress of remedial activities, upcoming activities, and documentation of QA/QC measures implemented at the site
    - Pre-Final/Final Certification Inspection (November 17, 2011)

Additional information regarding certain of the QA/QC items is provided in the report sections and/or attachments referenced above. Other elements of construction QA/QC are discussed in the following subsections.

3.3.1 Quality Assurance Observer

The Engineer's Representative served as the on-site quality assurance observer having primary responsibility for day-to-day coordination with the W.R. Grace project construction manager, documentation of the remedial action and observe that the remedial action was implemented in accordance with the 100% Design Report and Technical Specification. QC measures performed by the Engineer's Representative included the following items:

- perform water quality/turbidity monitoring during construction activities in Sinking Pond for exceedance of turbidity performance standards (Section 3.1.8)
- perform post-excavation confirmatory sediment sampling in Sinking Pond (Section 3.1.7)
- written and photographic documentation of the work activities

- provide update of QA measures taken during remedial action at the weekly progress meeting with the agencies and project team
- assist in the identification and resolution of RFIs or other minor modifications, as needed
- observe and document the Contractor's compliance with the design requirements

3.3.2 Characterization of Imported Materials

As a QC measure and consistent with the 100% Design Report, the Contractor was required to provide analytical data to confirm that the proposed backfill materials were appropriate and acceptable for use at the site. For each granular fill material to be used as part of the site restoration (i.e., excluding stone products and materials disposed at the completion of the work), laboratory analytical data were required at a frequency of one composite sample per 500 cy of imported soil material delivered to the Site, with initial results provided prior to material delivery. Samples of fill materials were analyzed for polychlorinated biphenyls (USEPA Method 8082), Target Analyte List metals (excluding sodium and potassium, which are essential elements for which no standards exist for comparison), extractable petroleum hydrocarbons (with polycyclic hydrocarbon reporting) (MassDEP EPH Method), and volatile petroleum hydrocarbons (with volatile organic compound reporting) (MassDEP VPH Method). The analytical results were compared with the S-1 Reportable Concentrations (RCS-1) presented in the MCP's Oil and Hazardous Material List (310 CMR 40.1600), MassDEP's Background Levels of Polycyclic Aromatic Hydrocarbons and Metals in Soil, or other appropriate standards. For lead, the established background level for natural soils (100 mg/kg) in Massachusetts was used rather than the higher RCS-1 standard (300 mg/kg). Detectable concentrations of polychlorinated biphenyls (PCBs) were not accepted in fill soils.

Based on the fill materials and quantities used at the site, the Contractor provided analytical data for eight samples of topsoil (four each for materials destined for the North Lagoon Wetland and Sinking Pond areas) and one of sandy silt used for construction of the permanent check dam between the Inlet and Sinking Pond (i.e., below the impermeable liner component). Analytical results for these samples are provided in Table 4. Laboratory analytical reports consistent with *MassDEP Compendium of Analytical Methods (CAM)* are included in Attachment J.

As discussed in the *Sediment Concept Design Report* (ARCADIS 2009), it was assumed for the purpose of developing the target removal limits that the backfill soils used in the North Lagoon Wetland area would have arsenic and manganese concentrations equal to MassDEP's published background values for these constituents in native soil (20 and 300 mg/kg, respectively). As indicated on Table 4, actual concentrations in the fill materials were

below these assumed concentrations. This indicates that the statistical evaluation used to support the post-removal average conditions for the North Lagoon Wetland remains conservative. Specifically, actual concentrations in backfill soils were lower than assumed, meaning that the area-wide post-construction concentrations were lower than predicted during the design process.

3.3.3 Data Quality Review

As part of the remedy implementation, 82 sediment samples were analyzed to confirm the post-removal conditions in Sinking Pond and nine samples were analyzed to characterize the fill materials used as part of the restoration activities (including eight topsoil samples and one sample of sandy silt used to construct the core of the permanent check dam between the Inlet and Sinking Pond). As described in Section 3.1.7, the Sinking Pond post-removal confirmation samples were collected from the locations and depth intervals described in the 100% Design Report (with slight modification of two locations where the proposed location fell below the thermocline elevation based on pre-removal bathymetry data), and analyzed for arsenic. Analytical data for fill materials was provided by the Contractor at a rate exceeding the minimum requirement of one sample per 500 cy of material, and analyzed for the parameters indicated in the 100% Design Report. Samples were collected using the respective methodologies indicated in the 100% Design Report.

As indicated in the 100% Design Report, laboratory data reports consistent with the Massachusetts Compendium of Analytical Methods (CAM) requirements were requested from the laboratories to provide a measure of data quality. The laboratory reports are included in Attachment J.

The resulting data is characterized as “CAM-compliant”, which is data that achieves “presumptive certainty” (i.e., analytical data that meet the requirements of MassDEP’s CAM [established August 1, 2003]). An assessment of the CAM-compliant data is presented in Table 5 and summarized below.

For the Sinking Pond confirmation samples, no issues were identified in the laboratory case narratives that would result in an underestimation of arsenic concentrations or unacceptable level of uncertainty in the data. For the backfill material data, certain data are potentially biased and may be qualified as estimated due to laboratory control sample/laboratory control sample duplicate recoveries or relative percent differences (RPDs) between quality control samples and their duplicates being outside control limits. However, it is unlikely these quality control factors would result in unacceptable uncertainty in the data due to the following:

- The purpose of the backfill material sample data was to demonstrate and provide secondary confirmation that the backfill is from a “clean” offsite source, and is not intended for “compliance” purposes. The data do not indicate elevated levels of constituents that would suggest an impacted source material.
- The recovery and RPD issues related to lab control and lab control duplicate samples generally occurred in non-site related constituents (the volatile organic compounds, semivolatile organic compounds, and extractable and volatile petroleum hydrocarbon parameter groups). The biases did not affect metals that are the primary focus of the sediment remediation activities.
- Although non detected, the reporting limits for certain volatile organic compounds (including dibromochloromethane, dibromomethane, 1,1,2,2-tetrachloroethane, and in some cases, bromoform and methylene chloride) exceeded standards to which backfill samples were compared. The reporting limits for bromoform and methylene chloride are only marginally above the standards (110 mg/kg compared to required limit of 100 mg/kg), and only in certain samples. The lack of detection in other samples from the same source corroborates the absence of these constituents. The other three constituents are not site related and rarely present in environmental media. Given the analytical data are secondary confirmations of “clean” offsite source and all other volatile organic compounds are non-detect, there is no reason to suspect that any of these three constituents is present above allowable background levels.
- The RPDs between samples SP-TS001 and NLW-TS002 and their laboratory duplicates were outside the control limit (20%). The reported concentrations arsenic (13.3 mg/kg and 17.7 mg/kg, respectively) were higher than their lab duplicate concentrations (10.24 mg/kg and 12.15 mg/kg, respectively). However, all reported concentrations were below the most stringent arsenic cleanup level for the site (28 mg/kg), so the deviations are inconsequential.

The following are also noted regarding the sample collection and analytical data:

- Chains of custody were utilized and completed correctly.
- Evaluated data were analyzed within acceptable holding time limits.
- Documentation indicates that appropriate sample containers and preservatives were used.
- Available rinse blank data were non-detect.
- The available duplicate data indicate acceptable reproducibility of results between parent samples and their duplicates with the exception of the re-dredge sample for location 16 where arsenic concentrations of 71 and 220 mg/kg were reported for the duplicates. The

associated RPD is 102% (compared to the control limit of 100%). However, even if the maximum value is used for the dataset, the ProUCL calculation still indicates a post-dredging 95% UCL value of 12.35 mg/kg arsenic for the entire applicable portion of the pond, which is well below the target cleanup level of 42 mg/kg.

- Number of field QA/QC samples collected meet or exceed CAM requirements and are consistent with investigation-specific goals.

The information summarized in this section indicates that data were collected and analyzed using appropriate methods and QA/QC procedures. Many factors have contributed to compiling a quality dataset, including but not limited to collection of data by qualified personnel, analysis of samples by reputable/certified laboratories and development of and adherence to written sampling plans and procedures. Although some minor deviations were noted, none would result in rejection of any of the data. As a result, the data are considered usable, representative of post-remediation conditions, and are of acceptable quality for supporting the remedy implementation.

4. Final Inspection and Certification

In accordance with Section VII.B.4 of the RD/RA SOW, a pre-final/final certification inspection of the sediment remedial action was conducted at the site on November 17, 2011 and attended by representatives of the USEPA, MassDEP, USEPA's oversight consultants, de maximis, ARCADIS and D.A. Collins. A visual inspection was performed to verify that remedial action in the North Lagoon Wetland and Sinking Pond was constructed in accordance with the ROD, RD/RA SOW, SCQAPP, and 100% Design Report (with the noted modifications). The inspection also served as the Final Certification Inspection given that no issues beyond minor "punch list" items were identified and a second certification inspection was therefore not required. Vegetation and seeding restoration was substantially completed and growth will be monitored (with repairs as needed) as part of the post-construction operation and maintenance plan (see Section 4.2). Following review by USEPA and MassDEP, USEPA issued an Operational & Functional letter on January 10, 2012 in which it determined that the sediment remedial actions for North Lagoon Wetland and Sinking Pond were operational and functional.

4.1 Punch List Items

The following minor "punch list" items were identified at the completion of the remedial action and will be addressed as a component of the monitoring and maintenance activities in the spring of 2012:

- Verification of vegetative growth in the restored portions of the North Lagoon Wetland, Sinking Pond and disturbed areas north of the railroad crossing.
- Removal of erosion and sedimentation controls such as haybales, silt fencing, and silt logs in the restored areas of North Lagoon Wetland, Sinking and north of the railroad crossing.
- Removal of the hydraulic barrier along the border of wooded swamp with Fort Pond Brook in North Lagoon Wetland.
- Removal of remaining high visibility fencing in North Lagoon Wetland and Sinking Pond (except where such fencing may be retained to deter vehicle trespass).

4.2 Post-Construction Operation and Maintenance Activities

As required under Section VII.B.3 of the RD/RA SOW, post-construction operation and maintenance activities are addressed in the Draft Sediment Demonstration of Compliance and Maintenance Plan (SDCMP). The draft SDCMP was submitted for review by the USEPA and MassDEP on November 11, 2011. The SDCMP describes the planned measures to be

implemented to ensure the long-term effectiveness of each component of the sediment remedial action. This primarily includes periodic inspections and documentation of vegetative growth in restored upland and wetland areas to verify achievement of the survival rates and to monitor for the presence of invasive species. It also includes an approach for sampling that may be required by USEPA in support of a subsequent 5-year review of the remedy effectiveness.

The activities described in the SDCMP will be initiated in the spring of 2012 pending USEPA approval. In the interim, the sediment work areas are subject to periodic inspections during the winter and early spring to verify that erosion controls remain effective. Such inspections are performed at least monthly and following significant rain events, with field observations documented and submitted to USEPA.

5. References

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Tables

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Table 1
Excavation and Backfill Volume Summary

Sediment Construction Summary and Final Sediment Remedial Action Report
W.R. Grace Superfund Site
Acton-Concord, Massachusetts

		Excavation				Backfill		
Area	**Target Removal Thickness (ft)**	**Average Excavated Depth[1] (ft)**	**Minimum Excavated Depth[1] (ft)**	**Excavation Area[2] (sy)**	**Excavated Volume (cy)**	**Average Backfill Depth[1] (ft)**	**Backfill Area[2] (sy)**	**Backfill Volume (cy)**
North Lagoon Wetland	1.0	1.12	1.00	5,430	**2,040**	1.15	5,430	**2,090**
Sinking Pond								
Area 1 - Inlet[2]	1.0	1.30	1.00	1,350	**590**	0.55	1,350	**250**
Area 2 - Initial	1.0	1.28	0.93	2,710	**1,160**	0.52	1,150	**200**
Area 2 Re-Dredge[3]	1.0	2.43	1.49	560	**450**	n/a	n/a	n/a
Area 3	1.0	1.53	0.74	2,410	**1,230**	0.51	950	**170**
Area 4	1.0	1.47	0.82	3,950	**1,940**	0.52	1,240	**220**
Area 5 - Initial	1.0	1.38	1.00	3,160	**1,460**	0.63	1,360	**290**
Area 5 - 2 ft Removal Area	2.0	2.45	2.01	180	**150**	n/a	n/a	n/a
Area 5 Re-Dredge[3]	1.0	2.88	1.01	1,160	**1,120**	n/a	n/a	n/a
Sinking Pond Total				**13,760**	**8,100**			**1,130**

Notes:
(1) Average depths estimated from subcontractor survey data summary tables. Calculated values exclude survey control points below the thermocline (elevation 128 ft) in Sinking Pond.
(2) Backfill volume does not include rip rap stone used for the Inlet channel and check dam.
(3) Excavated depth and volumes for re-dredge areas is the total amount for that area (i.e., includes depth and volume from the first round of dredging and from re-dredging).
cy: cubic yards
ft: feet
n/a: not applicable
sy: square yards

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Table 2
Sinking Pond Confirmatory Sampling Results Summary

Sediment Construction Summary and Final Sediment Remedial Action Report
W.R. Grace Superfund Site
Acton-Concord, Massachusetts

Confirmatory Sample Location ID	Sinking Pond Area	Initial Result		Following Re-Dredge		Final Arsenic Concentration[1] (mg/kg)
		Sample Date	Arsenic Concentration (mg/kg)	Sample Date	Arsenic Concentration (mg/kg)	
1	**1**	9/15/2011	11	n/a		**11**
2		9/15/2011	5.8	n/a		**5.8**
3		9/15/2011	7.7	n/a		**7.7**
4		9/15/2011	12 [8.9]	n/a		**12 [8.9]**
5		9/15/2011	8.1	n/a		**8.1**
6		9/15/2011	17	n/a		**17**
7		9/15/2011	28	n/a		**28**
8		9/15/2011	35	n/a		**35**
13	**2**	10/11/2011	5.5	n/a		**5.5**
14		10/11/2011	3.4 [4.2]	n/a		**3.4 [4.2]**
15		10/11/2011	4.7	n/a		**4.7**
16		10/11/2011	86	10/28/2011	71 [220]	**71 [220]**
17		10/11/2011	9.2	n/a		**9.2**
18		10/11/2011	4.9	n/a		**4.9**
19		10/11/2011	1.9	n/a		**1.9**
20		10/11/2011	1.6	n/a		**1.6**
21		10/11/2011	10	n/a		**10**
22		10/11/2011	7.6	n/a		**7.6**
23		10/11/2011	180	10/28/2011	6.4	**6.4**
24		10/11/2011	12	n/a		**12**
25		10/11/2011	6.1	n/a		**6.1**
26		10/11/2011	3.8	n/a		**3.8**
27		10/11/2011	9	n/a		**9**
28		10/11/2011	30	n/a		**30**
29		10/11/2011	3.2	n/a		**3.2**
30		10/11/2011	28	n/a		**28**
31		10/11/2011	5.4	n/a		**5.4**
32		10/11/2011	2.1	n/a		**2.1**
33	**3**	9/29/2011	9.7	n/a		**9.7**
34		9/29/2011	10	n/a		**10**
35		9/29/2011	3.3	n/a		**3.3**
36		9/29/2011	3.9	n/a		**3.9**
37		9/29/2011	4.8	n/a		**4.8**
38		9/29/2011	5.1	n/a		**5.1**
39		9/29/2011	4.2	n/a		**4.2**
40		9/29/2011	1.9	n/a		**1.9**
41		9/29/2011	2.6	n/a		**2.6**
42		9/29/2011	4.2	n/a		**4.2**
43		9/29/2011	29	n/a		**29**
44		9/29/2011	6.9	n/a		**6.9**
45		9/29/2011	5.2	n/a		**5.2**
46		9/29/2011	31	n/a		**31**
47		9/29/2011	6.5 [5.5]	n/a		**6.5 [5.5]**

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Table 2
Sinking Pond Confirmatory Sampling Results Summary

Sediment Construction Summary and Final Sediment Remedial Action Report
W.R. Grace Superfund Site
Acton-Concord, Massachusetts

Confirmatory Sample Location ID	Sinking Pond Area	Initial Result		Following Re-Dredge		Final Arsenic Concentration[1] (mg/kg)
		Sample Date	Arsenic Concentration (mg/kg)	Sample Date	Arsenic Concentration (mg/kg)	
48	**4**	10/6/2011	2.7	n/a		**2.7**
49		10/6/2011	< 1.6	n/a		**< 1.6**
50		10/6/2011	1.6 [< 1.6]	n/a		**1.6 [< 1.6]**
51		10/6/2011	2.6	n/a		**2.6**
52		10/6/2011	6.3	n/a		**6.3**
53		10/6/2011	8.3	n/a		**8.3**
54		10/6/2011	2.9	n/a		**2.9**
55		10/6/2011	17	n/a		**17**
56		10/6/2011	2.3	n/a		**2.3**
57		10/6/2011	2.1	n/a		**2.1**
58		10/6/2011	5.1	n/a		**5.1**
59		10/6/2011	33	n/a		**33**
60		10/6/2011	21	n/a		**21**
61		10/6/2011	5.1	n/a		**5.1**
9	**5**	10/17/2011	5.8	n/a		**5.8**
10		10/17/2011	10	n/a		**10**
11		10/17/2011	4.3	n/a		**4.3**
12		10/17/2011	61	10/28/2011	26	**26**
62		10/17/2011	8.3	n/a		**8.3**
63		10/17/2011	1.6 [< 1.6]	n/a		**1.6 [< 1.6]**
64		10/17/2011	5.4	n/a		**5.4**
65		10/17/2011	12	n/a		**12**
66		10/17/2011	14	n/a		**14**
67		10/17/2011	6.4	n/a		**6.4**
68		10/17/2011	6.7	n/a		**6.7**
69		10/17/2011	< 1.7	n/a		**< 1.7**
70		10/17/2011	8.8	n/a		**8.8**
71		10/17/2011	5.8	n/a		**5.8**
72		10/17/2011	280	10/28/2011	7.4	**7.4**
73		10/17/2011	160	10/28/2011	< 1.4	**< 1.4**
74		10/17/2011	4.8	n/a		**4.8**
75		10/17/2011	460	10/28/2011	4.2	**4.2**
76		10/17/2011	3.8	n/a		**3.8**

Notes:

(1) Final value represents post-remediation dataset. For duplicates, the average value between the parent and duplicate samples was used in the ProUCL calculations (Attachment I).
[….] Value in brackets is the result of the duplicate field analysis.
n/a: not applicable

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Table 3
Off-Site Waste Disposal Summary

Sediment Construction Summary and Final Sediment Remedial Action Report
W.R. Grace Superfund Site
Acton-Concord, Massachusetts

Disposal Facility	Material	Quantity	Notes
Waste Management Turnkey Recycling and Environmental Enterprises in Rochester, New Hampshire.	North Lagoon Wetlands Soil/Sediment	2,392.21 TONS(1)	Bill of Lading #1 submitted October 7, 2011.
	Sinking Pond Soil/Sediment	8,491.83 TONS(1)	Bill of Lading #2 submitted November 30, 2011.
	Other Impacted Material(2)	1,014.79 TONS	
	Turnkey Total	**11,898.83 TONS**	
RJ Cobb in Bellingham, Massachusetts	Non-Impacted Trees and Vegetative Material from North Lagoon Wetland	**1,600.00 CY**	
Clear Summit Earth Materials in Lancaster, Massachusetts.	Non-Impacted Trees and Vegetative Material from Sinking Pond	**525.00 CY**	
Devens Recycling Center in Devens, Massachusetts.	Turbidity Curtain from Sinking Pond	**10.50 TONS**	

Notes:

(1) Includes the Portland cement added to the sediment prior to off-site transportation and disposal.

(2) "Other impacted material" includes vegetative material (i.e., tree trunks, branches), and materials used in the construction of the Sediment Dewatering Pad and Decontamination Pad.

CY: cubic yards

Table 4
Imported Materials Analytical Results Summary

Sediment Construction Summary and Final Sediment Remedial Action Report
W.R. Grace Superfund Site
Acton-Concord, Massachusetts

			Material Use	Topsoil for North Lagoon Wetland								Topsoil for Sinking Pond								Sandy Silt for Check Dam[2]	
			Sample ID Sample Date	NLW-TS001 7/12/2011		NLW-TS002 8/3/2011		NLW-TS004 8/23/2011		NLW-TS006 9/6/2011		SP-TS001 9/23/2011		SP-TS002 9/23/2011		SP-TS003 10/14/2011		SP-TS004 10/14/2011		NLW SP Clay 001HF 9/6/2011	
Analyte	**Units**	**MassDEP MCP RCS-1 Standard[1]**	**MassDEP Background Standards[1]**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**
MADEP VPH Revision 1.1																					
C5-C8 Aliphatic Hydrocarbons	mg/Kg-dry	100	NA	ND	2.9	ND	2.0	ND	2.4	ND	2.0	ND	4.5	ND	4.5	ND	3.2	ND	3.8	ND	2.8
C9-C12 Aliphatic Hydrocarbons	mg/Kg-dry	1,000	NA	ND	2.9	ND	2.0	ND	2.4	ND	2.0	ND	4.5	ND	4.5	ND	3.2	ND	3.8	ND	2.8
C9-C10 Aromatic Hydrocarbons	mg/Kg-dry	1,000	NA	ND	2.9	ND	2.0	ND	2.4	ND	2.0	ND	4.5	ND	4.5	ND	3.2	ND	3.8	ND	2.8
Benzene	mg/Kg-dry	2	NA	ND	0.057	ND	0.039	ND	0.048	ND	0.041	ND	0.09	ND	0.091	ND	0.063	ND	0.076	ND	0.056
Ethylbenzene	mg/Kg-dry	40	NA	ND	0.057	ND	0.039	ND	0.048	ND	0.041	ND	0.09	ND	0.091	ND	0.063	ND	0.076	ND	0.056
Methyl tert-butyl ether	mg/Kg-dry	0.1	NA	ND	0.057	ND	0.039	ND	0.048	ND	0.041	ND	0.09	ND	0.091	ND	0.063	ND	0.076	ND	0.056
Naphthalene	mg/Kg-dry	4	NA	ND	0.057	ND	0.039	ND	0.048	ND	0.041	ND	0.09	ND	0.091	ND	0.063	ND	0.076	ND	0.056
Toluene	mg/Kg-dry	30	NA	ND	0.057	ND	0.039	ND	0.048	ND	0.041	ND	0.09	ND	0.091	ND	0.063	ND	0.076	ND	0.056
m,p-Xylene	mg/Kg-dry	300	NA	ND	0.057	ND	0.039	ND	0.048	ND	0.041	ND	0.09	ND	0.091	ND	0.063	ND	0.076	ND	0.056
o-Xylene	mg/Kg-dry	300	NA	ND	0.057	ND	0.039	ND	0.048	ND	0.041	ND	0.09	ND	0.091	ND	0.063	ND	0.076	ND	0.056
Volatile Organic Compounds																					
Acetone	µg/Kg-dry	6,000	NA	**260**	250	**160**	140	**230**	210	ND	170	ND	450	ND	470	ND	520	ND	530	ND	340
Tertiary Amyl Methyl Ether	µg/Kg-dry	NE	NA	ND	50	ND	28	ND	43	ND	35	ND	90	ND	95	ND	100	ND	110	ND	68
Benzene	µg/Kg-dry	2,000	NA	ND	25	ND	14	ND	21	ND	17	ND	45	ND	47	ND	52	ND	53	ND	34
Bromobenzene	µg/Kg-dry	NE	NA	ND	25	ND	14	ND	21	ND	17	ND	45	ND	47	ND	52	ND	53	ND	34
Bromochloromethane	µg/Kg-dry	NE	NA	ND	25	ND	14	ND	21	ND	17	ND	45	ND	47	ND	52	ND	53	ND	34
Bromodichloromethane	µg/Kg-dry	500	NA	ND	25	ND	14	ND	21	ND	17	ND	45	ND	47	ND	52	ND	53	ND	34
Bromoform	µg/Kg-dry	100	NA	ND	50	ND	28	ND	43	ND	35	ND	90	ND	95	ND	100	ND	110	ND	68
Bromomethane	µg/Kg-dry	500	NA	ND	50	ND	28	ND	43	ND	35	ND	90	ND	95	ND	100	ND	110	ND	68
sec-Butylbenzene	µg/Kg-dry	NE	NA	ND	25	ND	14	ND	21	ND	17	ND	45	ND	47	ND	52	ND	53	ND	34
n-Butylbenzene	µg/Kg-dry	NE	NA	ND	25	ND	14	ND	21	ND	17	ND	45	ND	47	ND	52	ND	53	ND	34
tert-Butylbenzene	µg/Kg-dry	NE	NA	ND	25	ND	14	ND	21	ND	17	ND	45	ND	47	ND	52	ND	53	ND	34
Carbon disulfide	µg/Kg-dry	NE	NA	ND	50	ND	28	ND	43	ND	35	ND	90	ND	95	ND	100	ND	110	ND	68
Carbon tetrachloride	µg/Kg-dry	5,000	NA	ND	25	ND	14	ND	21	ND	17	ND	45	ND	47	ND	52	ND	53	ND	34
Chlorobenzene	µg/Kg-dry	1,000	NA	ND	25	ND	14	ND	21	ND	17	ND	45	ND	47	ND	52	ND	53	ND	34
Dibromochloromethane	µg/Kg-dry	5	NA	ND	25	ND	14	ND	21	ND	17	ND	45	ND	47	ND	52	ND	53	ND	34
Chloroethane	µg/Kg-dry	NE	NA	ND	50	ND	28	ND	43	ND	35	ND	90	ND	95	ND	100	ND	110	ND	68
Chloroform	µg/Kg-dry	300	NA	ND	25	ND	14	ND	21	ND	17	ND	45	ND	47	ND	52	ND	53	ND	34
Chloromethane	µg/Kg-dry	NE	NA	ND	50	ND	28	ND	43	ND	35	ND	90	ND	95	ND	100	ND	110	ND	68
2-Chlorotoluene	µg/Kg-dry	NE	NA	ND	25	ND	14	ND	21	ND	17	ND	45	ND	47	ND	52	ND	53	ND	34
4-Chlorotoluene	µg/Kg-dry	NE	NA	ND	25	ND	14	ND	21	ND	17	ND	45	ND	47	ND	52	ND	53	ND	34
1,2-Dibromo-3-chloropropane	µg/Kg-dry	NE	NA	ND	130	ND	71	ND	110	ND	87	ND	230	ND	240	ND	260	ND	270	ND	170
1,2-Dibromoethane	µg/Kg-dry	NE	NA	ND	25	ND	14	ND	21	ND	17	ND	45	ND	47	ND	52	ND	53	ND	34
Dibromomethane	µg/Kg-dry	5	NA	ND	25	ND	14	ND	21	ND	17	ND	45	ND	47	ND	52	ND	53	ND	34
1,3-Dichlorobenzene	µg/Kg-dry	1,000	NA	ND	25	ND	14	ND	21	ND	17	ND	45	ND	47	ND	52	ND	53	ND	34
1,2-Dichlorobenzene	µg/Kg-dry	9,000	NA	ND	25	ND	14	ND	21	ND	17	ND	45	ND	47	ND	52	ND	53	ND	34
1,4-Dichlorobenzene	µg/Kg-dry	700	NA	ND	25	ND	14	ND	21	ND	17	ND	45	ND	47	ND	52	ND	53	ND	34
Dichlorodifluoromethane	µg/Kg-dry	NE	NA	ND	50	ND	28	ND	43	ND	35	ND	90	ND	95	ND	100	ND	110	ND	68
1,1-Dichloroethane	µg/Kg-dry	400	NA	ND	25	ND	14	ND	21	ND	17	ND	45	ND	47	ND	52	ND	53	ND	34
1,2-Dichloroethane	µg/Kg-dry	100	NA	ND	25	ND	14	ND	21	ND	17	ND	45	ND	47	ND	52	ND	53	ND	34
1,1-Dichloroethene	µg/Kg-dry	3,000	NA	ND	25	ND	14	ND	21	ND	17	ND	45	ND	47	ND	52	ND	53	ND	34
cis-1,2-Dichloroethene	µg/Kg-dry	300	NA	ND	25	ND	14	ND	21	ND	17	ND	45	ND	47	ND	52	ND	53	ND	34
trans-1,2-Dichloroethene	µg/Kg-dry	1,000	NA	ND	25	ND	14	ND	21	ND	17	ND	45	ND	47	ND	52	ND	53	ND	34
1,2-Dichloropropane	µg/Kg-dry	100	NA	ND	25	ND	14	ND	21	ND	17	ND	45	ND	47	ND	52	ND	53	ND	34
1,3-Dichloropropane	µg/Kg-dry	NE	NA	ND	25	ND	14	ND	21	ND	17	ND	45	ND	47	ND	52	ND	53	ND	34
2,2-Dichloropropane	µg/Kg-dry	NE	NA	ND	25	ND	14	ND	21	ND	17	ND	45	ND	47	ND	52	ND	53	ND	34
1,1-Dichloropropene	µg/Kg-dry	NE	NA	ND	25	ND	14	ND	21	ND	17	ND	45	ND	47	ND	52	ND	53	ND	34
cis-1,3-Dichloropropene	µg/Kg-dry	NE	NA	ND	25	ND	14	ND	21	ND	17	ND	45	ND	47	ND	52	ND	53	ND	34
trans-1,3-Dichloropropene	µg/Kg-dry	NE	NA	ND	25	ND	14	ND	21	ND	17	ND	45	ND	47	ND	52	ND	53	ND	34
Diethyl ether	µg/Kg-dry	NE	NA	ND	250	ND	140	ND	210	ND	170	ND	450	ND	470	ND	520	ND	530	ND	340
Diisopropyl ether	µg/Kg-dry	NE	NA	ND	50	ND	28	ND	43	ND	35	ND	90	ND	95	ND	100	ND	110	ND	68
1,4-Dioxane	µg/Kg-dry	NE	NA	ND	1,300	ND	710	ND	1,100	ND	870	ND	2,300	ND	2,400	ND	2,600	ND	2,700	ND	1700
Ethyl Tertiary Butyl Ether	µg/Kg-dry	NE	NA	ND	50	ND	28	ND	43	ND	35	ND	90	ND	95	ND	100	ND	110	ND	68
Ethylbenzene	µg/Kg-dry	40,000	NA	ND	25	ND	14	ND	21	ND	17	ND	45	ND	47	ND	52	ND	53	ND	34
Hexachlorobutadiene	µg/Kg-dry	6,000	NA	ND	50	ND	28	ND	43	ND	35	ND	90	ND	95	ND	100	ND	110	ND	68
2-Hexanone	µg/Kg-dry	NE	NA	ND	250	ND	140	ND	210	ND	170	ND	450	ND	470	ND	520	ND	530	ND	340
Isopropylbenzene	µg/Kg-dry	NE	NA	ND	25	ND	14	ND	21	ND	17	ND	45	ND	47	ND	52	ND	53	ND	34
4-Isopropyltoluene	µg/Kg-dry	NE	NA	**58**	25	ND	14	ND	21	ND	17	ND	45	ND	47	ND	52	ND	53	ND	34
2-Butanone	µg/Kg-dry	NE	NA	ND	250	ND	140	ND	210	ND	170	ND	450	ND	470	ND	520	ND	530	ND	340

Table 4
Imported Materials Analytical Results Summary

Sediment Construction Summary and Final Sediment Remedial Action Report
W.R. Grace Superfund Site
Acton-Concord, Massachusetts

			Material Use	Topsoil for North Lagoon Wetland								Topsoil for Sinking Pond								Sandy Silt for Check Dam[2]	
			Sample ID Sample Date	NLW-TS001 7/12/2011		NLW-TS002 8/3/2011		NLW-TS004 8/23/2011		NLW-TS006 9/6/2011		SP-TS001 9/23/2011		SP-TS002 9/23/2011		SP-TS003 10/14/2011		SP-TS004 10/14/2011		NLW SP Clay 001HF 9/6/2011	
Analyte	**Units**	**MassDEP MCP RCS-1 Standard[1]**	**MassDEP Background Standards[1]**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**
Volatile Organic Compounds (continued)																					
4-Methyl-2-pentanone	µg/Kg-dry	NE	NA	ND	250	ND	140	ND	210	ND	170	ND	450	ND	470	ND	520	ND	530	ND	340
Methyl tert-butyl ether	µg/Kg-dry	100	NA	ND	25	ND	14	ND	21	ND	17	ND	45	ND	47	ND	52	ND	53	ND	34
Naphthalene	µg/Kg-dry	4,000	NA	ND	50	ND	28	ND	43	ND	35	ND	90	ND	95	ND	100	ND	110	ND	68
Methylene chloride	µg/Kg-dry	100	NA	ND	50	ND	28	ND	43	ND	35	**91**	90	ND	95	ND	100	ND	110	ND	68
n-Propylbenzene	µg/Kg-dry	NE	NA	ND	25	ND	14	ND	21	ND	17	ND	45	ND	47	ND	52	ND	53	ND	34
Styrene	µg/Kg-dry	3,000	NA	ND	25	ND	14	ND	21	ND	17	ND	45	ND	47	ND	52	ND	53	ND	34
1,1,1,2-Tetrachloroethane	µg/Kg-dry	100	NA	ND	25	ND	14	ND	21	ND	17	ND	45	ND	47	ND	52	ND	53	ND	34
1,1,2,2-Tetrachloroethane	µg/Kg-dry	5	NA	ND	25	ND	14	ND	21	ND	17	ND	45	ND	47	ND	52	ND	53	ND	34
Tetrachloroethene	µg/Kg-dry	1,000	NA	ND	25	ND	14	ND	21	ND	17	ND	45	ND	47	ND	52	ND	53	ND	34
Tetrahydrofuran	µg/Kg-dry	NE	NA	ND	250	ND	140	ND	210	ND	170	ND	450	ND	470	ND	520	ND	530	ND	340
Toluene	µg/Kg-dry	30,000	NA	ND	25	ND	14	ND	21	ND	17	ND	45	ND	47	ND	52	ND	53	ND	34
1,2,4-Trichlorobenzene	µg/Kg-dry	2,000	NA	ND	25	ND	14	ND	21	ND	17	ND	45	ND	47	ND	52	ND	53	ND	34
1,2,3-Trichlorobenzene	µg/Kg-dry	NE	NA	ND	25	ND	14	ND	21	ND	17	ND	45	ND	47	ND	52	ND	53	ND	34
1,1,1-Trichloroethane	µg/Kg-dry	30,000	NA	ND	25	ND	14	ND	21	ND	17	ND	45	ND	47	ND	52	ND	53	ND	34
1,1,2-Trichloroethane	µg/Kg-dry	100	NA	ND	25	ND	14	ND	21	ND	17	ND	45	ND	47	ND	52	ND	53	ND	34
Trichloroethene	µg/Kg-dry	300	NA	ND	25	ND	14	ND	21	ND	17	ND	45	ND	47	ND	52	ND	53	ND	34
Trichlorofluoromethane	µg/Kg-dry	NE	NA	ND	50	ND	28	ND	43	ND	35	ND	90	ND	95	ND	100	ND	110	ND	68
1,2,3-Trichloropropane	µg/Kg-dry	NE	NA	ND	25	ND	14	ND	21	ND	17	ND	45	ND	47	ND	52	ND	53	ND	34
1,2,4-Trimethylbenzene	µg/Kg-dry	NE	NA	ND	25	ND	14	ND	21	ND	17	ND	45	ND	47	ND	52	ND	53	ND	34
1,3,5-Trimethylbenzene	µg/Kg-dry	NE	NA	ND	25	ND	14	ND	21	ND	17	ND	45	ND	47	ND	52	ND	53	ND	34
Vinyl chloride	µg/Kg-dry	600	NA	ND	25	ND	14	ND	21	ND	17	ND	45	ND	47	ND	52	ND	53	ND	34
o-Xylene	µg/Kg-dry	300,000	NA	ND	25	ND	14	ND	21	ND	17	ND	45	ND	47	ND	52	ND	53	ND	34
m,p-Xylene	µg/Kg-dry	300,000	NA	ND	25	ND	14	ND	21	ND	17	ND	45	ND	47	ND	52	ND	53	ND	34
MADEP EPH Revision 1.1																					
C9-C18 Aliphatic Hydrocarbons	mg/Kg-dry	1,000	NA	ND	12	ND	11	ND	11	ND	11	ND	11	ND	12	ND	11	ND	12	ND	12
C19-C36 Aliphatic Hydrocarbons	mg/Kg-dry	3,000	NA	**27**	12	**42**	11	**25**	11	**26**	11	**44**	11	**41**	12	**25**	11	**24**	12	ND	12
C11-C22 Aromatic Hydrocarbons	mg/Kg-dry	1,000	NA	**19**	12	**21**	11	ND	11	**14**	11	**12**	11	ND	12	ND	11	ND	12	ND	12
Naphthalene	mg/Kg-dry	4	NA	ND	0.12	ND	0.11	ND	0.11	ND	0.11	ND	0.11	ND	0.12	ND	0.11	ND	0.12	ND	0.12
2-Methylnaphthalene	mg/Kg-dry	0.7	NA	ND	0.12	ND	0.11	ND	0.11	ND	0.11	ND	0.11	ND	0.12	ND	0.11	ND	0.12	ND	0.12
Acenaphthylene	mg/Kg-dry	1	NA	ND	0.12	ND	0.11	ND	0.11	ND	0.11	ND	0.11	ND	0.12	ND	0.11	ND	0.12	ND	0.12
Acenaphthene	mg/Kg-dry	4	NA	ND	0.12	ND	0.11	ND	0.11	ND	0.11	ND	0.11	ND	0.12	ND	0.11	ND	0.12	ND	0.12
Fluorene	mg/Kg-dry	1,000	NA	ND	0.12	ND	0.11	ND	0.11	ND	0.11	ND	0.11	ND	0.12	ND	0.11	ND	0.12	ND	0.12
Phenanthrene	mg/Kg-dry	10	NA	ND	0.12	ND	0.11	ND	0.11	ND	0.11	ND	0.11	ND	0.12	ND	0.11	ND	0.12	ND	0.12
Anthracene	mg/Kg-dry	1,000	NA	ND	0.12	ND	0.11	ND	0.11	ND	0.11	ND	0.11	ND	0.12	ND	0.11	ND	0.12	ND	0.12
Fluoranthene	mg/Kg-dry	1,000	NA	ND	0.12	**0.14**	0.11	ND	0.11	**0.13**	0.11	ND	0.11	ND	0.12	ND	0.11	ND	0.12	ND	0.12
Pyrene	mg/Kg-dry	1,000	NA	ND	0.12	**0.12**	0.11	ND	0.11	ND	0.11	ND	0.11	ND	0.12	ND	0.11	ND	0.12	ND	0.12
Benz(a)anthracene	mg/Kg-dry	7	NA	ND	0.12	ND	0.11	ND	0.11	ND	0.11	ND	0.11	ND	0.12	ND	0.11	ND	0.12	ND	0.12
Chrysene	mg/Kg-dry	70	NA	ND	0.12	ND	0.11	ND	0.11	ND	0.11	ND	0.11	ND	0.12	ND	0.11	ND	0.12	ND	0.12
Benzo(b)fluoranthene	mg/Kg-dry	7	NA	ND	0.12	ND	0.11	ND	0.11	**0.11**	0.11	ND	0.11	ND	0.12	ND	0.11	ND	0.12	ND	0.12
Benzo(k)fluoranthene	mg/Kg-dry	70	NA	ND	0.12	ND	0.11	ND	0.11	ND	0.11	ND	0.11	ND	0.12	ND	0.11	ND	0.12	ND	0.12
Benzo(a)pyrene	mg/Kg-dry	2	NA	ND	0.12	ND	0.11	ND	0.11	ND	0.11	ND	0.11	ND	0.12	ND	0.11	ND	0.12	ND	0.12
Dibenz(a,h)anthracene	mg/Kg-dry	0.7	NA	ND	0.12	ND	0.11	ND	0.11	ND	0.11	ND	0.11	ND	0.12	ND	0.11	ND	0.12	ND	0.12
Indeno(1,2,3-cd)pyrene	mg/Kg-dry	7	NA	ND	0.12	ND	0.11	ND	0.11	ND	0.11	ND	0.11	ND	0.12	ND	0.11	ND	0.12	ND	0.12
Benzo(g,h,i)perylene	mg/Kg-dry	1,000	NA	ND	0.12	ND	0.11	ND	0.11	ND	0.11	ND	0.11	ND	0.12	ND	0.11	ND	0.12	ND	0.12
Semi-Volatile Organic Compounds																					
Acenaphthene	µg/Kg-dry	4,000	500	ND	290	ND	280	ND	270	ND	290	ND	280	ND	280	ND	290	ND	290	ND	300
Acenaphthylene	µg/Kg-dry	1,000	500	ND	290	ND	280	ND	270	ND	290	ND	280	ND	280	ND	290	ND	290	ND	300
Acetophenone	µg/Kg-dry	NE	NA	ND	290	ND	280	ND	270	ND	290	ND	280	ND	280	ND	290	ND	290	ND	300
Aniline	µg/Kg-dry	NE	NA	ND	290	ND	280	ND	270	ND	290	ND	280	ND	280	ND	290	ND	290	ND	300
Anthracene	µg/Kg-dry	1,000,000	1,000	ND	290	ND	280	ND	270	ND	290	ND	280	ND	280	ND	290	ND	290	ND	300
1,2-Diphenylhydrazine (as Azobenzene)	µg/Kg-dry	NE	NA	ND	290	ND	280	ND	270	ND	290	ND	280	ND	280	ND	290	ND	290	ND	300
Benzo(a)anthracene	µg/Kg-dry	7,000	2,000	ND	290	ND	280	ND	270	ND	290	ND	280	ND	280	ND	290	ND	290	ND	300
Benzo(a)pyrene	µg/Kg-dry	2,000	2,000	ND	290	ND	280	ND	270	ND	290	ND	280	ND	280	ND	290	ND	290	ND	300
Benzo(b)fluoranthene	µg/Kg-dry	7,000	2,000	ND	290	ND	280	ND	270	ND	290	ND	280	ND	280	ND	290	ND	290	ND	300
Benzo(k)fluoranthene	µg/Kg-dry	70,000	1,000	ND	290	ND	280	ND	270	ND	290	ND	280	ND	280	ND	290	ND	290	ND	300
Benzo(g,h,i)perylene	µg/Kg-dry	1,000,000	1,000	ND	290	ND	280	ND	270	ND	290	ND	280	ND	280	ND	290	ND	290	ND	300
4-Bromophenyl phenyl ether	µg/Kg-dry	NE	NA	ND	290	ND	280	ND	270	ND	290	ND	280	ND	280	ND	290	ND	290	ND	300
Butyl benzyl phthalate	µg/Kg-dry	NE	NA	ND	290	ND	280	ND	270	ND	290	ND	280	ND	280	ND	290	ND	290	ND	300
Di-n-butyl phthalate	µg/Kg-dry	NE	NA	ND	290	ND	280	ND	270	ND	290	ND	280	ND	280	ND	290	ND	290	ND	300
4-Chloroaniline	µg/Kg-dry	1000	NA	ND	290	ND	280	ND	270	ND	290	ND	280	ND	280	ND	290	ND	290	ND	300
Bis(2-chloroethoxy)methane	µg/Kg-dry	NE	NA	ND	290	ND	280	ND	270	ND	290	ND	280	ND	280	ND	290	ND	290	ND	300

Table 4
Imported Materials Analytical Results Summary

Sediment Construction Summary and Final Sediment Remedial Action Report
W.R. Grace Superfund Site
Acton-Concord, Massachusetts

			Material Use	Topsoil for North Lagoon Wetland								Topsoil for Sinking Pond								Sandy Silt for Check Dam[2]	
			Sample ID Sample Date	NLW-TS001 7/12/2011		NLW-TS002 8/3/2011		NLW-TS004 8/23/2011		NLW-TS006 9/6/2011		SP-TS001 9/23/2011		SP-TS002 9/23/2011		SP-TS003 10/14/2011		SP-TS004 10/14/2011		NLW SP Clay 001HF 9/6/2011	
Analyte	**Units**	**MassDEP MCP RCS-1 Standard[1]**	**MassDEP Background Standards[1]**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**
Semi-Volatile Organic Compounds (continued)																					
Bis(2-chloroethyl)ether	µg/Kg-dry	700	NA	ND	290	ND	280	ND	270	ND	290	ND	280	ND	280	ND	290	ND	290	ND	300
Bis(2-chloroisopropyl)ether	µg/Kg-dry	700	NA	ND	290	ND	280	ND	270	ND	290	ND	280	ND	280	ND	290	ND	290	ND	300
2-Chloronaphthalene	µg/Kg-dry	NE	NA	ND	290	ND	280	ND	270	ND	290	ND	280	ND	280	ND	290	ND	290	ND	300
2-Chlorophenol	µg/Kg-dry	700	NA	ND	290	ND	280	ND	270	ND	290	ND	280	ND	280	ND	290	ND	290	ND	300
Chrysene	µg/Kg-dry	70,000	NA	ND	290	ND	280	ND	270	ND	290	ND	280	ND	280	ND	290	ND	290	ND	300
Dibenzo(a,h)anthracene	µg/Kg-dry	700	500	ND	290	ND	280	ND	270	ND	290	ND	280	ND	280	ND	290	ND	290	ND	300
Dibenzofuran	µg/Kg-dry	NE	NA	ND	290	ND	280	ND	270	ND	290	ND	280	ND	280	ND	290	ND	290	ND	300
1,2-Dichlorobenzene	µg/Kg-dry	9,000	NA	ND	290	ND	280	ND	270	ND	290	ND	280	ND	280	ND	290	ND	290	ND	300
1,3-Dichlorobenzene	µg/Kg-dry	1,000	NA	ND	290	ND	280	ND	270	ND	290	ND	280	ND	280	ND	290	ND	290	ND	300
1,4-Dichlorobenzene	µg/Kg-dry	700	NA	ND	290	ND	280	ND	270	ND	290	ND	280	ND	280	ND	290	ND	290	ND	300
3,3´-Dichlorobenzidine	µg/Kg-dry	1,000	NA	ND	290	ND	280	ND	270	ND	290	ND	280	ND	280	ND	290	ND	290	ND	300
2,4-Dichlorophenol	µg/Kg-dry	700	NA	ND	290	ND	280	ND	270	ND	290	ND	280	ND	280	ND	290	ND	290	ND	300
Diethyl phthalate	µg/Kg-dry	10,000	NA	ND	290	ND	280	ND	270	ND	290	ND	280	ND	280	ND	290	ND	290	ND	300
Dimethyl phthalate	µg/Kg-dry	30,000	NA	ND	290	ND	280	ND	270	ND	290	ND	280	ND	280	ND	290	ND	290	ND	300
2,4-Dimethylphenol	µg/Kg-dry	700	NA	ND	290	ND	280	ND	270	ND	290	ND	280	ND	280	ND	290	ND	290	ND	300
2,4-Dinitrophenol	µg/Kg-dry	NE	NA	ND	580	ND	560	ND	540	ND	570	ND	570	ND	570	ND	580	ND	580	ND	610
2,4-Dinitrotoluene	µg/Kg-dry	700	NA	ND	290	ND	280	ND	270	ND	290	ND	280	ND	280	ND	290	ND	290	ND	300
2,6-Dinitrotoluene	µg/Kg-dry	NE	NA	ND	290	ND	280	ND	270	ND	290	ND	280	ND	280	ND	290	ND	290	ND	300
Bis(2-ethylhexyl)phthalate	µg/Kg-dry	200,000	NA	**440**	290	ND	280	ND	270	**650**	290	**350**	280	**480**	280	**400**	290	**410**	290	ND	300
Fluoranthene	µg/Kg-dry	1,000,000	500	ND	290	ND	280	ND	270	**310**	290	ND	280	ND	280	ND	290	ND	290	ND	300
Fluorene	µg/Kg-dry	1,000,000	1,000	ND	290	ND	280	ND	270	ND	290	ND	280	ND	280	ND	290	ND	290	ND	300
Hexachlorobenzene	µg/Kg-dry	700	NA	ND	290	ND	280	ND	270	ND	290	ND	280	ND	280	ND	290	ND	290	ND	300
Hexachlorobutadiene	µg/Kg-dry	6,000	NA	ND	290	ND	280	ND	270	ND	290	ND	280	ND	280	ND	290	ND	290	ND	300
Hexachloroethane	µg/Kg-dry	700	NA	ND	290	ND	280	ND	270	ND	290	ND	280	ND	280	ND	290	ND	290	ND	300
Indeno(1,2,3-cd)pyrene	µg/Kg-dry	7,000	NA	ND	290	ND	280	ND	270	ND	290	ND	280	ND	280	ND	290	ND	290	ND	300
Isophorone	µg/Kg-dry	NE	NA	ND	290	ND	280	ND	270	ND	290	ND	280	ND	280	ND	290	ND	290	ND	300
2-Methylnaphthalene	µg/Kg-dry	700	500	ND	290	ND	280	ND	270	ND	290	ND	280	ND	280	ND	290	ND	290	ND	300
2-Methylphenol	µg/Kg-dry	NE	NA	ND	290	ND	280	ND	270	ND	290	ND	280	ND	280	ND	290	ND	290	ND	300
4-Methylphenol	µg/Kg-dry	NE	NA	ND	290	ND	280	ND	270	ND	290	ND	280	ND	280	ND	290	ND	290	ND	300
Naphthalene	µg/Kg-dry	4,000	500	ND	290	ND	280	ND	270	ND	290	ND	280	ND	280	ND	290	ND	290	ND	300
Nitrobenzene	µg/Kg-dry	NE	NA	ND	290	ND	280	ND	270	ND	290	ND	280	ND	280	ND	290	ND	290	ND	300
2-Nitrophenol	µg/Kg-dry	NE	NA	ND	290	ND	280	ND	270	ND	290	ND	280	ND	280	ND	290	ND	290	ND	300
4-Nitrophenol	µg/Kg-dry	NE	NA	ND	580	ND	560	ND	540	ND	570	ND	570	ND	570	ND	580	ND	580	ND	610
Di-n-octyl phthalate	µg/Kg-dry	NE	NA	ND	290	ND	280	ND	270	ND	290	ND	280	ND	280	ND	290	ND	290	ND	300
Pentachlorophenol	µg/Kg-dry	3,000	NA	ND	580	ND	560	ND	540	ND	570	ND	570	ND	570	ND	580	ND	580	ND	610
Phenanthrene	µg/Kg-dry	10,000	3,000	ND	290	ND	280	ND	270	ND	290	ND	280	ND	280	ND	290	ND	290	ND	300
Phenol	µg/Kg-dry	1,000	NA	ND	290	ND	280	ND	270	ND	290	ND	280	ND	280	ND	290	ND	290	ND	300
Pyrene	µg/Kg-dry	1,000,000	4,000	ND	290	ND	280	ND	270	ND	290	ND	280	ND	280	ND	290	ND	290	ND	300
1,2,4-Trichlorobenzene	µg/Kg-dry	2,000	NA	ND	290	ND	280	ND	270	ND	290	ND	280	ND	280	ND	290	ND	290	ND	300
2,4,5-Trichlorophenol	µg/Kg-dry	4,000	NA	ND	290	ND	280	ND	270	ND	290	ND	280	ND	280	ND	290	ND	290	ND	300
2,4,6-Trichlorophenol	µg/Kg-dry	700	NA	ND	290	ND	280	ND	270	ND	290	ND	280	ND	280	ND	290	ND	290	ND	300
Chlorinated Pesticides																					
Aldrin	µg/Kg-dry	40	NA	ND	0.93	ND	0.9	ND	0.87	ND	0.91	ND	0.92	ND	0.93	ND	0.91	ND	0.93	ND	0.97
alpha-BHC	µg/Kg-dry	NE	NA	**5.7**	0.93	ND	0.9	ND	0.87	ND	0.91	ND	0.92	ND	0.93	ND	0.91	ND	0.93	ND	0.97
beta-BHC	µg/Kg-dry	NE	NA	ND	0.93	ND	0.9	ND	0.87	ND	0.91	ND	0.92	ND	0.93	ND	0.91	ND	0.93	ND	0.97
gamma-BHC	µg/Kg-dry	NE	NA	ND	0.93	ND	0.9	ND	0.87	ND	0.91	ND	0.92	ND	0.93	ND	0.91	ND	0.93	ND	0.97
delta-BHC	µg/Kg-dry	NE	NA	ND	0.93	ND	0.9	ND	0.87	ND	0.91	ND	0.92	ND	0.93	ND	0.91	ND	0.93	ND	0.97
Technical Chlordane	µg/Kg-dry	700	NA	ND	29	ND	28	ND	27	ND	29	ND	29	ND	29	ND	28	ND	29	ND	30
4,4´-DDD	µg/Kg-dry	4,000	NA	ND	1.9	ND	1.8	ND	1.7	ND	1.8	ND	1.8	ND	1.9	ND	1.8	ND	1.9	ND	1.9
4,4´-DDE	µg/Kg-dry	3,000	NA	**3.2**	1.9	**3.6**	1.8	**2**	1.7	**4.3**	1.8	**3.1**	1.8	**3.5**	1.9	ND	1.8	ND	1.9	ND	1.9
4,4´-DDT	µg/Kg-dry	3,000	NA	**2.3**	1.9	**7.4**	1.8	ND	1.7	ND	1.8	ND	1.8	ND	1.9	ND	1.8	ND	1.9	ND	1.9
Dieldrin	µg/Kg-dry	50	NA	ND	1.9	ND	1.8	ND	1.7	ND	1.8	ND	1.8	ND	1.9	ND	1.8	ND	1.9	ND	1.9
Endosulfan I	µg/Kg-dry	500	NA	ND	0.93	ND	0.9	ND	0.87	ND	0.91	ND	0.92	ND	0.93	ND	0.91	ND	0.93	ND	0.97
Endosulfan II	µg/Kg-dry	500	NA	ND	1.9	ND	1.8	ND	1.7	ND	1.8	ND	1.8	ND	1.9	ND	1.8	ND	1.9	ND	1.9
Endosulfan sulfate	µg/Kg-dry	NE	NA	ND	1.9	ND	1.8	ND	1.7	ND	1.8	ND	1.8	ND	1.9	ND	1.8	ND	1.9	ND	1.9
Endrin	µg/Kg-dry	8,000	NA	ND	1.9	ND	1.8	ND	1.7	ND	1.8	ND	1.8	ND	1.9	ND	1.8	ND	1.9	ND	1.9
Endrin ketone	µg/Kg-dry	NE	NA	ND	1.9	ND	1.8	ND	1.7	ND	1.8	ND	1.8	ND	1.9	ND	1.8	ND	1.9	ND	1.9
Heptachlor	µg/Kg-dry	200	NA	ND	0.93	ND	0.9	ND	0.87	ND	0.91	ND	0.92	ND	0.93	ND	0.91	ND	0.93	ND	0.97
Heptachlor epoxide	µg/Kg-dry	90	NA	ND	0.93	ND	0.9	ND	0.87	ND	0.91	ND	0.92	ND	0.93	ND	0.91	ND	0.93	ND	0.97
Hexachlorobenzene	µg/Kg-dry	700	NA	ND	0.93	ND	0.9	ND	0.87	ND	0.91	ND	0.92	ND	0.93	ND	0.91	ND	0.93	ND	0.97
Methoxychlor	µg/Kg-dry	200,000	NA	ND	9.3	ND	9	ND	8.7	ND	9.1	ND	9.2	ND	9.3	ND	9.1	ND	9.3	ND	9.7

Table 4
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Sediment Construction Summary and Final Sediment Remedial Action Report
W.R. Grace Superfund Site
Acton-Concord, Massachusetts

			Material Use	Topsoil for North Lagoon Wetland								Topsoil for Sinking Pond								Sandy Silt for Check Dam[2]	
			Sample ID / Sample Date	NLW-TS001 7/12/2011		NLW-TS002 8/3/2011		NLW-TS004 8/23/2011		NLW-TS006 9/6/2011		SP-TS001 9/23/2011		SP-TS002 9/23/2011		SP-TS003 10/14/2011		SP-TS004 10/14/2011		NLW SP Clay 001HF 9/6/2011	
Analyte	**Units**	**MassDEP MCP RCS-1 Standard[1]**	**MassDEP Background Standards[1]**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**	**Result**	**DL**
Polychlorinated Biphenyls																					
Aroclor 1254	µg/Kg-dry	2,000	NA	ND	29	ND	28	ND	27	ND	29	ND	29	ND	29	ND	28	ND	29	ND	30
Aroclor 1262	µg/Kg-dry	2,000	NA	ND	29	ND	28	ND	27	ND	29	ND	29	ND	29	ND	28	ND	29	ND	30
Aroclor 1221	µg/Kg-dry	2,000	NA	ND	29	ND	28	ND	27	ND	29	ND	29	ND	29	ND	28	ND	29	ND	30
Aroclor 1260	µg/Kg-dry	2,000	NA	ND	29	ND	28	ND	27	ND	29	ND	29	ND	29	ND	28	ND	29	ND	30
Aroclor 1268	µg/Kg-dry	2,000	NA	ND	29	ND	28	ND	27	ND	29	ND	29	ND	29	ND	28	ND	29	ND	30
Aroclor 1248	µg/Kg-dry	2,000	NA	ND	29	ND	28	ND	27	ND	29	ND	29	ND	29	ND	28	ND	29	ND	30
Aroclor 1232	µg/Kg-dry	2,000	NA	ND	29	ND	28	ND	27	ND	29	ND	29	ND	29	ND	28	ND	29	ND	30
Aroclor 1016	µg/Kg-dry	2,000	NA	ND	29	ND	28	ND	27	ND	29	ND	29	ND	29	ND	28	ND	29	ND	30
Aroclor 1242	µg/Kg-dry	2,000	NA	ND	29	ND	28	ND	27	ND	29	ND	29	ND	29	ND	28	ND	29	ND	30
Chlorinated Herbicides																					
2,4,5-T	µg/Kg-dry	NE	NA	ND	9.8	ND	12	ND	10	ND	11	ND	9.8	ND	9.4	ND	9.7	ND	9.5	ND	10
2,4,5-TP (Silvex)	µg/Kg-dry	NE	NA	ND	9.8	ND	12	ND	10	ND	11	ND	9.8	ND	9.4	ND	9.7	ND	9.5	ND	10
2,4-D	µg/Kg-dry	NE	NA	ND	9.8	ND	12	ND	10	ND	11	ND	9.8	ND	9.4	ND	9.7	ND	9.5	ND	10
2,4-DB	µg/Kg-dry	NE	NA	ND	78	ND	80	ND	80	ND	91	ND	78	ND	76	ND	77	ND	76	ND	80
Dalapon	µg/Kg-dry	NE	NA	ND	9.8	ND	12	ND	10	ND	11	ND	9.8	ND	9.4	ND	9.7	ND	9.5	ND	10
Dicamba	µg/Kg-dry	NE	NA	ND	20	ND	24	ND	21	ND	23	ND	20	ND	19	ND	19	ND	19	ND	20
Dichloroprop	µg/Kg-dry	NE	NA	ND	9.8	ND	12	ND	10	ND	11	ND	9.8	ND	9.4	ND	9.7	ND	9.5	ND	10
Dinoseb	µg/Kg-dry	NE	NA	ND	20	ND	24	ND	21	ND	23	ND	20	ND	19	ND	19	ND	19	ND	20
MCPA	µg/Kg-dry	NE	NA	ND	2,900	ND	3,300	ND	3,100	ND	3,400	ND	2,900	ND	2,800	ND	2,900	ND	2,800	ND	3,000
MCPP	µg/Kg-dry	NE	NA	ND	2,900	ND	3,300	ND	3,100	ND	3,400	ND	2,900	ND	2,800	ND	2,900	ND	2,800	ND	3,000
Metals																					
Arsenic	mg/Kg-dry	20	20	**7.94**	6.72	**17.7**	6.79	**9.57**	6.34	**9.84**	7.09	**13.3**	7.21	**10.4**	7.22	**11.1**	7.09	**14**	7.25	**23.1**	7.42
Barium	mg/Kg-dry	1,000	50	ND	26.9	**67.8**	27.2	**25.5**	25.3	**31.5**	14.2	**44.1**	14.4	**31.8**	14.5	**28.2**	14.1	**26.6**	14.5	**75.1**	14.8
Cadmium	mg/Kg-dry	2	2	ND	0.672	ND	0.679	ND	0.634	ND	0.709	ND	0.721	ND	0.722	ND	0.709	ND	0.725	ND	0.742
Chromium (Total)[3]	mg/Kg-dry	30	30	**9.99**	1.34	**30.62**	1.36	**11.8**	1.27	**13.6**	1.42	**14.9**	1.44	**12.6**	1.45	**10.8**	1.41	**9.96**	1.45	**28.9**	1.48
Chromium (VI)[3]	mg/Kg-dry	30	30	-	-	ND	1.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Copper	mg/Kg-dry	NE	40	**16.1**	3.36	**17.5**	3.39	**13.4**	3.17	**11.2**	3.55	**10.8**	3.6	**13.2**	3.61	**11.4**	3.54	**11.7**	3.62	**22.5**	3.71
Iron	mg/Kg-dry	NE	20,000	**5,670**	13.4	**13,900**	13.6	**6,280**	12.7	**7,690**	28.4	**8,680**	28.9	**5,990**	28.9	**6,670**	28.4	**6,690**	28.9	**20,800**	29.7
Lead	mg/Kg-dry	300	100	**13.5**	6.72	**20.3**	6.79	**16.3**	6.34	**81.6**	5.67	**23.9**	5.77	**31.6**	5.77	**23.5**	5.67	**20**	5.8	**8.35**	5.93
Manganese	mg/Kg-dry	NE	300	**112**	2.01	**194**	2.04	**119**	1.9	**134**	2.84	**137**	2.17	**118**	2.16	**120**	2.13	**96.6**	2.18	**452**	2.97
Selenium	mg/Kg-dry	400	0.5	ND	16.1	ND	16.3	ND	15.2	ND	17.0	ND	17.3	ND	17.3	ND	17.1	ND	17.4	ND	17.8
Silver	mg/Kg-dry	100	0.6	ND	1.88	ND	1.9	ND	1.77	ND	1.99	ND	2.02	ND	2.02	ND	1.99	ND	2.02	ND	2.08
Mercury	mg/Kg-dry	20	0.3	ND	0.0575	ND	0.0547	ND	0.0514	**0.244**	0.0557					ND	0.0573	**0.0562**	0.0553		
Percent Moisture	wt%	NE	NE	15	NE	11.9	NE	9.1	NE	13.4	NE	13.7	NE	14.9	NE	14.4	NE	15	NE	17.4	NE
pH	pH Units	NE	NE	7.1	NE	6.8	NE	7.5	NE	6.5	NE	5.7	NE	6.2	NE	6.9	NE	6.7	NE		NE

Notes:
1. Analytical results were compared to the RCS-1 standard, and the higher of RCS-1 standards and established Massachusetts background concentrations for PAHs and metals in soils, except for lead and PCBs (100% Design Report). For lead, the established background concentration for natural soils (100 mg/kg) was used. For PCBs, concentrations above the detection limit were unacceptable.

2. This material was used beneath an impermeable 40 mil HDPE liner for the construction of the permanent check dam between the Inlet and Sinking Pond.

3. The standard listed for total chromium is based on hexavalent chromium (30 mg/kg). If the result exceeded 30 mg/kg, the sample was analyzed for hexavalent chromium and compared to the hexavalent chromium standard (30 mg/kg). The standard for non-hexavalent chromium is 100 mg/kg; no sample exceeded this value.

DL: Detection Limit
EPH: Extractable Petroleum Hydrocarbons
MassDEP: Massachusetts Department of Environmental Protection
MCP: Massachusetts Contingency Plan
mg/kg: milligram per kilogram
µg/kg: microgram per kilogram
NA: Not Applicable
ND: Not Detected
NE: Not Established
RCS-1: Reportable Concentrations for Soils
VPH: Volatile Petroleum Hydrocarbon

BOLD - exceeds laboratory method detection limit

Table 5
Data Quality Review for Confirmatory and Fill Material Samples

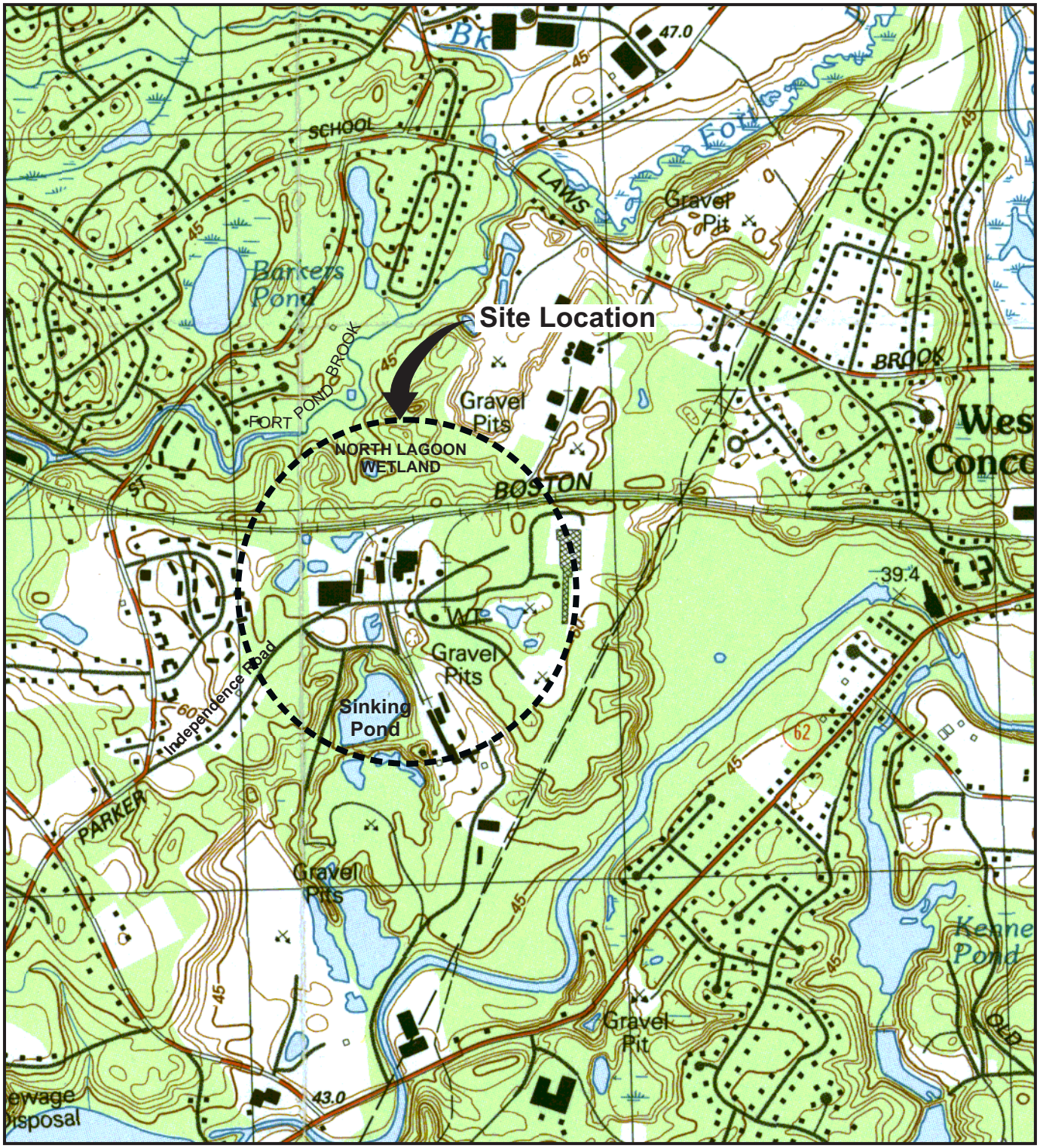
Sediment Construction Summary and Final Sediment Remedial Action Report
W.R. Grace Superfund Site
Acton-Concord, Massachusetts

Area / Sample Description	Lab SDG ID (see Note 1)	No. of Samples	No. of Duplicates	No. of Field Blanks	No. of MS/MSDs	Reporting Limit Below Required Value?	Case Narrative Available & Reviewed?	Presumptive Certainty Form Present?
CONFIRMATORY SAMPLES (SEE NOTE 2)								
Area 1	J36343	8	1	0	1	yes	yes	yes
Area 2	J36931	20	1	1	1	yes	yes	yes
Area 3	J36712	15	1	1	1	yes	yes	yes
Area 4	J36824	14	1	1	0	yes	yes	yes
Area 5	J37037	19	1	1	1	yes	yes	yes
Area 2 and Area 5 Re-Dredge (see Note 3)	J37282	6	1 (see Note 4)	1 (see Note 4)	0	yes	yes	yes
	TOTAL	82	6	5	4			
FILL MATERIAL SAMPLES (SEE NOTE 5)								
NLW-TS001 (Topsoil for North Lagoon Wetlands)	1107030	1	n/a	n/a	n/a	Yes, except for dibromochloromethane, dibromomethane and 1,1,2,2-tetrachloroethane	yes	yes
NLW-TS002 (Topsoil for North Lagoon Wetlands)	1108011	1	n/a	n/a	n/a	Yes, except for dibromochloromethane, dibromomethane and 1,1,2,2-tetrachloroethane	yes	yes
NLW-TS004 (Topsoil for North Lagoon Wetlands)	1108051	1	n/a	n/a	n/a	Yes, except for dibromochloromethane, dibromomethane and 1,1,2,2-tetrachloroethane	yes	yes
NLW-TS006 (Topsoil for North Lagoon Wetlands)	1109013	1	n/a	n/a	n/a	Yes, except for dibromochloromethane, dibromomethane and 1,1,2,2-tetrachloroethane	yes	Yes, except for herbicides and mercury (see Note 6)
SP-TS001 and SP-TS002 (Topsoil for sinking Pond)	1109052	2	n/a	n/a	n/a	Yes, except for dibromochloromethane, dibromomethane and 1,1,2,2-tetrachloroethane	yes	Yes, except for herbicides and mercury (see Note 6)
SP-TS003 and SP-TS004 (Topsoil for Sinking Pond)	1110051	2	n/a	n/a	n/a	Yes, except for bromoform, dibromochloromethane, dibromomethane, Methylene chloride and 1,1,2,2-tetrachloroethane	yes	Yes, except for herbicides (see Note 6)
NLWSPClay001HF (Material for construction of Sinking Pond Permanent Check Dam)	1109014	1	n/a	n/a	n/a	Yes, except for dibromochloromethane, dibromomethane and 1,1,2,2-tetrachloroethane	yes	Yes, except for herbicides and mercury (see Note 6)

Notes:
1. Laboratory reports for each sample are include in Attachment J.
2. Confirmatory samples consisted of soil/sediment from the limits of excavation in Sinking Pond and analyzed for arsenic using SW846 Method 6010B.
3. Additional confirmatory samples collected following re-dredge in Areas 2 and 5.
4. Confirmatory samples for Area 2 Re-Dredge and Area 5 Re-Dredge were submitted together and analyzed under one laboratory report. A single duplicate and field blank represent both areas
5. Samples consisted of topsoil and sandy silt from an offsite source and were analyzed for volatile organic compounds (VOCs) using SW846 Method 8260B, semivolatile organic compounds (SVOCs) using Method 8270C, polychlorinated biphenyls (PCBs) using Method 8082, extractable petroleum hydrocarbons (EPH) & volatile petroleum hydrocarbons (VPH) using MassDEP Method Revision 1.1, metals using Method 6010B/7141, pesticides using Method 8081A, and herbicides using Method 8151.
6. Herbicides and, in some cases mercury, were subcontracted by the primary laboratory (AMRO Environmental Laboratories Corporation) to a secondary laboratory (Phoenix Environmental Laboratories, Inc.). For these data packages, Phoenix did not provide the optional presumptive certainty forms. However, Phoenix did follow procedures necessary to achieve Presumptive Certainty as described in Section 2.1 of the Compendium of Analytical Methods document WSC-CAM-VII A. Therefore, Presumptive Certainty was achieved for all data.

CAM: Massachusetts Department of Environmental Protection Compendium of Analytical Methods
MS/MSD: laboratory matrix spike sample / matrix spike sample duplicate
n/a: indicates that the quality criterion is not applicable to the sample.
SDG ID: sample delivery group identification (laboratory's identifier for the group of samples)

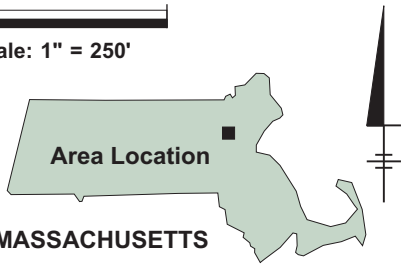
Figures



REFERENCE: BASE MAP USGS 7.5 MIN. QUAD., MASSACHUSETTS GEOGRAPHIC INFORMATION SYSTEM, 1987, at http://www.mass.gov/mgis/

250' 0 250'

Approximate Scale: 1" = 250'



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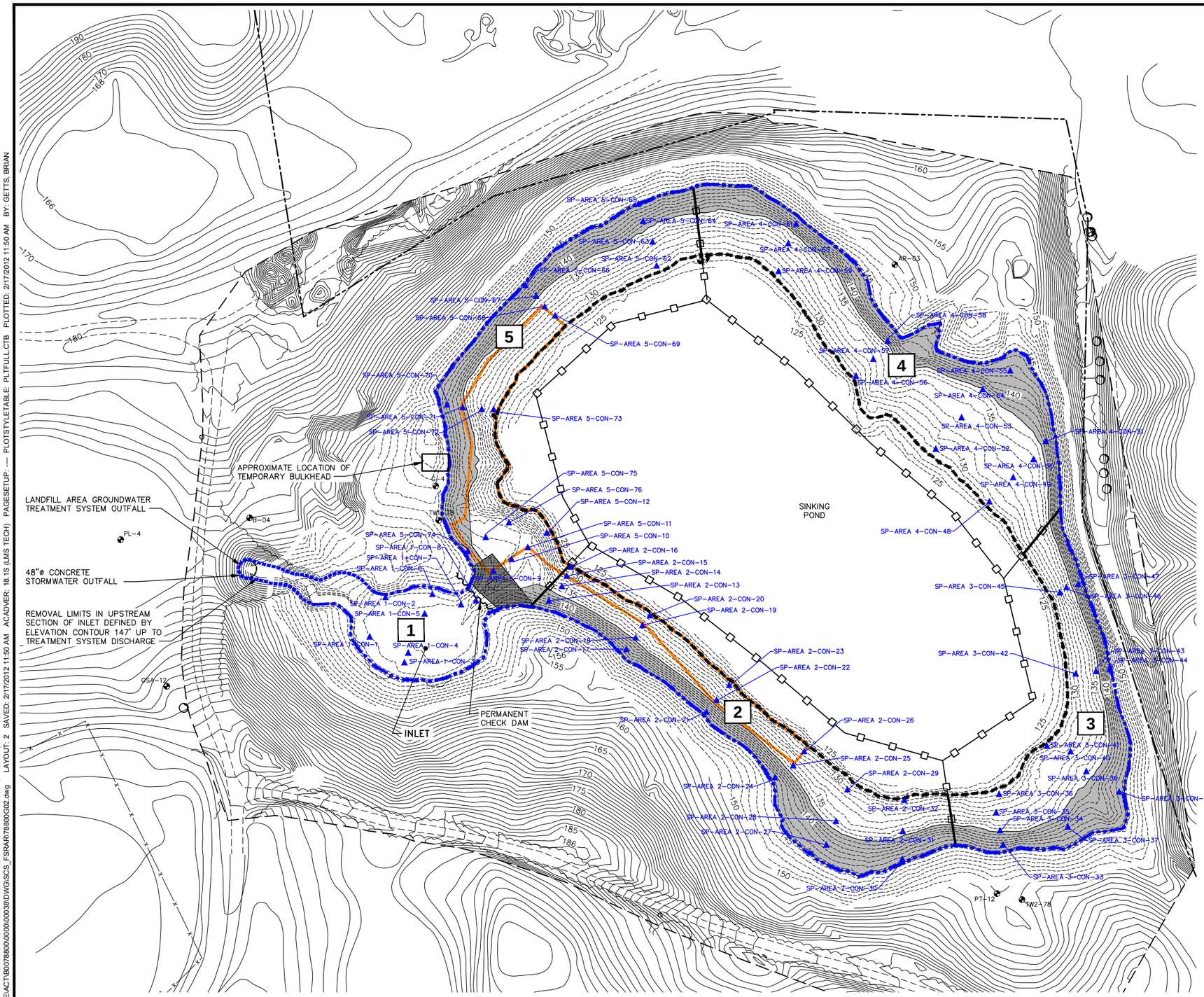
W.R. GRACE SUPERFUND SITE
ACTON-CONCORD, MASSACHUSETTS
SEDIMENT CONSTRUCTION SUMMARY AND FINAL SEDIMENT REMEDIAL ACTION REPORT

SITE LOCATION MAP

ARCADIS

FIGURE
1

01/31/2012 SYRACUSE, NY-ENV/CAD K.SARTORI, DJHOWES
B0078800/0000/00038/CDR/FINAL/78800N01.CDR



LEGEND:

- THERMOCLINE (EL. 128) – LOWER EXTENT OF REMOVAL
- HIGH WATER ELEVATION OF POND (ELEV. 144.5) – UPPER EXTENT OF REMOVAL UNLESS OTHERWISE INDICATED
- REMOVAL BOUNDARY EXTENDING ABOVE HIGH WATER ELEVATION
- 140 CONTOUR
- TURBIDITY CURTAIN
- HYDRAULIC CONTROL STRUCTURE
- INITIAL TARGET 2 FT REMOVAL AREA
- 1 SEDIMENT REMOVAL AREA ID
- AREA OF SINKING POND THAT WAS RE-DREDGED FOLLOWING INITIAL CONFIRMATORY SAMPLING (SEE NOTE 4)
- BACKFILL AREA (SEE NOTE 5)
- CONFIRMATION SAMPLE LOCATION

NOTES:

1. HORIZONTAL COORDINATE SYSTEM: STATE PLANE MASSACHUSETTS MAINLAND NAD 83 FEET. VERTICAL DATUM: NATIONAL GEODETIC VERTICAL DATUM 1329 (NGVD 29).
2. TOPOGRAPHY AND BATHYMETRY REVISED CONSISTENT WITH THE PRE-CONSTRUCTION SURVEY PERFORMED BY THEW ASSOCIATES ON JULY 29, 2011.
3. THE LOWER LIMIT OF EXCAVATION IN SINKING POND WILL BE ELEVATION 128. THE UPPER LIMIT WILL BE ELEVATION 144.5 EXCEPT AS OTHERWISE SHOWN FOR THE INLET.
4. THE LOWER REMOVAL LIMIT OF THE RE-DREDGE AREA SHALL BE THE PRE-DREDGING LOCATION OF THE THERMOCLINE (ELEVATION 128).
5. BACKFILL AREA ESTABLISHED FROM THE HISTORICAL HIGH WATER ELEVATION OF THE POND (ELEVATION 144.5) – DEFINED AS THE UPPER EXTENT OF REMOVAL LIMITS, TO THE WATER ELEVATION OF THE POND DURING REMEDIAL ACTION (APPROXIMATELY ELEVATION 137).

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0 50' 100'
GRAPHIC SCALE

W.R. GRACE SUPERFUND SITE
ACTON-CONCORD, MASSACHUSETTS
SEDIMENT CONSTRUCTION SUMMARY AND FINAL SEDIMENT REMEDIAL ACTION REPORT

REMEDIAL ACTION EXCAVATION AND BACKFILL - SINKING POND

ARCADIS

FIGURE
2

CITY: SYRACUSE-NY DIV/GROUP: 141/ENV DB: B.GETTS LD: PIC: PM: TM: LYR:ON=*;OFF=*REF*
G:\ENVCAD\SYRACUSE\ACT\B0078800\0000\00038\DWG\SCS_FSR\ARR78800G02.dwg LAYOUT: 2 SAVED: 2/17/2012 11:50 AM ACADVER: 18.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 2/17/2012 11:50 AM BY: GETTS, BRIAN
XREFS: 78800X00 78800X01 78800X02 78800X10
IMAGES:

Attachments

Attachment A

Submittal Register

Attachment A
Submittal Register

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Sediment Construction Summary and Final Sediment Remedial Action Report
W.R. Grace Superfund Site
Acton-Concord, Massachusetts

Item No.	Section	Submittal Description	Submittal Timeline	Date Received	Status/Date (see Note 1)	Notes	USEPA Approval (shading = items requested for review)
1	01 11 00	Contractor's Operations Plan	Submit 30 days after Notice of Award				
	01 14 13	Security Plan	Part of Contractor's Operations Plan	06/07/11	N-6/20/11		7/19/2011
	01 32 23	Topographic Survey Plan	Part of Contractor's Operations Plan	6/15/2011; 7/8/11 v2	S-6/23/11; N-7/11/11		assumed based on 7/25/11 email response
	01 32 23	Bathymetric Survey Plan	Part of Contractor's Operations Plan	6/15/2011; 7/8/11 v2	S-6/23/11; N-7/11/11		assumed based on 7/25/11 email response
	01 50 00	Temporary Facilities Plan	Part of Contractor's Operations Plan	6/7/2011; 6/15/11 v2; 7/8/11 v3	S-6/14/11; R-6/29/11; N-7/26/11	7/8/11 version eliminated duplicate PDF pages, clarified asphalt type used in railroad crossing, and included a cut sheet for the field office trailer. EPA 7/5/11 comments noted.	7/19/2011
	02 51 29	Equipment Decontamination Plan	Part of Contractor's Operations Plan	6/13/11; 6/21/11 v2	S-6/17/11; N-6/23/11		7/19/2011
	02 61 00	Off-Site Disposal Plan	Part of Contractor's Operations Plan	6/13/11; 6/21/11 v2	S-6/16/11; N-6/22/11		7/19/2011
	02 61 13	Sediment Removal Plan	Part of Contractor's Operations Plan	6/29/2011; 7/14/11 v2	S-7/11/11; N-7/15/11		8/11/2011
	31 10 00	Site Clearing Plan	Part of Contractor's Operations Plan	06/10/11	N-6/15/11		7/19/2011
	31 23 23	Select Fill Analysis Plan	Part of Contractor's Operations Plan	6/21/11 v2	N-6/23/11	v1 retracted	7/19/2011
	31 25 13	Sediment Erosion and Control Plan	Part of Contractor's Operations Plan	6/9/11; 6/16/11 v2	S-6/15/11; N-6/21/11	Land-Based E&S Plan	7/5/2011
				8/5/2011; 8/10/11 v2	S-8/8/11; N-8/11/10	In-Water E&S Plan	8/30/2011
	31 32 00	Material Transport and Sediment Stabilization	Part of Contractor's Operations Plan	6/13/11; 6/24/11 v2	S-6/21/11; N-6/28/11		verbal 8/2/11
	31 35 26	Sediment Cover Plan	Part of Contractor's Operations Plan			waived - sediment cover not needed	
	44 41 13	Spill Control Plan	Part of Contractor's Operations Plan	7/22/2011; 7/28/11 v2	S-7/25/11; N-7/28/11	titled "Environmental Protection Plan" by DAC	8/10/2011
	32 72 00	Backfilling Plan	Part of Contractor's Operations Plan	07/31/11	N-8/2/11	See also Site Restoration Plan below.	8/17/2011
2	01 11 00	Health and Safety Plan	Submit 30 days after Notice of Award.	6/7/11; 6/19/11 v2; 6/21/11 v3	S-6/14/11; v2 rtn for edit I-6/22/11 v3		
3	01 71 03	Construction Schedule	Submit 30 days after Notice of Award	06/27/11	I-6/27/11		6/2/2011
4	02 72 00	Water Treatment Plan	Submit 30 days after Notice of Award	6/13/11; 6/22/11 v2	S-6/17/11; N-6/23/11		8/9/2011
5	01 33 00	Daily Construction Report	8:30 am following day			daily information provided to Construction Manager.	
	01 14 13	Daily Log	Part of Daily Construction Report				
	01 14 13	Report of theft or vandalism	Part of Daily Construction Report	08/19/11	I-8/19/11	report for RR crossing and fence damage from 8/13.	
				12/16/11	I-12/16/11	report for 11/21 vandalism.	
	01 14 13	Daily Excavation and Material Details	Part of Daily Construction Report			daily information provided to Construction Manager.	
	02 61 13	Description of work activity	Part of Daily Construction Report				
	02 72 00	Water treatment effluent data	Part of Daily Construction Report				
	31 35 26	Daily progress numbers	Part of Daily Construction Report				
	32 72 00	Description of work activity	Part of Daily Construction Report				
6	01 33 00	Weekly Construction Report	8:30 am following day			weekly information provided to Construction Manager and reported on weekly calls.	ongoing as part of weekly calls
	01 32 23	Interim Survey Data for North Lagoon Wetland (Grade stakes)	Part of Weekly Construction Report				
	01 32 23	Interim Bucket Position Data for Sinking Pond (RTK-GPS)	Part of Weekly Construction Report				
	02 61 13	Description of Work activity	Part of Weekly Construction Report				
	02 61 00	Off-Site Disposal Documentation	Part of Weekly Construction Report				
	31 25 13	Erosion and sedimentation controls maintenance and repair activities	Part of Weekly Construction Report				
	31 32 00	Stabilization Section	Part of Weekly Construction Report				
	31 35 26	Weekly progress numbers	Part of Weekly Construction Report				
	32 72 00	Description of work activity	Part of Weekly Construction Report				
7	01 31 19	Updated and current submittal register	Weekly meeting			maintained by ARCADIS	
8	01 31 19	Updated and current construction schedule	Weekly meeting	08/03/11	I - 8/3/11	provided on weekly project calls	Submitted 8/3/11
9	01 32 23	Preconstruction Survey for North Lagoon Wetland (Topographic)	3 weeks prior to excavation	07/22/11	I-7/25/11		
10	01 32 23	Preconstruction Survey for Sinking Pond (Bathymetric and Topographic)	3 weeks prior to dredging	08/01/11	I-8/2/11		
11	01 32 23	Post-Removal Interim Survey for North Lagoon Wetland (Topographic)	2 weeks after completion	08/31/11	N-9/1/11		

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Sediment Construction Summary and Final Sediment Remedial Action Report
W.R. Grace Superfund Site
Acton-Concord, Massachusetts

Item No.	Section	Submittal Description	Submittal Timeline	Date Received	Status/Date (see Note 1)	Notes	USEPA Approval (shading = items requested for review)
12	01 32 23	Post-Removal Survey for Sinking Pond (Bathymetric and Topographic)	2 weeks after completion	9/26/11; 9/26/11; 10/8/11; 10/17/11;	R-9/30/11 (1); N-10/08/11 (2, 3&4); N-10/17/11;	Area 1 submitted 9/26; Area 3 on 9/26 (revised to new format on 10/17); Areas 2 and 4 on 10/08; Areas 1through 5 on 10/17; see also item 14.	
13	01 32 23	Post-Construction Survey for North Lagoon Wetland (Topographic)	2 weeks after completion	10/17/11	R-10/17/11		
14	01 32 23	Post-Construction Survey for Sinking Pond (Bathymetric and Topographic)	2 weeks after completion	12/6/2011; 01/03/12	S-12/11/11; N-01/13/12		
15	01 32 23	Survey Records	Project closeout			Final NLW certified survey covered in item 13; final SP certified survey covered in item 14.	
16	01 77 00	All documentation pertaining to all components	Prior to Pre-Final Certification Inspection	12/16/11	I-12/16/11	final volumes of imported materials (sandy silt for check dam, portland);	
				02/01/12	I-02/01/12	surveyor certified survey documents;	
						Final volumes of actual dredged materials: ARCADIS maintained tables based on information provided by DAC.	
						other items covered elsewhere.	
17	01 77 00	Operational items	Upon final acceptance			n/a	
18	01 78 39	Construction Drawings	Prior to Pre-Final Certification Inspection	07/15/11	N-7/20/11	as-built of sediment dewatering pad submitted as part of RFI 003.	
				10/17/11	R-10/18/11	as-built of check dam as part of RFI 007.	
				12/16/11	I-12/16/11	planting restoration as-built.	
19	02 51 29	Equipment Decontamination Documentation Report	2 days prior demobilization	12/16/11	I-12/16/11	Partial report submitted 12/16; other records destroyed by vandalism. Separate documentation of cleaning/inspection provided by ARCADIS	
20	02 61 00	Misplaced Material Report	Within 24 hours of an incident			n/a	
21	02 61 00	Off-Site Disposal Report	Upon final acceptance		I-10/07/11 (NLW); I-11/30/11 (SP).	Bill of Lading for NLW completed on 10/07/11; Bill of Lading for SP completed on 11/30/11.	
				12/16/11	I-12/16/11	documentation for off-site disposal facilities that received NLW and SP cleared vegetation and turbidity curtain.	
22	02 61 13	Misplaced Material Report	Within 24 hours of incident			n/a	
23	31 05 19	Manufacturer's Specifications Sheets	At least 2 weeks prior to use			provided as part of items 30 and 31.	
24	31 23 23	Samples and Related Documentation	At least 4 weeks before use	06/21/11	N-6/23/11	Lab documentation only.	
		Topsoil Characterization Data - New England Specialty Soils Lancaster		7/25/2011 8/25/11 8/30/11 9/9/11 9/30/11 10/19/11	N-7/26/11 N-8/29/11 N-8/31/11 R-9/9/11 R-9/30/11 R-10/20/11	7/25 data for 1st 500 cy; 8/25 data for 2nd 500 cy; 8/30 data for 3rd 500 cy; 9/9 data for 4th 500 cy; 9/30 data for 5th 1000 CY for SP area; 10/19 data for 6th 1000 CY for SP;	1st data - 7/29/2011 2nd & 3rd data - 9/1/11 4th data - 9/12/11 5th data - 10/4/11 6th data 10/19/11
		Dense Grade Characterization Data - PJ Keating Lunenburg		07/27/11	N-8/1/11	approved for use in Staging Area only	
25	32 72 00	Certificates from seed vendors	2 weeks prior to planting	09/23/11	N-10/4/11	included with Site Seeding & Planting Plan	
26	32 72 00	Certificates from plant stock supplier	4 weeks prior to planting	09/23/11	N-10/4/11	included with Site Seeding & Planting Plan	
27	32 72 00	Maintenance Data	Prior to Pre-Final Certification Inspection	09/23/11	N-10/4/11	included with Site Seeding & Planting Plan	
28	34 72 00	Final truck volume counts and measurement summary tables	Prior to Pre-Final Certification Inspection			Provided to AUS at the end of each trucking day; also documented in Bills of Lading (item 21).	
29	44 41 13	Spill Response Report	Within 72 hours of a spill			n/a	
30	var.	Material Information (cut sheets)				Provided as part of other submittals.	
	31 25 13	Turbidity Curtain		06/07/11	R-6/16/11	Enviro-USA SAVE-T in lieu of Brockton Spilldam	7/8/2011
31	var.	Miscellaneous					
		Sediment Processing Pad Liner Installation Report		07/29/11	R-7/29/11		
		Site Planting & Seeding Plan		09/30/11	N-10/4/11	includes approval of erosion control fabric ECSC-2B; includes addition of rye and oat cover crop seed	

Notes:

1. Submittal status nomenclature is as follows:
   - R - Reviewed
   - N - Reviewed and Noted
   - S - Resubmit
   - J - Rejected
   - I - For Information Only
2. Additional submittals may be required by the Engineer based on actual conditions encountered at the time of construction.

Attachment B

Pre-Construction Meeting Minutes

de maximis, inc.

TO: **MEMO TO FILE**

FROM: Clayton Smith

Cc: Attendees

DATE: June 24, 2011

RE: W.R. Grace Superfund Site, Acton MA. – Operable Unit No. 3 / Sediment Remedy Pre-Construction Meeting Minutes - Draft

---

On June 23, 2011, the Pre-Construction Meeting for the W.R. Grace Superfund Site – Operable Unit No. 3 - Sediment Remedy was conducted at the Site. The meeting sign-in sheet is attached. Attending the meeting were:

1) AECOM (Aecom): Kris Carbonneau, Nick Rudolfo, Barbara Weir.
2) ARCADIS (Arcadis): Irina Calante, Jeff Holden.
3) D.A. Collins Environmental (Collins): Steve Bullock, Bruce Hebbel.
4) de maximis, inc. (de maximis): Thor Helgason, Clayton Smith.
5) US EPA (EPA): Derrick Golden.

A summary of the meeting follows:

I. Introductions / Project Team and Lines of Communication

A. The participants discussed the procedure for preparation, distribution, revision and completion of meeting minutes. De maximis will prepare the minutes and distribute to meeting attendees. Comments, if any, should be provided to de maximis prior to the next meeting. A brief discussion of the previous meeting minutes will be conducted at the subsequent Progress Meeting. Once finalized, the minutes will be posted on Project Portal.

B. De maximis noted that weekly construction progress meetings will be held Tuesdays at 10:00 AM eastern. De maximis will prepare and distribute a draft agenda for the meetings with dial-in information for those wishing participate remotely.

C. De maximis distributed a draft site contact list. That list will be updated as needed during the course of work and can be used for emergency notifications or general site knowledge as necessary. An updated contact list dated June 24, based on comments received during the Pre-Construction Meeting, is attached.

D. The participants reviewed the following regarding the project team, roles/responsibilities and lines of communication:
   1) On behalf of W.R. Grace, Remedium Group, Inc (Remedium) is a subsidiary of W.R. Grace that handles their environmental matters. Remedium reports directly to W.R. Grace.
   2) On behalf of Remedium, de maximis is the Project Manager for this work and will provide Construction Management and oversight during RA construction. The designated Project Manager (PM) is Thor Helgason, and is the overall point of contact for the Acton Site, and primary liaison between the EPA, MADEP and Remedium. The Construction Manager (CM) for this work is Clayton Smith, who will monitor construction activities, conduct progress meetings, and communicate construction progress to the de maximis PM and Remedium as

needed.

3) EPA is the lead regulatory agency, and primary contact with the public. All communication between the EPA and the project Team will be through de maximis. AECOM is EPA's contractor for technical oversight.
4) The MADEP will also be on-site to review and monitor work progress as necessary.
5) Arcadis is the engineer for the project. Arcadis will review Contractor project submittals to insure conformance with project requirements; provide technical support and construction quality assurance (CQA); and prepare the Final Construction Report. Mr. Jeff Holden, PE is the lead Engineer; Ms. Irina Calante is the on-site CQA Inspector, and Mr. Mark Gravelding, PE is the Engineer-of Record.
6) Collins is the primary RA Contractor and is responsible for completing all construction activities associated with design drawings, specifications and related documents. Collins will direct all formal communication to de maximis. Mr. Bruce Hebbel is their Project Manager and Mr. Steve Bullock is their Site Superintendent and Health & Safety Officer.

II. Overview of Work Schedule and Activities

A. A discussion of the construction schedule dated May 20, 2011 took place. Collins noted the schedule will be revised now that they have secured the ability to cross the MBTA tracks and the revised schedule will provide actual start dates for tasks conducted to date and tasks to be performed in the near future. The construction schedule will be updated during the course of work as necessary.

B. De maximis provided an overview of Site work completed to date and a discussion of upcoming activities:

1) Collins mobilized equipment and manpower to prepare the staging areas.
2) Collins attended the MBTA-required railroad training for their work force on June 15 and June 17. The training is provided by the MBTA. Records of all personnel receiving the training will be maintained on-site. On June 22 Collins mobilized an MBTA flagman to allow members of Collins' work force to cross the tracks.
3) Collins began mobilization of field office trailers and support facilities.
4) Collins' surveyor, Thew & Associates, began establishing site control and verifying existing benchmarks.
5) Collins began installation of erosion and sediment controls.
6) Collins began installation of site security fencing.
7) Collins noted that they plan to install the railroad crossing on Monday June 27. It will take a few days to complete the crossing detail and once the asphalt layer has been placed, equipment will be allowed to cross the tracks. The crossing will be secured during off-hours by a locked gate.
8) Collins will start clearing/grubbing and installation of haul roads.

III. Project Submittals

A. EPA AECOM and MADEP will have access, via Project Portal, to all project submittals that have been approved by the Engineer in accordance with the specifications. Those submittals are in a folder titled "Submittal Reviewed or as Noted". A hard copy of each submittal will be maintained in the de maximis field office.

B. Arcadis will keep track of submittals using a Submittal Register that will be periodically updated and provided to the Team.

C. Regarding the Contractors Operation Plan, De maximis noted that the Contactors Operation Plan contains numerous, distinct components and that as those components (i.e. Sediment & Erosion Control Plan, Temporary Facilities Plan, Site Clearing plan, etc.). are prepared, they will be reviewed as they are submitted.

D. Collins Health & Safety Plan has been uploaded into the "Submittal Reviewed or as Noted" folder.

IV. Construction Quality Control (CQC) / Construction Quality Assurance (CQA)

A. Collins will be responsible for Construction Quality Control (CQC) and testing including, but not necessarily limited to the following;
   1) Collins will confirm site survey control and conduct all surveying necessary to complete the work and maintain as-built record documents.
   2) Collins will maintain daily reports of work completed.

B. Arcadis will have on-site a CQA inspector whose responsibilities will be to perform site inspections to confirm work is being done according to project plans and specifications including, but not necessarily limited to turbidity monitoring and confirmatory sampling to verify attainment of clean-up levels in Sinking Pond.

C. Arcadis provided a complete set of Plans and Specifications to each company and the EPA attending the meeting. Those Plans and Specification will be uploaded to the Project Portal. De maximis noted that minor changes to the original Plan and Specifications were incorporated during the bid process. The primary change to the Specifications was to allow for the Contractor to use the New Treatment Plant for treatment of construction water decanted during the sediment removal work.

V. Health & Safety

A. De maximis noted that Collins typically conducts tail-gate safety meeting shortly after 6:30 am each morning so that they are ready to start work promptly at 7:00 AM.

B. Any accident will be reported to the Site Health & Safety Officer as soon as possible and the Health & Safety Officer will provide prompt notification to de maximis of any incidents or accidents who will then report the nature of the issue to Remedium and EPA, as necessary.

C. All workers entering the MBTA right-of-way are required to complete the MBTA "Contractor Safety Training". The MBTA flagman will also provide a briefing to those personnel that will be crossing or entering the railroad "fouling Area" (a 15-foot buffer t from the centerline of the nearest rail).

D. Site security fencing will be placed around the support zones.

E. Regarding truck traffic during the hauling of the stabilized sediment, Collins' hauler has confirmed their preferred route to Interstate 495. Collins will contact Detective Cowan with the Acton Police Department to confirm the route.

VI. Identification of Problems that May Impeded Planned Progress

A. None noted.

VII. Other Business

A. The next weekly construction progress meetings will be conducted on Tuesday, June 28 at 10:00 AM eastern. De maximis will prepare and distribute a draft agenda and dial-in number for the meeting.

The meeting adjourned.

Attachment C

Construction Drawings

CITY: SYRACUSE-NY DIV/GROUP: 141/ENV DB: B.GETTS LD: B.GETTS PIC: PM: TM: LYR:ON=*;OFF=*REF*
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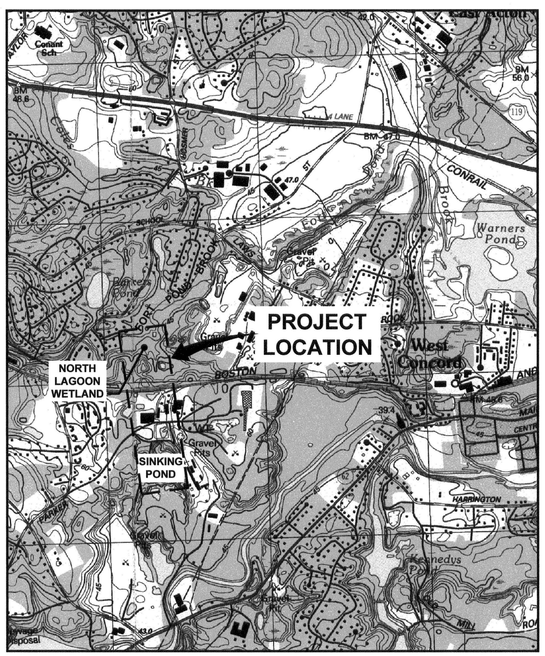
DESIGN DRAWINGS

CONSTRUCTION DRAWINGS
CONSTRUCTION DRAWINGS ARE BASED ON A FULL SET OF FINAL DESIGN DRAWINGS ANNOTATED TO INDICATE AS-BUILT CONDITIONS. THE CONSTRUCTION DRAWINGS ACCOMPANY THE "SEDIMENT CONSTRUCTION SUMMARY AND FINAL SEDIMENT REMEDIAL ACTION REPORT." TO THE BEST OF OUR KNOWLEDGE, INFORMATION AND BELIEF, THESE CONSTRUCTION DRAWINGS SUBSTANTIALLY REPRESENT THE PROJECT AS CONSTRUCTED.

FINAL (100%)
SEDIMENT REMEDIAL DESIGN REPORT
OPERABLE UNIT 3



REFERENCE: MASSACHUSETTS GEOGRAPHIC INFORMATION SYSTEM, 1987, at http://www.mass.gov/mgis

LOCATION MAP
NOT TO SCALE

DATE ISSUED
MARCH 2011

W.R. GRACE (ACTON PLANT) SUPERFUND SITE
ACTON-CONCORD, MASSACHUSETTS

RECORD DRAWINGS
TO THE BEST OF OUR KNOWLEDGE, INFORMATION AND BELIEF, THESE RECORD DRAWINGS SUBSTANTIALLY REPRESENT THE PROJECT AS CONSTRUCTED.

DATE MOG BY 3/1/12

ARCADIS

ARCADIS U.S., INC.

KEY CONTACTS:

PROJECT SITE:
W.R. GRACE SUPERFUND SITE
ACTON–CONCORD, MASSACHUSETTS
TELEPHONE: 781.642.8775
THOR HELGASON
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ENGINEER:
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6723 TOWPATH ROAD, P.O. BOX 66
SYRACUSE, NY 13214
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MARK O. GRAVELDING, PE

INDEX TO DRAWINGS

COVER
1 GENERAL NOTES, DEMOLITION SCHEDULE, AND LEGEND
2 EXISTING CONDITIONS
3 SITE LAYOUT
4 TEMPORARY FACILITIES DETAILS
5 EXCAVATION PLAN - SINKING POND
6 SINKING POND SECTIONS
7 EXCAVATION PLAN - NORTH LAGOON WETLAND
8 SITE RESTORATION PLAN - SINKING POND
9 INLET PLANTING PLAN
10 RESTORATION SECTIONS - SINKING POND
11 SITE RESTORATION PLAN - NORTH LAGOON WETLAND
12 RESTORATION SECTIONS - NORTH LAGOON WETLAND
13 TYPICAL DETAILS

GENERAL NOTES:

1. CONTRACTOR SHALL PERFORM THE WORK CONSISTENT WITH THE CONTRACT DOCUMENTS.
2. HORIZONTAL DATUM: STATE PLANE MASSACHUSETTS MAINLAND NORTH AMERICAN DATUM 1983 (NAD 83).
3. THE ELEVATIONS DEPICTED HEREON WERE BASED ON THE NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD29). STARTING BENCHMARK: RM 29, ELEVATION = 138.85. TOP OF DISK ON NORTHEAST ABUTMENT OF MAIN STREET BRIDGE OVER THE ASSABET RIVER, ABOUT 200 FEET EAST OF CORPORATE LIMITS. REFERENCE IS MADE TO FLOOD INSURANCE RATE MAP (FIRM). COMMUNITY PANEL NUMBER 250189 00108, EFFECTIVE DATE: JUNE 3, 1988.
4. CONTOURS IN AND AROUND SINKING POND WERE BASED ON LAND SURVEY CONDUCTED BY NORWOOD ENGINEERING IN APRIL 1994. AERIAL SURVEY WAS CONDUCTED BY COL-EAST IN 1998 FOR SINKING POND AND NORTH LAGOON WETLAND. SUPPLEMENTAL TOPOGRAPHY, SITE DETAILS, AND SURFACE IMPROVEMENTS WERE OBTAINED FROM A LAND SURVEY BY MERIDIAN ASSOCIATES, INC. IN 2007 AND AN AERIAL PHOTOGRAMETRIC SURVEY PERFORMED BY COL-EAST, INC., FLOWN ON APRIL 11, 2007.
5. ALL LOCATIONS, INCLUDING PROPERTY LINES, ARE APPROXIMATE, REFLECT AVAILABLE INFORMATION, ARE PROVIDED FOR REFERENCE ONLY, AND ARE SUBJECT TO FIELD VERIFICATION. EASEMENTS AND RIGHTS-OF-WAY ARE NOT SHOWN.
6. THE CONTRACTOR SHALL PROMPTLY NOTIFY THE OWNER AND PROJECT ENGINEER, UPON DISCOVERY, AND BEFORE CONDITIONS ARE FURTHER DISTURBED, OF PHYSICAL CONDITIONS AT THE SITE WHICH DIFFER MATERIALLY FROM THOSE INDICATED ON THE CONSTRUCTION DOCUMENTS AND REFERENCE DOCUMENTS.
7. THE CONTRACTOR SHALL PROMPTLY, AFTER DISCOVERING, GIVE WRITTEN AND ORAL NOTICE TO THE OWNER AND PROJECT ENGINEER OF DELAYS IN PROJECT SCHEDULE DUE TO EQUIPMENT MALFUNCTION, WEATHER, OR GENERAL FAILURE TO MEET PRODUCTION STANDARDS.
8. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL SAFETY PROGRAMS FOR THEIR EMPLOYEES, SUBCONTRACTORS, AND ANY OTHER PERSONS WHO MAY BE AFFECTED THEREBY. THIS INCLUDES THE PREPARATION OF A SITE-SPECIFIC HASP PRIOR TO ANY WORK AT THE SITE.
9. THE CONTRACTOR SHALL COMPLY WITH ALL REQUIREMENTS OF ANY ISSUED PERMITS AND ANY APPLICABLE STATE AND FEDERAL LAWS AND REGULATIONS.
10. THE CONTRACTOR SHALL PERFORM AND MAINTAIN SURVEY CONTROL THROUGH THE COURSE OF THE WORK. SURVEY DOCUMENTATION OF PRE-EXCAVATION, POST-EXCAVATION, AND RESTORED CONDITIONS SHALL BE PREPARED AND CERTIFIED BY A LICENSED PROFESSIONAL LAND SURVEYOR.
11. CONTRACTOR TO SIZE THE TEMPORARY FACILITIES AREA APPROPRIATELY TO SUPPORT THE CONSTRUCTION ACTIVITIES.
12. SECURITY FENCING SHALL BE INSTALLED AROUND THE TEMPORARY FACILITIES PER THE SPECIFICATIONS.
13. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE INSTALLATION AND MAINTENANCE OF ALL NECESSARY TEMPORARY EROSION AND SEDIMENT CONTROLS THROUGHOUT CONSTRUCTION IN ACCORDANCE WITH THE DESIGN DRAWINGS AND TECHNICAL SPECIFICATIONS.
14. THE CONTRACTOR SHALL IMPLEMENT APPROPRIATE BEST MANAGEMENT PRACTICES (DUST CONTROL MEASURES) AT ALL TIMES TO MINIMIZE FUGITIVE DUST.
15. THE CONTRACTOR SHALL UTILIZE GOOD HOUSEKEEPING PRACTICES TO MAINTAIN A NEAT AND ORDERLY SITE AT ALL TIMES DURING CONSTRUCTION.
16. THE CONTRACTOR SHALL PREVENT TRACKING OF SOIL MATERIALS ONTO OFF-SITE AREAS. ANY SOIL MATERIALS ACCIDENTALLY TRACKED OR OTHERWISE SPILLED OR DROPPED ONTO OFF-SITE AREAS SHALL BE IMMEDIATELY CLEANED UP BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
17. SITE ACCESS SHALL BE FROM INDEPENDENCE ROAD.
18. THE CONTRACTOR IS RESPONSIBLE FOR THE PROTECTION AND/OR MAINTENANCE OF ABOVE- AND UNDERGROUND UTILITIES DURING CONSTRUCTION. THE LOCATION OF ALL ABOVE- AND UNDERGROUND UTILITIES MUST BE VERIFIED IN THE FIELD PRIOR TO COMMENCING CONSTRUCTION. THE CONTRACTOR SHALL CONTACT DIG SAFE SYSTEM, INC. (1-800-344-7233) AND ALL APPLICABLE UTILITY COMPANIES FOR LOCATION OF UNDERGROUND UTILITIES. THE CONTRACTOR SHALL COORDINATE WITH THE APPROPRIATE UTILITY COMPANIES FOR THE TEMPORARY REMOVAL, RELOCATION, AND REPLACEMENT OF ANY UTILITY POLES, GUY WIRES, UNDERGROUND UTILITIES, AND/OR OVERHEAD WIRES THAT FALL WITHIN THE LIMITS OF CONSTRUCTION, OR THAT MAY INTERFERE WITH THE WORK.
19. CONSTRUCTION FENCING SHALL BE INSTALLED AROUND ACCESSIBLE PORTIONS OF THE LIMITS OF WORK.
20. THE CONTRACTOR SHALL FURNISH ALL LABOR, MATERIALS, TOOLS, EQUIPMENT, ACCESSORIES, AND APPURTENANCES NECESSARY TO COMPLETE EXCAVATION OF SOIL/SEDIMENT AND RELATED WORK SHOWN ON THE CONSTRUCTION DRAWINGS.
21. UPON COMPLETION OF CONSTRUCTION, THE WORK AREA SHALL BE LEFT IN A CLEAN, NEAT, AND ORDERLY CONDITION.
22. CONTRACTOR SHALL BEAR ALL COSTS AND RESPONSIBILITY FOR REPAIRS TO ANY ON-SITE AND/OR OFF-SITE FEATURES (UTILITIES, SIDEWALKS, ROADS, ETC.) AND/OR SURFACES DAMAGED AS A RESULT OF CONSTRUCTION ACTIVITIES.
23. ANY TREE AT OR IMMEDIATELY ADJACENT TO ELEVATION 144.5 CONTOUR SURROUNDING SINKING POND THAT WILL NOT HINDER WORK ACTIVITIES IS DESIGNATED TO BE SAVED AND SHALL BE PROTECTED TO THE EXTENT PRACTICABLE WITHOUT IMPACTING SEDIMENT REMOVAL ACTIVITIES. TREES BELOW THE ELEVATION 144.5 SHALL BE HANDLED IN ACCORDANCE WITH SECTION 31 12 00 – DEBRIS REMOVAL.
24. THE LOCATIONS AND SIZES OF EXISTING FACILITIES, INCLUDING BUT NOT LIMITED TO RAILROAD TRACKS, MONITORING WELLS, PIPES AND OUTFALLS, ARE ONLY APPROXIMATE AND THE CONTRACTOR SHALL CONDUCT ITS OPERATIONS WITH CAUTION AND VERIFY AS TO THE ACCURACY OF THE INFORMATION GIVEN.

DEMOLITION SCHEDULE

NO.	ITEM	ACTION
1	MASSACHUSETTS BAY TRANSPORTATION AUTHORITY RAILROAD	PROTECT
2	PIEZOMETER PZ-04	PROTECT
3	MONITORING WELL AR-03 MONITORING WELL AR-08 MONITORING WELL AR-16 MONITORING WELL AR-17 MONITORING WELL B-04 MONITORING WELL G-4 MONITORING WELL OSA-06 MONITORING WELL OSA-07 MONITORING WELL OSA-12 MONITORING WELL OSA-13 MONITORING WELL PL-4 MONITORING WELL PT-12 MONITORING WELL TW1-78 MONITORING WELL TW2-78	PROTECT
4	ISOLATED FRESHWATER VEGETATED WETLAND	PROTECT
5	FORT POND BROOK	PROTECT

DEMOLITION SCHEDULE NOTES:

1. SITE FEATURES ARE SHOWN ON DRAWING 2.
2. PROTECT ALL ITEMS NOT NOTED ON THE DEMOLITION SCHEDULE UNLESS INSTRUCTED OTHERWISE BY THE OWNER. IF A FEATURE IS DAMAGED AS A RESULT OF CONSTRUCTION ACTIVITIES, THE CONTRACTOR SHALL REPLACE THE ITEM AT THEIR OWN EXPENSE WITH SAME OR EQUIVALENT MATERIALS.

GENERAL LEGEND:

- PROPERTY BOUNDARY
- 155 CONTOUR
- 127 BATHYMETRIC CONTOUR
- LIMIT OF SURVEY
- EDGE OF WATER
- WETLAND BOUNDARY
- NORTH LAGOON WETLAND BOUNDARY
- BORDERING VEGETATED WETLAND (BVW) BOUNDARY (310 CMR 10.55)
- BANK (310 CMR 10.54) AND BVW BOUNDARY (310 CMR 10.55)
- EXISTING PAVED ROAD
- EXISTING GRAVEL PATH
- EXISTING FENCE
- RAILROAD TRACK
- OH OVERHEAD ELECTRIC
- VEGETATION/TREE LINE
- TREE
- EXISTING MONITORING WELL
- EXISTING PIEZOMETER

RECORD DRAWINGS
TO THE BEST OF OUR KNOWLEDGE, INFORMATION AND BELIEF, THESE RECORD DRAWINGS SUBSTANTIALLY REPRESENT THE PROJECT AS CONSTRUCTED.

DATE MOGt BY 3/1/12

CITY: SYRACUSE-NY DIV/GROUP: 141/ENV DB: B.GETTS LD: PIC: PM: TM: LYR:ON=*;OFF=*REF*
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XREFS: 77204X00 IMAGES: PROJECTNAME: ----

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

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Professional Engineer's Name: MARK O. GRAVELDING
Professional Engineer's No.: 42983

State	Date Signed	Project Mgr.
MA	3/15/2011	JSH
Designed by	Drawn by	Checked by
MAD	BGG	MJB

COMMONWEALTH OF MASSACHUSETTS MARK O. GRAVELDING No. 42983 REGISTERED PROFESSIONAL ENGINEER

ARCADIS
ARCADIS U.S., INC.

W.R. GRACE SUPERFUND SITE • ACTON-CONCORD, MASSACHUSETTS
FINAL (100%) SEDIMENT REMEDIAL DESIGN REPORT

GENERAL NOTES, DEMOLITION SCHEDULE, AND LEGEND

ARCADIS Project No. B0077204.0000.00032
Date MARCH 2011

ARCADIS
6723 Towpath Road
P.O. Box 66
Syracuse, NY 13214
Tel. 315.446.9120

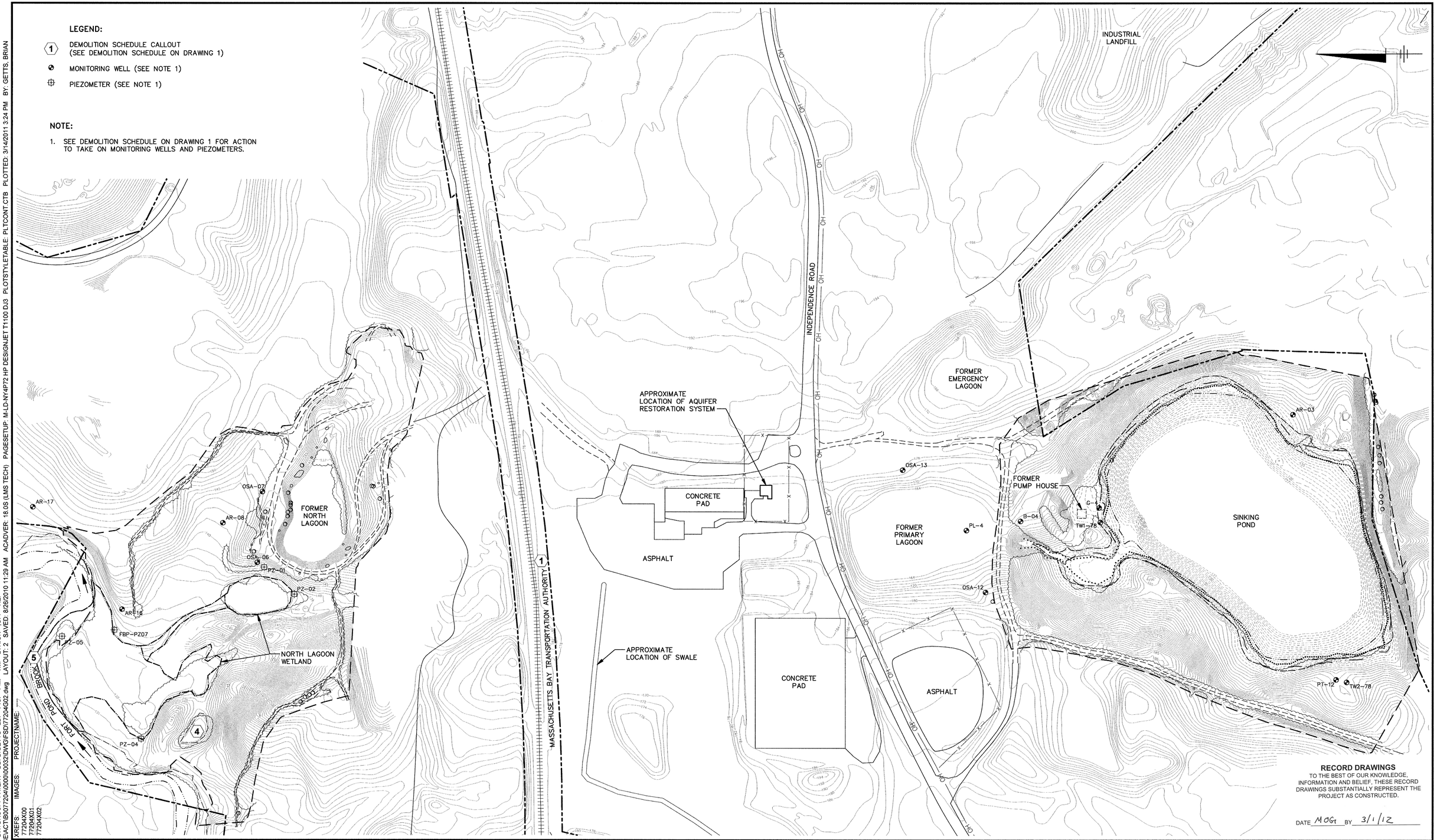
1

LEGEND:

- (1) DEMOLITION SCHEDULE CALLOUT (SEE DEMOLITION SCHEDULE ON DRAWING 1)
- MONITORING WELL (SEE NOTE 1)
- PIEZOMETER (SEE NOTE 1)

NOTE:

1. SEE DEMOLITION SCHEDULE ON DRAWING 1 FOR ACTION TO TAKE ON MONITORING WELLS AND PIEZOMETERS.



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DATE MOGT BY 3/1/12

1"=100' — 100' 0 100' 200'

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Professional Engineer's Name: MARK O. GRAVELDING
Professional Engineer's No.: 42983

State	Date Signed	Project Mgr.
MA	3/15/2011	JSH
Designed by MAD	Drawn by BGG	Checked by MJB

COMMONWEALTH OF MASSACHUSETTS — MARK O. GRAVELDING — No. 42983 — REGISTERED PROFESSIONAL ENGINEER

ARCADIS

ARCADIS U.S., INC.

W.R. GRACE SUPERFUND SITE • ACTON-CONCORD, MASSACHUSETTS

FINAL (100%) SEDIMENT REMEDIAL DESIGN REPORT

EXISTING CONDITIONS

ARCADIS Project No. B0077204.0000.00032

Date MARCH 2011

ARCADIS
6723 Towpath Road
P.O. Box 66
Syracuse, NY 13214
Tel. 315.446.9120

2

CITY: SYRACUSE-NY DIV/GROUP: 141ENV DB: B.GETTS LD: PIC: PM: TM: LYR:ON=*;OFF=*REF*
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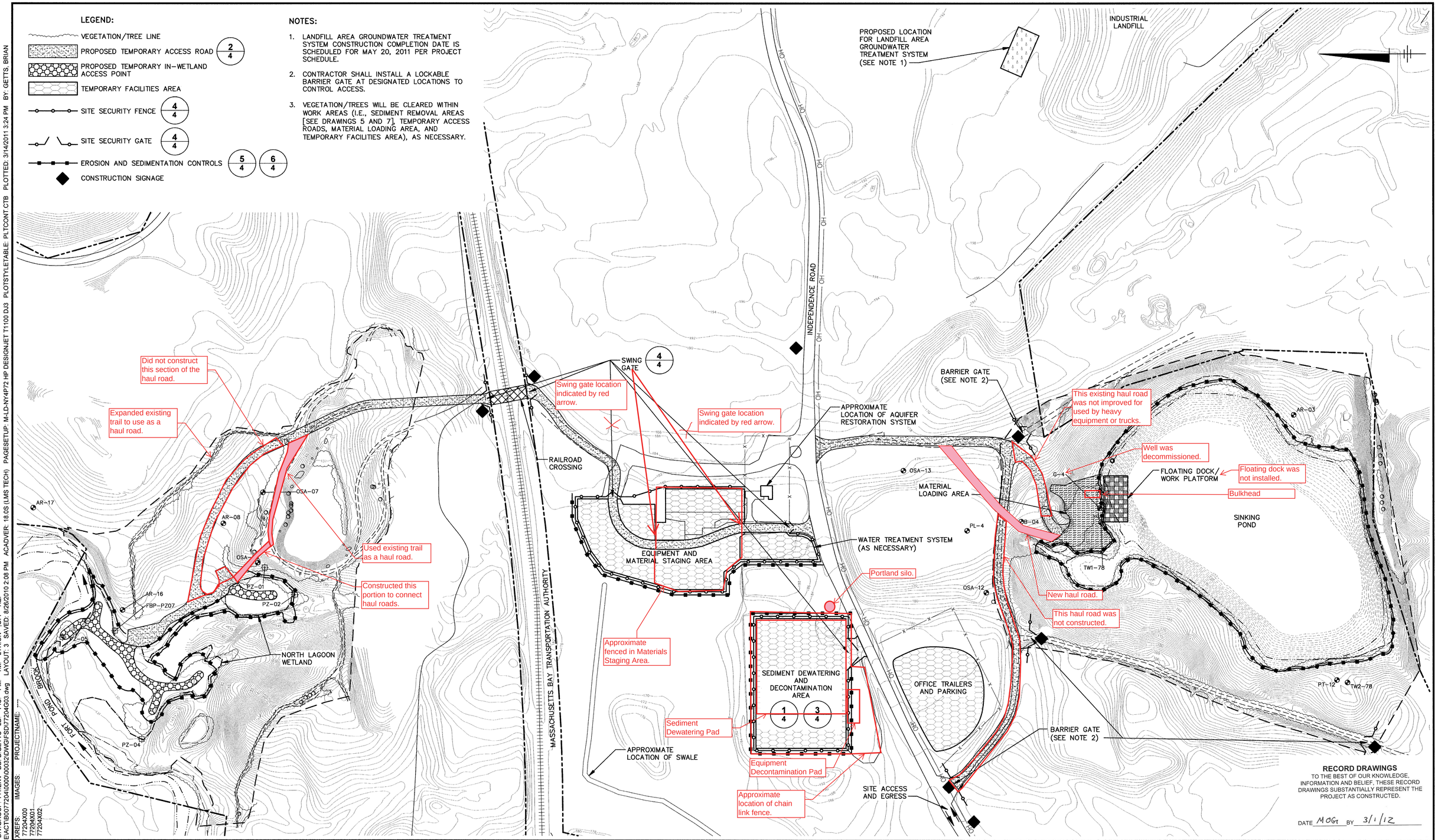
XREFS: 77204X00 77204X01 77204X02
IMAGES:
PROJECTNAME:

LEGEND:

- VEGETATION/TREE LINE
- PROPOSED TEMPORARY ACCESS ROAD (2/4)
- PROPOSED TEMPORARY IN-WETLAND ACCESS POINT
- TEMPORARY FACILITIES AREA
- SITE SECURITY FENCE (4/4)
- SITE SECURITY GATE (4/4)
- EROSION AND SEDIMENTATION CONTROLS (5/4) (6/4)
- CONSTRUCTION SIGNAGE

NOTES:

1. LANDFILL AREA GROUNDWATER TREATMENT SYSTEM CONSTRUCTION COMPLETION DATE IS SCHEDULED FOR MAY 20, 2011 PER PROJECT SCHEDULE.
2. CONTRACTOR SHALL INSTALL A LOCKABLE BARRIER GATE AT DESIGNATED LOCATIONS TO CONTROL ACCESS.
3. VEGETATION/TREES WILL BE CLEARED WITHIN WORK AREAS (I.E., SEDIMENT REMOVAL AREAS [SEE DRAWINGS 5 AND 7], TEMPORARY ACCESS ROADS, MATERIAL LOADING AREA, AND TEMPORARY FACILITIES AREA), AS NECESSARY.



RECORD DRAWINGS
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DATE MOGR BY 3/1/12

1"=100' 100' 0 100' 200'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

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Professional Engineer's Name: MARK O. GRAVELDING
Professional Engineer's No.: 42983

State	Date Signed	Project Mgr.
MA	3/15/2011	JSH
Designed by MAD	Drawn by BGG	Checked by MJB

COMMONWEALTH OF MASSACHUSETTS MARK O. GRAVELDING No. 42983 REGISTERED PROFESSIONAL ENGINEER

ARCADIS

ARCADIS U.S., INC.

W.R. GRACE SUPERFUND SITE • ACTON-CONCORD, MASSACHUSETTS
FINAL (100%) SEDIMENT REMEDIAL DESIGN REPORT

SITE LAYOUT

ARCADIS Project No. B0077204.0000.00032
Date MARCH 2011
ARCADIS 6723 Towpath Road P.O. Box 66 Syracuse, NY 13214 Tel. 315.446.9120

3

CITY: SYRACUSE-NY DIV/GROUP: 141ENV DB: B.GETTS LD: PIC: PM: TM: LYR:ON=*;OFF=*REF*
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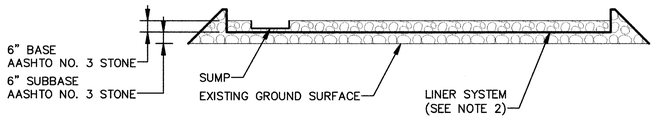


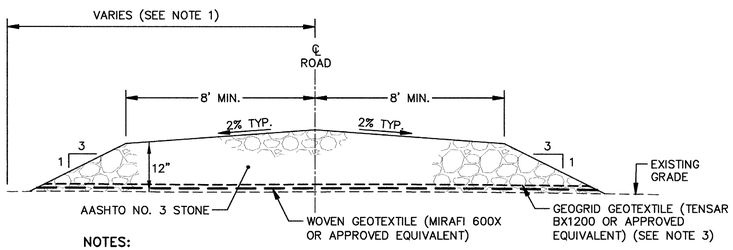
NOTES:

1. PLACE LINER SYSTEM (CONSISTING OF NON-WOVEN GEOTEXTILE FABRIC, SEAMED 40 MIL HDPE LINER, AND NON-WOVEN GEOTEXTILE FABRIC) OVER THE SUBBASE. NON-WOVEN GEOTEXTILE FABRIC TO BE MIRAFI 180N OR APPROVED EQUIVALENT
2. THE SEDIMENT DEWATERING AREA SHALL BE SLOPED TO A COLLECTION SUMP TO FACILITATE THE COLLECTION OF CONSTRUCTION WATER.
3. UPON COMPLETION OF CONSTRUCTION ACTIVITIES, THE SEDIMENT DEWATERING AREA, INCLUDING LINER, SHALL BE REMOVED FOR OFFSITE DISPOSAL AT AN APPROVED AND LICENSED NON-HAZARDOUS FACILITY.

SEDIMENT DEWATERING AREA (1)

NOT TO SCALE

Sediment Dewatering Pad constructed per RFI 003.

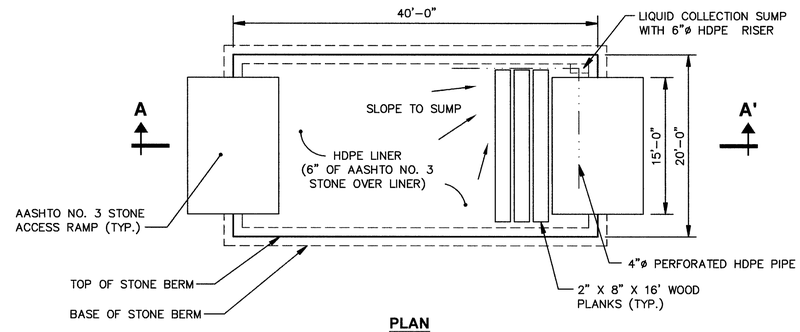


NOTES:

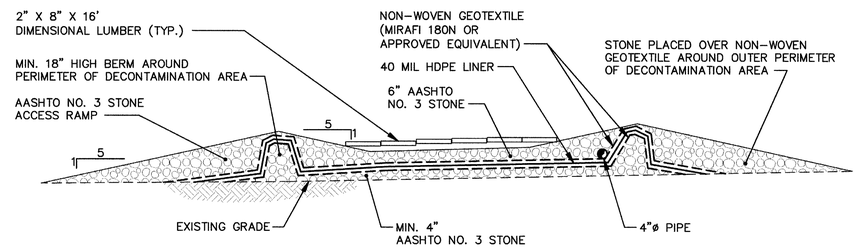
1. DIMENSION VARIES TO ACCOMMODATE EXISTING FEATURES AND TOPOGRAPHY.
2. PLACEMENT OF FILL FOR ACCESS ROADS SHALL BE AS REQUIRED TO SUPPORT CONSTRUCTION EQUIPMENT.
3. GEOGRID GEOTEXTILE MAY BE USED IN CONJUNCTION WITH WOVEN GEOTEXTILE IN AREAS WITH SOFT SOIL.

ACCESS ROAD TYPICAL SECTION (2)

NOT TO SCALE



PLAN



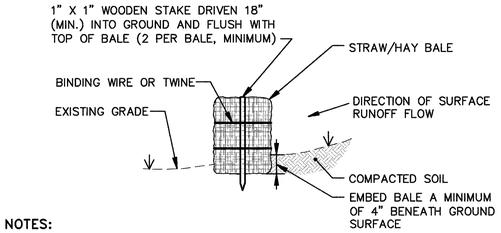
SECTION A-A'

NOTES:

1. DECONTAMINATION AREA SHALL HAVE A GENERAL SLOPE TOWARD A COLLECTION SUMP TO FACILITATE THE COLLECTION OF WASH FLUIDS. FLUIDS SHALL BE PUMPED FROM COLLECTION SUMP INTO A TEMPORARY STORAGE TANK FOR SUBSEQUENT TREATMENT.
2. DIMENSIONAL LUMBER SHALL BE PLACED ABOVE THE STONE DRAINAGE LAYER THROUGHOUT THE WORKING SURFACE OF THE DECONTAMINATION AREA TO PROVIDE A STABLE SURFACE FOR VEHICLES AND EQUIPMENT TO BE DECONTAMINATED. DAMAGED DIMENSIONAL LUMBER SHALL BE REPLACED DURING CONSTRUCTION ACTIVITIES (AS NECESSARY) TO MAINTAIN STABLE SURFACE.
3. UPON COMPLETION OF CONSTRUCTION ACTIVITIES, THE DECONTAMINATION AREA, INCLUDING LINER, SHALL BE REMOVED FOR OFFSITE DISPOSAL AT AN APPROVED AND LICENSED NON-HAZARDOUS FACILITY.

DECONTAMINATION AREA (3)

NOT TO SCALE

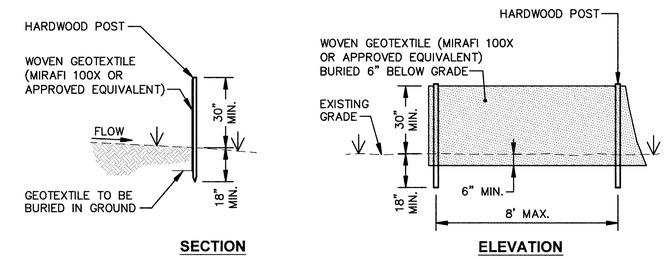


NOTES:

1. STRAW/HAY BALES SHALL ONLY BE USED AS REQUIRED.
2. BALES SHALL BE PLACED TIGHTLY TOGETHER, END TO END, TO FORM A CONTINUOUS BARRIER IN SELECTED AREAS.
3. THE INTEGRITY OF THE STRAW/HAY BALES SHALL BE MAINTAINED FOR THE PROJECT DURATION AND UNTIL ADEQUATE VEGETATIVE GROWTH IS ESTABLISHED.
4. STOCKPILE ANY EXCAVATED MATERIAL ONSITE FOR USE AS BACKFILL UPON COMPLETION.

STRAW/HAY BALE (5)

NOT TO SCALE



SECTION

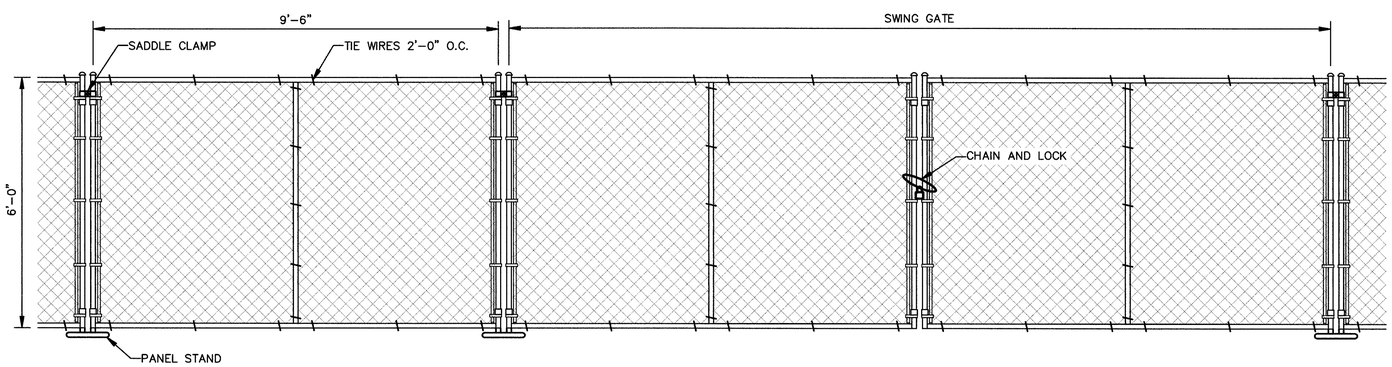
ELEVATION

NOTES:

1. ACCUMULATIONS OF SEDIMENT ADJACENT TO SILT FENCES WILL BE PERIODICALLY REMOVED THROUGHOUT THE DURATION OF CONSTRUCTION ACTIVITIES.
2. SILT ACCUMULATIONS SHALL BE REMOVED WHEN DEPOSITS REACH APPROXIMATELY ONE-HALF OF THE HEIGHT OF SILT FENCE.
3. THE INTEGRITY OF SILT FENCING SHALL BE MAINTAINED FOR THE PROJECT DURATION AND UNTIL ADEQUATE VEGETATIVE GROWTH IS ESTABLISHED.

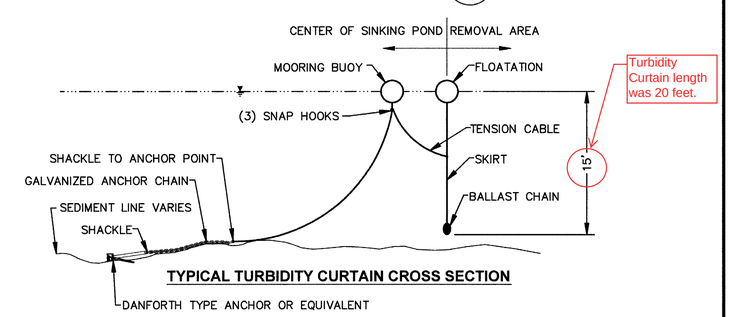
SILT FENCE (6)

NOT TO SCALE



TEMPORARY CONSTRUCTION FENCE AND SWING GATE (4)

NOT TO SCALE



TYPICAL TURBIDITY CURTAIN CROSS SECTION

NOTE:

1. THE TURBIDITY CURTAIN SHALL BE ANCHORED AS NECESSARY TO MAXIMIZE PROTECTION TO THE REMOVAL AREAS.

TURBIDITY CURTAIN (7)

NOT TO SCALE

RECORD DRAWINGS
TO THE BEST OF OUR KNOWLEDGE, INFORMATION AND BELIEF, THESE RECORD DRAWINGS SUBSTANTIALLY REPRESENT THE PROJECT AS CONSTRUCTED.

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Professional Engineer's Name: MARK O. GRAVELDING
Professional Engineer's No.: 42983

State	Date Signed	Project Mgr.
MA	3/15/2011	JSH
Designed by MAD	Drawn by BGG	Checked by MJB

COMMONWEALTH OF MASSACHUSETTS MARK O. GRAVELDING No. 42983 REGISTERED PROFESSIONAL ENGINEER

ARCADIS

ARCADIS U.S., INC.

W.R. GRACE SUPERFUND SITE • ACTON-CONCORD, MASSACHUSETTS
FINAL (100%) SEDIMENT REMEDIAL DESIGN REPORT

TEMPORARY FACILITIES DETAILS

ARCADIS Project No. B0077204.0000.00032
Date MARCH 2011

ARCADIS
6723 Towpath Road
P.O. Box 66
Syracuse, NY 13214
Tel. 315.446.9120

CITY: SYRACUSE-NY DIV/GROUP: 141ENV DB: B.GETTS LD: PIC: PM: TM: LYR:ON=*;OFF=*REF*
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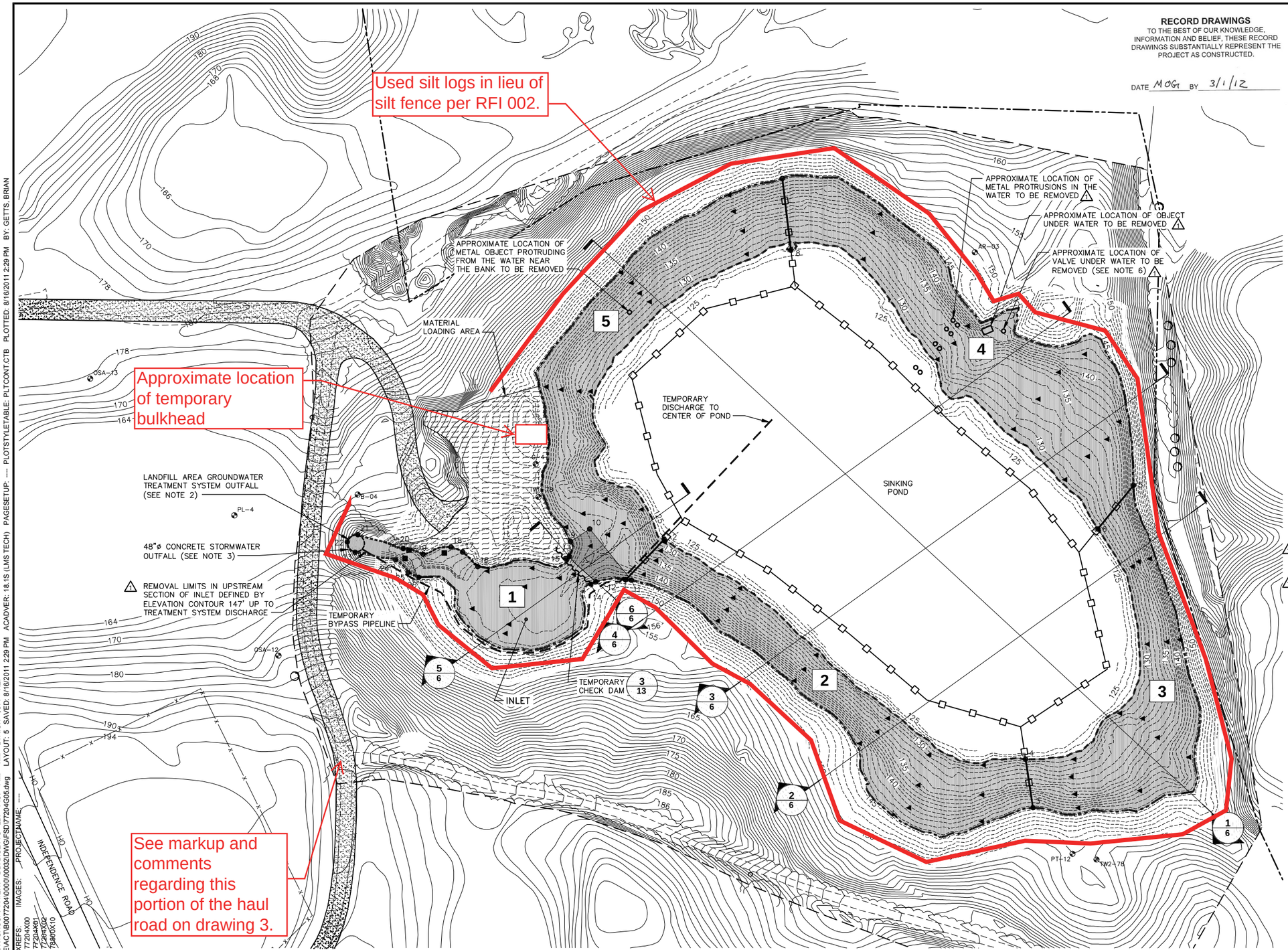
XREFS: 77204X00 IMAGES: PROJECTNAME: ----



RECORD DRAWINGS
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DATE MOGI BY 3/1/12

LEGEND:

- THERMOCLINE (EL. 128)
- HIGH WATER ELEVATION OF POND (ELEV. 144.5) – UPPER EXTENT OF REMOVAL UNLESS OTHERWISE INDICATED
- REMOVAL BOUNDARY EXTENDING ABOVE HIGH WATER ELEVATION △1
- 140 CONTOUR (SEE NOTE 5) △1
- PROPOSED TEMPORARY ACCESS ROAD
- TURBIDITY CURTAIN 7/4
- HYDRAULIC CONTROL STRUCTURE
- 1 FT REMOVAL AREA △1
- 2 FT REMOVAL AREA △1
- 1 SEDIMENT REMOVAL AREA ID
- CONFIRMATION SAMPLE LOCATION △1
- SAMPLE LOCATION ABOVE HIGH WATER ELEVATION REQUIRING REMOVAL △1
- ●1 SURVEY CONTROL POINT

NOTES:

1. THE LOWER LIMIT OF EXCAVATION IN SINKING POND WILL BE ELEVATION 128. THE UPPER LIMIT WILL BE ELEVATION 144.5 EXCEPT AS OTHERWISE SHOWN FOR THE INLET.
2. THE AQUIFER RESTORATION SYSTEM (ARS) OPERATION AND ASSOCIATED DISCHARGE WILL BE TERMINATED PRIOR TO COMMENCEMENT OF THE LANDFILL AREA GROUNDWATER TREATMENT SYSTEM. THE LANDFILL AREA GROUNDWATER TREATMENT SYSTEM PIPE WILL COINCIDE WITH THE FORMER ARS DISCHARGE OUTFALL. THE LANDFILL AREA GROUNDWATER TREATMENT SYSTEM OUTFALL WILL BE ROUTED INTO THE TEMPORARY BYPASS PIPELINE DURING THE COURSE OF THE REMEDIAL ACTION.
3. 48"ø CONCRETE STORMWATER OUTFALL DIMENSIONS BASED ON DRAINAGE AS-BUILT DRAWINGS FROM NORWOOD ENGINEERING CO. INC., JUNE 1997.
4. A WATER QUALITY MONITORING STATION SHALL BE ESTABLISHED WHENEVER WORK IS BEING PERFORMED IN A GIVEN SEDIMENT REMOVAL AREA. THE MONITORING STATION SHALL BE INSTALLED NO FURTHER THAN 100 FEET FROM THE TURBIDITY CURTAIN.
5. △1 TOPOGRAPHY AND BATHYMETRY REVISED CONSISTENT WITH THE PRE-CONSTRUCTION SURVEY PERFORMED BY THEW ASSOCIATES ON JULY 29, 2011.
6. △1 THE CONTRACTOR SHALL CONTACT DIG SAFE SYSTEM, INC. TO DETERMINE THE EXISTING CONDITIONS OF VALVE. FOLLOWING DIG SAFE SYSTEM, INC. CLEARANCE OF VALVE, THE CONTRACTOR MAY REMOVE.

UPDATED SURVEY CONTROL POINTS △1

Location	ID	Position Y	Position X
SEDIMENT REMOVAL LIMITS	1	2989564.418	675734.364
	2	2989526.407	675774.139
	3	2989162.947	675509.777
	4	2989170.186	675557.575
	5	2989063.839	675827.525
	6	2989098.919	675784.373
	7	2989410.007	676129.862
	8	2989401.529	676059.154
2 FT REMOVAL LIMITS	9	2989618.711	675772.021
	10	2989599.765	675784.426
	11	2989558.733	675733.957
	12	2989593.865	675732.460
	13	2989619.967	675757.269
CHECK DAM	14	2989598.730	675730.090
	15	2989623.613	675755.371
UPLAND REMOVAL LIMITS	16	2989710.132	675747.386
	17	2989724.977	675761.675
	18	2989736.558	675766.637
	19	2989764.016	675759.484
	20	2989783.604	675765.199
	21	2989828.351	675778.871
	22	2989838.784	675771.645
	23	2989831.083	675761.353
	24	2989791.213	675754.114
	25	2989778.633	675741.451
	26	2989768.277	675736.747

1"=50' (50' 0 50' 100')

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No.	Date	Revisions	By	Ckd
1	8/15/11	TOPOGRAPHIC AND BATHYMETRIC SURVEY FEATURES	MAD	JSH

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Professional Engineer's Name: MARK O. GRAVELDING
Professional Engineer's No.: 42983
State: MA | Date Signed: 3/15/2011 | Project Mgr.: JSH
Designed by: MAD | Drawn by: BGG | Checked by: MJB

ARCADIS
ARCADIS U.S., INC.

W.R. GRACE SUPERFUND SITE • ACTON-CONCORD, MASSACHUSETTS
FINAL (100%) SEDIMENT REMEDIAL DESIGN REPORT

EXCAVATION PLAN - SINKING POND

ARCADIS Project No. B0077204.0000.00032
Date MARCH 2011

ARCADIS
6723 Towpath Road
P.O. Box 66
Syracuse, NY 13214
Tel. 315.446.9120

5

CITY: SYRACUSE-NY DIV/GROUP: 141/ENV DB: B.GETTS LD: PIC: PM: TM: LYR:ON=*;OFF=*REF*
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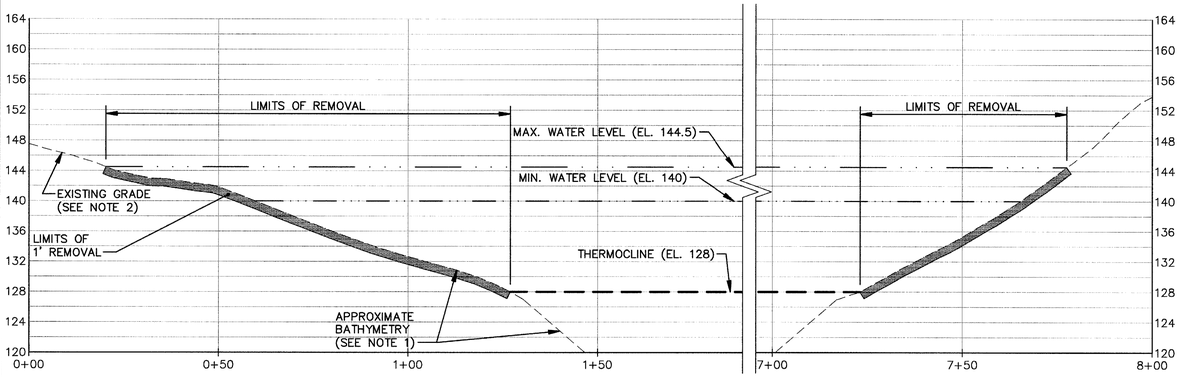
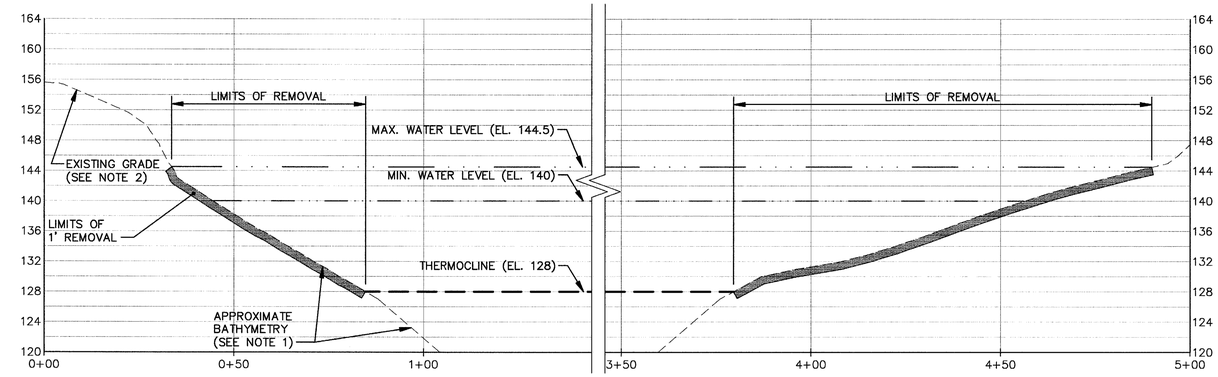


SECTION 1/5
NOT TO SCALE



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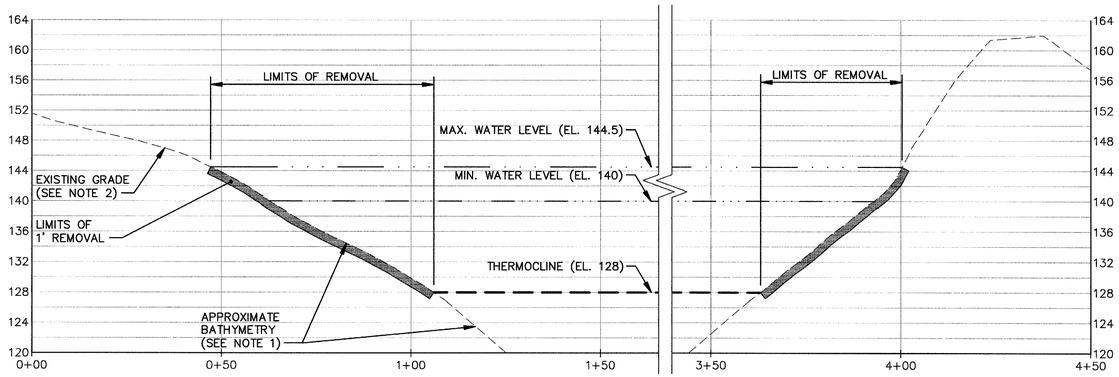

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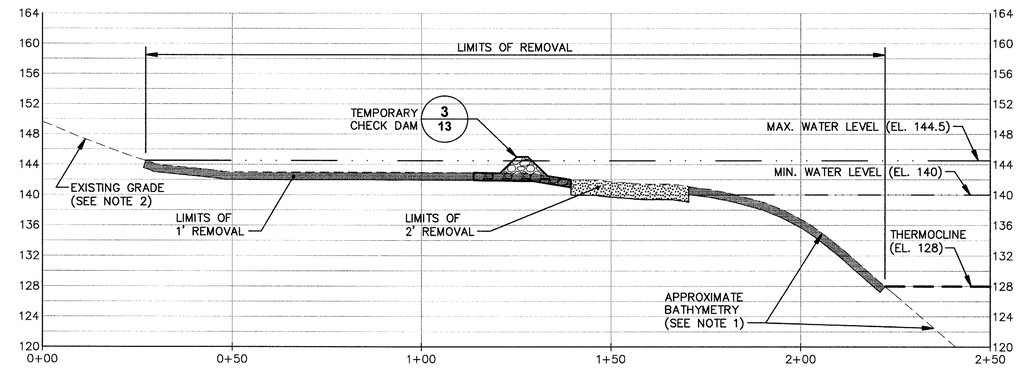
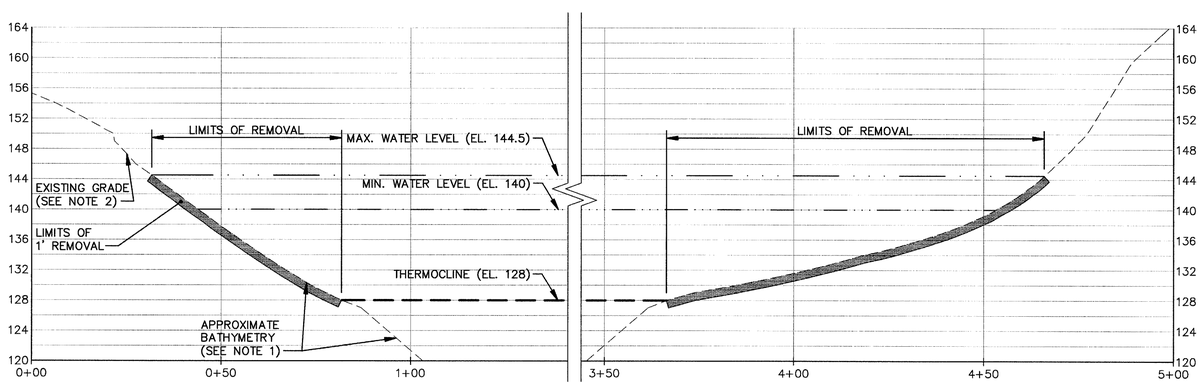
NOT TO SCALE

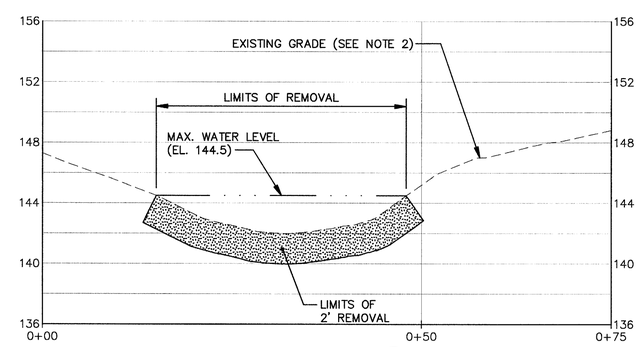


SECTION 5/5
NOT TO SCALE

Cross-Sections have not been updated to represent as-built conditions. Refer to final Drawings in Attachment D for surveyed final conditions and to Figure 2 of the Sediment Construction Summary and Final Sediment Remedial Action Report for an indication of the area where additional dredging was performed.



SECTION 3/5
NOT TO SCALE



SECTION 6/5
NOT TO SCALE

RECORD DRAWINGS
TO THE BEST OF OUR KNOWLEDGE, INFORMATION AND BELIEF, THESE RECORD DRAWINGS SUBSTANTIALLY REPRESENT THE PROJECT AS CONSTRUCTED.

DATE MOGT BY 3/1/12

NOTE:

1. SECTIONS BASED ON SINKING POND BATHYMETRIC CONTOURS INTERPOLATED FROM 2007 PROBING DATA (ARCADIS, 2007). BATHYMETRY BELOW ELEVATION 127 NOT AVAILABLE AND THEREFORE INFERRED.

NOT TO SCALE

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Professional Engineer's Name: MARK O. GRAVELDING
Professional Engineer's No.: 42983

State	Date Signed	Project Mgr.
MA	3/15/2011	JSH
Designed by MAD	Drawn by BGG	Checked by MJB

COMMONWEALTH OF MASSACHUSETTS MARK O. GRAVELDING CIVIL No. 42983 REGISTERED PROFESSIONAL ENGINEER

ARCADIS
ARCADIS U.S., INC.

W.R. GRACE SUPERFUND SITE • ACTON-CONCORD, MASSACHUSETTS
FINAL (100%) SEDIMENT REMEDIAL DESIGN REPORT

SINKING POND SECTIONS

ARCADIS Project No. B0077204.0000.00032
Date MARCH 2011

ARCADIS
6723 Towpath Road
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Syracuse, NY 13214
Tel. 315.446.9120

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CITY: SYRACUSE-NY DIV/GROUP: 141/ENV DB: B.GETTS LD: PIC: PM: TM: LYR:ON=*;OFF=*REF*
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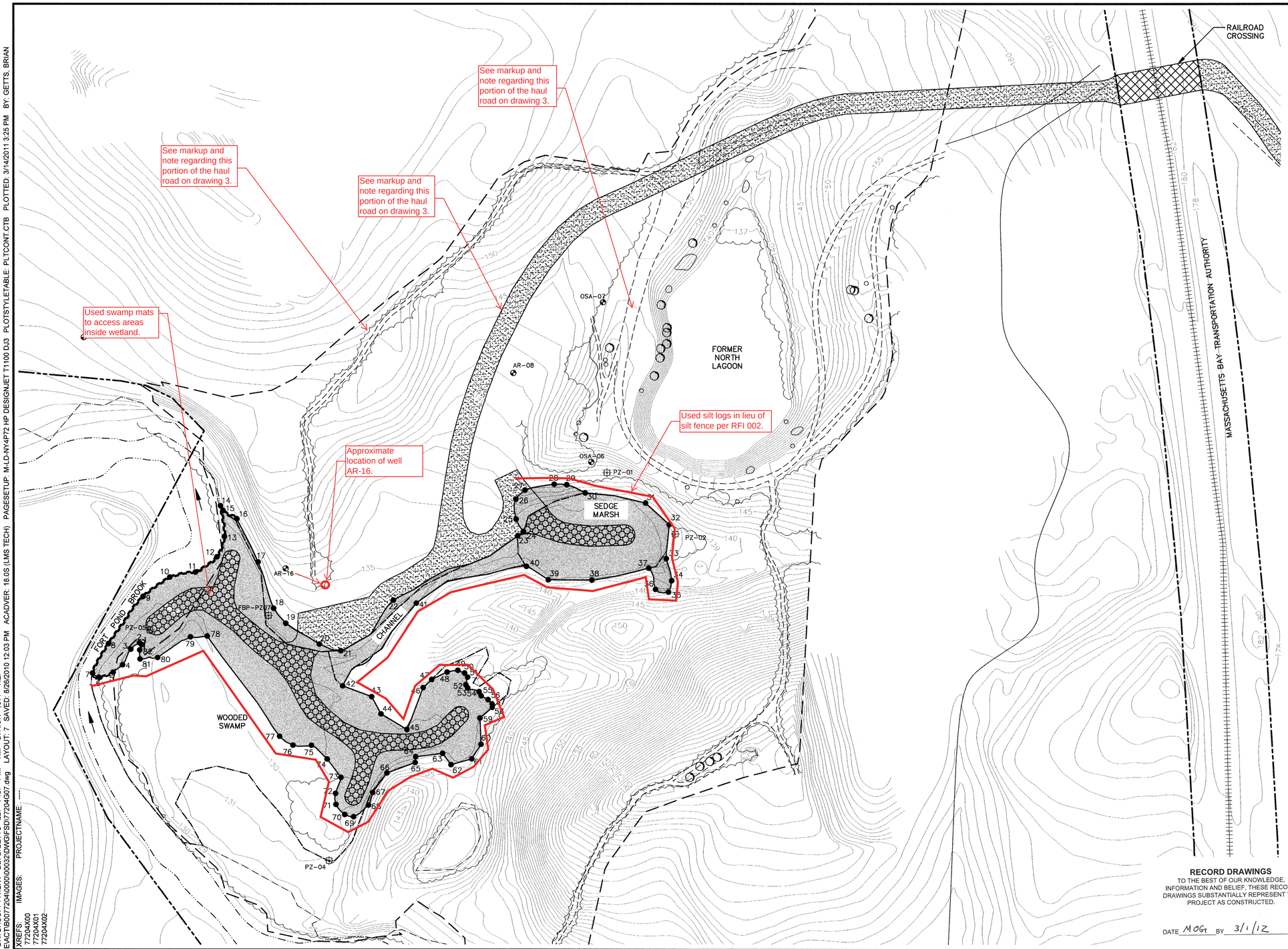
XREFS: 77204X00 77204X03 IMAGES: PROJECTNAME: ----



LEGEND:

- PROPOSED TEMPORARY ACCESS ROAD/POINT
- PROPOSED TEMPORARY IN-WETLAND ACCESS ROAD/POINT
- RAILROAD CROSSING
- 1 FT SEDIMENT REMOVAL AREA
- TEMPORARY HYDRAULIC CONTROL STRUCTURE (SEE NOTE 1)
- ● 1 SURVEY CONTROL POINT

SURVEY CONTROL POINTS		
ID	NORTHING	EASTING
1	2991977.413	675545.148
2	2991979.414	675546.931
3	2991987.932	675540.510
4	2991996.033	675525.042
5	2992005.393	675517.624
6	2992019.522	675512.679
7	2992025.860	675516.704
8	2992010.037	675546.058
9	2991975.885	675592.744
10	2991949.428	675611.816
11	2991924.108	675616.858
12	2991902.885	675631.851
13	2991895.568	675652.002
14	2991899.370	675682.474
15	2991896.795	675677.614
16	2991883.090	675669.520
17	2991862.151	675626.845
18	2991846.915	675581.135
19	2991834.880	675566.212
20	2991801.868	675545.694
21	2991780.670	675539.070
22	2991728.667	675589.085
23	2991605.566	675652.580
24	2991599.846	675656.786
25	2991607.123	675669.124
26	2991607.343	675688.914
27	2991598.365	675697.816
28	2991569.530	675703.703
29	2991557.151	675703.251
30	2991539.019	675695.160
31	2991479.502	675685.103
32	2991456.148	675663.639
33	2991459.151	675630.166
34	2991453.821	675608.315
35	2991457.019	675597.124
36	2991469.810	675599.788
37	2991476.389	675620.758
38	2991532.455	675608.899
39	2991575.446	675609.256
40	2991596.947	675622.393
41	2991705.992	675586.050

SURVEY CONTROL POINTS		
ID	NORTHING	EASTING
42	2991778.824	675504.147
43	2991750.184	675493.359
44	2991741.018	675476.279
45	2991715.360	675460.717
46	2991699.413	675502.345
47	2991690.921	675510.467
48	2991675.655	675517.812
49	2991665.090	675519.563
50	2991658.405	675516.836
51	2991655.374	675512.737
52	2991657.137	675505.212
53	2991655.351	675502.090
54	2991644.050	675498.346
55	2991642.051	675494.244
56	2991635.235	675490.472
57	2991631.103	675486.191
58	2991630.851	675482.650
59	2991643.207	675472.094
60	2991642.163	675446.068
61	2991651.417	675431.651
62	2991671.874	675425.932
63	2991680.181	675437.116
64	2991706.658	675433.771
65	2991707.261	675428.004
66	2991735.155	675417.743
67	2991749.213	675398.382
68	2991753.381	675386.095
69	2991768.061	675374.606
70	2991776.826	675376.716
71	2991785.591	675386.780
72	2991785.916	675397.655
73	2991780.559	675413.400
74	2991794.189	675431.511
75	2991809.713	675445.138
76	2991827.952	675445.233
77	2991841.148	675454.007
78	2991912.506	675553.519
79	2991929.029	675552.712
80	2991961.464	675532.228
81	2991978.862	675530.749
82	2991979.171	675539.805

NOTES:

1. THE CONTRACTOR SHALL INSTALL A TEMPORARY HYDRAULIC CONTROL STRUCTURE (I.E., SAND BAGS OR SHEETING) ALONG THE INTERFACE OF THE REMOVAL AREA AND FORT POND BROOK TO PROTECT THIS AREA FROM POTENTIAL FLOODING DURING EXCAVATION. THE TOP OF THE HYDRAULIC CONTROL STRUCTURE SHALL BE A MINIMUM OF 1 FOOT ABOVE THE ORDINARY HIGH WATER MARK. IN ADDITION, SILT FENCE AND STRAW BALES SHALL BE INSTALLED ALONG THE WETLAND-SIDE OF THE HYDRAULIC CONTROL STRUCTURE TO PREVENT IMPACTED WATER ASSOCIATED WITH THE NORTH LAGOON WETLAND FROM DIRECTLY ENTERING FORT POND BROOK CONSISTENT WITH 310 CMR 10.24.
2. SEDIMENT REMOVAL WITHIN THE CHANNEL WILL BE VISUALLY-BASED AND LIMITED TO THE INCISED FLOW PATH.

RECORD DRAWINGS
TO THE BEST OF OUR KNOWLEDGE, INFORMATION AND BELIEF, THESE RECORD DRAWINGS SUBSTANTIALLY REPRESENT THE PROJECT AS CONSTRUCTED.

DATE MOGt BY 3/1/12

CITY: SYRACUSE-NY DIV/GROUP: 141/ENV DB: B.GETTS LD: PIC: PM: TM: LYR:ON=*;OFF=*REF*
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XREFS: 77204X00 77204X01 77204X02 IMAGES: PROJECTNAME:

1"=50' 50' 0 50' 100'

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No.	Date	Revisions	By	Ckd

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Professional Engineer's Name: MARK O. GRAVELDING
Professional Engineer's No.: 42983

State	Date Signed	Project Mgr.
MA	3/15/2011	JSH
Designed by MAD	Drawn by BGG	Checked by MJB

COMMONWEALTH OF MASSACHUSETTS MARK O. GRAVELDING No. 42983 REGISTERED PROFESSIONAL ENGINEER

ARCADIS

ARCADIS U.S., INC.

W.R. GRACE SUPERFUND SITE • ACTON-CONCORD, MASSACHUSETTS
FINAL (100%) SEDIMENT REMEDIAL DESIGN REPORT

EXCAVATION PLAN - NORTH LAGOON WETLAND

ARCADIS Project No. B0077204.0000.00032

Date MARCH 2011

ARCADIS
6723 Towpath Road
P.O. Box 66
Syracuse, NY 13214
Tel: 315.446.9120

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RECORD DRAWINGS
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DATE MOG BY 3/1/12

1"=50' 50' 0 50' 100'

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No.	Date	Revisions	By	Ckd
1	4/13/11	SITE RESTORATION SPECIFICATION REVISED	MAD	MOG

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Professional Engineer's Name
MARK O. GRAVELDING
Professional Engineer's No.
42983

State	Date Signed	Project Mgr.
MA	3/15/2011	JSH
Designed by	Drawn by	Checked by
MAD	BGG	MJB

COMMONWEALTH OF MASSACHUSETTS MARK O. GRAVELDING 42983 REGISTERED PROFESSIONAL ENGINEER

ARCADIS

ARCADIS U.S., INC.

W.R. GRACE SUPERFUND SITE • ACTON-CONCORD, MASSACHUSETTS
FINAL (100%) SEDIMENT REMEDIAL DESIGN REPORT

SITE RESTORATION PLAN - SINKING POND

ARCADIS Project No.
B0077204.0000.00032

Date
MARCH 2011

ARCADIS
6723 Towpath Road
P.O. Box 66
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Tel. 315.446.9120

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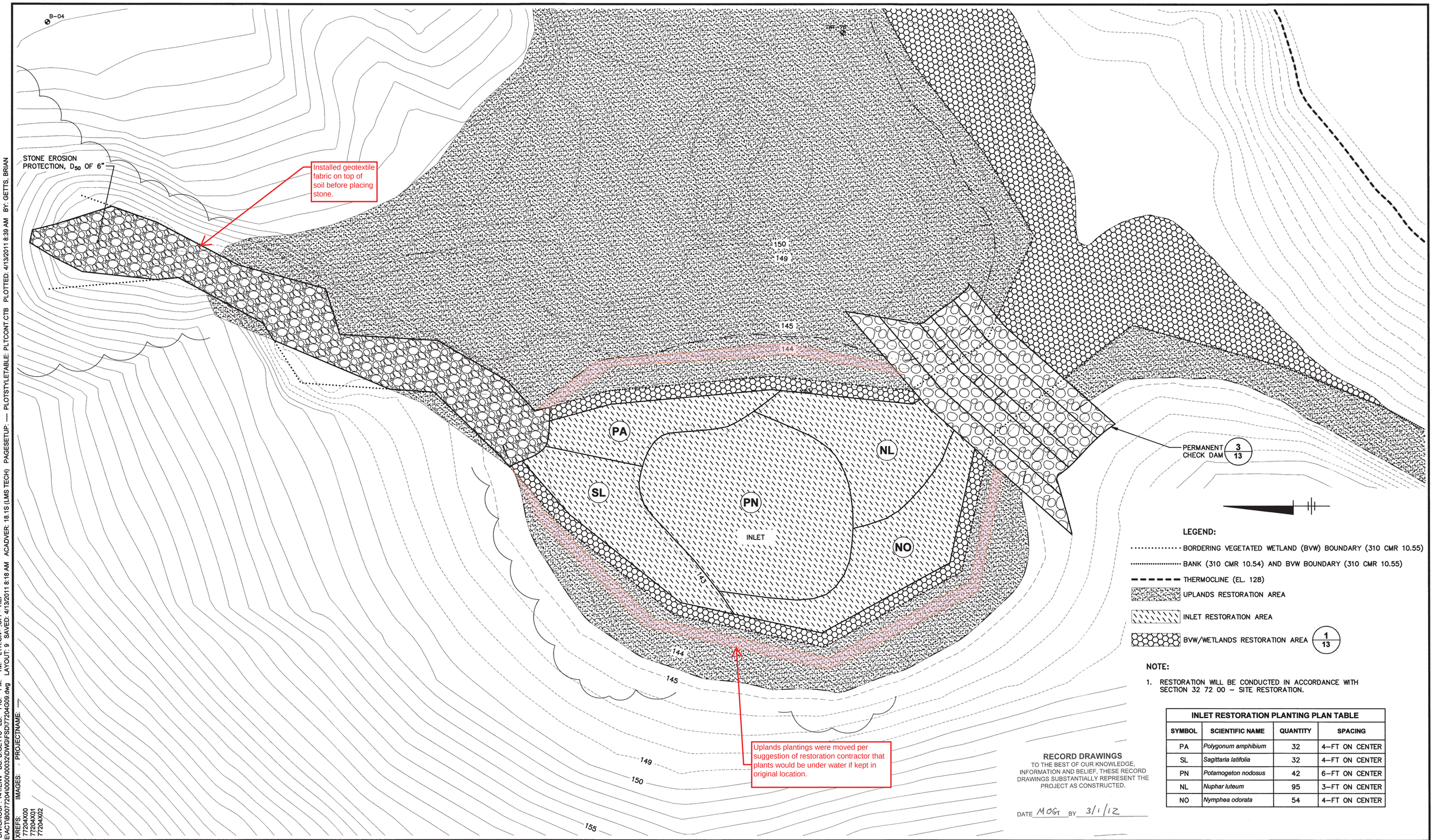

LEGEND:

- BORDERING VEGETATED WETLAND (BVW) BOUNDARY (310 CMR 10.55)
- BANK (310 CMR 10.54) AND BVW BOUNDARY (310 CMR 10.55)
- THERMOCLINE (EL. 128)
- UPLANDS RESTORATION AREA
- INLET RESTORATION AREA
- BVW/WETLANDS RESTORATION AREA (1/13)

NOTE:

1. RESTORATION WILL BE CONDUCTED IN ACCORDANCE WITH SECTION 32 72 00 – SITE RESTORATION.

INLET RESTORATION PLANTING PLAN TABLE

SYMBOL	SCIENTIFIC NAME	QUANTITY	SPACING
PA	*Polygonum amphibium*	32	4–FT ON CENTER
SL	*Sagittaria latifolia*	32	4–FT ON CENTER
PN	*Potamogeton nodosus*	42	6–FT ON CENTER
NL	*Nuphar luteum*	95	3–FT ON CENTER
NO	*Nymphea odorata*	54	4–FT ON CENTER

RECORD DRAWINGS

TO THE BEST OF OUR KNOWLEDGE, INFORMATION AND BELIEF, THESE RECORD DRAWINGS SUBSTANTIALLY REPRESENT THE PROJECT AS CONSTRUCTED.

DATE MOG BY 3/1/12

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1"=10' 10' 0 10' 20'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING:

USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd
1	4/13/11	SITE RESTORATION SPECIFICATION REVISED	MAD	MOG

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Professional Engineer's Name: MARK O. GRAVELDING
Professional Engineer's No.: 42983

State	Date Signed	Project Mgr.
MA	3/15/2011	JSH
Designed by MAD	Drawn by BGG	Checked by MJB

COMMONWEALTH OF MASSACHUSETTS MARK O. GRAVELDING CIVIL REGISTERED PROFESSIONAL ENGINEER

ARCADIS

ARCADIS U.S., INC.

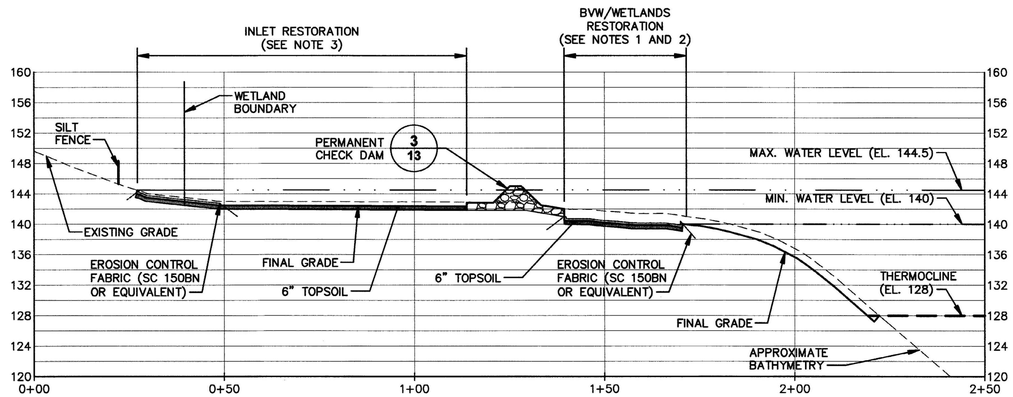
W.R. GRACE SUPERFUND SITE • ACTON-CONCORD, MASSACHUSETTS
FINAL (100%) SEDIMENT REMEDIAL DESIGN REPORT

INLET PLANTING PLAN

ARCADIS Project No. B0077204.0000.00032

Date MARCH 2011

ARCADIS
6723 Towpath Road
P.O. Box 66
Syracuse, NY 13214
Tel. 315.446.9120



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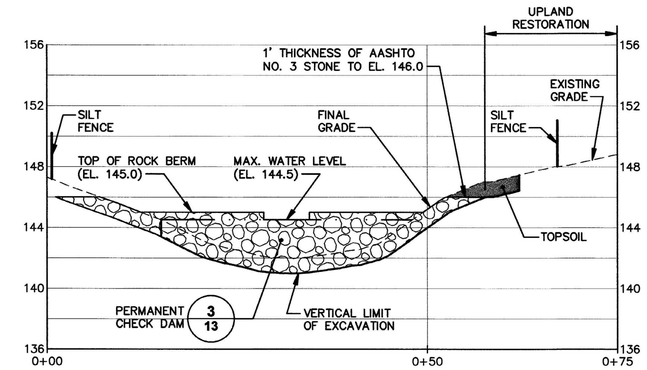
NOT TO SCALE



SECTION 3/8
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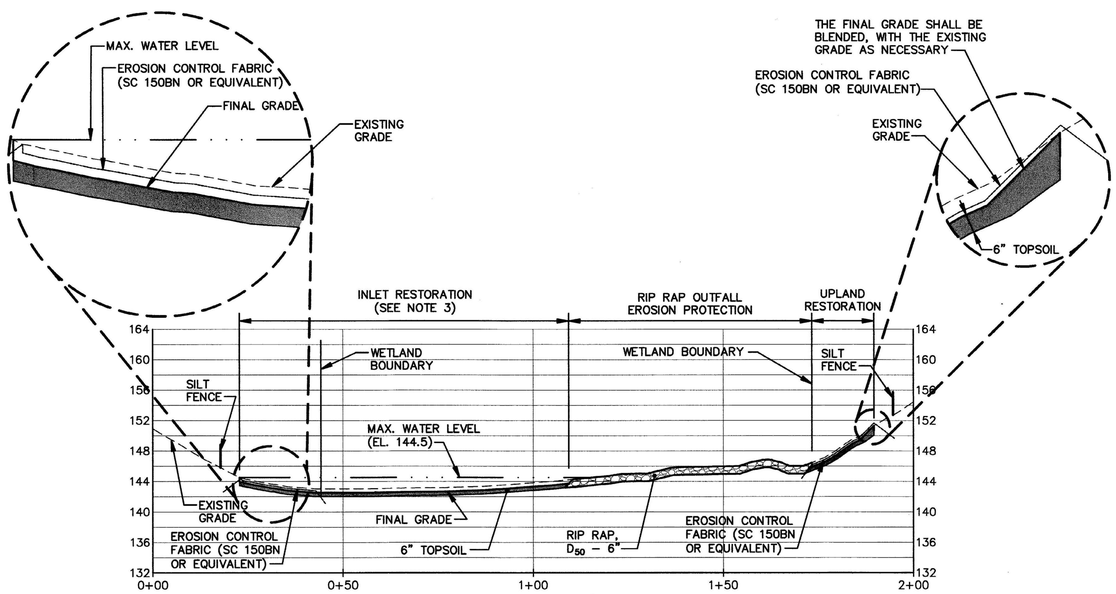

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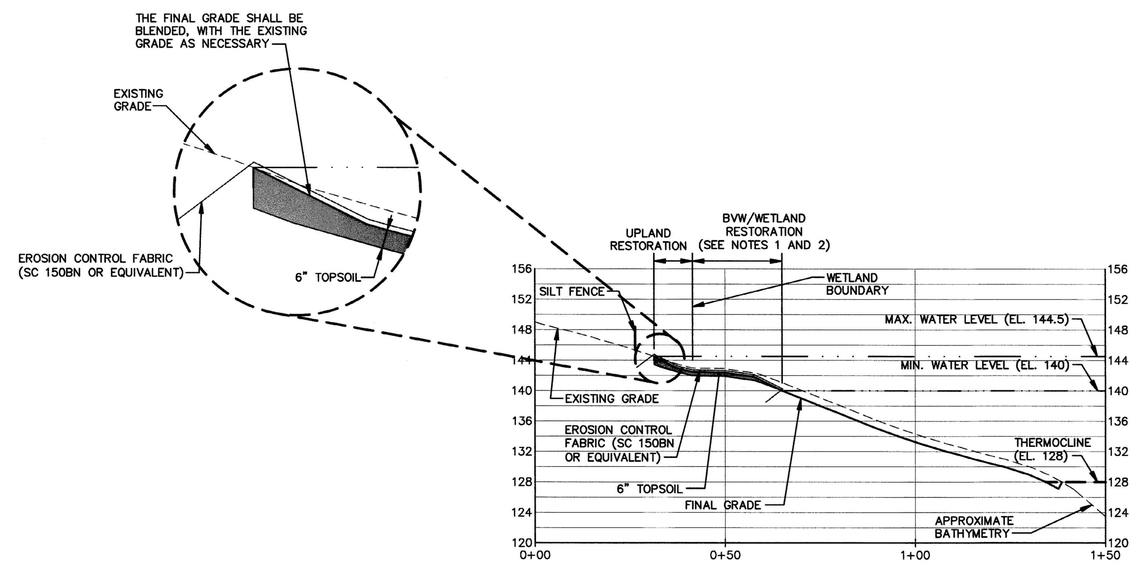

SECTION 4/8
NOT TO SCALE

NOTES:

1. RESTORATION WILL BE CONDUCTED IN ACCORDANCE WITH SECTION 32 72 00 – SITE RESTORATION.
2. BVW/WETLAND SEEDING STARTS AT THE WATER LINE AND EXTENDS UPLAND TO THE LIMITS SHOWN.
3. INLET PLANTING IS SHOWN ON DRAWING 10.

RECORD DRAWINGS
TO THE BEST OF OUR KNOWLEDGE, INFORMATION AND BELIEF, THESE RECORD DRAWINGS SUBSTANTIALLY REPRESENT THE PROJECT AS CONSTRUCTED.

DATE MOG BY 3/1/12

NOT TO SCALE

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd
2	4/13/11	REVISION TO SECTION 2/8	MAD	MOG
1	3/31/11	REVISION TO SECTION 1/8 AND SITE RESTORATION SPECIFICATION	MAD	MOG

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Professional Engineer's Name: MARK O. GRAVELDING
Professional Engineer's No.: 42983

State	Date Signed	Project Mgr.
MA	3/15/2011	JSH
Designed by MAD	Drawn by BGG	Checked by MJB

COMMONWEALTH OF MASSACHUSETTS MARK O. GRAVELDING No. 42983 REGISTERED PROFESSIONAL ENGINEER

ARCADIS
ARCADIS U.S., INC.

W.R. GRACE SUPERFUND SITE • ACTON-CONCORD, MASSACHUSETTS
FINAL (100%) SEDIMENT REMEDIAL DESIGN REPORT

RESTORATION SECTIONS - SINKING POND

ARCADIS Project No. B0077204.0000.00032
Date MARCH 2011
ARCADIS
6723 Towpath Road
P.O. Box 66
Syracuse, NY 13214
Tel. 315.446.9120

10

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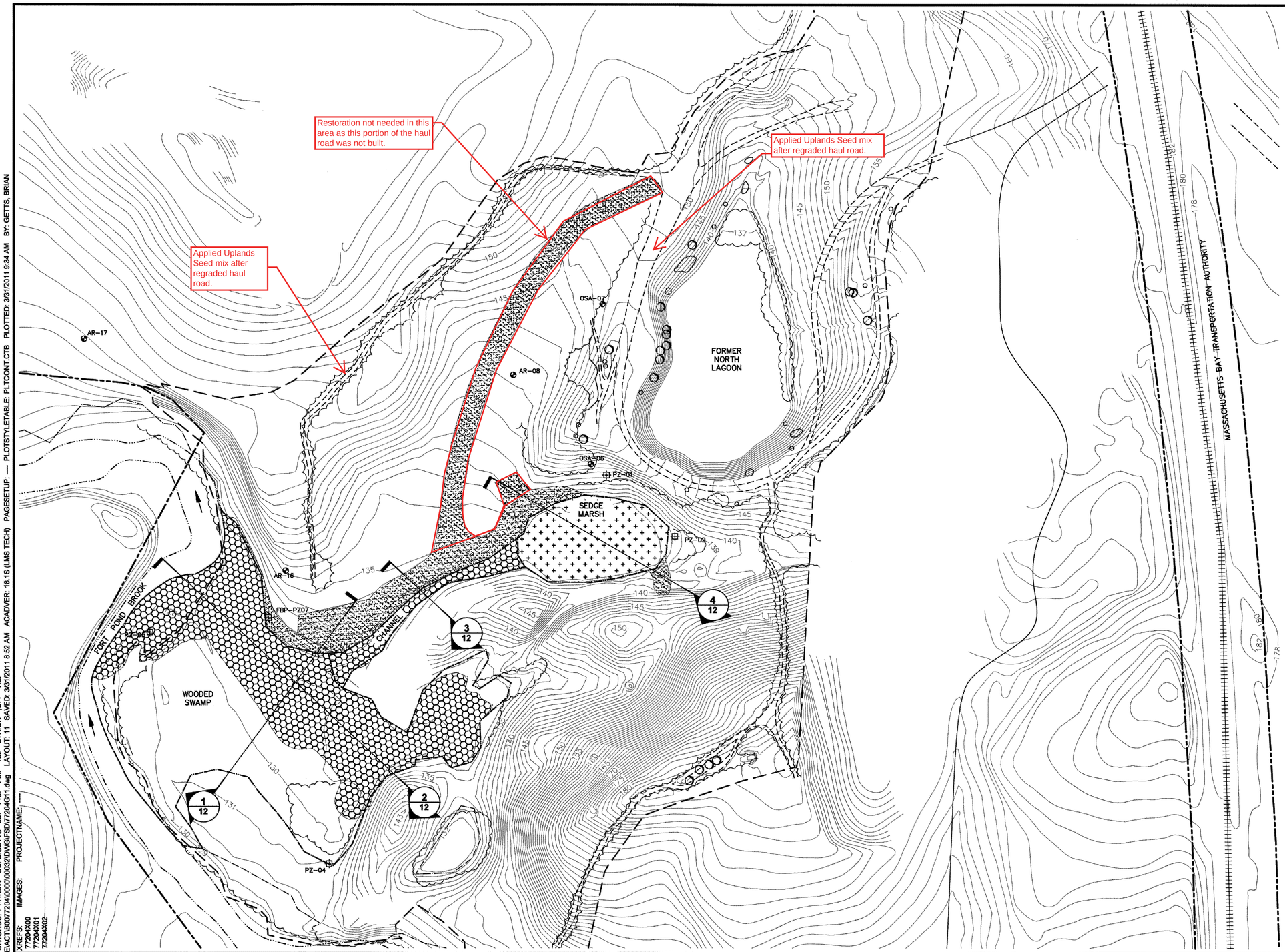

LEGEND:

- UPLANDS RESTORATION AREA (0.46 ACRES)
- SEDGE MARSH RESTORATION AREA (0.23 ACRES)
- BVW/WETLANDS RESTORATION AREA (0.81 ACRES)

NOTE:

1. RESTORATION WILL BE CONDUCTED IN ACCORDANCE WITH SECTION 32 72 00 – SITE RESTORATION.

RECORD DRAWINGS
TO THE BEST OF OUR KNOWLEDGE, INFORMATION AND BELIEF, THESE RECORD DRAWINGS SUBSTANTIALLY REPRESENT THE PROJECT AS CONSTRUCTED.

DATE MOG BY 3/1/12

1"=50' 50' 0 50' 100'

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No.	Date	Revisions	By	Ckd
1	3/31/11	SITE RESTORATION SPECIFICATION REVISED	MAD	MOG

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Professional Engineer's Name: MARK O. GRAVELDING
Professional Engineer's No.: 42983

State	Date Signed	Project Mgr.
MA	3/15/2011	JSH
Designed by MAD	Drawn by BGG	Checked by MJB

COMMONWEALTH OF MASSACHUSETTS MARK O. GRAVELDING 42983 REGISTERED PROFESSIONAL ENGINEER

ARCADIS

ARCADIS U.S., INC.

W.R. GRACE SUPERFUND SITE • ACTON-CONCORD, MASSACHUSETTS
FINAL (100%) SEDIMENT REMEDIAL DESIGN REPORT

SITE RESTORATION PLAN - NORTH LAGOON WETLAND

ARCADIS Project No. B0077204.0000.00032

Date MARCH 2011

ARCADIS
6723 Towpath Road
P.O. Box 66
Syracuse, NY 13214
Tel. 315.446.9120

11

CITY: SYRACUSE-NY DIV/GROUP: 141/ENV DB: B.GETTS LD: PIC: PM: TM: LYR:ON=*;OFF=*REF*
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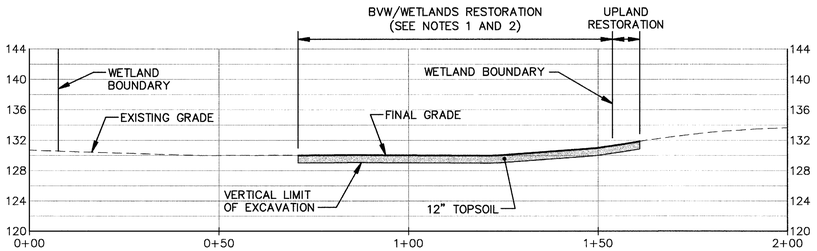
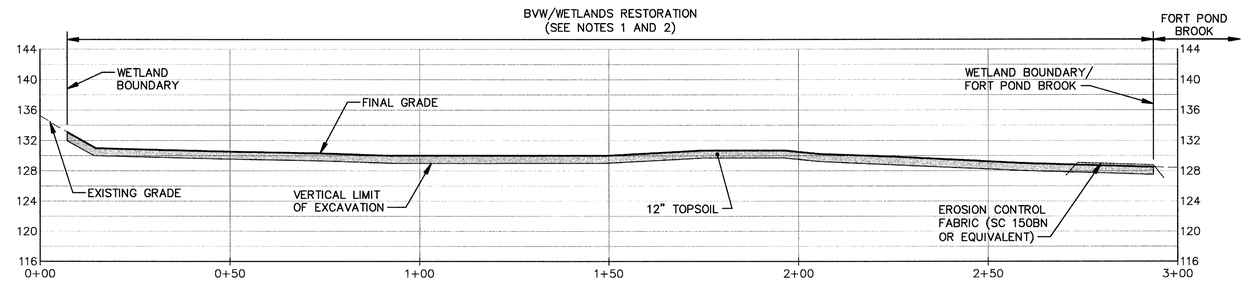


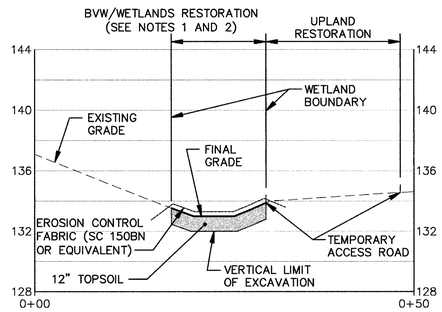
SECTION 1/11

NOT TO SCALE



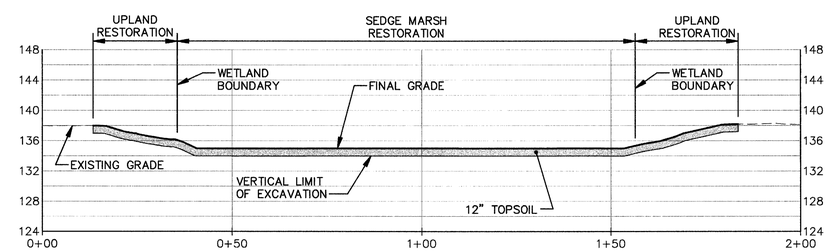
SECTION 2/11

NOT TO SCALE



SECTION 3/11

NOT TO SCALE



SECTION 4/11

NOT TO SCALE

NOTES:

1. RESTORATION WILL BE CONDUCTED IN ACCORDANCE WITH SECTION 31 78 00 – SITE RESTORATION.
2. BVW/WETLAND SEEDING STARTS AT THE WATER LINE AND EXTENDS UPLAND TO THE LIMITS SHOWN.

RECORD DRAWINGS

TO THE BEST OF OUR KNOWLEDGE, INFORMATION AND BELIEF, THESE RECORD DRAWINGS SUBSTANTIALLY REPRESENT THE PROJECT AS CONSTRUCTED.

DATE MOGr BY 3/1/12

NOT TO SCALE

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No.	Date	Revisions	By	Ckd

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Professional Engineer's Name: MARK O. GRAVELDING
Professional Engineer's No.: 42983

State	Date Signed	Project Mgr.
MA	3/15/2011	JSH
Designed by MAD	Drawn by BGG	Checked by MJB

COMMONWEALTH OF MASSACHUSETTS · MARK O. GRAVELDING · CIVIL · No. 42983 · REGISTERED PROFESSIONAL ENGINEER

ARCADIS

ARCADIS U.S., INC.

W.R. GRACE SUPERFUND SITE • ACTON-CONCORD, MASSACHUSETTS

FINAL (100%) SEDIMENT REMEDIAL DESIGN REPORT

RESTORATION SECTIONS - NORTH LAGOON WETLAND

ARCADIS Project No. B0077204.0000.00032

Date MARCH 2011

ARCADIS
6723 Towpath Road
P.O. Box 66
Syracuse, NY 13214
Tel. 315.446.9120

12

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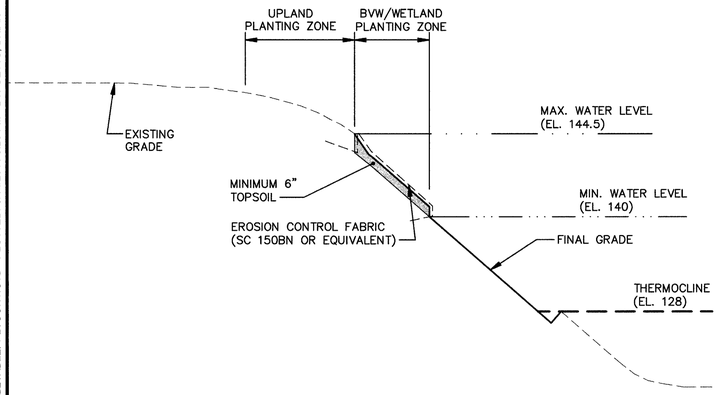
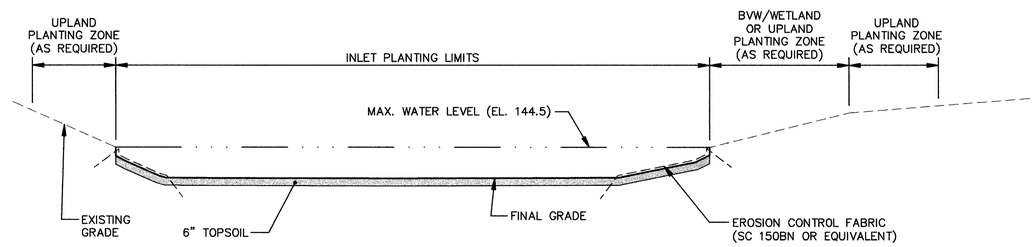
XREFS: 77204X00 77204X03 IMAGES: PROJECTNAME: ----



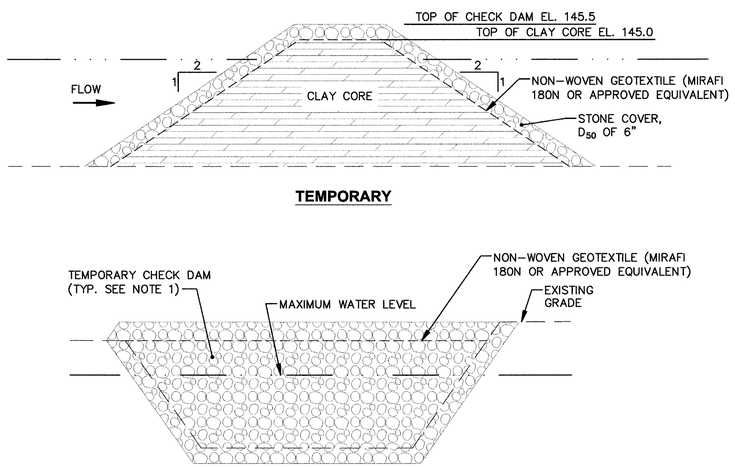
TYPICAL BVW/WETLAND BANK RESTORATION SECTION (1)

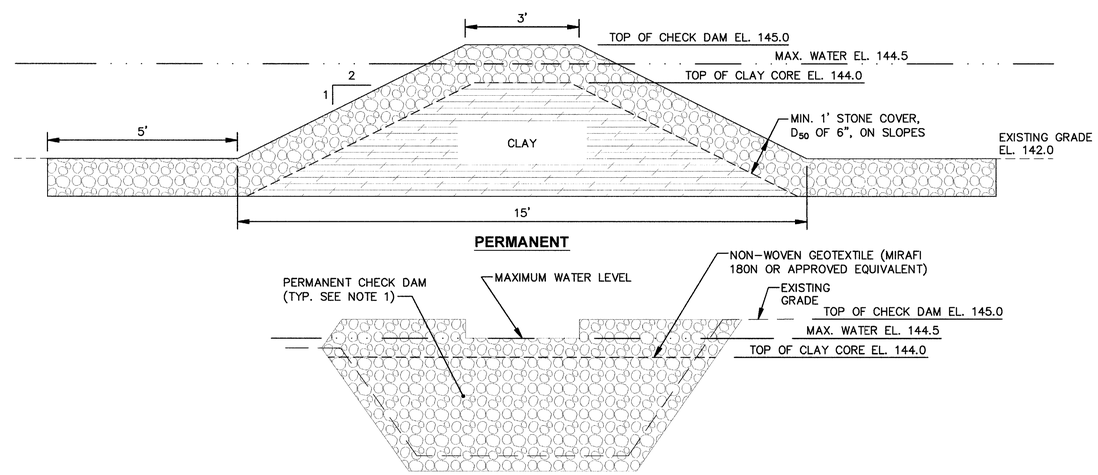
NOT TO SCALE



TYPICAL INLET RESTORATION SECTION (2)

NOT TO SCALE





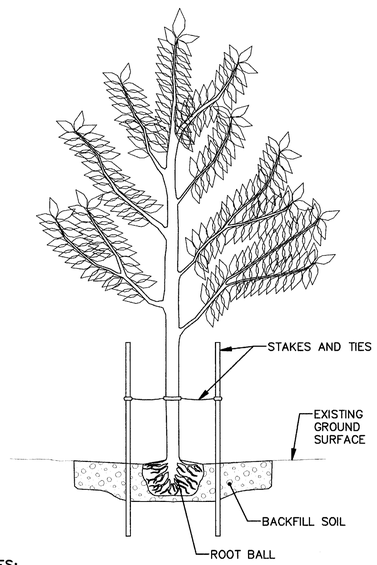
Check dam built per RFI 007.

TYPICAL CHECK DAM (3)

NOT TO SCALE

NOTES:

1. CHECK DAM TO BE CONSTRUCTED OF IMPORTED EARTHEN MATERIAL FROM AN APPROVED SOURCE (E.G., CLAY CORE AND STONE COVER) AND NON-WOVEN GEOTEXTILE (MIRAFI 180N OR APPROVED EQUIVALENT). PLACE MATERIAL AS REQUIRED TO ACHIEVE AN IN-PLACE, COMPACTED LIFT THICKNESS OF NO GREATER THAN 1.0 FOOT. COMPACTION SHALL BE PERFORMED VIA A MINIMUM OF THREE PASSES OF A SUITABLY SIZED ROLLER OR DOZER.
2. HEIGHT OF BERM TO BE EQUAL TO THE FULL HEIGHT OF THE LOWEST BANK. TEMPORARY AND PERMANENT CHECK DAMS TO BE CONSTRUCTED TO DIMENSIONS SHOWN.
3. INSTALLATION, REMOVAL, AND RELOCATION ACTIVITIES (IF NECESSARY) ASSOCIATED WITH THE CHECK DAM SHALL BE PERFORMED IN A MANNER THAT PREVENTS RECONTAMINATION OF REMEDIATED OR NON-REMEDIAL AREAS AND THAT MINIMIZES THE POTENTIAL FOR DISTURBANCE AND MIGRATION OF SEDIMENT AND SOILS.
4. RESTORATION WILL BE CONDUCTED IN ACCORDANCE WITH SECTION 31 78 00 – SITE RESTORATION.



NOTES:

1. TREE HOLE DIMENSIONS WILL BE DUG BASED ON ROOT BALL SIZE. THE TREE HOLE SHALL BE 2–3 TIMES THE DIAMETER AND 0.5 TIMES THE DEPTH OF THE ROOT BALL.
2. STAKES AND TIES WILL BE INSTALLED SUCH THAT 6–8 INCH OF TREE SWAY IS PERMITTED.

TYPICAL TREE PLANTING DETAIL (4)

NOT TO SCALE

RECORD DRAWINGS
TO THE BEST OF OUR KNOWLEDGE, INFORMATION AND BELIEF, THESE RECORD DRAWINGS SUBSTANTIALLY REPRESENT THE PROJECT AS CONSTRUCTED.

DATE MOGT BY 3/1/12

NOT TO SCALE

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

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Professional Engineer's Name: MARK O. GRAVELDING
Professional Engineer's No.: 42983

State	Date Signed	Project Mgr.
MA	3/15/2011	JSH
Designed by MAD	Drawn by BGG	Checked by MJB

ARCADIS U.S., INC.

W.R. GRACE SUPERFUND SITE • ACTON-CONCORD, MASSACHUSETTS
FINAL (100%) SEDIMENT REMEDIAL DESIGN REPORT

TYPICAL DETAILS

ARCADIS Project No. B0077204.0000.00032
Date MARCH 2011
ARCADIS 6723 Towpath Road P.O. Box 66 Syracuse, NY 13214 Tel. 315.446.9120

13

CITY: SYRACUSE-NY DIV/GROUP: 141/ENV DB: B.GETTS LD: PIC: PM: TM: LYR:ON=*;OFF=*REF*
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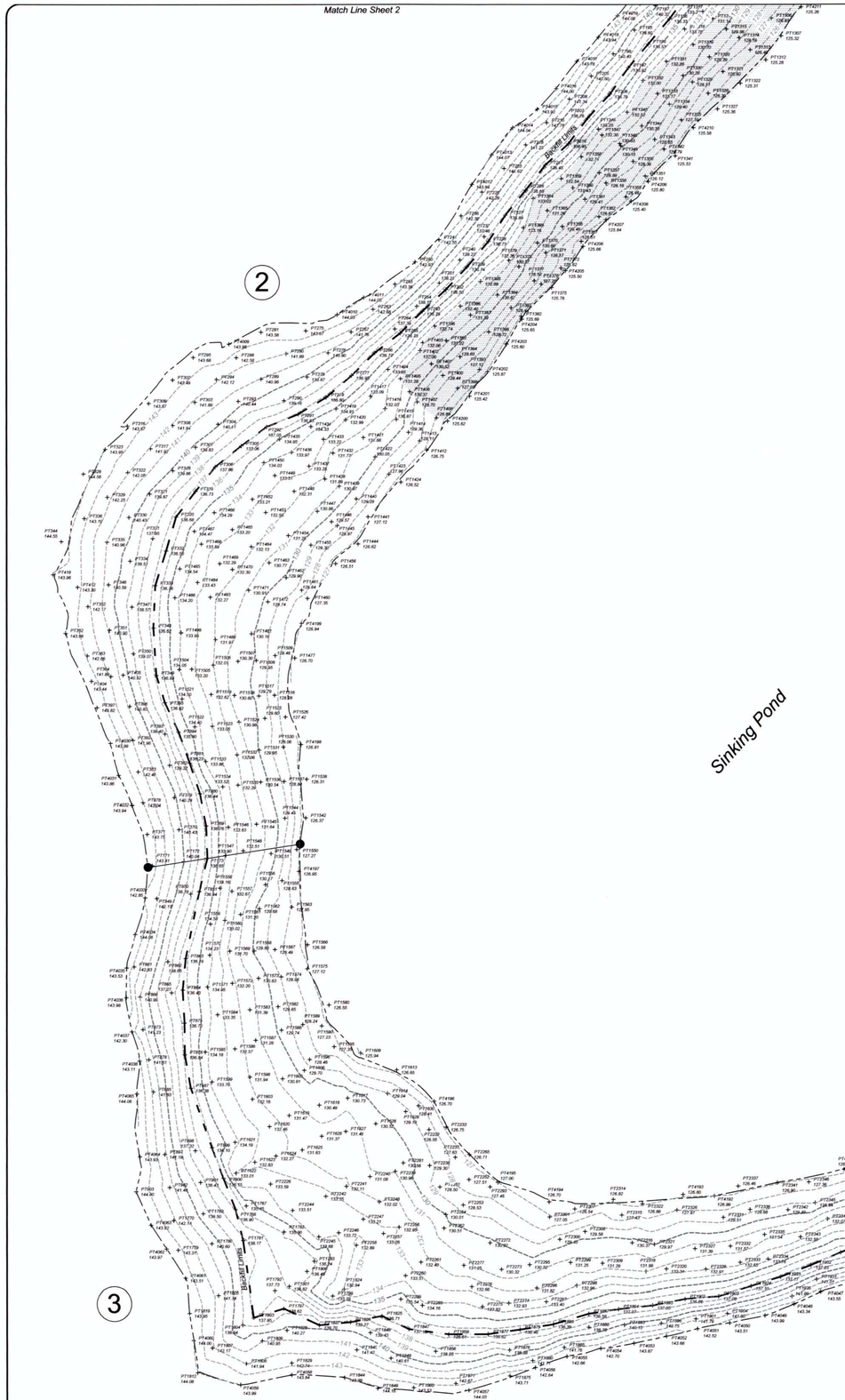
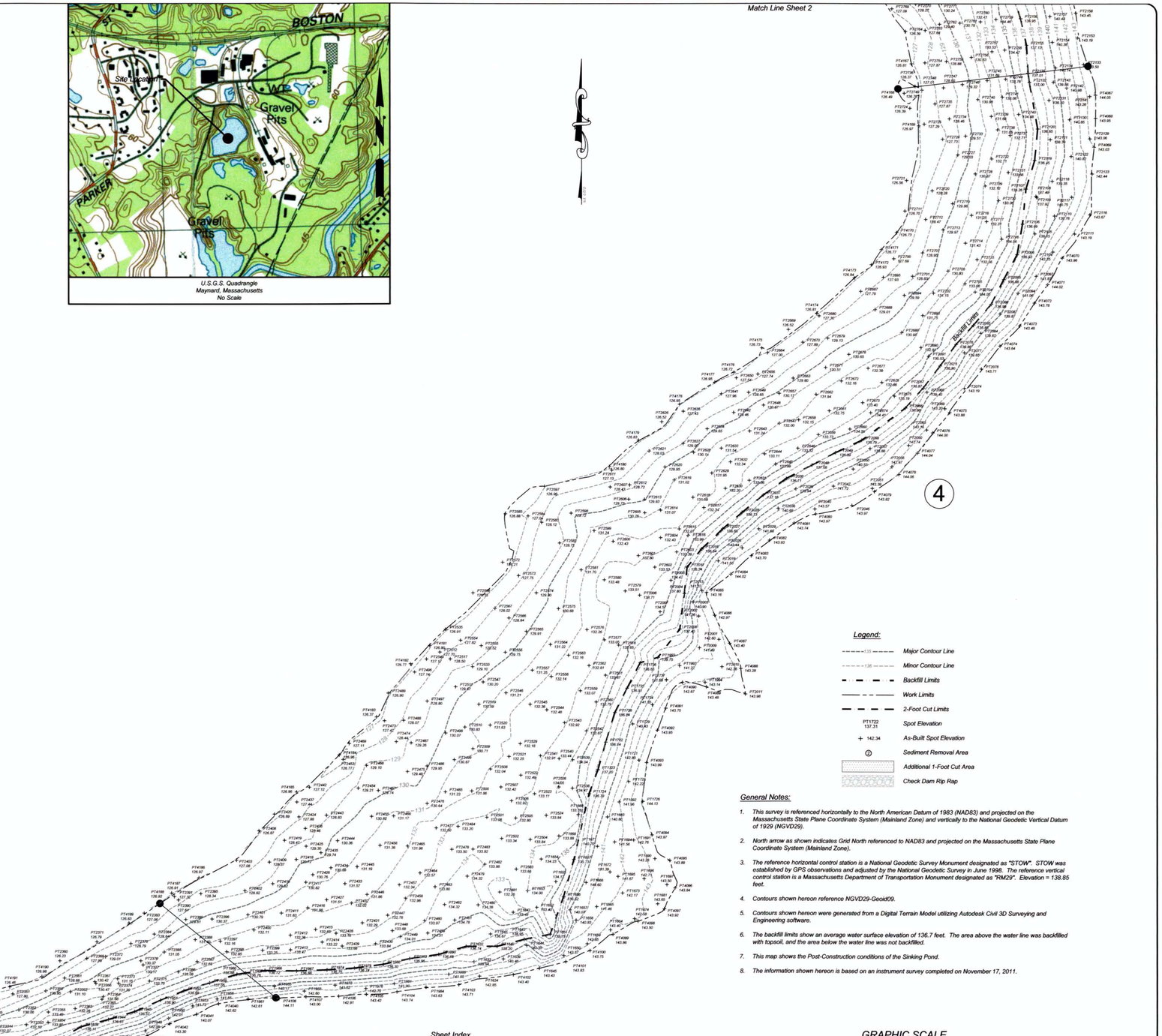
XREFS: 77204X00 IMAGES: PROJECTNAME: ---

Attachment D

Post-Construction Survey
Drawings and Control Points
Table



U.S.G.S. Quadrangle
Maynard, Massachusetts
No Scale



Legend:

- Major Contour Line
- Minor Contour Line
- Backfill Limits
- Work Limits
- 2-Foot Cut Limits
- PT1722 137.31 — Spot Elevation
- + 142.34 — As-Built Spot Elevation
- Sediment Removal Area
- Additional 1-Foot Cut Area
- Check Dam Rip Rap

General Notes:

1. This survey is referenced horizontally to the North American Datum of 1983 (NAD83) and projected on the Massachusetts State Plane Coordinate System (Mainland Zone) and vertically to the National Geodetic Vertical Datum of 1929 (NGVD29).
2. North arrow as shown indicates Grid North referenced to NAD83 and projected on the Massachusetts State Plane Coordinate System (Mainland Zone).
3. The reference horizontal control station is a National Geodetic Survey Monument designated as "STOW". STOW was established by GPS observations and adjusted by the National Geodetic Survey in June 1998. The reference vertical control station is a Massachusetts Department of Transportation Monument designated as "RM29". Elevation = 138.85 feet.
4. Contours shown hereon reference NGVD29-Geoid09.
5. Contours shown hereon were generated from a Digital Terrain Model utilizing Autodesk Civil 3D Surveying and Engineering software.
6. The backfill limits show an average water surface elevation of 136.7 feet. The area above the water line was backfilled with topsoil, and the area below the water line was not backfilled.
7. This map shows the Post-Construction conditions of the Sinking Pond.
8. The information shown hereon is based on an instrument survey completed on November 17, 2011.

Sheet Index

- Sheet 2
- Sheet 1

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

Surveyor's Certificate:

I certify that this plan conforms with the Rules and Regulations of the Registers deeds.
This survey and plan were prepared in accordance with the Procedural and Technical Standards for the Practice of Land Surveying within the Commonwealth of Massachusetts.

COMMONWEALTH OF MASSACHUSETTS
JOHN F. WAGENBLATT
No. 36396
PROFESSIONAL LAND SURVEYOR

John F. Wagenblatt — RPLS #36396
The LRC Group
190 West Street
Suite E
Cromwell, CT 06416

Sheet 1 of 2

REV	DESCRIPTION	DATE

PROJECT NUMBER: CK3311-05-11

DRAWN: JLS
CHECKED: JFW
SCALE: 1" = 20'
DATE: 12/27/2011

Map Showing
Post-Construction Conditions
Sinking Pond
W.R. Grace Superfund Site

Towns of Acton and Concord
County of Middlesex
Commonwealth of Massachusetts

Thew Associates
LAND SURVEYORS
P.O. Box 463
6431 US Highway 11
Canton, New York 13617
T: 315/386-2776
F: 315/386-1012
9478 River Road
Marcy, New York 13403
T: 315/733-7278
F: 315/797-1957
www.ThewAssociates.com

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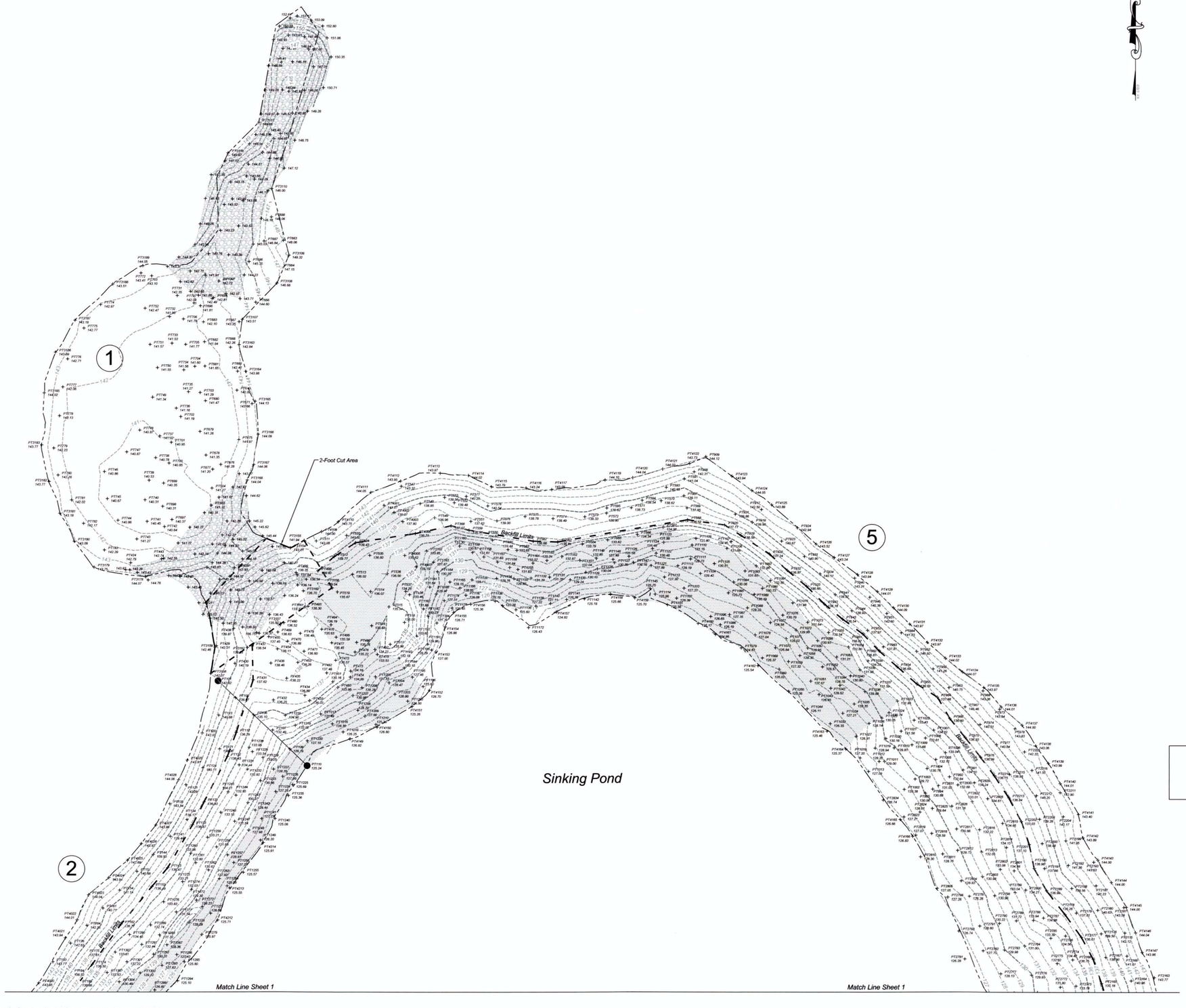
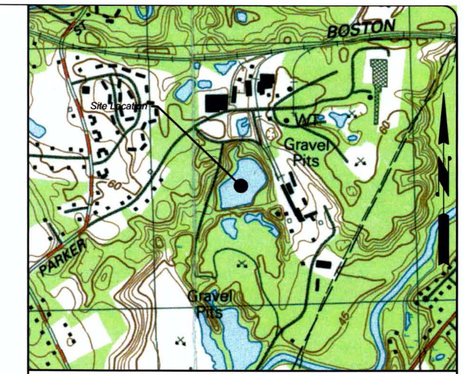
Only copies from the original of this survey marked with an original of the surveyor's inked seal or his embossed seal shall be considered to be valid and true copies.





U.S.G.S. Quadrangle
Maynard, Massachusetts
No Scale

Legend:

- Major Contour Line
- Minor Contour Line
- Backfill Limits
- Work Limits
- 2-Foot Cut Limits
- PT1722 137.31 — Spot Elevation
- + 142.34 — As-Built Spot Elevation
- ② — Sediment Removal Area
- Additional 1-Foot Cut Area
- Check Dam Rip Rap

General Notes:

1. This survey is referenced horizontally to the North American Datum of 1983 (NAD83) and projected on the Massachusetts State Plane Coordinate System (Mainland Zone) and vertically to the National Geodetic Vertical Datum of 1929 (NGVD29).
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7. This map shows the Post-Construction conditions of the Sinking Pond.
8. The information shown hereon is based on an instrument survey completed on November 17, 2011.

Sheet Index

- Sheet 2
- Sheet 1

Surveyor's Certificate:

I certify that this plan conforms with the Rules and Regulations of the Registers deeds.

This survey and plan were prepared in accordance with the Procedural and Technical Standards for the Practice of Land Surveying within the Commonwealth of Massachusetts.

John F. Wagenblatt — RPLS #36396

John F. Wagenblatt
The LRC Group
160 West Street
Suite E
Cromwell, CT 06416

COMMONWEALTH OF MASSACHUSETTS — JOHN F. WAGENBLATT — No. 36396 — PROFESSIONAL LAND SURVEYOR

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

Sheet 2 of 2

REV	DESCRIPTION	DATE

PROJECT NUMBER: CK3311-05-11

DRAWN: JLS
CHECKED: JFW
SCALE: 1" = 20'
DATE: 12/27/2011

Map Showing
Post-Construction Conditions
Sinking Pond
W.R. Grace Superfund Site

Towns of Acton and Concord
County of Middlesex
Commonwealth of Massachusetts

Thew Associates
LAND SURVEYORS
www.ThewAssociates.com
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6431 US Highway 11
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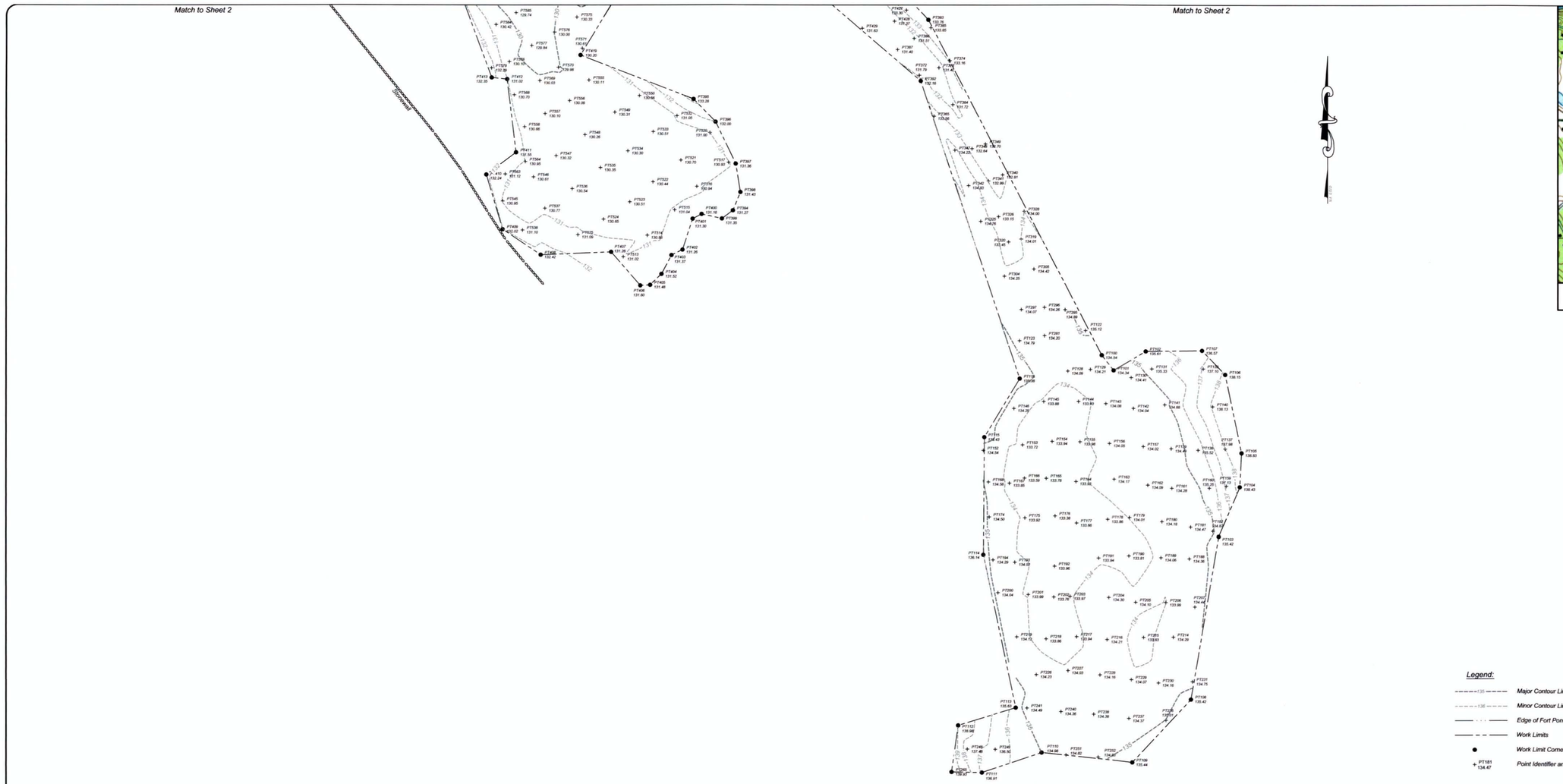

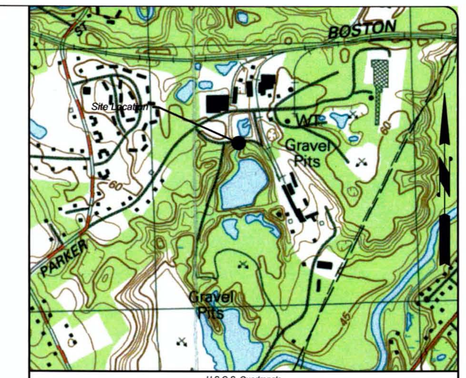

U.S.G.S. Quadrangle
Maynard, Massachusetts
No Scale

Legend:

- Major Contour Line
- Minor Contour Line
- Edge of Fort Pond Brook
- Work Limits
- Work Limit Corner
- PT181 134.47 — Point Identifier and Spot Elevation

General Notes:

1. This survey is referenced horizontally to the North American Datum of 1983 (NAD83) and projected on the Massachusetts State Plane Coordinate System (Mainland Zone) and vertically to the National Geodetic Vertical Datum of 1929 (NGVD29).
2. North arrow as shown indicates Grid North referenced to NAD83 and projected on the Massachusetts State Plane Coordinate System (Mainland Zone).
3. The reference horizontal control station is a National Geodetic Survey Monument designated as "STOW". STOW was established by GPS observations and adjusted by the National Geodetic Survey in June 1998. The reference vertical control station is a Massachusetts Department of Transportation Monument designated as "RM29". Elevation = 138.85 feet.
4. Contours shown hereon reference NGVD29-Geoid09.
5. Contours shown hereon were generated from a Digital Terrain Model utilizing Autodesk Civil 3D Surveying and Engineering software.
6. The information shown hereon is based on an instrument survey completed on October 13, 2011.

Sheet Index

Sheet 2
Sheet 1

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

Surveyor's Certificate:

I certify that this plan conforms with the Rules and Regulations of the Registers deeds.
This survey and plan were prepared in accordance with the Procedural and Technical Standards for the Practice of Land Surveying within the Commonwealth of Massachusetts.

COMMONWEALTH OF MASSACHUSETTS — JOHN WAGENBLATT No. 36396 — PROFESSIONAL — LICENSED SURVEYOR

John F. Wagenblatt RPLS #36396
The LRC Group
190 West Street
Suite E
Cromwell, CT 06416

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Sheet 1 of 2

REV	DESCRIPTION	DATE

PROJECT NUMBER: CK3311-05-11

DRAWN: JLS
CHECKED: JFW
SCALE: 1" = 20'
DATE: 10/14/2011

Map Showing
Post-Backfill Conditions
North Lagoon Wetland
W.R. Grace Superfund Site

Towns of Acton and Concord
County of Middlesex
Commonwealth of Massachusetts

P.O. Box 463
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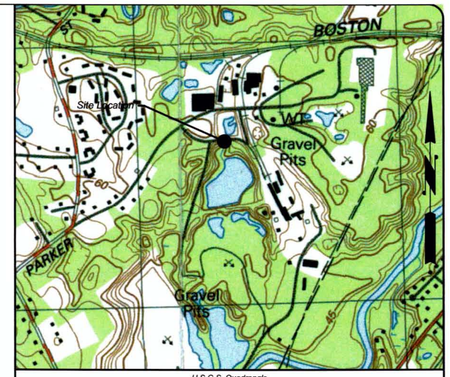
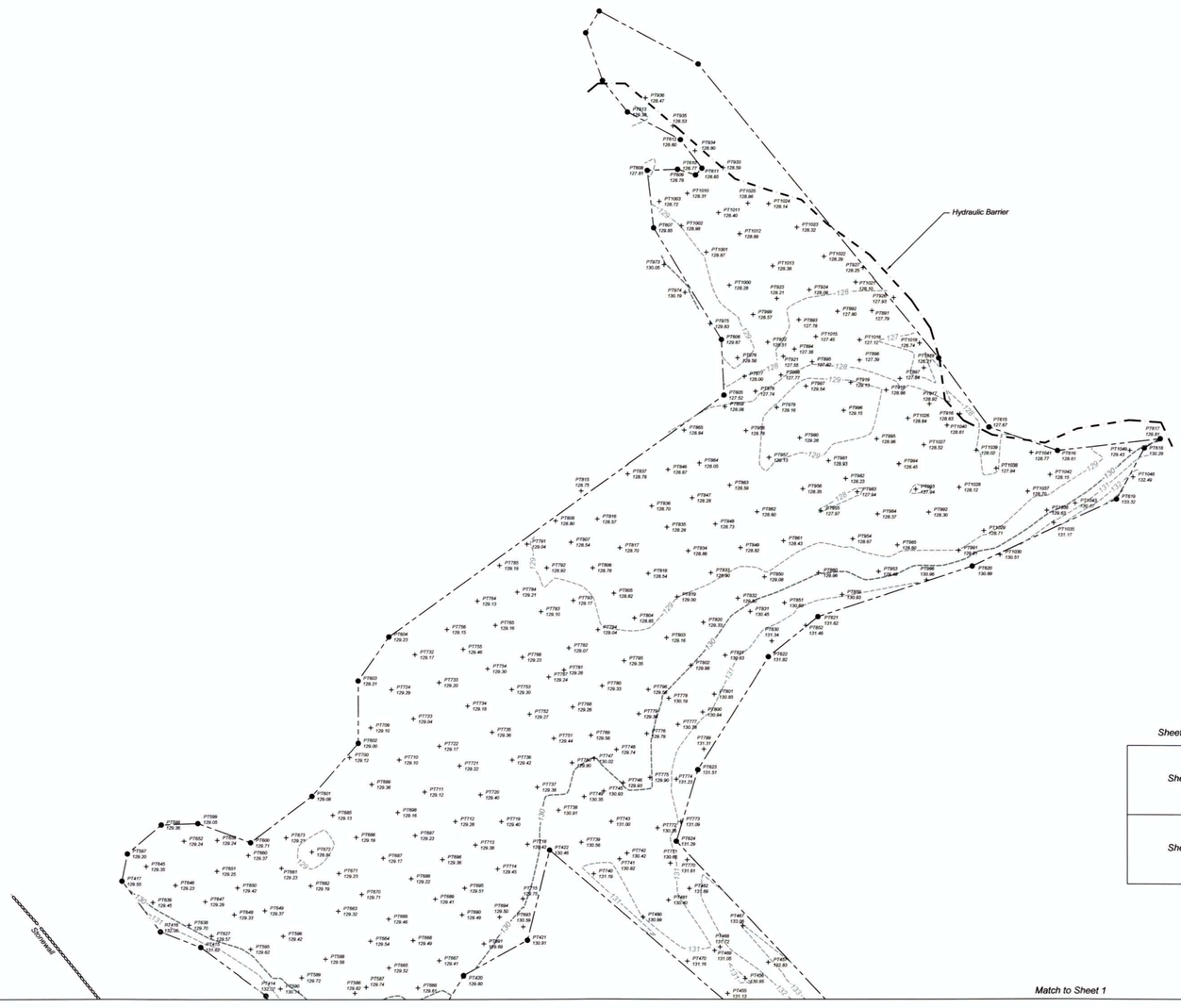


U.S.G.S. Quadrangle
Maynard, Massachusetts
No Scale



Sheet Index

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Sheet 1

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Sheet 2 of 2

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REV	DESCRIPTION	DATE

PROJECT NUMBER: CK3311-05-11

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Map Showing
Post-Backfill Conditions
North Lagoon Wetland
W.R. Grace Superfund Site

Towns of Acton and Concord
County of Middlesex
Commonwealth of Massachusetts

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Attachment D
North Lagoon Wetland
Survey Control Points

Sediment Construction Summary and Final Sediment Remedial Action Report
W.R. Grace Superfund Site
Acton-Concord, Massachusetts

	PRE-CONSTRUCTION			POST-EXCAVATION		POST-BACKFILL					
									Target Backfill Elevation Range [1]		
Point ID	Northing	Easting	Pre-Construction Elevation (feet)	Post-Excavation Elevation (feet)	Δ Elevation from Pre-Construction (feet)	Post-Backfill Elevation (feet)	Backfill Depth (feet)	Δ Elevation from Pre-Construction (feet)	Minimum (Post-Excavation + 1.00 feet)	Maximum (Pre-Construction + 0.10 feet)	Final Elevation in Target Range Y/N
PT100	2,991,605.43	675,652.45	134.50	133.44	1.06	134.54	1.10	0.04	134.44	134.60	Y
PT101	2,991,599.85	675,656.75	134.33	133.24	1.09	134.34	1.10	0.01	134.24	134.43	Y
PT102	2,991,606.92	675,668.46	135.60	134.58	1.02	135.61	1.03	0.01	135.58	135.70	Y
PT103	2,991,538.92	675,695.28	135.41	134.37	1.04	135.42	1.05	0.01	135.37	135.51	Y
PT104	2,991,557.09	675,703.02	138.42	137.39	1.03	138.43	1.04	0.01	138.39	138.52	Y
PT105	2,991,569.57	675,703.66	138.83	137.79	1.04	138.83	1.04	0.00	138.79	138.93	Y
PT106	2,991,598.40	675,697.67	138.07	136.90	1.17	138.15	1.25	0.08	137.90	138.17	Y
PT107	2,991,607.22	675,689.17	136.51	135.51	1.00	136.57	1.06	0.06	136.51	136.61	Y
PT108	2,991,479.30	675,685.08	135.41	134.36	1.05	135.42	1.06	0.01	135.36	135.51	Y
PT109	2,991,456.11	675,663.53	135.43	134.37	1.06	135.44	1.07	0.01	135.37	135.53	Y
PT110	2,991,459.75	675,630.35	134.97	133.95	1.02	134.98	1.03	0.01	134.95	135.07	Y
PT111	2,991,452.43	675,608.36	136.85	135.82	1.03	136.91	1.09	0.06	136.82	136.95	Y
PT112	2,991,469.71	675,599.66	138.95	137.89	1.06	138.98	1.09	0.03	138.89	139.05	Y
PT113	2,991,476.25	675,620.81	135.63	134.56	1.07	135.63	1.07	0.00	135.56	135.73	Y
PT114	2,991,532.32	675,608.92	136.15	134.93	1.22	136.14	1.21	-0.01	135.93	136.25	Y
PT115	2,991,575.43	675,609.27	135.39	134.36	1.03	135.43	1.07	0.04	135.36	135.49	Y
PT116	2,991,596.94	675,622.28	135.36	134.13	1.23	135.38	1.25	0.02	135.13	135.46	Y
PT122	2,991,614.42	675,646.54	135.10	134.02	1.08	135.12	1.10	0.02	135.02	135.20	Y
PT123	2,991,610.84	675,622.18	134.77	133.76	1.01	134.79	1.03	0.02	134.76	134.87	Y
PT128	2,991,599.60	675,639.97	134.08	133.05	1.03	134.09	1.04	0.01	134.05	134.18	Y
PT129	2,991,600.20	675,648.29	134.15	133.12	1.03	134.21	1.09	0.06	134.12	134.25	Y
PT130	2,991,597.28	675,663.06	134.41	133.39	1.02	134.41	1.02	0.00	134.39	134.51	Y
PT131	2,991,600.41	675,670.72	135.28	134.26	1.02	135.33	1.07	0.05	135.26	135.38	Y
PT132	2,991,600.53	675,689.59	137.09	135.99	1.10	137.10	1.11	0.01	136.99	137.19	Y
PT137	2,991,571.07	675,697.60	137.96	136.85	1.11	137.98	1.13	0.02	137.85	138.06	Y
PT138	2,991,570.62	675,687.77	135.45	134.44	1.01	135.52	1.08	0.07	135.44	135.55	Y
PT139	2,991,571.23	675,677.83	134.42	133.31	1.11	134.49	1.18	0.07	134.31	134.52	Y
PT140	2,991,586.55	675,693.08	138.13	136.86	1.27	138.13	1.27	0.00	137.86	138.23	Y
PT141	2,991,587.36	675,675.40	134.58	133.57	1.01	134.68	1.11	0.10	134.57	134.68	Y
PT142	2,991,586.01	675,663.93	133.97	132.96	1.01	134.04	1.08	0.07	133.96	134.07	Y
PT143	2,991,587.56	675,653.89	134.02	132.93	1.09	134.08	1.15	0.06	133.93	134.12	Y
PT144	2,991,588.51	675,643.92	133.86	132.85	1.01	133.93	1.08	0.07	133.85	133.96	Y
PT145	2,991,588.48	675,631.14	133.86	132.86	1.00	133.88	1.02	0.02	133.86	133.96	Y
PT146	2,991,586.03	675,620.20	134.25	133.22	1.03	134.29	1.07	0.04	134.22	134.35	Y
PT152	2,991,570.50	675,608.85	134.54	133.08	1.46	134.54	1.46	0.00	134.08	134.64	Y
PT153	2,991,572.50	675,623.29	133.63	132.62	1.01	133.72	1.10	0.09	133.62	133.73	Y
PT154	2,991,573.84	675,634.15	133.92	132.87	1.05	133.94	1.07	0.02	133.87	134.02	Y
PT155	2,991,573.62	675,644.49	133.94	132.85	1.09	133.98	1.13	0.04	133.85	134.04	Y
PT156	2,991,572.98	675,655.22	134.04	133.00	1.04	134.05	1.05	0.01	134.00	134.14	Y
PT157	2,991,571.85	675,667.55	133.99	132.94	1.05	134.02	1.08	0.03	133.94	134.09	Y
PT159	2,991,557.41	675,697.97	137.09	135.89	1.20	137.13	1.24	0.04	136.89	137.19	Y
PT160	2,991,556.74	675,691.86	135.21	134.16	1.05	135.25	1.09	0.04	135.16	135.31	Y
PT161	2,991,556.66	675,678.09	134.27	133.19	1.08	134.28	1.09	0.01	134.19	134.37	Y
PT162	2,991,557.80	675,669.17	134.03	132.93	1.10	134.09	1.16	0.06	133.93	134.13	Y
PT163	2,991,559.88	675,656.93	134.17	133.01	1.16	134.17	1.16	0.00	134.01	134.27	Y
PT164	2,991,559.01	675,643.04	133.90	132.81	1.09	133.92	1.11	0.02	133.81	134.00	Y
PT165	2,991,560.24	675,632.03	133.75	132.68	1.07	133.78	1.10	0.03	133.68	133.85	Y
PT166	2,991,560.41	675,624.00	133.50	132.47	1.03	133.59	1.12	0.09	133.47	133.60	Y
PT167	2,991,558.45	675,618.54	133.79	132.77	1.02	133.85	1.08	0.06	133.77	133.89	Y
PT168	2,991,558.96	675,610.87	134.56	133.45	1.11	134.58	1.13	0.02	134.45	134.66	Y
PT174	2,991,546.10	675,611.11	134.41	133.37	1.04	134.50	1.13	0.09	134.37	134.51	Y

Attachment D
North Lagoon Wetland
Survey Control Points

Sediment Construction Summary and Final Sediment Remedial Action Report
W.R. Grace Superfund Site
Acton-Concord, Massachusetts

	PRE-CONSTRUCTION			POST-EXCAVATION		POST-BACKFILL					
									Target Backfill Elevation Range [1]		
Point ID	Northing	Easting	Pre-Construction Elevation (feet)	Post-Excavation Elevation (feet)	Δ Elevation from Pre-Construction (feet)	Post-Backfill Elevation (feet)	Backfill Depth (feet)	Δ Elevation from Pre-Construction (feet)	Minimum (Post-Excavation + 1.00 feet)	Maximum (Pre-Construction + 0.10 feet)	Final Elevation in Target Range Y/N
PT175	2,991,545.80	675,624.15	133.92	132.91	1.01	133.92	1.01	0.00	133.91	134.02	Y
PT176	2,991,546.43	675,635.23	133.30	132.25	1.05	133.38	1.13	0.08	133.25	133.40	Y
PT177	2,991,543.80	675,643.16	133.61	132.59	1.02	133.66	1.07	0.05	133.59	133.71	Y
PT178	2,991,545.11	675,654.62	133.85	132.80	1.05	133.86	1.06	0.01	133.80	133.95	Y
PT179	2,991,545.85	675,662.58	133.99	132.96	1.03	134.01	1.05	0.02	133.96	134.09	Y
PT180	2,991,544.31	675,674.42	134.18	133.03	1.15	134.18	1.15	0.00	134.03	134.28	Y
PT181	2,991,542.38	675,684.97	134.45	133.42	1.03	134.47	1.05	0.02	134.42	134.55	Y
PT182	2,991,540.96	675,693.21	134.79	133.78	1.01	134.87	1.09	0.08	134.78	134.89	Y
PT188	2,991,530.89	675,684.50	134.34	133.24	1.10	134.36	1.12	0.02	134.24	134.44	Y
PT189	2,991,531.17	675,674.14	134.06	132.95	1.11	134.06	1.11	0.00	133.95	134.16	Y
PT190	2,991,531.82	675,662.38	133.81	132.80	1.01	133.81	1.01	0.00	133.80	133.91	Y
PT191	2,991,530.99	675,651.35	133.93	132.90	1.03	133.94	1.04	0.01	133.90	134.03	Y
PT192	2,991,528.13	675,635.11	133.95	132.95	1.00	133.96	1.01	0.01	133.95	134.05	Y
PT193	2,991,529.64	675,620.48	134.01	132.91	1.10	134.02	1.11	0.01	133.91	134.11	Y
PT194	2,991,530.47	675,612.54	134.25	133.10	1.15	134.29	1.19	0.04	134.10	134.35	Y
PT200	2,991,518.39	675,614.24	134.02	133.00	1.02	134.04	1.04	0.02	134.00	134.12	Y
PT201	2,991,517.71	675,625.35	133.98	132.85	1.13	133.99	1.14	0.01	133.85	134.08	Y
PT202	2,991,516.75	675,634.79	133.72	132.65	1.07	133.76	1.11	0.04	133.65	133.82	Y
PT203	2,991,516.91	675,640.81	133.96	132.86	1.10	133.97	1.11	0.01	133.86	134.06	Y
PT204	2,991,516.48	675,655.02	134.28	133.14	1.14	134.30	1.16	0.02	134.14	134.38	Y
PT205	2,991,514.84	675,664.75	134.09	132.99	1.10	134.10	1.11	0.01	133.99	134.19	Y
PT206	2,991,514.72	675,675.85	133.98	132.95	1.03	133.99	1.04	0.01	133.95	134.08	Y
PT207	2,991,513.21	675,686.58	134.38	133.30	1.08	134.44	1.14	0.06	134.30	134.48	Y
PT214	2,991,502.14	675,678.63	134.20	133.12	1.08	134.29	1.17	0.09	134.12	134.30	Y
PT215	2,991,501.90	675,667.59	133.83	132.81	1.02	133.83	1.02	0.00	133.81	133.93	Y
PT216	2,991,501.07	675,654.37	134.21	133.12	1.09	134.21	1.09	0.00	134.12	134.31	Y
PT217	2,991,502.17	675,643.20	133.90	132.86	1.04	133.94	1.08	0.04	133.86	134.00	Y
PT218	2,991,501.42	675,631.99	133.85	132.82	1.03	133.86	1.04	0.01	133.82	133.95	Y
PT219	2,991,502.17	675,621.24	134.09	132.99	1.10	134.12	1.13	0.03	133.99	134.19	Y
PT226	2,991,488.38	675,628.41	134.14	133.00	1.14	134.23	1.23	0.09	134.00	134.24	Y
PT227	2,991,489.73	675,640.12	134.01	132.95	1.06	134.03	1.08	0.02	133.95	134.11	Y
PT228	2,991,488.14	675,651.82	134.15	133.04	1.11	134.16	1.12	0.01	134.04	134.25	Y
PT229	2,991,486.46	675,663.16	134.06	133.01	1.05	134.07	1.06	0.01	134.01	134.16	Y
PT230	2,991,485.33	675,673.19	134.11	133.10	1.01	134.16	1.06	0.05	134.10	134.21	Y
PT231	2,991,485.87	675,685.59	134.73	133.71	1.02	134.75	1.04	0.02	134.71	134.83	Y
PT236	2,991,471.64	675,675.92	134.97	133.97	1.00	135.01	1.04	0.04	134.97	135.07	Y
PT237	2,991,472.24	675,662.29	134.37	133.28	1.09	134.37	1.09	0.00	134.28	134.47	Y
PT238	2,991,473.75	675,649.50	134.36	133.26	1.10	134.38	1.12	0.02	134.26	134.46	Y
PT240	2,991,474.82	675,637.42	134.33	133.25	1.08	134.36	1.11	0.03	134.25	134.43	Y
PT241	2,991,476.13	675,624.98	134.39	133.34	1.05	134.49	1.15	0.10	134.34	134.49	Y
PT248	2,991,461.05	675,603.06	137.48	136.44	1.04	137.48	1.04	0.00	137.44	137.58	Y
PT249	2,991,460.95	675,613.26	136.48	135.47	1.01	136.50	1.03	0.02	136.47	136.58	Y
PT251	2,991,458.84	675,639.30	134.82	133.81	1.01	134.82	1.01	0.00	134.81	134.92	Y
PT252	2,991,457.97	675,651.16	134.81	133.74	1.07	134.83	1.09	0.02	134.74	134.91	Y
PT265	2,991,452.64	675,597.23	139.85	138.78	1.07	139.93	1.15	0.08	139.78	139.95	Y
PT281	2,991,612.51	675,631.49	134.19	133.17	1.02	134.20	1.03	0.01	134.17	134.29	Y
PT295	2,991,622.09	675,639.02	134.84	133.62	1.22	134.89	1.27	0.05	134.62	134.94	Y
PT296	2,991,622.98	675,631.35	134.24	133.19	1.05	134.26	1.07	0.02	134.19	134.34	Y
PT297	2,991,622.18	675,622.94	134.06	132.97	1.09	134.07	1.10	0.01	133.97	134.16	Y
PT304	2,991,634.36	675,616.66	134.17	133.00	1.17	134.25	1.25	0.08	134.00	134.27	Y
PT305	2,991,637.03	675,627.48	134.42	133.32	1.10	134.42	1.10	0.00	134.32	134.52	Y

Attachment D
North Lagoon Wetland
Survey Control Points

Sediment Construction Summary and Final Sediment Remedial Action Report
W.R. Grace Superfund Site
Acton-Concord, Massachusetts

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Point ID	Northing	Easting	Pre-Construction Elevation (feet)	Post-Excavation Elevation (feet)	Δ Elevation from Pre-Construction (feet)	Post-Backfill Elevation (feet)	Backfill Depth (feet)	Δ Elevation from Pre-Construction (feet)	Minimum (Post-Excavation + 1.00 feet)	Maximum (Pre-Construction + 0.10 feet)	Final Elevation in Target Range Y/N
PT319	2,991,648.07	675,622.85	133.99	132.88	1.11	134.01	1.13	0.02	133.88	134.09	Y
PT320	2,991,646.97	675,618.17	133.35	132.26	1.09	133.45	1.19	0.10	133.26	133.45	Y
PT325	2,991,654.44	675,607.87	134.76	133.53	1.23	134.76	1.23	0.00	134.53	134.86	Y
PT326	2,991,656.29	675,614.48	133.14	132.07	1.07	133.15	1.08	0.01	133.07	133.24	Y
PT328	2,991,658.26	675,623.97	133.98	132.94	1.04	134.00	1.06	0.02	133.94	134.08	Y
PT340	2,991,671.61	675,615.95	132.76	131.68	1.08	132.81	1.13	0.05	132.68	132.86	Y
PT341	2,991,669.36	675,610.82	132.98	131.78	1.20	132.99	1.21	0.01	132.78	133.08	Y
PT342	2,991,667.63	675,603.47	134.82	133.72	1.10	134.83	1.11	0.01	134.72	134.92	Y
PT347	2,991,680.64	675,598.42	134.15	133.09	1.06	134.22	1.13	0.07	134.09	134.25	Y
PT348	2,991,681.19	675,604.74	132.62	131.54	1.08	132.64	1.10	0.02	132.54	132.72	Y
PT349	2,991,682.91	675,609.68	132.68	131.60	1.08	132.70	1.10	0.02	132.60	132.78	Y
PT364	2,991,697.31	675,597.67	131.70	130.65	1.05	131.72	1.07	0.02	131.65	131.80	Y
PT365	2,991,693.09	675,590.74	133.49	132.28	1.21	133.56	1.28	0.07	133.28	133.59	Y
PT372	2,991,708.12	675,585.36	131.71	130.62	1.09	131.79	1.17	0.08	131.62	131.81	Y
PT373	2,991,710.87	675,592.56	131.41	130.41	1.00	131.47	1.06	0.06	131.41	131.51	Y
PT374	2,991,713.42	675,596.59	133.14	131.85	1.29	133.16	1.31	0.02	132.85	133.24	Y
PT385	2,991,725.53	675,589.62	133.79	132.73	1.06	133.85	1.12	0.06	133.73	133.89	Y
PT386	2,991,721.64	675,583.43	131.49	130.47	1.02	131.51	1.04	0.02	131.47	131.59	Y
PT387	2,991,717.55	675,577.37	131.34	130.34	1.00	131.40	1.06	0.06	131.34	131.44	Y
PT392	2,991,706.00	675,585.87	132.13	131.12	1.01	132.16	1.04	0.03	132.12	132.23	Y
PT393	2,991,728.46	675,588.70	133.69	132.68	1.01	133.76	1.08	0.07	133.68	133.79	Y
PT394	2,991,658.41	675,516.83	131.20	130.10	1.10	131.27	1.17	0.07	131.10	131.30	Y
PT395	2,991,699.33	675,502.35	133.24	132.15	1.09	133.28	1.13	0.04	133.15	133.34	Y
PT396	2,991,690.95	675,510.42	131.97	130.89	1.08	132.00	1.11	0.03	131.89	132.07	Y
PT397	2,991,675.57	675,517.85	131.30	130.26	1.04	131.36	1.10	0.06	131.26	131.40	Y
PT398	2,991,665.15	675,519.54	131.42	130.31	1.11	131.43	1.12	0.01	131.31	131.52	Y
PT399	2,991,655.42	675,512.76	131.33	130.32	1.01	131.35	1.03	0.02	131.32	131.43	Y
PT400	2,991,657.12	675,505.31	131.12	130.12	1.00	131.16	1.04	0.04	131.12	131.22	Y
PT401	2,991,655.40	675,502.02	131.30	130.26	1.04	131.30	1.04	0.00	131.26	131.40	Y
PT402	2,991,644.07	675,498.29	131.24	130.22	1.02	131.26	1.04	0.02	131.22	131.34	Y
PT403	2,991,642.08	675,494.22	131.36	130.28	1.08	131.37	1.09	0.01	131.28	131.46	Y
PT404	2,991,635.16	675,490.56	131.51	130.48	1.03	131.52	1.04	0.01	131.48	131.61	Y
PT405	2,991,631.17	675,486.40	131.43	130.41	1.02	131.48	1.07	0.05	131.41	131.53	Y
PT406	2,991,630.95	675,482.74	131.60	130.50	1.10	131.60	1.10	0.00	131.50	131.70	Y
PT407	2,991,643.26	675,472.04	131.22	130.05	1.17	131.26	1.21	0.04	131.05	131.32	Y
PT408	2,991,642.21	675,446.10	132.34	131.09	1.25	132.42	1.33	0.08	132.09	132.44	Y
PT409	2,991,651.56	675,432.09	132.01	130.86	1.15	132.02	1.16	0.01	131.86	132.11	Y
PT410	2,991,671.67	675,426.09	132.22	131.19	1.03	132.24	1.05	0.02	132.19	132.32	Y
PT411	2,991,679.83	675,437.03	131.54	130.43	1.11	131.55	1.12	0.01	131.43	131.64	Y
PT412	2,991,706.71	675,433.73	131.00	129.75	1.25	131.02	1.27	0.02	130.75	131.10	Y
PT413	2,991,707.30	675,428.07	132.32	131.30	1.02	132.35	1.05	0.03	132.30	132.42	Y
PT414	2,991,735.15	675,417.75	132.07	130.89	1.18	132.07	1.18	0.00	131.89	132.17	Y
PT415	2,991,749.35	675,398.46	131.60	130.38	1.22	131.62	1.24	0.02	131.38	131.70	Y
PT416	2,991,753.93	675,386.50	132.03	131.03	1.00	132.06	1.03	0.03	132.03	132.13	Y
PT417	2,991,768.87	675,375.13	129.55	128.54	1.01	129.55	1.01	0.00	129.54	129.65	Y
PT419	2,991,715.55	675,460.72	130.19	129.17	1.02	130.20	1.03	0.01	130.17	130.29	Y
PT420	2,991,741.02	675,476.29	129.74	128.48	1.26	129.80	1.32	0.06	129.48	129.84	Y
PT421	2,991,751.42	675,495.23	130.95	129.65	1.30	130.91	1.26	-0.04	130.65	131.05	Y
PT422	2,991,778.03	675,501.81	130.44	129.17	1.27	130.46	1.29	0.02	130.17	130.54	Y
PT427	2,991,731.98	675,580.63	133.23	131.97	1.26	133.30	1.33	0.07	132.97	133.33	Y
PT428	2,991,727.94	675,576.23	131.34	130.32	1.02	131.37	1.05	0.03	131.32	131.44	Y

Attachment D
North Lagoon Wetland
Survey Control Points

Sediment Construction Summary and Final Sediment Remedial Action Report
W.R. Grace Superfund Site
Acton-Concord, Massachusetts

	PRE-CONSTRUCTION			POST-EXCAVATION		POST-BACKFILL					
									Target Backfill Elevation Range [1]		
Point ID	Northing	Easting	Pre-Construction Elevation (feet)	Post-Excavation Elevation (feet)	Δ Elevation from Pre-Construction (feet)	Post-Backfill Elevation (feet)	Backfill Depth (feet)	Δ Elevation from Pre-Construction (feet)	Minimum (Post-Excavation + 1.00 feet)	Maximum (Pre-Construction + 0.10 feet)	Final Elevation in Target Range Y/N
PT429	2,991,725.33	675,564.40	131.57	130.48	1.09	131.63	1.15	0.06	131.48	131.67	Y
PT455	2,991,735.78	675,554.43	131.08	129.98	1.10	131.13	1.15	0.05	130.98	131.18	Y
PT456	2,991,740.19	675,559.64	130.94	129.76	1.18	130.95	1.19	0.01	130.76	131.04	Y
PT457	2,991,744.88	675,566.50	132.77	131.65	1.12	132.83	1.18	0.06	132.65	132.87	Y
PT467	2,991,755.70	675,558.97	132.99	131.72	1.27	133.06	1.34	0.07	132.72	133.09	Y
PT468	2,991,749.42	675,552.20	131.72	130.69	1.03	131.72	1.03	0.00	131.69	131.82	Y
PT469	2,991,748.39	675,550.55	131.05	129.78	1.27	131.05	1.27	0.00	130.78	131.15	Y
PT470	2,991,745.23	675,542.50	131.13	130.12	1.01	131.16	1.04	0.03	131.12	131.23	Y
PT480	2,991,758.24	675,529.37	130.90	129.87	1.03	130.99	1.12	0.09	130.87	131.00	Y
PT481	2,991,763.26	675,536.97	130.32	129.32	1.00	130.40	1.08	0.08	130.32	130.42	Y
PT482	2,991,766.69	675,543.14	131.64	130.60	1.04	131.69	1.09	0.05	131.60	131.74	Y
PT513	2,991,641.55	675,476.53	131.00	129.97	1.03	131.02	1.05	0.02	130.97	131.10	Y
PT514	2,991,649.43	675,485.32	130.83	129.79	1.04	130.86	1.07	0.03	130.79	130.93	Y
PT515	2,991,658.64	675,495.35	131.03	130.02	1.01	131.04	1.02	0.01	131.02	131.13	Y
PT516	2,991,667.23	675,503.68	130.94	129.93	1.01	130.94	1.01	0.00	130.93	131.04	Y
PT517	2,991,676.03	675,515.23	130.92	129.90	1.02	130.93	1.03	0.01	130.90	131.02	Y
PT520	2,991,686.92	675,508.39	130.96	129.94	1.02	131.00	1.06	0.04	130.94	131.06	Y
PT521	2,991,676.97	675,497.73	130.70	129.61	1.09	130.70	1.09	0.00	130.61	130.80	Y
PT522	2,991,669.01	675,487.44	130.43	129.42	1.01	130.44	1.02	0.01	130.42	130.53	Y
PT523	2,991,661.66	675,478.90	130.50	129.49	1.01	130.51	1.02	0.01	130.49	130.60	Y
PT524	2,991,655.21	675,469.18	130.62	129.60	1.02	130.65	1.05	0.03	130.60	130.72	Y
PT525	2,991,649.66	675,459.81	131.09	130.01	1.08	131.09	1.08	0.00	131.01	131.19	Y
PT532	2,991,693.22	675,496.31	131.04	129.90	1.14	131.05	1.15	0.01	130.90	131.14	Y
PT533	2,991,687.34	675,487.51	130.49	129.47	1.02	130.51	1.04	0.02	130.47	130.59	Y
PT534	2,991,680.34	675,478.22	130.28	129.27	1.01	130.30	1.03	0.02	130.27	130.38	Y
PT535	2,991,674.31	675,468.16	130.35	129.33	1.02	130.35	1.02	0.00	130.33	130.45	Y
PT536	2,991,666.51	675,457.73	130.51	129.50	1.01	130.54	1.04	0.03	130.50	130.61	Y
PT537	2,991,659.28	675,447.63	130.77	129.63	1.14	130.77	1.14	0.00	130.63	130.87	Y
PT538	2,991,651.28	675,439.49	131.09	129.98	1.11	131.10	1.12	0.01	130.98	131.19	Y
PT545	2,991,661.96	675,432.07	130.90	129.60	1.30	130.95	1.35	0.05	130.60	131.00	Y
PT546	2,991,670.79	675,443.41	130.61	129.59	1.02	130.61	1.02	0.00	130.59	130.71	Y
PT547	2,991,678.63	675,451.74	130.27	129.16	1.11	130.32	1.16	0.05	130.16	130.37	Y
PT548	2,991,686.27	675,462.36	130.19	129.10	1.09	130.26	1.16	0.07	130.10	130.29	Y
PT549	2,991,694.52	675,473.36	130.26	129.12	1.14	130.31	1.19	0.05	130.12	130.36	Y
PT550	2,991,700.66	675,482.38	130.52	129.40	1.12	130.56	1.16	0.04	130.40	130.62	Y
PT555	2,991,706.36	675,463.85	130.10	129.01	1.09	130.11	1.10	0.01	130.01	130.20	Y
PT556	2,991,698.78	675,456.75	130.03	128.84	1.19	130.09	1.25	0.06	129.84	130.13	Y
PT557	2,991,694.01	675,447.77	130.05	128.93	1.12	130.10	1.17	0.05	129.93	130.15	Y
PT558	2,991,689.16	675,440.08	130.59	129.41	1.18	130.66	1.25	0.07	130.41	130.69	Y
PT563	2,991,671.95	675,433.09	131.12	129.82	1.30	131.12	1.30	0.00	130.82	131.22	Y
PT564	2,991,676.52	675,440.50	130.93	129.83	1.10	130.95	1.12	0.02	130.83	131.03	Y
PT568	2,991,700.96	675,436.44	130.63	129.56	1.07	130.70	1.14	0.07	130.56	130.73	Y
PT569	2,991,706.12	675,445.83	130.02	128.81	1.21	130.03	1.22	0.01	129.81	130.12	Y
PT570	2,991,711.00	675,452.62	129.96	128.84	1.12	129.98	1.14	0.02	129.84	130.06	Y
PT571	2,991,718.00	675,461.36	130.58	129.43	1.15	130.61	1.18	0.03	130.43	130.68	Y
PT575	2,991,729.49	675,459.39	130.37	129.27	1.10	130.33	1.06	-0.04	130.27	130.47	Y
PT576	2,991,724.03	675,451.25	129.99	128.95	1.04	130.00	1.05	0.01	129.95	130.09	Y
PT577	2,991,719.07	675,442.84	129.82	128.79	1.03	129.84	1.05	0.02	129.79	129.92	Y
PT578	2,991,713.20	675,434.54	130.04	128.97	1.07	130.10	1.13	0.06	129.97	130.14	Y
PT579	2,991,710.75	675,428.00	132.25	131.04	1.21	132.29	1.25	0.04	132.04	132.35	Y
PT584	2,991,726.66	675,429.70	130.42	129.15	1.27	130.42	1.27	0.00	130.15	130.52	Y

Attachment D
North Lagoon Wetland
Survey Control Points

Sediment Construction Summary and Final Sediment Remedial Action Report
W.R. Grace Superfund Site
Acton-Concord, Massachusetts

	PRE-CONSTRUCTION			POST-EXCAVATION		POST-BACKFILL					
									Target Backfill Elevation Range [1]		
Point ID	Northing	Easting	Pre-Construction Elevation (feet)	Post-Excavation Elevation (feet)	Δ Elevation from Pre-Construction (feet)	Post-Backfill Elevation (feet)	Backfill Depth (feet)	Δ Elevation from Pre-Construction (feet)	Minimum (Post-Excavation + 1.00 feet)	Maximum (Pre-Construction + 0.10 feet)	Final Elevation in Target Range Y/N
PT585	2,991,731.05	675,436.99	129.73	128.70	1.03	129.74	1.04	0.01	129.70	129.83	Y
PT586	2,991,735.90	675,444.04	129.78	128.64	1.14	129.82	1.18	0.04	129.64	129.88	Y
PT587	2,991,737.77	675,447.51	129.70	128.64	1.06	129.74	1.10	0.04	129.64	129.80	Y
PT588	2,991,745.83	675,435.40	129.58	128.54	1.04	129.58	1.04	0.00	129.54	129.68	Y
PT589	2,991,740.55	675,428.38	129.70	128.49	1.21	129.72	1.23	0.02	129.49	129.80	Y
PT590	2,991,737.20	675,422.15	130.14	128.90	1.24	130.14	1.24	0.00	129.90	130.24	Y
PT595	2,991,748.74	675,413.22	129.62	128.59	1.03	129.62	1.03	0.00	129.59	129.72	Y
PT596	2,991,752.60	675,422.90	129.41	128.40	1.01	129.42	1.02	0.01	129.40	129.51	Y
PT597	2,991,776.93	675,376.72	129.13	128.13	1.00	129.20	1.07	0.07	129.13	129.23	Y
PT598	2,991,785.55	675,386.77	129.36	128.34	1.02	129.36	1.02	0.00	129.34	129.46	Y
PT599	2,991,786.00	675,397.62	129.00	127.68	1.32	129.05	1.37	0.05	128.68	129.10	Y
PT600	2,991,780.33	675,413.25	129.66	128.31	1.35	129.71	1.40	0.05	129.31	129.76	Y
PT601	2,991,794.06	675,431.42	129.13	128.01	1.12	129.08	1.07	-0.05	129.01	129.23	Y
PT602	2,991,809.75	675,445.15	129.02	127.98	1.04	129.00	1.02	-0.02	128.98	129.12	Y
PT603	2,991,828.21	675,445.11	129.16	128.03	1.13	129.21	1.18	0.05	129.03	129.26	Y
PT604	2,991,841.18	675,454.23	129.19	127.90	1.29	129.23	1.33	0.04	128.90	129.29	Y
PT605	2,991,912.50	675,553.46	127.45	126.37	1.08	127.52	1.15	0.07	127.37	127.55	Y
PT606	2,991,928.90	675,552.71	129.64	128.51	1.13	129.67	1.16	0.03	129.51	129.74	Y
PT607	2,991,961.76	675,532.67	129.80	128.50	1.30	129.85	1.35	0.05	129.50	129.90	Y
PT608	2,991,978.76	675,530.80	127.75	126.70	1.05	127.81	1.11	0.06	127.70	127.85	Y
PT609	2,991,979.11	675,539.77	128.76	127.50	1.26	128.78	1.28	0.02	128.50	128.86	Y
PT610	2,991,977.44	675,545.09	128.71	127.47	1.24	128.77	1.30	0.06	128.47	128.81	Y
PT611	2,991,979.44	675,547.00	128.63	127.40	1.23	128.65	1.25	0.02	128.40	128.73	Y
PT612	2,991,987.89	675,540.62	128.60	127.42	1.18	128.60	1.18	0.00	128.42	128.70	Y
PT613	2,991,996.02	675,524.97	129.36	128.24	1.12	129.38	1.14	0.02	129.24	129.46	Y
PT615	2,991,902.98	675,631.91	127.64	126.64	1.00	127.67	1.03	0.03	127.64	127.74	Y
PT616	2,991,895.93	675,652.19	128.57	127.50	1.07	128.61	1.11	0.04	128.50	128.67	Y
PT617	2,991,899.55	675,682.44	129.80	128.53	1.27	129.81	1.28	0.01	129.53	129.90	Y
PT618	2,991,896.80	675,677.71	130.24	128.88	1.36	130.29	1.41	0.05	129.88	130.34	Y
PT619	2,991,881.78	675,669.45	133.29	132.17	1.12	133.32	1.15	0.03	133.17	133.39	Y
PT620	2,991,862.02	675,626.94	130.84	129.69	1.15	130.89	1.20	0.05	130.69	130.94	Y
PT621	2,991,847.09	675,581.26	131.61	130.28	1.33	131.62	1.34	0.01	131.28	131.71	Y
PT622	2,991,835.27	675,566.57	131.74	130.60	1.14	131.82	1.22	0.08	131.60	131.84	Y
PT623	2,991,801.85	675,545.66	131.44	129.99	1.45	131.51	1.52	0.07	130.99	131.54	Y
PT624	2,991,780.67	675,539.30	131.27	129.98	1.29	131.29	1.31	0.02	130.98	131.37	Y
PT627	2,991,752.67	675,401.58	129.57	128.55	1.02	129.57	1.02	0.00	129.55	129.67	Y
PT638	2,991,755.89	675,394.94	129.68	128.67	1.01	129.70	1.03	0.02	129.67	129.78	Y
PT639	2,991,762.56	675,384.28	129.37	128.31	1.06	129.45	1.14	0.08	129.31	129.47	Y
PT645	2,991,773.26	675,382.28	129.35	128.27	1.08	129.35	1.08	0.00	129.27	129.45	Y
PT646	2,991,767.67	675,390.98	129.18	128.18	1.00	129.23	1.05	0.05	129.18	129.28	Y
PT647	2,991,762.79	675,399.72	129.20	128.20	1.00	129.28	1.08	0.08	129.20	129.30	Y
PT648	2,991,758.99	675,408.44	129.33	128.29	1.04	129.33	1.04	0.00	129.29	129.43	Y
PT649	2,991,760.27	675,417.42	129.36	128.28	1.08	129.37	1.09	0.01	129.28	129.46	Y
PT650	2,991,766.83	675,409.39	129.38	128.35	1.03	129.42	1.07	0.04	129.35	129.48	Y
PT651	2,991,771.83	675,403.31	129.23	128.20	1.03	129.25	1.05	0.02	129.20	129.33	Y
PT652	2,991,780.71	675,393.61	129.24	128.23	1.01	129.24	1.01	0.00	129.23	129.34	Y
PT659	2,991,780.95	675,403.37	129.23	128.22	1.01	129.24	1.02	0.01	129.22	129.33	Y
PT660	2,991,776.48	675,412.56	129.33	128.33	1.00	129.37	1.04	0.04	129.33	129.43	Y
PT661	2,991,772.75	675,422.39	129.23	128.22	1.01	129.23	1.01	0.00	129.22	129.33	Y
PT662	2,991,767.55	675,430.88	129.18	128.18	1.00	129.19	1.01	0.01	129.18	129.28	Y
PT663	2,991,760.03	675,439.15	129.31	128.26	1.05	129.32	1.06	0.01	129.26	129.41	Y

Attachment D
North Lagoon Wetland
Survey Control Points

Sediment Construction Summary and Final Sediment Remedial Action Report
W.R. Grace Superfund Site
Acton-Concord, Massachusetts

	PRE-CONSTRUCTION			POST-EXCAVATION		POST-BACKFILL					
									Target Backfill Elevation Range [1]		
Point ID	Northing	Easting	Pre-Construction Elevation (feet)	Post-Excavation Elevation (feet)	Δ Elevation from Pre-Construction (feet)	Post-Backfill Elevation (feet)	Backfill Depth (feet)	Δ Elevation from Pre-Construction (feet)	Minimum (Post-Excavation + 1.00 feet)	Maximum (Pre-Construction + 0.10 feet)	Final Elevation in Target Range Y/N
PT664	2,991,751.17	675,448.74	129.48	128.44	1.04	129.54	1.10	0.06	129.44	129.58	Y
PT665	2,991,743.29	675,454.23	129.57	128.49	1.08	129.52	1.03	-0.05	129.49	129.67	Y
PT666	2,991,737.48	675,462.77	129.64	128.59	1.05	129.61	1.02	-0.03	129.59	129.74	Y
PT667	2,991,745.38	675,469.11	129.42	128.36	1.06	129.41	1.05	-0.01	129.36	129.52	Y
PT668	2,991,751.39	675,461.31	129.55	128.47	1.08	129.49	1.02	-0.06	129.47	129.65	Y
PT669	2,991,757.69	675,454.07	129.45	128.41	1.04	129.46	1.05	0.01	129.41	129.55	Y
PT670	2,991,764.94	675,446.12	129.70	128.44	1.26	129.71	1.27	0.01	129.44	129.80	Y
PT671	2,991,771.23	675,439.39	129.23	128.14	1.09	129.23	1.09	0.00	129.14	129.33	Y
PT672	2,991,777.63	675,431.34	128.77	127.67	1.10	128.81	1.14	0.04	128.67	128.87	Y
PT673	2,991,781.84	675,423.78	129.20	128.10	1.10	129.21	1.11	0.01	129.10	129.30	Y
PT685	2,991,788.42	675,437.59	129.14	127.89	1.25	129.13	1.24	-0.01	128.89	129.24	Y
PT686	2,991,781.89	675,444.54	129.21	128.02	1.19	129.19	1.17	-0.02	129.02	129.31	Y
PT687	2,991,775.72	675,452.55	129.17	128.15	1.02	129.17	1.02	0.00	129.15	129.27	Y
PT688	2,991,769.64	675,460.81	129.23	128.11	1.12	129.22	1.11	-0.01	129.11	129.33	Y
PT689	2,991,763.58	675,467.91	129.34	128.16	1.18	129.41	1.25	0.07	129.16	129.44	Y
PT690	2,991,758.94	675,475.82	129.49	128.41	1.08	129.49	1.08	0.00	129.41	129.59	Y
PT691	2,991,750.35	675,482.28	129.71	128.67	1.04	129.69	1.02	-0.02	129.67	129.81	Y
PT693	2,991,755.37	675,493.99	130.64	129.43	1.21	130.59	1.16	-0.05	130.43	130.74	Y
PT694	2,991,758.23	675,486.96	129.45	128.33	1.12	129.50	1.17	0.05	129.33	129.55	Y
PT695	2,991,766.79	675,476.64	129.51	128.33	1.18	129.51	1.18	0.00	129.33	129.61	Y
PT696	2,991,775.28	675,470.08	129.32	128.20	1.12	129.36	1.16	0.04	129.20	129.42	Y
PT697	2,991,782.41	675,461.98	129.19	128.14	1.05	129.23	1.09	0.04	129.14	129.29	Y
PT698	2,991,789.23	675,456.81	129.17	128.06	1.11	129.16	1.10	-0.01	129.06	129.27	Y
PT699	2,991,797.52	675,449.15	129.42	128.19	1.23	129.36	1.17	-0.06	129.19	129.52	Y
PT700	2,991,805.53	675,442.58	129.12	128.11	1.01	129.05	0.94	-0.07	129.11	129.22	Y
PT709	2,991,814.34	675,448.81	129.17	128.04	1.13	129.10	1.06	-0.07	129.04	129.27	Y
PT710	2,991,804.78	675,457.23	129.18	128.06	1.12	129.10	1.04	-0.08	129.06	129.28	Y
PT711	2,991,795.28	675,464.79	129.16	127.94	1.22	129.12	1.18	-0.04	128.94	129.26	Y
PT712	2,991,786.58	675,473.91	129.27	128.18	1.09	129.28	1.10	0.01	129.18	129.37	Y
PT713	2,991,779.61	675,479.81	129.37	128.25	1.12	129.38	1.13	0.01	129.25	129.47	Y
PT714	2,991,772.49	675,486.38	129.43	128.39	1.04	129.45	1.06	0.02	129.39	129.53	Y
PT715	2,991,763.65	675,493.88	129.66	128.62	1.04	129.75	1.13	0.09	129.62	129.76	Y
PT718	2,991,779.77	675,495.26	129.37	128.32	1.05	129.42	1.10	0.05	129.32	129.47	Y
PT719	2,991,786.50	675,487.54	129.39	128.33	1.06	129.40	1.07	0.01	129.33	129.49	Y
PT720	2,991,794.44	675,481.31	129.36	128.26	1.10	129.40	1.14	0.04	129.26	129.46	Y
PT721	2,991,802.96	675,475.15	129.20	128.17	1.03	129.22	1.05	0.02	129.17	129.30	Y
PT722	2,991,808.80	675,469.15	129.13	128.08	1.05	129.17	1.09	0.04	129.08	129.23	Y
PT723	2,991,816.95	675,461.46	129.02	127.97	1.05	129.04	1.07	0.02	128.97	129.12	Y
PT724	2,991,825.56	675,454.97	129.25	128.07	1.18	129.29	1.22	0.04	129.07	129.35	Y
PT732	2,991,835.92	675,461.91	129.15	128.04	1.11	129.17	1.13	0.02	129.04	129.25	Y
PT733	2,991,827.67	675,469.10	129.17	128.13	1.04	129.20	1.07	0.03	129.13	129.27	Y
PT734	2,991,820.68	675,477.54	129.18	128.15	1.03	129.18	1.03	0.00	129.15	129.28	Y
PT735	2,991,812.92	675,484.81	129.33	128.24	1.09	129.36	1.12	0.03	129.24	129.43	Y
PT736	2,991,804.65	675,490.75	129.35	128.13	1.22	129.42	1.29	0.07	129.13	129.45	Y
PT737	2,991,796.64	675,498.16	129.31	128.20	1.11	129.38	1.18	0.07	129.20	129.41	Y
PT738	2,991,789.83	675,504.48	130.90	129.25	1.65	130.91	1.66	0.01	130.25	131.00	Y
PT739	2,991,780.28	675,511.18	130.51	129.49	1.02	130.56	1.07	0.05	130.49	130.61	Y
PT740	2,991,770.97	675,514.84	131.17	130.09	1.08	131.19	1.10	0.02	131.09	131.27	Y
PT741	2,991,775.39	675,522.45	130.90	129.86	1.04	130.92	1.06	0.02	130.86	131.00	Y
PT742	2,991,777.10	675,524.66	130.41	129.40	1.01	130.42	1.02	0.01	130.40	130.51	Y
PT743	2,991,786.47	675,520.05	130.99	129.32	1.67	131.00	1.68	0.01	130.32	131.09	Y

Attachment D
North Lagoon Wetland
Survey Control Points

Sediment Construction Summary and Final Sediment Remedial Action Report
W.R. Grace Superfund Site
Acton-Concord, Massachusetts

	PRE-CONSTRUCTION			POST-EXCAVATION		POST-BACKFILL					
									Target Backfill Elevation Range [1]		
Point ID	Northing	Easting	Pre-Construction Elevation (feet)	Post-Excavation Elevation (feet)	Δ Elevation from Pre-Construction (feet)	Post-Backfill Elevation (feet)	Backfill Depth (feet)	Δ Elevation from Pre-Construction (feet)	Minimum (Post-Excavation + 1.00 feet)	Maximum (Pre-Construction + 0.10 feet)	Final Elevation in Target Range Y/N
PT745	2,991,795.42	675,517.82	130.91	128.91	2.00	130.93	2.02	0.02	129.91	131.01	Y
PT746	2,991,797.92	675,523.57	129.93	128.91	1.02	129.93	1.02	0.00	129.91	130.03	Y
PT747	2,991,805.04	675,515.01	130.00	128.78	1.22	130.02	1.24	0.02	129.78	130.10	Y
PT748	2,991,807.71	675,521.59	129.70	128.67	1.03	129.74	1.07	0.04	129.67	129.80	Y
PT749	2,991,793.78	675,512.03	130.38	129.04	1.34	130.35	1.31	-0.03	130.04	130.48	Y
PT750	2,991,803.76	675,508.48	129.87	128.55	1.32	129.90	1.35	0.03	129.55	129.97	Y
PT751	2,991,811.11	675,503.07	129.42	128.39	1.03	129.44	1.05	0.02	129.39	129.52	Y
PT752	2,991,818.26	675,495.87	129.25	128.22	1.03	129.27	1.05	0.02	129.22	129.35	Y
PT753	2,991,825.53	675,490.62	129.25	128.18	1.07	129.30	1.12	0.05	129.18	129.35	Y
PT754	2,991,831.67	675,483.48	129.27	128.12	1.15	129.30	1.18	0.03	129.12	129.37	Y
PT755	2,991,837.45	675,476.23	129.43	128.10	1.33	129.46	1.36	0.03	129.10	129.53	Y
PT756	2,991,843.36	675,471.44	129.13	128.03	1.10	129.15	1.12	0.02	129.03	129.23	Y
PT764	2,991,851.76	675,480.41	129.07	127.97	1.10	129.13	1.16	0.06	128.97	129.17	Y
PT765	2,991,844.57	675,485.76	129.14	128.02	1.12	129.16	1.14	0.02	129.02	129.24	Y
PT766	2,991,835.09	675,493.78	129.18	128.16	1.02	129.23	1.07	0.05	129.16	129.28	Y
PT767	2,991,829.22	675,501.60	129.18	128.16	1.02	129.24	1.08	0.06	129.16	129.28	Y
PT768	2,991,820.34	675,508.68	129.21	128.20	1.01	129.26	1.06	0.05	129.20	129.31	Y
PT769	2,991,811.92	675,514.09	129.55	128.46	1.09	129.56	1.10	0.01	129.46	129.65	Y
PT770	2,991,775.16	675,542.49	131.53	130.44	1.09	131.61	1.17	0.08	131.44	131.63	Y
PT771	2,991,774.17	675,537.53	130.64	129.61	1.03	130.65	1.04	0.01	130.61	130.74	Y
PT772	2,991,784.62	675,533.73	130.33	129.15	1.18	130.36	1.21	0.03	130.15	130.43	Y
PT773	2,991,786.51	675,540.67	131.05	129.92	1.13	131.09	1.17	0.04	130.92	131.15	Y
PT774	2,991,799.04	675,539.31	131.20	129.77	1.43	131.23	1.46	0.03	130.77	131.30	Y
PT775	2,991,799.53	675,531.45	129.83	128.75	1.08	129.90	1.15	0.07	129.75	129.93	Y
PT776	2,991,812.47	675,530.55	129.78	128.59	1.19	129.79	1.20	0.01	129.59	129.88	Y
PT777	2,991,815.24	675,539.74	130.76	129.51	1.25	130.78	1.27	0.02	130.51	130.86	Y
PT778	2,991,822.96	675,537.01	130.18	128.62	1.56	130.19	1.57	0.01	129.62	130.28	Y
PT779	2,991,818.30	675,528.15	129.32	128.22	1.10	129.38	1.16	0.06	129.22	129.42	Y
PT780	2,991,826.55	675,517.39	129.31	128.15	1.16	129.33	1.18	0.02	129.15	129.41	Y
PT781	2,991,831.22	675,506.11	129.18	128.18	1.00	129.26	1.08	0.08	129.18	129.28	Y
PT782	2,991,837.80	675,507.55	129.05	128.00	1.05	129.07	1.07	0.02	129.00	129.15	Y
PT783	2,991,848.59	675,499.27	129.04	128.03	1.01	129.10	1.07	0.06	129.03	129.14	Y
PT784	2,991,854.37	675,492.26	129.19	128.02	1.17	129.21	1.19	0.02	129.02	129.29	Y
PT785	2,991,862.22	675,486.99	129.14	128.07	1.07	129.19	1.12	0.05	129.07	129.24	Y
PT791	2,991,868.54	675,495.16	129.03	127.95	1.08	129.04	1.09	0.01	128.95	129.13	Y
PT792	2,991,861.50	675,500.99	128.82	127.75	1.07	128.92	1.17	0.10	128.75	128.92	Y
PT793	2,991,851.81	675,508.88	129.15	127.89	1.26	129.17	1.28	0.02	128.89	129.25	Y
PT794	2,991,843.16	675,516.11	128.99	127.96	1.03	129.04	1.08	0.05	128.96	129.09	Y
PT795	2,991,834.00	675,523.84	129.31	128.10	1.21	129.35	1.25	0.04	129.10	129.41	Y
PT796	2,991,825.53	675,530.96	129.48	128.30	1.18	129.56	1.26	0.08	129.30	129.58	Y
PT799	2,991,807.92	675,547.46	131.30	130.01	1.29	131.31	1.30	0.01	131.01	131.40	Y
PT800	2,991,818.85	675,547.09	130.93	129.53	1.40	130.94	1.41	0.01	130.53	131.03	Y
PT801	2,991,824.20	675,550.51	130.79	129.69	1.10	130.85	1.16	0.06	130.69	130.89	Y
PT802	2,991,832.71	675,543.57	129.92	128.86	1.06	129.98	1.12	0.06	129.86	130.02	Y
PT803	2,991,840.87	675,536.42	129.14	128.12	1.02	129.16	1.04	0.02	129.12	129.24	Y
PT804	2,991,846.64	675,526.91	128.83	127.81	1.02	128.85	1.04	0.02	128.81	128.93	Y
PT805	2,991,853.95	675,520.83	128.80	127.66	1.14	128.82	1.16	0.02	128.66	128.90	Y
PT806	2,991,861.47	675,514.60	128.74	127.63	1.11	128.78	1.15	0.04	128.63	128.84	Y
PT807	2,991,869.08	675,508.19	128.49	127.48	1.01	128.54	1.06	0.05	128.48	128.59	Y
PT808	2,991,875.37	675,503.61	128.77	127.63	1.14	128.80	1.17	0.03	128.63	128.87	Y
PT815	2,991,884.17	675,511.16	128.68	127.42	1.26	128.75	1.33	0.07	128.42	128.78	Y

Attachment D
North Lagoon Wetland
Survey Control Points

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W.R. Grace Superfund Site
Acton-Concord, Massachusetts

	PRE-CONSTRUCTION			POST-EXCAVATION		POST-BACKFILL					
									Target Backfill Elevation Range [1]		
Point ID	Northing	Easting	Pre-Construction Elevation (feet)	Post-Excavation Elevation (feet)	Δ Elevation from Pre-Construction (feet)	Post-Backfill Elevation (feet)	Backfill Depth (feet)	Δ Elevation from Pre-Construction (feet)	Minimum (Post-Excavation + 1.00 feet)	Maximum (Pre-Construction + 0.10 feet)	Final Elevation in Target Range Y/N
PT816	2,991,875.88	675,515.92	128.52	127.39	1.13	128.57	1.18	0.05	128.39	128.62	Y
PT817	2,991,867.42	675,522.62	128.68	127.49	1.19	128.70	1.21	0.02	128.49	128.78	Y
PT818	2,991,859.86	675,531.02	128.46	127.43	1.03	128.54	1.11	0.08	128.43	128.56	Y
PT819	2,991,852.92	675,539.51	128.91	127.65	1.26	129.00	1.35	0.09	128.65	129.01	Y
PT820	2,991,845.40	675,547.36	129.28	128.25	1.03	129.33	1.08	0.05	129.25	129.38	Y
PT821	2,991,835.71	675,553.78	130.61	129.50	1.11	130.63	1.13	0.02	130.50	130.71	Y
PT830	2,991,839.92	675,567.60	131.33	130.14	1.19	131.34	1.20	0.01	131.14	131.43	Y
PT831	2,991,848.62	675,561.24	130.45	129.01	1.44	130.45	1.44	0.00	130.01	130.55	Y
PT832	2,991,852.57	675,557.53	129.24	128.12	1.12	129.30	1.18	0.06	129.12	129.34	Y
PT833	2,991,860.12	675,549.56	128.93	127.63	1.30	128.90	1.27	-0.03	128.63	129.03	Y
PT834	2,991,866.57	675,542.85	128.81	127.65	1.16	128.86	1.21	0.05	128.65	128.91	Y
PT835	2,991,873.57	675,536.57	128.20	127.15	1.05	128.28	1.13	0.08	128.15	128.30	Y
PT836	2,991,879.79	675,532.03	128.68	127.41	1.27	128.70	1.29	0.02	128.41	128.78	Y
PT837	2,991,889.24	675,524.93	128.74	127.63	1.11	128.78	1.15	0.04	128.63	128.84	Y
PT846	2,991,890.60	675,536.87	128.86	127.53	1.33	128.87	1.34	0.01	128.53	128.96	Y
PT847	2,991,882.22	675,544.00	128.19	126.98	1.21	128.28	1.30	0.09	127.98	128.29	Y
PT848	2,991,874.51	675,550.85	128.65	127.45	1.20	128.73	1.28	0.08	128.45	128.75	Y
PT849	2,991,867.49	675,558.31	128.75	127.61	1.14	128.82	1.21	0.07	128.61	128.85	Y
PT850	2,991,858.87	675,565.42	129.05	128.00	1.05	129.08	1.08	0.03	129.00	129.15	Y
PT851	2,991,851.16	675,571.36	130.58	128.87	1.71	130.60	1.73	0.02	129.87	130.68	Y
PT852	2,991,844.51	675,577.64	131.38	130.33	1.05	131.46	1.13	0.08	131.33	131.48	Y
PT859	2,991,853.60	675,588.36	130.88	129.38	1.50	130.93	1.55	0.05	130.38	130.98	Y
PT860	2,991,860.06	675,581.41	129.95	128.45	1.50	129.96	1.51	0.01	129.45	130.05	Y
PT861	2,991,869.55	675,571.04	128.38	127.27	1.11	128.43	1.16	0.05	128.27	128.48	Y
PT862	2,991,878.11	675,563.22	128.54	127.39	1.15	128.60	1.21	0.06	128.39	128.64	Y
PT863	2,991,885.93	675,555.12	128.58	127.30	1.28	128.59	1.29	0.01	128.30	128.68	Y
PT864	2,991,892.39	675,546.13	127.97	126.90	1.07	128.05	1.15	0.08	127.90	128.07	Y
PT865	2,991,902.09	675,541.66	128.80	127.75	1.05	128.84	1.09	0.04	128.75	128.90	Y
PT891	2,991,937.39	675,597.25	127.74	126.66	1.08	127.79	1.13	0.05	127.66	127.84	Y
PT892	2,991,937.23	675,587.10	127.72	126.68	1.04	127.80	1.12	0.08	127.68	127.82	Y
PT893	2,991,934.74	675,575.60	127.71	126.68	1.03	127.78	1.10	0.07	127.68	127.81	Y
PT894	2,991,926.04	675,574.32	127.37	126.20	1.17	127.38	1.18	0.01	127.20	127.47	Y
PT895	2,991,922.28	675,579.58	127.82	126.75	1.07	127.82	1.07	0.00	127.75	127.92	Y
PT896	2,991,922.84	675,593.56	127.31	126.20	1.11	127.39	1.19	0.08	127.20	127.41	Y
PT897	2,991,917.35	675,605.56	127.62	126.59	1.03	127.64	1.05	0.02	127.59	127.72	Y
PT916	2,991,906.88	675,623.30	128.55	127.06	1.49	128.63	1.57	0.08	128.06	128.65	Y
PT917	2,991,909.87	675,614.30	128.89	127.46	1.43	128.92	1.46	0.03	128.46	128.99	Y
PT918	2,991,913.93	675,601.47	128.98	127.79	1.19	128.98	1.19	0.00	128.79	129.08	Y
PT919	2,991,916.21	675,591.01	129.11	127.56	1.55	129.13	1.57	0.02	128.56	129.21	Y
PT921	2,991,923.92	675,571.08	127.51	126.50	1.01	127.55	1.05	0.04	127.50	127.61	Y
PT922	2,991,928.10	675,566.42	128.43	127.22	1.21	128.51	1.29	0.08	128.22	128.53	Y
PT923	2,991,941.03	675,569.12	128.17	127.01	1.16	128.21	1.20	0.04	128.01	128.27	Y
PT924	2,991,943.61	675,578.69	128.08	126.99	1.09	128.09	1.10	0.01	127.99	128.18	Y
PT926	2,991,941.29	675,603.73	127.88	126.51	1.37	127.93	1.42	0.05	127.51	127.98	Y
PT927	2,991,950.04	675,594.63	128.24	126.77	1.47	128.25	1.48	0.01	127.77	128.34	Y
PT933	2,991,979.58	675,553.28	128.59	127.24	1.35	128.59	1.35	0.00	128.24	128.69	Y
PT934	2,991,984.61	675,544.90	128.80	127.47	1.33	128.80	1.33	0.00	128.47	128.90	Y
PT935	2,991,991.94	675,538.45	128.47	127.39	1.08	128.53	1.14	0.06	128.39	128.57	Y
PT936	2,992,000.20	675,530.27	128.39	127.34	1.05	128.47	1.13	0.08	128.34	128.49	Y
PT953	2,991,860.42	675,599.15	129.47	128.45	1.02	129.48	1.03	0.01	129.45	129.57	Y
PT954	2,991,870.11	675,591.49	128.63	127.59	1.04	128.67	1.08	0.04	128.59	128.73	Y

Attachment D
North Lagoon Wetland
Survey Control Points

Sediment Construction Summary and Final Sediment Remedial Action Report
W.R. Grace Superfund Site
Acton-Concord, Massachusetts

	PRE-CONSTRUCTION			POST-EXCAVATION		POST-BACKFILL					
									Target Backfill Elevation Range [1]		
Point ID	Northing	Easting	Pre-Construction Elevation (feet)	Post-Excavation Elevation (feet)	Δ Elevation from Pre-Construction (feet)	Post-Backfill Elevation (feet)	Backfill Depth (feet)	Δ Elevation from Pre-Construction (feet)	Minimum (Post-Excavation + 1.00 feet)	Maximum (Pre-Construction + 0.10 feet)	Final Elevation in Target Range Y/N
PT955	2,991,878.39	675,582.07	127.90	126.90	1.00	127.97	1.07	0.07	127.90	128.00	Y
PT956	2,991,884.90	675,576.78	128.35	127.28	1.07	128.35	1.07	0.00	128.28	128.45	Y
PT957	2,991,894.01	675,566.77	129.12	127.91	1.21	129.13	1.22	0.01	128.91	129.22	Y
PT958	2,991,901.98	675,559.95	128.76	127.57	1.19	128.78	1.21	0.02	128.57	128.86	Y
PT959	2,991,909.04	675,553.73	128.04	126.59	1.45	128.08	1.49	0.04	127.59	128.14	Y
PT973	2,991,950.88	675,535.78	130.03	128.98	1.05	130.05	1.07	0.02	129.98	130.13	Y
PT974	2,991,942.82	675,541.96	130.12	128.81	1.31	130.19	1.38	0.07	129.81	130.22	Y
PT975	2,991,933.54	675,549.38	129.83	128.42	1.41	129.83	1.41	0.00	129.42	129.93	Y
PT976	2,991,923.47	675,557.51	129.54	128.10	1.44	129.58	1.48	0.04	129.10	129.64	Y
PT977	2,991,918.01	675,559.51	127.97	126.92	1.05	128.00	1.08	0.03	127.92	128.07	Y
PT978	2,991,913.61	675,562.82	127.71	126.70	1.01	127.74	1.04	0.03	127.70	127.81	Y
PT979	2,991,908.85	675,569.05	129.11	127.97	1.14	129.16	1.19	0.05	128.97	129.21	Y
PT980	2,991,899.87	675,575.84	129.26	127.75	1.51	129.28	1.53	0.02	128.75	129.36	Y
PT981	2,991,893.04	675,584.40	128.85	127.72	1.13	128.93	1.21	0.08	128.72	128.95	Y
PT982	2,991,887.89	675,589.44	128.20	127.20	1.00	128.23	1.03	0.03	128.20	128.30	Y
PT983	2,991,883.98	675,592.89	127.92	126.80	1.12	127.94	1.14	0.02	127.80	128.02	Y
PT984	2,991,877.45	675,598.88	128.29	127.27	1.02	128.37	1.10	0.08	128.27	128.39	Y
PT985	2,991,868.27	675,604.76	128.55	127.55	1.00	128.60	1.05	0.05	128.55	128.65	Y
PT986	2,991,857.96	675,613.36	130.93	129.89	1.04	130.96	1.07	0.03	130.89	131.03	Y
PT991	2,991,866.66	675,622.92	128.94	127.90	1.04	129.01	1.11	0.07	128.90	129.04	Y
PT992	2,991,877.98	675,614.07	128.25	127.14	1.11	128.30	1.16	0.05	128.14	128.35	Y
PT993	2,991,884.74	675,610.22	127.90	126.64	1.26	127.94	1.30	0.04	127.64	128.00	Y
PT994	2,991,892.18	675,605.20	128.39	127.19	1.20	128.45	1.26	0.06	128.19	128.49	Y
PT995	2,991,899.50	675,598.64	128.91	127.72	1.19	128.96	1.24	0.05	128.72	129.01	Y
PT996	2,991,907.93	675,588.85	129.14	127.89	1.25	129.15	1.26	0.01	128.89	129.24	Y
PT997	2,991,915.10	675,577.70	129.53	128.18	1.35	129.54	1.36	0.01	129.18	129.63	Y
PT998	2,991,918.41	675,570.29	127.75	126.73	1.02	127.77	1.04	0.02	127.73	127.85	Y
PT999	2,991,936.27	675,562.08	128.54	127.49	1.05	128.57	1.08	0.03	128.49	128.64	Y
PT1000	2,991,945.00	675,555.08	128.26	127.25	1.01	128.28	1.03	0.02	128.25	128.36	Y
PT1001	2,991,954.59	675,548.24	128.86	127.85	1.01	128.87	1.02	0.01	128.85	128.96	Y
PT1002	2,991,962.37	675,540.85	128.95	127.84	1.11	128.98	1.14	0.03	128.84	129.05	Y
PT1003	2,991,969.52	675,534.33	128.70	127.64	1.06	128.72	1.08	0.02	128.64	128.80	Y
PT1010	2,991,971.95	675,542.65	128.25	126.93	1.32	128.31	1.38	0.06	127.93	128.35	Y
PT1011	2,991,966.25	675,551.87	128.33	127.23	1.10	128.40	1.17	0.07	128.23	128.43	Y
PT1012	2,991,960.03	675,558.13	128.66	127.39	1.27	128.69	1.30	0.03	128.39	128.76	Y
PT1013	2,991,950.58	675,567.90	128.35	127.18	1.17	128.38	1.20	0.03	128.18	128.45	Y
PT1015	2,991,929.71	675,580.64	127.36	126.35	1.01	127.45	1.10	0.09	127.35	127.46	Y
PT1016	2,991,928.77	675,593.54	127.08	126.06	1.02	127.12	1.06	0.04	127.06	127.18	Y
PT1018	2,991,927.82	675,611.35	126.72	125.69	1.03	126.74	1.05	0.02	126.69	126.82	Y
PT1019	2,991,920.54	675,612.62	126.14	125.14	1.00	126.21	1.07	0.07	126.14	126.24	Y
PT1021	2,991,945.86	675,592.46	128.04	126.90	1.14	128.10	1.20	0.06	127.90	128.14	Y
PT1022	2,991,953.32	675,583.10	128.29	127.00	1.29	128.29	1.29	0.00	128.00	128.39	Y
PT1023	2,991,961.97	675,575.04	128.24	127.04	1.20	128.32	1.28	0.08	128.04	128.34	Y
PT1024	2,991,968.89	675,566.73	128.11	126.93	1.18	128.14	1.21	0.03	127.93	128.21	Y
PT1025	2,991,969.07	675,560.54	128.95	127.56	1.39	128.96	1.40	0.01	128.56	129.05	Y
PT1026	2,991,905.61	675,607.88	128.83	127.32	1.51	128.84	1.52	0.01	128.32	128.93	Y
PT1027	2,991,897.76	675,612.63	128.46	127.13	1.33	128.52	1.39	0.06	128.13	128.56	Y
PT1028	2,991,885.30	675,623.06	128.06	126.90	1.16	128.12	1.22	0.06	127.90	128.16	Y
PT1029	2,991,872.47	675,630.38	128.68	127.64	1.04	128.71	1.07	0.03	128.64	128.78	Y
PT1030	2,991,865.40	675,635.20	130.48	129.41	1.07	130.51	1.10	0.03	130.41	130.58	Y
PT1035	2,991,874.74	675,651.05	131.13	130.00	1.13	131.17	1.17	0.04	131.00	131.23	Y

Attachment D
North Lagoon Wetland
Survey Control Points

Sediment Construction Summary and Final Sediment Remedial Action Report
W.R. Grace Superfund Site
Acton-Concord, Massachusetts

	PRE-CONSTRUCTION			POST-EXCAVATION		POST-BACKFILL					
									Target Backfill Elevation Range [1]		
Point ID	Northing	Easting	Pre-Construction Elevation (feet)	Post-Excavation Elevation (feet)	Δ Elevation from Pre-Construction (feet)	Post-Backfill Elevation (feet)	Backfill Depth (feet)	Δ Elevation from Pre-Construction (feet)	Minimum (Post-Excavation + 1.00 feet)	Maximum (Pre-Construction + 0.10 feet)	Final Elevation in Target Range Y/N
PT1036	2,991,878.40	675,649.00	129.60	128.53	1.07	129.63	1.10	0.03	129.53	129.70	Y
PT1037	2,991,884.05	675,643.36	128.68	127.45	1.23	128.70	1.25	0.02	128.45	128.78	Y
PT1038	2,991,890.89	675,634.01	127.97	126.70	1.27	127.94	1.24	-0.03	127.70	128.07	Y
PT1039	2,991,896.13	675,628.11	127.93	126.78	1.15	128.02	1.24	0.09	127.78	128.03	Y
PT1040	2,991,903.54	675,619.47	128.57	127.09	1.48	128.61	1.52	0.04	128.09	128.67	Y
PT1041	2,991,895.38	675,644.40	128.76	127.33	1.43	128.77	1.44	0.01	128.33	128.86	Y
PT1042	2,991,888.94	675,649.98	128.12	127.11	1.01	128.15	1.04	0.03	128.11	128.22	Y
PT1043	2,991,880.50	675,657.32	130.14	129.10	1.04	130.17	1.07	0.03	130.10	130.24	Y
PT1048	2,991,888.36	675,674.37	132.49	130.77	1.72	132.49	1.72	0.00	131.77	132.59	Y
PT1049	2,991,896.09	675,673.39	129.42	128.26	1.16	129.43	1.17	0.01	129.26	129.52	Y

Notes:
1. Target backfill elevation range for North Lagoon Wetland was established to ensure that each location had at least 12 inches of clean fill while limiting the potential for net fill within the wetland. The minimum target elevation is 1 foot over the post-excavation elevation. The maximum target elevation is no more than 0.10 feet above the pre-construction elevation. Control points that fell within the target backfill range were marked with a "Y".

Attachment D
Sinking Pond - Area 1 Survey Control Points

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Sediment Construction Summary and Final Sediment Remedial Action Report
W.R. Grace Superfund Site
Acton-Concord, Massachusetts

	PRE-CONSTRUCTION			POST-EXCAVATION		POST-BACKFILL	
Point ID	**Northing**	**Easting**	**Pre-Construction Elevation (feet)**	**Post-Excavation Elevation (feet)**	**Δ Elevation from Pre-Construction (feet)**	**Post-Backfill Elevation[3] (feet)**	**Δ Elevation from Post-Excavation (feet)**
PT3107	2,989,710.07	675,747.33	144.29	142.93	-1.36	143.51	0.58
PT3108	2,989,724.93	675,761.68	147.13	146.11	-1.02	146.68	0.57
PT3109	2,989,736.45	675,766.63	149.76	148.75	-1.01	149.32	0.57
PT3110	2,989,763.94	675,759.47	147.48	145.42	-2.06	146.00	0.58
PT3111	2,989,783.64	675,765.96	147.35	144.20	-3.15	--	--
PT3112	2,989,791.21	675,754.13	151.92	149.10	-2.82	149.65	0.55
PT3113	2,989,778.61	675,741.43	150.38	149.28	-1.10	149.87	0.59
PT3114	2,989,768.36	675,736.75	144.24	143.01	-1.23	--	--
PT3115	2,989,745.69	675,736.40	144.61	143.35	-1.26	--	--
PT3116	2,989,828.41	675,778.93	151.81	150.69	-1.12	--	--
PT3117	2,989,838.79	675,771.65	155.41	154.40	-1.01	--	--
PT3118	2,989,831.15	675,761.19	151.55	150.12	-1.43	--	--
PT3120	2,989,827.15	675,765.82	147.91	146.91	-1.00	--	--
PT3121	2,989,826.45	675,773.38	148.33	147.31	-1.02	--	--
PT3125	2,989,819.61	675,770.97	147.35	145.76	-1.59	--	--
PT3126	2,989,821.54	675,762.94	147.78	145.67	-2.11	--	--
PT3134	2,989,812.33	675,762.15	147.51	145.55	-1.96	--	--
PT3136	2,989,812.29	675,769.51	147.23	145.92	-1.31	--	--
PT3140	2,989,803.76	675,765.74	146.14	145.06	-1.08	--	--
PT3141	2,989,804.36	675,761.86	147.16	145.49	-1.67	--	--
PT3163	2,989,699.56	675,746.00	144.50	142.37	-2.13	142.94	0.57
PT3164	2,989,688.66	675,748.93	144.53	143.42	-1.11	143.98	0.56
PT3165	2,989,676.37	675,752.76	144.51	143.51	-1.00	144.13	0.62
PT3166	2,989,662.86	675,754.00	144.52	143.52	-1.00	144.09	0.57
PT3167	2,989,650.28	675,752.00	144.52	143.51	-1.01	144.06	0.55
PT3168	2,989,643.92	675,749.35	144.50	143.50	-1.00	144.04	0.54
PT3169	2,989,632.31	675,746.72	144.49	143.25	-1.24	--	--
PT3170	2,989,628.57	675,748.15	144.49	143.43	-1.06	--	--
PT3171	2,989,622.88	675,751.57	144.45	142.96	-1.49	--	--
PT3172	2,989,599.42	675,730.01	144.51	143.46	-1.05	--	--
PT3173	2,989,601.40	675,729.60	144.51	143.31	-1.20	--	--
PT3174	2,989,603.49	675,727.78	144.51	143.20	-1.31	--	--
PT3175	2,989,605.88	675,722.84	144.51	143.27	-1.24	--	--
PT3176	2,989,607.08	675,721.90	144.51	143.37	-1.14	--	--
PT3177	2,989,607.10	675,718.28	144.50	143.17	-1.33	--	--
PT3178	2,989,604.45	675,707.46	144.55	143.52	-1.03	144.07	0.55
PT3179	2,989,608.18	675,686.22	144.48	143.19	-1.29	143.75	0.56
PT3180	2,989,619.01	675,678.11	144.56	142.53	-2.03	143.09	0.56
PT3181	2,989,630.54	675,672.23	144.55	142.66	-1.89	143.18	0.52
PT3182	2,989,643.50	675,667.60	144.51	143.26	-1.25	143.77	0.51
PT3183	2,989,658.59	675,664.54	144.51	143.25	-1.26	143.77	0.52
PT3184	2,989,667.58	675,666.11	144.48	143.46	-1.02	--	--
PT3185	2,989,679.77	675,665.76	144.55	143.52	-1.03	144.02	0.50
PT3186	2,989,696.56	675,670.39	144.51	143.17	-1.34	143.69	0.52
PT3187	2,989,709.77	675,678.33	144.51	142.60	-1.91	143.18	0.58
PT3188	2,989,724.71	675,694.07	144.49	142.96	-1.53	143.51	0.55
PT3189	2,989,732.38	675,706.35	144.46	143.46	-1.00	144.05	0.59
PT3190	2,989,733.06	675,724.91	144.51	143.13	-1.38	--	--
PT3191	2,989,746.88	675,737.30	144.46	143.03	-1.43	--	--
PT3192	2,989,812.50	675,757.89	149.58	148.55	-1.03	--	--
PT424	2,989,609.97	675,701.43	143.31	142.29	-1.02	142.79	0.50
PT443	2,989,611.69	675,714.05	143.29	142.24	-1.05	142.74	0.50
PT444	2,989,602.98	675,729.68	144.37	143.35	-1.02	--	--
PT445	2,989,618.06	675,726.29	141.33	139.58	-1.75	--	--
PT446	2,989,610.53	675,732.37	141.23	138.35	-2.88	--	--

Attachment D
Sinking Pond - Area 1 Survey Control Points

Sediment Construction Summary and Final Sediment Remedial Action Report
W.R. Grace Superfund Site
Acton-Concord, Massachusetts

	PRE-CONSTRUCTION			POST-EXCAVATION		POST-BACKFILL	
Point ID	Northing	Easting	Pre-Construction Elevation (feet)	Post-Excavation Elevation (feet)	Δ Elevation from Pre-Construction (feet)	Post-Backfill Elevation[3] (feet)	Δ Elevation from Post-Excavation (feet)
PT460	2,989,615.35	675,735.37	140.26	138.51	-1.75	--	--
PT461	2,989,618.85	675,728.56	141.19	139.81	-1.38	--	--
PT462	2,989,620.90	675,729.42	140.58	139.46	-1.12	--	--
PT463	2,989,617.63	675,736.76	139.38	138.37	-1.01	--	--
PT485	2,989,617.50	675,737.84	139.29	138.25	-1.04	--	--
PT486	2,989,622.56	675,730.84	140.67	139.49	-1.18	--	--
PT487	2,989,624.78	675,732.48	141.30	139.58	-1.72	--	--
PT488	2,989,619.35	675,739.18	140.69	138.48	-2.21	--	--
PT502	2,989,623.03	675,741.04	141.16	139.86	-1.30	--	--
PT503	2,989,633.63	675,734.71	141.71	140.59	-1.12	141.10	0.51
PT504	2,989,640.81	675,734.91	141.85	140.75	-1.10	141.27	0.52
PT663	2,989,742.60	675,764.37	148.56	147.50	-1.06	148.06	0.56
PT664	2,989,731.43	675,763.24	147.60	146.59	-1.01	147.15	0.56
PT666	2,989,717.13	675,752.83	145.09	144.08	-1.01	144.60	0.52
PT667	2,989,709.01	675,746.01	143.64	142.64	-1.00	143.25	0.61
PT668	2,989,698.64	675,742.46	142.63	141.63	-1.00	142.26	0.63
PT669	2,989,688.64	675,745.36	142.81	141.81	-1.00	142.42	0.61
PT670	2,989,680.83	675,745.14	142.49	141.49	-1.00	142.09	0.60
PT671	2,989,675.45	675,751.43	144.08	143.08	-1.00	143.66	0.58
PT675	2,989,660.72	675,745.85	142.56	141.41	-1.15	141.97	0.56
PT676	2,989,650.37	675,738.38	142.07	140.70	-1.37	141.28	0.58
PT677	2,989,648.51	675,735.08	141.88	140.70	-1.18	141.20	0.50
PT678	2,989,654.33	675,732.51	141.86	140.85	-1.01	141.35	0.50
PT679	2,989,664.08	675,729.95	141.78	140.76	-1.02	141.26	0.50
PT680	2,989,676.72	675,732.13	141.97	140.96	-1.01	141.47	0.51
PT681	2,989,690.79	675,731.93	142.14	141.14	-1.00	141.65	0.51
PT682	2,989,700.90	675,731.82	142.36	141.34	-1.02	141.94	0.60
PT683	2,989,709.14	675,731.40	142.62	141.59	-1.03	142.10	0.51
PT684	2,989,719.03	675,735.58	144.02	142.36	-1.66	142.91	0.55
PT685	2,989,725.75	675,742.76	144.89	143.35	-1.54	--	--
PT686	2,989,733.85	675,750.18	146.07	144.83	-1.24	145.35	0.52
PT687	2,989,742.33	675,756.38	147.29	146.29	-1.00	146.84	0.55
PT688	2,989,752.23	675,759.30	148.61	147.56	-1.05	148.06	0.50
PT690	2,989,759.09	675,756.91	148.78	145.98	-2.80	--	--
PT691	2,989,751.86	675,753.21	147.74	145.37	-2.37	--	--
PT692	2,989,743.26	675,750.97	146.86	145.68	-1.18	--	--
PT693	2,989,736.18	675,746.65	146.17	144.43	-1.74	--	--
PT694	2,989,730.69	675,739.73	145.34	142.30	-3.04	--	--
PT695	2,989,722.28	675,734.50	144.22	141.68	-2.54	--	--
PT696	2,989,715.79	675,730.14	143.23	141.23	-2.00	141.81	0.58
PT697	2,989,627.91	675,718.31	140.95	139.87	-1.08	140.37	0.50
PT698	2,989,633.37	675,714.48	141.35	139.80	-1.55	140.31	0.51
PT699	2,989,642.77	675,714.86	141.33	139.82	-1.51	140.35	0.53
PT700	2,989,651.07	675,717.17	141.57	140.35	-1.22	140.85	0.50
PT701	2,989,659.70	675,718.18	141.42	140.42	-1.00	140.95	0.53
PT702	2,989,669.90	675,722.36	141.62	140.62	-1.00	141.19	0.57
PT703	2,989,679.88	675,729.96	141.72	140.71	-1.01	141.29	0.58
PT704	2,989,690.78	675,727.77	142.06	141.05	-1.01	141.60	0.55
PT705	2,989,699.79	675,723.99	142.15	141.15	-1.00	141.77	0.62
PT706	2,989,710.42	675,723.09	142.18	141.18	-1.00	141.78	0.60
PT707	2,989,716.88	675,727.52	143.01	141.57	-1.44	142.08	0.51
PT708	2,989,724.26	675,730.81	143.12	142.02	-1.10	--	--
PT709	2,989,731.96	675,735.62	143.49	141.94	-1.55	--	--
PT710	2,989,738.30	675,742.55	143.32	142.32	-1.00	--	--
PT711	2,989,746.54	675,744.81	143.61	142.61	-1.00	--	--

Attachment D
Sinking Pond - Area 1 Survey Control Points

Sediment Construction Summary and Final Sediment Remedial Action Report
W.R. Grace Superfund Site
Acton-Concord, Massachusetts

	PRE-CONSTRUCTION			POST-EXCAVATION		POST-BACKFILL	
Point ID	Northing	Easting	Pre-Construction Elevation (feet)	Post-Excavation Elevation (feet)	Δ Elevation from Pre-Construction (feet)	Post-Backfill Elevation[3] (feet)	Δ Elevation from Post-Excavation (feet)
PT712	2,989,753.40	675,745.40	143.75	142.74	-1.01	--	--
PT713	2,989,764.15	675,744.81	143.71	142.36	-1.35	--	--
PT714	2,989,767.15	675,753.49	144.32	142.33	-1.99	--	--
PT715	2,989,774.32	675,760.89	144.86	143.85	-1.01	--	--
PT716	2,989,781.29	675,762.65	145.26	143.93	-1.33	--	--
PT717	2,989,790.06	675,764.96	145.59	144.10	-1.49	--	--
PT718	2,989,804.39	675,772.07	146.69	145.62	-1.07	--	--
PT720	2,989,804.90	675,762.62	146.77	145.25	-1.52	--	--
PT721	2,989,792.77	675,762.21	145.53	144.22	-1.31	--	--
PT722	2,989,783.03	675,758.71	144.83	143.75	-1.08	--	--
PT723	2,989,775.63	675,754.65	144.56	142.59	-1.97	--	--
PT724	2,989,772.22	675,746.02	144.09	142.89	-1.20	--	--
PT725	2,989,769.40	675,739.10	143.40	142.34	-1.06	--	--
PT726	2,989,752.56	675,738.91	143.58	142.58	-1.00	--	--
PT727	2,989,745.14	675,738.91	143.44	142.44	-1.00	--	--
PT728	2,989,741.35	675,736.58	143.49	142.47	-1.02	--	--
PT729	2,989,735.22	675,729.86	143.59	142.16	-1.43	--	--
PT730	2,989,727.10	675,724.98	143.16	142.04	-1.12	--	--
PT731	2,989,719.91	675,720.59	142.96	141.79	-1.17	142.35	0.56
PT732	2,989,711.21	675,717.19	142.51	141.38	-1.13	141.96	0.58
PT733	2,989,700.26	675,718.36	142.02	140.97	-1.05	141.53	0.56
PT734	2,989,689.38	675,723.29	142.04	141.04	-1.00	141.56	0.52
PT735	2,989,680.43	675,724.79	141.74	140.74	-1.00	141.27	0.53
PT736	2,989,673.80	675,720.24	141.58	140.58	-1.00	141.16	0.58
PT737	2,989,662.12	675,713.40	141.48	140.45	-1.03	141.02	0.57
PT738	2,989,653.30	675,711.56	141.47	140.27	-1.20	140.78	0.51
PT739	2,989,644.00	675,708.98	141.40	140.03	-1.37	140.53	0.50
PT740	2,989,635.91	675,707.33	141.24	139.80	-1.44	140.31	0.51
PT741	2,989,627.11	675,708.14	141.54	139.94	-1.60	140.45	0.51
PT742	2,989,625.02	675,715.38	141.23	140.13	-1.10	140.64	0.51
PT743	2,989,619.84	675,703.90	141.74	140.73	-1.01	141.27	0.54
PT744	2,989,627.60	675,696.16	141.46	140.36	-1.10	140.86	0.50
PT745	2,989,636.28	675,691.69	141.34	140.15	-1.19	140.67	0.52
PT746	2,989,647.61	675,690.52	141.48	140.36	-1.12	140.86	0.50
PT747	2,989,655.70	675,699.74	141.39	140.37	-1.02	140.87	0.50
PT748	2,989,664.77	675,705.26	141.59	140.36	-1.23	140.87	0.51
PT749	2,989,678.14	675,710.52	141.84	140.83	-1.01	141.34	0.51
PT750	2,989,690.17	675,712.53	142.03	141.03	-1.00	141.55	0.52
PT751	2,989,699.80	675,709.46	142.08	140.97	-1.11	141.57	0.60
PT752	2,989,714.73	675,707.40	142.92	141.92	-1.00	142.47	0.55
PT753	2,989,728.02	675,710.15	143.62	142.58	-1.04	143.10	0.52
PT771	2,989,729.33	675,723.28	144.04	143.03	-1.01	--	--
PT772	2,989,729.31	675,705.64	143.86	142.84	-1.02	143.41	0.57
PT774	2,989,716.23	675,688.94	143.93	142.38	-1.55	142.97	0.59
PT775	2,989,706.65	675,682.10	143.33	142.27	-1.06	142.77	0.50
PT776	2,989,693.86	675,675.25	143.28	142.14	-1.14	142.71	0.57
PT777	2,989,682.39	675,673.38	142.70	141.52	-1.18	142.06	0.54
PT778	2,989,670.61	675,672.02	142.75	141.61	-1.14	142.13	0.52
PT779	2,989,657.33	675,669.72	142.65	141.64	-1.01	142.23	0.59
PT780	2,989,646.19	675,671.40	142.86	141.77	-1.09	142.28	0.51
PT781	2,989,636.00	675,677.00	142.57	141.45	-1.12	142.02	0.57
PT782	2,989,626.35	675,682.00	142.81	141.61	-1.20	142.17	0.56
PT783	2,989,615.22	675,690.57	142.82	141.75	-1.07	142.29	0.54

Notes:
1. All survey points that were not backfilled with topsoil were either in Inlet rip rap channel or permanent checkdam.

Attachment D
Sinking Pond - Area 2 Survey Control Points

Sediment Construction Summary and Final Sediment Remedial Action Report
W.R. Grace Superfund Site
Acton-Concord, Massachusetts

	PRE-CONSTRUCTION			POST-EXCAVATION						POST-BACKFILL	
Point ID	Pre-Construction Northing	Pre-Construction Easting	Pre-Construction Elevation (feet)	Post-Excavation Northing	Post-Excavation Easting	Δ Horizontal Distance between Pre-Construction and Post-Excavation[1] (feet)	Post-Excavation Elevation (feet)	Δ Elevation between Post-Excavation and Pre-Construction Elevations (feet)	Δ Elevation between Post-Excavation Surface and Pre-Construction Elevation[1] (feet)	Post-Backfill Elevation (feet)[2]	Δ Elevation from Post-Dredge Location (feet)
101	2,989,561.33	675,737.35	143.31	2,989,561.33	675,737.35	0.01	142.27	1.04	--	142.82	0.55
105	2,989,554.41	675,744.62	139.73	2,989,554.41	675,744.63	0.01	138.15	1.58	--	138.67	0.52
109	2,989,533.51	675,766.55	130.94	2,989,533.25	675,766.98	0.50	128.19	2.75	2.60	--	--
110	2,989,526.52	675,774.27	127.92	2,989,526.22	675,774.46	0.36	125.24	2.68	2.55	--	--
112	2,989,540.12	675,744.97	137.51	2,989,540.11	675,744.96	0.01	136.32	1.19	--	136.79	0.47
113	2,989,547.23	675,737.66	141.47	2,989,547.22	675,737.66	0.01	140.22	1.25	--	140.68	0.46
120	2,989,539.90	675,730.87	143.89	2,989,539.91	675,730.87	0.01	142.44	1.45	--	143.03	0.59
121	2,989,533.32	675,738.02	139.16	2,989,533.30	675,738.03	0.02	137.63	1.53	--	138.06	0.43
122	2,989,530.22	675,741.24	137.39	2,989,530.23	675,741.23	0.01	135.91	1.48	--	136.43	0.52
124	2,989,525.62	675,731.19	141.15	2,989,525.62	675,731.16	0.03	139.68	1.47	--	140.11	0.43
131	2,989,518.60	675,724.16	142.81	2,989,518.60	675,724.16	0.00	141.75	1.06	--	142.29	0.54
132	2,989,511.54	675,731.72	137.70	2,989,511.52	675,731.71	0.02	136.42	1.28	--	136.83	0.41
133	2,989,502.10	675,726.87	137.57	2,989,502.09	675,726.88	0.01	136.24	1.33	--	136.67	0.43
134	2,989,504.24	675,724.63	139.11	2,989,504.25	675,724.62	0.02	137.58	1.53	--	138.17	0.59
135	2,989,510.73	675,717.54	143.82	2,989,510.74	675,717.52	0.03	142.77	1.05	--	143.34	0.57
141	2,989,497.36	675,717.73	140.34	2,989,497.36	675,717.72	0.01	138.88	1.46	--	139.44	0.56
143	2,989,484.42	675,716.71	137.27	2,989,484.44	675,716.73	0.03	136.02	1.25	--	136.47	0.45
144	2,989,489.88	675,710.71	141.06	2,989,489.90	675,710.71	0.02	139.43	1.63	--	139.95	0.52
151	2,989,482.83	675,704.05	141.39	2,989,482.83	675,704.03	0.02	140.13	1.26	--	140.68	0.55
152	2,989,476.64	675,710.14	137.35	2,989,476.64	675,710.16	0.02	136.01	1.34	--	136.49	0.48
154	2,989,475.15	675,696.88	141.74	2,989,475.15	675,696.89	0.01	140.72	1.02	--	141.14	0.42
161	2,989,467.95	675,690.00	141.25	2,989,467.94	675,690.01	0.01	140.19	1.06	--	140.71	0.52
162	2,989,461.34	675,697.48	137.68	2,989,461.33	675,697.48	0.01	136.26	1.42	--	136.77	0.51
164	2,989,460.77	675,683.39	142.80	2,989,460.77	675,683.41	0.02	141.75	1.05	--	142.25	0.50
171	2,989,163.43	675,511.11	144.13	2,989,163.43	675,511.12	0.01	142.98	1.15	--	143.41	0.43
172	2,989,164.69	675,521.03	141.11	2,989,164.71	675,521.02	0.02	139.59	1.52	--	140.04	0.45
173	2,989,165.78	675,528.41	137.29	2,989,165.79	675,528.42	0.01	136.22	1.07	--	136.65	0.43
174	2,989,444.77	675,685.63	137.41	2,989,444.78	675,685.64	0.02	136.02	1.39	--	136.50	0.48
175	2,989,446.74	675,684.03	138.78	2,989,446.77	675,684.02	0.03	137.18	1.60	--	137.61	0.43
176	2,989,453.46	675,676.69	143.29	2,989,453.48	675,676.67	0.02	142.05	1.24	--	142.63	0.58
183	2,989,445.80	675,669.34	144.30	2,989,445.81	675,669.36	0.02	143.17	1.13	--	143.77	0.60
184	2,989,439.69	675,676.82	139.03	2,989,439.68	675,676.82	0.01	137.94	1.09	--	138.52	0.58
185	2,989,436.89	675,679.91	137.27	2,989,436.91	675,679.91	0.02	136.23	1.04	--	136.66	0.43
186	2,989,428.66	675,673.86	137.31	2,989,428.68	675,673.86	0.02	135.88	1.43	--	136.33	0.45
187	2,989,432.75	675,669.35	140.90	2,989,432.77	675,669.35	0.02	139.88	1.02	--	140.32	0.44
195	2,989,425.08	675,662.86	141.09	2,989,425.10	675,662.86	0.02	139.14	1.95	--	139.60	0.46
196	2,989,420.76	675,667.14	137.61	2,989,420.76	675,667.14	0.00	136.03	1.58	--	136.53	0.50
197	2,989,413.32	675,660.87	137.59	2,989,413.32	675,660.88	0.01	136.45	1.14	--	136.92	0.47
198	2,989,417.68	675,656.21	141.59	2,989,417.68	675,656.21	0.01	139.94	1.65	--	140.43	0.49
205	2,989,410.73	675,649.25	141.82	2,989,410.72	675,649.25	0.01	140.14	1.68	--	140.60	0.46
206	2,989,405.00	675,655.10	137.39	2,989,405.02	675,655.11	0.02	136.23	1.16	--	136.70	0.47
207	2,989,397.60	675,648.09	137.57	2,989,397.60	675,648.10	0.01	136.33	1.24	--	136.76	0.43
208	2,989,403.47	675,642.35	142.22	2,989,403.49	675,642.36	0.02	140.91	1.31	--	141.34	0.43
215	2,989,396.09	675,635.16	142.55	2,989,396.08	675,635.18	0.02	141.30	1.25	--	141.78	0.48
216	2,989,389.49	675,642.05	137.07	2,989,389.60	675,641.82	0.26	134.70	2.37	--	136.45	1.75
217	2,989,382.85	675,634.74	137.53	2,989,382.83	675,634.74	0.02	135.98	1.55	--	136.45	0.47
218	2,989,389.13	675,628.53	142.11	2,989,389.13	675,628.55	0.02	140.82	1.29	--	141.23	0.41
225	2,989,381.69	675,621.81	142.36	2,989,381.69	675,621.81	0.00	141.06	1.30	--	141.62	0.56
226	2,989,374.90	675,628.56	137.49	2,989,374.91	675,628.58	0.02	136.14	1.35	--	136.60	0.46
227	2,989,367.08	675,622.17	137.65	2,989,367.08	675,622.18	0.01	136.40	1.25	--	136.89	0.49
228	2,989,374.30	675,614.80	143.13	2,989,374.30	675,614.79	0.01	141.83	1.30	--	142.29	0.46
236	2,989,366.81	675,608.25	143.79	2,989,366.80	675,608.23	0.02	141.88	1.91	--	142.39	0.51
237	2,989,360.34	675,615.48	138.72	2,989,360.34	675,615.48	0.00	136.89	1.83	--	137.46	0.57
238	2,989,358.84	675,616.85	137.53	2,989,358.85	675,616.85	0.01	136.31	1.22	--	136.73	0.42

Attachment D
Sinking Pond - Area 2 Survey Control Points

Sediment Construction Summary and Final Sediment Remedial Action Report
W.R. Grace Superfund Site
Acton-Concord, Massachusetts

	PRE-CONSTRUCTION			POST-EXCAVATION						POST-BACKFILL	
Point ID	Pre-Construction Northing	Pre-Construction Easting	Pre-Construction Elevation (feet)	Post-Excavation Northing	Post-Excavation Easting	Δ Horizontal Distance between Pre-Construction and Post-Excavation[1] (feet)	Post-Excavation Elevation (feet)	Δ Elevation between Post-Excavation and Pre-Construction Elevations (feet)	Δ Elevation between Post-Excavation Surface and Pre-Construction Elevation[1] (feet)	Post-Backfill Elevation (feet)[2]	Δ Elevation from Post-Dredge Location (feet)
239	2,989,350.90	675,610.16	137.48	2,989,350.89	675,610.15	0.01	136.28	1.20	--	136.74	0.46
240	2,989,352.98	675,607.84	139.44	2,989,353.01	675,607.84	0.03	137.81	1.63	--	138.22	0.41
241	2,989,359.33	675,601.29	144.38	2,989,359.33	675,601.28	0.01	141.98	2.40	--	142.55	0.57
250	2,989,352.32	675,593.77	144.54	2,989,352.33	675,593.75	0.02	143.35	1.19	--	143.93	0.58
251	2,989,345.71	675,601.35	139.02	2,989,345.72	675,601.36	0.02	137.77	1.25	--	138.21	0.44
252	2,989,343.70	675,603.42	137.47	2,989,343.71	675,603.43	0.01	136.03	1.44	--	136.50	0.47
253	2,989,336.83	675,596.04	137.50	2,989,336.84	675,596.02	0.02	136.33	1.17	--	136.79	0.46
254	2,989,338.39	675,594.26	139.07	2,989,338.38	675,594.25	0.02	137.65	1.42	--	138.12	0.47
255	2,989,345.31	675,587.43	143.82	2,989,345.31	675,587.41	0.02	142.80	1.02	--	143.38	0.58
263	2,989,337.50	675,580.51	143.26	2,989,337.48	675,580.53	0.02	142.19	1.07	--	142.68	0.49
264	2,989,331.25	675,587.40	138.27	2,989,331.24	675,587.38	0.03	136.87	1.40	--	137.39	0.52
265	2,989,329.99	675,589.09	137.59	2,989,329.99	675,589.09	0.00	136.26	1.33	--	136.70	0.44
266	2,989,323.85	675,581.14	137.70	2,989,323.86	675,581.15	0.01	136.22	1.48	--	136.72	0.50
267	2,989,330.38	675,573.65	142.93	2,989,330.38	675,573.65	0.00	141.27	1.66	--	141.76	0.49
275	2,989,330.83	675,559.43	144.12	2,989,330.81	675,559.46	0.03	143.10	1.02	--	143.67	0.57
276	2,989,323.87	675,566.44	142.31	2,989,323.87	675,566.42	0.02	140.34	1.97	--	140.80	0.46
277	2,989,316.78	675,573.79	137.59	2,989,316.78	675,573.78	0.01	136.46	1.13	--	136.95	0.49
278	2,989,309.92	675,565.80	137.47	2,989,309.90	675,565.79	0.03	136.36	1.11	--	136.80	0.44
279	2,989,316.36	675,559.81	140.97	2,989,316.34	675,559.81	0.02	139.37	1.60	--	139.87	0.50
280	2,989,323.64	675,553.24	142.58	2,989,323.64	675,553.23	0.01	141.47	1.11	--	141.99	0.52
281	2,989,330.38	675,545.37	144.09	2,989,330.40	675,545.37	0.02	142.99	1.10	--	143.58	0.59
288	2,989,322.43	675,537.57	143.01	2,989,322.44	675,537.58	0.01	142.00	1.01	--	142.58	0.58
289	2,989,315.69	675,545.36	141.57	2,989,315.67	675,545.35	0.02	140.50	1.07	--	140.96	0.46
290	2,989,308.87	675,552.55	139.85	2,989,308.89	675,552.55	0.02	138.63	1.22	--	139.16	0.53
291	2,989,304.66	675,557.01	137.66	2,989,304.65	675,557.01	0.01	136.36	1.30	--	136.85	0.49
292	2,989,300.71	675,547.14	137.55	2,989,300.70	675,547.14	0.01	136.50	1.05	--	137.05	0.55
293	2,989,308.70	675,538.20	141.25	2,989,308.69	675,538.21	0.02	139.99	1.26	--	140.44	0.45
294	2,989,315.59	675,531.35	142.59	2,989,315.58	675,531.36	0.02	141.57	1.02	--	142.12	0.55
295	2,989,322.48	675,524.05	144.18	2,989,322.50	675,524.03	0.03	143.16	1.02	--	143.68	0.52
302	2,989,315.43	675,517.56	143.91	2,989,315.42	675,517.56	0.01	142.91	1.00	--	143.49	0.58
303	2,989,308.41	675,524.53	142.65	2,989,308.41	675,524.54	0.01	141.34	1.31	--	141.89	0.55
304	2,989,301.53	675,531.86	140.99	2,989,301.53	675,531.88	0.02	139.65	1.34	--	140.11	0.46
305	2,989,294.68	675,539.12	137.53	2,989,294.70	675,539.11	0.02	136.47	1.06	--	137.06	0.59
306	2,989,288.14	675,530.91	137.53	2,989,288.14	675,530.93	0.02	136.47	1.06	--	137.06	0.59
307	2,989,294.35	675,524.70	140.60	2,989,294.35	675,524.72	0.02	139.42	1.18	--	139.83	0.41
308	2,989,301.17	675,517.58	142.36	2,989,301.18	675,517.57	0.02	141.35	1.01	--	141.94	0.59
309	2,989,308.00	675,510.03	144.10	2,989,308.01	675,510.04	0.01	143.09	1.01	--	143.67	0.58
316	2,989,300.96	675,503.34	144.14	2,989,300.96	675,503.35	0.01	143.14	1.00	--	143.67	0.53
317	2,989,293.88	675,510.64	142.35	2,989,293.86	675,510.64	0.02	141.35	1.00	--	141.92	0.57
318	2,989,286.94	675,517.62	140.46	2,989,286.94	675,517.61	0.01	139.45	1.01	--	139.86	0.41
319	2,989,280.47	675,524.71	137.48	2,989,280.46	675,524.73	0.02	136.31	1.17	--	136.73	0.42
320	2,989,272.50	675,518.66	137.72	2,989,272.48	675,518.65	0.02	136.14	1.58	--	136.68	0.54
321	2,989,279.69	675,510.34	140.60	2,989,279.68	675,510.35	0.02	139.36	1.24	--	139.87	0.51
322	2,989,286.35	675,503.44	142.50	2,989,286.34	675,503.45	0.01	141.48	1.02	--	142.05	0.57
323	2,989,293.65	675,496.39	144.46	2,989,293.65	675,496.41	0.02	143.45	1.01	--	143.95	0.50
328	2,989,285.92	675,489.52	145.05	2,989,285.91	675,489.53	0.01	144.03	1.02	--	144.58	0.55
329	2,989,278.68	675,497.05	142.73	2,989,278.67	675,497.06	0.01	141.67	1.06	--	142.25	0.58
330	2,989,272.35	675,503.82	140.99	2,989,272.34	675,503.83	0.01	139.90	1.09	--	140.43	0.53
331	2,989,265.71	675,511.31	138.82	2,989,265.72	675,511.32	0.01	137.38	1.44	--	137.95	0.57
332	2,989,261.85	675,515.51	137.63	2,989,261.83	675,515.50	0.02	136.12	1.51	--	136.56	0.44
333	2,989,250.95	675,512.11	137.70	2,989,250.94	675,512.12	0.01	136.31	1.39	--	136.76	0.45
334	2,989,258.58	675,504.17	140.09	2,989,258.57	675,504.18	0.01	139.08	1.01	--	139.51	0.43
335	2,989,264.53	675,496.94	142.06	2,989,264.54	675,496.95	0.02	140.44	1.62	--	140.96	0.52
336	2,989,271.99	675,489.82	143.73	2,989,271.97	675,489.84	0.02	142.65	1.08	--	143.19	0.54

Attachment D
Sinking Pond - Area 2 Survey Control Points

Sediment Construction Summary and Final Sediment Remedial Action Report
W.R. Grace Superfund Site
Acton-Concord, Massachusetts

	PRE-CONSTRUCTION			POST-EXCAVATION						POST-BACKFILL	
Point ID	Pre-Construction Northing	Pre-Construction Easting	Pre-Construction Elevation (feet)	Post-Excavation Northing	Post-Excavation Easting	Δ Horizontal Distance between Pre-Construction and Post-Excavation[1] (feet)	Post-Excavation Elevation (feet)	Δ Elevation between Post-Excavation and Pre-Construction Elevations (feet)	Δ Elevation between Post-Excavation Surface and Pre-Construction Elevation[1] (feet)	Post-Backfill Elevation (feet)[2]	Δ Elevation from Post-Dredge Location (feet)
344	2,989,264.66	675,482.57	145.07	2,989,264.67	675,482.58	0.02	144.04	1.03	--	144.55	0.51
346	2,989,251.21	675,497.42	141.61	2,989,251.22	675,497.41	0.01	140.00	1.61	--	140.59	0.59
347	2,989,244.27	675,504.74	139.45	2,989,244.26	675,504.75	0.01	138.00	1.45	--	138.57	0.57
348	2,989,237.64	675,511.53	137.48	2,989,237.65	675,511.52	0.02	136.19	1.29	--	136.62	0.43
349	2,989,222.90	675,512.45	137.57	2,989,222.89	675,512.45	0.01	136.42	1.15	--	136.83	0.41
350	2,989,229.71	675,505.19	139.69	2,989,229.74	675,505.19	0.03	138.63	1.06	--	139.07	0.44
351	2,989,236.99	675,497.67	141.49	2,989,236.98	675,497.67	0.01	140.41	1.08	--	140.90	0.49
352	2,989,244.36	675,490.95	142.67	2,989,244.37	675,490.93	0.02	141.61	1.06	--	142.17	0.56
362	2,989,236.12	675,483.90	144.53	2,989,236.12	675,483.90	0.00	143.45	1.08	--	143.96	0.51
363	2,989,229.05	675,490.73	143.38	2,989,229.03	675,490.75	0.02	142.31	1.07	--	142.86	0.55
364	2,989,222.59	675,498.17	142.43	2,989,222.56	675,498.18	0.03	141.36	1.07	--	141.89	0.53
369	2,989,175.92	675,528.04	137.47	2,989,175.92	675,528.03	0.01	136.26	1.21	--	136.76	0.50
370	2,989,174.75	675,519.47	141.53	2,989,174.76	675,519.48	0.01	139.83	1.70	--	140.43	0.60
371	2,989,173.26	675,509.52	144.17	2,989,173.27	675,509.52	0.01	143.16	1.01	--	143.75	0.59
378	2,989,183.09	675,508.19	143.55	2,989,183.10	675,508.21	0.02	142.51	1.04	--	143.04	0.53
379	2,989,184.63	675,518.04	141.10	2,989,184.64	675,518.03	0.01	139.74	1.36	--	140.24	0.50
380	2,989,185.88	675,526.07	137.48	2,989,185.88	675,526.08	0.01	135.96	1.52	--	136.44	0.48
381	2,989,195.39	675,522.89	137.58	2,989,195.41	675,522.89	0.02	135.72	1.86	--	136.23	0.51
382	2,989,194.75	675,516.59	140.04	2,989,194.75	675,516.58	0.01	138.88	1.16	--	139.32	0.44
383	2,989,192.75	675,506.68	142.93	2,989,192.73	675,506.68	0.02	141.92	1.01	--	142.46	0.54
392	2,989,202.57	675,505.02	142.69	2,989,202.59	675,505.00	0.03	141.43	1.26	--	141.96	0.53
393	2,989,204.51	675,515.09	139.35	2,989,204.51	675,515.10	0.01	137.86	1.49	--	138.40	0.54
394	2,989,205.16	675,519.37	137.51	2,989,205.17	675,519.38	0.01	135.22	2.29	--	135.80	0.58
395	2,989,214.38	675,515.12	137.64	2,989,214.38	675,515.12	0.00	136.11	1.53	--	136.62	0.51
396	2,989,213.19	675,504.02	141.38	2,989,213.18	675,504.02	0.01	140.36	1.02	--	140.83	0.47
397	2,989,212.81	675,493.77	144.31	2,989,212.81	675,493.80	0.03	143.23	1.08	--	143.82	0.59
404	2,989,221.04	675,492.05	143.95	2,989,221.05	675,492.05	0.01	142.88	1.07	--	143.44	0.56
405	2,989,223.00	675,501.96	141.23	2,989,223.00	675,501.98	0.02	140.01	1.22	--	140.52	0.51
412	2,989,250.42	675,487.70	143.76	2,989,250.42	675,487.70	0.00	142.75	1.01	--	143.30	0.55
418	2,989,254.34	675,479.99	144.58	2,989,254.34	675,480.00	0.01	143.44	1.14	--	143.96	0.52
1225	2,989,518.94	675,768.31	128.37	2,989,518.59	675,768.21	0.36	125.69	2.68	2.62	--	--
1226	2,989,521.62	675,763.95	130.15	2,989,521.93	675,764.03	0.32	127.20	2.95	--	--	--
1227	2,989,524.74	675,760.53	131.23	2,989,524.93	675,760.26	0.33	128.35	2.88	3.02	--	--
1228	2,989,529.54	675,755.77	134.04	2,989,529.77	675,755.94	0.28	132.25	1.79	--	--	--
1229	2,989,532.22	675,751.40	134.60	2,989,532.17	675,751.58	0.18	133.54	1.06	--	--	--
1230	2,989,534.33	675,750.04	135.69	2,989,533.95	675,750.27	0.44	133.95	1.74	1.55	--	--
1231	2,989,526.75	675,746.23	135.74	2,989,526.72	675,746.11	0.12	134.44	1.30	--	--	--
1232	2,989,524.82	675,749.53	134.04	2,989,525.00	675,749.62	0.20	132.92	1.12	--	--	--
1233	2,989,520.17	675,754.87	131.91	2,989,520.11	675,754.98	0.13	130.86	1.05	--	--	--
1234	2,989,515.25	675,761.40	129.72	2,989,515.69	675,761.16	0.50	127.25	2.47	2.59	--	--
1235	2,989,514.26	675,766.25	127.76	2,989,514.10	675,766.39	0.21	125.36	2.40	--	--	--
1240	2,989,504.41	675,760.84	127.71	2,989,504.57	675,760.90	0.17	125.08	2.63	--	--	--
1241	2,989,504.45	675,755.36	129.65	2,989,504.55	675,755.45	0.13	127.23	2.42	--	--	--
1242	2,989,508.05	675,752.71	130.96	2,989,508.09	675,752.74	0.05	128.44	2.52	--	--	--
1243	2,989,511.26	675,749.68	132.92	2,989,511.18	675,749.79	0.14	130.97	1.95	--	--	--
1244	2,989,514.13	675,745.05	133.97	2,989,514.23	675,744.80	0.27	132.55	1.42	--	--	--
1245	2,989,515.58	675,741.54	135.32	2,989,515.59	675,741.57	0.04	134.01	1.31	--	--	--
1246	2,989,506.80	675,738.44	134.33	2,989,507.15	675,738.54	0.36	133.15	1.18	1.23	--	--
1247	2,989,503.36	675,744.29	132.62	2,989,503.48	675,744.27	0.12	131.54	1.08	--	--	--
1248	2,989,499.57	675,750.09	130.15	2,989,499.85	675,750.11	0.28	127.98	2.17	--	--	--
1249	2,989,495.70	675,754.72	128.47	2,989,495.73	675,754.95	0.23	126.20	2.27	--	--	--
1255	2,989,482.55	675,747.45	127.93	2,989,482.47	675,747.86	0.41	125.57	2.36	2.28	--	--
1256	2,989,486.31	675,743.91	129.92	2,989,486.50	675,743.95	0.20	127.33	2.59	--	--	--
1257	2,989,489.31	675,741.22	131.18	2,989,489.70	675,741.30	0.40	128.61	2.57	2.62	--	--

Attachment D
Sinking Pond - Area 2 Survey Control Points

Sediment Construction Summary and Final Sediment Remedial Action Report
W.R. Grace Superfund Site
Acton-Concord, Massachusetts

	PRE-CONSTRUCTION			POST-EXCAVATION						POST-BACKFILL	
Point ID	Pre-Construction Northing	Pre-Construction Easting	Pre-Construction Elevation (feet)	Post-Excavation Northing	Post-Excavation Easting	Δ Horizontal Distance between Pre-Construction and Post-Excavation[1] (feet)	Post-Excavation Elevation (feet)	Δ Elevation between Post-Excavation and Pre-Construction Elevations (feet)	Δ Elevation between Post-Excavation Surface and Pre-Construction Elevation[1] (feet)	Post-Backfill Elevation (feet)[2]	Δ Elevation from Post-Dredge Location (feet)
1258	2,989,492.71	675,736.98	132.65	2,989,492.95	675,736.83	0.28	131.63	1.02	--	--	--
1259	2,989,496.73	675,733.25	134.59	2,989,496.92	675,733.09	0.25	133.21	1.38	--	--	--
1260	2,989,490.47	675,726.04	135.34	2,989,490.38	675,726.17	0.16	133.96	1.38	--	--	--
1261	2,989,486.20	675,728.29	134.09	2,989,486.47	675,728.26	0.27	132.80	1.29	--	--	--
1262	2,989,483.48	675,733.42	131.90	2,989,483.45	675,733.54	0.12	130.67	1.23	--	--	--
1263	2,989,479.51	675,737.73	130.43	2,989,479.89	675,737.98	0.45	127.92	2.51	2.51	--	--
1264	2,989,476.69	675,741.15	128.25	2,989,476.84	675,741.21	0.16	126.09	2.16	--	--	--
1271	2,989,465.31	675,734.52	129.38	2,989,465.80	675,734.42	0.50	126.80	2.58	2.64	--	--
1272	2,989,468.74	675,731.14	130.52	2,989,468.50	675,730.92	0.33	128.23	2.29	--	--	--
1273	2,989,470.97	675,728.62	131.69	2,989,471.15	675,728.52	0.20	129.32	2.37	--	--	--
1274	2,989,475.62	675,726.59	133.36	2,989,475.46	675,726.47	0.20	132.03	1.33	--	--	--
1275	2,989,478.57	675,722.57	134.90	2,989,478.63	675,722.83	0.27	133.21	1.69	--	--	--
1276	2,989,470.57	675,714.87	134.99	2,989,470.48	675,715.02	0.17	133.83	1.16	--	--	--
1277	2,989,466.56	675,720.47	132.97	2,989,466.33	675,720.24	0.32	131.54	1.43	--	--	--
1278	2,989,462.08	675,725.45	131.06	2,989,462.02	675,725.52	0.09	128.29	2.77	--	--	--
1279	2,989,457.00	675,731.08	128.76	2,989,457.02	675,730.73	0.35	125.97	2.79	2.88	--	--
1285	2,989,446.32	675,723.43	128.64	2,989,445.77	675,723.56	0.57	125.80	2.84	2.68	--	--
1286	2,989,448.94	675,720.40	130.07	2,989,448.77	675,720.44	0.17	127.43	2.64	--	--	--
1287	2,989,453.22	675,716.33	131.37	2,989,452.83	675,716.40	0.39	128.36	3.01	2.95	--	--
1288	2,989,456.80	675,713.15	132.96	2,989,456.90	675,713.33	0.21	131.33	1.63	--	--	--
1289	2,989,460.70	675,709.59	134.19	2,989,460.96	675,709.69	0.28	132.74	1.45	--	--	--
1290	2,989,457.00	675,700.96	135.52	2,989,457.03	675,700.96	0.03	134.45	1.07	--	--	--
1291	2,989,452.90	675,706.19	133.86	2,989,452.91	675,706.00	0.19	132.44	1.42	--	--	--
1292	2,989,449.12	675,710.80	132.61	2,989,448.93	675,710.89	0.21	130.31	2.30	--	--	--
1293	2,989,444.42	675,714.76	130.50	2,989,444.28	675,714.37	0.42	127.63	2.87	2.91	--	--
1294	2,989,438.11	675,720.45	128.03	2,989,437.98	675,720.80	0.37	125.10	2.93	2.79	--	--
1299	2,989,434.19	675,711.51	129.19	2,989,434.14	675,711.39	0.13	126.69	2.50	--	--	--
1300	2,989,441.10	675,705.39	131.47	2,989,441.21	675,705.34	0.12	129.12	2.35	--	--	--
1301	2,989,445.76	675,699.78	133.26	2,989,445.83	675,699.88	0.12	132.22	1.04	--	--	--
1302	2,989,449.93	675,695.08	134.86	2,989,449.80	675,695.07	0.13	133.81	1.05	--	--	--
1303	2,989,441.55	675,691.52	134.75	2,989,441.36	675,691.74	0.29	133.63	1.12	--	--	--
1304	2,989,437.77	675,697.03	133.21	2,989,437.55	675,696.71	0.39	130.49	2.72	2.74	--	--
1305	2,989,433.81	675,700.19	131.64	2,989,433.76	675,700.18	0.05	128.93	2.71	--	--	--
1306	2,989,428.72	675,706.07	129.36	2,989,428.91	675,705.86	0.28	126.93	2.43	--	--	--
1307	2,989,423.04	675,708.94	127.90	2,989,423.28	675,708.91	0.24	125.32	2.58	--	--	--
1312	2,989,415.54	675,703.86	127.66	2,989,415.72	675,704.12	0.32	125.28	2.38	--	--	--
1313	2,989,419.04	675,699.27	129.42	2,989,418.93	675,699.20	0.13	126.49	2.93	--	--	--
1314	2,989,422.66	675,695.35	130.94	2,989,422.72	675,695.71	0.36	128.19	2.75	2.67	--	--
1315	2,989,425.74	675,691.48	132.03	2,989,425.41	675,691.74	0.42	129.86	2.17	2.08	--	--
1316	2,989,428.63	675,687.53	133.55	2,989,428.75	675,687.48	0.13	131.14	2.41	--	--	--
1317	2,989,430.99	675,684.13	134.51	2,989,430.98	675,684.32	0.19	133.22	1.29	--	--	--
1318	2,989,425.42	675,678.49	134.89	2,989,425.42	675,678.60	0.11	133.78	1.11	--	--	--
1319	2,989,420.87	675,681.18	133.63	2,989,420.55	675,681.30	0.34	130.70	2.93	2.84	--	--
1320	2,989,416.68	675,686.23	131.53	2,989,416.64	675,686.40	0.18	129.39	2.14	--	--	--
1321	2,989,411.93	675,690.15	129.74	2,989,412.13	675,690.66	0.55	126.60	3.14	3.08	--	--
1322	2,989,409.01	675,695.86	128.00	2,989,408.39	675,696.10	0.67	125.31	2.69	2.47	--	--
1327	2,989,400.28	675,688.71	127.52	2,989,400.31	675,688.95	0.24	125.36	2.16	--	--	--
1328	2,989,405.43	675,686.13	129.49	2,989,405.31	675,686.00	0.18	126.39	3.10	--	--	--
1329	2,989,408.30	675,680.85	131.06	2,989,408.81	675,681.04	0.54	128.51	2.55	2.62	--	--
1330	2,989,411.11	675,677.91	132.53	2,989,410.87	675,678.10	0.31	130.26	2.27	--	--	--
1331	2,989,415.64	675,672.66	134.69	2,989,415.29	675,672.86	0.41	132.26	2.43	2.31	--	--
1332	2,989,409.44	675,665.85	135.09	2,989,409.33	675,665.55	0.32	133.00	2.09	--	--	--
1333	2,989,405.43	675,669.90	133.31	2,989,405.19	675,670.08	0.30	131.17	2.14	--	--	--
1334	2,989,402.09	675,674.01	131.58	2,989,401.89	675,673.83	0.27	129.40	2.18	--	--	--

Attachment D
Sinking Pond - Area 2 Survey Control Points

Sediment Construction Summary and Final Sediment Remedial Action Report
W.R. Grace Superfund Site
Acton-Concord, Massachusetts

	PRE-CONSTRUCTION			POST-EXCAVATION						POST-BACKFILL	
Point ID	Pre-Construction Northing	Pre-Construction Easting	Pre-Construction Elevation (feet)	Post-Excavation Northing	Post-Excavation Easting	Δ Horizontal Distance between Pre-Construction and Post-Excavation[1] (feet)	Post-Excavation Elevation (feet)	Δ Elevation between Post-Excavation and Pre-Construction Elevations (feet)	Δ Elevation between Post-Excavation Surface and Pre-Construction Elevation[1] (feet)	Post-Backfill Elevation (feet)[2]	Δ Elevation from Post-Dredge Location (feet)
1335	2,989,397.12	675,677.25	129.68	2,989,397.00	675,677.50	0.28	127.19	2.49	--	--	--
1341	2,989,385.95	675,675.47	127.82	2,989,385.70	675,675.63	0.30	125.53	2.29	--	--	--
1342	2,989,388.13	675,672.12	129.25	2,989,387.78	675,672.11	0.35	126.79	2.46	2.38	--	--
1343	2,989,390.75	675,669.47	130.83	2,989,390.81	675,669.20	0.28	128.65	2.18	--	--	--
1344	2,989,395.11	675,664.99	132.86	2,989,395.06	675,665.10	0.12	130.33	2.53	--	--	--
1345	2,989,399.41	675,660.88	134.70	2,989,399.40	675,660.55	0.33	132.52	2.18	--	--	--
1346	2,989,394.02	675,651.69	135.45	2,989,394.09	675,651.45	0.25	133.25	2.20	--	--	--
1347	2,989,392.47	675,652.64	134.66	2,989,392.22	675,652.59	0.26	132.30	2.36	--	--	--
1348	2,989,389.68	675,658.27	133.10	2,989,389.57	675,658.17	0.15	130.63	2.47	--	--	--
1349	2,989,389.17	675,658.41	132.85	2,989,388.85	675,658.53	0.34	130.15	2.70	2.61	--	--
1350	2,989,384.14	675,662.10	130.99	2,989,383.94	675,662.42	0.38	128.36	2.63	2.48	--	--
1351	2,989,379.54	675,666.59	128.43	2,989,379.36	675,666.18	0.44	126.12	2.31	2.40	--	--
1355	2,989,372.82	675,660.28	128.92	2,989,372.79	675,660.11	0.17	126.46	2.46	--	--	--
1356	2,989,377.00	675,654.04	130.88	2,989,377.18	675,653.88	0.24	128.18	2.70	--	--	--
1357	2,989,380.94	675,651.67	132.14	2,989,380.43	675,651.70	0.51	129.89	2.25	2.16	--	--
1358	2,989,385.34	675,646.00	134.95	2,989,385.45	675,646.06	0.13	132.71	2.24	--	--	--
1359	2,989,378.72	675,640.05	134.71	2,989,378.51	675,639.77	0.34	132.54	2.17	2.20	--	--
1360	2,989,376.17	675,642.90	133.74	2,989,375.65	675,643.44	0.75	131.43	2.31	2.06	--	--
1361	2,989,372.19	675,647.47	131.75	2,989,372.10	675,647.22	0.27	129.41	2.34	--	--	--
1362	2,989,367.00	675,651.71	129.11	2,989,366.63	675,651.62	0.38	126.67	2.44	2.36	--	--
1364	2,989,372.32	675,630.69	135.62	2,989,372.27	675,630.91	0.23	133.03	2.59	--	--	--
1365	2,989,368.55	675,635.76	133.65	2,989,368.45	675,635.39	0.39	131.26	2.39	2.49	--	--
1366	2,989,363.61	675,640.38	131.56	2,989,363.53	675,640.12	0.27	129.46	2.10	--	--	--
1367	2,989,358.79	675,646.27	128.41	2,989,358.89	675,646.05	0.24	125.51	2.90	--	--	--
1369	2,989,363.18	675,627.82	135.37	2,989,363.12	675,627.86	0.08	133.16	2.21	--	--	--
1370	2,989,358.36	675,631.84	133.08	2,989,358.35	675,632.28	0.44	130.60	2.48	2.28	--	--
1371	2,989,355.18	675,634.66	130.41	2,989,355.33	675,634.90	0.28	128.17	2.24	--	--	--
1372	2,989,350.72	675,639.23	129.03	2,989,350.51	675,639.68	0.50	126.62	2.41	2.17	--	--
1375	2,989,344.49	675,636.26	128.14	2,989,344.42	675,636.70	0.44	125.78	2.36	2.16	--	--
1376	2,989,345.36	675,633.59	129.45	2,989,345.49	675,633.40	0.23	127.20	2.25	--	--	--
1377	2,989,346.67	675,631.10	130.82	2,989,346.48	675,631.26	0.25	128.52	2.30	--	--	--
1378	2,989,350.54	675,626.37	132.84	2,989,350.93	675,626.43	0.39	130.57	2.27	2.35	--	--
1379	2,989,353.15	675,623.10	134.64	2,989,352.89	675,623.24	0.29	132.36	2.28	--	--	--
1382	2,989,335.56	675,626.79	128.25	2,989,335.30	675,627.16	0.45	125.69	2.56	2.43	--	--
1383	2,989,337.81	675,624.02	130.99	2,989,338.03	675,623.97	0.22	128.44	2.55	--	--	--
1384	2,989,342.23	675,619.19	133.09	2,989,342.05	675,619.67	0.51	130.67	2.42	2.26	--	--
1385	2,989,346.58	675,614.32	135.28	2,989,346.33	675,614.32	0.25	132.89	2.39	--	--	--
1386	2,989,338.40	675,607.86	134.72	2,989,338.53	675,607.99	0.18	132.40	2.32	--	--	--
1387	2,989,335.58	675,611.29	133.53	2,989,335.73	675,611.20	0.17	131.39	2.14	--	--	--
1388	2,989,330.47	675,616.55	131.15	2,989,330.43	675,616.93	0.38	128.72	2.43	2.27	--	--
1393	2,989,319.24	675,613.87	129.31	2,989,318.62	675,613.99	0.63	127.12	2.19	2.77	--	--
1394	2,989,322.67	675,608.07	131.13	2,989,322.66	675,607.93	0.14	128.65	2.48	--	--	--
1395	2,989,327.78	675,603.41	133.60	2,989,327.73	675,603.52	0.12	131.22	2.38	--	--	--
1396	2,989,332.41	675,599.69	135.03	2,989,332.18	675,599.93	0.33	132.74	2.29	2.21	--	--
1399	2,989,312.51	675,607.25	129.16	2,989,312.80	675,607.16	0.30	127.03	2.13	--	--	--
1400	2,989,316.72	675,602.62	130.69	2,989,316.77	675,602.49	0.14	128.44	2.25	--	--	--
1401	2,989,320.63	675,599.13	133.63	2,989,320.35	675,598.90	0.36	130.52	3.11	3.08	--	--
1402	2,989,324.66	675,595.73	134.55	2,989,324.52	675,595.33	0.42	132.00	2.55	2.60	--	--
1403	2,989,326.93	675,596.47	134.69	2,989,327.01	675,596.16	0.32	132.06	2.63	--	--	--
1404	2,989,318.84	675,584.99	135.34	2,989,318.62	675,585.20	0.30	133.85	1.49	--	--	--
1405	2,989,315.30	675,588.99	133.94	2,989,315.69	675,589.16	0.42	131.28	2.66	2.71	--	--
1406	2,989,311.38	675,591.92	132.65	2,989,311.58	675,592.00	0.21	130.37	2.28	--	--	--
1407	2,989,308.36	675,594.37	131.26	2,989,308.39	675,594.39	0.04	128.70	2.56	--	--	--
1408	2,989,303.80	675,600.20	129.35	2,989,303.48	675,600.43	0.40	126.89	2.46	2.32	--	--

Attachment D
Sinking Pond - Area 2 Survey Control Points

Sediment Construction Summary and Final Sediment Remedial Action Report
W.R. Grace Superfund Site
Acton-Concord, Massachusetts

	PRE-CONSTRUCTION			POST-EXCAVATION						POST-BACKFILL	
Point ID	Pre-Construction Northing	Pre-Construction Easting	Pre-Construction Elevation (feet)	Post-Excavation Northing	Post-Excavation Easting	Δ Horizontal Distance between Pre-Construction and Post-Excavation[1] (feet)	Post-Excavation Elevation (feet)	Δ Elevation between Post-Excavation and Pre-Construction Elevations (feet)	Δ Elevation between Post-Excavation Surface and Pre-Construction Elevation[1] (feet)	Post-Backfill Elevation (feet)[2]	Δ Elevation from Post-Dredge Location (feet)
1412	2,989,293.39	675,597.20	128.14	2,989,293.29	675,597.35	0.18	126.75	1.39	--	--	--
1413	2,989,296.00	675,595.33	129.23	2,989,296.18	675,595.14	0.26	128.11	1.12	--	--	--
1414	2,989,298.75	675,591.36	130.60	2,989,298.86	675,591.64	0.30	129.36	1.24	--	--	--
1415	2,989,302.96	675,587.69	132.17	2,989,302.95	675,587.82	0.13	130.87	1.30	--	--	--
1416	2,989,306.01	675,584.28	133.12	2,989,306.26	675,584.33	0.26	132.03	1.09	--	--	--
1417	2,989,310.57	675,579.73	134.54	2,989,310.24	675,579.79	0.33	133.09	1.45	1.39	--	--
1418	2,989,313.55	675,577.09	136.01	2,989,313.60	675,576.97	0.13	135.00	1.01	--	--	--
1419	2,989,306.48	675,569.05	136.04	2,989,306.26	675,568.93	0.25	134.91	1.13	--	--	--
1420	2,989,302.89	675,571.76	134.48	2,989,302.82	675,571.91	0.17	132.99	1.49	--	--	--
1421	2,989,297.20	675,577.43	132.69	2,989,297.27	675,577.49	0.09	131.66	1.03	--	--	--
1422	2,989,290.79	675,581.25	131.38	2,989,291.16	675,581.22	0.37	130.05	1.33	1.38	--	--
1423	2,989,285.73	675,585.63	129.27	2,989,285.76	675,585.47	0.16	127.96	1.31	--	--	--
1424	2,989,283.48	675,589.49	127.69	2,989,283.25	675,589.24	0.33	126.52	1.17	1.18	--	--
1432	2,989,292.46	675,568.18	133.14	2,989,292.42	675,567.95	0.23	131.77	1.37	--	--	--
1433	2,989,297.00	675,565.02	134.34	2,989,296.75	675,564.96	0.25	133.22	1.12	--	--	--
1434	2,989,300.43	675,561.06	135.39	2,989,300.73	675,561.00	0.30	134.33	1.06	--	--	--
1435	2,989,296.84	675,551.22	136.14	2,989,296.86	675,551.17	0.05	134.95	1.19	--	--	--
1436	2,989,292.68	675,555.08	135.21	2,989,292.69	675,554.93	0.15	133.97	1.24	--	--	--
1437	2,989,288.37	675,560.49	134.42	2,989,288.33	675,560.42	0.08	133.25	1.17	--	--	--
1438	2,989,284.84	675,565.24	132.90	2,989,284.30	675,565.38	0.56	131.89	1.01	0.93	--	--
1439	2,989,282.25	675,569.85	132.01	2,989,282.08	675,569.89	0.17	130.97	1.04	--	--	--
1440	2,989,277.90	675,575.29	130.30	2,989,278.02	675,575.26	0.12	129.29	1.01	--	--	--
1441	2,989,272.28	675,579.31	128.28	2,989,272.40	675,578.94	0.39	127.12	1.16	1.27	--	--
1444	2,989,264.29	675,575.88	127.84	2,989,263.85	675,575.82	0.44	126.62	1.22	1.07	--	--
1445	2,989,269.65	675,569.40	130.00	2,989,269.71	675,569.24	0.17	128.97	1.03	--	--	--
1446	2,989,270.93	675,567.49	130.68	2,989,270.90	675,567.45	0.05	129.57	1.11	--	--	--
1447	2,989,274.56	675,563.05	132.02	2,989,274.18	675,563.01	0.38	130.86	1.16	1.10	--	--
1448	2,989,280.47	675,555.83	133.39	2,989,280.48	675,555.73	0.10	132.31	1.08	--	--	--
1449	2,989,285.06	675,549.90	134.32	2,989,285.43	675,549.66	0.44	133.31	1.01	1.08	--	--
1450	2,989,289.42	675,545.99	135.20	2,989,289.46	675,546.26	0.27	134.03	1.17	--	--	--
1451	2,989,282.51	675,536.03	135.69	2,989,282.67	675,536.24	0.26	134.52	1.17	--	--	--
1452	2,989,277.83	675,542.35	134.21	2,989,278.01	675,542.61	0.31	133.21	1.00	--	--	--
1453	2,989,273.92	675,546.61	133.61	2,989,273.87	675,546.78	0.17	132.58	1.03	--	--	--
1454	2,989,266.71	675,553.73	132.45	2,989,266.58	675,553.89	0.21	131.25	1.20	--	--	--
1455	2,989,263.34	675,561.29	130.42	2,989,263.57	675,560.97	0.39	129.30	1.12	1.22	--	--
1456	2,989,257.70	675,568.92	127.63	2,989,257.73	675,568.76	0.16	126.51	1.12	--	--	--
1460	2,989,247.02	675,559.94	128.41	2,989,246.86	675,559.91	0.16	127.35	1.06	--	--	--
1461	2,989,249.51	675,558.01	129.87	2,989,249.48	675,558.10	0.10	128.64	1.23	--	--	--
1462	2,989,253.15	675,553.11	130.94	2,989,253.39	675,553.23	0.27	129.90	1.04	--	--	--
1463	2,989,258.06	675,547.86	132.20	2,989,258.05	675,547.86	0.01	130.77	1.43	--	--	--
1464	2,989,263.11	675,542.44	133.21	2,989,263.10	675,542.26	0.18	132.13	1.08	--	--	--
1465	2,989,268.68	675,536.40	134.20	2,989,268.47	675,536.28	0.24	133.20	1.00	--	--	--
1466	2,989,273.95	675,530.81	135.32	2,989,273.85	675,530.67	0.17	134.29	1.03	--	--	--
1467	2,989,267.87	675,524.31	135.70	2,989,267.93	675,524.35	0.07	134.47	1.23	--	--	--
1468	2,989,264.39	675,526.56	134.60	2,989,263.92	675,526.56	0.47	133.59	1.01	1.00	--	--
1469	2,989,257.95	675,532.29	133.37	2,989,257.79	675,532.35	0.17	132.29	1.08	--	--	--
1470	2,989,255.98	675,536.27	133.47	2,989,255.97	675,536.34	0.07	132.30	1.17	--	--	--
1471	2,989,249.47	675,541.29	132.13	2,989,249.47	675,541.42	0.13	130.91	1.22	--	--	--
1472	2,989,246.28	675,547.48	131.15	2,989,245.84	675,547.45	0.44	129.74	1.41	1.44	--	--
1477	2,989,228.36	675,555.76	127.72	2,989,228.31	675,555.89	0.14	126.70	1.02	--	--	--
1481	2,989,235.71	675,541.99	131.46	2,989,235.94	675,542.28	0.37	130.18	1.28	1.88	--	--
1483	2,989,247.24	675,529.74	133.40	2,989,247.31	675,529.39	0.36	132.27	1.13	1.21	--	--
1484	2,989,251.87	675,525.36	134.50	2,989,251.92	675,525.36	0.05	133.43	1.07	--	--	--
1485	2,989,256.23	675,519.93	135.72	2,989,256.16	675,519.81	0.14	134.54	1.18	--	--	--

Attachment D
Sinking Pond - Area 2 Survey Control Points

Sediment Construction Summary and Final Sediment Remedial Action Report
W.R. Grace Superfund Site
Acton-Concord, Massachusetts

	PRE-CONSTRUCTION			POST-EXCAVATION						POST-BACKFILL	
Point ID	Pre-Construction Northing	Pre-Construction Easting	Pre-Construction Elevation (feet)	Post-Excavation Northing	Post-Excavation Easting	Δ Horizontal Distance between Pre-Construction and Post-Excavation[1] (feet)	Post-Excavation Elevation (feet)	Δ Elevation between Post-Excavation and Pre-Construction Elevations (feet)	Δ Elevation between Post-Excavation Surface and Pre-Construction Elevation[1] (feet)	Post-Backfill Elevation (feet)[2]	Δ Elevation from Post-Dredge Location (feet)
1486	2,989,247.02	675,518.31	135.86	2,989,247.15	675,518.27	0.13	134.20	1.66	--	--	--
1489	2,989,234.04	675,530.99	133.03	2,989,234.14	675,530.97	0.10	131.97	1.06	--	--	--
1499	2,989,236.09	675,520.17	134.98	2,989,236.23	675,520.15	0.14	133.95	1.03	--	--	--
1504	2,989,224.88	675,519.96	135.12	2,989,224.74	675,519.61	0.38	134.05	1.07	1.19	--	--
1505	2,989,224.85	675,523.71	134.47	2,989,224.84	675,523.52	0.19	133.20	1.27	--	--	--
1506	2,989,225.93	675,530.25	133.39	2,989,226.13	675,530.30	0.20	132.01	1.38	--	--	--
1507	2,989,226.79	675,538.18	132.05	2,989,227.32	675,538.06	0.55	130.30	1.75	1.73	--	--
1508	2,989,227.52	675,543.96	131.20	2,989,227.57	675,543.79	0.17	129.95	1.25	--	--	--
1509	2,989,228.74	675,549.84	129.78	2,989,229.11	675,549.72	0.39	128.46	1.32	1.42	--	--
1516	2,989,216.63	675,549.62	129.69	2,989,216.68	675,549.51	0.12	128.28	1.41	--	--	--
1517	2,989,216.75	675,544.43	130.98	2,989,216.43	675,544.61	0.37	129.79	1.19	1.16	--	--
1518	2,989,216.59	675,536.97	132.46	2,989,216.65	675,536.93	0.07	130.60	1.86	--	--	--
1519	2,989,216.62	675,529.84	133.62	2,989,216.94	675,529.61	0.39	132.62	1.00	1.03	--	--
1520	2,989,215.96	675,524.76	134.89	2,989,215.77	675,524.41	0.40	133.60	1.29	1.42	--	--
1521	2,989,215.57	675,520.52	136.31	2,989,215.55	675,520.51	0.02	134.50	1.81	--	--	--
1522	2,989,206.86	675,524.40	135.55	2,989,206.79	675,524.49	0.12	134.40	1.15	--	--	--
1523	2,989,206.52	675,530.06	134.24	2,989,206.96	675,529.99	0.45	133.05	1.19	1.18	--	--
1524	2,989,208.28	675,538.41	132.31	2,989,208.22	675,538.35	0.09	130.98	1.33	--	--	--
1525	2,989,209.71	675,546.47	130.77	2,989,209.45	675,546.50	0.26	129.60	1.17	--	--	--
1526	2,989,209.85	675,553.01	128.53	2,989,209.85	675,552.95	0.06	127.42	1.11	--	--	--
1530	2,989,200.42	675,552.37	129.37	2,989,200.45	675,552.29	0.09	128.06	1.31	--	--	--
1531	2,989,199.59	675,545.00	131.33	2,989,199.46	675,544.70	0.33	129.95	1.38	1.48	--	--
1532	2,989,197.81	675,537.87	133.48	2,989,198.04	675,537.73	0.27	132.06	1.42	--	--	--
1533	2,989,196.09	675,527.98	134.95	2,989,195.92	675,527.94	0.18	133.86	1.09	--	--	--
1534	2,989,187.87	675,533.07	135.05	2,989,188.04	675,533.26	0.26	133.52	1.53	--	--	--
1535	2,989,188.58	675,537.87	133.83	2,989,188.57	675,538.06	0.19	132.29	1.54	--	--	--
1536	2,989,189.69	675,545.39	131.94	2,989,189.50	675,545.18	0.29	130.54	1.40	--	--	--
1537	2,989,189.86	675,552.49	130.02	2,989,189.66	675,552.53	0.20	128.80	1.22	--	--	--
1538	2,989,190.44	675,559.39	127.33	2,989,190.38	675,559.61	0.23	126.31	1.02	--	--	--
1542	2,989,178.34	675,559.61	127.59	2,989,178.34	675,559.34	0.27	126.37	1.22	--	--	--
1544	2,989,178.48	675,552.62	130.69	2,989,178.29	675,552.77	0.24	129.45	1.24	--	--	--
1545	2,989,176.34	675,543.60	133.03	2,989,176.44	675,543.86	0.28	131.64	1.39	--	--	--
1546	2,989,175.66	675,534.97	134.78	2,989,175.47	675,535.01	0.20	133.63	1.15	--	--	--
1547	2,989,166.50	675,534.27	135.02	2,989,166.67	675,534.24	0.17	133.90	1.12	--	--	--
1548	2,989,168.15	675,539.44	133.86	2,989,168.12	675,539.67	0.24	132.51	1.35	--	--	--
4009	2,989,326.64	675,535.27	144.50	2,989,326.64	675,535.25	0.02	143.47	1.03	--	143.98	0.51
4010	2,989,335.86	675,569.30	144.50	2,989,335.85	675,569.29	0.01	143.46	1.04	--	144.03	0.57
4011	2,989,341.17	675,577.66	144.50	2,989,341.16	675,577.66	0.01	143.49	1.01	--	144.05	0.56
4012	2,989,376.71	675,611.63	144.50	2,989,376.72	675,611.63	0.01	143.37	1.13	--	143.94	0.57
4013	2,989,385.92	675,617.82	144.50	2,989,385.93	675,617.83	0.01	143.49	1.01	--	144.07	0.58
4014	2,989,394.47	675,624.54	144.53	2,989,394.49	675,624.52	0.02	143.48	1.05	--	144.04	0.56
4015	2,989,400.33	675,632.27	144.49	2,989,400.31	675,632.26	0.02	143.44	1.05	--	143.90	0.46
4016	2,989,406.79	675,638.17	144.50	2,989,406.76	675,638.16	0.03	143.47	1.03	--	144.00	0.53
4017	2,989,415.36	675,644.70	144.50	2,989,415.35	675,644.71	0.01	143.25	1.25	--	143.78	0.53
4018	2,989,422.94	675,651.49	144.50	2,989,422.93	675,651.48	0.01	143.38	1.12	--	143.94	0.56
4019	2,989,429.64	675,657.47	144.50	2,989,429.64	675,657.49	0.02	143.47	1.03	--	144.00	0.53
4020	2,989,437.12	675,663.56	144.49	2,989,437.11	675,663.58	0.02	143.47	1.02	--	143.95	0.48
4021	2,989,455.66	675,674.52	144.50	2,989,455.67	675,674.52	0.01	143.37	1.13	--	143.94	0.57
4022	2,989,463.05	675,679.32	144.48	2,989,463.07	675,679.33	0.02	143.45	1.03	--	144.01	0.56
4023	2,989,473.18	675,684.06	144.51	2,989,473.20	675,684.06	0.02	143.50	1.01	--	144.04	0.54
4024	2,989,480.34	675,692.42	144.49	2,989,480.34	675,692.41	0.01	143.45	1.04	--	143.94	0.49
4025	2,989,487.45	675,700.05	144.49	2,989,487.44	675,700.06	0.02	143.10	1.39	--	143.69	0.59
4026	2,989,494.38	675,705.82	144.50	2,989,494.37	675,705.82	0.01	143.43	1.07	--	143.93	0.50
4027	2,989,502.01	675,711.77	144.50	2,989,501.99	675,711.77	0.02	143.38	1.12	--	143.90	0.52

Attachment D
Sinking Pond - Area 2 Survey Control Points

Sediment Construction Summary and Final Sediment Remedial Action Report
W.R. Grace Superfund Site
Acton-Concord, Massachusetts

	PRE-CONSTRUCTION			POST-EXCAVATION						POST-BACKFILL	
Point ID	Pre-Construction Northing	Pre-Construction Easting	Pre-Construction Elevation (feet)	Post-Excavation Northing	Post-Excavation Easting	Δ Horizontal Distance between Pre-Construction and Post-Excavation[1] (feet)	Post-Excavation Elevation (feet)	Δ Elevation between Post-Excavation and Pre-Construction Elevations (feet)	Δ Elevation between Post-Excavation Surface and Pre-Construction Elevation[1] (feet)	Post-Backfill Elevation (feet)[2]	Δ Elevation from Post-Dredge Location (feet)
4028	2,989,520.63	675,721.16	144.49	2,989,520.64	675,721.15	0.01	143.48	1.01	--	144.06	0.58
4029	2,989,528.71	675,724.70	144.49	2,989,528.72	675,724.72	0.02	143.32	1.17	--	143.91	0.59
4030	2,989,201.62	675,497.96	144.50	2,989,201.62	675,497.96	0.00	143.47	1.03	--	143.99	0.52
4031	2,989,191.70	675,500.56	144.51	2,989,191.69	675,500.54	0.02	143.26	1.25	--	143.86	0.60
4032	2,989,182.26	675,504.74	144.50	2,989,182.27	675,504.74	0.01	143.37	1.13	--	143.94	0.57
4198	2,989,201.24	675,557.69	127.99	2,989,201.20	675,557.85	0.16	126.81	1.18	--	--	--
4199	2,989,238.86	675,558.24	128.00	2,989,239.08	675,558.02	0.31	126.94	1.06	--	--	--
4200	2,989,302.74	675,603.71	128.00	2,989,302.49	675,603.92	0.32	125.62	2.38	--	--	--
4201	2,989,310.06	675,610.22	128.00	2,989,310.29	675,610.81	0.64	125.42	2.58	2.47	--	--
4202	2,989,317.91	675,616.75	127.98	2,989,318.06	675,616.59	0.22	125.87	2.11	--	--	--
4203	2,989,326.59	675,622.52	128.00	2,989,326.63	675,622.52	0.04	125.60	2.40	--	--	--
4204	2,989,334.37	675,627.11	128.00	2,989,334.47	675,627.36	0.27	125.65	2.35	--	--	--
4205	2,989,350.02	675,641.33	127.99	2,989,349.71	675,641.07	0.40	125.50	2.49	2.48	--	--
4206	2,989,357.17	675,646.38	128.00	2,989,357.28	675,646.62	0.26	125.66	2.34	--	--	--
4207	2,989,365.26	675,653.68	128.00	2,989,365.64	675,653.92	0.45	125.84	2.16	2.23	--	--
4208	2,989,371.27	675,661.69	128.00	2,989,371.51	675,661.79	0.26	125.40	2.60	--	--	--
4209	2,989,378.09	675,667.02	128.02	2,989,377.62	675,667.15	0.48	125.80	2.22	2.09	--	--
4210	2,989,394.92	675,681.06	128.01	2,989,394.50	675,681.31	0.49	125.58	2.43	2.24	--	--
4211	2,989,432.34	675,715.00	128.00	2,989,432.36	675,715.21	0.21	125.26	2.74	--	--	--
4212	2,989,463.04	675,737.10	127.98	2,989,462.98	675,737.29	0.20	125.71	2.27	--	--	--
4213	2,989,475.52	675,742.27	128.00	2,989,476.01	675,742.27	0.49	125.55	2.45	2.50	--	--
4214	2,989,494.64	675,755.91	128.00	2,989,494.71	675,756.08	0.19	125.91	2.09	--	--	--

Note:
1. Values shaded in green represent locations below the water line where the horizontal distance between the pre-construction and post-construction survey points exceeded 0.33 feet (discussed in RFI 006, Attachment L). For these points, the change from pre-construction elevation was derived from a CADD surface elevation and reported in the final column of the post-excavation data.

2. Consistent with the 100% design, topsoil was placed in excavated areas between the water line and the historical high water elevation (144.5 ft). Survey control points located below the water line were not backfilled and no post-backfill elevation or thickness is provided.

Attachment D
Sinking Pond - Area 3 Survey Control Points

Sediment Construction Summary and Final Sediment Remedial Action Report
W.R. Grace Superfund Site
Acton-Concord, Massachusetts

	PRE-CONSTRUCTION			POST-EXCAVATION						POST-BACKFILL	
Point ID	Pre-Construction Northing	Pre-Construction Easting	Pre-Construction Elevation (feet)	Post-Excavation Northing	Post-Excavation Easting	Δ Horizontal Distance between Pre-Construction and Post-Excavation[1] (feet)	Post-Excavation Elevation (feet)	Δ Elevation between Post-Excavation and Pre-Construction Elevations (feet)	Δ Elevation between Post-Excavation Surface and Pre-Construction Elevation[1] (feet)	Post-Backfill Elevation (feet)[2]	Δ Elevation from Post-Dredge Location (feet)
849	2,989,153.26	675,512.60	143.44	2,989,153.18	675,512.51	0.13	141.57	1.87	--	142.17	0.60
850	2,989,154.62	675,523.09	139.40	2,989,154.56	675,523.14	0.08	137.77	1.63	--	138.19	0.42
851	2,989,155.30	675,525.75	137.66	2,989,155.31	675,525.84	0.09	136.49	1.17	--	136.94	0.45
861	2,989,131.67	675,505.37	143.66	2,989,131.70	675,505.37	0.03	142.27	1.39	--	142.83	0.56
862	2,989,133.39	675,516.03	139.78	2,989,133.34	675,515.97	0.08	138.16	1.62	--	138.65	0.49
863	2,989,134.31	675,521.60	137.68	2,989,134.32	675,521.58	0.03	135.75	1.93	--	136.19	0.44
864	2,989,124.38	675,520.63	137.62	2,989,124.42	675,520.65	0.04	135.99	1.63	--	136.43	0.44
865	2,989,123.48	675,517.13	138.86	2,989,123.55	675,517.16	0.07	136.78	2.08	--	137.27	0.49
866	2,989,122.17	675,507.32	142.90	2,989,122.24	675,507.23	0.12	140.42	2.48	--	140.99	0.57
873	2,989,112.05	675,508.18	143.24	2,989,112.03	675,508.16	0.03	140.65	2.59	--	141.23	0.58
875	2,989,114.09	675,521.24	137.59	2,989,114.07	675,521.19	0.05	136.25	1.34	--	136.70	0.45
876	2,989,104.00	675,521.20	137.55	2,989,104.10	675,521.27	0.12	136.42	1.13	--	136.84	0.42
878	2,989,102.61	675,510.12	143.63	2,989,102.57	675,510.04	0.08	141.01	2.62	--	141.61	0.60
885	2,989,092.47	675,511.50	142.79	2,989,092.49	675,511.40	0.10	141.25	1.54	--	141.83	0.58
887	2,989,093.63	675,523.22	137.46	2,989,093.63	675,523.16	0.06	135.94	1.52	--	136.38	0.44
897	2,989,072.86	675,514.94	142.43	2,989,072.85	675,514.98	0.04	140.74	1.69	--	141.18	0.44
898	2,989,074.09	675,524.56	139.26	2,989,074.05	675,524.57	0.05	136.76	2.50	--	137.32	0.56
899	2,989,074.94	675,529.88	137.67	2,989,074.96	675,529.80	0.08	135.65	2.02	--	136.10	0.45
900	2,989,065.34	675,533.44	137.73	2,989,065.36	675,533.39	0.05	135.72	2.01	--	136.15	0.43
901	2,989,064.05	675,526.16	140.03	2,989,064.03	675,526.18	0.03	137.91	2.12	--	138.43	0.52
902	2,989,062.43	675,516.54	142.54	2,989,062.47	675,516.51	0.04	140.84	1.70	--	141.40	0.56
903	2,989,061.17	675,506.01	144.48	2,989,061.16	675,505.99	0.02	143.42	1.06	--	144.00	0.58
1549	2,989,167.07	675,548.42	131.60	2,989,167.20	675,548.43	0.13	130.51	1.09	--	--	--
1550	2,989,168.78	675,556.42	128.37	2,989,168.46	675,556.50	0.33	127.27	1.10	1.07	--	--
1555	2,989,159.19	675,551.55	130.62	2,989,158.73	675,551.85	0.55	128.63	1.99	1.85	--	--
1556	2,989,157.67	675,546.39	131.82	2,989,157.48	675,546.67	0.33	130.17	1.65	1.56	--	--
1557	2,989,155.53	675,536.08	134.34	2,989,155.41	675,536.11	0.12	132.67	1.67	--	--	--
1558	2,989,156.55	675,532.14	135.24	2,989,156.39	675,532.34	0.26	134.16	1.08	--	--	--
1559	2,989,144.97	675,529.58	136.53	2,989,145.11	675,529.40	0.22	134.53	2.00	--	--	--
1560	2,989,146.18	675,534.25	134.21	2,989,146.27	675,533.88	0.39	133.02	1.19	1.38	--	--
1561	2,989,147.22	675,538.58	133.05	2,989,148.09	675,538.81	0.90	131.20	1.85	1.84	--	--
1562	2,989,149.32	675,544.75	131.39	2,989,149.90	675,544.73	0.59	129.68	1.71	1.78	--	--
1563	2,989,149.58	675,555.18	129.01	2,989,150.44	675,554.87	0.92	127.95	1.06	1.20	--	--
1566	2,989,138.94	675,560.38	127.73	2,989,138.58	675,559.86	0.64	126.58	1.15	1.27	--	--
1567	2,989,137.49	675,549.70	129.97	2,989,137.08	675,549.62	0.42	128.49	1.48	1.52	--	--
1568	2,989,136.60	675,542.09	131.66	2,989,136.67	675,543.14	1.05	129.88	1.78	1.55	--	--
1569	2,989,136.19	675,535.74	133.53	2,989,136.63	675,535.46	0.52	131.70	1.83	1.97	--	--
1570	2,989,135.15	675,529.07	136.11	2,989,135.37	675,529.17	0.25	134.23	1.88	--	--	--
1571	2,989,125.34	675,528.15	135.05	2,989,125.40	675,528.44	0.30	134.05	1.00	--	--	--
1572	2,989,126.63	675,536.15	133.42	2,989,126.55	675,536.21	0.10	132.20	1.22	--	--	--
1573	2,989,128.29	675,543.24	131.84	2,989,128.12	675,544.44	1.21	130.63	1.21	0.97	--	--
1574	2,989,129.01	675,550.98	130.15	2,989,128.50	675,551.59	0.79	128.96	1.19	1.07	--	--
1575	2,989,130.22	675,559.20	128.26	2,989,131.01	675,559.77	0.98	127.12	1.14	0.98	--	--
1580	2,989,120.10	675,566.47	127.78	2,989,119.67	675,566.60	0.45	126.55	1.23	1.22	--	--
1582	2,989,118.91	675,550.71	130.85	2,989,119.20	675,550.57	0.31	129.65	1.20	--	--	--
1583	2,989,117.97	675,541.17	132.41	2,989,118.25	675,541.73	0.63	131.39	1.02	0.92	--	--
1584	2,989,116.71	675,531.16	134.35	2,989,116.70	675,531.58	0.41	133.35	1.00	0.92	--	--
1585	2,989,105.13	675,528.18	135.20	2,989,104.98	675,527.71	0.49	134.18	1.02	1.18	--	--
1586	2,989,106.92	675,536.98	133.57	2,989,105.94	675,537.04	0.98	132.57	1.00	1.01	--	--
1587	2,989,108.40	675,544.38	132.28	2,989,108.64	675,543.54	0.88	131.28	1.00	1.13	--	--
1588	2,989,111.91	675,550.80	130.99	2,989,111.81	675,551.64	0.85	129.74	1.25	1.11	--	--
1589	2,989,113.94	675,558.36	129.26	2,989,113.57	675,558.34	0.36	128.24	1.02	1.08	--	--
1590	2,989,114.38	675,564.48	128.25	2,989,113.09	675,564.29	1.30	127.23	1.02	1.22	--	--
1595	2,989,105.82	675,568.42	128.93	2,989,106.53	675,568.17	0.75	127.35	1.58	1.51	--	--

Attachment D
Sinking Pond - Area 3 Survey Control Points

Sediment Construction Summary and Final Sediment Remedial Action Report
W.R. Grace Superfund Site
Acton-Concord, Massachusetts

	PRE-CONSTRUCTION			POST-EXCAVATION						POST-BACKFILL	
Point ID	Pre-Construction Northing	Pre-Construction Easting	Pre-Construction Elevation (feet)	Post-Excavation Northing	Post-Excavation Easting	Δ Horizontal Distance between Pre-Construction and Post-Excavation[1] (feet)	Post-Excavation Elevation (feet)	Δ Elevation between Post-Excavation and Pre-Construction Elevations (feet)	Δ Elevation between Post-Excavation Surface and Pre-Construction Elevation[1] (feet)	Post-Backfill Elevation (feet)[2]	Δ Elevation from Post-Dredge Location (feet)
1596	2,989,102.07	675,561.18	130.41	2,989,102.53	675,560.51	0.81	128.46	1.95	1.99	--	--
1598	2,989,097.58	675,542.67	132.97	2,989,097.12	675,541.72	1.06	131.94	1.03	1.20	--	--
1599	2,989,096.10	675,529.80	134.80	2,989,095.62	675,529.84	0.48	133.78	1.02	1.10	--	--
1603	2,989,090.59	675,541.69	133.88	2,989,090.19	675,542.53	0.93	132.18	1.70	1.62	--	--
1605	2,989,096.07	675,551.87	131.90	2,989,096.53	675,551.99	0.48	130.81	1.09	1.05	--	--
1606	2,989,099.05	675,558.11	130.80	2,989,099.16	675,558.83	0.73	129.70	1.10	1.07	--	--
1608	2,989,104.21	675,576.15	127.68	2,989,104.49	675,576.51	0.46	125.94	1.74	1.69	--	--
1613	2,989,098.90	675,588.91	127.68	2,989,099.20	675,587.83	1.12	126.65	1.03	1.08	--	--
1614	2,989,092.09	675,584.75	130.71	2,989,091.84	675,584.96	0.33	129.04	1.67	1.70	--	--
1617	2,989,090.62	675,572.05	131.87	2,989,090.41	675,572.43	0.43	130.73	1.14	1.09	--	--
1618	2,989,088.09	675,562.34	131.88	2,989,088.24	675,563.52	1.19	130.49	1.39	1.40	--	--
1619	2,989,085.01	675,554.83	132.66	2,989,085.01	675,554.06	0.77	131.47	1.19	1.28	--	--
1620	2,989,081.86	675,547.16	133.81	2,989,081.57	675,547.86	0.76	132.46	1.35	1.30	--	--
1621	2,989,076.95	675,536.98	135.39	2,989,076.69	675,537.04	0.27	134.19	1.20	--	--	--
1622	2,989,067.60	675,537.92	136.46	2,989,066.93	675,537.34	0.89	133.01	3.45	3.67	--	--
1623	2,989,069.21	675,543.21	135.23	2,989,070.41	675,543.27	1.20	132.83	2.40	2.30	--	--
1624	2,989,072.01	675,550.24	134.41	2,989,072.33	675,549.90	0.47	132.27	2.14	2.14	--	--
1625	2,989,075.16	675,558.38	133.30	2,989,074.20	675,558.17	0.99	131.63	1.67	1.81	--	--
1626	2,989,078.24	675,564.77	132.38	2,989,078.52	675,564.24	0.60	131.37	1.01	1.04	--	--
1627	2,989,080.06	675,572.30	132.46	2,989,079.99	675,571.83	0.48	131.41	1.05	1.04	--	--
1628	2,989,081.91	675,581.81	132.31	2,989,082.33	675,581.26	0.69	130.52	1.79	1.73	--	--
1629	2,989,085.57	675,590.13	131.60	2,989,086.09	675,590.64	0.73	129.19	2.41	2.13	--	--
1630	2,989,088.15	675,595.07	129.65	2,989,087.93	675,594.65	0.47	128.41	1.24	1.41	--	--
1767	2,989,056.62	675,540.49	137.62	2,989,056.67	675,540.52	0.06	135.45	2.17	--	--	--
1768	2,989,055.55	675,537.13	138.79	2,989,055.59	675,537.19	0.08	136.46	2.33	--	136.90	0.44
1769	2,989,054.27	675,526.97	141.27	2,989,054.25	675,527.06	0.10	138.91	2.36	--	139.50	0.59
1770	2,989,052.14	675,517.73	143.06	2,989,052.11	675,517.75	0.04	141.55	1.51	--	142.14	0.59
1779	2,989,042.85	675,519.20	143.86	2,989,042.82	675,519.18	0.03	142.73	1.13	--	143.31	0.58
1780	2,989,044.75	675,529.70	141.91	2,989,044.83	675,529.78	0.12	140.13	1.78	--	140.60	0.47
1781	2,989,045.89	675,539.55	140.11	2,989,045.84	675,539.54	0.05	137.75	2.36	--	138.17	0.42
1782	2,989,048.61	675,552.32	137.65	2,989,048.50	675,552.40	0.13	135.90	1.75	--	--	--
1783	2,989,039.37	675,561.86	137.50	2,989,039.28	675,561.88	0.09	136.24	1.26	--	--	--
1792	2,989,030.02	675,549.53	138.98	2,989,030.09	675,549.53	0.07	137.73	1.25	--	--	--
1797	2,989,024.49	675,552.29	139.27	2,989,024.54	675,552.29	0.06	138.21	1.06	--	138.62	0.41
1799	2,989,028.31	675,567.36	138.73	2,989,028.45	675,567.67	0.33	133.19	5.54	5.48	--	--
1800	2,989,036.06	675,559.59	138.01	2,989,036.10	675,559.63	0.06	136.49	1.52	--	--	--
1801	2,989,031.40	675,554.01	138.51	2,989,031.40	675,554.02	0.01	136.82	1.69	--	--	--
1803	2,989,021.63	675,542.85	139.63	2,989,021.71	675,542.86	0.08	137.27	2.36	--	137.85	0.58
1804	2,989,019.42	675,539.32	139.94	2,989,019.44	675,539.40	0.09	138.40	1.54	--	138.94	0.54
1805	2,989,028.59	675,531.76	142.84	2,989,028.66	675,531.77	0.08	141.30	1.54	--	141.74	0.44
1807	2,989,012.25	675,529.93	143.27	2,989,012.25	675,529.88	0.06	141.58	1.69	--	142.17	0.59
1808	2,989,007.46	675,540.44	142.67	2,989,007.38	675,540.51	0.11	141.46	1.21	--	141.94	0.48
1809	2,989,014.46	675,545.53	141.66	2,989,014.48	675,545.56	0.04	140.51	1.15	--	140.95	0.44
1812	2,989,004.46	675,525.19	144.61	2,989,004.49	675,525.22	0.04	143.51	1.10	--	144.08	0.57
1819	2,989,023.00	675,522.63	144.51	2,989,023.09	675,522.71	0.12	143.42	1.09	--	143.95	0.53
1824	2,989,030.54	675,572.01	137.77	2,989,030.48	675,571.30	0.71	132.94	4.83	4.92	--	--
1825	2,989,022.52	675,583.52	137.57	2,989,022.15	675,583.12	0.54	136.14	1.43	1.64	136.71	0.57
1826	2,989,020.27	675,573.30	140.38	2,989,020.25	675,573.30	0.01	138.82	1.56	--	139.27	0.45
1827	2,989,019.36	675,563.43	141.62	2,989,019.30	675,563.47	0.07	139.27	2.35	--	139.70	0.43
1828	2,989,017.70	675,553.32	140.99	2,989,017.76	675,553.31	0.06	139.85	1.14	--	140.27	0.42
1829	2,989,007.43	675,554.83	143.52	2,989,007.45	675,554.80	0.04	142.20	1.32	--	142.74	0.54
1844	2,989,002.76	675,571.42	144.55	2,989,002.81	675,571.37	0.08	143.42	1.13	--	143.99	0.57
1845	2,989,011.56	675,575.24	142.03	2,989,011.56	675,575.28	0.04	140.94	1.09	--	141.42	0.48
1846	2,989,016.89	675,579.53	140.27	2,989,016.93	675,579.53	0.04	138.97	1.30	--	139.43	0.46

Attachment D
Sinking Pond - Area 3 Survey Control Points

Sediment Construction Summary and Final Sediment Remedial Action Report
W.R. Grace Superfund Site
Acton-Concord, Massachusetts

	PRE-CONSTRUCTION			POST-EXCAVATION						POST-BACKFILL	
Point ID	Pre-Construction Northing	Pre-Construction Easting	Pre-Construction Elevation (feet)	Post-Excavation Northing	Post-Excavation Easting	Δ Horizontal Distance between Pre-Construction and Post-Excavation[1] (feet)	Post-Excavation Elevation (feet)	Δ Elevation between Post-Excavation and Pre-Construction Elevations (feet)	Δ Elevation between Post-Excavation Surface and Pre-Construction Elevation[1] (feet)	Post-Backfill Elevation (feet)[2]	Δ Elevation from Post-Dredge Location (feet)
1847	2,989,017.99	675,591.69	137.68	2,989,017.98	675,591.60	0.09	136.59	1.09	--	137.13	0.54
1848	2,989,008.82	675,585.99	141.68	2,989,008.86	675,585.97	0.05	140.13	1.55	--	140.61	0.48
1849	2,988,999.40	675,581.86	144.59	2,988,999.46	675,581.80	0.08	143.57	1.02	--	144.16	0.59
1856	2,989,011.01	675,600.02	139.75	2,989,011.07	675,599.99	0.06	137.68	2.07	--	138.26	0.58
1858	2,989,016.44	675,604.11	137.56	2,989,016.40	675,604.09	0.05	136.13	1.43	--	136.61	0.48
1868	2,988,999.52	675,593.05	144.20	2,988,999.63	675,593.04	0.11	143.07	1.13	--	143.53	0.46
1871	2,989,000.99	675,606.31	143.27	2,989,001.02	675,606.33	0.04	142.15	1.12	--	142.67	0.52
1875	2,989,003.47	675,623.41	144.28	2,989,003.40	675,623.39	0.07	143.15	1.13	--	143.71	0.56
1876	2,989,011.48	675,623.34	140.97	2,989,011.51	675,623.28	0.07	138.38	2.59	--	138.88	0.50
1877	2,989,016.51	675,616.59	137.68	2,989,016.47	675,616.51	0.09	136.08	1.60	--	136.62	0.54
1879	2,989,017.98	675,626.59	137.62	2,989,017.93	675,626.58	0.05	135.99	1.63	--	136.46	0.47
1880	2,989,008.25	675,630.60	143.37	2,989,008.21	675,630.51	0.10	141.15	2.22	--	141.71	0.56
1885	2,989,012.35	675,640.42	143.14	2,989,012.37	675,640.45	0.03	141.35	1.79	--	141.76	0.41
1886	2,989,019.58	675,637.15	137.64	2,989,019.60	675,637.06	0.10	135.89	1.75	--	136.39	0.50
1887	2,989,022.98	675,648.14	137.12	2,989,022.93	675,648.13	0.05	136.12	1.00	--	136.58	0.46
1888	2,989,018.68	675,648.19	140.57	2,989,018.67	675,648.19	0.01	138.16	2.41	--	138.76	0.60
1893	2,989,019.32	675,659.43	140.83	2,989,019.36	675,659.40	0.05	139.65	1.18	--	140.13	0.48
1894	2,989,024.30	675,657.52	137.65	2,989,024.37	675,657.52	0.08	136.63	1.02	--	137.07	0.44
1895	2,989,025.52	675,668.26	137.62	2,989,025.51	675,668.26	0.01	136.56	1.06	--	137.05	0.49
1896	2,989,019.95	675,670.99	141.94	2,989,019.88	675,670.97	0.07	140.17	1.77	--	140.75	0.58
1901	2,989,021.32	675,681.79	142.42	2,989,021.29	675,681.81	0.04	141.27	1.15	--	141.79	0.52
1902	2,989,027.43	675,678.53	137.56	2,989,027.53	675,678.43	0.14	136.29	1.27	--	136.86	0.57
1903	2,989,028.33	675,688.97	137.65	2,989,028.37	675,688.99	0.04	136.50	1.15	--	137.08	0.58
1904	2,989,023.06	675,691.72	142.53	2,989,022.96	675,691.72	0.09	141.21	1.32	--	141.80	0.59
1921	2,989,039.97	675,747.20	144.24	2,989,039.97	675,747.20	0.01	141.32	2.92	--	141.88	0.56
1924	2,989,031.45	675,699.20	137.57	2,989,031.45	675,699.19	0.01	136.55	1.02	--	137.10	0.55
1925	2,989,034.30	675,708.48	137.62	2,989,034.31	675,708.48	0.02	136.60	1.02	--	137.17	0.57
1926	2,989,028.29	675,712.06	142.50	2,989,028.30	675,712.05	0.01	141.48	1.02	--	141.99	0.51
1931	2,989,033.45	675,719.80	141.53	2,989,033.46	675,719.79	0.02	140.51	1.02	--	141.01	0.50
1932	2,989,037.93	675,718.01	137.70	2,989,037.95	675,718.04	0.04	136.68	1.02	--	137.25	0.57
1933	2,989,041.89	675,727.42	137.63	2,989,041.86	675,727.39	0.04	136.30	1.33	--	136.81	0.51
1934	2,989,035.11	675,730.51	142.45	2,989,035.13	675,730.50	0.02	141.04	1.41	--	141.59	0.55
1937	2,989,045.71	675,736.85	137.50	2,989,045.71	675,736.85	0.00	136.47	1.03	--	136.98	0.51
1938	2,989,047.99	675,745.91	137.55	2,989,048.00	675,745.91	0.02	136.21	1.34	--	136.65	0.44
1939	2,989,053.09	675,755.06	137.31	2,989,053.12	675,755.07	0.03	135.65	1.66	--	136.11	0.46
1940	2,989,045.45	675,757.39	142.37	2,989,045.45	675,757.39	0.01	141.29	1.08	--	141.81	0.52
1943	2,989,048.51	675,767.56	142.87	2,989,048.49	675,767.57	0.01	141.53	1.34	--	142.10	0.57
1944	2,989,055.81	675,765.21	137.57	2,989,055.81	675,765.23	0.02	136.39	1.18	--	136.81	0.42
1945	2,989,058.73	675,774.88	137.59	2,989,058.71	675,774.90	0.02	136.14	1.45	--	136.57	0.43
1946	2,989,051.61	675,778.91	142.97	2,989,051.63	675,778.89	0.02	141.57	1.40	--	142.09	0.52
1950	2,989,056.23	675,787.51	142.93	2,989,056.22	675,787.52	0.02	141.50	1.43	--	142.01	0.51
1951	2,989,062.91	675,784.65	137.49	2,989,062.92	675,784.62	0.03	136.46	1.03	--	136.90	0.44
1952	2,989,066.47	675,793.33	137.16	2,989,066.48	675,793.32	0.02	136.15	1.01	--	136.69	0.54
1953	2,989,060.84	675,796.60	142.44	2,989,060.83	675,796.58	0.02	141.22	1.22	--	141.73	0.51
1958	2,989,063.42	675,805.67	143.61	2,989,063.42	675,805.65	0.02	141.19	2.42	--	141.65	0.46
1959	2,989,069.41	675,802.88	137.60	2,989,069.42	675,802.87	0.02	136.57	1.03	--	137.05	0.48
1960	2,989,072.62	675,813.04	137.39	2,989,072.63	675,813.04	0.02	136.12	1.27	--	136.66	0.54
1961	2,989,063.42	675,817.25	144.44	2,989,063.43	675,817.22	0.04	142.08	2.36	--	142.61	0.53
2226	2,989,062.97	675,548.25	136.40	2,989,063.52	675,548.19	0.55	133.59	2.81	2.69	--	--
2232	2,989,079.95	675,598.11	129.88	2,989,080.52	675,597.95	0.59	128.55	1.33	1.29	--	--
2233	2,989,081.43	675,604.18	127.81	2,989,081.31	675,603.40	0.80	126.75	1.06	1.32	--	--
2237	2,989,071.57	675,606.16	128.82	2,989,071.83	675,606.22	0.27	127.63	1.19	--	--	--
2238	2,989,069.19	675,597.81	131.38	2,989,069.25	675,598.14	0.34	129.30	2.08	1.98	--	--
2239	2,989,067.22	675,588.58	132.48	2,989,067.38	675,587.35	1.24	130.96	1.52	1.55	--	--

Attachment D
Sinking Pond - Area 3 Survey Control Points

Sediment Construction Summary and Final Sediment Remedial Action Report
W.R. Grace Superfund Site
Acton-Concord, Massachusetts

	PRE-CONSTRUCTION			POST-EXCAVATION						POST-BACKFILL	
Point ID	Pre-Construction Northing	Pre-Construction Easting	Pre-Construction Elevation (feet)	Post-Excavation Northing	Post-Excavation Easting	Δ Horizontal Distance between Pre-Construction and Post-Excavation[1] (feet)	Post-Excavation Elevation (feet)	Δ Elevation between Post-Excavation and Pre-Construction Elevations (feet)	Δ Elevation between Post-Excavation Surface and Pre-Construction Elevation[1] (feet)	Post-Backfill Elevation (feet)[2]	Δ Elevation from Post-Dredge Location (feet)
2240	2,989,065.32	675,579.89	132.81	2,989,065.75	675,579.42	0.64	131.08	1.73	1.71	--	--
2241	2,989,062.70	675,572.94	133.38	2,989,062.70	675,572.03	0.90	132.11	1.27	1.38	--	--
2242	2,989,059.64	675,565.81	134.59	2,989,059.61	675,565.55	0.26	133.35	1.24	--	--	--
2244	2,989,056.16	675,555.36	136.64	2,989,055.23	675,555.10	0.96	133.51	3.13	3.22	--	--
2245	2,989,047.45	675,563.24	136.91	2,989,046.96	675,563.33	0.50	133.68	3.23	3.24	--	--
2246	2,989,047.93	675,569.89	136.01	2,989,048.18	675,569.54	0.43	133.72	2.29	2.29	--	--
2247	2,989,051.69	675,577.87	134.57	2,989,052.41	675,577.33	0.89	133.21	1.36	1.31	--	--
2248	2,989,056.57	675,582.12	133.87	2,989,057.82	675,582.34	1.27	132.02	1.85	1.67	--	--
2251	2,989,062.62	675,601.96	130.14	2,989,062.53	675,601.34	0.62	128.50	1.64	1.75	--	--
2252	2,989,063.86	675,610.69	129.19	2,989,064.89	675,610.50	1.05	127.51	1.68	1.59	--	--
2253	2,989,056.71	675,609.58	130.05	2,989,056.86	675,608.72	0.88	128.53	1.52	1.59	--	--
2254	2,989,053.55	675,602.72	131.22	2,989,053.85	675,603.22	0.58	130.01	1.21	1.05	--	--
2256	2,989,049.75	675,589.39	134.00	2,989,049.85	675,588.53	0.86	132.95	1.05	1.14	--	--
2257	2,989,047.31	675,582.77	135.20	2,989,047.89	675,583.63	1.04	133.26	1.94	1.74	--	--
2258	2,989,044.54	675,575.30	135.79	2,989,044.27	675,575.16	0.31	132.89	2.90	--	--	--
2260	2,989,034.25	675,590.76	134.92	2,989,034.65	675,590.56	0.45	133.51	1.41	1.39	--	--
2261	2,989,039.86	675,595.54	133.90	2,989,038.91	675,595.39	0.95	132.40	1.50	1.63	--	--
2262	2,989,048.71	675,602.25	131.92	2,989,049.59	675,602.66	0.97	130.51	1.41	1.24	--	--
2265	2,989,072.26	675,610.80	127.93	2,989,072.75	675,610.63	0.52	126.71	1.22	1.30	--	--
2272	2,989,044.86	675,616.84	131.46	2,989,045.03	675,617.16	0.36	130.22	1.24	1.20	--	--
2273	2,989,036.03	675,620.15	132.64	2,989,036.69	675,620.70	0.86	130.32	2.32	2.18	--	--
2274	2,989,025.59	675,623.41	134.43	2,989,026.23	675,623.03	0.74	132.93	1.50	1.39	--	--
2275	2,989,024.54	675,614.85	134.86	2,989,025.09	675,614.72	0.57	133.83	1.03	0.93	--	--
2276	2,989,031.18	675,612.19	133.73	2,989,031.28	675,611.37	0.83	132.66	1.07	1.11	--	--
2277	2,989,038.60	675,609.17	132.77	2,989,037.96	675,608.89	0.70	131.25	1.52	1.64	--	--
2281	2,989,070.77	675,591.08	132.16	2,989,069.99	675,589.84	1.46	130.56	1.60	1.71	--	--
2288	2,989,025.66	675,596.23	135.74	2,989,025.49	675,595.81	0.45	134.16	1.58	1.67	--	--
2289	2,989,027.39	675,589.36	136.58	2,989,027.37	675,589.05	0.32	135.54	1.04	--	--	--
2293	2,989,062.70	675,617.86	128.47	2,989,062.59	675,617.13	0.73	127.46	1.01	1.11	--	--
2295	2,989,038.01	675,629.61	131.72	2,989,038.16	675,629.60	0.15	130.52	1.20	--	--	--
2296	2,989,030.06	675,631.91	133.36	2,989,030.87	675,631.83	0.81	131.82	1.54	1.38	--	--
2297	2,989,026.15	675,634.42	134.52	2,989,026.68	675,634.82	0.66	133.40	1.12	1.03	--	--
2298	2,989,032.45	675,644.75	134.06	2,989,031.66	675,644.38	0.87	132.96	1.10	1.28	--	--
2299	2,989,038.55	675,641.38	132.31	2,989,038.88	675,642.45	1.12	131.25	1.06	1.05	--	--
2300	2,989,045.56	675,638.91	130.96	2,989,046.09	675,639.09	0.56	129.45	1.51	1.38	--	--
2301	2,989,053.17	675,635.28	128.97	2,989,053.10	675,635.84	0.56	127.05	1.92	1.94	--	--
2307	2,989,056.54	675,643.43	128.19	2,989,055.64	675,643.80	0.97	126.54	1.65	1.89	--	--
2308	2,989,047.54	675,646.76	130.59	2,989,048.58	675,647.02	1.08	129.58	1.01	0.74	--	--
2309	2,989,038.01	675,651.87	133.01	2,989,038.65	675,652.49	0.88	131.29	1.72	1.57	--	--
2314	2,989,057.52	675,655.86	127.98	2,989,058.66	675,655.91	1.14	126.82	1.16	0.86	--	--
2315	2,989,052.45	675,658.74	129.43	2,989,053.70	675,658.57	1.26	127.43	2.00	1.65	--	--
2316	2,989,045.41	675,661.98	131.40	2,989,045.01	675,661.84	0.42	130.37	1.03	1.14	--	--
2318	2,989,036.97	675,666.07	133.19	2,989,036.07	675,666.13	0.91	131.98	1.21	1.55	--	--
2320	2,989,037.33	675,673.03	133.63	2,989,036.85	675,672.58	0.66	132.34	1.29	1.43	--	--
2321	2,989,045.72	675,668.59	131.71	2,989,044.53	675,668.85	1.21	129.97	1.74	1.98	--	--
2322	2,989,057.17	675,665.13	128.28	2,989,057.26	675,665.06	0.11	126.86	1.42	--	--	--
2326	2,989,054.72	675,676.46	129.40	2,989,055.28	675,675.90	0.78	127.97	1.43	1.23	--	--
2327	2,989,042.36	675,681.34	132.66	2,989,043.16	675,681.57	0.84	131.39	1.27	1.07	--	--
2328	2,989,037.37	675,685.05	133.91	2,989,036.74	675,684.97	0.64	132.91	1.00	1.25	--	--
2331	2,989,052.48	675,690.35	130.34	2,989,052.94	675,690.50	0.48	128.51	1.83	1.70	--	--
2332	2,989,043.57	675,693.21	132.89	2,989,043.95	675,692.73	0.61	131.57	1.32	1.20	--	--
2333	2,989,038.88	675,696.46	134.14	2,989,038.85	675,695.77	0.70	132.55	1.59	1.56	--	--
2334	2,989,040.35	675,704.99	134.91	2,989,039.88	675,704.54	0.66	133.76	1.15	1.27	--	--
2335	2,989,047.87	675,703.31	132.67	2,989,047.53	675,703.44	0.36	131.54	1.13	1.23	--	--

Attachment D
Sinking Pond - Area 3 Survey Control Points

Sediment Construction Summary and Final Sediment Remedial Action Report
W.R. Grace Superfund Site
Acton-Concord, Massachusetts

	PRE-CONSTRUCTION			POST-EXCAVATION						POST-BACKFILL	
Point ID	Pre-Construction Northing	Pre-Construction Easting	Pre-Construction Elevation (feet)	Post-Excavation Northing	Post-Excavation Easting	Δ Horizontal Distance between Pre-Construction and Post-Excavation[1] (feet)	Post-Excavation Elevation (feet)	Δ Elevation between Post-Excavation and Pre-Construction Elevations (feet)	Δ Elevation between Post-Excavation Surface and Pre-Construction Elevation[1] (feet)	Post-Backfill Elevation (feet)[2]	Δ Elevation from Post-Dredge Location (feet)
2336	2,989,055.80	675,699.63	130.03	2,989,055.42	675,698.86	0.86	128.68	1.35	1.40	--	--
2337	2,989,062.96	675,696.03	127.50	2,989,062.77	675,695.14	0.90	126.46	1.04	1.05	--	--
2341	2,989,063.13	675,707.95	128.30	2,989,063.84	675,707.48	0.85	126.90	1.40	1.13	--	--
2342	2,989,054.39	675,711.03	131.43	2,989,055.29	675,710.80	0.93	129.49	1.94	1.63	--	--
2343	2,989,047.16	675,715.28	133.58	2,989,046.78	675,714.73	0.67	132.58	1.00	1.08	--	--
2344	2,989,051.56	675,723.32	133.21	2,989,052.36	675,723.26	0.80	132.07	1.14	0.85	--	--
2345	2,989,057.38	675,720.38	130.82	2,989,057.49	675,719.39	0.99	128.94	1.88	1.80	--	--
2346	2,989,064.31	675,718.35	128.42	2,989,064.00	675,717.37	1.03	127.36	1.06	1.12	--	--
2351	2,989,065.55	675,729.70	129.15	2,989,065.23	675,729.56	0.34	127.80	1.35	1.44	--	--
2352	2,989,058.99	675,732.44	131.62	2,989,059.28	675,731.86	0.65	130.06	1.56	1.40	--	--
2353	2,989,053.28	675,734.84	133.41	2,989,053.79	675,734.67	0.53	132.10	1.31	1.16	--	--
2354	2,989,054.21	675,742.93	135.45	2,989,054.66	675,742.69	0.52	133.85	1.60	1.39	--	--
2355	2,989,058.64	675,742.67	133.93	2,989,058.52	675,742.79	0.17	132.49	1.44	--	--	--
2356	2,989,066.13	675,741.24	129.95	2,989,066.38	675,741.86	0.68	128.95	1.00	1.04	--	--
2360	2,989,076.95	675,746.99	127.62	2,989,077.60	675,747.10	0.65	126.23	1.39	1.16	--	--
2361	2,989,071.26	675,749.51	129.86	2,989,071.18	675,748.89	0.63	128.68	1.18	1.07	--	--
2362	2,989,065.15	675,751.24	132.25	2,989,066.08	675,751.04	0.95	131.10	1.15	0.79	--	--
2363	2,989,059.99	675,753.33	134.53	2,989,059.81	675,752.82	0.54	132.28	2.25	2.26	--	--
2364	2,989,063.29	675,763.45	134.06	2,989,064.30	675,763.31	1.02	131.88	2.18	1.92	--	--
2365	2,989,063.46	675,763.47	134.05	2,989,063.26	675,762.78	0.71	132.27	1.78	1.80	--	--
2366	2,989,069.49	675,761.05	132.06	2,989,069.18	675,760.55	0.59	130.47	1.59	1.63	--	--
2367	2,989,070.28	675,761.14	131.85	2,989,069.85	675,760.14	1.09	130.42	1.43	1.44	--	--
2368	2,989,077.72	675,757.50	129.10	2,989,078.52	675,757.15	0.88	127.99	1.11	0.81	--	--
2371	2,989,084.69	675,761.48	127.80	2,989,084.66	675,760.90	0.58	126.79	1.01	0.91	--	--
2372	2,989,078.50	675,764.46	130.21	2,989,079.17	675,764.13	0.74	129.01	1.20	0.94	--	--
2373	2,989,070.18	675,768.92	132.98	2,989,070.95	675,768.65	0.82	131.15	1.83	1.59	--	--
2374	2,989,070.05	675,768.98	132.98	2,989,069.28	675,768.96	0.77	131.29	1.69	1.98	--	--
2375	2,989,070.19	675,781.16	134.37	2,989,070.08	675,780.50	0.67	132.73	1.64	1.61	--	--
2376	2,989,076.86	675,777.67	132.47	2,989,077.64	675,777.27	0.87	130.37	2.10	1.84	--	--
2377	2,989,076.47	675,778.08	132.50	2,989,076.10	675,778.11	0.36	130.17	2.33	2.52	--	--
2378	2,989,084.23	675,773.88	130.05	2,989,084.01	675,773.56	0.39	128.79	1.26	1.27	--	--
2383	2,989,094.40	675,778.90	128.19	2,989,095.39	675,778.53	1.06	127.06	1.13	0.83	--	--
2384	2,989,088.41	675,782.69	130.12	2,989,087.53	675,782.28	0.97	128.64	1.48	1.65	--	--
2385	2,989,081.13	675,785.15	132.30	2,989,080.91	675,785.97	0.85	131.05	1.25	1.37	--	--
2386	2,989,072.82	675,790.45	134.34	2,989,073.51	675,791.22	1.03	133.08	1.26	1.21	--	--
2387	2,989,077.26	675,798.82	134.34	2,989,077.32	675,798.25	0.57	132.68	1.66	1.59	--	--
2388	2,989,084.58	675,797.77	133.15	2,989,085.49	675,797.54	0.93	131.40	1.75	1.54	--	--
4033	2,989,153.35	675,508.87	144.49	2,989,153.39	675,508.89	0.05	142.36	2.13	--	142.85	0.49
4034	2,989,141.74	675,505.71	144.50	2,989,141.83	675,505.70	0.08	143.50	1.00	--	144.08	0.58
4035	2,989,131.39	675,503.03	144.50	2,989,131.39	675,503.07	0.04	143.13	1.37	--	143.53	0.40
4036	2,989,121.97	675,502.76	144.51	2,989,122.02	675,502.95	0.19	143.42	1.09	--	143.98	0.56
4037	2,989,111.39	675,504.71	144.50	2,989,111.34	675,504.70	0.05	141.72	2.78	--	142.30	0.58
4038	2,989,102.18	675,507.17	144.49	2,989,102.12	675,507.10	0.09	142.59	1.90	--	143.11	0.52
4040	2,989,061.66	675,806.21	144.49	2,989,061.66	675,806.22	0.01	142.04	2.45	--	142.62	0.58
4041	2,989,057.69	675,798.02	144.50	2,989,057.70	675,798.02	0.01	142.48	2.02	--	143.07	0.59
4042	2,989,054.18	675,788.02	144.50	2,989,054.18	675,788.01	0.01	142.77	1.73	--	143.30	0.53
4043	2,989,049.69	675,779.55	144.51	2,989,049.67	675,779.57	0.03	143.23	1.28	--	143.79	0.56
4044	2,989,046.12	675,768.00	144.49	2,989,046.11	675,767.98	0.02	142.55	1.94	--	143.07	0.52
4045	2,989,042.66	675,757.98	144.49	2,989,042.65	675,757.98	0.01	143.47	1.02	--	143.90	0.43
4046	2,989,032.57	675,730.58	144.51	2,989,032.56	675,730.61	0.03	143.33	1.18	--	143.80	0.47
4047	2,989,029.66	675,721.18	144.48	2,989,029.65	675,721.16	0.02	143.07	1.41	--	143.55	0.48
4048	2,989,025.86	675,712.77	144.50	2,989,025.84	675,712.73	0.04	142.78	1.72	--	143.34	0.56
4049	2,989,022.24	675,703.62	144.51	2,989,022.30	675,703.58	0.07	143.46	1.05	--	143.99	0.53
4050	2,989,019.99	675,692.42	144.51	2,989,019.96	675,692.46	0.05	143.03	1.48	--	143.51	0.48

Attachment D
Sinking Pond - Area 3 Survey Control Points

Sediment Construction Summary and Final Sediment Remedial Action Report
W.R. Grace Superfund Site
Acton-Concord, Massachusetts

	PRE-CONSTRUCTION			POST-EXCAVATION						POST-BACKFILL	
Point ID	Pre-Construction Northing	Pre-Construction Easting	Pre-Construction Elevation (feet)	Post-Excavation Northing	Post-Excavation Easting	Δ Horizontal Distance between Pre-Construction and Post-Excavation[1] (feet)	Post-Excavation Elevation (feet)	Δ Elevation between Post-Excavation and Pre-Construction Elevations (feet)	Δ Elevation between Post-Excavation Surface and Pre-Construction Elevation[1] (feet)	Post-Backfill Elevation (feet)[2]	Δ Elevation from Post-Dredge Location (feet)
4051	2,989,018.23	675,682.35	144.49	2,989,018.15	675,682.38	0.08	141.93	2.56	--	142.52	0.59
4052	2,989,015.81	675,672.58	144.50	2,989,015.82	675,672.59	0.02	143.23	1.27	--	143.66	0.43
4053	2,989,013.72	675,662.42	144.46	2,989,013.68	675,662.38	0.06	143.44	1.02	--	143.87	0.43
4054	2,989,011.97	675,651.97	144.49	2,989,011.97	675,651.97	0.01	142.13	2.36	--	142.70	0.57
4055	2,989,009.55	675,641.24	144.49	2,989,009.51	675,641.31	0.08	142.18	2.31	--	142.66	0.48
4056	2,989,006.08	675,631.43	144.50	2,989,006.03	675,631.38	0.07	142.08	2.42	--	142.64	0.56
4057	2,988,998.95	675,610.37	144.50	2,988,998.94	675,610.43	0.06	143.47	1.03	--	144.03	0.56
4058	2,989,003.78	675,554.83	144.49	2,989,003.79	675,554.78	0.05	143.29	1.20	--	143.84	0.55
4059	2,989,000.66	675,538.73	144.51	2,989,000.72	675,538.76	0.06	143.46	1.05	--	143.99	0.53
4060	2,989,014.59	675,524.03	144.50	2,989,014.57	675,523.98	0.05	143.43	1.07	--	144.00	0.57
4061	2,989,034.12	675,521.47	144.50	2,989,034.10	675,521.47	0.02	142.91	1.59	--	143.51	0.60
4062	2,989,043.24	675,515.57	144.50	2,989,043.21	675,515.56	0.03	143.43	1.07	--	143.97	0.54
4063	2,989,050.76	675,510.65	144.50	2,989,050.67	675,510.66	0.09	143.39	1.11	--	143.92	0.53
4064	2,989,072.15	675,507.03	144.50	2,989,072.11	675,507.15	0.14	143.34	1.16	--	143.93	0.59
4065	2,989,091.84	675,506.08	144.50	2,989,091.88	675,506.20	0.12	143.50	1.00	--	144.08	0.58
4066	2,989,036.23	675,739.82	144.50	2,989,036.24	675,739.80	0.03	142.14	2.36	--	142.68	0.54
4189	2,989,091.19	675,772.70	128.00	2,989,091.66	675,772.89	0.50	126.83	1.17	1.08	--	--
4190	2,989,071.14	675,740.63	128.03	2,989,071.76	675,740.40	0.66	126.98	1.05	0.78	--	--
4191	2,989,068.37	675,729.51	128.00	2,989,067.88	675,728.49	1.13	126.46	1.54	1.64	--	--
4192	2,989,059.83	675,688.73	128.01	2,989,059.69	675,687.69	1.05	126.99	1.02	1.00	--	--
4193	2,989,059.04	675,677.99	128.00	2,989,060.18	675,677.85	1.15	126.80	1.20	0.81	--	--
4194	2,989,058.61	675,635.68	128.01	2,989,057.88	675,635.72	0.74	126.70	1.31	1.44	--	--
4195	2,989,064.88	675,619.07	128.01	2,989,063.98	675,619.60	1.04	127.00	1.01	1.09	--	--
4196	2,989,089.69	675,599.22	127.99	2,989,089.42	675,599.55	0.43	126.70	1.29	1.26	--	--
4197	2,989,160.71	675,557.57	128.00	2,989,161.62	675,557.17	0.99	126.95	1.05	1.20	--	--

Note:
1. Values shaded in green represent locations below the water line where the horizontal distance between the pre-construction and post-construction survey points exceeded 0.33 feet (discussed in RFI 006, Attachment L). For these points, the change from pre-construction elevation was derived from a CADD surface elevation and reported in the final column of the post-excavation data.

2. Consistent with the 100% design, topsoil was placed in excavated areas between the water line and the historical high water elevation (144.5 ft). Survey control points located below the water line were not backfilled and no post-backfill elevation or thickness is provided.

Attachment D
Sinking Pond - Area 4 Survey Control Points

Sediment Construction Summary and Final Sediment Remedial Action Report
W.R. Grace Superfund Site
Acton-Concord, Massachusetts

	PRE-CONSTRUCTION			POST-EXCAVATION						POST-BACKFILL	
Point ID	Pre-Construction Northing	Pre-Construction Easting	Pre-Construction Elevation (feet)	Post-Excavation Northing	Post-Excavation Easting	Δ Horizontal Distance between Pre-Construction and Post-Excavation[1] (feet)	Post-Excavation Elevation (feet)	Δ Elevation between Post-Excavation and Pre-Construction Elevations (feet)	Δ Elevation between Post-Excavation Surface and Pre-Construction Elevation[1] (feet)	Post-Backfill Elevation (feet)[2]	Δ Elevation from Post-Dredge Location (feet)
1632	2,989,083.00	675,898.21	138.11	2,989,083.00	675,898.21	0.00	136.28	1.83	--	136.74	0.46
1633	2,989,077.24	675,901.09	140.99	2,989,077.25	675,901.10	0.01	138.42	2.57	--	138.94	0.52
1634	2,989,071.91	675,903.17	143.95	2,989,071.90	675,903.17	0.01	142.36	1.59	--	142.85	0.49
1639	2,989,078.35	675,912.08	141.47	2,989,078.33	675,912.08	0.02	140.03	1.44	--	140.46	0.43
1640	2,989,083.06	675,909.76	139.30	2,989,083.06	675,909.76	0.00	137.77	1.53	--	138.20	0.43
1641	2,989,087.57	675,907.29	138.15	2,989,087.59	675,907.28	0.02	136.67	1.48	--	--	--
1642	2,989,095.07	675,914.80	138.05	2,989,095.67	675,915.73	1.10	132.49	5.56	5.63	--	--
1643	2,989,085.64	675,919.79	139.76	2,989,085.62	675,919.80	0.02	138.53	1.23	--	138.95	0.42
1644	2,989,083.30	675,920.78	141.69	2,989,083.30	675,920.80	0.02	139.91	1.78	--	140.35	0.44
1645	2,989,074.93	675,925.46	144.49	2,989,074.92	675,925.46	0.01	142.98	1.51	--	143.43	0.45
1650	2,989,079.60	675,934.57	143.28	2,989,079.61	675,934.56	0.01	142.11	1.17	--	142.67	0.56
1651	2,989,087.82	675,929.28	140.77	2,989,087.51	675,929.52	0.39	133.17	7.60	7.71	133.73	0.56
1652	2,989,097.44	675,924.73	139.03	2,989,097.50	675,924.50	0.24	133.40	5.63	--	--	--
1653	2,989,103.91	675,921.08	138.17	2,989,103.69	675,921.11	0.22	134.00	4.17	--	--	--
1654	2,989,115.78	675,926.10	138.10	2,989,115.48	675,926.16	0.31	134.23	3.87	--	--	--
1655	2,989,106.90	675,931.44	139.58	2,989,107.12	675,931.59	0.27	134.13	5.45	--	--	--
1656	2,989,101.74	675,933.95	140.27	2,989,101.45	675,934.47	0.60	136.09	4.18	4.25	136.52	0.43
1657	2,989,096.55	675,936.87	140.76	2,989,096.55	675,936.86	0.01	139.63	1.13	--	140.07	0.44
1658	2,989,092.75	675,939.14	141.45	2,989,092.75	675,939.15	0.01	140.40	1.05	--	140.83	0.43
1659	2,989,083.98	675,943.31	143.35	2,989,083.99	675,943.31	0.01	142.33	1.02	--	142.85	0.52
1664	2,989,089.14	675,951.94	143.97	2,989,089.14	675,951.93	0.01	142.81	1.16	--	143.40	0.59
1665	2,989,097.79	675,946.80	142.05	2,989,097.78	675,946.80	0.01	140.96	1.09	--	141.46	0.50
1666	2,989,106.78	675,942.87	141.22	2,989,106.78	675,942.87	0.00	140.12	1.10	--	140.60	0.48
1667	2,989,115.78	675,937.75	140.18	2,989,115.28	675,938.32	0.76	135.16	5.02	5.12	135.73	0.57
1668	2,989,123.47	675,933.23	138.07	2,989,124.07	675,932.74	0.77	133.88	4.19	3.97	--	--
1669	2,989,132.26	675,940.01	138.18	2,989,131.98	675,939.99	0.28	133.76	4.42	--	--	--
1670	2,989,128.31	675,942.73	140.35	2,989,128.23	675,942.48	0.26	135.74	4.61	--	--	--
1671	2,989,120.21	675,947.11	141.33	2,989,120.22	675,947.09	0.02	140.29	1.04	--	140.70	0.41
1672	2,989,110.67	675,951.75	141.93	2,989,110.68	675,951.75	0.01	140.89	1.04	--	141.39	0.50
1673	2,989,102.85	675,956.42	142.64	2,989,102.86	675,956.43	0.01	141.60	1.04	--	142.17	0.57
1674	2,989,093.28	675,960.90	144.26	2,989,093.29	675,960.90	0.01	141.99	2.27	--	142.58	0.59
1681	2,989,098.79	675,969.55	144.11	2,989,098.80	675,969.55	0.01	143.09	1.02	--	143.65	0.56
1690	2,989,115.57	675,968.50	143.99	2,989,115.59	675,968.52	0.02	142.73	1.26	--	143.28	0.55
1691	2,989,122.54	675,960.56	143.25	2,989,122.53	675,960.54	0.02	142.20	1.05	--	142.76	0.56
1692	2,989,136.64	675,955.26	142.52	2,989,136.65	675,955.25	0.01	141.43	1.09	--	141.96	0.53
1693	2,989,131.14	675,950.77	141.76	2,989,131.12	675,950.79	0.02	140.32	1.44	--	140.80	0.48
1694	2,989,121.83	675,953.55	142.21	2,989,121.83	675,953.54	0.01	141.02	1.19	--	141.56	0.54
1695	2,989,109.01	675,954.76	142.23	2,989,108.99	675,954.76	0.02	141.08	1.15	--	141.67	0.59
1696	2,989,108.17	675,964.49	143.19	2,989,108.17	675,964.48	0.01	142.12	1.07	--	142.71	0.59
1697	2,989,105.94	675,972.95	144.17	2,989,105.94	675,972.94	0.01	142.91	1.26	--	143.50	0.59
1721	2,989,152.24	675,962.56	143.50	2,989,152.23	675,962.57	0.02	142.28	1.22	--	142.88	0.60
1722	2,989,158.92	675,950.27	137.60	2,989,158.92	675,950.25	0.02	136.49	1.11	--	136.94	0.45
1723	2,989,148.66	675,947.30	137.63	2,989,148.66	675,947.29	0.01	136.60	1.03	--	137.20	0.60
1724	2,989,139.78	675,944.05	137.60	2,989,139.80	675,944.02	0.04	136.28	1.32	--	136.79	0.51
1725	2,989,144.29	675,958.70	142.68	2,989,144.29	675,958.70	0.00	141.65	1.03	--	142.22	0.57
1726	2,989,136.89	675,964.02	144.61	2,989,136.88	675,964.03	0.02	143.60	1.01	--	144.13	0.53
1728	2,989,169.94	675,953.65	137.57	2,989,169.92	675,953.63	0.03	136.41	1.16	--	136.84	0.43
1729	2,989,165.72	675,960.26	141.17	2,989,165.70	675,960.26	0.02	139.92	1.25	--	140.43	0.51
1734	2,989,172.90	675,967.59	142.73	2,989,172.89	675,967.57	0.03	141.36	1.37	--	141.85	0.49
1735	2,989,179.00	675,958.17	137.55	2,989,178.98	675,958.18	0.02	136.48	1.07	--	136.91	0.43
1736	2,989,188.36	675,963.01	137.69	2,989,188.37	675,963.03	0.02	136.15	1.54	--	136.65	0.50
1737	2,989,182.02	675,972.84	143.47	2,989,182.01	675,972.82	0.02	141.16	2.31	--	141.60	0.44
1908	2,989,073.12	675,816.28	137.69	2,989,073.10	675,816.28	0.02	136.30	1.39	--	136.76	0.46
1965	2,989,068.08	675,826.94	142.18	2,989,068.10	675,826.95	0.02	139.59	2.59	--	140.17	0.58

Attachment D
Sinking Pond - Area 4 Survey Control Points

Sediment Construction Summary and Final Sediment Remedial Action Report
W.R. Grace Superfund Site
Acton-Concord, Massachusetts

	PRE-CONSTRUCTION			POST-EXCAVATION						POST-BACKFILL	
Point ID	Pre-Construction Northing	Pre-Construction Easting	Pre-Construction Elevation (feet)	Post-Excavation Northing	Post-Excavation Easting	Δ Horizontal Distance between Pre-Construction and Post-Excavation[1] (feet)	Post-Excavation Elevation (feet)	Δ Elevation between Post-Excavation and Pre-Construction Elevations (feet)	Δ Elevation between Post-Excavation Surface and Pre-Construction Elevation[1] (feet)	Post-Backfill Elevation (feet)[2]	Δ Elevation from Post-Dredge Location (feet)
1966	2,989,074.05	675,823.48	137.50	2,989,074.05	675,823.45	0.03	136.27	1.23	--	136.72	0.45
1967	2,989,073.88	675,835.23	137.55	2,989,073.86	675,835.23	0.02	136.38	1.17	--	136.88	0.50
1968	2,989,066.32	675,838.11	143.31	2,989,066.31	675,838.10	0.02	142.16	1.15	--	142.60	0.44
1973	2,989,068.44	675,849.61	141.88	2,989,068.44	675,849.60	0.01	140.80	1.08	--	141.32	0.52
1974	2,989,074.24	675,846.59	137.34	2,989,074.21	675,846.60	0.03	136.27	1.07	--	136.75	0.48
1975	2,989,074.84	675,856.79	137.72	2,989,074.83	675,856.79	0.01	136.26	1.46	--	136.74	0.48
1976	2,989,067.14	675,861.10	143.35	2,989,067.15	675,861.06	0.03	142.17	1.18	--	142.73	0.56
1981	2,989,068.97	675,871.56	142.53	2,989,068.99	675,871.58	0.03	141.39	1.14	--	141.90	0.51
1982	2,989,076.19	675,867.48	137.53	2,989,076.19	675,867.50	0.02	135.74	1.79	--	136.32	0.58
1983	2,989,078.29	675,877.25	137.49	2,989,078.28	675,877.25	0.01	136.47	1.02	--	136.96	0.49
1984	2,989,067.76	675,883.26	144.35	2,989,067.77	675,883.26	0.01	143.09	1.26	--	143.63	0.54
1989	2,989,072.56	675,891.76	141.69	2,989,072.55	675,891.75	0.02	140.47	1.22	--	141.03	0.56
1990	2,989,079.93	675,888.01	137.61	2,989,079.92	675,887.99	0.02	136.25	1.36	--	136.68	0.43
1992	2,989,190.35	675,969.67	141.41	2,989,190.33	675,969.67	0.02	139.34	2.07	--	139.75	0.41
1993	2,989,187.16	675,977.67	142.31	2,989,187.18	675,977.68	0.02	140.70	1.61	--	141.22	0.52
1994	2,989,181.12	675,987.24	143.95	2,989,181.13	675,987.23	0.01	142.55	1.40	--	143.14	0.59
2001	2,989,196.86	675,992.38	143.46	2,989,196.86	675,992.37	0.01	142.04	1.42	--	142.60	0.56
2002	2,989,205.56	675,984.93	142.02	2,989,205.55	675,984.93	0.01	140.80	1.22	--	141.36	0.56
2003	2,989,210.83	675,982.78	141.71	2,989,210.82	675,982.77	0.01	140.32	1.39	--	140.90	0.58
2004	2,989,213.96	675,979.50	140.96	2,989,213.98	675,979.52	0.03	136.45	4.51	--	137.03	0.58
2005	2,989,218.81	675,974.58	138.49	2,989,218.86	675,974.52	0.08	134.47	4.02	--	--	--
2006	2,989,213.35	675,962.86	138.58	2,989,213.32	675,962.85	0.03	133.71	4.87	--	--	--
2007	2,989,207.15	675,970.50	140.56	2,989,207.17	675,970.50	0.02	134.57	5.99	--	--	--
2008	2,989,200.74	675,977.82	141.59	2,989,200.73	675,977.80	0.02	136.84	4.75	--	137.40	0.56
2009	2,989,193.79	675,985.14	142.37	2,989,193.81	675,985.14	0.02	140.94	1.43	--	141.49	0.55
2010	2,989,186.77	675,993.53	143.46	2,989,186.76	675,993.52	0.01	141.79	1.67	--	142.36	0.57
2011	2,989,176.75	676,002.29	144.52	2,989,176.75	676,002.26	0.03	143.47	1.05	--	143.98	0.51
2013	2,989,215.05	675,986.00	143.93	2,989,215.07	675,986.01	0.02	140.96	2.97	--	141.37	0.41
2017	2,989,223.79	675,980.56	137.52	2,989,223.76	675,980.55	0.03	135.81	1.71	--	136.34	0.53
2018	2,989,230.47	675,985.93	137.44	2,989,230.48	675,985.93	0.01	136.15	1.29	--	136.64	0.49
2019	2,989,226.01	675,992.18	142.07	2,989,226.02	675,992.17	0.02	140.94	1.13	--	141.50	0.56
2026	2,989,230.86	676,001.09	143.14	2,989,230.87	676,001.09	0.01	142.01	1.13	--	142.44	0.43
2027	2,989,237.79	675,993.81	137.38	2,989,237.80	675,993.80	0.01	136.16	1.22	--	136.68	0.52
2028	2,989,243.90	676,001.09	137.51	2,989,243.91	676,001.09	0.01	136.19	1.32	--	136.73	0.54
2029	2,989,237.75	676,007.23	142.56	2,989,237.76	676,007.23	0.01	141.24	1.32	--	141.68	0.44
2036	2,989,245.36	676,014.50	142.23	2,989,245.38	676,014.47	0.03	140.14	2.09	--	140.69	0.55
2037	2,989,250.30	676,008.96	137.70	2,989,250.29	676,008.96	0.01	136.62	1.08	--	137.16	0.54
2038	2,989,256.47	676,017.51	137.37	2,989,256.47	676,017.52	0.01	136.21	1.16	--	136.71	0.50
2039	2,989,252.64	676,021.10	140.44	2,989,252.65	676,021.09	0.02	138.36	2.08	--	138.94	0.58
2040	2,989,245.13	676,028.12	144.21	2,989,245.15	676,028.11	0.02	143.10	1.11	--	143.57	0.47
2046	2,989,246.54	676,041.88	144.40	2,989,246.53	676,041.87	0.02	143.38	1.02	--	143.97	0.59
2047	2,989,253.66	676,035.01	142.82	2,989,253.67	676,035.00	0.01	141.21	1.61	--	141.72	0.51
2048	2,989,261.48	676,027.06	137.59	2,989,261.47	676,027.07	0.02	136.52	1.07	--	137.08	0.56
2049	2,989,266.12	676,035.87	137.62	2,989,266.13	676,035.88	0.02	136.30	1.32	--	136.89	0.59
2050	2,989,260.07	676,042.38	141.52	2,989,260.07	676,042.38	0.00	140.02	1.50	--	140.53	0.51
2051	2,989,252.88	676,049.51	144.19	2,989,252.88	676,049.51	0.00	142.89	1.30	--	143.39	0.50
2056	2,989,260.97	676,056.84	143.54	2,989,260.97	676,056.83	0.01	142.42	1.12	--	142.97	0.55
2057	2,989,267.65	676,048.69	140.16	2,989,267.67	676,048.70	0.02	138.32	1.84	--	138.88	0.56
2058	2,989,270.80	676,045.63	137.47	2,989,270.82	676,045.62	0.02	136.24	1.23	--	136.79	0.55
2059	2,989,276.48	676,054.31	137.52	2,989,276.46	676,054.30	0.02	136.44	1.08	--	--	--
2060	2,989,268.86	676,063.05	143.18	2,989,268.87	676,063.04	0.01	142.17	1.01	--	142.74	0.57
2065	2,989,274.68	676,069.74	143.67	2,989,274.66	676,069.75	0.02	142.62	1.05	--	143.16	0.54
2066	2,989,282.83	676,061.84	137.32	2,989,282.84	676,061.85	0.01	136.30	1.02	--	136.86	0.56
2067	2,989,290.20	676,068.48	137.50	2,989,290.22	676,068.48	0.02	136.31	1.19	--	136.87	0.56

Attachment D
Sinking Pond - Area 4 Survey Control Points

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W.R. Grace Superfund Site
Acton-Concord, Massachusetts

	PRE-CONSTRUCTION			POST-EXCAVATION						POST-BACKFILL	
Point ID	Pre-Construction Northing	Pre-Construction Easting	Pre-Construction Elevation (feet)	Post-Excavation Northing	Post-Excavation Easting	Δ Horizontal Distance between Pre-Construction and Post-Excavation[1] (feet)	Post-Excavation Elevation (feet)	Δ Elevation between Post-Excavation and Pre-Construction Elevations (feet)	Δ Elevation between Post-Excavation Surface and Pre-Construction Elevation[1] (feet)	Post-Backfill Elevation (feet)[2]	Δ Elevation from Post-Dredge Location (feet)
2068	2,989,288.71	676,069.92	139.97	2,989,288.71	676,069.92	0.00	138.94	1.03	--	139.40	0.46
2069	2,989,282.55	676,076.52	143.69	2,989,282.55	676,076.53	0.01	142.67	1.02	--	143.20	0.53
2074	2,989,290.09	676,083.80	144.18	2,989,290.10	676,083.78	0.02	142.60	1.58	--	143.19	0.59
2075	2,989,298.42	676,074.75	137.61	2,989,298.45	676,074.76	0.03	136.30	1.31	--	136.90	0.60
2076	2,989,306.49	676,080.71	137.48	2,989,306.49	676,080.72	0.01	136.30	1.18	--	136.86	0.56
2077	2,989,303.37	676,083.80	140.51	2,989,303.36	676,083.80	0.01	139.15	1.36	--	139.65	0.50
2078	2,989,297.39	676,090.14	144.35	2,989,297.36	676,090.15	0.03	143.12	1.23	--	143.71	0.59
2084	2,989,310.65	676,089.87	140.56	2,989,310.64	676,089.87	0.01	139.45	1.11	--	139.87	0.42
2085	2,989,313.61	676,087.15	137.54	2,989,313.63	676,087.14	0.02	136.39	1.15	--	136.88	0.49
2086	2,989,321.48	676,093.77	137.42	2,989,321.49	676,093.76	0.01	136.41	1.01	--	136.99	0.58
2087	2,989,317.92	676,097.08	141.02	2,989,317.91	676,097.10	0.02	139.43	1.59	--	139.87	0.44
2094	2,989,325.62	676,103.81	141.57	2,989,325.62	676,103.79	0.02	140.55	1.02	--	141.06	0.51
2095	2,989,330.70	676,098.44	137.56	2,989,330.72	676,098.44	0.02	136.08	1.48	--	136.66	0.58
2096	2,989,339.97	676,103.44	137.59	2,989,339.99	676,103.45	0.02	136.23	1.36	--	136.83	0.60
2097	2,989,331.90	676,110.51	142.45	2,989,331.91	676,110.52	0.01	141.42	1.03	--	141.87	0.45
2104	2,989,340.93	676,116.76	143.08	2,989,340.92	676,116.76	0.01	141.69	1.39	--	142.25	0.56
2105	2,989,347.67	676,109.99	139.18	2,989,347.67	676,110.01	0.02	137.59	1.59	--	138.15	0.56
2106	2,989,351.34	676,105.45	137.54	2,989,351.34	676,105.45	0.00	136.19	1.35	--	136.69	0.50
2107	2,989,364.34	676,106.72	137.44	2,989,364.34	676,106.72	0.01	135.83	1.61	--	136.26	0.43
2108	2,989,361.62	676,110.43	138.63	2,989,361.64	676,110.44	0.02	137.02	1.61	--	137.49	0.47
2109	2,989,361.23	676,110.76	138.70	2,989,361.23	676,110.74	0.02	137.44	1.26	--	137.92	0.48
2110	2,989,354.34	676,117.33	140.19	2,989,354.34	676,117.32	0.01	139.19	1.00	--	139.76	0.57
2111	2,989,347.64	676,124.79	143.83	2,989,347.65	676,124.80	0.02	142.64	1.19	--	143.19	0.55
2116	2,989,354.76	676,130.49	144.32	2,989,354.77	676,130.49	0.01	143.17	1.15	--	143.67	0.50
2117	2,989,361.32	676,123.68	141.22	2,989,361.33	676,123.69	0.02	140.19	1.03	--	140.75	0.56
2118	2,989,367.29	676,116.47	139.95	2,989,367.28	676,116.47	0.01	138.94	1.01	--	139.35	0.41
2119	2,989,374.98	676,109.95	137.67	2,989,374.99	676,109.97	0.03	135.97	1.70	--	136.45	0.48
2120	2,989,386.66	676,111.10	137.53	2,989,386.67	676,111.10	0.01	136.21	1.32	--	136.65	0.44
2121	2,989,382.72	676,115.81	139.19	2,989,382.71	676,115.81	0.01	137.81	1.38	--	138.30	0.49
2122	2,989,376.45	676,123.55	141.55	2,989,376.46	676,123.55	0.01	140.40	1.15	--	140.82	0.42
2123	2,989,369.95	676,131.35	144.61	2,989,369.95	676,131.34	0.01	141.85	2.76	--	142.44	0.59
2129	2,989,382.98	676,130.51	143.80	2,989,382.97	676,130.51	0.01	142.54	1.26	--	143.06	0.52
2130	2,989,390.11	676,122.93	141.64	2,989,390.10	676,122.93	0.01	140.33	1.31	--	140.85	0.52
2131	2,989,397.38	676,115.34	138.99	2,989,397.36	676,115.32	0.03	137.98	1.01	--	138.50	0.52
2132	2,989,404.01	676,108.01	137.55	2,989,404.00	676,108.01	0.01	136.47	1.08	--	137.00	0.53
2133	2,989,410.63	676,128.28	144.06	2,989,410.63	676,128.27	0.01	142.97	1.09	--	143.50	0.53
2134	2,989,409.39	676,117.74	140.65	2,989,409.39	676,117.75	0.01	139.63	1.02	--	140.14	0.51
2135	2,989,407.44	676,107.54	137.51	2,989,407.45	676,107.53	0.02	136.49	1.02	--	137.01	0.52
2141	2,989,398.73	676,130.48	143.74	2,989,398.74	676,130.46	0.02	142.69	1.05	--	143.26	0.57
2142	2,989,401.94	676,121.85	141.52	2,989,401.93	676,121.87	0.02	140.40	1.12	--	140.98	0.58
2143	2,989,404.03	676,116.96	140.31	2,989,404.04	676,116.96	0.01	139.28	1.03	--	139.86	0.58
2389	2,989,093.16	675,794.47	131.05	2,989,092.98	675,794.02	0.48	129.61	1.44	1.40	--	--
2390	2,989,099.70	675,791.56	128.69	2,989,100.22	675,791.28	0.59	127.64	1.05	0.98	--	--
2391	2,989,101.19	675,790.53	128.46	2,989,101.48	675,789.79	0.80	127.32	1.14	0.93	--	--
2395	2,989,102.15	675,799.90	129.60	2,989,102.55	675,799.64	0.48	128.34	1.26	1.12	--	--
2396	2,989,093.14	675,803.60	131.88	2,989,093.13	675,803.79	0.19	130.37	1.51	--	--	--
2397	2,989,085.02	675,807.32	133.22	2,989,084.86	675,806.84	0.50	132.16	1.06	1.08	--	--
2398	2,989,081.12	675,809.69	134.23	2,989,081.01	675,809.25	0.46	132.85	1.38	1.38	--	--
2399	2,989,081.20	675,823.14	134.76	2,989,081.50	675,822.57	0.65	133.25	1.51	1.43	--	--
2400	2,989,088.94	675,819.83	133.23	2,989,089.08	675,819.37	0.48	132.11	1.12	1.09	--	--
2401	2,989,094.99	675,817.55	132.35	2,989,094.71	675,817.18	0.46	130.79	1.56	1.58	--	--
2402	2,989,103.06	675,816.78	130.27	2,989,103.68	675,816.04	0.97	128.82	1.45	1.31	--	--
2403	2,989,114.36	675,813.26	128.21	2,989,115.05	675,812.86	0.80	127.08	1.13	0.96	--	--
2408	2,989,126.04	675,821.74	128.02	2,989,125.99	675,821.29	0.46	126.87	1.15	1.06	--	--

Attachment D
Sinking Pond - Area 4 Survey Control Points

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W.R. Grace Superfund Site
Acton-Concord, Massachusetts

	PRE-CONSTRUCTION			POST-EXCAVATION						POST-BACKFILL	
Point ID	Pre-Construction Northing	Pre-Construction Easting	Pre-Construction Elevation (feet)	Post-Excavation Northing	Post-Excavation Easting	Δ Horizontal Distance between Pre-Construction and Post-Excavation[1] (feet)	Post-Excavation Elevation (feet)	Δ Elevation between Post-Excavation and Pre-Construction Elevations (feet)	Δ Elevation between Post-Excavation Surface and Pre-Construction Elevation[1] (feet)	Post-Backfill Elevation (feet)[2]	Δ Elevation from Post-Dredge Location (feet)
2409	2,989,114.50	675,824.95	130.34	2,989,114.29	675,825.14	0.27	128.37	1.97	--	--	--
2410	2,989,105.32	675,826.82	130.97	2,989,106.23	675,826.40	1.00	129.32	1.65	1.57	--	--
2411	2,989,095.13	675,829.10	132.66	2,989,095.34	675,829.63	0.57	131.63	1.03	1.04	--	--
2412	2,989,086.93	675,832.30	133.93	2,989,087.11	675,832.97	0.70	132.36	1.57	1.57	--	--
2413	2,989,081.30	675,833.23	134.79	2,989,081.67	675,833.01	0.44	133.47	1.32	1.26	--	--
2414	2,989,084.35	675,844.31	134.67	2,989,084.51	675,844.80	0.51	133.22	1.45	1.43	--	--
2415	2,989,088.51	675,842.22	134.04	2,989,089.23	675,842.33	0.72	132.68	1.36	1.28	--	--
2416	2,989,096.37	675,839.16	133.11	2,989,097.28	675,839.45	0.95	131.98	1.13	1.03	--	--
2417	2,989,106.84	675,838.65	131.93	2,989,106.79	675,838.71	0.08	130.82	1.11	--	--	--
2418	2,989,115.31	675,835.43	131.13	2,989,115.27	675,835.18	0.26	129.72	1.41	--	--	--
2419	2,989,122.85	675,830.75	130.16	2,989,122.39	675,830.78	0.46	128.47	1.69	1.73	--	--
2420	2,989,131.78	675,826.23	127.77	2,989,132.13	675,827.08	0.93	126.69	1.08	1.18	--	--
2424	2,989,130.82	675,836.78	129.66	2,989,131.11	675,836.17	0.68	127.88	1.78	1.64	--	--
2425	2,989,119.58	675,838.68	130.80	2,989,120.19	675,838.84	0.63	129.30	1.50	1.48	--	--
2426	2,989,109.26	675,842.05	131.77	2,989,109.57	675,841.30	0.81	130.76	1.01	0.97	--	--
2427	2,989,100.39	675,846.06	132.71	2,989,100.25	675,846.48	0.44	131.51	1.20	1.23	--	--
2428	2,989,087.83	675,849.11	134.18	2,989,087.77	675,849.95	0.84	133.16	1.02	1.06	--	--
2429	2,989,083.29	675,852.22	135.15	2,989,083.00	675,852.24	0.29	133.68	1.47	--	--	--
2430	2,989,083.43	675,863.93	135.13	2,989,083.81	675,864.66	0.83	133.84	1.29	1.27	--	--
2431	2,989,091.33	675,859.57	133.96	2,989,091.60	675,859.78	0.34	132.29	1.67	1.65	--	--
2432	2,989,098.95	675,856.38	133.13	2,989,098.93	675,855.67	0.71	132.02	1.11	1.09	--	--
2433	2,989,105.56	675,852.85	132.67	2,989,106.22	675,853.28	0.79	131.57	1.10	1.07	--	--
2434	2,989,112.17	675,848.37	131.92	2,989,112.15	675,848.07	0.30	130.68	1.24	--	--	--
2435	2,989,117.73	675,844.31	131.48	2,989,117.79	675,844.35	0.07	129.74	1.74	--	--	--
2436	2,989,126.33	675,839.04	130.41	2,989,126.81	675,838.59	0.66	128.46	1.95	1.85	--	--
2437	2,989,135.92	675,835.94	128.91	2,989,136.64	675,835.41	0.89	127.44	1.47	1.25	--	--
2442	2,989,141.65	675,840.39	128.24	2,989,142.12	675,840.08	0.56	127.12	1.12	1.01	--	--
2443	2,989,132.10	675,846.06	130.15	2,989,131.69	675,846.43	0.55	128.83	1.32	1.39	--	--
2444	2,989,122.79	675,851.54	131.59	2,989,122.21	675,850.51	1.18	130.36	1.23	1.20	--	--
2445	2,989,112.18	675,857.68	132.40	2,989,112.51	675,857.85	0.37	131.19	1.21	1.21	--	--
2446	2,989,102.16	675,861.96	133.22	2,989,102.15	675,861.52	0.44	131.86	1.36	1.34	--	--
2447	2,989,094.16	675,868.79	134.11	2,989,094.39	675,869.17	0.44	132.78	1.33	1.35	--	--
2448	2,989,089.03	675,871.34	134.78	2,989,088.63	675,870.90	0.60	133.68	1.10	1.13	--	--
2449	2,989,086.82	675,873.83	135.04	2,989,086.43	675,873.80	0.39	134.01	1.03	1.13	--	--
2453	2,989,152.83	675,853.10	128.42	2,989,152.37	675,852.64	0.65	126.77	1.65	1.65	--	--
2454	2,989,142.24	675,858.33	130.84	2,989,141.72	675,858.26	0.52	129.21	1.63	1.65	--	--
2455	2,989,131.63	675,862.87	131.84	2,989,131.21	675,863.24	0.56	130.62	1.22	1.27	--	--
2456	2,989,119.47	675,866.86	132.75	2,989,120.42	675,866.37	1.07	131.36	1.39	1.31	--	--
2457	2,989,105.89	675,874.02	133.85	2,989,105.75	675,873.45	0.59	132.34	1.51	1.48	--	--
2458	2,989,101.27	675,876.28	134.22	2,989,100.78	675,875.72	0.75	132.96	1.26	1.25	--	--
2459	2,989,087.81	675,884.13	135.43	2,989,087.83	675,883.91	0.22	134.31	1.12	--	--	--
2460	2,989,092.34	675,882.76	135.20	2,989,092.42	675,882.76	0.08	133.97	1.23	--	--	--
2461	2,989,092.18	675,894.05	136.03	2,989,092.72	675,893.97	0.55	134.78	1.25	1.23	--	--
2462	2,989,098.00	675,890.37	135.56	2,989,098.47	675,890.17	0.51	134.32	1.24	1.20	--	--
2463	2,989,105.15	675,886.63	134.90	2,989,105.10	675,886.62	0.05	133.80	1.10	--	--	--
2464	2,989,110.05	675,881.29	133.98	2,989,110.22	675,881.08	0.28	132.57	1.41	--	--	--
2465	2,989,120.90	675,876.91	133.26	2,989,120.21	675,876.48	0.81	131.96	1.30	1.31	--	--
2466	2,989,131.16	675,871.40	132.46	2,989,131.35	675,871.36	0.20	131.17	1.29	--	--	--
2467	2,989,140.73	675,865.96	131.32	2,989,140.81	675,865.74	0.23	129.74	1.58	--	--	--
2468	2,989,150.22	675,860.81	130.12	2,989,150.14	675,861.35	0.55	129.10	1.02	1.04	--	--
2469	2,989,158.47	675,854.74	128.12	2,989,158.33	675,854.87	0.20	127.11	1.01	--	--	--
2473	2,989,166.80	675,867.78	128.46	2,989,166.72	675,868.02	0.26	127.42	1.04	--	--	--
2474	2,989,158.98	675,872.13	129.82	2,989,158.96	675,872.37	0.24	128.44	1.38	--	--	--
2475	2,989,148.00	675,876.70	130.66	2,989,147.88	675,876.48	0.25	129.48	1.18	--	--	--

Attachment D
Sinking Pond - Area 4 Survey Control Points

Sediment Construction Summary and Final Sediment Remedial Action Report
W.R. Grace Superfund Site
Acton-Concord, Massachusetts

	PRE-CONSTRUCTION			POST-EXCAVATION						POST-BACKFILL	
Point ID	Pre-Construction Northing	Pre-Construction Easting	Pre-Construction Elevation (feet)	Post-Excavation Northing	Post-Excavation Easting	Δ Horizontal Distance between Pre-Construction and Post-Excavation[1] (feet)	Post-Excavation Elevation (feet)	Δ Elevation between Post-Excavation and Pre-Construction Elevations (feet)	Δ Elevation between Post-Excavation Surface and Pre-Construction Elevation[1] (feet)	Post-Backfill Elevation (feet)[2]	Δ Elevation from Post-Dredge Location (feet)
2476	2,989,135.75	675,883.12	131.93	2,989,136.05	675,883.70	0.65	130.64	1.29	1.33	--	--
2477	2,989,127.09	675,887.35	133.84	2,989,126.99	675,887.08	0.29	132.60	1.24	--	--	--
2478	2,989,118.39	675,893.08	134.58	2,989,119.04	675,892.89	0.67	133.50	1.08	1.04	--	--
2479	2,989,109.26	675,898.57	135.62	2,989,109.09	675,898.63	0.18	134.32	1.30	--	--	--
2480	2,989,098.63	675,902.51	136.40	2,989,098.39	675,902.65	0.27	134.38	2.02	--	--	--
2481	2,989,103.80	675,910.71	136.75	2,989,103.20	675,910.74	0.60	132.26	4.49	4.55	--	--
2482	2,989,113.20	675,904.87	135.95	2,989,113.54	675,905.13	0.43	133.98	1.97	1.97	--	--
2483	2,989,119.02	675,900.67	135.38	2,989,119.13	675,900.75	0.14	133.92	1.46	--	--	--
2484	2,989,127.43	675,895.38	134.39	2,989,127.58	675,895.22	0.22	133.20	1.19	--	--	--
2485	2,989,140.20	675,890.27	132.28	2,989,140.41	675,890.49	0.30	131.23	1.05	--	--	--
2486	2,989,150.01	675,884.26	131.24	2,989,150.01	675,883.68	0.58	129.95	1.29	1.24	--	--
2487	2,989,158.34	675,878.31	130.26	2,989,158.57	675,877.84	0.53	129.26	1.00	0.95	--	--
2488	2,989,166.58	675,875.11	129.26	2,989,166.91	675,875.08	0.33	128.07	1.19	1.16	--	--
2489	2,989,177.27	675,869.42	127.94	2,989,177.01	675,869.44	0.26	126.90	1.04	--	--	--
2496	2,989,184.67	675,878.69	128.25	2,989,184.76	675,879.08	0.40	127.14	1.11	1.15	--	--
2497	2,989,173.76	675,883.87	129.84	2,989,174.09	675,883.75	0.35	128.80	1.04	0.99	--	--
2498	2,989,162.27	675,890.39	131.08	2,989,162.26	675,890.65	0.26	130.07	1.01	--	--	--
2499	2,989,152.37	675,893.82	132.28	2,989,152.36	675,893.84	0.02	130.87	1.41	--	--	--
2500	2,989,140.94	675,900.01	132.92	2,989,140.78	675,900.35	0.38	131.86	1.06	1.10	--	--
2501	2,989,131.53	675,905.66	134.14	2,989,130.98	675,905.93	0.61	133.08	1.06	1.16	--	--
2502	2,989,123.09	675,911.50	135.80	2,989,123.15	675,911.44	0.08	133.34	2.46	--	--	--
2503	2,989,111.77	675,916.69	136.60	2,989,111.73	675,916.88	0.19	133.66	2.94	--	--	--
2504	2,989,122.27	675,921.58	136.34	2,989,122.73	675,922.10	0.70	133.84	2.50	2.48	--	--
2505	2,989,131.18	675,917.36	134.80	2,989,130.69	675,916.68	0.84	132.80	2.00	2.04	--	--
2506	2,989,136.92	675,914.89	133.94	2,989,137.14	675,915.13	0.33	132.92	1.02	--	--	--
2507	2,989,142.44	675,911.43	133.64	2,989,142.27	675,911.20	0.29	132.42	1.22	--	--	--
2508	2,989,148.86	675,906.95	133.27	2,989,148.94	675,907.30	0.35	132.04	1.23	1.24	--	--
2509	2,989,156.82	675,901.05	132.61	2,989,156.50	675,900.77	0.42	130.71	1.90	1.89	--	--
2510	2,989,164.44	675,897.98	131.92	2,989,164.51	675,897.78	0.21	130.83	1.09	--	--	--
2511	2,989,179.39	675,894.33	131.14	2,989,179.48	675,894.38	0.11	129.67	1.47	--	--	--
2512	2,989,192.55	675,888.31	128.74	2,989,192.22	675,888.45	0.36	127.70	1.04	1.09	--	--
2517	2,989,189.55	675,892.69	129.55	2,989,189.70	675,892.35	0.37	128.50	1.05	0.99	--	--
2519	2,989,173.52	675,902.73	131.67	2,989,173.02	675,903.00	0.57	130.59	1.08	1.15	--	--
2520	2,989,165.12	675,907.56	132.86	2,989,165.28	675,907.19	0.40	131.63	1.23	1.18	--	--
2521	2,989,154.00	675,914.26	133.51	2,989,153.63	675,914.19	0.38	132.25	1.26	1.27	--	--
2522	2,989,146.94	675,918.88	133.87	2,989,146.68	675,918.59	0.39	132.49	1.38	1.38	--	--
2523	2,989,140.08	675,923.25	134.43	2,989,139.77	675,923.68	0.53	133.11	1.32	1.37	--	--
2524	2,989,132.11	675,927.97	135.26	2,989,131.73	675,928.05	0.38	133.84	1.42	1.51	--	--
2526	2,989,142.30	675,932.72	135.16	2,989,142.27	675,932.74	0.04	134.05	1.11	--	--	--
2529	2,989,158.15	675,918.18	133.51	2,989,158.40	675,918.37	0.32	132.18	1.33	--	--	--
2533	2,989,186.93	675,900.38	130.18	2,989,186.83	675,900.64	0.28	129.10	1.08	--	--	--
2535	2,989,200.38	675,890.74	128.07	2,989,200.62	675,890.61	0.27	126.91	1.16	--	--	--
2538	2,989,141.57	675,937.47	136.20	2,989,141.85	675,937.83	0.46	134.47	1.73	1.78	--	--
2539	2,989,152.11	675,938.10	135.05	2,989,152.39	675,937.93	0.33	134.04	1.01	0.98	--	--
2540	2,989,152.78	675,932.81	134.53	2,989,152.85	675,932.85	0.08	133.44	1.09	--	--	--
2541	2,989,153.83	675,925.77	133.99	2,989,153.91	675,925.94	0.19	132.91	1.08	--	--	--
2542	2,989,163.20	675,942.64	135.14	2,989,163.12	675,943.03	0.40	133.87	1.27	1.38	--	--
2543	2,989,166.37	675,935.11	134.23	2,989,166.22	675,934.85	0.30	132.92	1.31	--	--	--
2544	2,989,170.77	675,928.57	133.71	2,989,170.97	675,928.31	0.32	132.48	1.23	--	--	--
2545	2,989,172.79	675,922.08	133.42	2,989,173.02	675,922.10	0.23	132.36	1.06	--	--	--
2546	2,989,177.01	675,913.17	132.47	2,989,177.27	675,913.11	0.27	131.21	1.26	--	--	--
2547	2,989,181.31	675,904.95	131.32	2,989,181.31	675,904.61	0.34	130.20	1.12	1.05	--	--
2549	2,989,189.37	675,883.21	128.41	2,989,189.65	675,883.51	0.41	127.17	1.24	1.25	--	--
2554	2,989,196.64	675,896.47	128.98	2,989,196.56	675,896.20	0.28	127.82	1.16	--	--	--

Attachment D
Sinking Pond - Area 4 Survey Control Points

Sediment Construction Summary and Final Sediment Remedial Action Report
W.R. Grace Superfund Site
Acton-Concord, Massachusetts

	PRE-CONSTRUCTION			POST-EXCAVATION						POST-BACKFILL	
Point ID	Pre-Construction Northing	Pre-Construction Easting	Pre-Construction Elevation (feet)	Post-Excavation Northing	Post-Excavation Easting	Δ Horizontal Distance between Pre-Construction and Post-Excavation[1] (feet)	Post-Excavation Elevation (feet)	Δ Elevation between Post-Excavation and Pre-Construction Elevations (feet)	Δ Elevation between Post-Excavation Surface and Pre-Construction Elevation[1] (feet)	Post-Backfill Elevation (feet)[2]	Δ Elevation from Post-Dredge Location (feet)
2555	2,989,194.59	675,903.93	129.91	2,989,194.60	675,903.87	0.07	128.52	1.39	--	--	--
2556	2,989,191.85	675,912.67	130.76	2,989,192.24	675,912.83	0.42	129.75	1.01	1.00	--	--
2557	2,989,186.85	675,922.89	132.35	2,989,185.55	675,922.89	1.30	131.25	1.10	1.20	--	--
2558	2,989,183.34	675,929.97	133.32	2,989,183.24	675,929.97	0.10	132.14	1.18	--	--	--
2559	2,989,178.20	675,940.97	134.25	2,989,178.03	675,940.78	0.26	133.07	1.18	--	--	--
2560	2,989,173.82	675,946.40	134.93	2,989,173.87	675,946.67	0.28	133.79	1.14	--	--	--
2561	2,989,183.36	675,950.03	134.76	2,989,183.69	675,950.12	0.34	133.67	1.09	1.09	--	--
2562	2,989,187.03	675,944.02	133.89	2,989,187.31	675,943.99	0.28	132.81	1.08	--	--	--
2563	2,989,190.89	675,936.42	133.36	2,989,191.14	675,936.36	0.26	132.16	1.20	--	--	--
2564	2,989,194.90	675,929.59	132.29	2,989,195.08	675,929.64	0.19	131.22	1.07	--	--	--
2565	2,989,199.66	675,920.77	131.10	2,989,199.93	675,920.66	0.29	129.91	1.19	--	--	--
2566	2,989,204.74	675,913.99	130.00	2,989,204.86	675,914.23	0.27	128.84	1.16	--	--	--
2567	2,989,208.23	675,909.08	129.22	2,989,208.47	675,909.00	0.26	128.02	1.20	--	--	--
2568	2,989,213.85	675,900.93	127.50	2,989,214.19	675,900.82	0.36	126.18	1.32	1.27	--	--
2572	2,989,225.74	675,911.88	127.35	2,989,225.62	675,911.85	0.12	126.21	1.14	--	--	--
2573	2,989,220.69	675,917.54	128.88	2,989,220.64	675,917.78	0.25	127.75	1.13	--	--	--
2574	2,989,214.26	675,924.43	130.42	2,989,214.22	675,924.44	0.05	129.30	1.12	--	--	--
2575	2,989,208.62	675,932.58	131.85	2,989,208.37	675,932.62	0.26	130.68	1.17	--	--	--
2576	2,989,200.82	675,943.04	133.55	2,989,200.56	675,943.22	0.32	132.26	1.29	--	--	--
2577	2,989,196.83	675,949.95	134.28	2,989,196.76	675,949.70	0.26	133.05	1.23	--	--	--
2578	2,989,194.55	675,955.41	135.31	2,989,194.80	675,955.02	0.46	133.65	1.66	1.59	--	--
2579	2,989,214.48	675,957.38	137.14	2,989,214.91	675,957.53	0.45	133.51	3.63	3.54	--	--
2580	2,989,218.78	675,949.43	136.00	2,989,219.08	675,949.69	0.40	133.48	2.52	2.46	--	--
2581	2,989,222.52	675,941.36	134.21	2,989,222.79	675,941.12	0.36	131.70	2.51	2.43	--	--
2582	2,989,232.76	675,932.86	131.28	2,989,232.78	675,933.06	0.20	128.72	2.56	--	--	--
2583	2,989,240.02	675,926.52	129.61	2,989,240.33	675,926.44	0.32	128.12	1.49	--	--	--
2584	2,989,242.80	675,921.19	129.62	2,989,242.68	675,921.36	0.21	127.04	2.58	--	--	--
2585	2,989,243.62	675,912.60	127.99	2,989,243.50	675,912.89	0.31	126.89	1.10	--	--	--
2597	2,989,253.62	675,927.41	128.03	2,989,253.71	675,927.54	0.16	126.96	1.07	--	--	--
2598	2,989,243.84	675,937.08	131.94	2,989,243.73	675,937.40	0.34	129.72	2.22	2.24	--	--
2599	2,989,237.23	675,946.01	133.26	2,989,237.25	675,945.92	0.10	131.24	2.02	--	--	--
2600	2,989,233.26	675,952.74	133.61	2,989,233.35	675,953.03	0.30	132.43	1.18	--	--	--
2601	2,989,227.91	675,962.74	134.35	2,989,228.07	675,962.39	0.38	132.80	1.55	1.63	--	--
2602	2,989,224.03	675,968.26	135.32	2,989,223.78	675,968.54	0.38	133.53	1.79	1.94	--	--
2603	2,989,229.23	675,976.59	134.62	2,989,229.39	675,976.67	0.17	133.39	1.23	--	--	--
2604	2,989,234.75	675,970.51	133.75	2,989,234.73	675,970.71	0.20	132.43	1.32	--	--	--
2605	2,989,243.74	675,965.08	132.20	2,989,243.83	675,964.79	0.30	130.76	1.44	--	--	--
2606	2,989,248.64	675,958.64	130.90	2,989,248.86	675,958.86	0.31	129.73	1.17	--	--	--
2607	2,989,253.67	675,952.05	129.68	2,989,253.43	675,951.94	0.27	128.43	1.25	--	--	--
2611	2,989,259.76	675,952.74	128.62	2,989,259.71	675,952.53	0.22	127.13	1.49	--	--	--
2612	2,989,254.12	675,959.28	130.27	2,989,254.21	675,959.19	0.13	128.72	1.55	--	--	--
2613	2,989,249.02	675,964.46	131.43	2,989,248.82	675,964.68	0.30	129.93	1.50	--	--	--
2614	2,989,244.72	675,970.65	132.41	2,989,244.81	675,970.71	0.10	131.07	1.34	--	--	--
2615	2,989,238.07	675,977.59	133.84	2,989,237.81	675,977.64	0.26	132.07	1.77	--	--	--
2616	2,989,235.67	675,981.18	134.94	2,989,235.56	675,980.91	0.29	133.99	0.95	--	--	--
2617	2,989,245.61	675,986.97	133.78	2,989,245.71	675,986.81	0.19	132.34	1.44	--	--	--
2618	2,989,249.20	675,982.78	132.76	2,989,249.53	675,982.74	0.33	131.59	1.17	--	--	--
2619	2,989,255.98	675,975.63	132.13	2,989,255.99	675,975.78	0.15	131.02	1.11	--	--	--
2620	2,989,260.70	675,972.22	131.03	2,989,260.82	675,972.35	0.18	129.95	1.08	--	--	--
2621	2,989,266.81	675,966.40	129.13	2,989,266.81	675,966.43	0.03	128.03	1.10	--	--	--
2626	2,989,277.59	675,971.40	127.58	2,989,277.69	675,971.17	0.25	126.52	1.06	--	--	--
2627	2,989,269.48	675,979.13	130.62	2,989,269.60	675,979.12	0.12	129.00	1.62	--	--	--
2628	2,989,266.13	675,982.96	131.73	2,989,266.29	675,983.02	0.17	130.14	1.59	--	--	--
2629	2,989,258.39	675,989.83	133.34	2,989,258.56	675,989.78	0.18	131.95	1.39	--	--	--

Attachment D
Sinking Pond - Area 4 Survey Control Points

Sediment Construction Summary and Final Sediment Remedial Action Report
W.R. Grace Superfund Site
Acton-Concord, Massachusetts

	PRE-CONSTRUCTION			POST-EXCAVATION						POST-BACKFILL	
Point ID	Pre-Construction Northing	Pre-Construction Easting	Pre-Construction Elevation (feet)	Post-Excavation Northing	Post-Excavation Easting	Δ Horizontal Distance between Pre-Construction and Post-Excavation[1] (feet)	Post-Excavation Elevation (feet)	Δ Elevation between Post-Excavation and Pre-Construction Elevations (feet)	Δ Elevation between Post-Excavation Surface and Pre-Construction Elevation[1] (feet)	Post-Backfill Elevation (feet)[2]	Δ Elevation from Post-Dredge Location (feet)
2630	2,989,252.72	675,995.02	133.44	2,989,252.85	675,994.83	0.23	132.20	1.24	--	--	--
2631	2,989,255.81	676,003.71	134.42	2,989,255.79	676,003.77	0.06	133.36	1.06	--	--	--
2632	2,989,262.50	675,996.84	133.39	2,989,262.69	675,996.72	0.23	132.34	1.05	--	--	--
2633	2,989,267.87	675,993.29	132.64	2,989,267.79	675,993.32	0.08	131.54	1.10	--	--	--
2634	2,989,274.96	675,988.04	130.80	2,989,275.03	675,988.11	0.10	129.65	1.15	--	--	--
2635	2,989,281.77	675,979.16	128.63	2,989,281.57	675,979.18	0.20	127.43	1.20	--	--	--
2641	2,989,287.99	675,993.33	129.16	2,989,288.04	675,993.38	0.07	127.96	1.20	--	--	--
2642	2,989,280.92	675,997.80	130.92	2,989,281.07	675,997.95	0.21	129.46	1.46	--	--	--
2643	2,989,274.12	676,004.00	132.45	2,989,274.16	676,003.92	0.09	131.24	1.21	--	--	--
2644	2,989,265.52	676,009.60	134.28	2,989,265.63	676,009.48	0.16	133.11	1.17	--	--	--
2645	2,989,261.91	676,013.37	135.05	2,989,261.83	676,013.59	0.23	133.99	1.06	--	--	--
2646	2,989,267.98	676,021.87	134.93	2,989,267.70	676,021.83	0.28	133.52	1.41	--	--	--
2647	2,989,277.21	676,015.02	133.56	2,989,277.02	676,014.96	0.20	132.00	1.56	--	--	--
2648	2,989,283.65	676,008.91	131.81	2,989,283.77	676,009.06	0.19	130.67	1.14	--	--	--
2649	2,989,288.74	676,003.74	130.24	2,989,288.50	676,003.54	0.31	128.65	1.59	--	--	--
2650	2,989,293.88	675,998.89	128.55	2,989,293.93	675,998.97	0.09	127.54	1.01	--	--	--
2656	2,989,295.24	676,007.11	129.04	2,989,295.30	676,006.98	0.15	127.74	1.30	--	--	--
2657	2,989,288.03	676,014.89	131.72	2,989,288.09	676,014.88	0.06	130.17	1.55	--	--	--
2658	2,989,278.22	676,021.99	133.79	2,989,278.29	676,022.12	0.15	132.15	1.64	--	--	--
2659	2,989,272.65	676,029.41	134.92	2,989,272.80	676,029.43	0.15	133.73	1.19	--	--	--
2660	2,989,275.00	676,041.20	135.99	2,989,274.94	676,041.16	0.07	134.50	1.49	--	--	--
2661	2,989,281.64	676,033.63	134.14	2,989,281.70	676,033.53	0.12	132.75	1.39	--	--	--
2662	2,989,287.78	676,028.66	133.53	2,989,287.81	676,028.59	0.08	131.94	1.59	--	--	--
2663	2,989,293.94	676,020.24	131.06	2,989,293.76	676,020.11	0.23	129.80	1.26	--	--	--
2664	2,989,303.06	676,010.65	128.23	2,989,303.25	676,010.57	0.20	127.00	1.23	--	--	--
2669	2,989,311.68	676,018.01	127.56	2,989,311.85	676,018.32	0.36	126.52	1.04	1.06	--	--
2670	2,989,306.97	676,023.65	129.14	2,989,307.13	676,023.69	0.16	127.89	1.25	--	--	--
2671	2,989,298.13	676,032.28	131.90	2,989,297.82	676,032.17	0.33	130.51	1.39	--	--	--
2672	2,989,292.75	676,038.23	133.16	2,989,292.81	676,038.00	0.23	132.16	1.00	--	--	--
2673	2,989,284.54	676,045.95	134.55	2,989,284.75	676,045.90	0.22	133.40	1.15	--	--	--
2674	2,989,280.87	676,048.90	135.56	2,989,281.04	676,048.92	0.17	134.41	1.15	--	--	--
2675	2,989,287.32	676,057.70	136.48	2,989,287.22	676,057.73	0.10	135.19	1.29	--	--	--
2676	2,989,292.39	676,052.89	134.57	2,989,292.32	676,053.07	0.19	132.86	1.71	--	--	--
2677	2,989,297.48	676,047.79	133.42	2,989,297.56	676,047.94	0.17	132.39	1.03	--	--	--
2678	2,989,302.67	676,040.89	131.68	2,989,302.70	676,040.78	0.11	130.65	1.03	--	--	--
2679	2,989,308.71	676,033.08	130.15	2,989,308.69	676,032.98	0.10	129.13	1.02	--	--	--
2680	2,989,316.88	676,029.77	128.31	2,989,317.04	676,029.75	0.16	127.30	1.01	--	--	--
2687	2,989,326.37	676,045.10	129.03	2,989,326.19	676,045.25	0.23	127.79	1.24	--	--	--
2688	2,989,319.17	676,050.75	130.41	2,989,319.43	676,050.59	0.31	129.01	1.40	--	--	--
2689	2,989,310.63	676,060.43	132.71	2,989,310.91	676,060.49	0.29	130.95	1.76	--	--	--
2690	2,989,305.34	676,067.74	134.18	2,989,305.31	676,067.66	0.09	132.81	1.37	--	--	--
2691	2,989,302.05	676,070.59	136.43	2,989,302.08	676,070.51	0.08	135.03	1.40	--	--	--
2693	2,989,317.54	676,068.40	133.06	2,989,317.28	676,068.31	0.27	131.75	1.31	--	--	--
2694	2,989,324.62	676,061.39	131.07	2,989,324.76	676,061.44	0.15	129.59	1.48	--	--	--
2695	2,989,331.08	676,053.52	129.13	2,989,331.43	676,053.69	0.39	127.93	1.20	1.19	--	--
2700	2,989,338.54	676,057.56	128.95	2,989,338.37	676,057.54	0.17	127.69	1.26	--	--	--
2701	2,989,331.78	676,064.67	130.43	2,989,331.85	676,064.56	0.13	128.83	1.60	--	--	--
2702	2,989,325.58	676,072.35	132.27	2,989,325.59	676,072.31	0.05	131.15	1.12	--	--	--
2704	2,989,325.84	676,087.72	135.08	2,989,326.06	676,087.84	0.25	134.05	1.03	--	--	--
2705	2,989,329.21	676,083.90	134.15	2,989,329.13	676,084.01	0.14	133.06	1.09	--	--	--
2706	2,989,333.76	676,077.59	132.28	2,989,333.81	676,077.71	0.13	130.93	1.35	--	--	--
2707	2,989,340.39	676,068.21	129.97	2,989,340.54	676,068.24	0.15	128.95	1.02	--	--	--
2711	2,989,356.09	676,061.93	127.72	2,989,356.08	676,061.69	0.24	126.70	1.02	--	--	--
2712	2,989,352.81	676,069.12	129.92	2,989,352.99	676,069.43	0.36	128.47	1.45	1.48	--	--

Attachment D
Sinking Pond - Area 4 Survey Control Points

Sediment Construction Summary and Final Sediment Remedial Action Report
W.R. Grace Superfund Site
Acton-Concord, Massachusetts

	PRE-CONSTRUCTION			POST-EXCAVATION						POST-BACKFILL	
Point ID	Pre-Construction Northing	Pre-Construction Easting	Pre-Construction Elevation (feet)	Post-Excavation Northing	Post-Excavation Easting	Δ Horizontal Distance between Pre-Construction and Post-Excavation[1] (feet)	Post-Excavation Elevation (feet)	Δ Elevation between Post-Excavation and Pre-Construction Elevations (feet)	Δ Elevation between Post-Excavation Surface and Pre-Construction Elevation[1] (feet)	Post-Backfill Elevation (feet)[2]	Δ Elevation from Post-Dredge Location (feet)
2713	2,989,348.85	676,075.81	130.97	2,989,349.14	676,075.89	0.30	129.97	1.00	--	--	--
2714	2,989,344.14	676,084.16	132.45	2,989,344.21	676,084.23	0.10	131.43	1.02	--	--	--
2715	2,989,338.39	676,088.46	133.85	2,989,338.11	676,088.52	0.28	132.56	1.29	--	--	--
2716	2,989,345.47	676,097.74	135.33	2,989,345.70	676,097.69	0.23	134.06	1.27	--	--	--
2717	2,989,352.53	676,092.12	134.28	2,989,352.24	676,092.06	0.30	132.31	1.97	--	--	--
2718	2,989,354.69	676,086.74	133.13	2,989,354.56	676,086.49	0.28	131.25	1.88	--	--	--
2719	2,989,358.56	676,079.68	131.19	2,989,358.86	676,079.46	0.37	129.88	1.31	1.28	--	--
2720	2,989,363.84	676,071.73	129.95	2,989,363.65	676,071.86	0.23	128.28	1.67	--	--	--
2721	2,989,367.66	676,062.53	127.64	2,989,367.49	676,062.33	0.26	126.56	1.08	--	--	--
2724	2,989,394.29	676,063.60	127.55	2,989,394.29	676,063.58	0.02	126.39	1.16	--	--	--
2725	2,989,388.43	676,069.11	128.41	2,989,388.40	676,068.93	0.18	127.29	1.12	--	--	--
2726	2,989,382.62	676,075.36	129.63	2,989,382.79	676,075.75	0.42	127.73	1.90	1.96	--	--
2727	2,989,377.05	676,081.67	130.53	2,989,377.04	676,081.43	0.24	129.03	1.50	--	--	--
2728	2,989,369.77	676,087.98	132.28	2,989,370.00	676,087.87	0.26	130.87	1.41	--	--	--
2729	2,989,365.48	676,091.74	133.81	2,989,365.50	676,091.55	0.19	132.12	1.69	--	--	--
2730	2,989,360.02	676,096.46	135.01	2,989,360.05	676,096.54	0.08	133.06	1.95	--	--	--
2731	2,989,370.78	676,100.11	134.90	2,989,370.54	676,100.15	0.25	133.56	1.34	--	--	--
2732	2,989,375.37	676,093.92	133.67	2,989,375.58	676,093.99	0.22	132.11	1.56	--	--	--
2733	2,989,383.68	676,084.16	130.93	2,989,384.01	676,084.30	0.36	129.51	1.42	1.46	--	--
2734	2,989,390.28	676,078.41	130.34	2,989,390.39	676,078.25	0.19	128.46	1.88	--	--	--
2735	2,989,395.89	676,073.18	129.21	2,989,395.94	676,072.91	0.27	127.87	1.34	--	--	--
2736	2,989,402.66	676,065.59	127.92	2,989,402.46	676,065.57	0.20	126.37	1.55	--	--	--
2737	2,989,384.50	676,100.88	134.36	2,989,384.25	676,100.85	0.25	132.71	1.65	--	--	--
2738	2,989,386.55	676,096.26	134.03	2,989,386.34	676,096.22	0.21	131.85	2.18	--	--	--
2739	2,989,391.41	676,093.91	133.17	2,989,391.32	676,093.86	0.10	131.66	1.51	--	--	--
2740	2,989,397.46	676,088.53	132.00	2,989,397.60	676,088.85	0.35	130.88	1.12	1.21	--	--
2741	2,989,398.49	676,098.11	134.37	2,989,398.49	676,097.98	0.13	133.08	1.29	--	--	--
2743	2,989,391.77	676,104.17	136.45	2,989,392.10	676,104.03	0.36	134.48	1.97	1.95	--	--
2744	2,989,405.44	676,099.23	135.43	2,989,405.20	676,099.19	0.25	133.78	1.65	--	--	--
2745	2,989,404.85	676,092.60	133.31	2,989,404.67	676,092.31	0.34	131.69	1.62	1.54	--	--
2746	2,989,403.34	676,083.10	131.14	2,989,403.17	676,083.10	0.17	129.32	1.82	--	--	--
2747	2,989,401.94	676,076.10	129.72	2,989,401.94	676,076.10	0.00	128.60	1.12	--	--	--
2748	2,989,400.98	676,068.09	128.15	2,989,401.03	676,068.04	0.07	127.01	1.14	--	--	--
2749	2,989,400.10	676,061.47	129.15	2,989,399.87	676,061.45	0.23	126.76	2.39	--	--	--
4067	2,989,399.25	676,132.65	144.51	2,989,399.24	676,132.64	0.02	143.48	1.03	--	144.05	0.57
4068	2,989,390.63	676,132.63	144.50	2,989,390.62	676,132.63	0.01	143.44	1.06	--	143.95	0.51
4069	2,989,379.92	676,132.08	144.50	2,989,379.92	676,132.09	0.01	142.50	2.00	--	143.03	0.53
4070	2,989,338.72	676,120.17	144.49	2,989,338.71	676,120.16	0.01	143.37	1.12	--	143.96	0.59
4071	2,989,328.82	676,114.76	144.50	2,989,328.82	676,114.77	0.01	143.49	1.01	--	144.02	0.53
4072	2,989,321.96	676,109.86	144.50	2,989,321.95	676,109.85	0.01	143.29	1.21	--	143.78	0.49
4073	2,989,313.42	676,104.37	144.50	2,989,313.42	676,104.36	0.01	142.93	1.57	--	143.48	0.55
4074	2,989,305.86	676,097.05	144.50	2,989,305.87	676,097.04	0.02	143.16	1.34	--	143.64	0.48
4075	2,989,281.09	676,078.29	144.50	2,989,281.10	676,078.29	0.01	143.39	1.11	--	143.88	0.49
4076	2,989,273.53	676,072.01	144.50	2,989,273.55	676,072.00	0.02	143.46	1.04	--	144.00	0.54
4077	2,989,266.02	676,066.36	144.51	2,989,266.01	676,066.35	0.02	143.45	1.06	--	144.04	0.59
4078	2,989,258.06	676,059.37	144.50	2,989,258.08	676,059.37	0.02	143.47	1.03	--	144.06	0.59
4079	2,989,251.72	676,050.27	144.50	2,989,251.70	676,050.27	0.02	143.32	1.18	--	143.82	0.50
4080	2,989,243.36	676,028.40	144.50	2,989,243.34	676,028.40	0.02	143.41	1.09	--	143.97	0.56
4081	2,989,239.89	676,020.39	144.49	2,989,239.90	676,020.40	0.01	143.21	1.28	--	143.74	0.53
4082	2,989,233.67	676,011.27	144.49	2,989,233.66	676,011.30	0.03	143.39	1.10	--	143.93	0.54
4083	2,989,227.93	676,004.45	144.50	2,989,227.94	676,004.43	0.02	143.18	1.32	--	143.70	0.52
4084	2,989,221.06	675,996.85	144.51	2,989,221.06	675,996.83	0.02	143.48	1.03	--	144.02	0.54
4085	2,989,214.32	675,987.76	144.47	2,989,214.32	675,987.78	0.02	142.74	1.73	--	143.16	0.42
4086	2,989,205.83	675,990.82	144.49	2,989,205.83	675,990.81	0.01	142.39	2.10	--	142.97	0.58

Attachment D
Sinking Pond - Area 4 Survey Control Points

Sediment Construction Summary and Final Sediment Remedial Action Report
W.R. Grace Superfund Site
Acton-Concord, Massachusetts

	PRE-CONSTRUCTION			POST-EXCAVATION						POST-BACKFILL	
Point ID	Pre-Construction Northing	Pre-Construction Easting	Pre-Construction Elevation (feet)	Post-Excavation Northing	Post-Excavation Easting	Δ Horizontal Distance between Pre-Construction and Post-Excavation[1] (feet)	Post-Excavation Elevation (feet)	Δ Elevation between Post-Excavation and Pre-Construction Elevations (feet)	Δ Elevation between Post-Excavation Surface and Pre-Construction Elevation[1] (feet)	Post-Backfill Elevation (feet)[2]	Δ Elevation from Post-Dredge Location (feet)
4087	2,989,195.44	675,996.37	144.52	2,989,195.41	675,996.37	0.03	142.87	1.65	--	143.40	0.53
4088	2,989,186.13	676,000.54	144.51	2,989,186.15	676,000.53	0.02	142.69	1.82	--	143.28	0.59
4089	2,989,179.44	675,987.71	144.50	2,989,179.44	675,987.69	0.02	142.95	1.55	--	143.48	0.53
4090	2,989,181.18	675,978.74	144.44	2,989,181.18	675,978.78	0.04	142.31	2.13	--	142.87	0.56
4091	2,989,171.57	675,972.60	144.50	2,989,171.56	675,972.61	0.01	143.16	1.34	--	143.70	0.54
4092	2,989,163.39	675,969.48	144.50	2,989,163.38	675,969.46	0.02	143.38	1.12	--	143.95	0.57
4093	2,989,151.35	675,965.39	144.49	2,989,151.35	675,965.40	0.01	143.42	1.07	--	143.99	0.57
4094	2,989,124.41	675,967.37	144.46	2,989,124.43	675,967.37	0.02	143.44	1.02	--	143.97	0.53
4095	2,989,114.89	675,974.03	144.50	2,989,114.92	675,974.03	0.03	143.30	1.20	--	143.89	0.59
4096	2,989,104.75	675,976.00	144.51	2,989,104.73	675,975.99	0.02	143.31	1.20	--	143.84	0.53
4097	2,989,096.96	675,972.03	144.51	2,989,096.97	675,972.03	0.01	143.48	1.03	--	143.92	0.44
4098	2,989,092.36	675,962.18	144.50	2,989,092.37	675,962.19	0.01	142.96	1.54	--	143.50	0.54
4099	2,989,087.46	675,952.88	144.50	2,989,087.44	675,952.89	0.02	143.38	1.12	--	143.86	0.48
4100	2,989,081.46	675,944.32	144.52	2,989,081.45	675,944.32	0.01	143.19	1.33	--	143.75	0.56
4101	2,989,077.34	675,935.30	144.51	2,989,077.37	675,935.30	0.03	143.29	1.22	--	143.83	0.54
4102	2,989,072.49	675,915.79	144.51	2,989,072.48	675,915.80	0.01	142.90	1.61	--	143.40	0.50
4103	2,989,068.73	675,895.50	144.53	2,989,068.74	675,895.48	0.02	143.15	1.38	--	143.71	0.56
4104	2,989,065.96	675,872.57	144.50	2,989,065.94	675,872.57	0.02	143.16	1.34	--	143.74	0.58
4105	2,989,065.01	675,861.21	144.50	2,989,065.03	675,861.23	0.03	142.90	1.60	--	143.42	0.52
4106	2,989,064.39	675,850.91	144.51	2,989,064.37	675,850.92	0.02	142.48	2.03	--	142.91	0.43
4107	2,989,064.24	675,838.71	144.49	2,989,064.22	675,838.72	0.02	142.42	2.07	--	143.00	0.58
4108	2,989,063.62	675,828.78	144.61	2,989,063.59	675,828.78	0.03	143.56	1.05	--	144.11	0.55
4168	2,989,401.39	676,059.17	127.83	2,989,401.07	676,059.19	0.32	126.49	1.34	--	--	--
4169	2,989,387.69	676,066.72	128.00	2,989,387.78	676,066.86	0.16	126.97	1.03	--	--	--
4170	2,989,348.16	676,058.76	128.00	2,989,348.11	676,058.61	0.16	126.73	1.27	--	--	--
4171	2,989,341.71	676,053.00	127.99	2,989,341.70	676,052.91	0.09	126.77	1.22	--	--	--
4172	2,989,336.22	676,049.25	128.01	2,989,336.13	676,049.22	0.10	126.93	1.08	--	--	--
4173	2,989,331.24	676,042.99	127.99	2,989,331.19	676,042.88	0.12	126.84	1.15	--	--	--
4174	2,989,318.01	676,029.06	128.00	2,989,318.00	676,028.85	0.21	126.81	1.19	--	--	--
4175	2,989,305.08	676,008.34	127.99	2,989,305.06	676,008.45	0.12	126.73	1.26	--	--	--
4176	2,989,296.26	675,997.98	128.00	2,989,296.03	675,998.05	0.24	126.72	1.28	--	--	--
4177	2,989,292.43	675,990.81	128.00	2,989,292.34	675,990.95	0.17	126.95	1.05	--	--	--
4178	2,989,284.12	675,977.87	127.99	2,989,284.16	675,977.80	0.08	126.95	1.04	--	--	--
4179	2,989,270.87	675,962.88	128.00	2,989,270.86	675,962.48	0.40	126.83	1.17	1.12	--	--
4180	2,989,261.24	675,951.62	128.00	2,989,261.07	675,951.62	0.17	126.80	1.20	--	--	--
4181	2,989,194.62	675,884.52	128.01	2,989,194.63	675,884.70	0.19	126.90	1.11	--	--	--
4182	2,989,187.31	675,877.84	128.00	2,989,187.83	675,877.61	0.57	126.77	1.23	1.17	--	--
4183	2,989,167.82	675,865.18	128.02	2,989,168.18	675,865.06	0.38	126.37	1.65	1.59	--	--
4184	2,989,154.31	675,851.42	128.01	2,989,154.11	675,851.21	0.29	126.96	1.05	--	--	--
4185	2,989,139.78	675,835.29	127.98	2,989,140.38	675,835.31	0.60	126.96	1.02	0.89	--	--
4186	2,989,108.12	675,799.20	128.00	2,989,108.43	675,798.94	0.40	126.97	1.03	0.92	--	--
4187	2,989,102.19	675,789.41	128.00	2,989,102.77	675,788.75	0.88	126.91	1.09	0.82	--	--
4188	2,989,098.93	675,784.41	128.00	2,989,099.42	675,784.31	0.50	126.92	1.08	0.94	--	--

Note:
1. Values shaded in green represent locations below the water line where the horizontal distance between the pre-construction and post-construction survey points exceeded 0.33 feet (discussed in RFI 006, Attachment L). For these points, the change from pre-construction elevation was derived from a CADD surface elevation and reported in the final column of the post-excavation data.

2. Consistent with the 100% design, topsoil was placed in excavated areas between the water line and the historical high water elevation (144.5 ft). Survey control points located below the water line were not backfilled and no post-backfill elevation or thickness is provided.

Attachment D
Sinking Pond - Area 5 Survey Control Points

Sediment Construction Summary and Final Sediment Remedial Action Report
W.R. Grace Superfund Site
Acton-Concord, Massachusetts

	PRE-CONSTRUCTION			POST-EXCAVATION						POST-BACKFILL	
Point ID[1]	Pre-Construction Northing	Pre-Construction Easting	Pre-Construction Elevation (feet)	Post-Excavation Northing	Post-Excavation Easting	Δ Horizontal Distance between Pre-Construction and Post-Excavation[2] (feet)	Post-Excavation Elevation (feet)	Δ Elevation between Post-Excavation and Pre-Construction Elevations (feet)	Δ Elevation between Post-Excavation Surface and Pre-Construction Elevation[2] (feet)	Post-Backfill Elevation (feet)[3]	Δ Elevation from Post-Dredge Location (feet)
49	2,989,579.38	675,786.20	139.30	2,989,579.39	675,786.14	0.06	135.59	3.71	--	--	--
368	2,989,625.31	675,833.55	139.36	2,989,625.16	675,833.52	0.15	135.52	3.84	--	137.07	1.55
429	2,989,575.92	675,736.70	144.32	2,989,575.90	675,736.70	0.02	141.48	2.84	--	142.01	0.53
430	2,989,568.56	675,744.37	141.12	2,989,568.55	675,744.37	0.01	139.65	1.47	--	140.19	0.54
431	2,989,561.73	675,751.88	139.06	2,989,561.72	675,751.86	0.02	137.10	1.96	--	137.62	0.52
432	2,989,553.42	675,760.21	137.72	2,989,553.41	675,760.20	0.02	136.25	1.47	--	--	--
433	2,989,553.21	675,775.21	137.47	2,989,553.21	675,775.19	0.02	136.03	1.44	--	--	--
434	2,989,555.38	675,773.20	138.28	2,989,555.40	675,773.21	0.02	136.89	1.39	--	--	--
435	2,989,562.35	675,765.72	139.26	2,989,562.37	675,765.71	0.02	138.22	1.04	--	--	--
436	2,989,568.62	675,759.18	139.61	2,989,568.63	675,759.17	0.01	138.46	1.15	--	--	--
437	2,989,575.65	675,751.50	140.06	2,989,575.67	675,751.51	0.02	137.97	2.09	--	138.54	0.57
438	2,989,582.97	675,743.83	142.59	2,989,582.99	675,743.84	0.02	139.30	3.29	--	139.87	0.57
439	2,989,589.26	675,736.84	143.83	2,989,589.27	675,736.84	0.01	141.00	2.83	--	--	--
447	2,989,599.87	675,738.40	140.96	2,989,599.87	675,738.41	0.01	138.87	2.09	--	--	--
448	2,989,595.17	675,746.30	140.36	2,989,595.16	675,746.28	0.02	137.58	2.78	--	--	--
449	2,989,586.65	675,750.40	140.27	2,989,586.63	675,750.41	0.02	137.73	2.54	--	--	--
450	2,989,558.60	675,786.94	137.43	2,989,558.73	675,786.77	0.22	133.96	3.47	--	--	--
451	2,989,561.07	675,784.75	137.86	2,989,561.07	675,784.76	0.01	136.16	1.70	--	--	--
452	2,989,564.65	675,782.22	138.83	2,989,564.65	675,782.21	0.01	137.48	1.35	--	--	--
453	2,989,568.92	675,770.28	139.50	2,989,568.92	675,770.28	0.00	138.26	1.24	--	--	--
454	2,989,574.45	675,761.84	139.81	2,989,574.46	675,761.82	0.02	138.11	1.70	--	--	--
455	2,989,579.50	675,758.28	139.96	2,989,579.49	675,758.30	0.02	137.45	2.51	--	--	--
456	2,989,590.97	675,757.01	139.44	2,989,590.99	675,757.01	0.02	136.77	2.67	--	--	--
457	2,989,596.85	675,749.22	139.95	2,989,596.84	675,749.22	0.01	137.10	2.85	--	--	--
458	2,989,602.40	675,750.73	139.52	2,989,602.40	675,750.71	0.02	137.40	2.12	--	--	--
459	2,989,606.34	675,744.97	139.98	2,989,606.34	675,744.98	0.01	137.92	2.06	--	--	--
464	2,989,608.48	675,746.37	139.07	2,989,608.47	675,746.40	0.03	137.06	2.01	--	--	--
465	2,989,603.26	675,752.48	138.71	2,989,603.27	675,752.49	0.02	136.70	2.01	--	--	--
466	2,989,601.82	675,752.85	137.85	2,989,601.83	675,752.84	0.01	135.73	2.12	--	--	--
467	2,989,597.94	675,751.59	138.01	2,989,597.94	675,751.60	0.01	135.97	2.04	--	--	--
468	2,989,592.20	675,758.47	138.21	2,989,592.21	675,758.49	0.02	136.18	2.03	--	--	--
469	2,989,581.40	675,762.05	137.64	2,989,581.39	675,762.05	0.01	136.63	1.01	--	--	--
470	2,989,577.61	675,766.07	137.93	2,989,577.61	675,766.06	0.01	136.89	1.04	--	--	--
471	2,989,573.51	675,772.81	137.62	2,989,573.52	675,772.83	0.02	136.60	1.02	--	--	--
472	2,989,569.87	675,785.92	137.58	2,989,569.88	675,785.91	0.01	136.57	1.01	--	--	--
473	2,989,565.64	675,792.11	137.60	2,989,565.43	675,792.07	0.21	134.19	3.41	--	--	--
474	2,989,562.79	675,792.04	137.46	2,989,562.96	675,791.94	0.19	134.30	3.16	--	--	--
475	2,989,571.82	675,803.33	137.55	2,989,572.31	675,803.15	0.52	133.51	4.04	4.19	--	--
476	2,989,573.49	675,793.63	137.69	2,989,573.30	675,793.91	0.34	135.22	2.47	2.46	--	--
477	2,989,577.05	675,784.17	137.71	2,989,577.05	675,784.26	0.09	135.45	2.26	--	--	--
478	2,989,582.67	675,780.11	137.71	2,989,582.63	675,780.12	0.04	135.63	2.08	--	--	--
479	2,989,580.89	675,771.30	137.50	2,989,580.89	675,771.32	0.02	136.48	1.02	--	--	--
480	2,989,585.25	675,764.50	137.60	2,989,585.27	675,764.50	0.02	136.52	1.08	--	--	--
481	2,989,594.64	675,760.94	138.11	2,989,594.64	675,760.94	0.00	136.07	2.04	--	--	--
482	2,989,603.26	675,755.62	137.11	2,989,603.26	675,755.62	0.00	134.99	2.12	--	--	--
483	2,989,604.13	675,755.13	139.03	2,989,604.13	675,755.15	0.02	137.02	2.01	--	--	--
484	2,989,609.85	675,748.05	139.15	2,989,609.85	675,748.07	0.02	137.06	2.09	--	--	--
490	2,989,604.33	675,756.61	139.92	2,989,604.34	675,756.63	0.02	137.73	2.19	--	--	--
491	2,989,595.82	675,763.89	139.60	2,989,595.83	675,763.89	0.01	137.27	2.33	--	--	--
492	2,989,587.24	675,768.82	139.24	2,989,587.23	675,768.84	0.03	136.24	3.00	--	--	--
493	2,989,592.18	675,774.45	139.59	2,989,592.09	675,774.43	0.09	136.30	3.29	--	--	--
494	2,989,584.33	675,783.94	139.49	2,989,584.45	675,784.01	0.14	136.19	3.30	--	--	--
496	2,989,576.95	675,794.71	138.91	2,989,577.22	675,794.58	0.30	135.76	3.15	--	--	--
497	2,989,574.37	675,802.13	138.38	2,989,574.36	675,802.14	0.02	134.21	4.17	--	--	--

Attachment D
Sinking Pond - Area 5 Survey Control Points

Sediment Construction Summary and Final Sediment Remedial Action Report
W.R. Grace Superfund Site
Acton-Concord, Massachusetts

	PRE-CONSTRUCTION			POST-EXCAVATION						POST-BACKFILL	
Point ID[1]	Pre-Construction Northing	Pre-Construction Easting	Pre-Construction Elevation (feet)	Post-Excavation Northing	Post-Excavation Easting	Δ Horizontal Distance between Pre-Construction and Post-Excavation[2] (feet)	Post-Excavation Elevation (feet)	Δ Elevation between Post-Excavation and Pre-Construction Elevations (feet)	Δ Elevation between Post-Excavation Surface and Pre-Construction Elevation[2] (feet)	Post-Backfill Elevation (feet)[3]	Δ Elevation from Post-Dredge Location (feet)
498	2,989,606.70	675,778.56	140.32	2,989,606.71	675,778.61	0.05	137.11	3.21	--	138.80	1.69
499	2,989,605.67	675,769.51	140.49	2,989,605.88	675,769.61	0.23	137.30	3.19	--	--	--
500	2,989,609.24	675,759.20	140.69	2,989,609.24	675,759.19	0.01	138.60	2.09	--	--	--
511	2,989,619.01	675,777.89	143.78	2,989,618.99	675,777.90	0.03	142.54	1.24	--	143.08	0.54
512	2,989,612.61	675,785.27	140.39	2,989,612.68	675,785.16	0.13	138.16	2.23	--	139.77	1.61
513	2,989,605.28	675,792.91	139.35	2,989,605.32	675,792.87	0.06	136.02	3.33	--	--	--
514	2,989,598.14	675,800.36	138.92	2,989,598.19	675,800.35	0.05	136.07	2.85	--	--	--
515	2,989,591.84	675,807.93	138.51	2,989,591.87	675,807.89	0.05	135.34	3.17	--	--	--
516	2,989,585.23	675,814.49	137.47	2,989,585.48	675,814.35	0.29	136.00	1.47	--	--	--
517	2,989,576.32	675,808.74	137.65	2,989,576.49	675,808.42	0.36	135.96	1.69	1.73	--	--
518	2,989,584.08	675,800.75	138.78	2,989,584.10	675,800.76	0.02	135.68	3.10	--	--	--
519	2,989,598.03	675,786.58	139.55	2,989,598.06	675,786.61	0.04	135.67	3.88	--	--	--
533	2,989,621.29	675,790.48	142.16	2,989,621.22	675,790.35	0.15	138.93	3.23	--	141.32	2.39
534	2,989,618.28	675,794.08	140.02	2,989,618.37	675,794.14	0.11	137.34	2.68	--	139.43	2.09
535	2,989,613.00	675,800.06	139.10	2,989,613.07	675,800.01	0.09	136.60	2.50	--	--	--
536	2,989,605.60	675,807.15	138.55	2,989,605.58	675,807.25	0.10	136.00	2.55	--	--	--
537	2,989,598.46	675,814.80	138.42	2,989,598.29	675,814.85	0.18	134.26	4.16	--	--	--
538	2,989,596.83	675,816.76	137.49	2,989,596.93	675,816.40	0.37	133.46	4.03	4.15	--	--
547	2,989,641.55	675,813.00	143.82	2,989,641.54	675,813.00	0.01	142.81	1.01	--	143.32	0.51
548	2,989,634.46	675,820.76	139.56	2,989,634.46	675,820.77	0.01	138.48	1.08	--	138.95	0.47
549	2,989,628.59	675,826.71	137.62	2,989,628.62	675,826.72	0.03	136.40	1.22	--	136.96	0.56
550	2,989,619.40	675,850.62	137.39	2,989,619.37	675,850.62	0.03	134.60	2.79	--	--	--
551	2,989,627.13	675,841.67	138.85	2,989,627.12	675,841.68	0.01	137.12	1.73	--	137.62	0.50
552	2,989,634.83	675,834.86	140.50	2,989,634.83	675,834.85	0.01	138.96	1.54	--	139.49	0.53
553	2,989,636.97	675,830.85	139.98	2,989,636.94	675,830.85	0.03	138.96	1.02	--	139.56	0.60
559	2,989,623.47	675,840.97	137.56	2,989,623.49	675,840.95	0.03	135.29	2.27	--	136.98	1.69
560	2,989,615.39	675,856.79	137.53	2,989,615.52	675,857.03	0.27	133.44	4.09	--	--	--
561	2,989,615.12	675,860.62	137.51	2,989,615.21	675,860.69	0.11	133.65	3.86	--	--	--
562	2,989,618.98	675,867.47	137.56	2,989,619.10	675,867.35	0.17	134.60	2.96	--	136.68	2.08
563	2,989,618.60	675,877.61	137.42	2,989,618.56	675,877.37	0.24	134.28	3.14	--	136.81	2.53
564	2,989,617.79	675,887.85	137.53	2,989,617.72	675,887.72	0.14	133.79	3.74	--	--	--
565	2,989,619.33	675,898.24	137.59	2,989,619.35	675,898.20	0.05	133.62	3.97	--	--	--
566	2,989,621.83	675,909.98	137.55	2,989,621.69	675,910.39	0.43	134.34	3.21	3.09	--	--
567	2,989,624.86	675,920.82	137.53	2,989,624.68	675,920.98	0.24	134.96	2.57	--	--	--
568	2,989,627.75	675,931.11	137.52	2,989,627.77	675,931.11	0.02	136.00	1.52	--	136.52	0.52
569	2,989,632.60	675,930.84	138.79	2,989,632.61	675,930.83	0.02	137.39	1.40	--	137.85	0.46
570	2,989,635.48	675,920.17	139.95	2,989,635.50	675,920.17	0.02	138.03	1.92	--	138.62	0.59
571	2,989,632.63	675,907.91	140.01	2,989,632.64	675,907.92	0.01	138.22	1.79	--	138.73	0.51
572	2,989,630.38	675,897.70	139.89	2,989,630.40	675,897.69	0.02	138.39	1.50	--	138.90	0.51
573	2,989,628.93	675,888.72	139.80	2,989,628.93	675,888.73	0.01	138.80	1.00	--	139.33	0.53
574	2,989,628.22	675,875.65	139.04	2,989,628.24	675,875.64	0.02	137.97	1.07	--	138.49	0.52
575	2,989,629.15	675,864.08	139.28	2,989,629.14	675,864.06	0.02	138.19	1.09	--	138.78	0.59
576	2,989,627.30	675,852.40	139.55	2,989,627.32	675,852.40	0.02	138.54	1.01	--	139.00	0.46
577	2,989,637.36	675,839.79	141.17	2,989,637.37	675,839.80	0.02	139.76	1.41	--	140.29	0.53
578	2,989,633.45	675,848.70	141.06	2,989,633.46	675,848.71	0.01	140.00	1.06	--	140.54	0.54
591	2,989,644.60	675,929.74	142.01	2,989,644.58	675,929.72	0.03	140.51	1.50	--	141.04	0.53
593	2,989,641.00	675,922.32	141.16	2,989,641.01	675,922.34	0.02	140.10	1.06	--	140.65	0.55
594	2,989,635.66	675,912.34	140.54	2,989,635.67	675,912.34	0.01	138.98	1.56	--	139.54	0.56
595	2,989,632.54	675,897.82	140.61	2,989,632.56	675,897.83	0.02	139.09	1.52	--	139.62	0.53
907	2,989,637.54	675,929.55	140.05	2,989,637.53	675,929.57	0.02	138.61	1.44	--	139.11	0.50
908	2,989,647.47	675,933.83	143.34	2,989,647.47	675,933.84	0.01	141.80	1.54	--	142.31	0.51
909	2,989,653.75	675,938.57	144.57	2,989,653.76	675,938.58	0.01	143.54	1.03	--	144.12	0.58
917	2,989,632.00	675,961.57	142.97	2,989,632.01	675,961.58	0.02	141.94	1.03	--	142.50	0.56
918	2,989,626.70	675,957.78	141.01	2,989,626.73	675,957.77	0.03	139.48	1.53	--	139.98	0.50

Attachment D
Sinking Pond - Area 5 Survey Control Points

Sediment Construction Summary and Final Sediment Remedial Action Report
W.R. Grace Superfund Site
Acton-Concord, Massachusetts

	PRE-CONSTRUCTION			POST-EXCAVATION						POST-BACKFILL	
Point ID[1]	Pre-Construction Northing	Pre-Construction Easting	Pre-Construction Elevation (feet)	Post-Excavation Northing	Post-Excavation Easting	Δ Horizontal Distance between Pre-Construction and Post-Excavation[2] (feet)	Post-Excavation Elevation (feet)	Δ Elevation between Post-Excavation and Pre-Construction Elevations (feet)	Δ Elevation between Post-Excavation Surface and Pre-Construction Elevation[2] (feet)	Post-Backfill Elevation (feet)[3]	Δ Elevation from Post-Dredge Location (feet)
919	2,989,621.34	675,953.17	137.80	2,989,621.35	675,953.16	0.01	136.02	1.78	--	136.58	0.56
920	2,989,625.64	675,946.38	137.66	2,989,625.64	675,946.38	0.00	136.59	1.07	--	137.11	0.52
921	2,989,630.04	675,950.80	140.64	2,989,630.05	675,950.81	0.01	139.31	1.33	--	139.86	0.55
922	2,989,613.78	675,964.84	137.76	2,989,613.79	675,964.84	0.01	136.73	1.03	--	137.24	0.51
923	2,989,619.01	675,969.93	141.37	2,989,619.01	675,969.92	0.01	140.11	1.26	--	140.67	0.56
924	2,989,624.50	675,976.44	144.43	2,989,624.49	675,976.42	0.02	142.37	2.06	--	142.94	0.57
931	2,989,612.69	675,979.37	142.04	2,989,612.69	675,979.36	0.01	140.35	1.69	--	140.90	0.55
932	2,989,606.95	675,972.30	137.47	2,989,606.95	675,972.29	0.01	136.44	1.03	--	136.87	0.43
933	2,989,600.34	675,980.27	137.64	2,989,600.33	675,980.27	0.01	136.21	1.43	--	136.66	0.45
934	2,989,605.54	675,985.75	141.44	2,989,605.54	675,985.76	0.01	139.58	1.86	--	140.11	0.53
940	2,989,603.75	676,000.09	143.84	2,989,603.74	676,000.09	0.01	142.67	1.17	--	143.21	0.54
941	2,989,596.95	675,992.08	140.20	2,989,596.94	675,992.07	0.01	138.46	1.74	--	138.97	0.51
942	2,989,593.12	675,987.56	137.65	2,989,593.11	675,987.56	0.01	135.65	2.00	--	136.18	0.53
943	2,989,586.86	675,995.12	137.55	2,989,586.86	675,995.11	0.01	136.02	1.53	--	136.54	0.52
944	2,989,590.35	675,998.89	139.60	2,989,590.34	675,998.91	0.02	138.41	1.19	--	138.92	0.51
945	2,989,595.87	676,006.32	142.84	2,989,595.86	676,006.30	0.02	141.80	1.04	--	142.38	0.58
951	2,989,589.18	676,013.36	143.01	2,989,589.18	676,013.35	0.01	142.00	1.01	--	142.60	0.60
952	2,989,582.29	676,005.41	138.50	2,989,582.28	676,005.42	0.01	137.46	1.04	--	137.97	0.51
953	2,989,573.50	676,025.61	142.39	2,989,573.52	676,025.61	0.02	140.33	2.06	--	140.92	0.59
954	2,989,567.25	676,017.63	137.73	2,989,567.24	676,017.63	0.01	136.10	1.63	--	136.64	0.54
955	2,989,560.09	676,025.72	137.57	2,989,560.08	676,025.73	0.02	136.17	1.40	--	136.70	0.53
956	2,989,566.27	676,032.46	141.96	2,989,566.27	676,032.46	0.00	140.73	1.23	--	141.26	0.53
963	2,989,558.56	676,039.00	141.31	2,989,558.56	676,038.99	0.01	140.23	1.08	--	140.75	0.52
964	2,989,554.62	676,034.20	139.26	2,989,554.63	676,034.21	0.01	137.45	1.81	--	137.98	0.53
966	2,989,545.80	676,039.37	137.41	2,989,545.80	676,039.36	0.01	136.40	1.01	--	136.90	0.50
967	2,989,550.59	676,045.57	141.05	2,989,550.60	676,045.58	0.02	139.93	1.12	--	140.46	0.53
968	2,989,557.27	676,052.85	143.94	2,989,557.28	676,052.86	0.01	142.77	1.17	--	143.36	0.59
973	2,989,549.68	676,059.68	144.09	2,989,549.70	676,059.68	0.02	142.96	1.13	--	143.54	0.58
974	2,989,543.37	676,051.69	140.79	2,989,543.36	676,051.69	0.01	139.77	1.02	--	140.31	0.54
975	2,989,538.04	676,045.62	137.43	2,989,538.04	676,045.63	0.01	136.38	1.05	--	136.93	0.55
976	2,989,529.95	676,051.91	137.61	2,989,529.95	676,051.88	0.03	136.52	1.09	--	136.99	0.47
977	2,989,535.16	676,058.37	140.49	2,989,535.14	676,058.37	0.02	139.46	1.03	--	140.04	0.58
978	2,989,541.72	676,065.98	143.26	2,989,541.71	676,066.00	0.02	142.24	1.02	--	142.83	0.59
981	2,989,580.79	676,003.48	137.47	2,989,580.77	676,003.49	0.02	136.11	1.36	--	136.67	0.56
982	2,989,573.76	676,010.18	137.65	2,989,573.74	676,010.17	0.02	136.23	1.42	--	136.81	0.58
983	2,989,575.46	676,011.88	138.86	2,989,575.45	676,011.88	0.01	137.27	1.59	--	137.81	0.54
984	2,989,581.20	676,019.30	142.50	2,989,581.20	676,019.31	0.01	141.32	1.18	--	141.83	0.51
991	2,989,524.61	676,044.37	135.20	2,989,524.64	676,044.75	0.38	134.10	1.10	1.21	--	--
992	2,989,521.50	676,039.10	133.68	2,989,521.83	676,039.20	0.35	132.64	1.04	1.09	--	--
994	2,989,516.85	676,032.43	131.99	2,989,516.76	676,032.30	0.16	130.69	1.30	--	--	--
995	2,989,515.23	676,029.09	131.16	2,989,515.10	676,029.25	0.20	130.06	1.10	--	--	--
1002	2,989,516.43	676,020.65	129.61	2,989,516.70	676,020.53	0.29	128.38	1.23	--	--	--
1003	2,989,520.80	676,025.15	130.82	2,989,520.95	676,025.03	0.20	129.72	1.10	--	--	--
1004	2,989,525.13	676,029.78	132.03	2,989,525.27	676,029.95	0.23	130.79	1.24	--	--	--
1005	2,989,528.99	676,033.44	133.39	2,989,528.98	676,033.59	0.15	132.12	1.27	--	--	--
1006	2,989,531.60	676,037.32	134.21	2,989,531.77	676,037.52	0.27	133.04	1.17	--	--	--
1007	2,989,541.08	676,033.00	135.18	2,989,541.07	676,032.69	0.31	134.10	1.08	--	--	--
1008	2,989,537.75	676,029.10	133.91	2,989,537.83	676,029.30	0.21	132.61	1.30	--	--	--
1009	2,989,535.10	676,023.65	132.85	2,989,535.05	676,023.73	0.10	131.68	1.17	--	--	--
1010	2,989,533.64	676,016.07	131.04	2,989,533.81	676,016.37	0.35	129.81	1.23	1.32	--	--
1011	2,989,528.47	676,012.36	130.13	2,989,528.21	676,012.42	0.27	129.00	1.13	--	--	--
1012	2,989,528.11	676,010.02	129.39	2,989,528.25	676,010.18	0.21	128.26	1.13	--	--	--
1013	2,989,523.93	676,005.75	128.20	2,989,524.12	676,005.80	0.20	127.09	1.11	--	--	--
1018	2,989,529.49	676,002.33	128.24	2,989,529.68	676,002.34	0.19	127.20	1.04	--	--	--

Attachment D
Sinking Pond - Area 5 Survey Control Points

Sediment Construction Summary and Final Sediment Remedial Action Report
W.R. Grace Superfund Site
Acton-Concord, Massachusetts

	PRE-CONSTRUCTION			POST-EXCAVATION						POST-BACKFILL	
Point ID[1]	Pre-Construction Northing	Pre-Construction Easting	Pre-Construction Elevation (feet)	Post-Excavation Northing	Post-Excavation Easting	Δ Horizontal Distance between Pre-Construction and Post-Excavation[2] (feet)	Post-Excavation Elevation (feet)	Δ Elevation between Post-Excavation and Pre-Construction Elevations (feet)	Δ Elevation between Post-Excavation Surface and Pre-Construction Elevation[2] (feet)	Post-Backfill Elevation (feet)[3]	Δ Elevation from Post-Dredge Location (feet)
1019	2,989,533.95	676,008.79	129.98	2,989,533.74	676,008.55	0.32	128.94	1.04	--	--	--
1020	2,989,537.51	676,013.15	131.25	2,989,537.67	676,012.95	0.26	130.16	1.09	--	--	--
1021	2,989,540.69	676,018.95	132.78	2,989,540.69	676,019.26	0.31	131.58	1.20	--	--	--
1022	2,989,545.20	676,024.73	134.76	2,989,545.18	676,024.63	0.11	133.43	1.33	--	--	--
1023	2,989,553.02	676,017.95	134.64	2,989,553.09	676,017.73	0.23	131.95	2.69	--	--	--
1024	2,989,548.29	676,014.42	133.11	2,989,548.29	676,014.21	0.21	130.74	2.37	--	--	--
1025	2,989,546.16	676,011.23	132.15	2,989,546.11	676,011.32	0.11	130.05	2.10	--	--	--
1026	2,989,543.66	676,006.36	130.99	2,989,543.90	676,006.01	0.42	128.14	2.85	2.84	--	--
1027	2,989,538.83	676,000.54	129.39	2,989,538.56	676,000.71	0.32	126.91	2.48	--	--	--
1033	2,989,543.32	675,990.01	128.66	2,989,543.80	675,990.03	0.48	126.35	2.31	2.37	--	--
1034	2,989,548.41	675,995.13	130.04	2,989,548.10	675,995.16	0.31	127.21	2.83	--	--	--
1035	2,989,552.10	675,999.62	131.30	2,989,551.88	675,999.88	0.34	128.35	2.95	2.96	--	--
1036	2,989,556.66	676,004.45	132.98	2,989,556.97	676,004.37	0.32	129.88	3.10	--	--	--
1037	2,989,560.02	676,008.90	134.32	2,989,560.02	676,008.91	0.01	131.59	2.73	--	--	--
1038	2,989,569.33	676,005.77	135.59	2,989,569.68	676,005.60	0.39	134.23	1.36	1.40	--	--
1039	2,989,566.01	676,001.97	134.27	2,989,565.99	676,002.29	0.32	131.95	2.32	2.35	--	--
1040	2,989,563.92	675,998.25	133.12	2,989,563.50	675,998.35	0.43	130.60	2.52	2.46	--	--
1041	2,989,559.42	675,994.06	131.56	2,989,559.55	675,994.02	0.13	128.76	2.80	--	--	--
1042	2,989,558.73	675,990.06	130.90	2,989,558.35	675,990.24	0.42	128.52	2.38	2.34	--	--
1043	2,989,555.90	675,985.44	129.51	2,989,555.82	675,985.40	0.09	126.65	2.86	--	--	--
1044	2,989,549.77	675,980.80	128.18	2,989,549.94	675,980.50	0.35	126.11	2.07	2.05	--	--
1050	2,989,557.06	675,972.87	128.00	2,989,557.07	675,972.84	0.03	125.36	2.64	--	--	--
1051	2,989,561.88	675,981.85	129.99	2,989,561.33	675,981.95	0.56	127.67	2.32	2.25	--	--
1052	2,989,567.29	675,987.29	131.52	2,989,567.21	675,986.80	0.50	128.57	2.95	2.87	--	--
1053	2,989,571.14	675,993.15	133.42	2,989,571.28	675,992.69	0.48	131.21	2.21	2.16	--	--
1054	2,989,574.86	675,997.12	134.81	2,989,575.40	675,997.53	0.68	132.00	2.81	3.05	--	--
1055	2,989,581.40	675,989.09	134.98	2,989,581.38	675,989.33	0.24	132.54	2.44	--	--	--
1056	2,989,578.33	675,984.76	133.52	2,989,578.08	675,984.74	0.25	130.93	2.59	--	--	--
1057	2,989,575.08	675,980.61	132.22	2,989,575.01	675,980.70	0.12	129.95	2.27	--	--	--
1058	2,989,571.87	675,977.12	130.74	2,989,571.86	675,977.44	0.32	128.32	2.42	--	--	--
1059	2,989,569.28	675,973.10	129.48	2,989,569.39	675,972.75	0.37	127.32	2.16	2.14	--	--
1060	2,989,566.30	675,969.16	128.68	2,989,566.21	675,968.93	0.24	126.02	2.66	--	--	--
1069	2,989,571.02	675,962.05	128.50	2,989,570.89	675,961.98	0.15	126.37	2.13	--	--	--
1070	2,989,575.37	675,967.22	129.55	2,989,575.10	675,967.37	0.31	126.84	2.71	--	--	--
1071	2,989,579.04	675,971.69	131.03	2,989,578.81	675,971.81	0.26	128.02	3.01	--	--	--
1072	2,989,582.72	675,976.02	132.60	2,989,582.37	675,975.91	0.36	129.95	2.65	2.57	--	--
1073	2,989,585.54	675,980.80	134.63	2,989,585.54	675,980.70	0.10	131.64	2.99	--	--	--
1075	2,989,593.53	675,974.05	134.36	2,989,593.55	675,974.53	0.48	131.68	2.68	2.95	--	--
1076	2,989,588.56	675,970.31	133.00	2,989,588.50	675,970.42	0.12	130.70	2.30	--	--	--
1077	2,989,585.80	675,965.22	131.24	2,989,585.49	675,965.32	0.32	128.58	2.66	--	--	--
1078	2,989,580.47	675,959.37	129.32	2,989,580.35	675,958.98	0.40	127.04	2.28	2.22	--	--
1079	2,989,575.18	675,953.13	127.83	2,989,575.02	675,953.29	0.23	124.83	3.00	--	--	--
1086	2,989,584.75	675,944.86	128.87	2,989,584.57	675,944.62	0.30	126.19	2.68	--	--	--
1087	2,989,588.53	675,948.60	129.77	2,989,588.72	675,948.44	0.25	127.16	2.61	--	--	--
1088	2,989,591.54	675,955.52	131.04	2,989,591.53	675,955.84	0.32	128.20	2.84	--	--	--
1089	2,989,596.66	675,958.57	132.52	2,989,597.07	675,958.69	0.42	130.19	2.33	2.43	--	--
1090	2,989,599.39	675,962.02	133.48	2,989,599.47	675,961.96	0.10	130.73	2.75	--	--	--
1091	2,989,602.55	675,965.70	134.86	2,989,602.74	675,965.30	0.44	132.59	2.27	2.24	--	--
1092	2,989,608.94	675,959.14	135.28	2,989,608.83	675,959.43	0.31	132.96	2.32	--	--	--
1093	2,989,606.67	675,955.00	134.24	2,989,606.68	675,954.87	0.13	131.65	2.59	--	--	--
1094	2,989,602.56	675,950.06	132.65	2,989,602.16	675,950.10	0.40	130.08	2.57	2.50	--	--
1095	2,989,597.75	675,947.79	131.48	2,989,597.69	675,947.95	0.17	128.73	2.75	--	--	--
1096	2,989,588.45	675,940.36	129.27	2,989,587.91	675,940.68	0.63	126.65	2.62	2.53	--	--

Attachment D
Sinking Pond - Area 5 Survey Control Points

Sediment Construction Summary and Final Sediment Remedial Action Report
W.R. Grace Superfund Site
Acton-Concord, Massachusetts

	PRE-CONSTRUCTION			POST-EXCAVATION						POST-BACKFILL	
Point ID[1]	Pre-Construction Northing	Pre-Construction Easting	Pre-Construction Elevation (feet)	Post-Excavation Northing	Post-Excavation Easting	Δ Horizontal Distance between Pre-Construction and Post-Excavation[2] (feet)	Post-Excavation Elevation (feet)	Δ Elevation between Post-Excavation and Pre-Construction Elevations (feet)	Δ Elevation between Post-Excavation Surface and Pre-Construction Elevation[2] (feet)	Post-Backfill Elevation (feet)[3]	Δ Elevation from Post-Dredge Location (feet)
1101	2,989,592.59	675,923.05	127.95	2,989,592.74	675,922.83	0.27	125.58	2.37	--	--	--
1102	2,989,595.10	675,926.37	128.64	2,989,595.44	675,926.64	0.44	126.39	2.25	2.34	--	--
1103	2,989,600.02	675,929.84	129.89	2,989,599.55	675,929.65	0.51	127.31	2.58	2.48	--	--
1104	2,989,605.34	675,936.34	131.75	2,989,605.66	675,936.39	0.33	129.42	2.33	--	--	--
1105	2,989,610.10	675,941.96	132.88	2,989,609.72	675,942.17	0.43	130.51	2.37	2.34	--	--
1106	2,989,615.86	675,947.70	134.41	2,989,616.02	675,947.33	0.40	131.68	2.73	2.75	--	--
1107	2,989,619.01	675,949.04	135.64	2,989,618.86	675,949.08	0.15	134.45	1.19	--	--	--
1109	2,989,620.26	675,934.69	134.42	2,989,620.07	675,934.60	0.21	131.80	2.62	--	--	--
1110	2,989,617.12	675,932.66	133.79	2,989,617.34	675,932.95	0.36	131.15	2.64	2.69	--	--
1111	2,989,611.93	675,932.24	132.68	2,989,611.61	675,932.35	0.34	129.73	2.95	2.90	--	--
1112	2,989,608.64	675,927.00	131.47	2,989,608.84	675,927.13	0.24	129.19	2.28	--	--	--
1113	2,989,604.47	675,921.68	130.30	2,989,604.15	675,921.57	0.34	127.30	3.00	2.93	--	--
1114	2,989,597.14	675,917.94	128.58	2,989,597.08	675,917.80	0.15	125.96	2.62	--	--	--
1121	2,989,609.10	675,916.41	130.63	2,989,608.92	675,916.05	0.40	127.89	2.74	2.80	--	--
1122	2,989,613.69	675,918.19	133.55	2,989,613.94	675,918.14	0.25	130.48	3.07	--	--	--
1123	2,989,618.53	675,921.32	134.38	2,989,618.50	675,921.24	0.09	131.99	2.39	--	--	--
1124	2,989,615.57	675,916.49	133.84	2,989,615.81	675,916.61	0.27	131.48	2.36	--	--	--
1126	2,989,612.34	675,907.00	134.04	2,989,612.65	675,906.98	0.31	131.58	2.46	--	--	--
1127	2,989,610.14	675,901.01	133.58	2,989,610.03	675,901.00	0.11	130.79	2.79	--	--	--
1128	2,989,607.62	675,894.41	132.89	2,989,607.55	675,893.97	0.45	130.04	2.85	2.87	--	--
1129	2,989,605.88	675,889.12	132.60	2,989,606.11	675,889.19	0.24	130.10	2.50	--	--	--
1130	2,989,603.07	675,882.87	131.86	2,989,603.01	675,882.71	0.17	129.24	2.62	--	--	--
1131	2,989,603.86	675,874.40	134.41	2,989,604.16	675,874.19	0.36	131.76	2.65	2.74	--	--
1132	2,989,603.84	675,866.70	134.59	2,989,603.78	675,866.57	0.14	131.29	3.30	--	--	--
1133	2,989,603.39	675,859.65	132.41	2,989,603.54	675,859.49	0.22	129.99	2.42	--	--	--
1134	2,989,603.78	675,852.23	131.57	2,989,603.60	675,852.33	0.21	129.16	2.41	--	--	--
1135	2,989,603.36	675,842.11	130.63	2,989,603.09	675,842.17	0.28	128.11	2.52	--	--	--
1136	2,989,594.04	675,851.86	127.68	2,989,594.26	675,851.77	0.24	125.12	2.56	--	--	--
1137	2,989,591.85	675,855.03	128.03	2,989,592.37	675,854.80	0.57	125.28	2.75	2.82	--	--
1138	2,989,590.95	675,860.43	128.64	2,989,590.70	675,860.32	0.27	125.60	3.04	--	--	--
1139	2,989,592.41	675,868.32	131.63	2,989,592.15	675,868.56	0.36	127.22	4.41	4.22	--	--
1140	2,989,593.30	675,874.68	130.23	2,989,593.27	675,874.64	0.05	127.11	3.12	--	--	--
1141	2,989,595.03	675,881.55	129.05	2,989,594.88	675,881.27	0.32	126.39	2.66	--	--	--
1142	2,989,595.24	675,888.66	127.75	2,989,595.14	675,888.60	0.11	125.18	2.57	--	--	--
1145	2,989,599.05	675,915.86	127.97	2,989,599.32	675,915.73	0.30	125.75	2.22	--	--	--
1147	2,989,610.41	675,908.74	133.60	2,989,610.13	675,908.76	0.28	130.16	3.44	--	--	--
1148	2,989,611.79	675,900.52	135.35	2,989,611.38	675,900.41	0.42	131.49	3.86	3.49	--	--
1149	2,989,611.90	675,893.49	135.90	2,989,611.82	675,893.52	0.09	132.95	2.95	--	--	--
1151	2,989,611.16	675,887.11	135.24	2,989,611.04	675,886.69	0.43	132.04	3.20	3.17	--	--
1152	2,989,612.41	675,878.96	136.30	2,989,612.59	675,879.28	0.37	132.87	3.43	3.47	--	--
1153	2,989,611.13	675,873.06	136.91	2,989,611.01	675,873.11	0.13	133.34	3.57	--	--	--
1154	2,989,610.03	675,867.00	135.96	2,989,609.91	675,867.34	0.36	132.57	3.39	3.38	--	--
1155	2,989,607.82	675,861.11	134.75	2,989,607.32	675,861.14	0.50	131.63	3.12	2.91	--	--
1156	2,989,608.06	675,857.78	134.10	2,989,608.15	675,857.73	0.11	131.64	2.46	--	--	--
1157	2,989,610.32	675,853.00	134.67	2,989,610.41	675,852.69	0.32	131.83	2.84	--	--	--
1158	2,989,612.46	675,847.60	134.20	2,989,612.45	675,847.08	0.52	131.61	2.59	2.48	--	--
1159	2,989,614.36	675,842.56	133.60	2,989,614.32	675,842.44	0.13	130.67	2.93	--	--	--
1160	2,989,617.18	675,837.61	134.88	2,989,616.97	675,837.07	0.58	131.30	3.58	3.60	--	--
1162	2,989,614.48	675,823.33	136.40	2,989,614.91	675,823.51	0.46	133.85	2.55	2.61	--	--
1163	2,989,610.13	675,826.01	134.48	2,989,610.35	675,826.32	0.38	131.87	2.61	2.63	--	--
1164	2,989,606.66	675,828.19	132.92	2,989,606.41	675,827.94	0.35	130.25	2.67	2.77	--	--
1165	2,989,602.41	675,833.00	131.38	2,989,602.18	675,833.06	0.24	128.15	3.23	--	--	--
1166	2,989,599.05	675,837.54	130.26	2,989,599.62	675,837.21	0.65	128.05	2.21	2.35	--	--
1167	2,989,596.77	675,839.82	128.92	2,989,596.73	675,839.66	0.16	126.39	2.53	--	--	--

Attachment D
Sinking Pond - Area 5 Survey Control Points

Sediment Construction Summary and Final Sediment Remedial Action Report
W.R. Grace Superfund Site
Acton-Concord, Massachusetts

	PRE-CONSTRUCTION			POST-EXCAVATION						POST-BACKFILL	
Point ID[1]	Pre-Construction Northing	Pre-Construction Easting	Pre-Construction Elevation (feet)	Post-Excavation Northing	Post-Excavation Easting	Δ Horizontal Distance between Pre-Construction and Post-Excavation[2] (feet)	Post-Excavation Elevation (feet)	Δ Elevation between Post-Excavation and Pre-Construction Elevations (feet)	Δ Elevation between Post-Excavation Surface and Pre-Construction Elevation[2] (feet)	Post-Backfill Elevation (feet)[3]	Δ Elevation from Post-Dredge Location (feet)
1172	2,989,583.48	675,865.71	127.69	2,989,583.36	675,865.54	0.20	126.43	1.26	--	--	--
1178	2,989,591.12	675,833.78	128.44	2,989,591.41	675,834.00	0.37	125.45	2.99	3.04	--	--
1179	2,989,594.44	675,830.48	130.33	2,989,594.45	675,830.75	0.27	127.51	2.82	--	--	--
1180	2,989,597.08	675,827.07	132.28	2,989,597.24	675,827.47	0.43	129.97	2.31	2.20	--	--
1181	2,989,600.21	675,825.08	133.96	2,989,600.09	675,824.78	0.32	131.64	2.32	--	--	--
1182	2,989,590.95	675,821.80	135.90	2,989,591.03	675,822.13	0.34	131.68	4.22	3.99	--	--
1183	2,989,588.27	675,824.12	132.95	2,989,588.14	675,824.02	0.16	130.23	2.72	--	--	--
1184	2,989,585.27	675,827.89	129.87	2,989,585.25	675,827.71	0.18	127.39	2.48	--	--	--
1190	2,989,574.30	675,825.31	129.36	2,989,574.17	675,825.49	0.22	128.29	1.07	--	--	--
1191	2,989,576.29	675,823.79	131.19	2,989,576.57	675,823.92	0.30	129.86	1.33	--	--	--
1192	2,989,579.45	675,819.51	134.55	2,989,579.81	675,819.44	0.37	132.85	1.70	1.76	--	--
1193	2,989,570.65	675,812.00	134.61	2,989,570.78	675,812.15	0.20	132.18	2.43	--	--	--
1194	2,989,566.86	675,814.12	132.47	2,989,566.72	675,814.22	0.17	130.15	2.32	--	--	--
1195	2,989,563.02	675,817.53	130.60	2,989,562.99	675,817.61	0.08	127.46	3.14	--	--	--
1196	2,989,559.44	675,822.17	129.10	2,989,559.09	675,822.02	0.38	125.60	3.50	3.44	--	--
1202	2,989,553.04	675,815.71	128.84	2,989,553.06	675,815.69	0.03	126.50	2.34	--	--	--
1203	2,989,555.52	675,810.68	130.49	2,989,555.91	675,810.38	0.49	126.90	3.59	3.90	--	--
1204	2,989,560.42	675,807.78	134.18	2,989,560.64	675,807.96	0.28	128.47	5.71	--	--	--
1205	2,989,563.16	675,802.53	137.22	2,989,563.14	675,802.35	0.18	131.33	5.89	--	--	--
1206	2,989,558.81	675,796.87	136.33	2,989,558.60	675,796.78	0.23	132.28	4.05	--	--	--
1207	2,989,555.52	675,793.21	135.75	2,989,555.36	675,793.03	0.25	130.96	4.79	--	--	--
1208	2,989,549.61	675,795.30	132.83	2,989,549.22	675,795.07	0.46	128.70	4.13	3.96	--	--
1209	2,989,546.67	675,797.89	130.61	2,989,546.81	675,798.03	0.20	127.00	3.61	--	--	--
1210	2,989,543.47	675,802.55	128.37	2,989,543.41	675,802.54	0.06	125.38	2.99	--	--	--
1215	2,989,540.31	675,789.23	129.05	2,989,540.32	675,789.00	0.23	126.25	2.80	--	--	--
1216	2,989,543.11	675,784.58	131.09	2,989,543.67	675,784.57	0.56	128.39	2.70	3.02	--	--
1217	2,989,547.75	675,780.03	134.94	2,989,547.71	675,779.70	0.34	131.49	3.45	3.44	--	--
1218	2,989,547.16	675,765.03	136.26	2,989,547.11	675,765.10	0.08	134.90	1.36	--	--	--
1219	2,989,543.07	675,769.17	133.13	2,989,542.99	675,769.25	0.11	132.02	1.11	--	--	--
1220	2,989,536.93	675,774.11	130.16	2,989,536.70	675,774.20	0.25	127.18	2.98	--	--	--
1221	2,989,533.43	675,776.11	128.33	2,989,533.27	675,776.22	0.19	127.09	1.24	--	--	--
2153	2,989,420.50	676,126.00	144.32	2,989,420.49	676,126.01	0.01	142.66	1.66	--	143.19	0.53
2154	2,989,418.90	676,116.60	140.99	2,989,418.90	676,116.59	0.01	139.83	1.16	--	140.38	0.55
2155	2,989,417.81	676,106.98	137.65	2,989,417.80	676,106.99	0.01	136.61	1.04	--	137.13	0.52
2156	2,989,427.71	676,104.75	137.52	2,989,427.70	676,104.77	0.02	136.42	1.10	--	136.95	0.53
2157	2,989,428.53	676,115.68	141.74	2,989,428.51	676,115.68	0.02	139.95	1.79	--	140.48	0.53
2158	2,989,429.78	676,125.27	144.49	2,989,429.76	676,125.27	0.02	142.86	1.63	--	143.45	0.59
2163	2,989,439.50	676,123.53	144.67	2,989,439.49	676,123.51	0.02	143.26	1.41	--	143.77	0.51
2164	2,989,438.13	676,114.05	141.16	2,989,438.15	676,114.05	0.02	140.09	1.07	--	140.66	0.57
2165	2,989,437.04	676,101.78	137.65	2,989,437.05	676,101.78	0.01	136.61	1.04	--	137.18	0.57
2166	2,989,447.11	676,098.30	137.70	2,989,447.10	676,098.29	0.02	136.23	1.47	--	136.75	0.52
2167	2,989,447.80	676,103.55	139.46	2,989,447.81	676,103.53	0.02	138.43	1.03	--	138.90	0.47
2168	2,989,448.32	676,112.29	142.54	2,989,448.31	676,112.28	0.01	141.03	1.51	--	141.61	0.58
2175	2,989,457.81	676,111.44	143.39	2,989,457.79	676,111.43	0.02	141.54	1.85	--	142.12	0.58
2176	2,989,457.44	676,101.61	140.44	2,989,457.44	676,101.62	0.01	138.99	1.45	--	139.50	0.51
2177	2,989,456.07	676,093.42	137.47	2,989,456.09	676,093.43	0.02	136.14	1.33	--	136.61	0.47
2178	2,989,465.35	676,086.70	137.49	2,989,465.35	676,086.71	0.01	135.81	1.68	--	136.26	0.45
2179	2,989,465.96	676,091.41	138.98	2,989,465.95	676,091.40	0.02	137.39	1.59	--	137.81	0.42
2180	2,989,467.18	676,100.20	141.12	2,989,467.17	676,100.21	0.01	140.12	1.00	--	140.63	0.51
2181	2,989,468.28	676,111.03	144.20	2,989,468.28	676,111.01	0.02	143.01	1.19	--	143.59	0.58
2187	2,989,477.14	676,099.57	142.88	2,989,477.14	676,099.57	0.00	141.70	1.18	--	142.23	0.53
2188	2,989,476.04	676,089.49	140.48	2,989,476.05	676,089.50	0.02	139.15	1.33	--	139.56	0.41
2189	2,989,475.01	676,079.13	137.54	2,989,475.01	676,079.13	0.01	136.44	1.10	--	136.99	0.55
2190	2,989,484.21	676,073.98	137.51	2,989,484.21	676,073.99	0.01	136.46	1.05	--	136.98	0.52

Attachment D
Sinking Pond - Area 5 Survey Control Points

Sediment Construction Summary and Final Sediment Remedial Action Report
W.R. Grace Superfund Site
Acton-Concord, Massachusetts

	PRE-CONSTRUCTION			POST-EXCAVATION						POST-BACKFILL	
Point ID[1]	Pre-Construction Northing	Pre-Construction Easting	Pre-Construction Elevation (feet)	Post-Excavation Northing	Post-Excavation Easting	Δ Horizontal Distance between Pre-Construction and Post-Excavation[2] (feet)	Post-Excavation Elevation (feet)	Δ Elevation between Post-Excavation and Pre-Construction Elevations (feet)	Δ Elevation between Post-Excavation Surface and Pre-Construction Elevation[2] (feet)	Post-Backfill Elevation (feet)[3]	Δ Elevation from Post-Dredge Location (feet)
2191	2,989,484.21	676,078.26	138.53	2,989,484.20	676,078.24	0.02	137.19	1.34	--	137.66	0.47
2192	2,989,485.54	676,088.12	141.85	2,989,485.53	676,088.11	0.01	140.81	1.04	--	141.26	0.45
2193	2,989,486.83	676,098.56	144.13	2,989,486.85	676,098.57	0.02	143.10	1.03	--	143.63	0.53
2199	2,989,495.59	676,086.99	142.49	2,989,495.60	676,087.00	0.01	141.43	1.06	--	141.95	0.52
2200	2,989,494.47	676,077.25	139.52	2,989,494.46	676,077.26	0.01	138.05	1.47	--	138.48	0.43
2201	2,989,494.03	676,071.93	137.66	2,989,494.04	676,071.93	0.01	136.60	1.06	--	137.10	0.50
2202	2,989,503.45	676,068.71	137.63	2,989,503.44	676,068.71	0.01	136.58	1.05	--	137.03	0.45
2203	2,989,504.45	676,076.17	139.77	2,989,504.47	676,076.16	0.02	138.77	1.00	--	139.28	0.51
2204	2,989,505.52	676,085.98	142.80	2,989,505.53	676,085.98	0.01	141.62	1.18	--	142.17	0.55
2211	2,989,515.51	676,084.72	143.96	2,989,515.50	676,084.71	0.01	142.37	1.59	--	142.90	0.53
2212	2,989,514.20	676,074.91	141.10	2,989,514.22	676,074.90	0.02	139.62	1.48	--	140.20	0.58
2213	2,989,513.20	676,063.47	137.66	2,989,513.21	676,063.48	0.01	136.33	1.33	--	136.84	0.51
2214	2,989,522.32	676,057.51	137.61	2,989,522.30	676,057.53	0.03	136.22	1.39	--	136.75	0.53
2215	2,989,522.97	676,063.74	139.45	2,989,522.95	676,063.73	0.03	138.36	1.09	--	138.93	0.57
2216	2,989,524.57	676,073.07	142.29	2,989,524.58	676,073.07	0.01	141.04	1.25	--	141.55	0.51
2225	2,989,532.18	676,069.97	142.86	2,989,532.18	676,069.97	0.00	141.79	1.07	--	142.33	0.54
2754	2,989,410.96	676,069.25	129.11	2,989,411.19	676,069.23	0.23	127.87	1.24	--	--	--
2755	2,989,411.65	676,077.31	130.40	2,989,411.74	676,077.19	0.15	128.88	1.52	--	--	--
2756	2,989,413.34	676,086.56	131.81	2,989,413.31	676,086.44	0.12	130.63	1.18	--	--	--
2757	2,989,415.25	676,094.22	134.63	2,989,415.42	676,094.12	0.20	133.53	1.10	--	--	--
2758	2,989,415.94	676,098.96	135.74	2,989,416.04	676,098.89	0.12	134.47	1.27	--	--	--
2759	2,989,427.40	676,095.44	135.71	2,989,427.41	676,095.64	0.20	134.46	1.25	--	--	--
2760	2,989,426.37	676,089.74	133.77	2,989,426.49	676,089.86	0.17	132.41	1.36	--	--	--
2761	2,989,426.11	676,082.30	132.15	2,989,425.98	676,082.21	0.15	130.78	1.37	--	--	--
2762	2,989,425.63	676,074.74	130.90	2,989,425.52	676,074.64	0.15	129.40	1.50	--	--	--
2763	2,989,423.40	676,069.16	129.13	2,989,423.24	676,069.31	0.22	127.64	1.49	--	--	--
2764	2,989,423.11	676,062.02	128.06	2,989,422.88	676,061.95	0.24	126.39	1.67	--	--	--
2769	2,989,431.13	676,057.00	128.22	2,989,431.30	676,056.88	0.21	127.09	1.13	--	--	--
2770	2,989,433.07	676,066.01	129.93	2,989,433.07	676,065.75	0.26	128.27	1.66	--	--	--
2771	2,989,433.35	676,075.38	131.33	2,989,433.29	676,075.35	0.07	130.24	1.09	--	--	--
2772	2,989,435.46	676,084.73	133.07	2,989,435.49	676,084.77	0.04	131.80	1.27	--	--	--
2773	2,989,435.99	676,091.14	134.63	2,989,435.95	676,091.24	0.11	133.14	1.49	--	--	--
2774	2,989,446.91	676,090.08	136.35	2,989,446.75	676,089.88	0.25	134.42	1.93	--	--	--
2775	2,989,445.20	676,083.70	134.20	2,989,445.24	676,083.48	0.23	132.82	1.38	--	--	--
2776	2,989,440.43	676,072.66	131.30	2,989,440.45	676,072.89	0.23	129.93	1.37	--	--	--
2777	2,989,440.75	676,060.20	129.49	2,989,440.93	676,060.23	0.18	128.13	1.36	--	--	--
2781	2,989,447.09	676,045.69	127.52	2,989,446.96	676,045.50	0.23	126.28	1.24	--	--	--
2782	2,989,450.25	676,052.69	128.95	2,989,450.37	676,052.95	0.29	127.70	1.25	--	--	--
2783	2,989,450.82	676,061.71	131.00	2,989,450.75	676,061.76	0.09	129.98	1.02	--	--	--
2784	2,989,452.27	676,069.82	132.41	2,989,452.39	676,070.08	0.28	131.00	1.41	--	--	--
2785	2,989,455.67	676,080.89	134.47	2,989,455.64	676,080.84	0.06	133.39	1.08	--	--	--
2786	2,989,456.54	676,086.84	136.86	2,989,456.55	676,086.94	0.10	134.56	2.30	--	--	--
2787	2,989,463.87	676,078.00	135.48	2,989,463.93	676,077.83	0.18	134.38	1.10	--	--	--
2788	2,989,463.01	676,073.94	135.18	2,989,462.93	676,073.64	0.31	133.94	1.24	--	--	--
2789	2,989,462.66	676,066.53	133.30	2,989,462.73	676,066.62	0.11	131.72	1.58	--	--	--
2790	2,989,461.89	676,059.66	131.59	2,989,461.65	676,059.67	0.24	130.22	1.37	--	--	--
2791	2,989,460.44	676,051.41	129.75	2,989,460.54	676,051.57	0.19	128.60	1.15	--	--	--
2792	2,989,458.61	676,043.30	127.95	2,989,458.46	676,043.13	0.23	126.74	1.21	--	--	--
2796	2,989,472.28	676,038.69	128.29	2,989,472.28	676,038.52	0.17	127.26	1.03	--	--	--
2797	2,989,472.86	676,047.22	129.90	2,989,472.63	676,047.34	0.26	128.28	1.62	--	--	--
2798	2,989,473.17	676,057.98	132.41	2,989,472.93	676,057.67	0.39	130.90	1.51	1.42	--	--
2799	2,989,474.36	676,066.19	134.33	2,989,474.22	676,066.13	0.15	133.04	1.29	--	--	--
2800	2,989,474.99	676,070.17	135.71	2,989,475.28	676,070.47	0.42	134.21	1.50	1.60	--	--
2801	2,989,483.32	676,065.39	135.52	2,989,483.20	676,065.70	0.33	134.48	1.04	--	--	--

Attachment D
Sinking Pond - Area 5 Survey Control Points

Sediment Construction Summary and Final Sediment Remedial Action Report
W.R. Grace Superfund Site
Acton-Concord, Massachusetts

	PRE-CONSTRUCTION			POST-EXCAVATION						POST-BACKFILL	
Point ID[1]	Pre-Construction Northing	Pre-Construction Easting	Pre-Construction Elevation (feet)	Post-Excavation Northing	Post-Excavation Easting	Δ Horizontal Distance between Pre-Construction and Post-Excavation[2] (feet)	Post-Excavation Elevation (feet)	Δ Elevation between Post-Excavation and Pre-Construction Elevations (feet)	Δ Elevation between Post-Excavation Surface and Pre-Construction Elevation[2] (feet)	Post-Backfill Elevation (feet)[3]	Δ Elevation from Post-Dredge Location (feet)
2802	2,989,483.57	676,059.83	134.24	2,989,483.71	676,060.00	0.22	133.08	1.16	--	--	--
2803	2,989,481.10	676,052.64	132.35	2,989,480.77	676,052.70	0.33	130.98	1.37	1.34	--	--
2804	2,989,478.80	676,044.17	130.11	2,989,478.99	676,044.07	0.21	128.83	1.28	--	--	--
2805	2,989,476.06	676,033.93	128.14	2,989,475.94	676,034.17	0.27	127.05	1.09	--	--	--
2810	2,989,488.69	676,027.36	127.54	2,989,488.92	676,027.27	0.25	126.30	1.24	--	--	--
2811	2,989,489.96	676,036.49	129.87	2,989,490.08	676,036.44	0.13	128.75	1.12	--	--	--
2812	2,989,491.31	676,042.74	131.09	2,989,491.51	676,042.55	0.28	129.72	1.37	--	--	--
2813	2,989,491.06	676,052.24	133.33	2,989,490.94	676,052.32	0.15	132.05	1.28	--	--	--
2814	2,989,492.54	676,062.27	135.30	2,989,492.80	676,062.51	0.35	134.13	1.17	1.24	--	--
2815	2,989,502.83	676,061.13	135.71	2,989,502.68	676,060.94	0.24	134.65	1.06	--	--	--
2816	2,989,500.11	676,051.65	133.74	2,989,500.05	676,051.45	0.21	132.22	1.52	--	--	--
2817	2,989,500.67	676,041.96	131.80	2,989,500.34	676,042.16	0.39	130.66	1.14	1.15	--	--
2818	2,989,498.31	676,032.00	129.76	2,989,498.51	676,031.89	0.23	128.59	1.17	--	--	--
2819	2,989,497.90	676,025.35	128.36	2,989,497.86	676,025.28	0.08	127.07	1.29	--	--	--
2823	2,989,505.03	676,020.54	128.34	2,989,505.35	676,020.43	0.34	127.21	1.13	1.16	--	--
2824	2,989,507.42	676,027.10	129.90	2,989,507.35	676,027.03	0.10	128.61	1.29	--	--	--
2825	2,989,508.48	676,032.41	131.00	2,989,508.81	676,032.15	0.42	129.64	1.36	1.35	--	--
2826	2,989,509.59	676,040.32	132.28	2,989,509.74	676,040.18	0.20	131.16	1.12	--	--	--
2827	2,989,511.89	676,048.34	134.10	2,989,511.64	676,048.48	0.29	133.01	1.09	--	--	--
2828	2,989,512.95	676,054.66	135.77	2,989,512.86	676,054.79	0.16	134.61	1.16	--	--	--
2829	2,989,519.58	676,049.11	136.31	2,989,519.40	676,049.37	0.32	134.24	2.07	--	--	--
2830	2,989,518.61	676,042.77	134.07	2,989,518.45	676,042.66	0.19	132.68	1.39	--	--	--
2831	2,989,518.17	676,034.45	132.38	2,989,518.23	676,034.67	0.23	131.05	1.33	--	--	--
2834	2,989,512.23	676,011.86	127.90	2,989,512.33	676,011.89	0.10	126.74	1.16	--	--	--
3102	2,989,619.97	675,757.27	143.86	2,989,619.97	675,757.25	0.02	141.84	2.02	--	--	--
3152	2,989,593.87	675,732.46	144.46	2,989,593.87	675,732.45	0.01	142.25	2.21	--	--	--
3154	2,989,616.11	675,767.15	144.50	2,989,616.10	675,767.15	0.01	142.49	2.01	--	143.01	0.52
3155	2,989,619.20	675,772.89	144.51	2,989,619.20	675,772.89	0.00	141.42	3.09	--	141.94	0.52
3156	2,989,599.77	675,784.43	139.73	2,989,599.70	675,784.44	0.07	135.54	4.19	--	--	--
3157	2,989,584.65	675,763.02	137.68	2,989,584.65	675,763.02	0.00	135.60	2.08	--	--	--
3158	2,989,564.42	675,734.36	144.55	2,989,564.41	675,734.37	0.01	141.52	3.03	--	142.07	0.55
3159	2,989,575.29	675,736.11	144.50	2,989,575.29	675,736.11	0.01	141.89	2.61	--	142.46	0.57
3160	2,989,598.49	675,772.48	140.00	2,989,598.43	675,772.53	0.08	136.70	3.30	--	--	--
3161	2,989,591.79	675,773.13	139.55	2,989,591.79	675,773.13	0.00	137.32	2.23	--	--	--
3162	2,989,575.11	675,749.50	140.49	2,989,575.10	675,749.50	0.01	138.41	2.08	--	138.95	0.54
4001	2,989,633.74	675,805.80	141.82	2,989,633.81	675,805.76	0.08	139.78	2.04	--	141.27	1.49
4002	2,989,630.78	675,809.95	139.69	2,989,630.75	675,809.97	0.04	137.37	2.32	--	138.97	1.60
4003	2,989,627.02	675,813.66	138.71	2,989,627.03	675,813.68	0.03	136.25	2.46	--	137.80	1.55
4004	2,989,619.51	675,806.93	138.89	2,989,619.51	675,806.82	0.11	136.38	2.51	--	--	--
4005	2,989,613.12	675,814.41	138.27	2,989,613.08	675,814.42	0.05	135.62	2.65	--	--	--
4006	2,989,622.13	675,818.81	137.49	2,989,622.15	675,818.91	0.10	135.09	2.40	--	136.71	1.62
4007	2,989,608.57	675,818.97	137.48	2,989,608.44	675,819.13	0.21	135.15	2.33	--	--	s
4109	2,989,622.86	675,780.08	144.50	2,989,622.87	675,780.07	0.01	143.47	1.03	--	144.00	0.53
4110	2,989,626.94	675,787.00	144.49	2,989,626.94	675,786.98	0.02	143.25	1.24	--	143.75	0.50
4111	2,989,638.95	675,800.43	144.52	2,989,638.94	675,800.44	0.01	143.50	1.02	--	144.05	0.55
4112	2,989,643.71	675,812.70	144.50	2,989,643.70	675,812.71	0.02	143.43	1.07	--	143.95	0.52
4113	2,989,646.94	675,829.06	144.52	2,989,646.93	675,829.04	0.02	143.40	1.12	--	143.97	0.57
4114	2,989,645.99	675,840.69	144.53	2,989,646.00	675,840.71	0.02	143.48	1.05	--	144.02	0.54
4115	2,989,641.35	675,850.22	144.48	2,989,641.34	675,850.23	0.02	143.23	1.25	--	143.79	0.56
4116	2,989,640.81	675,864.46	144.52	2,989,640.81	675,864.47	0.01	142.66	1.86	--	143.24	0.58
4117	2,989,640.18	675,875.09	144.50	2,989,640.16	675,875.09	0.02	142.52	1.98	--	143.09	0.57
4118	2,989,641.17	675,885.90	144.49	--	--	--	--	--	--	--	--
4119	2,989,644.08	675,897.07	144.52	2,989,644.07	675,897.06	0.01	143.51	1.01	--	144.10	0.59
4120	2,989,644.93	675,908.49	144.50	2,989,644.94	675,908.48	0.01	143.48	1.02	--	144.04	0.56

Attachment D
Sinking Pond - Area 5 Survey Control Points

Sediment Construction Summary and Final Sediment Remedial Action Report
W.R. Grace Superfund Site
Acton-Concord, Massachusetts

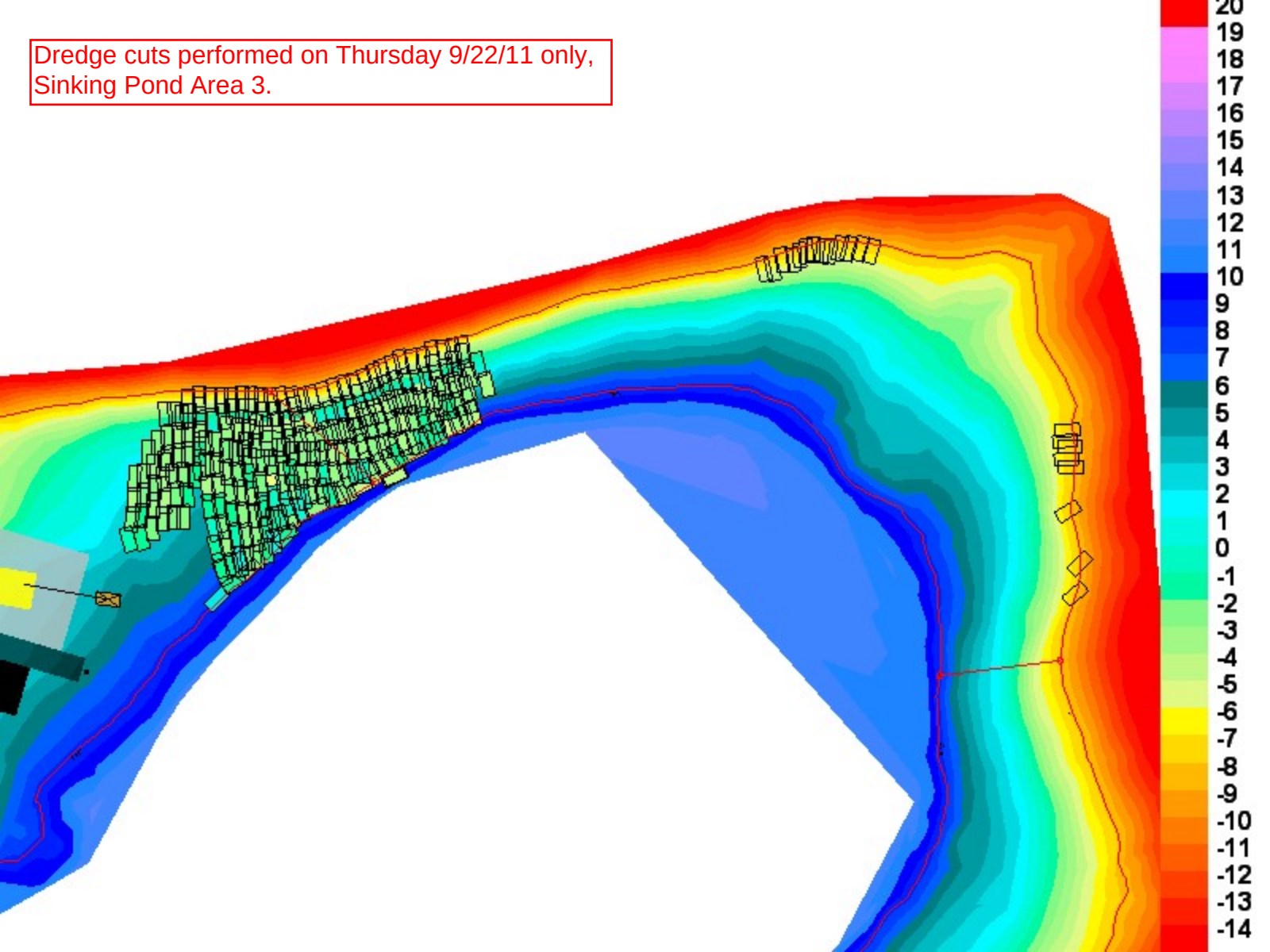
	PRE-CONSTRUCTION			POST-EXCAVATION						POST-BACKFILL	
Point ID[1]	Pre-Construction Northing	Pre-Construction Easting	Pre-Construction Elevation (feet)	Post-Excavation Northing	Post-Excavation Easting	Δ Horizontal Distance between Pre-Construction and Post-Excavation[2] (feet)	Post-Excavation Elevation (feet)	Δ Elevation between Post-Excavation and Pre-Construction Elevations (feet)	Δ Elevation between Post-Excavation Surface and Pre-Construction Elevation[2] (feet)	Post-Backfill Elevation (feet)[3]	Δ Elevation from Post-Dredge Location (feet)
4121	2,989,648.55	675,920.80	144.51	2,989,648.55	675,920.80	0.01	143.48	1.03	--	144.02	0.54
4122	2,989,650.91	675,931.93	144.49	2,989,650.92	675,931.95	0.02	143.24	1.25	--	143.73	0.49
4123	2,989,645.68	675,949.42	144.50	2,989,645.70	675,949.42	0.02	143.45	1.05	--	143.94	0.49
4124	2,989,639.76	675,957.63	144.50	2,989,639.75	675,957.64	0.01	143.49	1.01	--	144.05	0.56
4125	2,989,633.92	675,965.76	144.51	2,989,633.92	675,965.78	0.02	143.35	1.16	--	143.89	0.54
4126	2,989,617.73	675,984.20	144.49	2,989,617.75	675,984.20	0.02	142.93	1.56	--	143.52	0.59
4127	2,989,612.30	675,991.58	144.50	2,989,612.28	675,991.60	0.02	142.68	1.82	--	143.24	0.56
4128	2,989,605.21	676,001.24	144.51	2,989,605.21	676,001.25	0.01	143.42	1.09	--	143.94	0.52
4129	2,989,598.25	676,009.41	144.51	2,989,598.25	676,009.40	0.01	143.45	1.06	--	144.01	0.56
4130	2,989,591.51	676,016.13	144.50	2,989,591.50	676,016.13	0.01	143.49	1.01	--	144.09	0.60
4131	2,989,584.83	676,022.74	144.50	2,989,584.84	676,022.75	0.01	143.42	1.08	--	143.97	0.55
4132	2,989,577.27	676,030.02	144.50	2,989,577.27	676,030.01	0.01	143.44	1.06	--	143.97	0.53
4133	2,989,570.70	676,037.54	144.50	2,989,570.70	676,037.53	0.01	143.47	1.03	--	144.02	0.55
4134	2,989,564.96	676,044.53	144.50	2,989,564.98	676,044.52	0.02	143.49	1.01	--	144.07	0.58
4135	2,989,558.66	676,053.16	144.50	2,989,558.66	676,053.17	0.01	143.43	1.07	--	143.97	0.54
4136	2,989,550.64	676,060.35	144.50	2,989,550.63	676,060.34	0.02	143.46	1.04	--	144.01	0.55
4137	2,989,543.13	676,068.93	144.52	2,989,543.14	676,068.95	0.02	143.51	1.01	--	144.00	0.49
4138	2,989,534.74	676,074.59	144.50	2,989,534.73	676,074.56	0.03	142.47	2.03	--	143.06	0.59
4139	2,989,527.50	676,079.80	144.50	2,989,527.49	676,079.80	0.01	143.50	1.00	--	143.99	0.49
4140	2,989,519.22	676,084.73	144.50	2,989,519.22	676,084.70	0.03	143.43	1.07	--	144.01	0.58
4141	2,989,506.40	676,092.27	144.50	2,989,506.40	676,092.26	0.01	142.81	1.69	--	143.40	0.59
4142	2,989,496.85	676,094.05	144.50	2,989,496.86	676,094.07	0.02	143.48	1.02	--	143.89	0.41
4143	2,989,487.67	676,100.27	144.50	2,989,487.66	676,100.27	0.01	143.49	1.01	--	144.00	0.51
4144	2,989,478.54	676,105.80	144.50	2,989,478.55	676,105.78	0.02	143.42	1.08	--	144.00	0.58
4145	2,989,468.41	676,111.99	144.50	2,989,468.38	676,111.99	0.03	143.43	1.07	--	144.00	0.57
4146	2,989,457.87	676,115.82	144.50	2,989,457.88	676,115.83	0.02	143.47	1.03	--	144.04	0.57
4147	2,989,449.85	676,118.52	144.49	2,989,449.84	676,118.50	0.02	143.46	1.03	--	143.96	0.50
4148	2,989,532.79	675,777.48	128.03	2,989,532.90	675,777.70	0.25	126.74	1.29	--	--	--
4149	2,989,537.41	675,791.68	128.00	2,989,537.53	675,791.84	0.20	126.92	1.08	--	--	--
4150	2,989,542.46	675,802.92	128.00	2,989,542.28	675,803.01	0.20	126.80	1.20	--	--	--
4151	2,989,551.15	675,817.74	127.99	2,989,550.94	675,817.46	0.35	125.26	2.73	2.74	--	--
4152	2,989,557.52	675,824.91	127.96	2,989,557.59	675,824.63	0.29	126.70	1.26	--	--	--
4153	2,989,573.08	675,827.36	128.00	2,989,573.34	675,827.19	0.31	127.00	1.00	--	--	--
4154	2,989,583.49	675,831.10	128.01	2,989,583.65	675,831.16	0.17	126.86	1.15	--	--	--
4155	2,989,589.64	675,834.65	128.01	2,989,589.66	675,834.65	0.02	126.71	1.30	--	--	--
4156	2,989,593.33	675,842.14	128.01	2,989,593.01	675,841.68	0.56	125.36	2.65	2.61	--	--
4157	2,989,589.62	675,876.67	128.01	2,989,589.71	675,877.02	0.36	124.82	3.19	3.13	--	--
4158	2,989,596.89	675,899.65	128.00	2,989,597.07	675,899.37	0.33	125.66	2.34	2.40	--	--
4159	2,989,595.91	675,909.69	127.97	2,989,595.53	675,909.35	0.51	125.70	2.27	2.11	--	--
4160	2,989,585.36	675,935.55	128.00	2,989,585.10	675,935.49	0.27	125.17	2.83	--	--	--
4161	2,989,580.73	675,943.13	127.98	2,989,580.53	675,942.67	0.50	124.96	3.02	2.92	--	--
4162	2,989,568.09	675,960.31	128.00	2,989,567.68	675,960.18	0.43	125.54	2.46	2.40	--	--
4163	2,989,540.82	675,989.10	128.01	2,989,540.68	675,988.70	0.42	125.46	2.55	2.49	--	--
4164	2,989,533.51	675,996.47	128.00	2,989,533.40	675,996.42	0.12	125.37	2.63	--	--	--
4165	2,989,504.48	676,019.06	128.00	2,989,504.33	676,018.90	0.22	126.66	1.34	--	--	--
4166	2,989,497.37	676,024.12	128.00	2,989,497.40	676,024.03	0.09	126.83	1.17	--	--	--
4167	2,989,410.76	676,064.20	128.00	2,989,410.85	676,064.14	0.11	126.81	1.19	--	--	--

Notes:
1. Survey locations shaded in orange are within the area initially targeted for 2-foot sediment removal.
2 Values shaded in green represent locations below the water line where the horizontal distance between the pre-construction and post-construction survey points exceeded 0.33 feet (discussed in RFI 006, Attachment L). For these points, the change from pre-construction elevation was derived from a CADD surface elevation and reported in the final column of the post-excavation data.
3. Consistent with the 100% design, topsoil was placed in excavated areas between the water line and the historical high water elevation (144.5 ft). Survey control points located below the water line were not backfilled and no post-backfill elevation or thickness is provided.

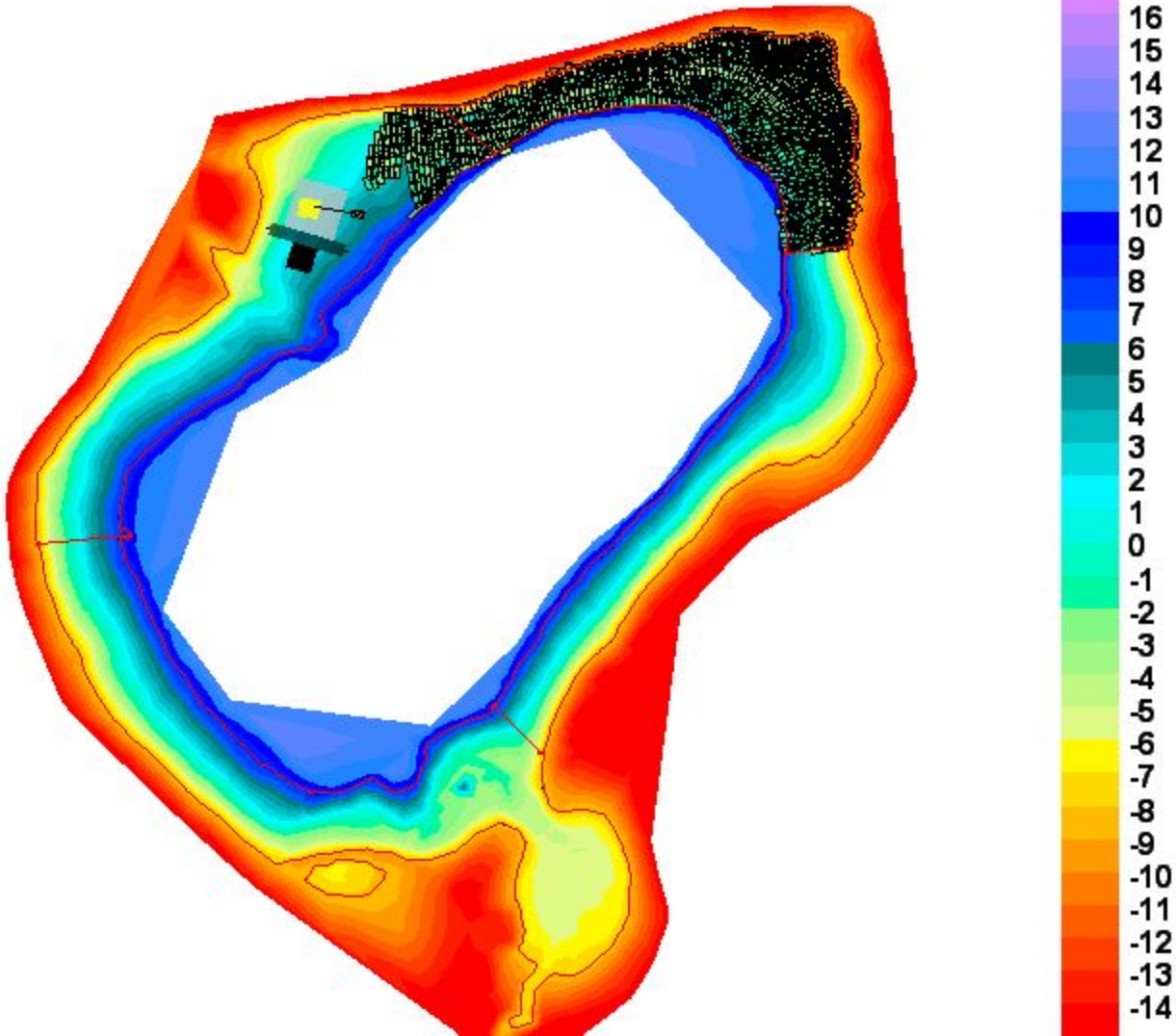
Attachment E

ClamVision Reports

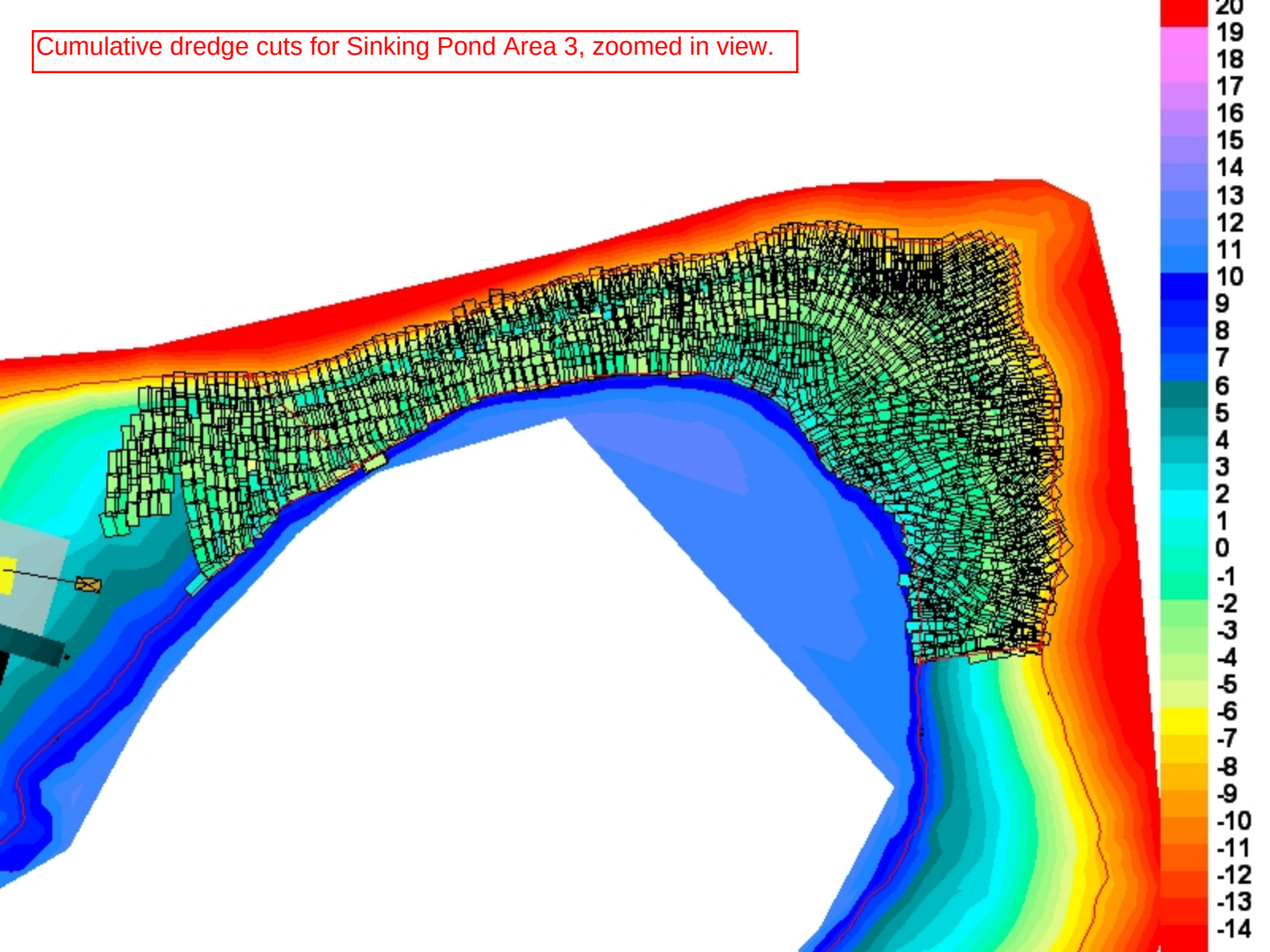
Dredge cuts performed on Thursday 9/22/11 only, Sinking Pond Area 3.



Cumulative dredge cuts in Sinking Pond.

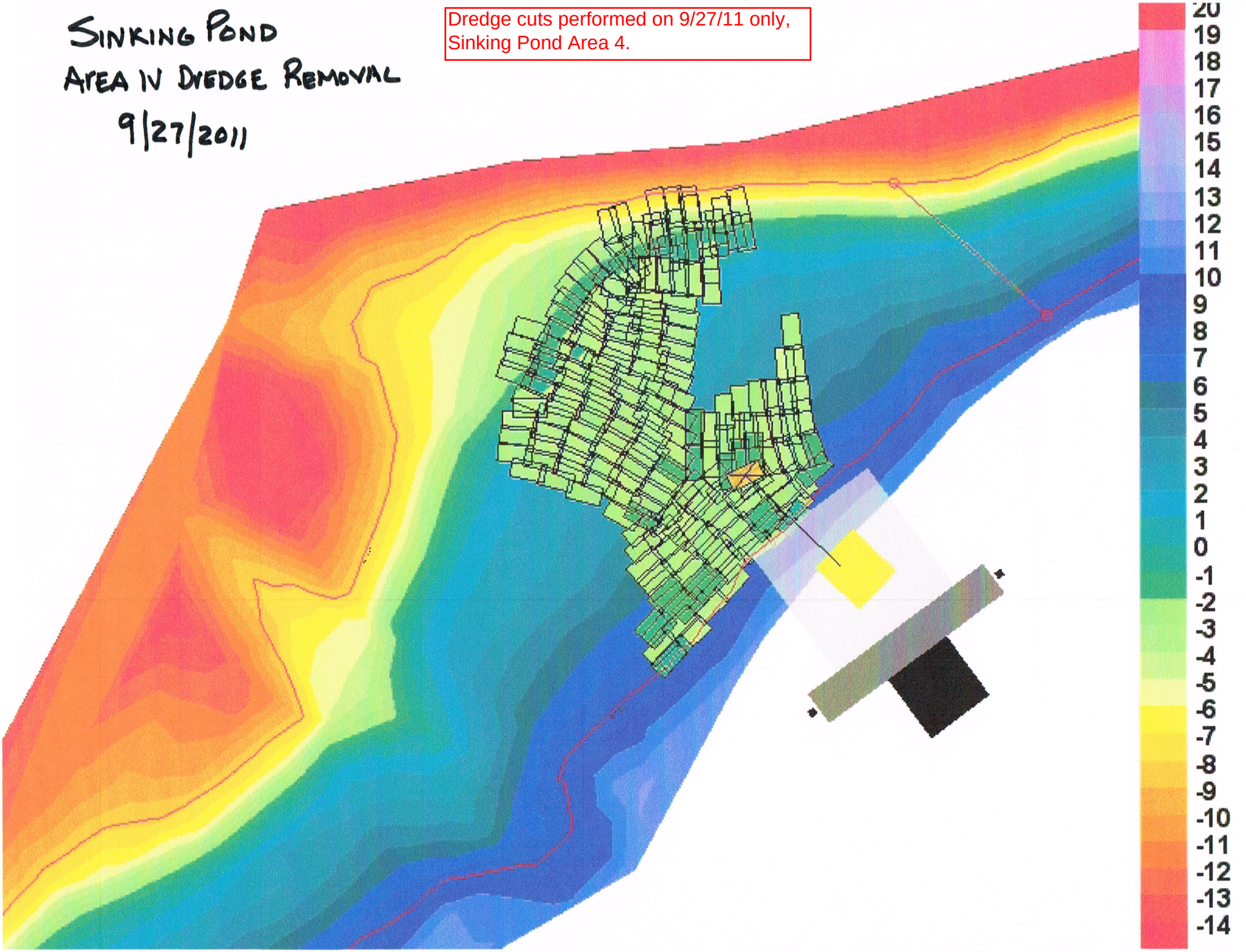


Cumulative dredge cuts for Sinking Pond Area 3, zoomed in view.



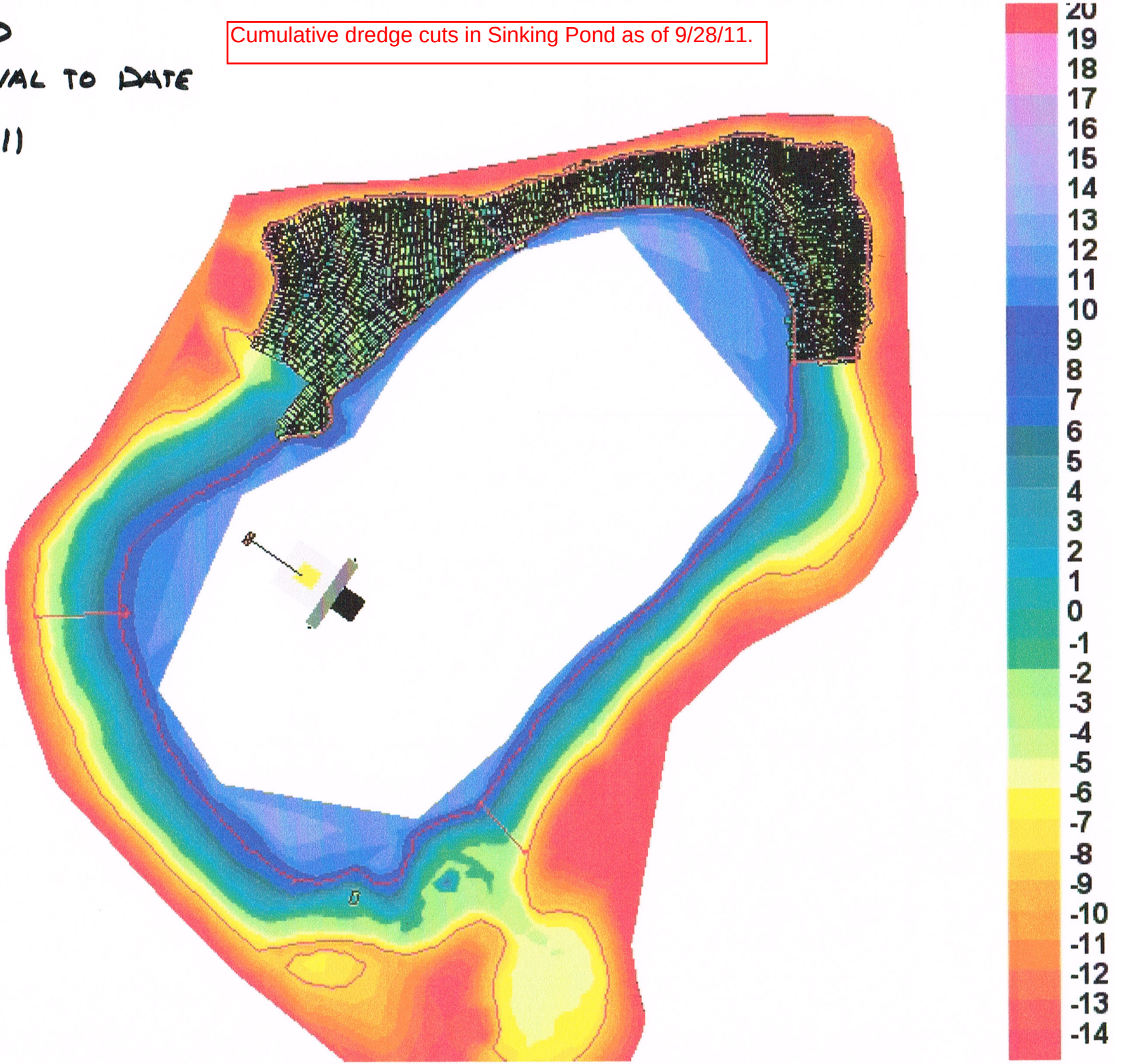
SINKING POND
AREA IV DREDGE REMOVAL
9/27/2011

Dredge cuts performed on 9/27/11 only, Sinking Pond Area 4.



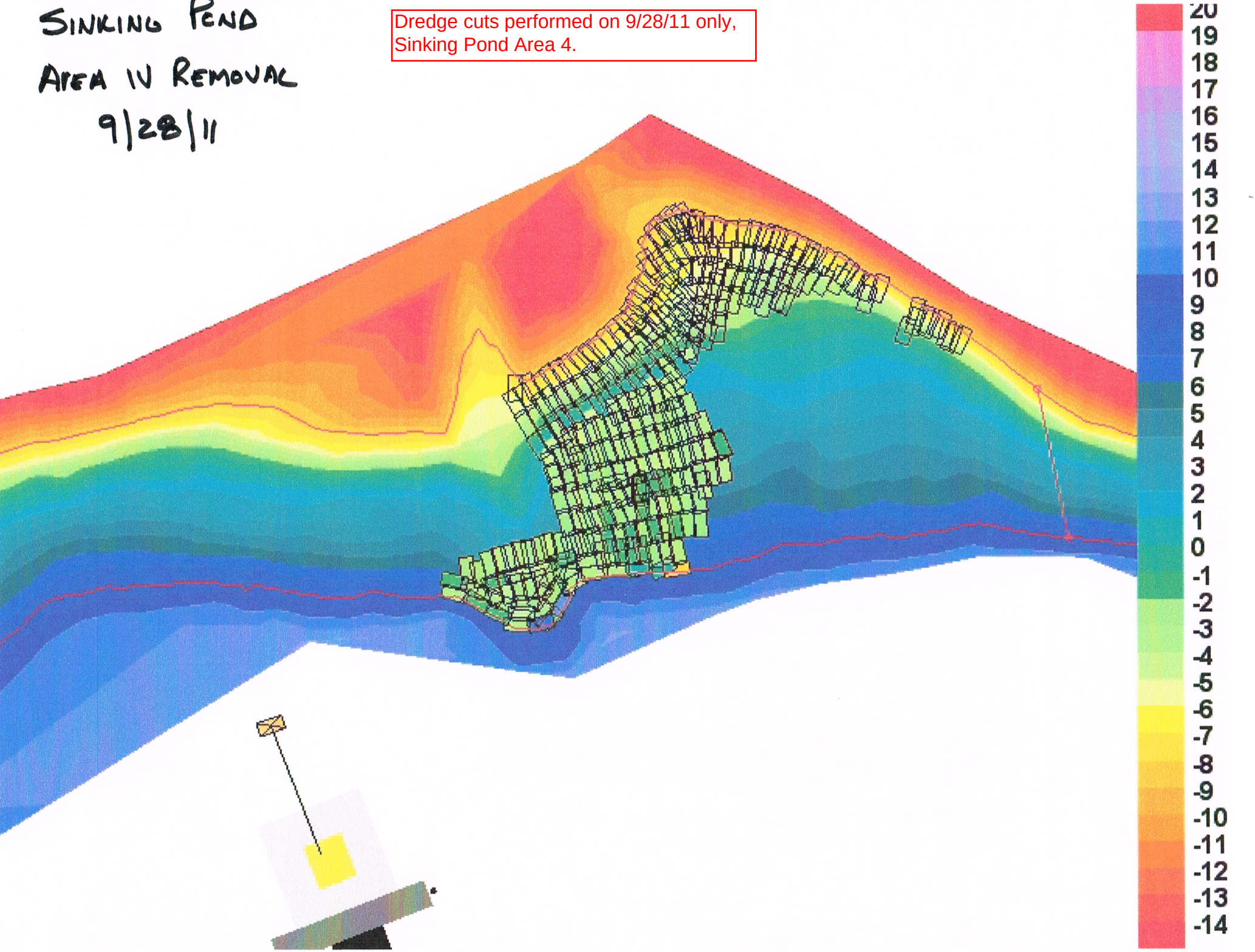
SINKING POND
DREDGE REMOVAL TO DATE
9/28/2011

Cumulative dredge cuts in Sinking Pond as of 9/28/11.



SINKING POND
AREA IV REMOVAL
9/28/11

Dredge cuts performed on 9/28/11 only, Sinking Pond Area 4.

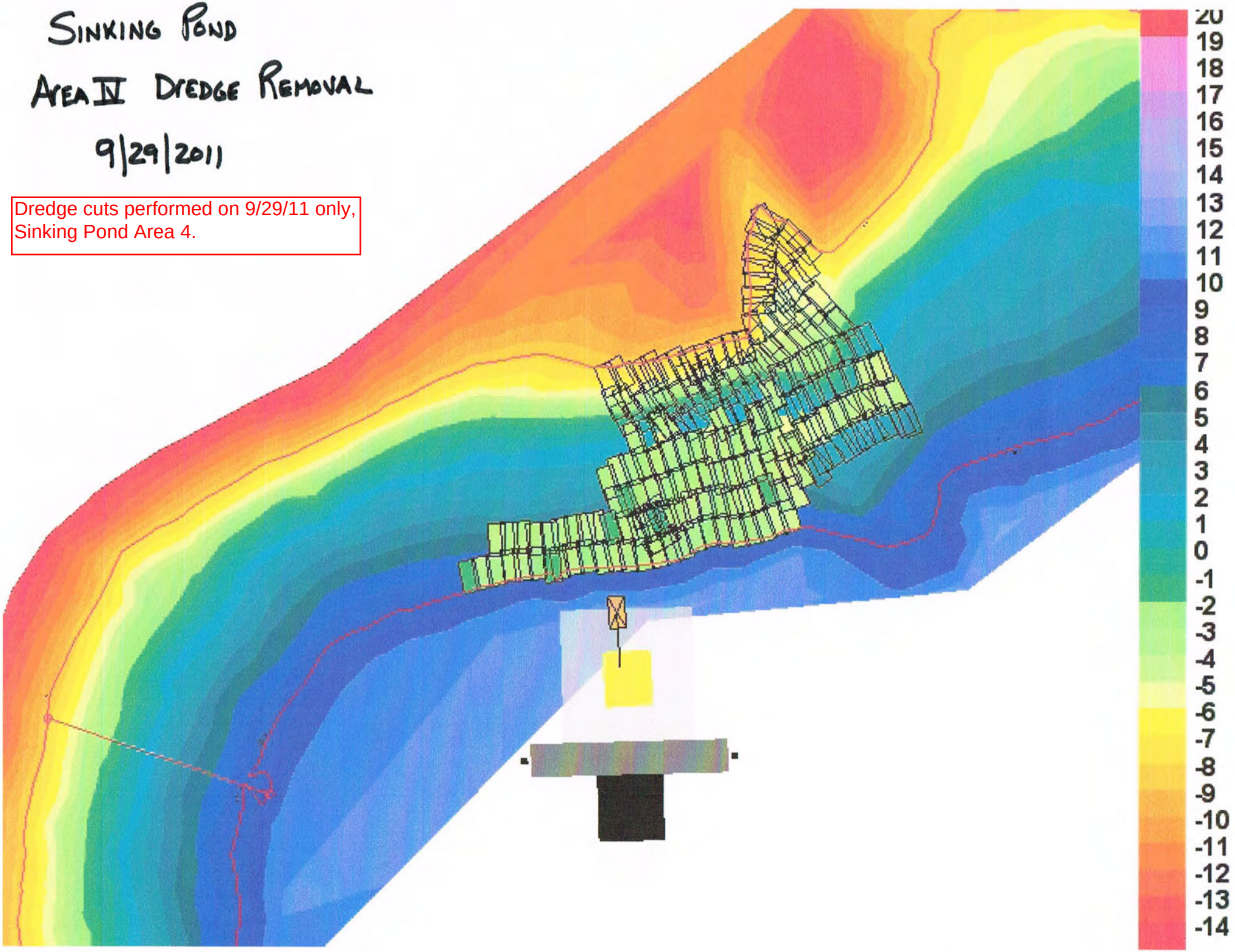


SINKING POND

AREA IV DREDGE REMOVAL

9/29/2011

Dredge cuts performed on 9/29/11 only, Sinking Pond Area 4.

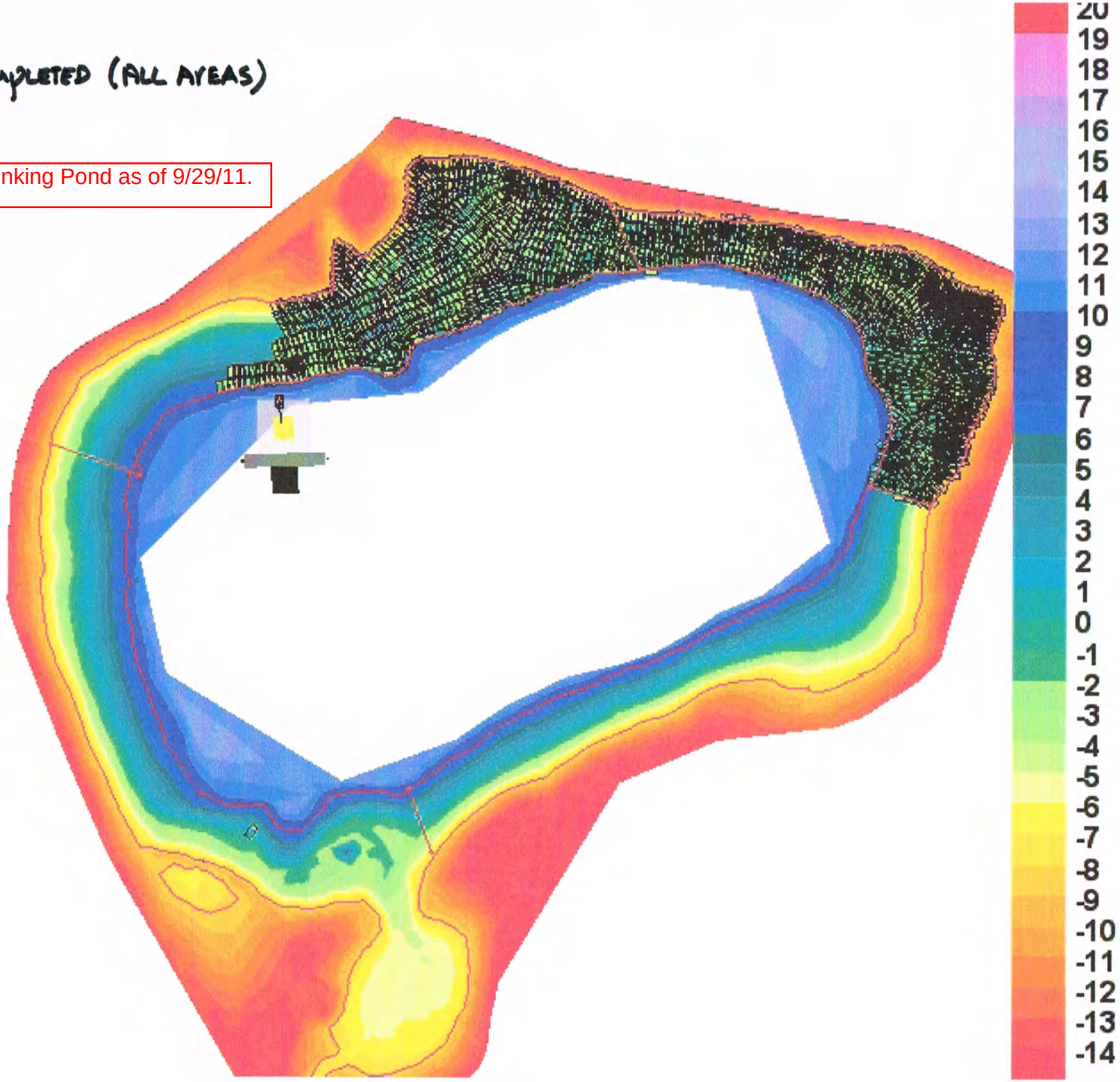


SINKING POND

DREDGE REMOVAL COMPLETED (ALL AREAS)

9/29/2011

Cumulative dredge cuts in Sinking Pond as of 9/29/11.

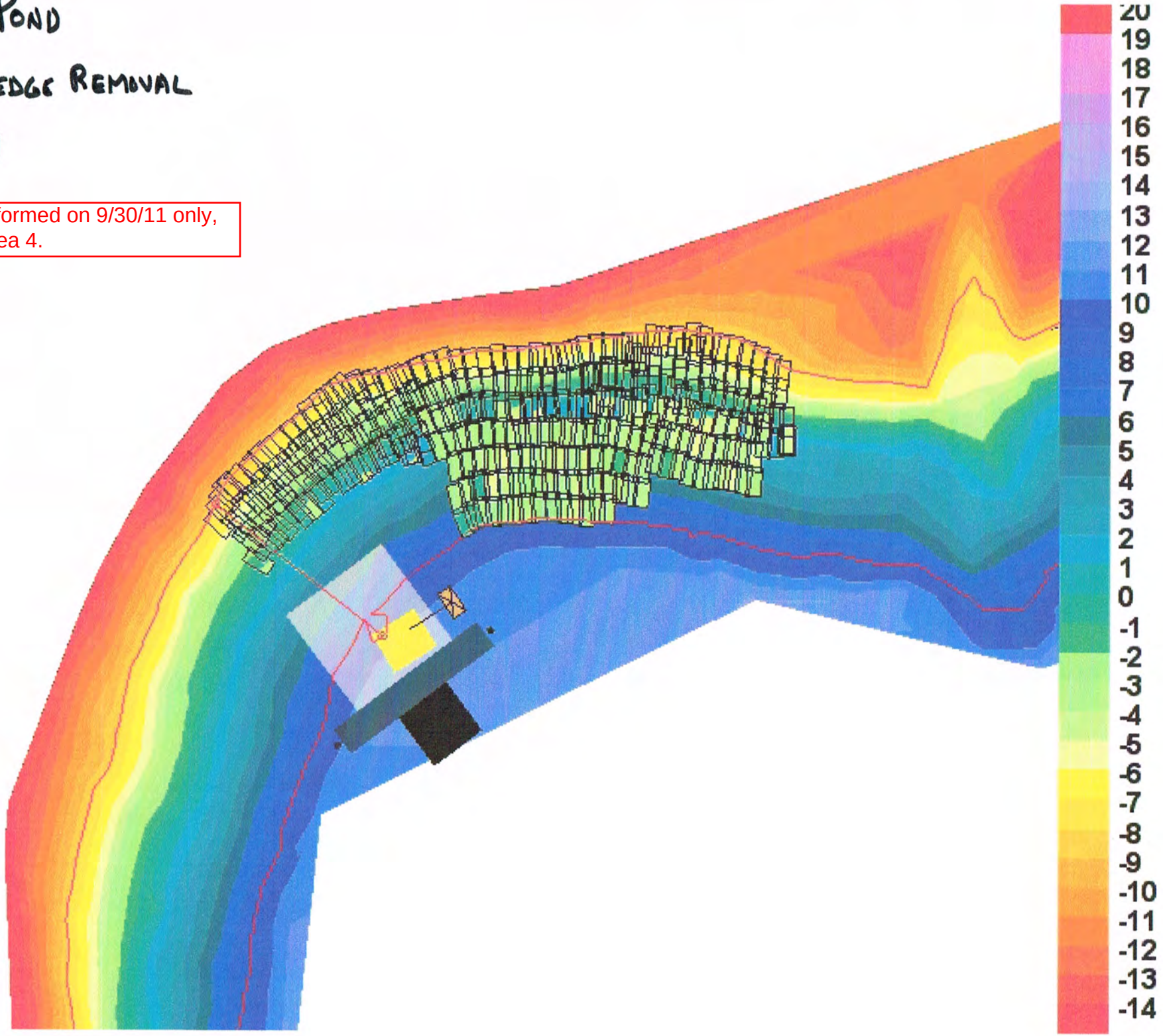


SINKING POND

AREA IV DREDGE REMOVAL

9/30/11

Dredge cuts performed on 9/30/11 only, Sinking Pond Area 4.

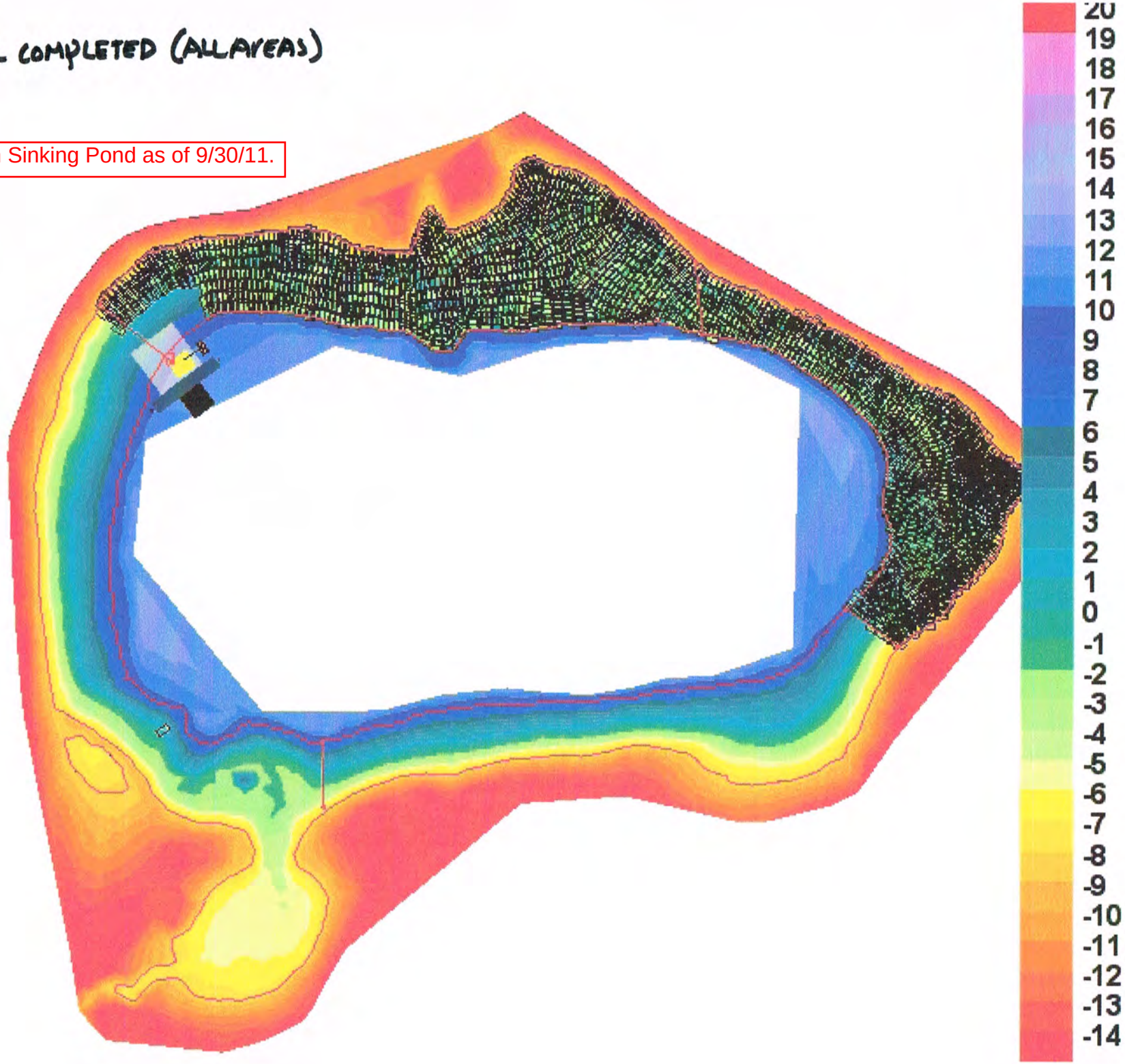


SINKING POND

DREDGE REMOVAL COMPLETED (ALL AREAS)

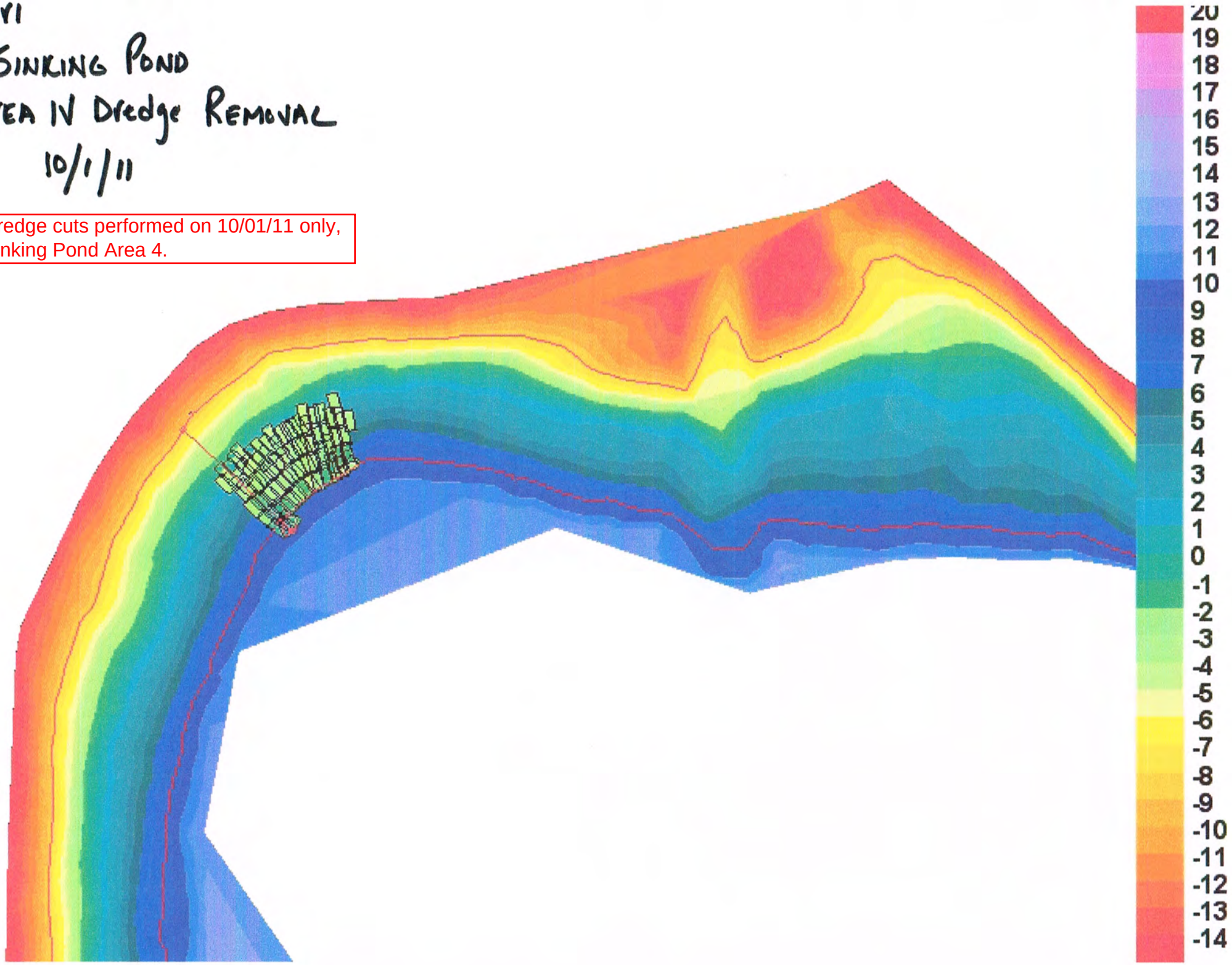
9/30/2011

Cumulative dredge cuts in Sinking Pond as of 9/30/11.



AYI
SINKING POND
AREA IV DREDGE REMOVAL
10/1/11

Dredge cuts performed on 10/01/11 only, Sinking Pond Area 4.

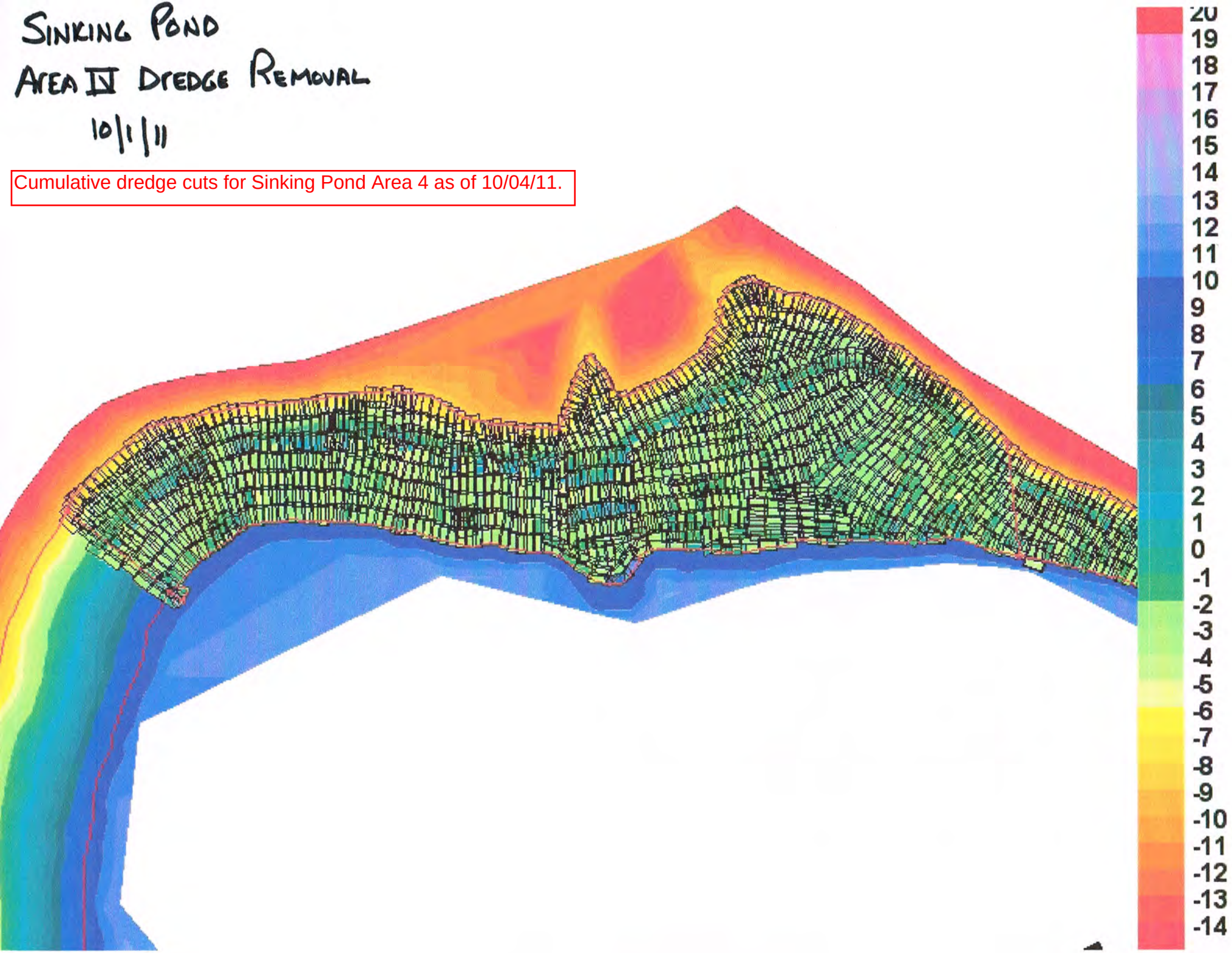


SINKING POND

AREA IV DREDGE REMOVAL

10/1/11

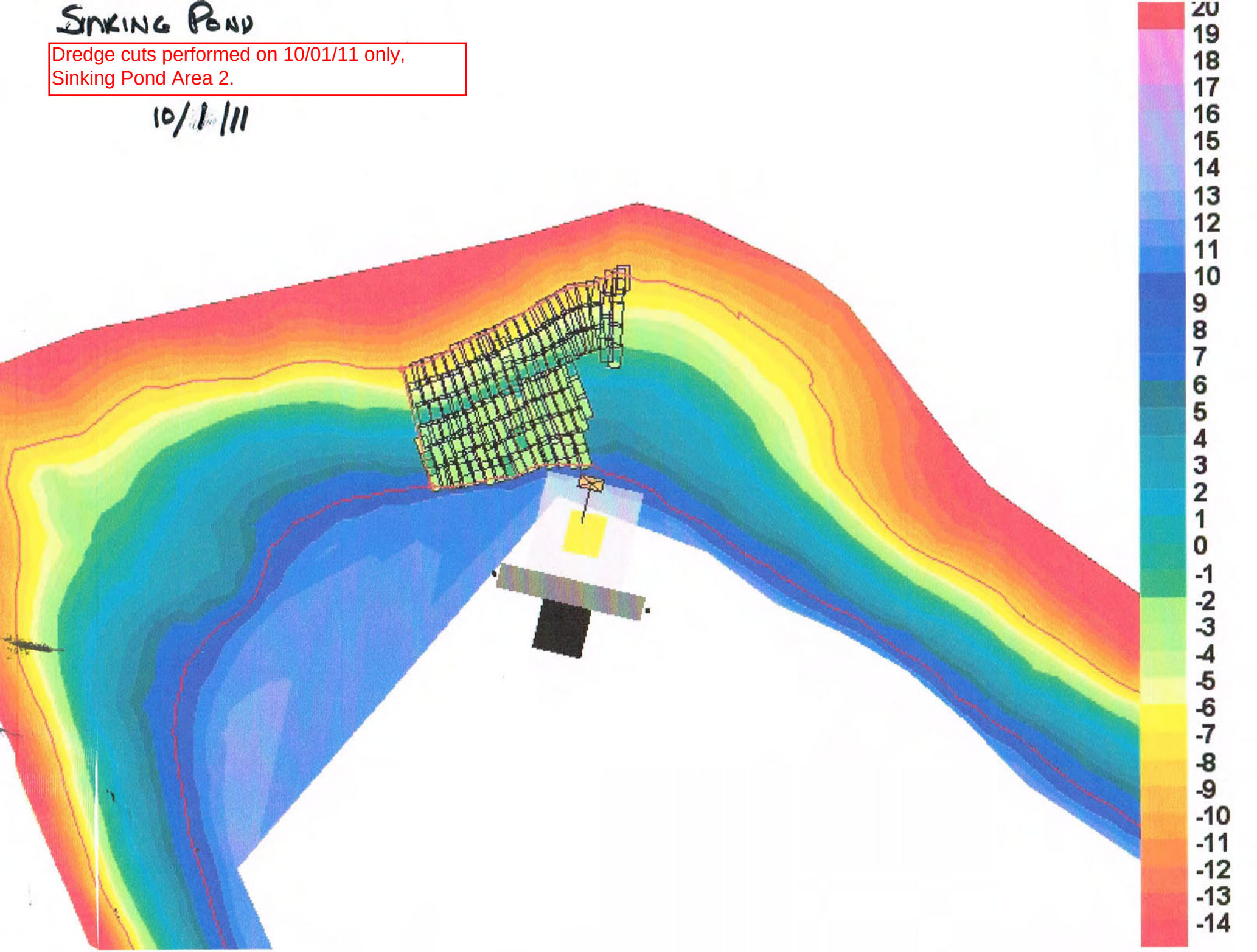
Cumulative dredge cuts for Sinking Pond Area 4 as of 10/04/11.



SINKING POND

Dredge cuts performed on 10/01/11 only,
Sinking Pond Area 2.

10/1/11

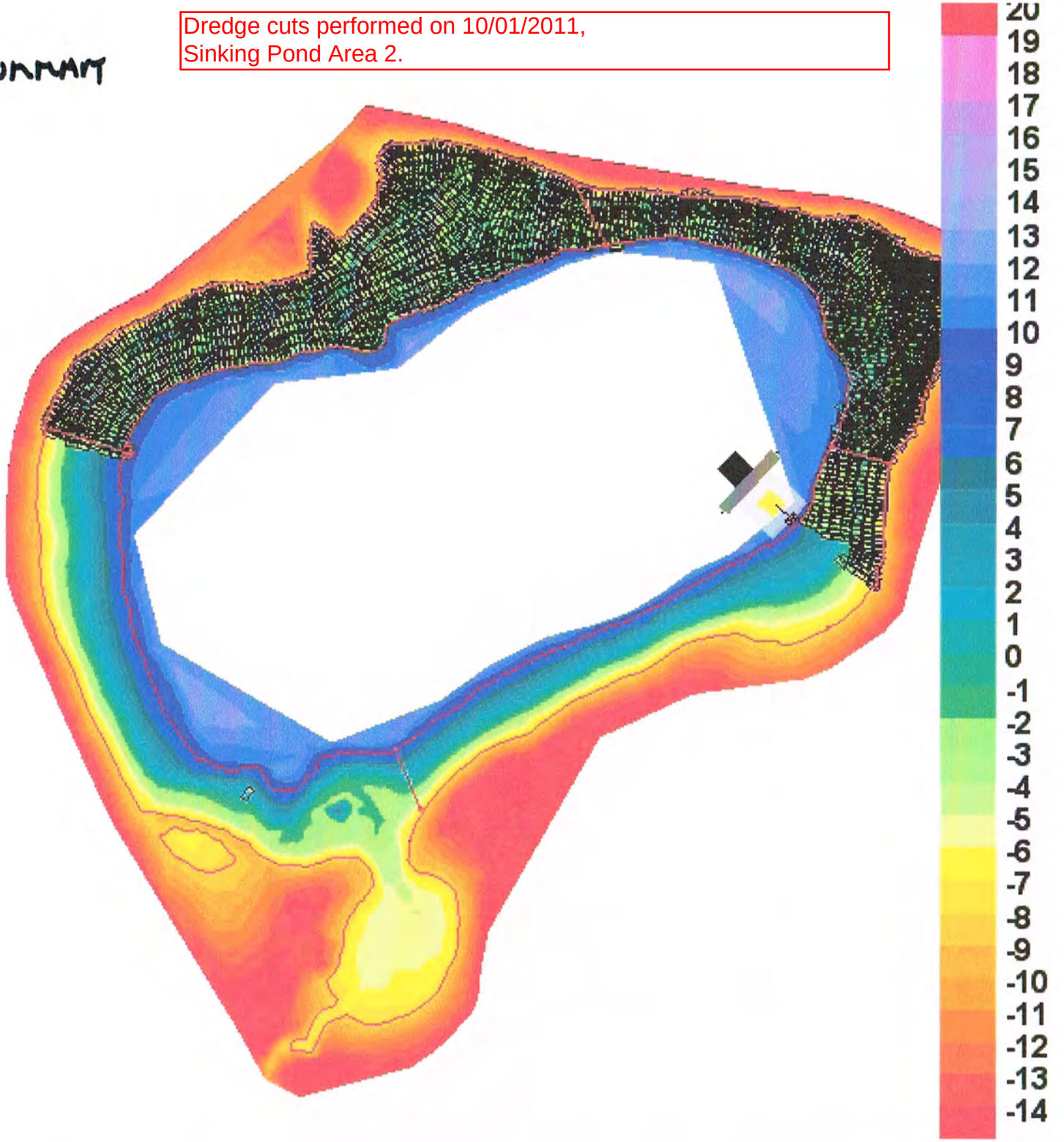


SINKING POND

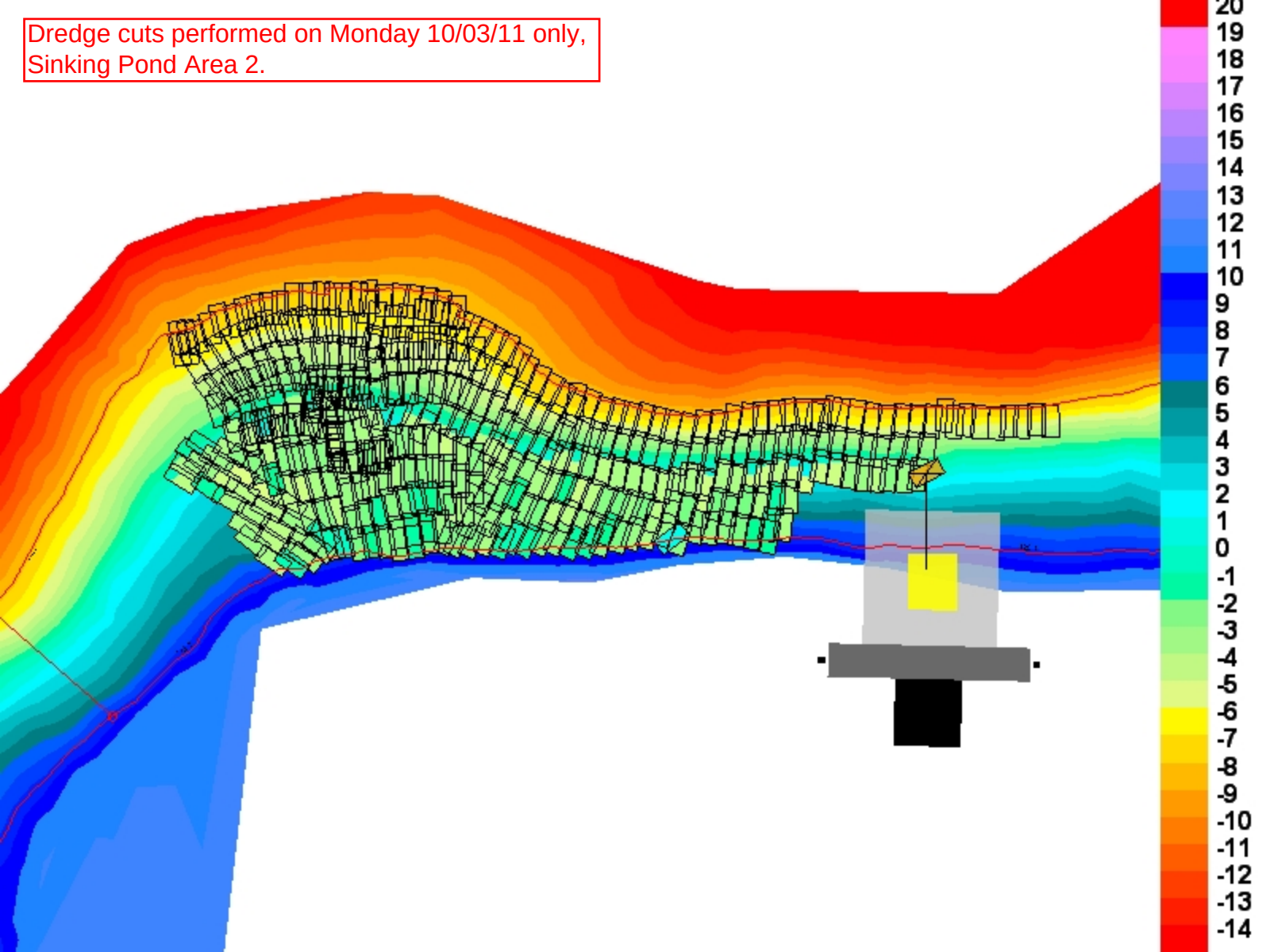
DREDGE AREA REMOVAL SUMMARY

10/1/11

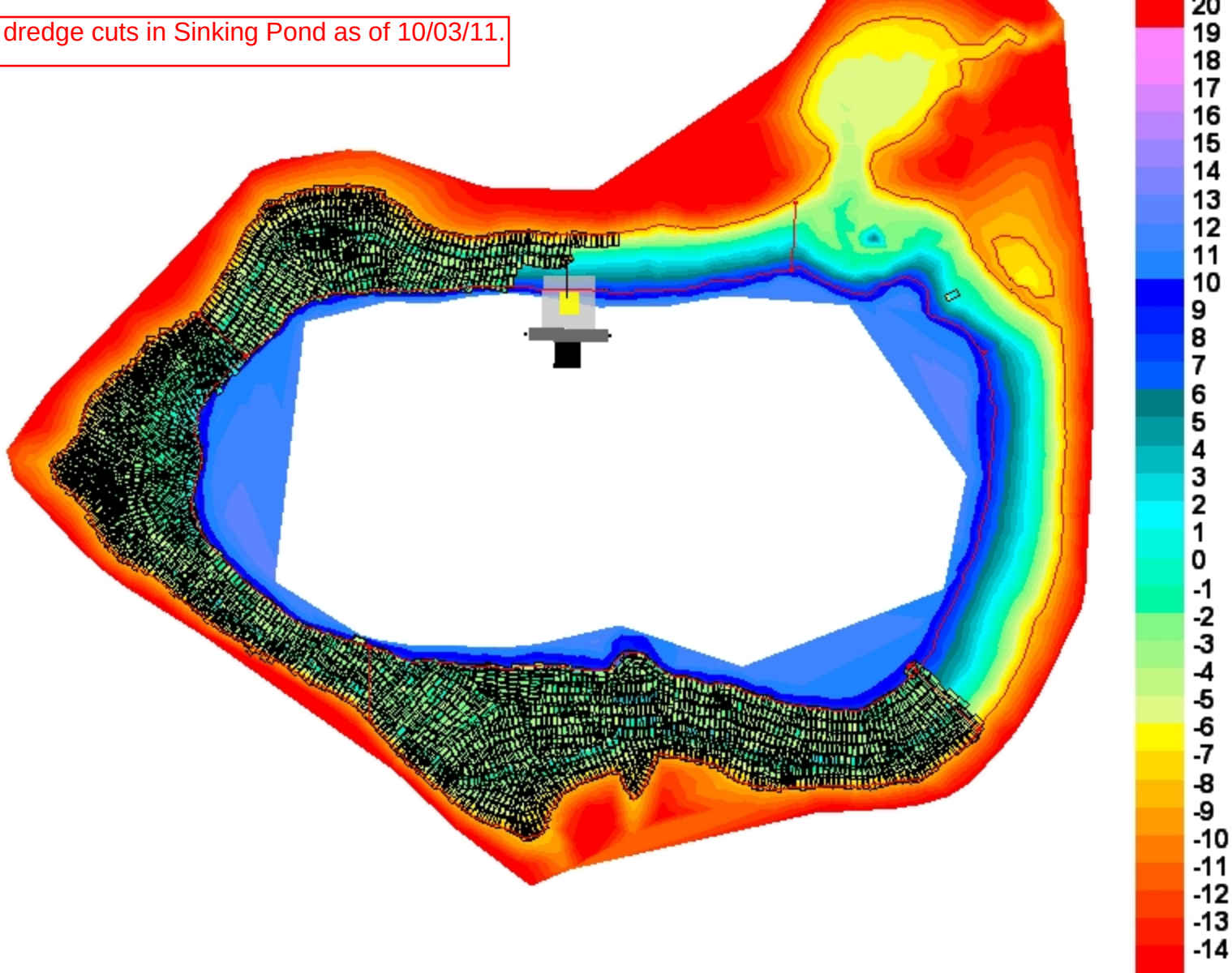
Dredge cuts performed on 10/01/2011,
Sinking Pond Area 2.



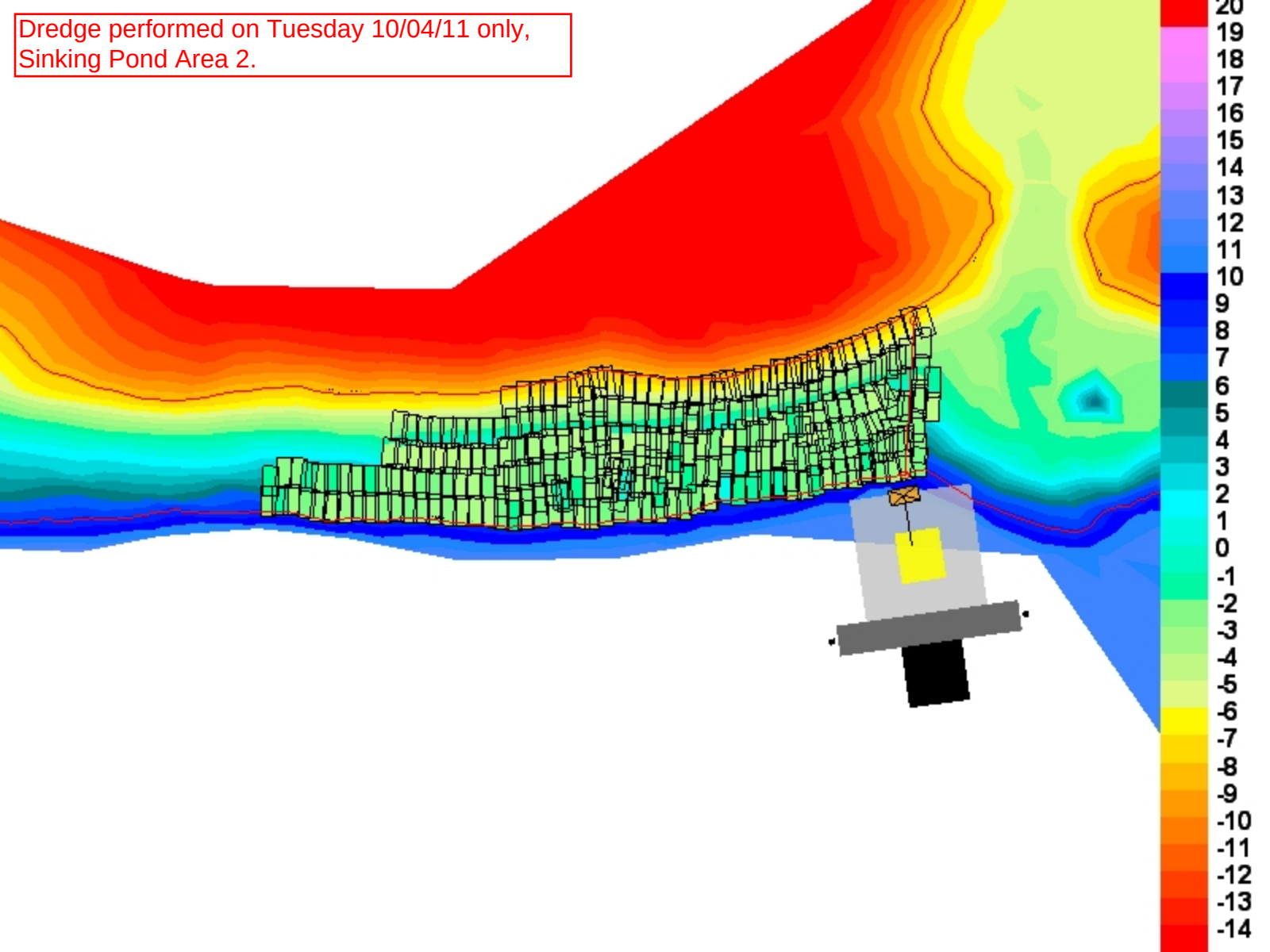
Dredge cuts performed on Monday 10/03/11 only, Sinking Pond Area 2.



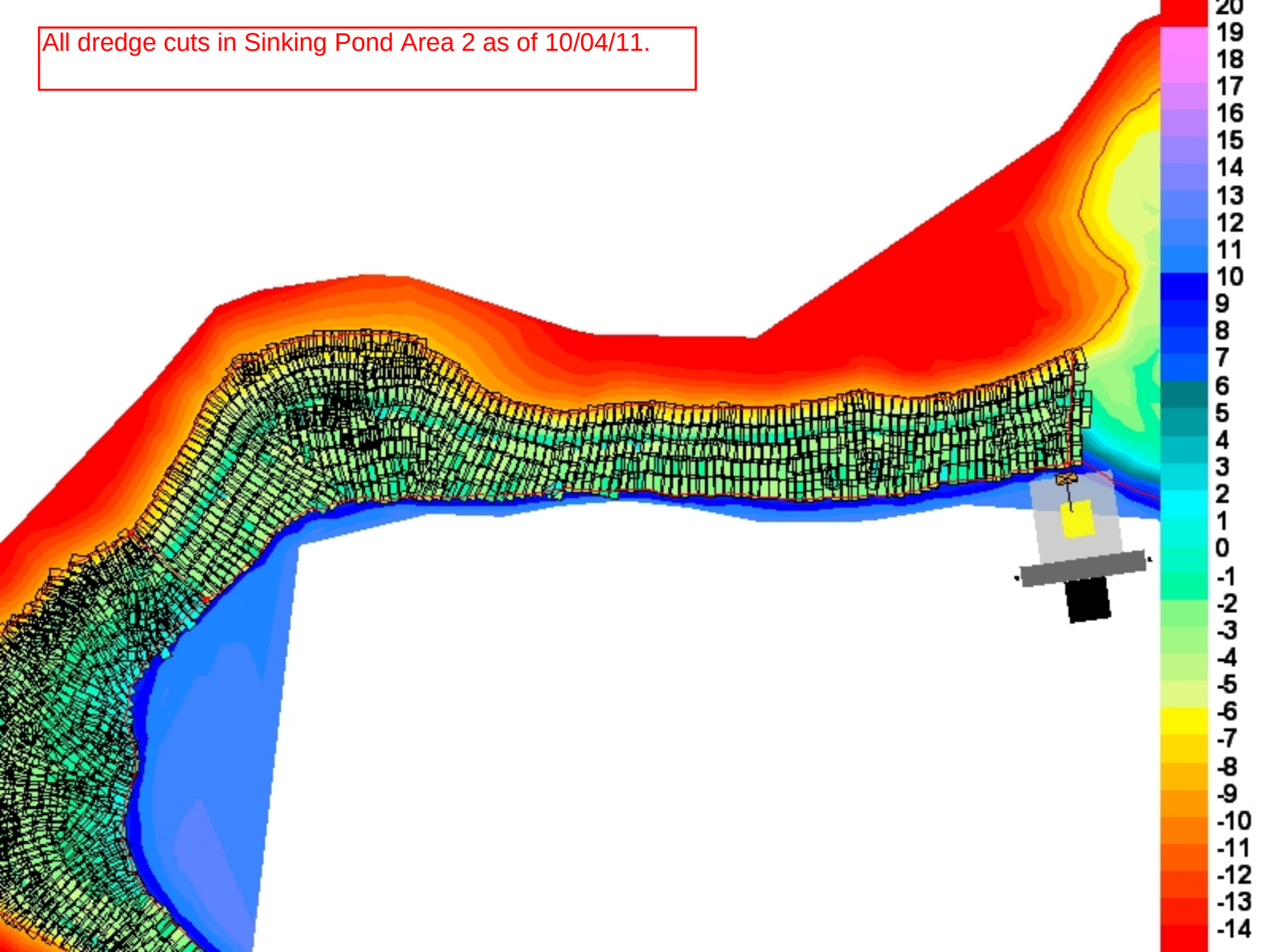
All dredge cuts in Sinking Pond as of 10/03/11.



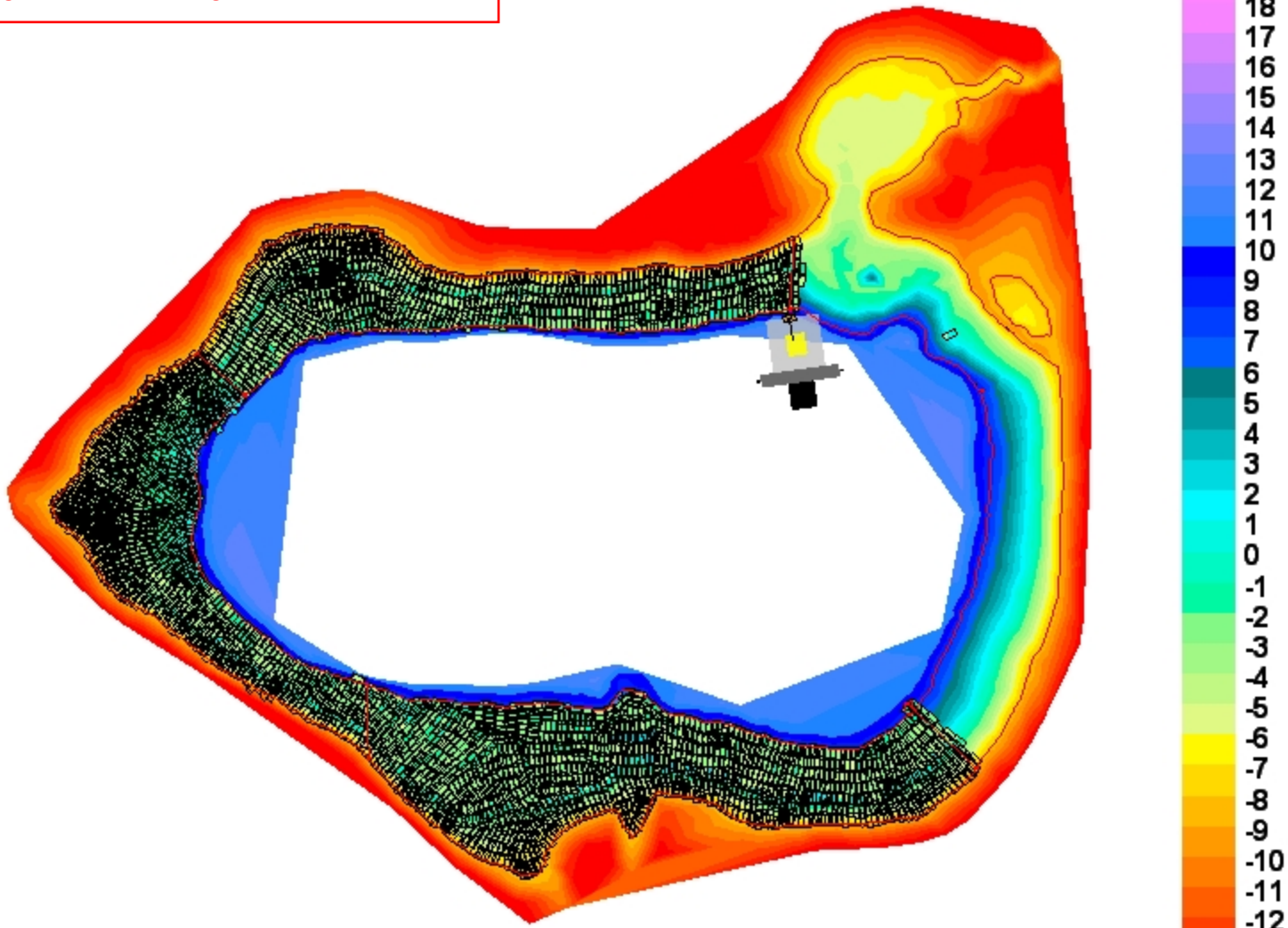
Dredge performed on Tuesday 10/04/11 only,
Sinking Pond Area 2.



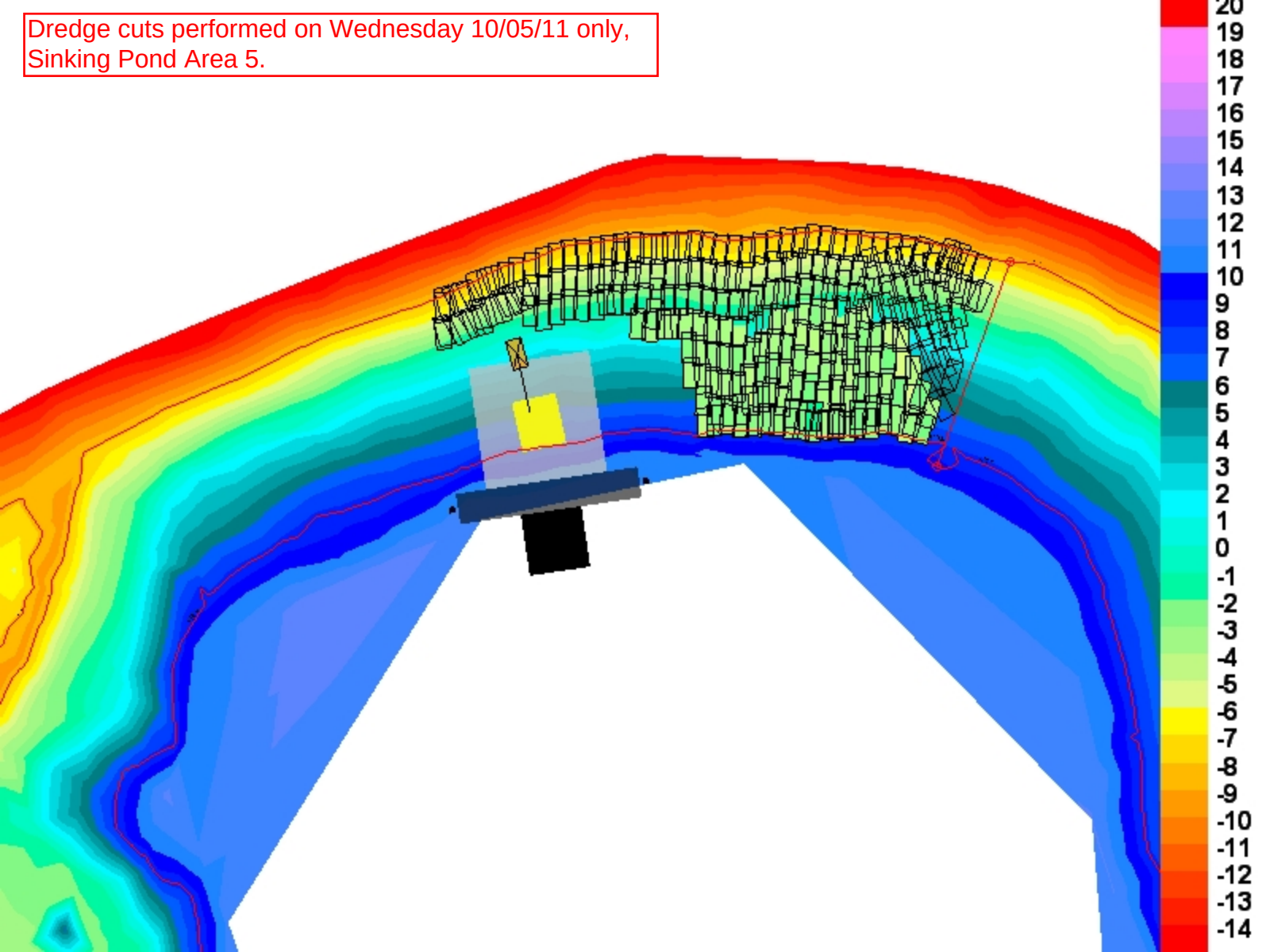
All dredge cuts in Sinking Pond Area 2 as of 10/04/11.



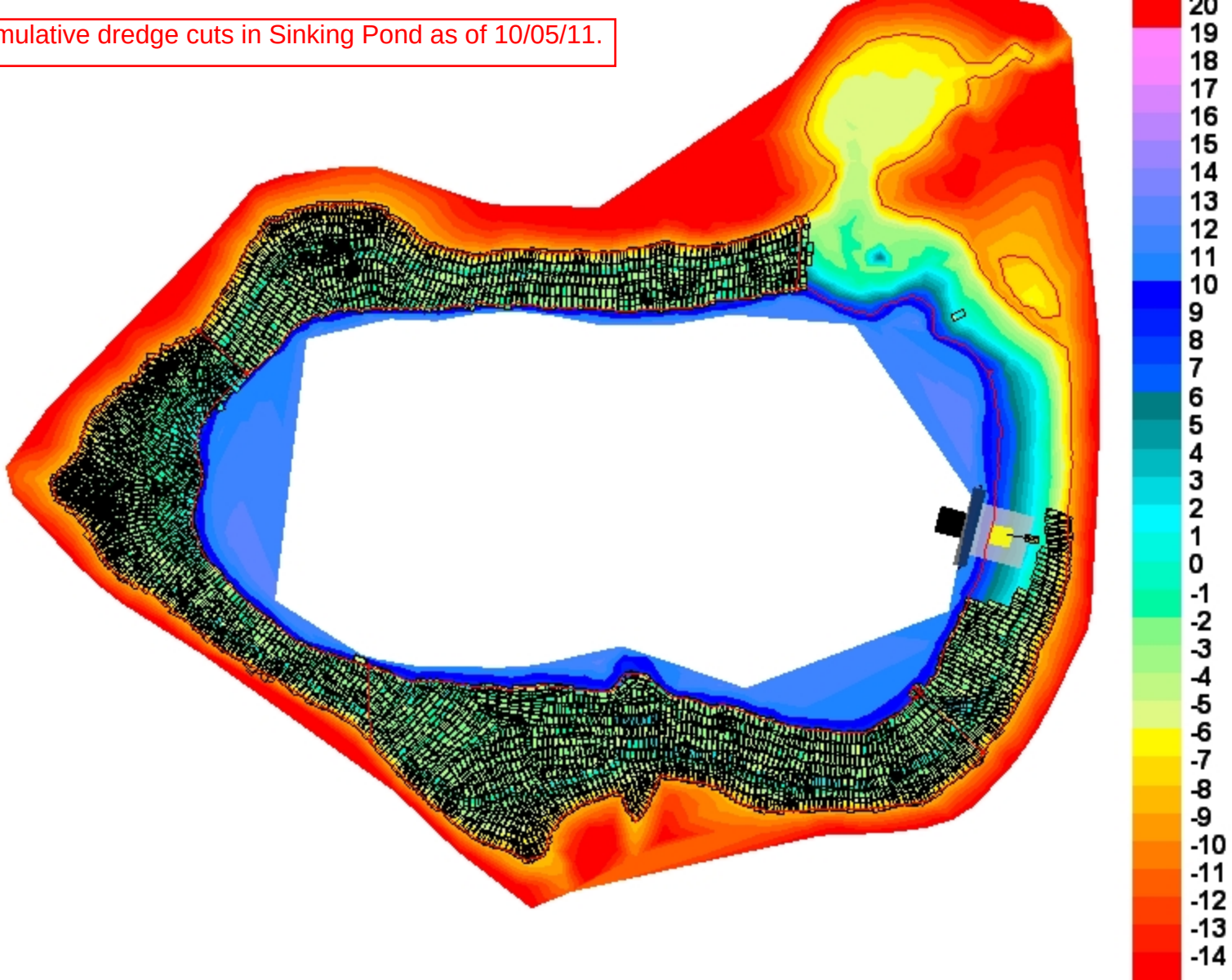
All dredge cuts in Sinking Pond as of 10/04/11.



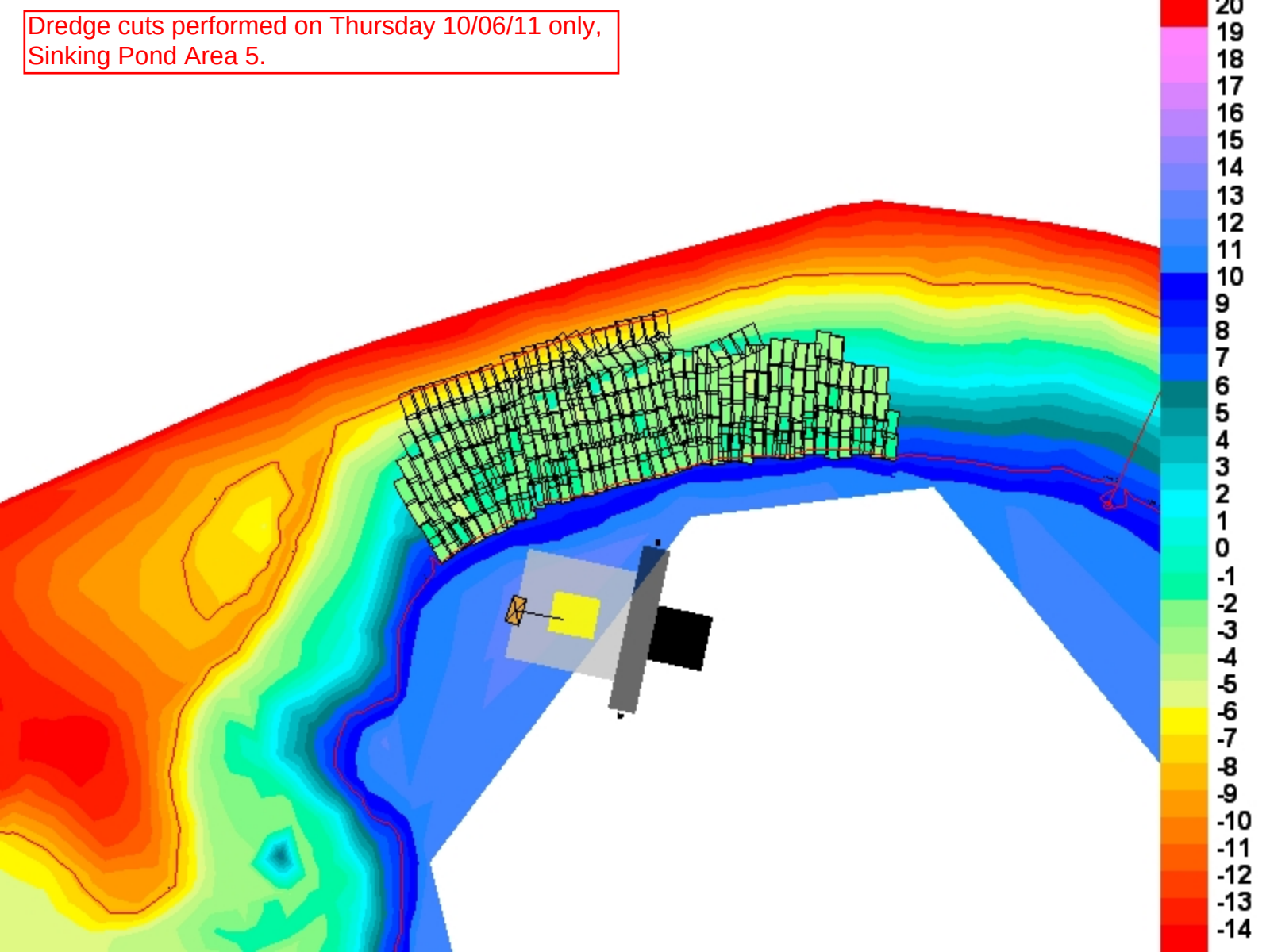
Dredge cuts performed on Wednesday 10/05/11 only, Sinking Pond Area 5.



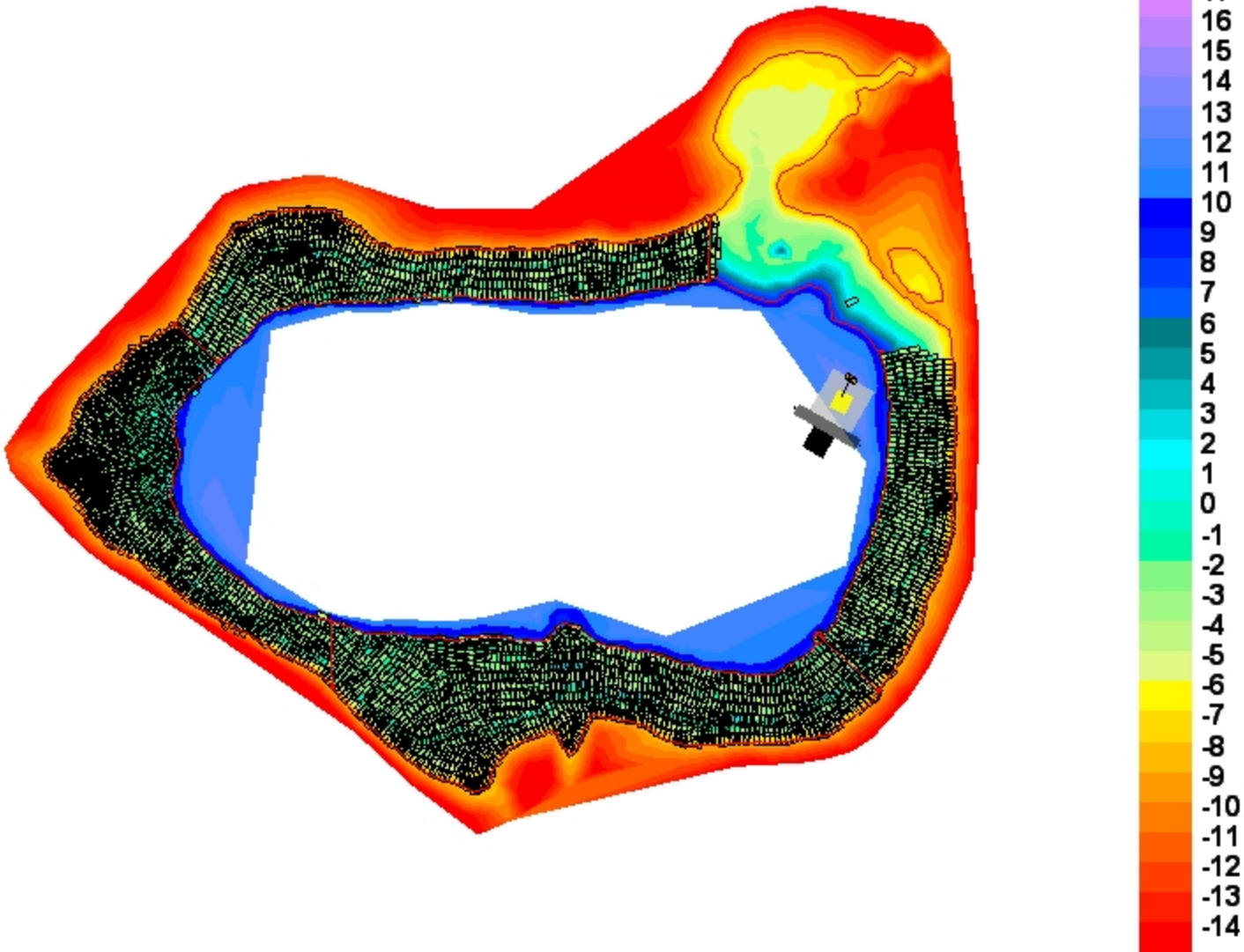
Cumulative dredge cuts in Sinking Pond as of 10/05/11.

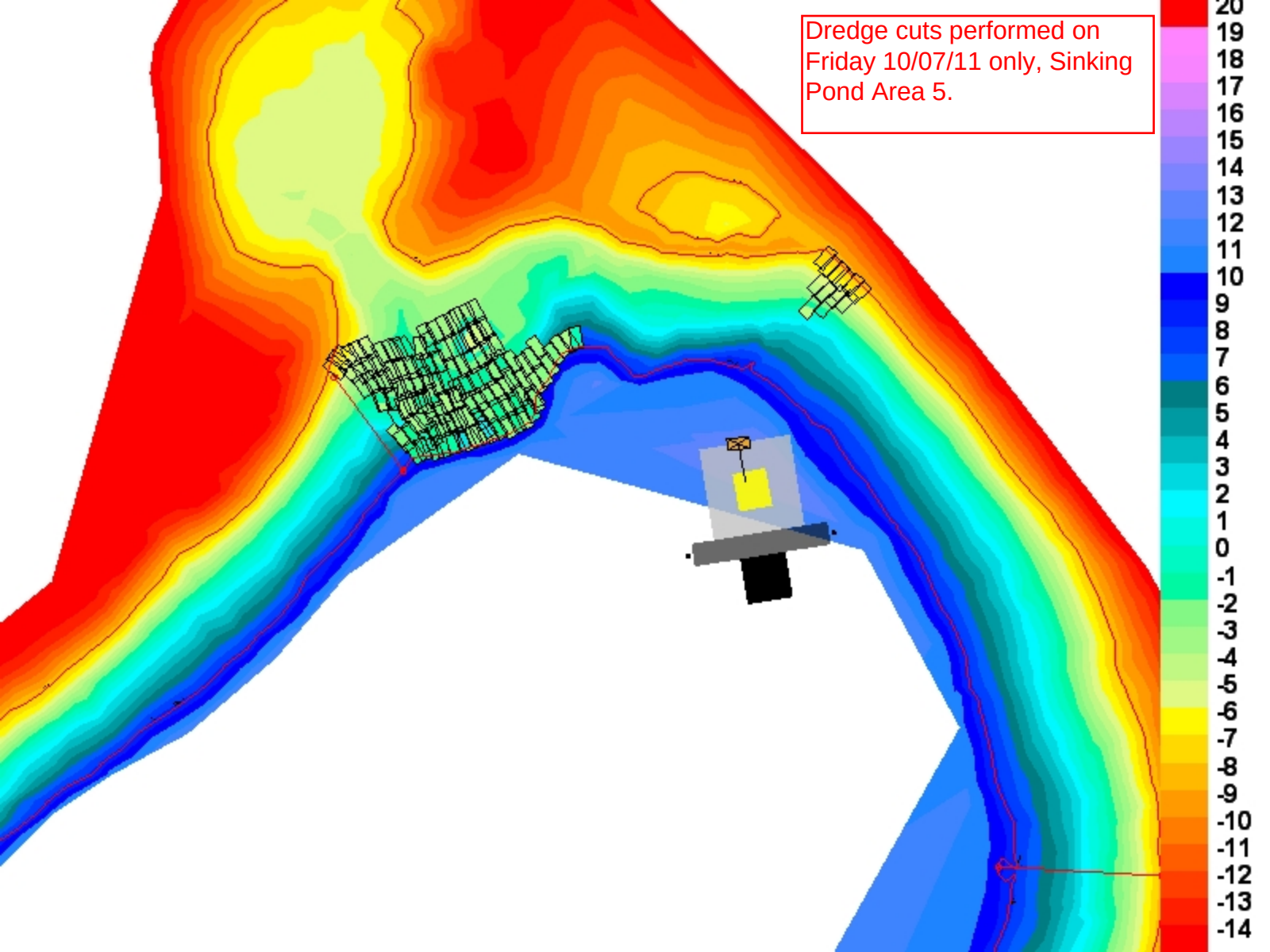


Dredge cuts performed on Thursday 10/06/11 only, Sinking Pond Area 5.



Cumulative dredge cuts in Sinking Pond as of 10/06/11.




Dredge cuts performed on Friday 10/07/11 only, Sinking Pond Area 5.
20
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7
6
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2
1
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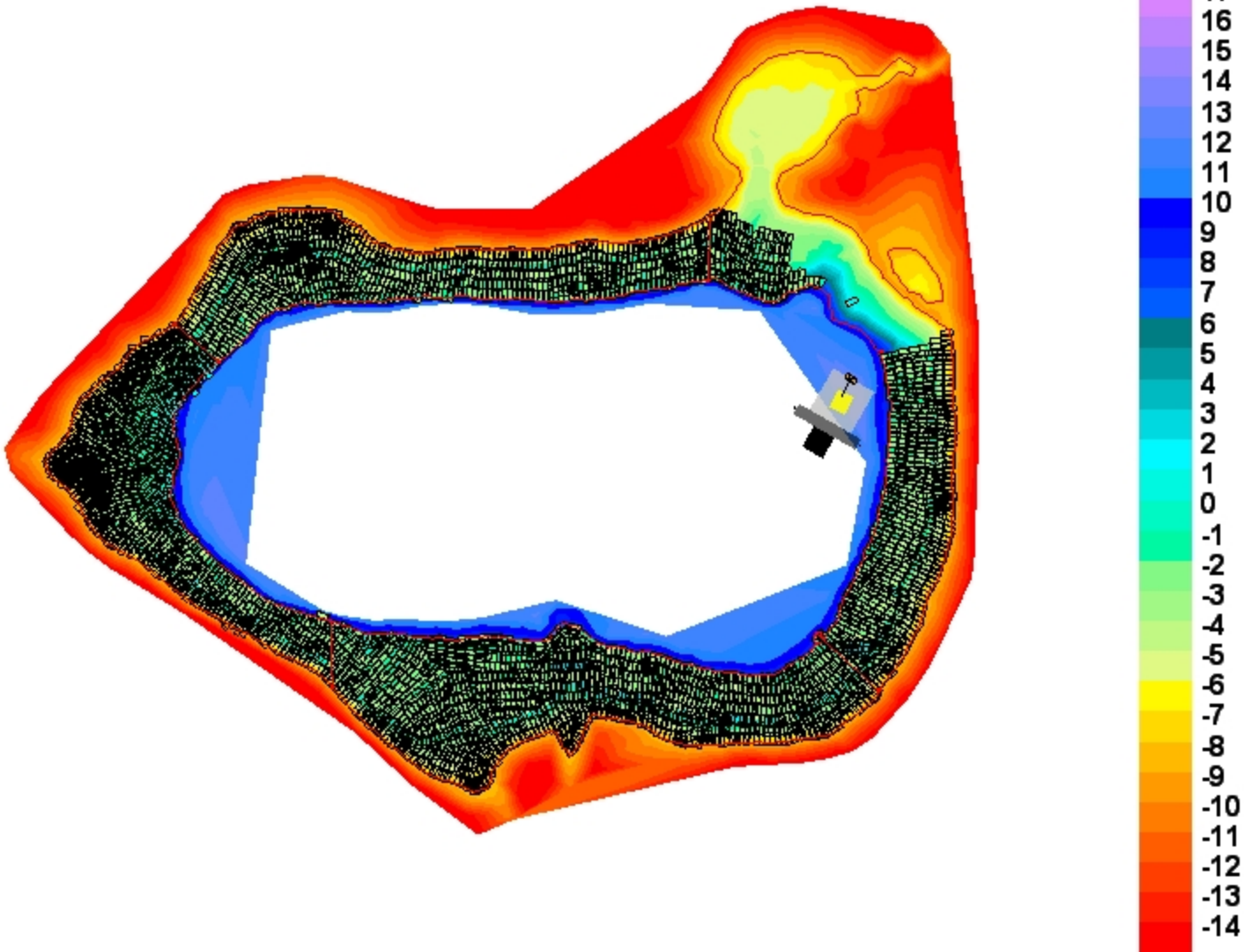
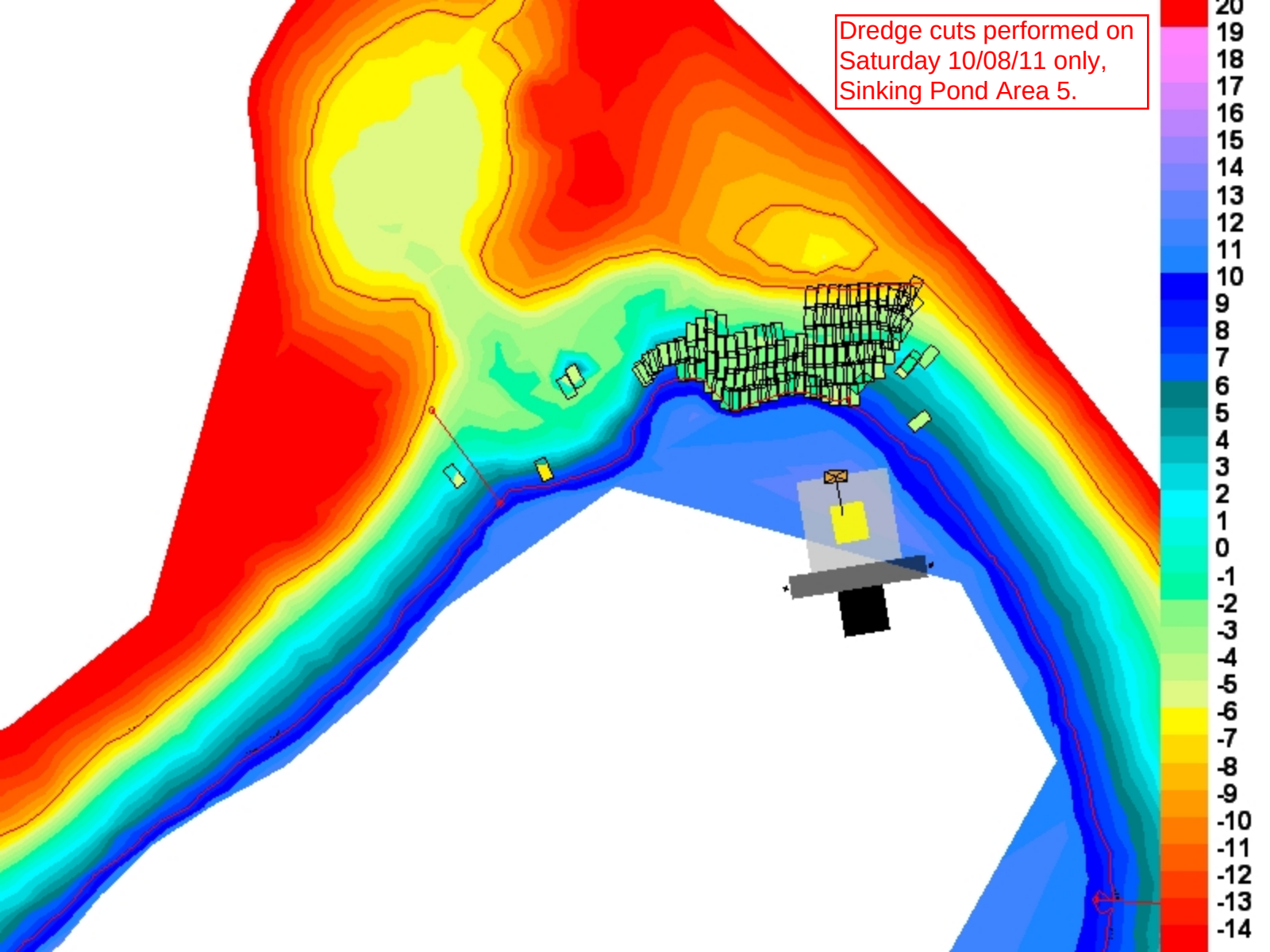
Cumulative dredge cuts in Sinking Pond as of 10/07/11.




Dredge cuts performed on Saturday 10/08/11 only, Sinking Pond Area 5.
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-10
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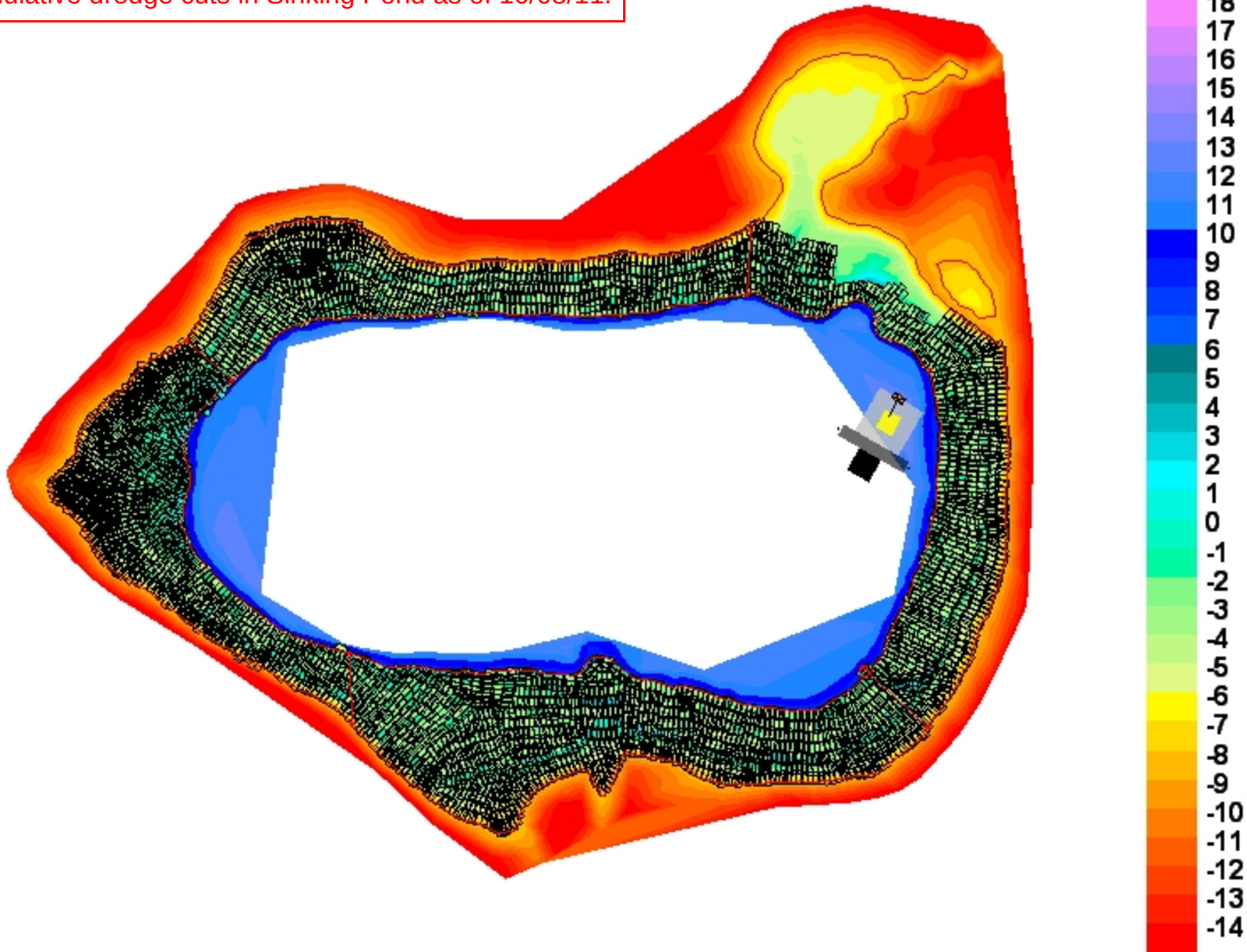
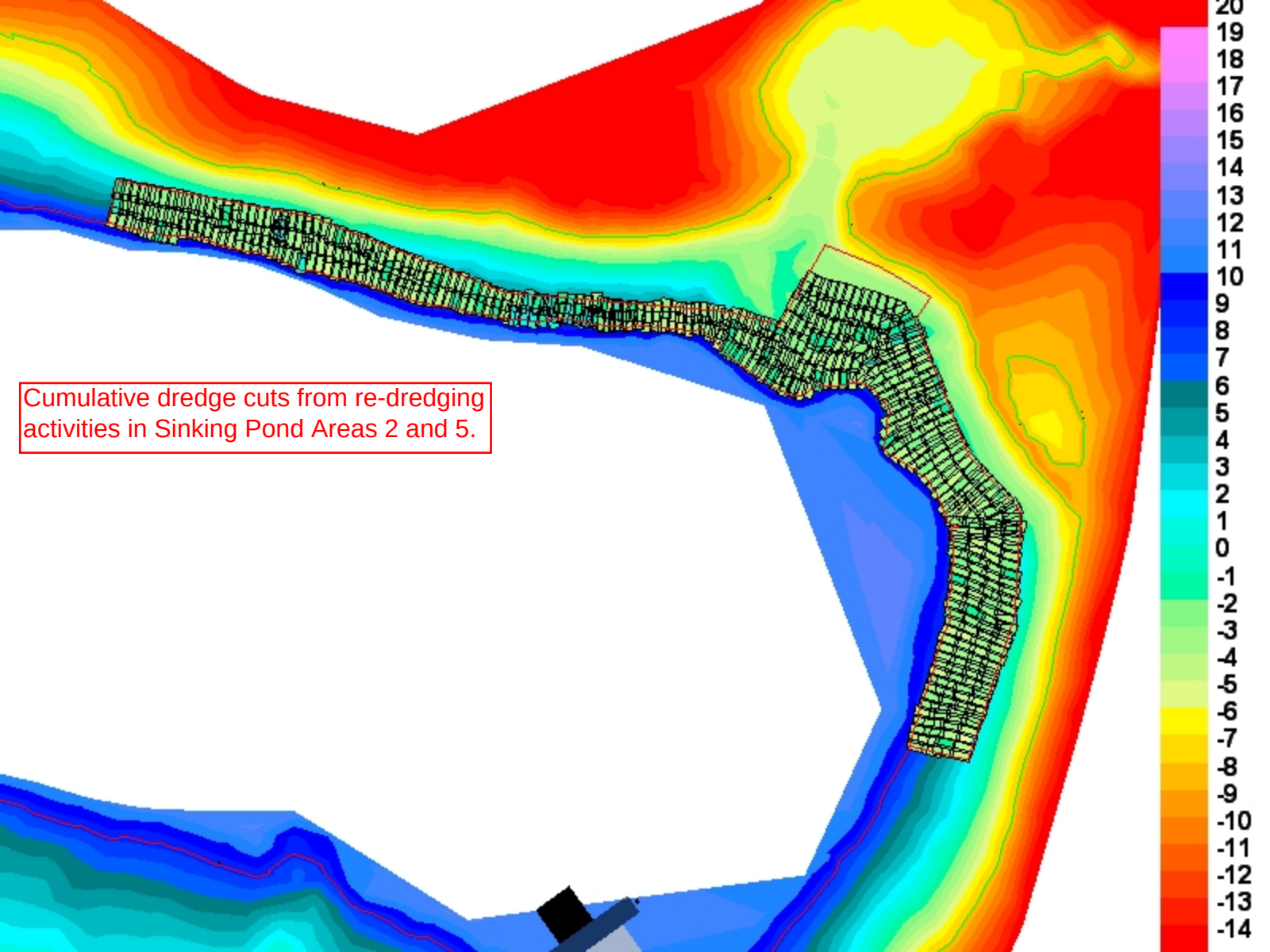
Cumulative dredge cuts in Sinking Pond as of 10/08/11.




Cumulative dredge cuts from re-dredging activities in Sinking Pond Areas 2 and 5.
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Attachment F

Planting Restoration Summary

WR Grace Planting Summary

Scientific Name	Common Name	Inlet to Sinking Pond	Border of Inlet to Sinking Pond	Wooded Swamp (Not Channel)	Lagoon Upland	Sinking Pond Upland	Sinking Pond Staging Area
-Polygonum amphibium	Water Smartweed	50					
-Sagittaria latifolia	Broadleaf Arrowhead	96					
-Potamogeton nodosus	Longleaf Pondweed	42					
-Nuphar luteum	Yellow Water Lilly	100					
-Nymphaea odorata	White Water Lilly	54					
Quercus bicolor	Swamp White Oak		8	22			10
Fraxinus pennsylvanica	Green Ash		5	27			8
Rhododendron viscosum	Swamp Azalea		5	25			10
Acer rubrum	Red Maple		10	20	3	3	14
Aronia melanocarpa	Black Chokeberry		6	24	3	7	10
Fraxinus americana	White Ash				3	7	
Quercus alba	White Oak				3	7	
Gaylussacia baccata	Black Huckleberry				3	7	
Quercus rubra	Red Oak				3	7	
Pinus strobus	White Pine				3	7	
Prunus serotina	Black Cherry				3	7	
Corylus cornuta	Beaked Hazelnut				3	7	
Pinus resinosa	Red Pine				3	3	4
Ilex verticillata	Winterberry		8	20			12
Viburnum dentatum	Arrowwood		3	39	10		8
Cornus amomum	Silky Dogwood		4	26			5
Vaccinium corymbosum	Highbush Blueberry		8	21			6
Clethra alnifolia	Sweet Pepperbush		10	15			10
Sambucus canadensis	Elderberry			15			
Vaccinium angustifolium	Lowbush Blueberry				30	10	
Viburnum acerifolium	Maple-Leaf Viburnum				30	10	

Attachment G

Off-Site Waste Disposal Documentation

Bill of Lading for North Lagoon
Wetland Impacted Materials

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC112

Release Tracking Number
2 - 10

BILL OF LADING (pursuant to 310 CMR 40.0030)

A. LOCATION OF SITE OR DISPOSAL SITE WHERE REMEDIATION WASTE WAS GENERATED:

1. Release Name/Location Aid: **WR GRACE**
2. Street Address: **50 INDEPENDENCE RD**
3. City/Town: **ACTON** 4. Zip Code:
5. ☑ Check her if a Tier Classification Submittal has been provided to DEP for this disposal site:
   ☑ a. Tier 1A ☐ b. Tier 1B ☐ b. Tier 1C ☐ d. Tier II
6. If applicable provide the Permit Number: **NA**

B. THIS FORM IS BEING USED TO: (check one: B1-B4):

☑ 1. Submit a **Bill of Lading (BOL)** to transport Remediation Waste to Temporary Storage or a Receiving Facility. Response Actions associated with this BOL (check all that apply):

- ☐ a. Immediate Response Action (IRA)
- ☐ b. Release Abatement Measure (RAM)
- ☐ c. Downgradient Property Status (DPS)
- ☐ d. Utility Release Abatement Measure (URAM)
- ☐ e. Comprehensive Response Actions
- ☐ f.. Limited Removal Action (LRA): (must be retained pursuant to 310 CMR 40.0034(6); can't be submitted via eDEP)
- ☑ g. Other **SUPERFUND REMEDIAL ACTION**

☐ 2. Submit an Attestation of Completion of **Shipment to Temporary Storage** (Sections C, F and J are not required):

☐ 3. Submit an Attestation of Completion of **Shipment to a Receiving Facility** (Sections C, F and J are not required):

☐ 4. Certify that Remediation Waste Was **Not Shipped, and the Bill of Lading is Void.** (Sections C, D, E, and F are not required)

5. Date Bill of Lading submitted to the Department:_____ (mm/dd/yyyy) b. eDEP Transaction ID:

6. Period of Generation Associated with this Bill of Lading **7/29/2011** (mm/dd/yyyy) to **8/26/2011** (mm/dd/yyyy)

(All sections of this transmittal form must be filled out unless otherwise noted)
The Bill of Lading is not considered complete until the Attestation of Completion of Shipment is received by the Department.

C. DESCRIPTION OF WASTE AND WASTE SOURCE:

1. Contaminated Media /Debris (check all that apply):
   ☑ a. Soil ☐ b. Groundwater ☐ c. Surface Water ☑ d. Sediment ☑ e. Vegetation or Organic Debris
   ☐ f. Demolition/Construction Waste ☐ g. Inorganic Absorbent Materials ☐ h. Other:
2. Uncontainerized Waste (check all that apply):
   ☐ a. Inorganic Absorbent Materials ☐ b. Other:

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BILL OF LADING **(pursuant to 310 CMR 40.0030)**

BWSC112

Release Tracking Number
2 - 10

C. DESCRIPTION OF WASTE AND WASTE SOURCE (cont.):

3. Containerized Waste (check all that apply):

☐ a. Tank Bottoms/Sludges ☐ b. Containers ☐ c. Drums ☐ d. Engineered Impoundments

☐ e. Other:

4. Estimated Quantity: 2000 ☐ Tons ☑ Cu. Yds. ☐ Gallons

5. Contaminant Source (check one):

☐ a. Transportation Accident ☐ b. Underground Storage Tank ☐ c. Brownfields Redevelopment

☑ d. Other: OXIDATION OF NAT. OCCURRING METALS

6. Type of Contaminant (check all that apply):

☐ a. Gasoline ☐ b. Diesel Fuel ☐ c. #2 Fuel Oil ☐ d. #4 Fuel Oil ☐ e. #6 Fuel Oil ☐ f. Jet Fuel

☐ g. Waste Oil ☐ h. Kerosene ☐ i. Chlorinated Solvents ☐ j. Urban Fill ☑ k. Other: METALS

7. Constituents of Concern (check all that apply):

☑ a. As ☐ b. Cd ☐ c. Cr ☐ d. Pb ☐ e. Hg ☐ f. EPH/TPH ☐ g. VPH

☐ h. PCBs ☐ i. VOCs ☐ j. SVOCs ☐ k. Other:

8. If applicable, check the box for the Reportable Concentration Category of the site:

☑ a. RCS-1 ☐ b. RCS-2 ☐ c. RCGW-1 ☐ d. RCGW-2

9. Remediation Waste Characterization Documentation (check at least one):

☐ a. Site History Information ☐ b. Sampling Analytical Methods and Procedures ☑ c. Laboratory Data

☐ d. Field Screening Data ☐ e. Characterization Documentation previously submitted to the Department

i. Date submitted: (mm/dd/yyyy) ii. Type of Documentation:

D. TRANSPORTER OR COMMON CARRIER INFORMATION:

1. Transporter/Common Carrier Name: D.A. COLLINS ENVIRONMENTAL SERVICES LLC

2. Contact First Name: BRUCE 3. Last Name: HEBBEL

4. Street: 269 BALLARD ROAD 5. Title:

6. City/Town: WILTON 7. State: NY 8. Zip Code: 128310000

9. Telephone: 518-664-9855 10. Ext: 11. Fax: 518-664-0925

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC112

Release Tracking Number
2 - 10

BILL OF LADING **(pursuant to 310 CMR 40.0030)**

E. RECEIVING FACILITY/TEMPORARY STORAGE LOCATION:

1. Operator/Facility Name: **WASTE MANAGEMENT - TURNKEY LANDFILL**
2. Contact First Name: **JOYCE** 3. Last Name: **GAUTHIER**
4. Street: **90 ROCHESTER NECK ROAD** 5. Title: **TECHNICAL COORDINATOR**
6. City/Town: **ROCHESTER** 7. State: **NH** 8. Zip Code: **038390000**
9. Telephone: **603-330-2119** 10. Ext: 11. Fax: **603-330-2198**
12. Type of Facility: (Check one)
   a. Temporary Storage i. Period of Temporary Storage: _____ (mm/dd/yyyy) to _____ (mm/dd/yyyy)
   ii. Reason for Temporary Storage:
   ☐ b. Asphalt Batch/Hot Mix ☑ c. Landfill/Disposal ☐ d. Landfill/Structural Fill ☐ e. Landfill/Daily Cover
   ☐ f. Asphalt Batch/Cold Mix ☐ g. Thermal Processing ☐ h. Incinerator ☐ i. Other:
13. Division of Hazardous Waste/Class A Permit Number: **NA**
14. Division of Solid Waste Permit Number: **DES-SW-SP-95001**
15. EPA Identification Number: **NA**

F. LSP SIGNATURE AND STAMP:

I attest under the pains and penalties of perjury that I have personally examined and am familiar with this submittal 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, the assessment action(s) undertaken to characterize the Remediation Waste which is (are) the subject of this submittal for acceptance at the facility identified in this submittal comply with applicable provisions of 310 CMR 40.0000, and such facility is permitted to accept Remediation Waste having the characteristics described 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 #: **8137**
2. First Name: **JEFFREY S** 3. Last Name: **HOLDEN**
4. Telephone: **8606451084** 5. Ext.
6. FAX:
7. Signature: **Jeffrey S Holden**
8. Date: **8/15/2011** (mm/dd/yyyy)
9. LSP Stamp: Commonwealth of Massachusetts Electronic Seal Licensed Site Professional

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC112

BILL OF LADING **(pursuant to 310 CMR 40.0030)**

Release Tracking Number
2 - 10

G. PERSON SUBMITTING BILL OF LADING:

1. Check all that apply: ☐ a. change in contact name ☐ b. Change of address ☑ c. change in person undertaking response actions

2. Name of Organization: **W.R. GRACE**

3. Contact First Name: **THOR** 4. Last Name: **HELGASON**

5. Street: **135 BEAVER STREET** 6. Title: **AGENT FOR GRACE**

7. City/Town: **WALTHAM** 8. State: **MA** 9. Zip Code: **024520000**

10. Telephone: **7816428775** 11. Ext: 12. Fax:

H. RELATIONSHIP TO SITE OF PERSON SUBMITTING BILL OF LADING:

☐ 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 Response Actions: Specify Relationship:

I. REQUIRED ATTACHMENTS AND SUBMITTALS :

☑ 1. 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 approvals issued by DEP or EPA. If the box is checked, you must attach a statement identifying the applicable provisions thereof.

☐ 2. Check here if any non-updatable information provided on this form is incorrect, e. g. property address. Send corrections to BWSC.eDEP@state.ma.us

☑ 3. Check here to certify that the LSP Opinion containing the material facts, data, and other information is attached.

J. CERTIFICATION OF PERSON SUBMITTING BILL OF LADING :

1. I, **Thor Helgason**, attest under the pains and penalties or 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: **Thor Helgason** 3. Title: **PROJECT COORDINATOR**

4. For **W.R. GRACE** 5. Date: **8/9/2011**

(Name of person or entity recorded in Section H) (mm/dd/yyyy)

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BILL OF LADING **(pursuant to 310 CMR 40.0030)**

BWSC112

Release Tracking Number
2 - 10

J. CERTIFICATION OF PERSON SUBMITTING BILL OF LADING (cont.) :

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

7. Street:

8. City/Town: 9. State: 10. Zip Code:

11. Telephone: 12. Ext: 13. Fax:

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 (MassDEP USE ONLY):

Received by DEP on

8/15/2011 5:22:00 PM

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC112

Release Tracking Number
2 - 10

BILL OF LADING (pursuant to 310 CMR 40.0030)

A. LOCATION OF SITE OR DISPOSAL SITE WHERE REMEDIATION WASTE WAS GENERATED:

1. Release Name/Location Aid: **WR GRACE**
2. Street Address: **50 INDEPENDENCE RD**
3. City/Town: **ACTON** 4. Zip Code:
5. ☑ Check her if a Tier Classification Submittal has been provided to DEP for this disposal site:
   ☑ a. Tier 1A ☐ b. Tier 1B ☐ b. Tier 1C ☐ d. Tier II
6. If applicable provide the Permit Number: **NA**

B. THIS FORM IS BEING USED TO: (check one: B1-B4):

☐ 1. Submit a **Bill of Lading (BOL)** to transport Remediation Waste to Temporary Storage or a Receiving Facility. Response Actions associated with this BOL (check all that apply):

- ☐ a. Immediate Response Action (IRA)
- ☐ b. Release Abatement Measure (RAM)
- ☐ c. Downgradient Property Status (DPS)
- ☐ d. Utility Release Abatement Measure (URAM)
- ☐ e. Comprehensive Response Actions
- ☐ f.. Limited Removal Action (LRA): (must be retained pursuant to 310 CMR 40.0034(6); can't be submitted via eDEP)
- ☐ g. Other

☐ 2. Submit an Attestation of Completion of **Shipment to Temporary Storage** (Sections C, F and J are not required):

☑ 3. Submit an Attestation of Completion of **Shipment to a Receiving Facility** (Sections C, F and J are not required):

☐ 4. Certify that Remediation Waste Was **Not Shipped, and the Bill of Lading is Void.** (Sections C, D, E, and F are not required)

5. Date Bill of Lading submitted to the Department: **8/15/2011 5:22:00** (mm/dd/yyyy) b. eDEP Transaction ID: **402980**

6. Period of Generation Associated with this Bill of Lading **7/29/2011** (mm/dd/yyyy) to **8/26/2011** (mm/dd/yyyy)

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

The Bill of Lading is not considered complete until the Attestation of Completion of Shipment is received by the Department.

C. DESCRIPTION OF WASTE AND WASTE SOURCE:

1. Contaminated Media /Debris (check all that apply):

☐ a. Soil ☐ b. Groundwater ☐ c. Surface Water ☐ d. Sediment ☐ e. Vegetation or Organic Debris

☐ f. Demolition/Construction Waste ☐ g. Inorganic Absorbent Materials ☐ h. Other:

2. Uncontainerized Waste (check all that apply):

☐ a. Inorganic Absorbent Materials ☐ b. Other:

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BILL OF LADING **(pursuant to 310 CMR 40.0030)**

BWSC112

Release Tracking Number
2 - 10

C. DESCRIPTION OF WASTE AND WASTE SOURCE (cont.):

3. Containerized Waste (check all that apply):

☐ a. Tank Bottoms/Sludges ☐ b. Containers ☐ c. Drums ☐ d. Engineered Impoundments

☐ e. Other:

4. Estimated Quantity: ☐ Tons ☐ Cu. Yds. ☐ Gallons

5. Contaminant Source (check one):

☐ a. Transportation Accident ☐ b. Underground Storage Tank ☐ c. Brownfields Redevelopment

☐ d. Other:

6. Type of Contaminant (check all that apply):

☐ a. Gasoline ☐ b. Diesel Fuel ☐ c. #2 Fuel Oil ☐ d. #4 Fuel Oil ☐ e. #6 Fuel Oil ☐ f. Jet Fuel

☐ g. Waste Oil ☐ h. Kerosene ☐ i. Chlorinated Solvents ☐ j. Urban Fill ☐ k. Other:

7. Constituents of Concern (check all that apply):

☐ a. As ☐ b. Cd ☐ c. Cr ☐ d. Pb ☐ e. Hg ☐ f. EPH/TPH ☐ g. VPH

☐ h. PCBs ☐ i. VOCs ☐ j. SVOCs ☐ k. Other:

8. If applicable, check the box for the Reportable Concentration Category of the site:

☐ a. RCS-1 ☐ b. RCS-2 ☐ c. RCGW-1 ☐ d. RCGW-2

9. Remediation Waste Characterization Documentation (check at least one):

☐ a. Site History Information ☐ b. Sampling Analytical Methods and Procedures ☐ c. Laboratory Data

☐ d. Field Screening Data ☐ e. Characterization Documentation previously submitted to the Department

i. Date submitted: (mm/dd/yyyy) ii. Type of Documentation:

D. TRANSPORTER OR COMMON CARRIER INFORMATION:

1. Transporter/Common Carrier Name: **D.A. COLLINS ENVIRONMENTAL LLC**

2. Contact First Name: **BRUCE** 3. Last Name: **HEBBEL**

4. Street: **269 BALLARD ROAD** 5. Title: **PROJECT MANAGER**

6. City/Town: **WILTON** 7. State: **NY** 8. Zip Code: **128310000**

9. Telephone: **518-664-9855** 10. Ext: 11. Fax: **518-664-0925**

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC112

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BILL OF LADING **(pursuant to 310 CMR 40.0030)**

E. RECEIVING FACILITY/TEMPORARY STORAGE LOCATION:

1. Operator/Facility Name: **WASTE MANAGEMENT - TURNKEY LANDFILL**
2. Contact First Name: **JOYCE** 3. Last Name: **GAUTHIER**
4. Street: **90 ROCHESTER NECK ROAD** 5. Title: **TECHNICAL COORDINATOR**
6. City/Town: **ROCHESTER** 7. State: **NH** 8. Zip Code: **038390000**
9. Telephone: **603-330-2119** 10. Ext: 11. Fax: **603-330-2198**
12. Type of Facility: (Check one)

a. Temporary Storage i. Period of Temporary Storage: _____ (mm/dd/yyyy) to _____ (mm/dd/yyyy)

ii. Reason for Temporary Storage:

☐ b. Asphalt Batch/Hot Mix ☑ c. Landfill/Disposal ☐ d. Landfill/Structural Fill ☐ e. Landfill/Daily Cover

☐ f. Asphalt Batch/Cold Mix ☐ g. Thermal Processing ☐ h. Incinerator ☐ i. Other:

13. Division of Hazardous Waste/Class A Permit Number: **NA**
14. Division of Solid Waste Permit Number: **DES-SW-SP-95001**
15. EPA Identification Number: **NA**

F. LSP SIGNATURE AND STAMP:

I attest under the pains and penalties of perjury that I have personally examined and am familiar with this submittal 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, the assessment action(s) undertaken to characterize the Remediation Waste which is (are) the subject of this submittal for acceptance at the facility identified in this submittal comply with applicable provisions of 310 CMR 40.0000, and such facility is permitted to accept Remediation Waste having the characteristics described 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 #:
2. First Name: 3. Last Name:
4. Telephone: 5. Ext.
6. FAX:
7. Signature:
8. Date: (mm/dd/yyyy)
9. LSP Stamp:

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC112

BILL OF LADING **(pursuant to 310 CMR 40.0030)**

Release Tracking Number
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G. PERSON SUBMITTING BILL OF LADING:

1. Check all that apply: ☐ a. change in contact name ☐ b. Change of address ☐ c. change in person undertaking response actions

2. Name of Organization: W.R. GRACE

3. Contact First Name: THOR 4. Last Name: HELGASON

5. Street: 135 BEAVER STREET 6. Title: AGENT FOR GRACE

7. City/Town: WALTHAM 8. State: MA 9. Zip Code: 024520000

10. Telephone: 7816428775 11. Ext: 12. Fax:

H. RELATIONSHIP TO SITE OF PERSON SUBMITTING BILL OF LADING:

☐ 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 Response Actions: Specify Relationship:

I. REQUIRED ATTACHMENTS AND SUBMITTALS :

☐ 1. 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 approvals issued by DEP or EPA. If the box is checked, you must attach a statement identifying the applicable provisions thereof.

☐ 2. Check here if any non-updatable information provided on this form is incorrect, e. g. property address. Send corrections to BWSC.eDEP@state.ma.us

☐ 3. Check here to certify that the LSP Opinion containing the material facts, data, and other information is attached.

J. CERTIFICATION OF PERSON SUBMITTING BILL OF LADING :

1. I, _____, attest under the pains and penalties or 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:

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

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BILL OF LADING **(pursuant to 310 CMR 40.0030)**

BWSC112

Release Tracking Number
2 - 10

J. CERTIFICATION OF PERSON SUBMITTING BILL OF LADING (cont.) :

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

7. Street:

8. City/Town: 9. State: 10. Zip Code:

11. Telephone: 12. Ext: 13. Fax:

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 (MassDEP USE ONLY):

Received by DEP on

10/7/2011 6:00:19 PM

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC112A

BILL OF LADING **(pursuant to 310 CMR 40.0030)**

Release Tracking Number

SUMMARY OF SHIPMENT SHEET 1 **OF** 1

2 - 10

A. SUMMARY OF SHIPMENT (To be filled out by the receiving facility upon receipt of Remediation Waste):

1. Date of Shipment: (mm/dd/yyyy)	2. Date of Receipt: (mm/dd/yyyy)	3. Number of Loads Shipped:	4. Daily Volume Shipped: ☐ yds³ ☑ tons ☐ gals
8/23/2011	8/23/2011	8	255.24
8/24/2011	8/24/2011	17	544.15
8/25/2011	8/25/2011	14	445.68
8/26/2011	8/26/2011	6	196.58
8/30/2011	8/30/2011	14	457.20
8/31/2011	8/31/2011	11	350.57
9/1/2011	9/1/2011	5	142.79
5. Totals Recorded on this Summary of Shipment Sheet:		75	2392.21

B. ☐ Check here if additional BWSC112A BOL Summary Sheets are needed.

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC112B

Release Tracking Number

2 - 10

BILL OF LADING **(pursuant to 310 CMR 40.0030)**
SUMMARY SHEET SIGNATURE PAGE

A. ACKNOWLEDGEMENT OF RECEIPT OF REMEDIATION WASTE AT RECEIVING FACILITY OR TEMPORARY STORAGE:

1. I, **John E Nadeau**, attest under the pains and penalties or 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: **John E Nadeau** 3. Title: **DISTRICT MANAGER**

4. For: **WASTE MANAGEMENT - TURNEY LANDFILL** 5. Date: **9/26/2011** (mm/dd/yyyy)

6. Date of Final Shipment associated with this Bill of Lading: **9/1/2011** (mm/dd/yyyy)

B. ACKNOWLEDGEMENT OF SHIPMENT AND RECEIPT OF REMEDIATION WASTE BY PERSON CONDUCTING RESPONSE ACTIONS ASSOCIATED WITH THIS BILL OF LADING:

1. I, **Thor Helgason**, attest under the pains and penalties or 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: **Thor Helgason** 3. Title: **AGENT FOR GRACE**

4. For: **W.R. GRACE** (Name of person or entity recorded in Section G 5. Date: **10/7/2011** (mm/dd/yyyy)

☐ 6. Check here if the address of the person providing certification is different from address recorded in BWSC112 Section H.

7. Street: _____

8. City/Town: _____ 9. State: _____ 10. Zip Code: _____

11. Telephone: _____ 12. Ext: _____ 13. Fax: _____

☐ 14. Check here if attaching optional supporting documentation such as copies of Load Information Summary Sheets

Bill of Lading for Sinking Pond Impacted Materials

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC112

Release Tracking Number
2 - 10

BILL OF LADING (pursuant to 310 CMR 40.0030)

A. LOCATION OF SITE OR DISPOSAL SITE WHERE REMEDIATION WASTE WAS GENERATED:

1. Release Name/Location Aid: **WR GRACE**
2. Street Address: **50 INDEPENDENCE RD**
3. City/Town: **ACTON** 4. Zip Code:
- [x] 5. Check her if a Tier Classification Submittal has been provided to DEP for this disposal site:
  - [x] a. Tier 1A [ ] b. Tier 1B [ ] b. Tier 1C [ ] d. Tier II
6. If applicable provide the Permit Number: **NA**

B. THIS FORM IS BEING USED TO: (check one: B1-B4):

- [x] 1. Submit a **Bill of Lading (BOL)** to transport Remediation Waste to Temporary Storage or a Receiving Facility. Response Actions associated with this BOL (check all that apply):
  - [ ] a. Immediate Response Action (IRA)
  - [ ] b. Release Abatement Measure (RAM)
  - [ ] c. Downgradient Property Status (DPS)
  - [ ] d. Utility Release Abatement Measure (URAM)
  - [ ] e. Comprehensive Response Actions
  - [ ] f.. Limited Removal Action (LRA): (must be retained pursuant to 310 CMR 40.0034(6); can't be submitted via eDEP)
  - [x] g. Other **SUPERFUND REMEDIAL ACTION**
- [ ] 2. Submit an Attestation of Completion of **Shipment to Temporary Storage** (Sections C, F and J are not required):
- [ ] 3. Submit an Attestation of Completion of **Shipment to a Receiving Facility** (Sections C, F and J are not required):
- [ ] 4. Certify that Remediation Waste Was **Not Shipped, and the Bill of Lading is Void.** (Sections C, D, E, and F are not required)

5. Date Bill of Lading submitted to the Department:_____ (mm/dd/yyyy) b. eDEP Transaction ID:

6. Period of Generation Associated with this Bill of Lading **9/2/2011** (mm/dd/yyyy) to **11/30/2011** (mm/dd/yyyy)

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

The Bill of Lading is not considered complete until the Attestation of Completion of Shipment is received by the Department.

C. DESCRIPTION OF WASTE AND WASTE SOURCE:

1. Contaminated Media /Debris (check all that apply):
   - [x] a. Soil [ ] b. Groundwater [ ] c. Surface Water [x] d. Sediment [x] e. Vegetation or Organic Debris
   - [ ] f. Demolition/Construction Waste [ ] g. Inorganic Absorbent Materials [ ] h. Other:
2. Uncontainerized Waste (check all that apply):
   - [ ] a. Inorganic Absorbent Materials [ ] b. Other:

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BILL OF LADING **(pursuant to 310 CMR 40.0030)**

BWSC112

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C. DESCRIPTION OF WASTE AND WASTE SOURCE (cont.):

3. Containerized Waste (check all that apply):

☐ a. Tank Bottoms/Sludges ☐ b. Containers ☐ c. Drums ☐ d. Engineered Impoundments

☐ e. Other:

4. Estimated Quantity: 6000 ☐ Tons ☑ Cu. Yds. ☐ Gallons

5. Contaminant Source (check one):

☐ a. Transportation Accident ☐ b. Underground Storage Tank ☐ c. Brownfields Redevelopment

☑ d. Other: OXIDATION OF NAT. OCCURRING METALS

6. Type of Contaminant (check all that apply):

☐ a. Gasoline ☐ b. Diesel Fuel ☐ c. #2 Fuel Oil ☐ d. #4 Fuel Oil ☐ e. #6 Fuel Oil ☐ f. Jet Fuel

☐ g. Waste Oil ☐ h. Kerosene ☐ i. Chlorinated Solvents ☐ j. Urban Fill ☑ k. Other: METALS

7. Constituents of Concern (check all that apply):

☑ a. As ☐ b. Cd ☐ c. Cr ☐ d. Pb ☐ e. Hg ☐ f. EPH/TPH ☐ g. VPH

☐ h. PCBs ☐ i. VOCs ☐ j. SVOCs ☐ k. Other:

8. If applicable, check the box for the Reportable Concentration Category of the site:

☑ a. RCS-1 ☐ b. RCS-2 ☐ c. RCGW-1 ☐ d. RCGW-2

9. Remediation Waste Characterization Documentation (check at least one):

☐ a. Site History Information ☐ b. Sampling Analytical Methods and Procedures ☑ c. Laboratory Data

☐ d. Field Screening Data ☐ e. Characterization Documentation previously submitted to the Department

i. Date submitted: (mm/dd/yyyy) ii. Type of Documentation:

D. TRANSPORTER OR COMMON CARRIER INFORMATION:

1. Transporter/Common Carrier Name: D.A. COLLINS ENVIRONMENTAL SERVICES LLC

2. Contact First Name: BRUCE 3. Last Name: HEBBEL

4. Street: 269 BALLARD ROAD 5. Title:

6. City/Town: WILTON 7. State: NY 8. Zip Code: 128310000

9. Telephone: 5186649855 10. Ext: 11. Fax: 5186640925

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC112

Release Tracking Number
2 - 10

BILL OF LADING **(pursuant to 310 CMR 40.0030)**

E. RECEIVING FACILITY/TEMPORARY STORAGE LOCATION:

1. Operator/Facility Name: **WASTE MANAGEMENT - TURNKEY LANDFILL**
2. Contact First Name: **JOYCE** 3. Last Name: **GAUTHIER**
4. Street: **90 ROCHESTER NECK ROAD** 5. Title: **TECHNICAL COORDINATOR**
6. City/Town: **ROCHESTER** 7. State: **NH** 8. Zip Code: **038390000**
9. Telephone: **6033302119** 10. Ext: 11. Fax: **6033302198**
12. Type of Facility: (Check one)
   a. Temporary Storage i. Period of Temporary Storage: _____ (mm/dd/yyyy) to _____ (mm/dd/yyyy)
   ii. Reason for Temporary Storage:
   ☐ b. Asphalt Batch/Hot Mix ☑ c. Landfill/Disposal ☐ d. Landfill/Structural Fill ☐ e. Landfill/Daily Cover
   ☐ f. Asphalt Batch/Cold Mix ☐ g. Thermal Processing ☐ h. Incinerator ☐ i. Other:
13. Division of Hazardous Waste/Class A Permit Number: **N/A**
14. Division of Solid Waste Permit Number: **DES-SW-SP-95001**
15. EPA Identification Number: **N/A**

F. LSP SIGNATURE AND STAMP:

I attest under the pains and penalties of perjury that I have personally examined and am familiar with this submittal 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, the assessment action(s) undertaken to characterize the Remediation Waste which is (are) the subject of this submittal for acceptance at the facility identified in this submittal comply with applicable provisions of 310 CMR 40.0000, and such facility is permitted to accept Remediation Waste having the characteristics described 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 #: **8137**
2. First Name: **JEFFREY S** 3. Last Name: **HOLDEN**
4. Telephone: **8606451084** 5. Ext.
6. FAX:
7. Signature: **Jeffrey S Holden**
8. Date: **9/22/2011** (mm/dd/yyyy)
9. LSP Stamp: Commonwealth of Massachusetts — Electronic Seal — Licensed Site Professional

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC112

BILL OF LADING **(pursuant to 310 CMR 40.0030)**

Release Tracking Number
2 - 10

G. PERSON SUBMITTING BILL OF LADING:

1. Check all that apply: ☐ a. change in contact name ☐ b. Change of address ☑ c. change in person undertaking response actions

2. Name of Organization: **W.R. GRACE**

3. Contact First Name: **THOR** 4. Last Name: **HELGASON**

5. Street: **135 BEAVER STREET** 6. Title: **AGENT FOR GRACE**

7. City/Town: **WALTHAM** 8. State: **MA** 9. Zip Code: **024520000**

10. Telephone: **7816428775** 11. Ext: 12. Fax:

H. RELATIONSHIP TO SITE OF PERSON SUBMITTING BILL OF LADING:

☐ 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 Response Actions: Specify Relationship:

I. REQUIRED ATTACHMENTS AND SUBMITTALS :

☑ 1. 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 approvals issued by DEP or EPA. If the box is checked, you must attach a statement identifying the applicable provisions thereof.

☐ 2. Check here if any non-updatable information provided on this form is incorrect, e. g. property address. Send corrections to BWSC.eDEP@state.ma.us

☑ 3. Check here to certify that the LSP Opinion containing the material facts, data, and other information is attached.

J. CERTIFICATION OF PERSON SUBMITTING BILL OF LADING :

1. I, **THOR HELGASON**, attest under the pains and penalties or 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: **THOR HELGASON** 3. Title: **AGENT FOR GRACE**

4. For **W.R. GRACE** 5. Date: **9/22/2011**
(Name of person or entity recorded in Section H) (mm/dd/yyyy)

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BILL OF LADING **(pursuant to 310 CMR 40.0030)**

BWSC112

Release Tracking Number
2 - 10

J. CERTIFICATION OF PERSON SUBMITTING BILL OF LADING (cont.) :

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

7. Street:

8. City/Town: 9. State: 10. Zip Code:

11. Telephone: 12. Ext: 13. Fax:

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 (MassDEP USE ONLY):

Received by DEP on

9/22/2011 9:18:24 AM

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC112

Release Tracking Number
2 - 10

BILL OF LADING (pursuant to 310 CMR 40.0030)

A. LOCATION OF SITE OR DISPOSAL SITE WHERE REMEDIATION WASTE WAS GENERATED:

1. Release Name/Location Aid: **WR GRACE**
2. Street Address: **50 INDEPENDENCE RD**
3. City/Town: **ACTON** 4. Zip Code:
5. ☑ Check her if a Tier Classification Submittal has been provided to DEP for this disposal site:
   ☑ a. Tier 1A ☐ b. Tier 1B ☐ b. Tier 1C ☐ d. Tier II
6. If applicable provide the Permit Number: **NA**

B. THIS FORM IS BEING USED TO: (check one: B1-B4):

☐ 1. Submit a **Bill of Lading (BOL)** to transport Remediation Waste to Temporary Storage or a Receiving Facility. Response Actions associated with this BOL (check all that apply):

- ☐ a. Immediate Response Action (IRA)
- ☐ b. Release Abatement Measure (RAM)
- ☐ c. Downgradient Property Status (DPS)
- ☐ d. Utility Release Abatement Measure (URAM)
- ☐ e. Comprehensive Response Actions
- ☐ f.. Limited Removal Action (LRA): (must be retained pursuant to 310 CMR 40.0034(6); can't be submitted via eDEP)
- ☐ g. Other

☐ 2. Submit an Attestation of Completion of **Shipment to Temporary Storage** (Sections C, F and J are not required):

☑ 3. Submit an Attestation of Completion of **Shipment to a Receiving Facility** (Sections C, F and J are not required):

☐ 4. Certify that Remediation Waste Was **Not Shipped, and the Bill of Lading is Void.** (Sections C, D, E, and F are not required)

5. Date Bill of Lading submitted to the Department: **9/22/2011 9:18:24** (mm/dd/yyyy) b. eDEP Transaction ID: **417741**

6. Period of Generation Associated with this Bill of Lading **9/2/2011** (mm/dd/yyyy) to **11/30/2011** (mm/dd/yyyy)

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

The Bill of Lading is not considered complete until the Attestation of Completion of Shipment is received by the Department.

C. DESCRIPTION OF WASTE AND WASTE SOURCE:

1. Contaminated Media /Debris (check all that apply):

☐ a. Soil ☐ b. Groundwater ☐ c. Surface Water ☐ d. Sediment ☐ e. Vegetation or Organic Debris

☐ f. Demolition/Construction Waste ☐ g. Inorganic Absorbent Materials ☐ h. Other:

2. Uncontainerized Waste (check all that apply):

☐ a. Inorganic Absorbent Materials ☐ b. Other:

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BILL OF LADING **(pursuant to 310 CMR 40.0030)**

BWSC112

Release Tracking Number
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C. DESCRIPTION OF WASTE AND WASTE SOURCE (cont.):

3. Containerized Waste (check all that apply):

☐ a. Tank Bottoms/Sludges ☐ b. Containers ☐ c. Drums ☐ d. Engineered Impoundments

☐ e. Other:

4. Estimated Quantity: ☐ Tons ☐ Cu. Yds. ☐ Gallons

5. Contaminant Source (check one):

☐ a. Transportation Accident ☐ b. Underground Storage Tank ☐ c. Brownfields Redevelopment

☐ d. Other:

6. Type of Contaminant (check all that apply):

☐ a. Gasoline ☐ b. Diesel Fuel ☐ c. #2 Fuel Oil ☐ d. #4 Fuel Oil ☐ e. #6 Fuel Oil ☐ f. Jet Fuel

☐ g. Waste Oil ☐ h. Kerosene ☐ i. Chlorinated Solvents ☐ j. Urban Fill ☐ k. Other:

7. Constituents of Concern (check all that apply):

☐ a. As ☐ b. Cd ☐ c. Cr ☐ d. Pb ☐ e. Hg ☐ f. EPH/TPH ☐ g. VPH

☐ h. PCBs ☐ i. VOCs ☐ j. SVOCs ☐ k. Other:

8. If applicable, check the box for the Reportable Concentration Category of the site:

☐ a. RCS-1 ☐ b. RCS-2 ☐ c. RCGW-1 ☐ d. RCGW-2

9. Remediation Waste Characterization Documentation (check at least one):

☐ a. Site History Information ☐ b. Sampling Analytical Methods and Procedures ☐ c. Laboratory Data

☐ d. Field Screening Data ☐ e. Characterization Documentation previously submitted to the Department

i. Date submitted: (mm/dd/yyyy) ii. Type of Documentation:

D. TRANSPORTER OR COMMON CARRIER INFORMATION:

1. Transporter/Common Carrier Name: **D.A. COLLINS ENVIRONMENTAL LLC**

2. Contact First Name: **BRUCE** 3. Last Name: **HEBBEL**

4. Street: **269 BALLARD ROAD** 5. Title: **PROJECT MANAGER**

6. City/Town: **WILTON** 7. State: **NY** 8. Zip Code: **128310000**

9. Telephone: **518-6649855** 10. Ext: 11. Fax: **518-6640925**

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC112

Release Tracking Number
2 - 10

BILL OF LADING **(pursuant to 310 CMR 40.0030)**

E. RECEIVING FACILITY/TEMPORARY STORAGE LOCATION:

1. Operator/Facility Name: **WASTE MANAGEMENT OF NEW HAMPSHIRE (TREE)**
2. Contact First Name: **ELLEN** 3. Last Name: **BELLIO**
4. Street: **30 ROCHESTER NECK ROAD** 5. Title: **WASTE APPROVALS MANAGER**
6. City/Town: **ROCHESTER** 7. State: **NH** 8. Zip Code: **038390000**
9. Telephone: **603-3302119** 10. Ext: 11. Fax: **603-3302198**
12. Type of Facility: (Check one)
   a. Temporary Storage i. Period of Temporary Storage: _____ (mm/dd/yyyy) to _____ (mm/dd/yyyy)
   ii. Reason for Temporary Storage:
   ☐ b. Asphalt Batch/Hot Mix ☑ c. Landfill/Disposal ☐ d. Landfill/Structural Fill ☐ e. Landfill/Daily Cover
   ☐ f. Asphalt Batch/Cold Mix ☐ g. Thermal Processing ☐ h. Incinerator ☐ i. Other:
13. Division of Hazardous Waste/Class A Permit Number: **NA**
14. Division of Solid Waste Permit Number: **DES-SW-SP-95-001**
15. EPA Identification Number: **NA**

F. LSP SIGNATURE AND STAMP:

I attest under the pains and penalties of perjury that I have personally examined and am familiar with this submittal 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, the assessment action(s) undertaken to characterize the Remediation Waste which is (are) the subject of this submittal for acceptance at the facility identified in this submittal comply with applicable provisions of 310 CMR 40.0000, and such facility is permitted to accept Remediation Waste having the characteristics described 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 #:
2. First Name: 3. Last Name:
4. Telephone: 5. Ext.
6. FAX:
7. Signature:
8. Date: (mm/dd/yyyy)
9. LSP Stamp:

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC112

BILL OF LADING **(pursuant to 310 CMR 40.0030)**

Release Tracking Number
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G. PERSON SUBMITTING BILL OF LADING:

1. Check all that apply: ☐ a. change in contact name ☐ b. Change of address ☐ c. change in person undertaking response actions

2. Name of Organization: W.R. GRACE

3. Contact First Name: THOR 4. Last Name: HELGASON

5. Street: 135 BEAVER STREET 6. Title: AGENT FOR GRACE

7. City/Town: WALTHAM 8. State: MA 9. Zip Code: 024520000

10. Telephone: 7816428775 11. Ext: 12. Fax:

H. RELATIONSHIP TO SITE OF PERSON SUBMITTING BILL OF LADING:

☐ 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 Response Actions: Specify Relationship:

I. REQUIRED ATTACHMENTS AND SUBMITTALS :

☐ 1. 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 approvals issued by DEP or EPA. If the box is checked, you must attach a statement identifying the applicable provisions thereof.

☐ 2. Check here if any non-updatable information provided on this form is incorrect, e. g. property address. Send corrections to BWSC.eDEP@state.ma.us

☐ 3. Check here to certify that the LSP Opinion containing the material facts, data, and other information is attached.

J. CERTIFICATION OF PERSON SUBMITTING BILL OF LADING :

1. I, _____, attest under the pains and penalties or 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:

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

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BILL OF LADING **(pursuant to 310 CMR 40.0030)**

BWSC112

Release Tracking Number
2 - 10

J. CERTIFICATION OF PERSON SUBMITTING BILL OF LADING (cont.) :

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

7. Street:

8. City/Town: 9. State: 10. Zip Code:

11. Telephone: 12. Ext: 13. Fax:

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 (MassDEP USE ONLY):

Received by DEP on

11/30/2011 8:53:33 PM

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC112A

BILL OF LADING **(pursuant to 310 CMR 40.0030)**

Release Tracking Number

SUMMARY OF SHIPMENT SHEET 1 **OF** 2

2 - 10

A. SUMMARY OF SHIPMENT (To be filled out by the receiving facility upon receipt of Remediation Waste):

1. Date of Shipment: (mm/dd/yyyy)	2. Date of Receipt: (mm/dd/yyyy)	3. Number of Loads Shipped:	4. Daily Volume Shipped: ☐ yds³ ☑ tons ☐ gals
9/23/2011	9/23/2011	9	288.38
9/26/2011	9/26/2011	12	359.80
9/27/2011	9/27/2011	11	354.95
9/28/2011	9/28/2011	15	480.94
9/29/2011	9/29/2011	9	268.45
9/30/2011	9/30/2011	16	515.61
10/3/2011	10/3/2011	20	641.34
10/4/2011	10/4/2011	17	539.56
10/5/2011	10/5/2011	16	505.73
10/6/2011	10/6/2011	15	471.99
10/7/2011	10/7/2011	19	607.97
10/8/2011	10/8/2011	1	30.07
10/10/2011	10/10/2011	25	752.13
10/11/2011	10/11/2011	15	479.18
10/12/2011	10/12/2011	14	411.03
10/13/2011	10/13/2011	21	608.17
5. Totals Recorded on this Summary of Shipment Sheet:		23	7315.3

B. ☑ Check here if additional BWSC112A BOL Summary Sheets are needed.

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC112A

BILL OF LADING **(pursuant to 310 CMR 40.0030)**

Release Tracking Number

SUMMARY OF SHIPMENT SHEET 2 **OF** 2

2 - 10

A. SUMMARY OF SHIPMENT (To be filled out by the receiving facility upon receipt of Remediation Waste):

1. Date of Shipment: (mm/dd/yyyy)	2. Date of Receipt: (mm/dd/yyyy)	3. Number of Loads Shipped:	4. Daily Volume Shipped: ☐ yds³ ☑ tons ☐ gals
10/14/2011	10/14/2011	10	315.25
10/17/2011	10/17/2011	4	130.11
11/4/2011	11/4/2011	9	282.29
11/7/2011	11/7/2011	13	417.57
11/8/2011	11/8/2011	8	249.21
11/9/2011	11/9/2011	10	311.93
11/10/2011	11/10/2011	8	252.33
11/14/2011	11/14/2011	6	176.21
11/15/2011	11/15/2011	2	39.42
11/16/2011	11/16/2011	1	17
5. Totals Recorded on this Summary of Shipment Sheet:		71	2191.32

B. ☐ Check here if additional BWSC112A BOL Summary Sheets are needed.

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC112B

Release Tracking Number

2 - 10

BILL OF LADING **(pursuant to 310 CMR 40.0030)**
SUMMARY SHEET SIGNATURE PAGE

A. ACKNOWLEDGEMENT OF RECEIPT OF REMEDIATION WASTE AT RECEIVING FACILITY OR TEMPORARY STORAGE:

1. I, **John E. Nadeau**, attest under the pains and penalties or 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: **John E. Nadeau** 3. Title: **DISTRICT MANAGER**

4. For: **WASTE MANAGEMENT OF NEW HAMPSHIRE (TREE)** 5. Date: **11/29/2011** (mm/dd/yyyy)

6. Date of Final Shipment associated with this Bill of Lading: **11/16/2011** (mm/dd/yyyy)

B. ACKNOWLEDGEMENT OF SHIPMENT AND RECEIPT OF REMEDIATION WASTE BY PERSON CONDUCTING RESPONSE ACTIONS ASSOCIATED WITH THIS BILL OF LADING:

1. I, **Thor Helgason**, attest under the pains and penalties or 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: **Thor Helgason** 3. Title: **AGENT FOR GRACE**

4. For: **W.R. GRACE** (Name of person or entity recorded in Section G 5. Date: **11/30/2011** (mm/dd/yyyy)

☐ 6. Check here if the address of the person providing certification is different from address recorded in BWSC112 Section H.

7. Street: _____

8. City/Town: _____ 9. State: _____ 10. Zip Code: _____

11. Telephone: _____ 12. Ext: _____ 13. Fax: _____

☐ 14. Check here if attaching optional supporting documentation such as copies of Load Information Summary Sheets

Non-Impacted Trees and Vegetative Material from North Lagoon Wetland Disposed at

RJ Cobb in Bellingham, MA

THIS SHIPPING ORDER must be legibly filled in, in Ink, in Indelible Pencil, or in Carbon, and retained by the Agent.

Shipper's No. _____

Carrier's Name: Cobb

Carrier's No.

RECEIVED, subject to the classifications and tariffs in effect on the date of the issue of this Bill of lading,

at 50 Independence Rd (Date) 7/12/11 FROM Acton, MA

the property described below, in apparent good order, except as noted (contents and condition of contents of packages unknown), marked, consigned, and destined as shown below, which said company (the word company being understood throughout this contract as meaning any person or corporation in possession of the property under the contract) agrees to carry to its usual place of delivery at said destination, if on its own railroad, water line, highway route or routes, or within the territory of its highway operations, otherwise to deliver to another carrier on the route to said destination. It is mutually agreed, as to each carrier of all or any of said property over all or any portion of said route to destination, and as to each party at any time interested in all or any of said property, that every service to be performed hereunder shall be subject to all the terms and conditions of the Uniform Domestic Straight Bill of Lading set forth (1) in the Uniform Freight Classification in effect on the date hereof, if this is a rail or rail-water shipment, or (2) in the applicable motor carrier classification or tariff if this is a motor carrier shipment. Shipper hereby certifies that he is familiar with all the terms and conditions of the said bill of lading, including those on the back thereof, set forth in the classification or tariff which governs the transportation of this shipment, and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns.

(Mail or street address for purposes of notification only.)

Consigned TO Cobb

On Collect on Delivery Shipments, the letters "COD" must appear before consignee's name or as otherwise provided in Item 430, Sec. 1.

Destination 174 Maple Ave Street Belmont MA City

County State Zip

Route East Delivery Address★

(★To be filled in only when shipper desires and governing tariffs provide for delivery thereat.)

Delivering Carrier RJ Cobb Car or Vehicle Initials and No. _____

Collect on Delivery $ _____ And Remit to _____

Street City State

No. Packages	H.M.	Kind of Package, Description of Articles, Special Marks, and Exceptions	*Weight (Subject to Correction)	Class or Rate	Check Column
1		Dump trailer (wood chips)			
		(100 cu yds)			

Subject to Section 7 of conditions, if this shipment is to be delivered to the consignee without recourse on the consignor, the consignor shall sign the following statement:

The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges.

(Signature of consignor.)

C. O. D. Charges to be Paid by

☐ Shipper ☐ Consignee

If charges are to be prepaid, write or stamp here, "To be Prepaid."

Received $ _____ to apply in prepayment of the charges on the property described hereon.

Agent or Cashier

Per _____

(The signature here acknowledges only the amount prepaid.)

Charges Advanced:

$ _____

† "The fibre containers used for this shipment conform to the specifications set forth in the box maker's certificate thereon, and all other requirements of Rule 41 of the Uniform Freight Classification

IS MEMORANDUM is an acknowledgment that a Bill of Lading has been issued and is not the Original Bill of Lading, nor a copy or duplicate, covering the property named herein, and is intended solely for filing or record.

Shipper's No. _____

Carrier's Name: RJ Cobb

Carrier's No.

RECEIVED, subject to the classifications and tariffs in effect on the date of the issue of this Bill of lading,

at 50 Independence Rd (Date) 7/12/11 FROM Acton, MA

the property described below, in apparent good order, except as noted (contents and condition of contents of packages unknown), marked, consigned, and destined as shown below, which said company (the word company being understood throughout this contract as meaning any person or corporation in possession of the property under the contract) agrees to carry to its usual place of delivery at said destination, if on its own railroad, water line, highway route or routes, or within the territory of its highway operations, otherwise to deliver to another carrier on the route to said destination. It is mutually agreed, as to each carrier of all or any of said property over all or any portion of said route to destination, and as to each party at any time interested in all or any of said property, that every service to be performed hereunder shall be subject to all the terms and conditions of the Uniform Domestic Straight Bill of Lading set forth (1) in the Uniform Freight Classification in effect on the date hereof, if this is a rail or rail-water shipment, or (2) in the applicable motor carrier classification or tariff if this is a motor carrier shipment. Shipper hereby certifies that he is familiar with all the terms and conditions of the said bill of lading, including those on the back thereof, set forth in the classification or tariff which governs the transportation of this shipment, and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns.

Consigned TO RJ Cobb (Mail or street address for purposes of notification only.)

On Collect on Delivery Shipments, the letters "COD" must appear before consignee's name or as otherwise provided in Item 430, Sec. 1.

Destination 17 Maple Ave, ~~Street~~ Bellingham, MA City

County _____ State _____ Zip

Route BPA Delivery Address★ _____

(★To be filled in only when shipper desires and governing tariffs provide for delivery thereat.)

Delivering Carrier RJ Cobb Car or Vehicle Initials and No. _____

Collect on Delivery $ _____ And Remit to _____

Street _____ City _____ State

No. Packages	H.M.	Kind of Package, Description of Articles, Special Marks, and Exceptions	*Weight (Subject to Correction)	Class or Rate	Check Column
1		Dump Trailer (wood chips)			
		(100 yds)			

Subject to Section 7 of conditions, if this shipment is to be delivered to the consignee without recourse on the consignor, the consignor shall sign the following statement:

The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges.

(Signature of consignor.)

C. O. D. Charges to be Paid by

☐ Shipper ☐ Consignee

If charges are to be prepaid, write or stamp here, "To be Prepaid."

Received $ _____ to apply in prepayment of the charges on the property described hereon.

Agent or Cashier

Per _____

(The signature here acknowledges only the amount prepaid.)

Charges Advanced:

$ _____

† "The fibre containers used for this shipment conform to the specifications set forth in the box maker's certificate thereon, and all other requirements of Rule 41 of the Uniform Freight Classification

THIS MEMORANDUM is an acknowledgment that a Bill of Lading has been issued and is not the Original Bill of Lading, nor a copy or duplicate, covering the property named herein, and is intended solely for filing or record.

Shipper's No. _____

Carrier's Name: Cobb

Carrier's No. _____

RECEIVED, subject to the classifications and tariffs in effect on the date of the issue of this Bill of lading,

at 50 Independence Rd (Date) 7/12/11 FROM Acton MA

the property described below, in apparent good order, except as noted (contents and condition of contents of packages unknown), marked, consigned, and destined as shown below, which said company (the word company being understood throughout this contract as meaning any person or corporation in possession of the property under the contract) agrees to carry to its usual place of delivery at said destination, if on its own railroad, water line, highway route or routes, or within the territory of its highway operations, otherwise to deliver to another carrier on the route to said destination. It is mutually agreed, as to each carrier of all or any of said property over all or any portion of said route to destination, and as to each party at any time interested in all or any of said property, that every service to be performed hereunder shall be subject to all the terms and conditions of the Uniform Domestic Straight Bill of Lading set forth (1) in the Uniform Freight Classification in effect on the date hereof, if this is a rail or rail-water shipment, or (2) in the applicable motor carrier classification or tariff if this is a motor carrier shipment. Shipper hereby certifies that he is familiar with all the terms and conditions of the said bill of lading, including those on the back thereof, set forth in the classification or tariff which governs the transportation of this shipment, and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns.

(Mail or street address for purposes of notification only.)

Consigned TO Cobb

On Collect on Delivery Shipments, the letters "COD" must appear before consignee's name or as otherwise provided in item 430, Sec. 1.

Destination 174 Maple Ave Street Belmont MA City

County _____ State _____ Zip

Route Best Delivery Address★ _____

(★To be filled in only when shipper desires and governing tariffs provide for delivery thereat.)

Delivering Carrier RJ Cobb Car or Vehicle Initials and No. _____

Collect on Delivery $ _____ And Remit to _____

Street _____ City _____ State

No. Packages	H.M.	Kind of Package, Description of Articles, Special Marks, and Exceptions	*Weight (Subject to Correction)	Class or Rate	Check Column
1		DUMP TRAILER (wood chips)			
		(100 cu. yds)			

Subject to Section 7 of conditions, if this shipment is to be delivered to the consignee without recourse on the consignor, the consignor shall sign the following statement:

The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges.

_____ (Signature of consignor.)

C. O. D. Charges to be Paid by ☐ Shipper ☐ Consignee

If charges are to be prepaid, write or stamp here, "To be Prepaid."

Received $ _____ to apply in prepayment of the charges on the property described hereon.

Agent or Cashier

Per _____ (The signature here acknowledges only the amount prepaid.)

Charges Advanced:

$_____

† "The fibre containers used for this shipment conform to the specifications set forth in the box maker's certificate thereon, and all other requirements of Rule 41 of the Uniform Freight Classification

THIS SHIPPING ORDER must be legibly filled in, in Ink, in Indelible Pencil, or in Carbon, and retained by the Agent.

Shipper's No. _____

Carrier's Name: R.J. Cobb

Carrier's No.

RECEIVED, subject to the classifications and tariffs in effect on the date of the issue of this Bill of lading,

at 50 Independence Rd (Date) 7/12/11 FROM Acton MA

the property described below, in apparent good order, except as noted (contents and condition of contents of packages unknown), marked, consigned, and destined as shown below, which said company (the word company being understood throughout this contract as meaning any person or corporation in possession of the property under the contract) agrees to carry to its usual place of delivery at said destination, if on its own railroad, water line, highway route or routes, or within the territory of its highway operations, otherwise to deliver to another carrier on the route to said destination. It is mutually agreed, as to each carrier of all or any of said property over all or any portion of said route to destination, and as to each party at any time interested in all or any of said property, that every service to be performed hereunder shall be subject to all the terms and conditions of the Uniform Domestic Straight Bill of Lading set forth (1) in the Uniform Freight Classification in effect on the date hereof, if this is a rail or rail-water shipment, or (2) in the applicable motor carrier classification or tariff if this is a motor carrier shipment. Shipper hereby certifies that he is familiar with all the terms and conditions of the said bill of lading, including those on the back thereof, set forth in the classification or tariff which governs the transportation of this shipment, and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns.

(Mail or street address for purposes of notification only.)

Consigned TO R.J. Cobb

On Collect on Delivery Shipments, the letters "COD" must appear before consignee's name or as otherwise provided in Item 43d, Sec. 1.

Destination 174 Maple Ave ~~Street~~ Bellingham, MA City

County State Zip

Route Best Delivery Address★

(★To be filled in only when shipper desires and governing tariffs provide for delivery thereat.)

Delivering Carrier RJ Cobb Car or Vehicle Initials and No.

Collect on Delivery $ And Remit to

Street City State

No. Packages	H.M.	Kind of Package, Description of Articles, Special Marks, and Exceptions	*Weight (Subject to Correction)	Class or Rate	Check Column
1		Dump Trailer (wood chips)			
		(100 cu yds)			

Subject to Section 7 of conditions, if this shipment is to be delivered to the consignee without recourse on the consignor, the consignor shall sign the following statement:

The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges.

(Signature of consignor.)

C. O. D. Charges to be Paid by

☐ Shipper ☐ Consignee

If charges are to be prepaid, write or stamp here, "To be Prepaid."

Received $ _____ to apply in prepayment of the charges on the property described hereon.

Agent or Cashier

Per _____

(The signature here acknowledges only the amount prepaid.)

Charges Advanced:

$_____

† "The fibre containers used for this shipment conform to the specifications set forth in the box maker's certificate thereon, and all other requirements of Rule 41 of the Uniform Freight Classification

THIS SHIPPING ORDER must be legibly filled in, in Ink, in Indelible Pencil, or in Carbon, and retained by the Agent.

Shipper's No. _____

Carrier's Name: RJ Cobb

Carrier's No. _____

RECEIVED, subject to the classifications and tariffs in effect on the date of the issue of this Bill of lading,

at 50 Independence Rd (Date) 7/12/11 FROM Acton, MA

the property described below, in apparent good order, except as noted (contents and condition of contents of packages unknown), marked, consigned, and destined as shown below, which said company (the word company being understood throughout this contract as meaning any person or corporation in possession of the property under the contract) agrees to carry to its usual place of delivery at said destination, if on its own railroad, water line, highway route or routes, or within the territory of its highway operations, otherwise to deliver to another carrier on the route to said destination. It is mutually agreed, as to each carrier of all or any of said property over all or any portion of said route to destination, and as to each party at any time interested in all or any of said property, that every service to be performed hereunder shall be subject to all the terms and conditions of the Uniform Domestic Straight Bill of Lading set forth (1) in the Uniform Freight Classification in effect on the date hereof, if this is a rail or rail-water shipment, or (2) in the applicable motor carrier classification or tariff if this is a motor carrier shipment. Shipper hereby certifies that he is familiar with all the terms and conditions of the said bill of lading, including those on the back thereof, set forth in the classification or tariff which governs the transportation of this shipment, and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns.

Consigned TO RJ Cobb (Mail or street address for purposes of notification only.)

On Collect on Delivery Shipments, the letters "COD" must appear before consignee's name or as otherwise provided in Item 430, Sec. 1.

Destination 174 Maple Ave, Bellingham MA Street City

County State Zip

Route Delivery Address★

(★To be filled in only when shipper desires and governing tariffs provide for delivery thereat.)

Delivering Carrier RJ Cobb Car or Vehicle Initials and No. _____

Collect on Delivery $ _____ And Remit to _____

Street City State

No. Packages	H.M.	Kind of Package, Description of Articles, Special Marks, and Exceptions	*Weight (Subject to Correction)	Class or Rate	Check Column
1		Dump Trailer (Wood chips) (100 cu yd)			

Subject to Section 7 of conditions, if this shipment is to be delivered to the consignee without recourse on the consignor, the consignor shall sign the following statement:
The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges.

(Signature of consignor.)

C. O. D. Charges to be Paid by
☐ Shipper ☐ Consignee

If charges are to be prepaid, write or stamp here, "To be Prepaid."

Received $ _____ to apply in prepayment of the charges on the property described hereon.

Agent or Cashier

Per _____
(The signature here acknowledges only the amount prepaid.)

Charges Advanced:

$ _____

† "The fibre containers used for this shipment conform to the specifications set forth in the box maker's certificate thereon, and all other requirements of Rule 41 of the Uniform Freight Classification

THIS SHIPPING ORDER must be legibly filled in, in ink, in indelible Pencil, or in Carbon, and retained by the Agent.

Shipper's No. _____

Carrier's Name: Cobb

Carrier's No. _____

RECEIVED, subject to the classifications and tariffs in effect on the date of the issue of this Bill of lading,

at 50 Independence Rd (Date) 7/12/11 FROM Acton, MA

the property described below, in apparent good order, except as noted (contents and condition of contents of packages unknown), marked, consigned, and destined as shown below, which said company (the word company being understood throughout this contract as meaning any person or corporation in possession of the property under the contract) agrees to carry to its usual place of delivery at said destination, if on its own railroad, water line, highway route or routes, or within the territory of its highway operations, otherwise to deliver to another carrier on the route to said destination. It is mutually agreed, as to each carrier of all or any of said property over all or any portion of said route to destination, and as to each party at any time interested in all or any of said property, that every service to be performed hereunder shall be subject to all the terms and conditions of the Uniform Domestic Straight Bill of Lading set forth (1) in the Uniform Freight Classification in effect on the date hereof, if this is a rail or rail-water shipment, or (2) in the applicable motor carrier classification or tariff if this is a motor carrier shipment. Shipper hereby certifies that he is familiar with all the terms and conditions of the said bill of lading, including those on the back thereof, set forth in the classification or tariff which governs the transportation of this shipment, and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns.

(Mail or street address for purposes of notification only.)

Consigned TO Cobb

On Collect on Delivery Shipments, the letters "COD" must appear before consignee's name or as otherwise provided in Item 430, Sec. 1.

Destination 174 Maple Ave Street Bellingham MA City

_____ County _____ State _____ Zip

Route East Delivery Address★ _____

(★To be filled in only when shipper desires and governing tariffs provide for delivery thereat.)

Delivering Carrier RJ Cobb Car or Vehicle Initials and No. _____

Collect on Delivery $ _____ And Remit to _____

Street _____ City _____ State _____

No. Packages	H.M.	Kind of Package, Description of Articles, Special Marks, and Exceptions	*Weight (Subject to Correction)	Class or Rate	Check Column
1		Dump Trailer (wood chips)			
		(100 cu yds)			

Subject to Section 7 of conditions, if this shipment is to be delivered to the consignee without recourse on the consignor, the consignor shall sign the following statement:

The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges.

(Signature of consignor.)

C. O. D. Charges to be Paid by

☐ Shipper ☐ Consignee

If charges are to be prepaid, write or stamp here, "To be Prepaid."

Received $ _____ to apply in prepayment of the charges on the property described hereon.

Agent or Cashier

Per _____

(The signature here acknowledges only the amount prepaid.)

Charges Advanced:

$ _____

† "The fibre containers used for this shipment conform to the specifications set forth in the box maker's certificate thereon, and all other requirements of Rule 41 of the Uniform Freight Classification

THIS SHIPPING ORDER must be legibly filled in, in Ink, in Indelible Pencil, or in Carbon, and retained by the Agent.

Shipper's No. _____

Carrier's Name: RJ Cobb

Carrier's No. _____

RECEIVED, subject to the classifications and tariffs in effect on the date of the issue of this Bill of lading,

at 50 Independence Rd (Date) 7/13/11 FROM Acton MA

the property described below, in apparent good order, except as noted (contents and condition of contents of packages unknown), marked, consigned, and destined as shown below, which said company (the word company being understood throughout this contract as meaning any person or corporation in possession of the property under the contract) agrees to carry to its usual place of delivery at said destination, if on its own railroad, water line, highway route or routes, or within the territory of its highway operations, otherwise to deliver to another carrier on the route to said destination. It is mutually agreed, as to each carrier of all or any of said property over all or any portion of said route to destination, and as to each party at any time interested in all or any of said property, that every service to be performed hereunder shall be subject to all the terms and conditions of the Uniform Domestic Straight Bill of Lading set forth (1) in the Uniform Freight Classification in effect on the date hereof, if this is a rail or rail-water shipment, or (2) in the applicable motor carrier classification or tariff if this is a motor carrier shipment. Shipper hereby certifies that he is familiar with all the terms and conditions of the said bill of lading, including those on the back thereof, set forth in the classification or tariff which governs the transportation of this shipment, and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns.

Consigned TO RJ Cobb (Mail or street address for purposes of notification only.)

On Collect on Delivery Shipments the letters "COD" must appear before consignee's name or as otherwise provided in item 430 Sec. 1.

Destination 179 Maple Ave, Street Bellingham MA City

County _____ State _____ Zip

Route Best Delivery Address★ _____

(★To be filled in only when shipper desires and governing tariffs provide for delivery thereat.)

Delivering Carrier RJ Cobb Car or Vehicle Initials and No. _____

Collect on Delivery $ _____ And Remit to _____

Street _____ City _____ State

No. Packages	H.M.	Kind of Package, Description of Articles, Special Marks, and Exceptions	*Weight (Subject to Correction)	Class or Rate	Check Column
1		Dump Trailer wood chips			
		(100 cu yds)			

Subject to Section 7 of conditions, if this shipment is to be delivered to the consignee without recourse on the consignor, the consignor shall sign the following statement:

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C. O. D. Charges to be Paid by

☐ Shipper ☐ Consignee

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Agent or Cashier

Per _____

(The signature here acknowledges only the amount prepaid.)

Charges Advanced:

$_____

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THIS SHIPPING ORDER must be legibly filled in, in Ink, in Indelible Pencil, or in Carbon, and retained by the Agent.

Shipper's No. _____

Carrier's Name: RJ Cobb

Carrier's No.

RECEIVED, subject to the classifications and tariffs in effect on the date of the issue of this Bill of lading,

at 50 Independence Rd (Date) 7/13/11 FROM Acton MA

the property described below, in apparent good order, except as noted (contents and condition of contents of packages unknown), marked, consigned, and destined as shown below, which said company (the word company being understood throughout this contract as meaning any person or corporation in possession of the property under the contract) agrees to carry to its usual place of delivery at said destination, if on its own railroad, water line, highway route or routes, or within the territory of its highway operations, otherwise to deliver to another carrier on the route to said destination. It is mutually agreed, as to each carrier of all or any of said property over all or any portion of said route to destination, and as to each party at any time interested in all or any of said property, that every service to be performed hereunder shall be subject to all the terms and conditions of the Uniform Domestic Straight Bill of Lading set forth (1) in the Uniform Freight Classification in effect on the date hereof, if this is a rail or rail-water shipment, or (2) in the applicable motor carrier classification or tariff if this is a motor carrier shipment. Shipper hereby certifies that he is familiar with all the terms and conditions of the said bill of lading, including those on the back thereof, set forth in the classification or tariff which governs the transportation of this shipment, and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns.

(Mail or street address for purposes of notification only.)

Consigned TO RJ Cobb

On Collect on Delivery Shipments, the letters "COD" must appear before consignee's name or as otherwise provided in Item 430, Sec. 1.

Destination 174 Maple Ave Street Bellingham MA City

County State Zip

Route Best Delivery Address★

(★To be filled in only when shipper desires and governing tariffs provide for delivery thereat.)

Delivering Carrier RJ Cobb Car or Vehicle Initials and No.

Collect on Delivery $ And Remit to

Street City State

No. Packages	H.M.	Kind of Package, Description of Articles, Special Marks, and Exceptions	*Weight (Subject to Correction)	Class or Rate	Check Column
1		Dump Trailer (wood chips)			
		(100 cu yds)			

Subject to Section 7 of conditions, if this shipment is to be delivered to the consignee without recourse on the consignor, the consignor shall sign the following statement:

The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges.

(Signature of consignor.)

C. O. D. Charges to be Paid by

☐ Shipper ☐ Consignee

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Agent or Cashier

Per _____

(The signature here acknowledges only the amount prepaid.)

Charges Advanced:

$_____

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THIS SHIPPING ORDER must be legibly filled in, in Ink, in Indelible Pencil, or in Carbon, and retained by the Agent.

Shipper's No. _____

Carrier's Name: RJ Cobb

Carrier's No. _____

RECEIVED, subject to the classifications and tariffs in effect on the date of the issue of this Bill of lading,

at 50 Independence Rd (Date) 7/13/11 FROM ~~Acton~~ Acton, MA

the property described below, in apparent good order, except as noted (contents and condition of contents of packages unknown), marked, consigned, and destined as shown below, which said company (the word company being understood throughout this contract as meaning any person or corporation in possession of the property under the contract) agrees to carry to its usual place of delivery at said destination, if on its own railroad, water line, highway route or routes, or within the territory of its highway operations, otherwise to deliver to another carrier on the route to said destination. It is mutually agreed, as to each carrier of all or any of said property over all or any portion of said route to destination, and as to each party at any time interested in all or any of said property, that every service to be performed hereunder shall be subject to all the terms and conditions of the Uniform Domestic Straight Bill of Lading set forth (1) in the Uniform Freight Classification in effect on the date hereof, if this is a rail or rail-water shipment, or (2) in the applicable motor carrier classification or tariff if this is a motor carrier shipment. Shipper hereby certifies that he is familiar with all the terms and conditions of the said bill of lading, including those on the back thereof, set forth in the classification or tariff which governs the transportation of this shipment, and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns.

Consigned TO RJ Cobb (Mail or street address for purposes of notification only.)

On Collect on Delivery Shipments, the letters "COD" must appear before consignee's name or as otherwise provided in item 430, Sec. 1.

Destination 174 Maple Ave Street Bellingham MA City

_____ County _____ State _____ Zip

Route _____ Delivery Address★ _____

(★To be filled in only when shipper desires and governing tariffs provide for delivery thereat.)

Delivering Carrier _____ Car or Vehicle Initials and No. _____

Collect on Delivery $ _____ And Remit to _____

_____ Street _____ City _____ State

No. Packages	H.M.	Kind of Package, Description of Articles, Special Marks, and Exceptions	*Weight (Subject to Correction)	Class or Rate	Check Column
1		Dump Trailer (wood chips)			
		(100 cu yds)			

Subject to Section 7 of conditions, if this shipment is to be delivered to the consignee without recourse on the consignor, the consignor shall sign the following statement:
The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges.

_____ (Signature of consignor.)

C. O. D. Charges to be Paid by
☐ Shipper ☐ Consignee

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Agent or Cashier

Per _____
(The signature here acknowledges only the amount prepaid.)

Charges Advanced:

$ _____

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THIS SHIPPING ORDER must be legibly filled in, in Ink, in Indelible Pencil, or in Carbon, and retained by the Agent.

Shipper's No. _____

Carrier's Name: RJ Cobb

Carrier's No.

RECEIVED, subject to the classifications and tariffs in effect on the date of the issue of this Bill of lading,

at 50 Independence Rd (Date) 7/13/11 FROM Acton MA

the property described below, in apparent good order, except as noted (contents and condition of contents of packages unknown), marked, consigned, and destined as shown below, which said company (the word company being understood throughout this contract as meaning any person or corporation in possession of the property under the contract) agrees to carry to its usual place of delivery at said destination, if on its own railroad, water line, highway route or routes, or within the territory of its highway operations, otherwise to deliver to another carrier on the route to said destination. It is mutually agreed, as to each carrier of all or any of said property over all or any portion of said route to destination, and as to each party at any time interested in all or any of said property, that every service to be performed hereunder shall be subject to all the terms and conditions of the Uniform Domestic Straight Bill of Lading set forth (1) in the Uniform Freight Classification in effect on the date hereof, if this is a rail or rail-water shipment, or (2) in the applicable motor carrier classification or tariff if this is a motor carrier shipment. Shipper hereby certifies that he is familiar with all the terms and conditions of the said bill of lading, including those on the back thereof, set forth in the classification or tariff which governs the transportation of this shipment, and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns.

Consigned TO RJ Cobb (Mail or street address for purposes of notification only.)

On Collect on Delivery Shipments, the letters "COD" must appear before consignee's name or as otherwise provided in Item 430, Sec. 1.

Destination 174 Maple Ave Street Bellingham MA City

County State Zip

Route Best Delivery Address★ SAME

(★To be filled in only when shipper desires and governing tariffs provide for delivery thereat.)

Delivering Carrier RJ Cobb Car or Vehicle Initials and No. _____

Collect on Delivery $ _____ And Remit to _____

Street City State

No. Packages	H.M.	Kind of Package, Description of Articles, Special Marks, and Exceptions	*Weight (Subject to Correction)	Class or Rate	Check Column
1		Dump Trailer (wood chips)			
		(100 cu yds)			

Subject to Section 7 of conditions, if this shipment is to be delivered to the consignee without recourse on the consignor, the consignor shall sign the following statement:
The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges.

(Signature of consignor.)

C. O. D. Charges to be Paid by
☐ Shipper ☐ Consignee

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Agent or Cashier

Per _____
(The signature here acknowledges only the amount prepaid.)

Charges Advanced:

$_____

† "The fibre containers used for this shipment conform to the specifications set forth in the box maker's certificate thereon, and all other requirements of Rule 41 of the Uniform Freight Classification

THIS MEMORANDUM is an acknowledgment that a Bill of Lading has been issued and is not the Original Bill of Lading, nor a copy or duplicate, covering the property named herein, and is intended solely for filing or record.

Shipper's No. _____

Carrier's Name: RJ Cobb

Carrier's No.

RECEIVED, subject to the classifications and tariffs in effect on the date of the issue of this Bill of lading,

at 50 Independence Rd (Date) 7/13/11 FROM Acton MA

the property described below, in apparent good order, except as noted (contents and condition of contents of packages unknown), marked, consigned, and destined as shown below, which said company (the word company being understood throughout this contract as meaning any person or corporation in possession of the property under the contract) agrees to carry to its usual place of delivery at said destination, if on its own railroad, water line, highway route or routes, or within the territory of its highway operations, otherwise to deliver to another carrier on the route to said destination. It is mutually agreed, as to each carrier of all or any of said property over all or any portion of said route to destination, and as to each party at any time interested in all or any of said property, that every service to be performed hereunder shall be subject to all the terms and conditions of the Uniform Domestic Straight Bill of Lading set forth (1) in the Uniform Freight Classification in effect on the date hereof, if this is a rail or rail-water shipment, or (2) in the applicable motor carrier classification or tariff if this is a motor carrier shipment. Shipper hereby certifies that he is familiar with all the terms and conditions of the said bill of lading, including those on the back thereof, set forth in the classification or tariff which governs the transportation of this shipment, and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns.

Consigned TO RJ Cobb (Mail or street address for purposes of notification only.)

On Collect on Delivery Shipments, the letters "COD" must appear before consignee's name or as otherwise provided in Item 430, Sec. 1.

Destination 174 Maple Ave Street Bolingham MA City

County State Zip

Route Best Delivery Address★

(★To be filled in only when shipper desires and governing tariffs provide for delivery thereat.)

Delivering Carrier RJ Cobb Car or Vehicle Initials and No.

Collect on Delivery $ And Remit to

Street City State

No. Packages	H.M.	Kind of Package, Description of Articles, Special Marks, and Exceptions	*Weight (Subject to Correction)	Class or Rate	Check Column
1		Dump Trailer (wood chips)			
		(100 cu yds)			

Subject to Section 7 of conditions, if this shipment is to be delivered to the consignee without recourse on the consignor, the consignor shall sign the following statement:
The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges.

(Signature of consignor.)

C. O. D. Charges to be Paid by
☐ Shipper ☐ Consignee

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Agent or Cashier

Per _____
(The signature here acknowledges only the amount prepaid.)

Charges Advanced:

$_____

† "The fibre containers used for this shipment conform to the specifications set forth in the box maker's certificate thereon, and all other requirements of Rule 41 of the Uniform Freight Classification

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Shipper's No. _____

Carrier's Name: RJ Cobb

Carrier's No.

RECEIVED, subject to the classifications and tariffs in effect on the date of the issue of this Bill of lading,

at 50 Independence Rd (Date) 7/13/11 FROM Acton MA

the property described below, in apparent good order, except as noted (contents and condition of contents of packages unknown), marked, consigned, and destined as shown below, which said company (the word company being understood throughout this contract as meaning any person or corporation in possession of the property under the contract) agrees to carry to its usual place of delivery at said destination, if on its own railroad, water line, highway route or routes, or within the territory of its highway operations, otherwise to deliver to another carrier on the route to said destination. It is mutually agreed, as to each carrier of all or any of said property over all or any portion of said route to destination, and as to each party at any time interested in all or any of said property, that every service to be performed hereunder shall be subject to all the terms and conditions of the Uniform Domestic Straight Bill of Lading set forth (1) in the Uniform Freight Classification in effect on the date hereof, if this is a rail or rail-water shipment, or (2) in the applicable motor carrier classification or tariff if this is a motor carrier shipment. Shipper hereby certifies that he is familiar with all the terms and conditions of the said bill of lading, including those on the back thereof, set forth in the classification or tariff which governs the transportation of this shipment, and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns.

(Mail or street address for purposes of notification only.)

Consigned TO RJ Cobb

On Collect on Delivery Shipments the letters "COD" must appear before consignee's name or as otherwise provided in Item 430, Sec. 1.

Destination 174 Maple Ave, ~~Street~~ Brighton, MA City

County State Zip

Route Best Delivery Address* Same

(★To be filled in only when shipper desires and governing tariffs provide for delivery thereat.)

Delivering Carrier RJ Cobb Car or Vehicle Initials and No.

Collect on Delivery $ And Remit to

Street City State

No. Packages	H.M.	Kind of Package, Description of Articles, Special Marks, and Exceptions	*Weight (Subject to Correction)	Class or Rate	Check Column
1		Dump Trailer (wood chips)			
		(100 cu yds)			

Subject to Section 7 of conditions, if this shipment is to be delivered to the consignee without recourse on the consignor, the consignor shall sign the following statement:
The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges.

(Signature of consignor.)

C. O. D. Charges to be Paid by
☐ Shipper ☐ Consignee

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Agent or Cashier

Per _____
(The signature here acknowledges only the amount prepaid.)

Charges Advanced:

$_____

† "The fibre containers used for this shipment conform to the specifications set forth in the box maker's certificate thereon, and all other requirements of Rule 41 of the Uniform Freight Classification

THIS SHIPPING ORDER must be legibly filled in, in Ink, in Indelible Pencil, or in Carbon, and retained by the Agent.

Shipper's No. _____

Carrier's Name: RJ Cobb

Carrier's No.

RECEIVED, subject to the classifications and tariffs in effect on the date of the issue of this Bill of lading,

at 50 Independence Rd (Date) 7/13/11 FROM Acton MA

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(Mail or street address for purposes of notification only.)

Consigned TO RJ Cobb

On Collect on Delivery Shipments, the letters "COD" must appear before consignee's name or as otherwise provided in Item 430, Sec. 1.

Destination 174 Maple Ave Street Bellingham MA City

County State Zip

Route Best Delivery Address★ SAME

(★To be filled in only when shipper desires and governing tariffs provide for delivery thereat.)

Delivering Carrier RJ Cobb Car or Vehicle Initials and No.

Collect on Delivery $ And Remit to

Street City State

No. Packages	H.M.	Kind of Package, Description of Articles, Special Marks, and Exceptions	*Weight (Subject to Correction)	Class or Rate	Check Column
1		Dump Trailer (wood chips) (100 cu yds)			

Subject to Section 7 of conditions, if this shipment is to be delivered to the consignee without recourse on the consignor, the consignor shall sign the following statement:
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(Signature of consignor.)

C. O. D. Charges to be Paid by
☐ Shipper ☐ Consignee

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Agent or Cashier

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(The signature here acknowledges only the amount prepaid.)

Charges Advanced:

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Shipper's No. _____

Carrier's Name: RJ Cobb

Carrier's No. _____

RECEIVED, subject to the classifications and tariffs in effect on the date of the issue of this Bill of lading,

at 50 Independence Rd (Date) 7/13/11 FROM Acton, MA

the property described below, in apparent good order, except as noted (contents and condition of contents of packages unknown), marked, consigned, and destined as shown below, which said company (the word company being understood throughout this contract as meaning any person or corporation in possession of the property under the contract) agrees to carry to its usual place of delivery at said destination, if on its own railroad, water line, highway route or routes, or within the territory of its highway operations, otherwise to deliver to another carrier on the route to said destination. It is mutually agreed, as to each carrier of all or any of said property over all or any portion of said route to destination, and as to each party at any time interested in all or any of said property, that every service to be performed hereunder shall be subject to all the terms and conditions of the Uniform Domestic Straight Bill of Lading set forth (1) in the Uniform Freight Classification in effect on the date hereof, if this is a rail or rail-water shipment, or (2) in the applicable motor carrier classification or tariff if this is a motor carrier shipment. Shipper hereby certifies that he is familiar with all the terms and conditions of the said bill of lading, including those on the back thereof, set forth in the classification or tariff which governs the transportation of this shipment, and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns.

Consigned TO RJ Cobb (Mail or street address for purposes of notification only.)

On Collect on Delivery Shipments, the letters "COD" must appear before consignee's name or as otherwise provided in Item 430, Sec. 1.

Destination 174 Maple Ave, Street Bellingham, MA City

County State Zip

Route best Delivery Address★ SAME

(★To be filled in only when shipper desires and governing tariffs provide for delivery thereat.)

Delivering Carrier RJ Cobb Car or Vehicle Initials and No. _____

Collect on Delivery $ _____ And Remit to _____

Street City State

No. Packages	H.M.	Kind of Package, Description of Articles, Special Marks, and Exceptions	*Weight (Subject to Correction)	Class or Rate	Check Column
1		Dump Trailer (wood chips)			
		100 cu yds			

Subject to Section 7 of conditions, if this shipment is to be delivered to the consignee without recourse on the consignor, the consignor shall sign the following statement:
The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges.

(Signature of consignor.)

C. C. D. Charges to be Paid by
☐ Shipper ☐ Consignee

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Agent or Cashier

Per _____
(The signature here acknowledges only the amount prepaid.)

Charges Advanced:

$_____

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THIS SHIPPING ORDER must be legibly filled in, in Ink, in Indelible Pencil, or in Carbon, and retained by the Agent.

Shipper's No. _____

Carrier's Name: RJ Cobb

Carrier's No. _____

RECEIVED, subject to the classifications and tariffs in effect on the date of the issue of this Bill of lading,

at 50 Independence Rd (Date) 7/14/11 FROM Acton MA

the property described below, in apparent good order, except as noted (contents and condition of contents of packages unknown), marked, consigned, and destined as shown below, which said company (the word company being understood throughout this contract as meaning any person or corporation in possession of the property under the contract) agrees to carry to its usual place of delivery at said destination, if on its own railroad, water line, highway route or routes, or within the territory of its highway operations, otherwise to deliver to another carrier on the route to said destination. It is mutually agreed, as to each carrier of all or any of said property over all or any portion of said route to destination, and as to each party at any time interested in all or any of said property, that every service to be performed hereunder shall be subject to all the terms and conditions of the Uniform Domestic Straight Bill of Lading set forth (1) in the Uniform Freight Classification in effect on the date hereof, if this is a rail or rail-water shipment, or (2) in the applicable motor carrier classification or tariff if this is a motor carrier shipment. Shipper hereby certifies that he is familiar with all the terms and conditions of the said bill of lading, including those on the back thereof, set forth in the classification or tariff which governs the transportation of this shipment, and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns.

Consigned TO RJ Cobb (Mail or street address for purposes of notification only.)

On Collect on Delivery Shipments, the letters "COD" must appear before consignee's name or as otherwise provided in Item 430, Sec. 1.

Destination 174 Maple Ave Street, Bellingham, MA City

County _____ State _____ Zip _____

Route BT3 Delivery Address★ SAME

(★To be filled in only when shipper desires and governing tariffs provide for delivery thereat.)

Delivering Carrier RJ Cobb Car or Vehicle Initials and No. _____

Collect on Delivery $ _____ And Remit to _____

Street _____ City _____ State _____

No. Packages	H.M.	Kind of Package, Description of Articles, Special Marks, and Exceptions	*Weight (Subject to Correction)	Class or Rate	Check Column
1		Dump Trailer (wood chips)			
		(100 cu yds)			

Subject to Section 7 of conditions, if this shipment is to be delivered to the consignee without recourse on the consignor, the consignor shall sign the following statement:

The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges.

_____ (Signature of consignor.)

C. O. D. Charges to be Paid by ☐ Shipper ☐ Consignee

If charges are to be prepaid, write or stamp here, "To be Prepaid."

Received $ _____ to apply in prepayment of the charges on the property described hereon.

Agent or Cashier

Per _____

(This signature here acknowledges only the amount prepaid.)

Charges Advanced:

$ _____

† "The fibre containers used for this shipment conform to the specifications set forth in the box maker's certificate thereon, and all other requirements of Rule 41 of the Uniform Freight Classification

THIS SHIPPING ORDER must be legibly filled in, in Ink, in Indelible Pencil, or in Carbon, and retained by the Agent.

Shipper's No. _____

Carrier's Name: RJ Cobb

Carrier's No. _____

RECEIVED, subject to the classifications and tariffs in effect on the date of the issue of this Bill of lading,

at 50 Independence Rd (Date) 7/14/11 FROM Acton MA

the property described below, in apparent good order, except as noted (contents and condition of contents of packages unknown), marked, consigned, and destined as shown below, which said company (the word company being understood throughout this contract as meaning any person or corporation in possession of the property under the contract) agrees to carry to its usual place of delivery at said destination, if on its own railroad, water line, highway route or routes, or within the territory of its highway operations, otherwise to deliver to another carrier on the route to said destination. It is mutually agreed, as to each carrier of all or any of said property over all or any portion of said route to destination, and as to each party at any time interested in all or any of said property, that every service to be performed hereunder shall be subject to all the terms and conditions of the Uniform Domestic Straight Bill of Lading set forth (1) in the Uniform Freight Classification in effect on the date hereof, if this is a rail or rail-water shipment, or (2) in the applicable motor carrier classification or tariff if this is a motor carrier shipment. Shipper hereby certifies that he is familiar with all the terms and conditions of the said bill of lading, including those on the back thereof, set forth in the classification or tariff which governs the transportation of this shipment, and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns.

Consigned TO RJ Cobb (Mail or street address for purposes of notification only.)

On Collect on Delivery Shipments, the letters "COD" must appear before consignee's name or as otherwise provided in Item 430, Sec. 1.

Destination 174 Maple Ave, ~~Street~~ Bellingham, MA City

County _____ State _____ Zip

Route Best Delivery Address★ Same

(★To be filled in only when shipper desires and governing tariffs provide for delivery thereat.)

Delivering Carrier RJ Cobb Car or Vehicle Initials and No. _____

Collect on Delivery $ _____ And Remit to _____

Street _____ City _____ State

No. Packages	H.M.	Kind of Package, Description of Articles, Special Marks, and Exceptions	*Weight (Subject to Correction)	Class or Rate	Check Column
1		Dump Trailer (wood chips) (100 cu yds)			

Subject to Section 7 of conditions, if this shipment is to be delivered to the consignee without recourse on the consignor, the consignor shall sign the following statement:
The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges.

(Signature of consignor.)

C. O. D. Charges to be Paid by
☐ Shipper ☐ Consignee

If charges are to be prepaid, write or stamp here, "To be Prepaid."

Received $ _____ to apply in prepayment of the charges on the property described hereon.

Agent or Cashier

Per _____
(The signature here acknowledges only the amount prepaid.)

Charges Advanced:

$ _____

† "The fibre containers used for this shipment conform to the specifications set forth in the box maker's certificate thereon, and all other requirements of Rule 41 of the Uniform Freight Classification

Non-Impacted Trees and Vegetative Material from Sinking Pond Disposed at

Clear Summit Earth Materials in Lancaster, MA

CLEAR SUMMIT EARTH MATERIALS
1558 Lunenburg Road
Lancaster, Massachusetts 01523
Phone (978) 537-7729

NAME	DATE
W.L French	10/26/11

ADDRESS #60

PHONE

SOLD BY	CASH	C.O.D	CHARGE	ON ACCT	MDSE RET'D	

QTY.	DESCRIPTION	AMOUNT
	Yds. Fill	
	Yds. Gravel	
	Yds. Septic Sand	
	Yds. Loam	
	Yds. Loam Tailings	
	Yds. Compost	
	Yds. Stone	
	Yds. Wood Mulch	
30	Yds. Stumps/Brush	
	Hrs. Trucking	
	Not Responsible For Damage Beyond Curb Line TAX	
RECEIVED BY	TOTAL	

52183

Thank You

All claims and returned goods MUST be accompanied by this bill.

Clean Stumps + Trees

CLEAN STUMPS TREES Vegetation

CLEAR SUMMIT EARTH MATERIALS
1558 Lunenburg Road
Lancaster, Massachusetts 01523
Phone (978) 537-7729

NAME: W.L. French
DATE: 10/26/11
ADDRESS: #60
Acton Job
PHONE:

SOLD BY	CASH	C.O.D	CHARGE	ON ACCT	MDSE RET'D

QTY.	DESCRIPTION	AMOUNT
	Yds. Fill	
	Yds. Gravel	
	Yds. Septic Sand	
	Yds. Loam	
	Yds. Loam Tailings	
	Yds. Compost	
	Yds. Stone	
	Yds. Wood Mulch	
30	Yds. Stumps/Brush	
	Hrs. Trucking	
	Not Responsible For Damage Beyond Curb Line — TAX	
RECEIVED BY	TOTAL	

52184

Thank You

All claims and returned goods MUST be accompanied by this bill.

CLEAR SUMMIT EARTH MATERIALS
1338 Lunenburg Road
Lancaster, Massachusetts 01523
Phone (978) 537-7729

NAME: W.L. French
DATE: 10/26/11
ADDRESS: #60
PHONE:

SOLD BY	CASH	C.O.D.	CHARGE	ON ACCT	MDSE. RET'D

QTY.	DESCRIPTION	AMOUNT
	Yds. Fill	
	Yds. Gravel	
	Yds. Septic Sand	
	Yds. Loam	
	Yds. Loam Tailings	
	Yds. Compost	
	Yds. Stone	
	Yds. Wood Mulch	
30	Yds. Stumps/Brush	
	Hrs. Trucking	
	Not Responsible For Damage Beyond Curb Line — TAX	
RECEIVED BY	TOTAL	

52187

Thank You

All claims and returned goods MUST be accompanied by this bill.

CLEAR SUMMIT EARTH MATERIALS
1558 Lunenburg Road
Lancaster, Massachusetts 01523
Phone (978) 537-7729

NAME: W. L French
DATE: 10/26/11
ADDRESS: #60
PHONE:

SOLD BY	CASH	C.O.D	CHARGE	ON ACCT	MDSE RET'D

QTY.	DESCRIPTION	AMOUNT
	Yds. Fill	
	Yds. Gravel	
	Yds. Septic Sand	
	Yds. Loam	
	Yds. Loam Tailings	
	Yds. Compost	
	Yds. Stone	
	Yds. Wood Mulch	
30	Yds. Stumps/Brush	
	Hrs. Trucking	
	Not Responsible For Damage Beyond Curb Line TAX	
RECEIVED BY	TOTAL	

52191

Thank You

All claims and returned goods MUST be accompanied by this bill.

CLEAR SUMMIT EARTH MATERIALS
1568 Lunenburg Road
Lancaster, Massachusetts 01523
Phone (978) 537-7729

NAME	DATE
W. L. French	10-27

ADDRESS

PHONE L+L Service

SOLD BY	CASH	C.O.D	CHARGE	ON ACCT	MDSE RET'D

QTY.	DESCRIPTION	AMOUNT
	Yds. Fill	
	Yds. Gravel	
	Yds. Septic Sand	
	Yds. Loam	
	Yds. Loam Tailings	
	Yds. Compost	
	Yds. Stone	
	Yds. Wood Mulch	
30	Yds. Stumps/Brush	
	Hrs. Trucking	
	Not Responsible For Damage Beyond Curb Line TAX	
RECEIVED BY	TOTAL	

52200

Thank You

All claims and returned goods MUST be accompanied by this bill.

CLEAR SUMMIT EARTH MATERIALS

1558 Lunenburg Road
Lancaster, Massachusetts 01523
Phone (978) 537-7729

NAME: W.L. French

DATE: 10-27

ADDRESS:

PHONE: L+L Services

SOLD BY	CASH	C.O.D.	CHARGE	ON ACCT	MDSE RET'D

QTY.	DESCRIPTION	AMOUNT
	Yds. Fill	
	Yds. Gravel	
	Yds. Septic Sand	
	Yds. Loam	
	Yds. Loam Tailings	
	Yds. Compost	
	Yds. Stone	
	Yds. Wood Mulch	
30	Yds. Stumps/Brush	
	Hrs. Trucking	
	Not Responsible For Damage Beyond Curb Line — TAX	
RECEIVED BY B	TOTAL	

52199

Thank You

All claims and returned goods MUST be accompanied by this bill.

CLEAR SUMMIT EARTH MATERIALS
1558 Lunenburg Road
Lancaster, Massachusetts 01523
Phone (978) 537-7729

NAME: W.L. French
DATE: 10/27/11
ADDRESS: D+L Sewer #3
PHONE:

SOLD BY	CASH	C.O.D	CHARGE	ON ACCT	MDSE RET'D

QTY.	DESCRIPTION	AMOUNT
	Yds. Fill	
	Yds. Gravel	
	Yds. Septic Sand	
	Yds. Loam	
	Yds. Loam Tailings	
	Yds. Compost	
	Yds. Stone	
	Yds. Wood Mulch	
30	Yds. Stumps/Brush	
	Hrs. Trucking	
	Not Responsible For Damage Beyond Curb Line — TAX	
RECEIVED BY	TOTAL	

52197

Thank You

All claims and returned goods MUST be accompanied by this bill.

CLEAR SUMMIT EARTH
MATERIALS
1558 Lunenburg Road
Lancaster, Massachusetts 01523
Phone (978) 537-7729

NAME: W.L French
DATE: 10/27/11
ADDRESS: L+L Services #3
PHONE:

SOLD BY	CASH	C.O.D	CHARGE	ON ACCT	MDSE RET'D

QTY.	DESCRIPTION	AMOUNT
	Yds. Fill	
	Yds. Gravel	
	Yds. Septic Sand	
	Yds. Loam	
	Yds. Loam Tailings	
	Yds. Compost	
	Yds. Stone	
	Yds. Wood Mulch	
30	Yds. Stumps/Brush	
	Hrs. Trucking	
	Not Responsible For Damage Beyond Curb Line TAX	
RECEIVED BY	TOTAL	

52193

Thank You

All claims and returned goods MUST be accompanied by this bill.

...AR SUMMIT EARTH MATERIALS
1558 Lunenburg Road
Lancaster, Massachusetts 01523
Phone (978) 537-7729

NAME	DATE
Wil Brock	6-27-11

ADDRESS: 20 60

PHONE:

SOLD BY	CASH	C.O.D	CHARGE	ON ACCT	MDSE RET'D	

QTY.	DESCRIPTION	AMOUNT
	Yds. Fill	
	Yds. Gravel	
	Yds. Septic Sand	
	Yds. Loam	
	Yds. Loam Tailings	
	Yds. Compost	
	Yds. Stone	
	Yds. Wood Mulch	
30	Yds. Stumps/Brush	
	Hrs. Trucking	
	Not Responsible For Damage Beyond Curb Line — TAX	
RECEIVED BY MR	TOTAL	

52417

Thank You

All claims and returned goods MUST be accompanied by this bill.

CLEAR SUMMIT TRANSPORTATION & MATERIALS

62 South Bolton Road
BOLTON, MASSACHUSETTS 01740
Phone & Fax (978) 779-6673

SOLD BY	DATE 10/28/11
NAME W.L. French	
ADDRESS	

CASH	C.O.D	CHARGE	ON ACCT		
	Yds. Fill				
	Yds. Gravel				
	Yds. Loam				
	Yds. Wood Chips				
	Yds. Stone				
30	Yds. Stumps / Brush				
	Tax				
	Hrs. Trucking				
RECEIVED BY					

All claims and returned goods MUST be accompanied by this bill.

26195

NEBS To Reorder: 800-225-6380 or nebs.com

Thank You

CLEAR SUMMIT EARTH MATERIALS
1558 Lunenburg Road
Lancaster, Massachusetts 01523
Phone (978) 537-7729

NAME	DATE
Reach Excavating	10-31-11

ADDRESS

PHONE

SOLD BY	CASH	C.O.D	CHARGE	ON ACCT	MDSE RET'D

QTY.	DESCRIPTION	AMOUNT
	Yds. Fill	
	Yds. Gravel	
	Yds. Septic Sand	
	Yds. Loam	
	Yds. Loam Tailings	
	Yds. Compost	
	Yds. Stone	
	Yds. Wood Mulch	
	1 TREE LOAD	
	Yds. Stumps/Brush	
	Hrs. Trucking	
	Not Responsible For: Damage Beyond Curb Line TAX	
	TOTAL	

RECEIVED BY

52423

Thank You

All claims and returned goods MUST be accompanied by this bill.

CLEAR SUMMIT EARTH MATERIALS
1558 Lunenburg Road
Lancaster, Massachusetts 01523
Phone (978) 537-7729

NAME	DATE
FRENCH EXCAVATING	10-31-11

ADDRESS

PHONE

SOLD BY	CASH	C.O.D	CHARGE	ON ACCT.	MDSE RET'D

QTY.	DESCRIPTION	AMOUNT
	Yds. Fill	
	Yds. Gravel	
	Yds. Septic Sand	
	Yds. Loam	
	Yds. Loam Tailings	
	Yds. Compost	
	Yds. Stone	
	Yds. Wood Mulch	
	1 TRAILER LOAD	
	Yds. Stumps/Brush	
	Hrs. Trucking	
	Not Responsible For Damage Beyond Curb Line TAX	
	TOTAL	

RECEIVED BY

52421

Thank You

All claims and returned goods MUST be accompanied by this bill.

CLEAR SUMMIT EARTH MATERIALS
1559 Lunenburg Road
Lancaster, Massachusetts 01523
Phone (978) 537-7729

NAME	DATE
W L French	11-2-11

ADDRESS
Acton

PHONE

SOLD BY	CASH	C.O.D	CHARGE	ON ACCT	MDSE RET'D

QTY.	DESCRIPTION	AMOUNT
	Yds. Fill	
	Yds. Gravel	
	Yds. Septic Sand	
	Yds. Loam	
	Yds. Loam Tailings	
	Yds. Compost	
	Yds. Stone	
	Yds. Wood Mulch	
2.5	Yds. Stumps/Brush	
	Hrs. Trucking	
	Not Responsible For Damage Beyond Curb Line TAX	
	TOTAL	

RECEIVED BY

52432

Thank You

All claims and returned goods MUST be accompanied by this bill.

Turbidity Curtain from Sinking Pond Disposed at

Devens Recycling Center in Devens, MA

DEVENS RECYCLING CENTER LLC
[illegible] INDEPENDENCE DR
DEVENS, MA 01434
THANK YOU FOR YOUR BUSINESS

Ticket: 190849
Date: 11/8/2011
Time: 10:54:17 - [illegible]

Gross: 45540 lb In Scale [illegible]
Tare: 36200 lb Out Scale [illegible]
Net: 9340 lb
Ton: 4.67

Truck: AW3430
Customer: 27/Allied Waste Services

DEVENS RECYCLING CENTER

DA: Collins Gosset

Comment: indepence rd, acton

Origin	Materials & Services	Quantity	Unit
MA/Massachusetts	100% of CD/Mixed C&D	4.67	TON

Driver: _____ Deputy Weighmaster: _____

SINKING POND TURBIDITY CURTAIN

DEVENS RECYCLING CENTER LLC
40 INDEPENDENCE DR
DEVENS, MA 01434
THANK YOU FOR YOUR BUSINESS

Truck: AW3435
Customer: 27/Allied Waste Services

Ticket: 190/00
Date: 11/7/2011
Time: 14:25:09 - 14:44:06

			Scale
Gross:	47600	lb	In Scale 1
Tare:	35940	lb	Out Scale 2
Net:	11660	lb	
Ton:	5.83		

DEVENS RECYCLING CENTER

Comments: Acton, MA

Origin	Materials & Services	Quantity	Unit
MA/Massachusetts	100% of CD/Mixed C&D	5.83	TON

Driver: [signature] Deputy Weighmaster: [signature] Ashley

D.A. Collins Co
50 Independence way
Acton MA 17
30 open

Attachment H

Paint Filter Test Log

PAINT FILTER TEST

DRAFT

Project No.: B0078800.0000
Project W.R. Grace Superfund - OU3
Location: 50 Independence Road, Acton, MA 01720
Report By: Irina Calante (ARCADIS-US)

Paint Filter Test performed by DAC, verified by AUS.

Paint Filter Test for Stabilized Sediment

Sediment Source	Date	Sample ID	Weight of Foil (g)	Weight of Foil + Sediment (g)	Weight of Sediment (g)	Start Time	End Time	Total Time	Free Liquid Observed (yes/no)	Test Pass / Fail
North Lagoon Wetland	8/22/2011	100 Tons	2	108	106	15:33	15:39	0:06	no	pass
		200 Tons	0	106	106	15:45	15:50	0:05	no	pass
		300 Tons	1	101	100	15:54	15:59	0:05	no	pass
		400 Tons	4	104	100	16:05	16:10	0:05	no	pass
		500 Tons	0	99	99	16:15	16:20	0:05	no	pass
	8/23/2011	600 Tons	1	101	100	15:55	16:00	0:05	no	pass
		700 Tons	2	106	104	16:02	16:07	0:05	no	pass
		800 Tons	1	102	101	16:08	16:13	0:05	no	pass
		900 Tons	2	104	102	16:15	16:21	0:06	no	pass
		1000 Tons	3	105	102	16:25	16:30	0:05	no	pass
		1100 Tons	1	102	101	16:30	16:35	0:05	no	pass
	8/24/2011	1200 Tons	2	104	102	16:50	16:55	0:05	no	pass
		1300 Tons	0	108	108	16:58	17:03	0:05	no	pass
		1400 Tons	2	101	99	17:08	17:13	0:05	no	pass
		1500 Tons	3	106	103	17:15	17:20	0:05	no	pass
		1600 Tons	3	104	101	17:24	17:29	0:05	no	pass
	8/30/2011	1700 Tons	0	106	106	10:30	10:35	0:05	no	pass
		1800 Tons	2	100	98	10:40	10:45	0:05	no	pass
		1900 Tons	2	107	105	10:45	10:50	0:05	no	pass
		2000 Tons	2	106	104	10:54	11:02	0:08	no	pass
		2100 Tons	4	107	103	11:06	11:11	0:05	no	pass
Sinking Pond	9/22/2011	SP-100 Tons	3	104	101	15:30	15:35	0:05	no	pass
		SP-200 Tons	2	101	99	15:40	15:45	0:05	no	pass
		SP-300 Tons	3	105	102	15:55	16:00	0:05	no	pass
		SP-400 Tons	2	105	103	16:05	16:10	0:05	no	pass
		SP-500 Tons	2	101	99	16:10	16:15	0:05	no	pass
		SP-600 Tons	3	102	99	16:15	16:20	0:05	no	pass
		SP-700 Tons	3	101	98	16:27	16:32	0:05	no	pass
	9/27/2011	SP-800 Tons	3	106	103	7:50	7:55	0:05	no	pass
		SP-900 Tons	2	101	99	8:00	8:05	0:05	no	pass
		SP-1000 Tons	3	105	102	8:10	8:15	0:05	no	pass
		SP-1100 Tons	2	105	103	8:20	8:25	0:05	no	pass
		SP-1200 Tons	3	108	105	8:30	8:35	0:05	no	pass
		SP-1300 Tons	4	110	106	8:35	8:40	0:05	no	pass
		SP-1400 Tons	3	104	101	8:50	8:55	0:05	no	pass
		SP-1500 Tons	3	112	109	9:05	9:10	0:05	no	pass
		SP-1600 Tons	5	108	103	9:15	9:25	0:10	no	pass
		SP-1700 Tons	3	107	104	9:35	9:50	0:15	no	pass
	9/29/2011	SP-1800 Tons	3	101	98	11:10	11:15	0:05	no	pass
		SP-1900 Tons	4	106	102	11:20	11:25	0.05	no	pass
		SP-2000 Tons	3	107	104	11:25	11:30	0.05	no	pass
		SP-2100 Tons	3	102	99	11:30	11:35	0.05	no	pass
		SP-2200 Tons	4	108	104	11:45	11:50	0.05	no	pass
		SP-2300 Tons	2	106	104	11:55	12:00	0.05	no	pass
		SP-2400 Tons	4	105	101	12:05	12:10	0.05	no	pass
		SP-2500 Tons	4	104	100	12:10	12:15	0.05	no	pass
		SP-2600 Tons	3	104	101	12:20	12:25	0.05	no	pass
		SP-2700 Tons	3	106	103	12:25	12:30	0.05	no	pass
		SP-2800 Tons	6	106	100	12:30	12:35	0.05	no	pass
		SP-2900 Tons	2	108	106	12:40	12:45	0.05	no	pass
		SP-3000 Tons	3	104	101	13:10	13:15	0.05	no	pass

PAINT FILTER TEST

DRAFT

Paint Filter Test performed by DAC, verified by AUS.

Project No.: B0078800.0000
Project W.R. Grace Superfund - OU3
Location: 50 Independence Road, Acton, MA 01720
Report By: Irina Calante (ARCADIS-US)

Paint Filter Test for Stabilized Sediment

Sediment Source	Date	Sample ID	Weight of Foil (g)	Weight of Foil + Sediment (g)	Weight of Sediment (g)	Start Time	End Time	Total Time	Free Liquid Observed (yes/no)	Test Pass / Fail
Sinking Pond	10/3/2011	SP-3100 Tons	2	104	102	13:35	13:40	0:05	no	pass
		SP-3200 Tons	3	101	98	13:45	13:50	0:05	no	pass
		SP-3300 Tons	3	103	100	13:55	14:00	0:05	no	pass
		SP-3400 Tons	3	104	101	14:00	14:05	0:05	no	pass
		SP-3500 Tons	3	102	99	14:05	14:10	0:05	no	pass
		SP-3600 Tons	3	104	101	14:10	14:15	0:05	no	pass
		SP-3700 Tons	4	106	102	14:15	14:20	0:05	no	pass
		SP-3800 Tons	3	103	100	14:20	14:25	0:05	no	pass
		SP-3900 Tons	3	105	102	14:25	14:30	0:05	no	pass
		SP-4000 Tons	4	104	100	14:30	14:35	0:05	no	pass
		SP-4100 Tons	3	104	101	14:35	14:40	0:05	no	pass
		SP-4200 Tons	4	105	101	14:40	14:45	0:05	no	pass
		SP-4300 Tons	5	106	101	14:45	14:50	0:05	no	pass
		SP-4400 Tons	5	105	100	14:50	14:55	0:05	no	pass
		SP-4500 Tons	5	107	102	14:55	15:00	0:05	no	pass
		SP-4600 Tons	3	103	100	15:00	15:05	0:05	no	pass
		SP-4700 Tons	3	104	101	15:05	15:10	0:05	no	pass
		SP-4800 Tons	4	106	102	15:10	15:15	0:05	no	pass
		SP-4900 Tons	3	103	100	15:20	15:25	0:05	no	pass
		SP-5000 Tons	3	107	104	15:45	15:55	0:10	no	pass
	10/7/2011	SP-5100 Tons	3	105	102	15:30	15:35	0:05	no	pass
		SP-5200 Tons	3	103	100	15:35	15:40	0:05	no	pass
		SP-5300 Tons	3	104	101	15:40	15:45	0:05	no	pass
		SP-5400 Tons	4	104	100	15:45	15:50	0:05	no	pass
		SP-5500 Tons	4	105	101	15:50	15:55	0:05	no	pass
		SP-5600 Tons	5	105	100	15:55	16:00	0:05	no	pass
		SP-5700 Tons	3	103	100	16:00	16:05	0:05	no	pass
		SP-5800 Tons	5	105	100	16:05	16:10	0:05	no	pass
		SP-5900 Tons	3	104	101	16:10	16:15	0:05	no	pass
		SP-6000 Tons	5	105	100	16:15	16:20	0:05	no	pass
		SP-6100 Tons	4	104	100	16:20	16:25	0:05	no	pass
		SP-6200 Tons	5	105	100	16:25	16:30	0:05	no	pass
		SP-6300 Tons	3	103	100	16:30	16:35	0:05	no	pass
		SP-6400 Tons	3	104	101	16:35	16:40	0:05	no	pass
		SP-6500 Tons	3	106	103	16:40	16:45	0:05	no	pass
		SP-6600 Tons	5	105	100	16:45	16:50	0:05	no	pass
		SP-6700 Tons	5	105	100	16:50	16:55	0:05	no	pass
		SP-6800 Tons	5	108	103	16:55	17:00	0:05	no	pass
		SP-6900 Tons	6	110	104	17:00	17:05	0:05	no	pass
		SP-7000 Tons	4	104	100	17:05	17:10	0:05	no	pass
	10/12/2011	SP-7100 Tons	3	104	101	17:00	17:05	0:05	no	pass
		SP-7200 Tons	3	103	100	17:10	17:15	0:05	no	pass
		SP-7300 Tons	3	103	100	17:15	17:20	0:05	no	pass
		SP-7500 Tons	7	107	100	17:25	17:30	0:05	no	pass
		SP-7600 Tons	3	103	100	17:30	17:35	0:05	no	pass
		SP-7700 Tons	3	103	100	17:35	17:40	0:05	no	pass
		SP-7800 Tons	3	104	101	17:40	17:45	0:05	no	pass
		SP-8000 Tons	3	106	103	17:50	17:55	0:05	no	pass
		SP-8100 Tons	4	106	102	17:55	18:00	0:05	no	pass
		SP-8200 Tons	6	106	100	18:00	18:05	0:05	no	pass
	11/8/2011	SP-8300 Tons	3	103	100	5:45	5:50	0:05	no	pass
		SP8400 Tons	6	116	110	6:00	6:05	0:05	no	pass
		SP-8500 Tons	5	110	105	6:05	6:10	0:05	no	pass
		SP-8600 Tons	5	105	100	6:10	6:15	0:05	no	pass
		SP-8700 Tons	5	117	112	6:15	6:20	0:05	no	pass
		SP-8800 Tons	5	107	102	6:20	6:25	0:05	no	pass
		SP-8900 Tons	6	108	102	6:25	6:30	0:05	no	pass
		SP-9000 Tons	6	120	114	6:30	6:35	0:05	no	pass

Attachment I

95% ProUCL Calculations

DRAFT

Sediment Construction Summary and Final Sediment Remedial Action Report
W.R. Grace Superfund Site
Acton-Concord, Massachusetts

Sample ID	Removal Area	In Human Accessible Area?	Arsenic Concentration (mg/kg)[1]	Laboratory Reporting Limit[2]
SP-Area1-CS01	Area 1	yes	11.0	
SP-Area1-CS02	Area 1	yes	5.8	
SP-Area1-CS03	Area 1	yes	7.7	
SP-Area1-CS04	Area 1	yes	10.45	
SP-Area1-CS05	Area 1	yes	8.1	
SP-Area1-CS06	Area 1	yes	17.0	
SP-Area1-CS07	Area 1	yes	28.0	
SP-Area1-CS08	Area 1	yes	35.0	
SP-Area2-CON-13	Area 2	yes	5.5	
SP-Area2-CON-14	Area 2	no	3.8	
SP-Area2-CON-15	Area 2	no	4.7	
SP-Area2-CON-16	Area 2	no	145.5	
SP-Area2-CON-17	Area 2	no	9.2	
SP-Area2-CON-18	Area 2	no	4.9	
SP-Area2-CON-19	Area 2	no	1.9	
SP-Area2-CON-20	Area 2	no	1.6	
SP-Area2-CON-21	Area 2	no	10.0	
SP-Area2-CON-22	Area 2	no	7.6	
SP-Area2-CON-23	Area 2	no	6.4	
SP-Area2-CON-24	Area 2	yes	12.0	
SP-Area2-CON-25	Area 2	no	6.1	
SP-Area2-CON-26	Area 2	no	3.8	
SP-Area2-CON-27	Area 2	yes	9.0	
SP-Area2-CON-28	Area 2	no	30.0	
SP-Area2-CON-29	Area 2	no	3.2	
SP-Area2-CON-30	Area 2	yes	28.0	
SP-Area2-CON-31	Area 2	no	5.4	
SP-Area2-CON-32	Area 2	no	2.1	
SP-Area3-CON-33	Area 3	yes	9.7	
SP-Area3-CON-34	Area 3	no	10.0	
SP-Area3-CON-35	Area 3	no	3.3	
SP-Area3-CON-36	Area 3	no	3.9	
SP-Area3-CON-37	Area 3	yes	4.8	
SP-Area3-CON-38	Area 3	yes	5.1	
SP-Area3-CON-39	Area 3	no	4.2	
SP-Area3-CON-40	Area 3	no	1.9	
SP-Area3-CON-41	Area 3	no	2.6	
SP-Area3-CON-42	Area 3	no	4.2	
SP-Area3-CON-43	Area 3	no	29.0	
SP-Area3-CON-44	Area 3	no	6.9	
SP-Area3-CON-45	Area 3	no	5.2	
SP-Area3-CON-46	Area 3	no	31.0	
SP-Area3-CON-47	Area 3	no	6.0	
SP-Area4-CON-48	Area 4	no	2.7	
SP-Area4-CON-49	Area 4	no	1.6	ND(1.6)
SP-Area4-CON-50	Area 4	no	1.6	
SP-Area4-CON-51	Area 4	no	2.6	
SP-Area4-CON-52	Area 4	no	6.3	
SP-Area4-CON-53	Area 4	no	8.3	
SP-Area4-CON-54	Area 4	no	2.9	
SP-Area4-CON-55	Area 4	no	17.0	
SP-Area4-CON-56	Area 4	no	2.3	

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Sediment Construction Summary and Final Sediment Remedial Action Report
W.R. Grace Superfund Site
Acton-Concord, Massachusetts

Sample ID	Removal Area	In Human Accessible Area?	Arsenic Concentration (mg/kg)[1]	Laboratory Reporting Limit[2]
SP-Area4-CON-57	Area 4	no	2.1	
SP-Area4-CON-58	Area 4	no	5.1	
SP-Area4-CON-59	Area 4	no	33.0	
SP-Area4-CON-60	Area 4	no	21.0	
SP-Area4-CON-61	Area 4	no	5.1	
SP-Area5-CON-09	Area 5	yes	5.8	
SP-Area5-CON-10	Area 5	yes	10.0	
SP-Area5-CON-11	Area 5	yes	4.3	
SP-Area5-CON-12	Area 5	no	26.0	
SP-Area5-CON-62	Area 5	no	8.3	
SP-Area5-CON-63	Area 5	no	1.6	
SP-Area5-CON-64	Area 5	no	5.4	
SP-Area5-CON-65	Area 5	no	12.0	
SP-Area5-CON-66	Area 5	no	14.0	
SP-Area5-CON-67	Area 5	no	6.4	
SP-Area5-CON-68	Area 5	no	6.7	
SP-Area5-CON-69	Area 5	no	1.7	ND(1.7)
SP-Area5-CON-70	Area 5	yes	8.8	
SP-Area5-CON-71	Area 5	yes	5.8	
SP-Area5-CON-72	Area 5	no	7.4	
SP-Area5-CON-73	Area 5	no	1.4	ND(1.4)
SP-Area5-CON-74	Area 5	yes	4.8	
SP-Area5-CON-75	Area 5	yes	4.2	
SP-Area5-CON-76	Area 5	yes	3.8	

Shading indicates result following re-dredge in Areas 2 and 5.

1. In cases where blind duplicates were analyzed, the arsenic concentration used is the average of the duplicate sample results.

2. For non-detect results, the value used is the laboratory reporting limit.

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Sediment Construction Summary and Final Sediment Remedial Action Report
W.R. Grace Superfund Site
Acton-Concord, Massachusetts

General UCL Statistics for Full Data Sets

User Selected Options

From File	Input Data.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

General Statistics

Number of Valid Observations	76	Number of Distinct Observations	53

Raw Statistics		Log-transformed Statistics	
Minimum	1.4	Minimum of Log Data	0.336
Maximum	145.5	Maximum of Log Data	4.98
Mean	10.55	Mean of log Data	1.86
Median	5.8	SD of log Data	0.895
SD	17.74		
Coefficient of Variation	1.682		
Skewness	6.145		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.303	Lilliefors Test Statistic	0.0866
Lilliefors Critical Value	0.102	Lilliefors Critical Value	0.102
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	13.94	95% H-UCL	11.98
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	14.44
95% Adjusted-CLT UCL (Chen-1995)	15.43	97.5% Chebyshev (MVUE) UCL	16.57
95% Modified-t UCL (Johnson-1978)	14.18	99% Chebyshev (MVUE) UCL	20.76

Gamma Distribution Test		Data Distribution
k star (bias corrected)	1.109	Data appear Lognormal at 5% Significance Level
Theta Star	9.507	
MLE of Mean	10.55	
MLE of Standard Deviation	10.01	
nu star	168.6	
Approximate Chi Square Value (.05)	139.6	**Nonparametric Statistics**
Adjusted Level of Significance	0.0468	95% CLT UCL 13.89
Adjusted Chi Square Value	139.1	95% Jackknife UCL 13.94
		95% Standard Bootstrap UCL 13.87
Anderson-Darling Test Statistic	3.13	95% Bootstrap-t UCL 17.32
Anderson-Darling 5% Critical Value	0.778	95% Hall's Bootstrap UCL 27.41
Kolmogorov-Smirnov Test Statistic	0.174	95% Percentile Bootstrap UCL 14.21
Kolmogorov-Smirnov 5% Critical Value	0.105	95% BCA Bootstrap UCL 15.98
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL 19.42
		97.5% Chebyshev(Mean, Sd) UCL 23.26
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL 30.8
95% Approximate Gamma UCL	12.74	
95% Adjusted Gamma UCL	12.79	

Potential UCL to Use Use 95% H-UCL 11.98

Notes:

ProUCL computes and outputs H-statistic based UCLs for historical reasons only.

H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.

It is therefore recommended to avoid the use of H-statistic based 95% UCLs.

Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.

Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

DRAFT

Sediment Construction Summary and Final Sediment Remedial Action Report
W.R. Grace Superfund Site
Acton-Concord, Massachusetts

General UCL Statistics for Full Data Sets

User Selected Options

From File	Input Data.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	19

Raw Statistics		Log-transformed Statistics	
Minimum	3.8	Minimum of Log Data	1.335
Maximum	35	Maximum of Log Data	3.555
Mean	10.64	Mean of log Data	2.145
Median	8.1	SD of log Data	0.631
SD	8.488		
Coefficient of Variation	0.798		
Skewness	1.893		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.724	Shapiro Wilk Test Statistic	0.905
Shapiro Wilk Critical Value	0.914	Shapiro Wilk Critical Value	0.914
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	13.68	95% H-UCL	13.82
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	16.6
95% Adjusted-CLT UCL (Chen-1995)	14.29	97.5% Chebyshev (MVUE) UCL	19.32
95% Modified-t UCL (Johnson-1978)	13.79	99% Chebyshev (MVUE) UCL	24.65

Gamma Distribution Test		Data Distribution
k star (bias corrected)	2.145	Data Follow Appr. Gamma Distribution at 5% Significance Level
Theta Star	4.959	
MLE of Mean	10.64	
MLE of Standard Deviation	7.263	
nu star	98.68	
Approximate Chi Square Value (.05)	76.76	**Nonparametric Statistics**
Adjusted Level of Significance	0.0389	95% CLT UCL 13.55
Adjusted Chi Square Value	75.36	95% Jackknife UCL 13.68
		95% Standard Bootstrap UCL 13.49
Anderson-Darling Test Statistic	1.237	95% Bootstrap-t UCL 15.11
Anderson-Darling 5% Critical Value	0.753	95% Hall's Bootstrap UCL 13.84
Kolmogorov-Smirnov Test Statistic	0.177	95% Percentile Bootstrap UCL 13.59
Kolmogorov-Smirnov 5% Critical Value	0.183	95% BCA Bootstrap UCL 14.48
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL 18.35
		97.5% Chebyshev(Mean, Sd) UCL 21.69
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL 28.25
95% Approximate Gamma UCL	13.67	
95% Adjusted Gamma UCL	13.93	

Potential UCL to Use Use 95% Approximate Gamma UCL 13.67

Notes:

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Attachment I
ProUCL 95% UCL Summary

DRAFT

Sediment Construction Summary and Final Sediment Remedial Action Report
W.R. Grace Superfund Site
Acton-Concord, Massachusetts

Area	n	95% UCL	Method
All Areas	**76**	**11.98**	**H-UCL**
Human Accessible Area	**23**	**13.67**	**Approximate Gamma UCL**

Notes:
UCL: upper confidence limit
H-UCL: UCL based upon Land's H-statistic

Attachment J

Laboratory Data

Attachment J

Complete Laboratory Analytical Data on CD (in front sleeve)

Attachment K

Turbidity Monitoring Log

SINKING POND TURBIDITY READINGS

DRAFT

Project No.: B0078800.0000
Project W.R. Grace Superfund - OU3
Location: 50 Independence Road, Acton, MA 01720
Report By: Irina Calante (ARCADIS-US)

Average Water Elevation[1] (FT): 136.863
Upper Excavation Elevation[1] (FT): 144.5
Lower Excavation Elevation[1] (FT): 128.0

Turbidity Readings (NTU) at Sinking Pond

			Morning							Afternoon						
Date	**Water Elevation (FT)**	**Daily Average NTU**	**Time**	**Depth of Shallow Reading (ft)**	**NTU**	**Depth of Deep Reading (ft)**	**NTU**	**Ave. NTU**	**Activity in the Pond**	**Time**	**Depth of Shallow Reading (ft)**	**NTU**	**Depth of Deep Reading (ft)**	**NTU**	**Ave. NTU**	**Activity in the Pond**
06/29/11		**1.19**	08:08	5 FT	0.1	15 FT	2.8	**1.5**	**Background Turbidity Readings.** No activity at the pond.	No readings taken in the afternoon.						
			08:15		0.0		2.1	**1.1**								
			08:21		-0.1		2.4	**1.2**								
			08:32		0.1		2.3	**1.2**								
			08:39		0.0		2.6	**1.3**								
			08:44		0.0		2	**1.0**								
08/23/11		**0.58**	13:30	5 FT	0.5	10 FT	1.0	**0.8**	Minimal activity at the Pond today. Barges were moved within the Pond.	No readings taken in the afternoon.						
			13:32		0.3		0.4	**0.4**								
			13:33		1.1		0.5	**0.8**								
			13:36		0.6		0.7	**0.7**								
					0.5		0.6	**0.6**								
					0.4		0.4	**0.4**								
08/24/11	**137.265**	**0.52**	11:42	5 FT	0.2	10 FT	0.4	**0.3**	Minimal activity at the Pond. Platform dock was used to transport silt socks across the Pond. Temporary buoys were deployed to delineate location of the turbidity curtain.	15:15	5 FT	1.7	10 FT	0.4	**1.05**	Minimal activity at the Pond. Platform dock was used to transport silt socks across the Pond.
					0.5		0.5	**0.5**				0.1		0.3	**0.2**	
					0.5		0.6	**0.6**				0.4		0.5	**0.45**	
					0.3		0.4	**0.4**				0.4		0.4	**0.4**	
					0.3		0.3	**0.3**				0.9		0.4	**0.65**	
08/25/11		**0.30**	8:30	5 FT	0.0	10 FT		**0.0**	Minimal activity at the Pond. Floating platform with the mechanical dredge and jon boat were used to place the turbidity curtain on the Pond.	15:15	5 FT	0.3	10 FT	0.6	**0.5**	Minimal activity at the Pond. Platform dock was used to transport silt socks across the Pond.
					0.1		0.2	**0.2**				0.2		0.5	**0.4**	
					0.1		0.1	**0.1**				0.2		0.3	**0.3**	
					0.1		0.5	**0.3**				0.1		0.6	**0.4**	
					0.1		0.1	**0.1**				0.3		0.3	**0.3**	
00/26/11	**136.515**	**0.39**	0:15	5 FT	0.1	10 FT	0.2	**0.2**	No activity at the Pond.	12:53	5 FT	0.5	10 FT	0.0	**0.7**	No activity at the Pond.
					0.4		0.5	**0.5**				0.1		0.2	**0.2**	
					0.1		0.5	**0.3**				0.3		0.5	**0.4**	
					0.1		0.6	**0.4**				0.5		0.5	**0.5**	
					0.1		0.6	**0.4**				0.3		0.4	**0.4**	
08/30/11	**137.453**	**0.30**	7:19	5 FT	0.2	15 FT	0.4	**0.3**	Minimal activity at the Pond today. Platform dock was used to transport silt socks across the Pond.	No readings taken in the afternoon, as there was no activity at the Pond.						
					0.1		0.5	**0.3**								
					0.1		0.5	**0.3**								
					0.0		0.4	**0.2**								
					0.0		0.8	**0.4**								
09/12/11	**137.215**	**1.93**	12:06	5 FT	1.0	15 FT	0.2	**0.6**	No activity at the Pond. Activity at the Pond expected in the afternoon. Readings taken right outside curtain.	14:04	5 FT	0.1	15 FT	0.9	**0.5**	Mechanical dredge on floating dock, tug boat and 2 jon boats traveling around Pond delineating excavation, and removing waterborne obstructions. Readings taken right outside curtain.
					0.0		0.5	**0.3**				0.0		0.3	**0.2**	
					0.0		0.5	**0.3**				0.0		0.1	**0.1**	
					0.0		0.6	**0.3**				0.0		10.0	**5.0**	
					0.0		0.6	**0.3**				3.1		11.0	**7.1**	
09/13/11	**137.190**	**1.13**	8:30	5 FT	0.0	15 FT	3.0	**1.5**	Mechanical dredge on floating dock, tug boat and 2 jon boats traveling around Pond clearing vegetation from Pond bank in Area 3. Readings taken right outside curtain.	15:15	5 FT	0.1	15 FT	3.4	**1.8**	Mechanical dredge on floating dock, tug boat and 2 jon boats traveling around Pond clearing vegetation from Pond bank in Area 3. Readings taken ~10-20 FT from curtain.
					0.0		3.5	**1.8**				0.0		2.8	**1.4**	
					0.0		2.6	**1.3**				0.0		1.7	**0.9**	
					0.0		4.4	**2.2**				0.0		1.6	**0.8**	
					0.0		0.4	**0.2**				0.0		1.1	**0.6**	

NOTES:
1. All elevation readings are relative to NGVD 29.
2. Shallow depth reading represents condition above thermocline. Deep depth reading represents condition below thermocline.

SINKING POND TURBIDITY READINGS

DRAFT

Project No.: B0078800.0000
Project W.R. Grace Superfund - OU3
Location: 50 Independence Road, Acton, MA 01720
Report By: Irina Calante (ARCADIS-US)

Average Water Elevation[1] (FT): 136.863
Upper Excavation Elevation[1] (FT): 144.5
Lower Excavation Elevation[1] (FT): 128.0

Turbidity Readings (NTU) at Sinking Pond

			Morning							Afternoon						
Date	**Water Elevation (FT)**	**Daily Average NTU**	**Time**	**Depth of Shallow Reading (ft)**	**NTU**	**Depth of Deep Reading (ft)**	**NTU**	**Ave. NTU**	**Activity in the Pond**	**Time**	**Depth of Shallow Reading (ft)**	**NTU**	**Depth of Deep Reading (ft)**	**NTU**	**Ave. NTU**	**Activity in the Pond**
09/14/11	**137.165**	**2.04**	9:30	5 FT	0.0	15 FT	1.5	**0.8**	Mechanical dredge on floating dock and 2 jon boats clearing trees from Pond bank. Readings taken ~10-20 FT from curtain.	14:04	5 FT	0.1	15 FT	0.9	**0.5**	Mechanical dredge on floating dock and 2 jon boats clearing trees from Pond bank. Readings taken ~10-20 FT from curtain.
					0.0		1.7	**0.9**				0.0		0.3	**0.2**	
					0.0		1.5	**0.8**				0.0		0.1	**0.1**	
					0.0		1.8	**0.9**				0.0		10.0	**5.0**	
					0.0		1.7	**0.9**				3.1		11.0	**7.1**	
09/15/11	**137.115**	**2.75**	10:30	5 FT	0.2	15 FT	1.1	**0.7**	Dredging in Area 3. Readings taken ~16 FT from curtain.	15:00	5 FT	0.0	15 FT	9.7	**4.9**	Dredging in Area 3. Readings taken ~16 FT from curtain.
09/16/11	**137.040**	**3.60**	9:23	5 FT	2.4	15 FT	5.7	**4.1**	Dredging in Area 3. Readings taken ~16 FT from curtain.	14:53	5 FT	1.9	15 FT	4.4	**3.2**	Completed dredging for the day in Area 3. Readings taken ~16 FT from curtain.
09/19/11	**136.990**	**1.95**	9:10	5 FT	1.4	15 FT	3.0	**2.2**	Dredging in Area 3. Readings taken ~16 FT from curtain.	14:44	5 FT	1.3	15 FT	2.1	**1.7**	Dredging in Area 3. Readings taken ~16 FT from curtain.
09/20/11	**136.955**	**2.05**	9:50	5 FT	1.7	15 FT	1.8	**1.8**	Dredging in Area 3. Readings taken ~16 FT from curtain.	15:10	5 FT	1.7	15 FT	3.0	**2.4**	Dredging in Area 3. Readings taken ~16 FT from curtain.
09/21/11	**136.708**	**4.73**	9:10	5 FT	2.6	15 FT	5.8	**4.2**	Dredging in Area 3. Readings taken ~16 FT from curtain.	14:13	5 FT	5.6	15 FT	4.9	**5.3**	Dredging in Area 3. Readings taken ~16 FT from curtain.
09/22/11	**136.735**	**4.53**	10:05	5 FT	4.4	15 FT	3.2	**3.8**	Dredging in Area 3. Readings taken ~16 FT from curtain.	15:30	5 FT	4.8	15 FT	5.7	**5.3**	Dredging in Area 3. Readings taken ~16 FT from curtain.
09/23/11	**136.730**	**5.45**	8:45	5 FT	5.4	15 FT	4.0	**4.7**	Began clearing roots in Area 4. Readings taken ~16 FT from curtain from Area 3 station. Completed excavation in Area 3 as of yesterday afternoon.	14:50	5 FT	7.8	15 FT	4.6	**6.2**	Completed clearing activities for the day. Readings taken ~16 FT from curtain from Area 4 station. Raining during turbidity readings.
09/26/11	**136.837**	**1.63**	8:45	5 FT	1.5	15 FT	2.0	**1.8**	No activities at this time. Readings taken ~16 FT from curtain from Area 4 station.	14:45	5 FT	1.6	15 FT	1.4	**1.5**	Barge mounted excavator transported from bulkhead to area 4. Readings taken ~16 FT from curtain from Area 4 station.
09/27/11	**136.770**	**2.53**	7:50	5 FT	0.7	15 FT	0.8	**0.8**	Dredging in Area 4. Readings taken ~16 FT from curtain.	15:00	5 FT	0.7	15 FT	7.9	**4.3**	Dredging in Area 4. Readings taken ~16 FT from curtain.
09/28/11	**136.730**	**2.73**	8:30	5 FT	3.2	15 FT	0.3	**1.8**	Dredging in Area 4. Readings taken ~16 FT from curtain.	14:15	5 FT	3.2	15 FT	4.2	**3.7**	Dredging in Area 4. Readings taken ~16 FT from curtain.
09/29/11	**136.743**	**7.54**	9:30	5 FT	7.1	15 FT	3.2	**5.2**	Dredging in Area 4. Readings taken ~16 FT from curtain.	15:15	5 FT	8.1	15 FT	11.8	**9.9**	Dredging in Area 4. Readings taken ~16 FT from curtain.
09/30/11	**136.741**	**6.40**	8:45	5 FT	2.4	15 FT	10.9	**6.7**	Dredging in Area 4. Readings taken ~16 FT from curtain.	13:50	5 FT	3.2	15 FT	9.1	**6.2**	Dredging in Area 4. Readings taken ~16 FT from curtain.
10/01/11	**136.720**	**6.95**	10:05	5 FT	6.6	15 FT	5.9	**6.3**	Dredging in Area 2. Readings taken ~1.5 FT from curtain.	13:20	5 FT	6.1	15 FT	9.2	**7.7**	Dredging in Area 2. Readings taken ~1.5 FT from curtain.
10/03/11	**136.720**	**9.45**	9:30	5 FT	4.3	15 FT	11.2	**7.8**	Dredging in Area 2. Readings taken ~1.5 FT from curtain.	14:38	5 FT	13.2	15 FT	9.1	**11.2**	Dredging in Area 2. Readings taken ~1.5 FT from curtain.
10/04/11	**136.740**	**8.10**	8:40	5 FT	6.3	15 FT	7.7	**7.0**	Dredging in Area 2. Readings taken right outside of curtain, ~ 1 FT from curtain.	15:40	5 FT	8.6	15 FT	9.8	**9.2**	Dredging in Area 2. Readings taken right outside of curtain, ~ 1 FT from curtain..
10/05/11	**136.720**	**19.10**	11:30	5 FT	9.6	15 FT	30.0	**19.8**	Dredging in Area 5. Readings taken right outside of curtain, ~ 1 FT from curtain.	15:35	5 FT	21.1	15 FT	15.7	**18.4**	Dredging in Area 5. Readings taken right outside of curtain, ~ 1 FT from curtain.
10/06/11	**136.720**	**15.33**	8:40	5 FT	10.5	15 FT	11.4	**11.0**	Dredging in Area 5. Readings taken right outside of curtain, ~ 1 FT from curtain.	15:40	5 FT	24.2	15 FT	15.2	**19.7**	Dredging in Area 5. Readings taken right outside of curtain, ~ 1 FT from curtain..
10/07/11	**136.512**	**18.75**	11:29	5 FT	11.8	15 FT	22.2	**17.0**	Dredging in Area 5. Readings taken right outside of curtain, ~ 1 FT from curtain.	15:35	5 FT	27.3	15 FT	13.7	**20.5**	Dredging in Area 5. Readings taken right outside of curtain, ~ 1 FT from curtain.
10/08/11	**136.512**	**22.33**	9:35	5 FT	10.0	15 FT	47.1	**28.6**	Dredging in Area 5. Readings taken right outside of curtain, ~ 1 FT from curtain.	13:47	5 FT	11.9	15 FT	20.3	**16.1**	Dredging in Area 5. Readings taken right outside of curtain, ~ 1 FT from curtain.
10/10/11		**6.50**	8:55	5 FT	6.1	15 FT	7.9	**7.0**	Dredging in Area 5. Readings taken right outside of curtain, ~ 1 FT from curtain.	15:10	5 FT	4.0	15 FT	8.0	**6.0**	Dredging in Area 5. Readings taken right outside of curtain, ~ 1 FT from curtain.

NOTES:
1. All elevation readings are relative to NGVD 29.
2. Shallow depth reading represents condition above thermocline. Deep depth reading represents condition below thermocline.

ARCADIS

SINKING POND TURBIDITY READINGS

DRAFT

Project No.: B0078800.0000
Project W.R. Grace Superfund - OU3
Location: 50 Independence Road, Acton, MA 01720
Report By: Irina Calante (ARCADIS-US)

Average Water Elevation[1] (FT): 136.863
Upper Excavation Elevation[1] (FT): 144.5
Lower Excavation Elevation[1] (FT): 128.0

Turbidity Readings (NTU) at Sinking Pond

			Morning							Afternoon						
Date	**Water Elevation (FT)**	**Daily Average NTU**	**Time**	**Depth of Shallow Reading (ft)**	**NTU**	**Depth of Deep Reading (ft)**	**NTU**	**Ave. NTU**	**Activity in the Pond**	**Time**	**Depth of Shallow Reading (ft)**	**NTU**	**Depth of Deep Reading (ft)**	**NTU**	**Ave. NTU**	**Activity in the Pond**
10/11/11		**4.45**	9:17	5 FT	3.2	15 FT	3.7	**3.5**	Dredging in Area 5. Readings taken right outside of curtain, ~ 1 FT from curtain.	14:45	5 FT	5.8	15 FT	5.1	**5.5**	Dredging in Area 5. Readings taken right outside of curtain, ~ 1 FT from curtain.
10/12/11		**9.40**	10:35	5 FT	6.3	15 FT	19.9	**13.1**	Dredging in Area 5. Readings taken right outside of curtain, ~ 1 FT from curtain.	14:55	5 FT	9.1	15 FT	2.3	**5.7**	Dredging in Area 5. Readings taken right outside of curtain, ~ 1 FT from curtain.
10/13/11	**136.479**	**4.93**	10:40	5 FT	4.0	15 FT	6.8	**5.4**	No activity in the Pond. Readings taken right outside of curtain in Area 5, ~ 1 FT from curtain.	15:10	5 FT	3.9	15 FT	5.0	**4.5**	Dredging in Area 5. Readings taken right outside of curtain, ~ 1 FT from curtain.
10/17/11		**1.25**	8:40	5 FT	1.3	15 FT	1.2	**1.3**	Confirmatory sample collection in Area 5. Readings taken right outside of curtain in Area 5, ~ 1 FT from curtain.							No reading taken as there was no activity at the pond.
10/18/11		**2.70**	11:10	5 FT	0.4	15 FT	4.0	**2.2**	Topsoil was being placed in Area 3. Readings taken right outside of curtain in Area 3, ~ 3 FT from curtain.	15:18	5 FT	0.5	15 FT	5.9	**3.2**	Completed placing topsoil in Area 3 for the day. Readings taken right outside of curtain in Area 3, ~ 2 FT from curtain.
10/19/11		**2.85**	11:30	5 FT	2.1	15 FT	2.2	**2.2**	Topsoil was being placed in Area 4. Readings taken right outside of curtain in Area 4, ~ 2 FT from curtain.	14:40	5 FT	3.0	15 FT	4.1	**3.6**	Topsoil was being placed in Area 4. Readings taken right outside of curtain in Area 4, ~ 2 FT from curtain.
10/20/11		**9.25**	11:07	5 FT	6.1	15 FT	12.3	**9.2**	Topsoil was being placed in Area 4. Readings taken right outside of curtain in Area 4, ~ 2 FT from curtain.	16:20	5 FT	8.1	15 FT	10.5	**9.3**	Topsoil was being placed in Area 3. Readings taken right outside of curtain in Area 3, ~ 2 FT from curtain.
10/21/11		**8.40**	10:55	5 FT	9.7	15 FT	10.7	**10.2**	Topsoil was being placed in Area 4. Readings taken right outside of curtain in Area 4, ~ 2 FT from curtain.	3:30	5 FT	6.1	15 FT	7.1	**6.6**	Topsoil was being placed in Area 5. Readings taken right outside of curtain in Area 5, ~ 2 FT from curtain.
10/22/11		**13.38**	8:15	5 FT	11.7	15 FT	13.9	**12.8**	Topsoil was being placed in Area 2. Readings taken right outside of curtain in Area 2, ~ 2 FT from curtain.	13:37	5 FT	11.8	15 FT	16.1	**14.0**	Topsoil was being placed in Area 2. Readings taken right outside of curtain in Area 2, ~ 2 FT from curtain.
10/24/11		**11.87**	11:35	5 FT		15 FT	11.2	**11.2**	Topsoil placement completed in Area 2. Readings taken right outside of curtain in Area 2, ~ 2 FT from curtain.	15:30	5 FT	9.7	15 FT	14.7	**12.2**	No topsoil placement, only barge and jon boats navigating in the pond. Readings taken right outside of curtain in Area 5, ~ 2 FT from curtain.
10/25/11	**136.520**	**9.30**	11:30	5 FT	8.8	15 FT	9.8	**9.3**	No topsoil placement. Barge, mini-scows and jon boats navigating in the pond. Readings taken right outside of curtain in Area 5 near bulkhead and Area 2, ~ 2 FT from curtain.	15:10	5 FT	8.9	15 FT	9.7	**9.3**	No topsoil placement. Barge, mini-scows and jon boats navigating in the pond. Readings taken right outside of curtain in Area 5 near bulkhead and Area 2, ~ 2 FT from curtain.
10/26/11	**136.460**	**7.93**	8:10	5 FT	7.0	15 FT	8.0	**7.5**	Re-dredging in Area 2. Readings taken right outside of curtain in Area 2, ~ 2 FT from curtain.	14:50	5 FT	7.0	15 FT	9.7	**8.4**	Re-dredging in Area 2. Readings taken right outside of curtain in Area 5 close to Area 2 and near the barge, ~ 2 FT from curtain.
10/27/11		**11.38**	9:30	5 FT	8.7	15 FT	8.3	**8.5**	Re-dredging in Area 5. Readings taken right outside of curtain in Area 5 across from Inlet and near Area 2, ~ 2 FT from curtain.	15:35	5 FT	13.3	15 FT	15.2	**14.3**	Re-dredging in Area 5. Readings taken right outside of curtain in Area 5 across from Inlet and near Area 2, ~ 2 FT from curtain.
10/28/11		**14.90**	9:25	5 FT	11.1	15 FT	10.5	**10.8**	Re-dredging in Area 2. Readings taken right outside of curtain in Area 2, ~ 2 FT from curtain.	13:15	5 FT	10.8	15 FT	27.2	**19.0**	Re-dredging in Area 2. Readings taken right outside of curtain in Area 5 close to Area 2 and near the barge, ~ 2 FT from curtain.

NOTES:
1. All elevation readings are relative to NGVD 29.
2. Shallow depth reading represents condition above thermocline. Deep depth reading represents condition below thermocline.

SINKING POND TURBIDITY READINGS

DRAFT

Project No.: B0078800.0000
Project W.R. Grace Superfund - OU3
Location: 50 Independence Road, Acton, MA 01720
Report By: Irina Calante (ARCADIS-US)

Average Water Elevation[1] (FT): 136.863
Upper Excavation Elevation[1] (FT): 144.5
Lower Excavation Elevation[1] (FT): 128.0

Turbidity Readings (NTU) at Sinking Pond

			Morning							Afternoon						
Date	**Water Elevation (FT)**	**Daily Average NTU**	**Time**	**Depth of Shallow Reading (ft)**	**NTU**	**Depth of Deep Reading (ft)**	**NTU**	**Ave. NTU**	**Activity in the Pond**	**Time**	**Depth of Shallow Reading (ft)**	**NTU**	**Depth of Deep Reading (ft)**	**NTU**	**Ave. NTU**	**Activity in the Pond**
10/31/11		**5.98**	9:40	5 FT	4.3	15 FT	4.8	**4.6**	Bypass removal from pond. Readings taken right outside of curtain in Area 5 across from Inlet and near Area 2, ~ 2 FT from curtain.	14:45	5 FT	4.4	15 FT	10.4	**7.4**	No activity at the pond. Check dam construction at the Inlet. Readings taken right outside of curtain in Area 5 across from Inlet and near Area 2, ~ 2 FT from curtain.
11/01/11		**6.43**	9:34	5 FT	4.3	15 FT	10.3	**7.3**	Washing of roll-off containers on mini-scows. Readings taken right outside of curtain in Area 5 across from Inlet, ~ 2 FT from curtain.	14:35	5 FT	3.6	15 FT	7.5	**5.6**	No activity at the pond. Readings taken right outside of curtain in Area 5 across from Inlet, ~ 2 FT from curtain.
11/02/11		**3.70**	No readings taken in the morning as there was no activity at the pond.							13:45	5 FT	2.8	15 FT	4.6	**3.7**	Washing of mini-scow platform. Readings taken right outside of curtain in Area 5 across from Inlet, ~ 2 FT from curtain.
11/03/11		**3.43**	11:30	5 FT	1.0	15 FT	2.8	**1.9**	Topsoil placement from land in Area 5. Readings taken right outside of curtain in Area 5 across from Inlet, ~ 2 FT from curtain.	14:30	5 FT	4.3	15 FT	5.6	**5.0**	No activity at the pond. Readings taken right outside of curtain in Area 5 across from Inlet, ~ 2 FT from curtain.
11/04/11		**4.90**	9:30	5 FT	2.3	15 FT	2.8	**2.6**	Boat traffic near the bulkhead. Readings taken right outside of curtain in Area 5 across from Inlet, ~ 2 FT from curtain.	14:30	5 FT	5.6	15 FT	8.9	**7.3**	No activity at the pond. Readings taken approximately in the same location as morning. Turbidity curtain had been removed.
11/07/11		**3.95**	11:00	5 FT	3.3	15 FT	4.6	**4.0**	Washing of main barge. Readings taken approximately in Area 5 across from Inlet.	No readings taken in the afternoon as there was no activity or boat traffic at the pond.						
11/08/11		**0.45**	8:30	5 FT	0.4	15 FT	0.5	**0.5**	Minor boat activity at the pond. Readings taken approximately 150 feet from shore through pond.	No readings taken in the afternoon as there was no activity or boat traffic at the pond.						
					0.4		0.4	**0.4**								
					0.7		0.5	**0.6**								
					0.5		0.5	**0.5**								
					0.3		0.3	**0.3**								

NOTES:
1. All elevation readings are relative to NGVD 29.
2. Shallow depth reading represents condition above thermocline. Deep depth reading represents condition below thermocline.

Attachment L

Requests for Information

D.A. COLLINS COMPANIES

W.R. Grace Superfund Site, Acton MA. – Operable Unit No. 3 / Sediment Remedy
REQUEST FOR INFORMATION (RFI)

RFI #	**001**	**Reference Documents, Drawings, Specifications**
Date:	6/27/11	**Drawing** **Excavation Plan – North Lagoon Wetland DWG #7**
Subject:	Survey Data Clarification No. Lagoon Wetland	
To:	Clayton Smith, CM de maximis	
Copy To:	Jeffrey Holden, PE Arcadis	

Information or Clarification Requested

DAC Survey subcontractor Thew Associates currently performing layout at North Lagoon Wetland- information copied from 24 June 2011 e-mail is as follows

```
Original Message-----
From: Bruce Hebbel [mailto:bhebbel@dacollins.com]
Sent: Friday, June 24, 2011 2:34 PM
To: csmith@demaximis.com; Holden, Jeffrey
Cc: Calante, Irina; Steve Bullock
Subject: Grace Survey

Clayton and Jeff

Our wetland topo survey is carrying us across to the opposite bank of Ft Pond
Brook In particular Arcadis Control points #9 and #10.

We have confirmed the starting Benchmark. At Main St bridge abutment and we're
good. What we would like is the location and survey data of any Hard Structure
Arcadis has for this site so we can shoot and verify/confirm.

We do not want to get too far into layout without this check

This will be placed into a formal RFI as 001 when I get to connectivity However
if we can begin the discussion it would be most helpful

Thanks
Bruce
```

Reason for Request

Design Ambiguity	X	Operability	
Constructability		Weather	
Cost		Other: **Clarification**	
Schedule			

Response/Solution (with attachments as necessary)

See attached response.

Signatures/Dates

Originated by:	Bruce C. Hebbel, P.G. D.A. Collins	6/27/11
Prepared by:	Bruce C. Hebbel, P.G. D.A. Collins	6/27/11
Responded by:	Mark O. Gravelding, P.E. ARCADIS	7/5/11

DAC's RFI #1 requests clarification on the locations of control points #9 and #10, which were provided to help define the horizontal limits of removal in the North Lagoon Wetland area and which, when staked in the field, fall within Fort Pond Brook. Although not mentioned in the RFI, we also understand that control points #7 and #8 plot within the brook.

ARCADIS has coordinated with DAC's field surveyors (Thew Associates) and they have confirmed use of the appropriate survey coordinate system. We have also confirmed that the control point coordinates, which were extracted from the CADD basemap, were properly transcribed. Finally, Thew has indicated that, with the exception of the control points that follow the boundary of the brook, the remaining control points appear to plot correctly in the field.

The root cause of the discrepancy appears to be the aerial-based interpretation of the brook boundary that appears on the base map. The feature was interpreted as part of the aerial-based survey mapping, and apparently does not precisely match the actual field condition.

The intent when developing the NLW removal limits was to carry the excavation to the top of the bank along the boundary of Fort Pond Brook. Accordingly, the removal limits between control points #6 and #14 should follow the top of the brook bank regardless of where the survey control points plot.

D.A. COLLINS COMPANIES

W.R. Grace Superfund Site, Acton MA – Operable Unit No. 3 / Sediment Remedy

REQUEST FOR INFORMATION (RFI)

RFI #	**002**	**Reference Documents, Drawings, Specifications**
Date:	7/1/11	**Drawing** **Temporary Facilities Details, DWG #4, Detail 6** **Silt Fence**
Subject:	Silt Sock Alternate Material to Approved Silt Fence	
To:	Clayton Smith, CM de maximis	
Copy To:	Jeffrey Holden, PE Arcadis	

Information or Clarification Requested

DAC requests approval to utilize the Silt Sock product as an alternate material to the specified silt fence in select areas where installation of silt fence in accordance with the specification is not practical.

Justification for Alternate Material:

- Most of the silt fence installation areas are heavily vegetated with a high concentration of near-surface tree roots. Trenching for silt fence embedment in these areas will require the use of an excavator. In the wetland areas this would create a significant impact to the surrounding vegetation and sensitive environment. In the Sinking Pond location most of the shoreline is inaccessible to an excavator.
- Most of the silt fence installations do not have any planned site disturbance upgradient of the silt fence. These areas should remain relatively stable and do not warrant significant disturbance in order to trench in silt fence.
- The Silt Sock product is designed to be installed on the ground surface without any trenching, and can be easily configured to run around tree stumps and other surface obstructions. The Silt Sock product will result in a less intrusive installation of erosion controls in the difficult and sensitive areas of the site.

Attachments:

- Silt Sock technical information.
- Preliminary drawing of proposed locations for Silt Sock installation shown in red.

Reason for Request

Design Ambiguity		Operability	
Constructability	x	Weather	
Cost		Other:	
Schedule			

Response/Solution (with attachments as necessary)

Silt sock use in lieu of silt fencing in heavily vegetated and rooted areas is approved.

Signatures/Dates

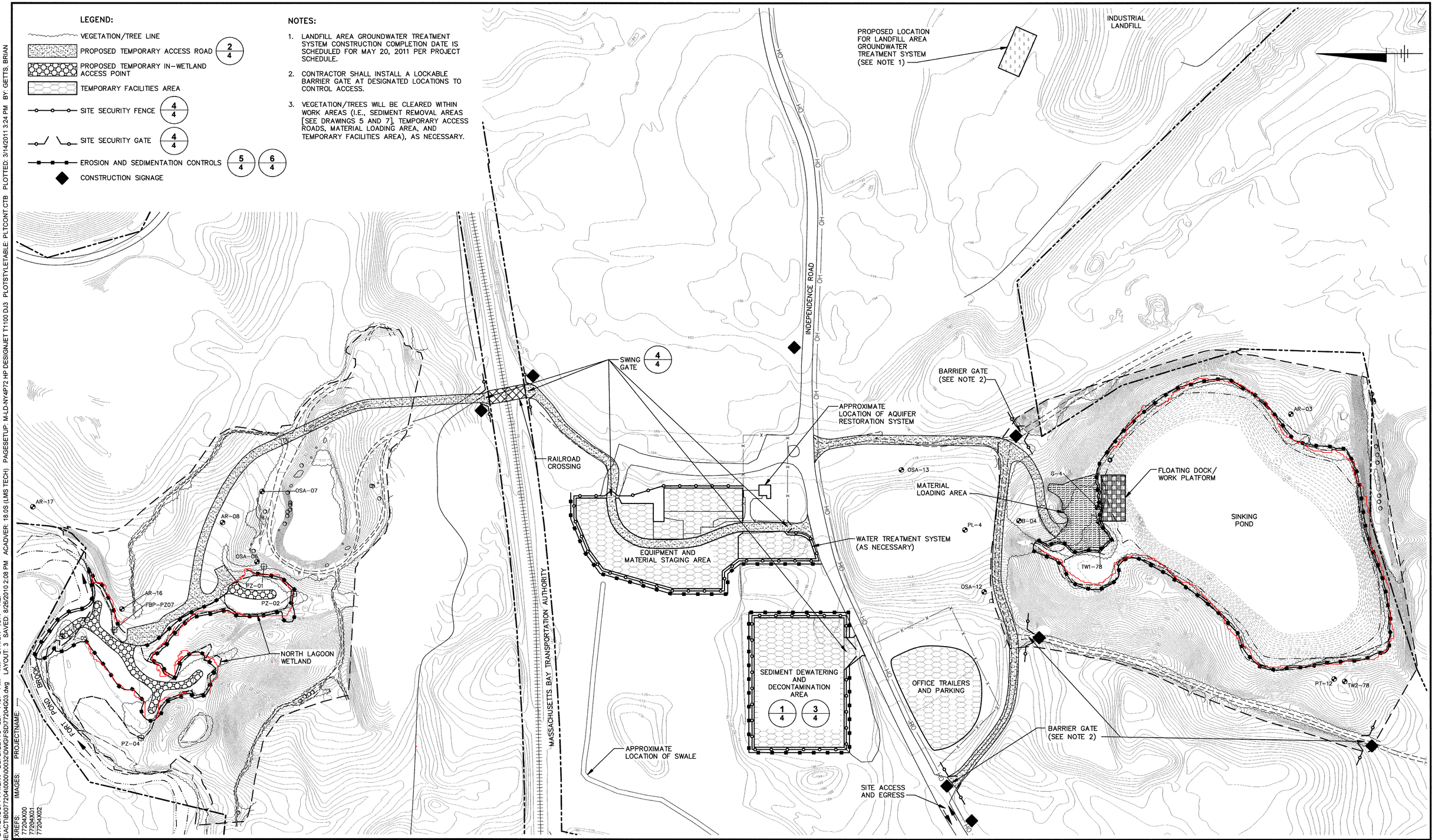
Originated by:	Bruce C. Hebbel, P.G., D.A. Collins	7/1/11
Prepared by:	Bruce C. Hebbel, P.G., D.A. Collins	7/1/11
Responded by:	Mark O. Gravelding,P.E. ARCADIS	7/5/11

LEGEND:

- VEGETATION/TREE LINE
- PROPOSED TEMPORARY ACCESS ROAD (2/4)
- PROPOSED TEMPORARY IN-WETLAND ACCESS POINT
- TEMPORARY FACILITIES AREA
- SITE SECURITY FENCE (4/4)
- SITE SECURITY GATE (4/4)
- EROSION AND SEDIMENTATION CONTROLS (5/4) (6/4)
- CONSTRUCTION SIGNAGE

NOTES:

1. LANDFILL AREA GROUNDWATER TREATMENT SYSTEM CONSTRUCTION COMPLETION DATE IS SCHEDULED FOR MAY 20, 2011 PER PROJECT SCHEDULE.
2. CONTRACTOR SHALL INSTALL A LOCKABLE BARRIER GATE AT DESIGNATED LOCATIONS TO CONTROL ACCESS.
3. VEGETATION/TREES WILL BE CLEARED WITHIN WORK AREAS (I.E., SEDIMENT REMOVAL AREAS [SEE DRAWINGS 5 AND 7], TEMPORARY ACCESS ROADS, MATERIAL LOADING AREA, AND TEMPORARY FACILITIES AREA), AS NECESSARY.



CITY: SYRACUSE-NY DIV/GROUP: 141/ENV DB: B.GETTS LD: PIC: PM: TM: LYR:ON=*;OFF=*REF*
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XREFS: 77204X00 77204X01 77204X02
IMAGES:
PROJECTNAME:

100' 0 100' 200'
1"=100'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING:

USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

THIS DRAWING IS THE PROPERTY OF THE ARCADIS ENTITY IDENTIFIED IN THE TITLE BLOCK AND MAY NOT BE REPRODUCED OR ALTERED IN WHOLE OR IN PART WITHOUT THE EXPRESS WRITTEN PERMISSION OF SAME.

Professional Engineer's Name		
MARK O. GRAVELDING		
Professional Engineer's No. 42983		
State MA	Date Signed 3/15/2011	Project Mgr. JSH
Designed by MAD	Drawn by BGG	Checked by MJB

COMMONWEALTH OF MASSACHUSETTS MARK O. GRAVELDING No. 42983 REGISTERED PROFESSIONAL ENGINEER

ARCADIS

ARCADIS U.S., INC.

W.R. GRACE SUPERFUND SITE • ACTON-CONCORD, MASSACHUSETTS

FINAL (100%) SEDIMENT REMEDIAL DESIGN REPORT

SITE LAYOUT

ARCADIS Project No. B0077204.0000.00032

Date MARCH 2011

ARCADIS
6723 Towpath Road
P.O. Box 66
Syracuse, NY 13214
Tel. 315.446.9120

3

call today
608-438-7625

COST EFFECTIVE

Silt Socks are a filter fabric sock filled with wood chips or compost.

LOW MAINTENANCE

Silt Socks allow water to flow through at a controlled rate while trapping sediment. This is accomplished by a filter fabric filled with organic material. The design of the sock provides intimate contact with the ground preventing water from flowing underneath.

EASY INSTALL

Filled socks may be used as an alternative to silt fence in many areas.

GREEN PRODUCT

The socks are filled with 100% wood recycled from new construction debris. This filler is inert, free of seed, low in moisture content and incredibly environmentally friendly.

BETTER SITE ACCESS

The sock is an effective erosion control device with a lower profile making your project easier to access and more aesthetically pleasing.

REUSABLE

The Silt Sock is an effective perimeter control device.

SHIPABLE

Any quantity of filled Sock is palletized and ready to ship to your projects location.

©2011 Silt Sock Erosion Control

call today
608-438-7625

Product Specification

Size Options	Fabric Options
• 8” diameter • 12” diameter • 18” diameter • 24" diameter	• Standard Duty • Heavy Duty • Biodegradeable

Definition:

A silt sock is a tubular-shaped material comprised of a fabric exterior filled with wood chips or compost. The material used in the sock is an environmentally safe material. The silt sock fabric comes in rolls of 600 – 1000 feet.

The silt sock is typically laid on the top of the ground along the down-slope areas and along side-slope areas as required to prevent or reduce erosion. The silt sock is either lapped or butted at the ends to create a continuous line of defense. Staking the sock is not usually required. The first water to contact the sock is absorbed “staking” the sock in place by its weight alone. In greater sloped areas the sock may be secured in place by stakes or other supports.

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call today
608-438-7625

Care and Maintenance

The following silt sock conditions require maintenance:

- Deformation due to drive-over or dragging
  Action required: Re-contour by hand if applicable. If not, see applicable repair methods below.
- Sock rolling due to hydraulic force
  Action required: Reposition and stake.
- Loss of ground contact
  Action required: Fill in depressions and back-grout with chips from damaged section.
- Sediment accumulation of ½ sock height
  Action required: Remove by hand or install a second row of sock positioned on top of or up slope of the original sock

The following silt sock conditions require repair:

- Holes, rips or tears of the sock
  Action required: Small holes or narrow rips shorter than 12 inches may be stitched closed using plastic zip-ties. Tears longer than 12 inches require the sock be replaced.
- Pinch or localized diameter reduction of more than ½ the original diameter
  Action required: Install new section of sock upslope of the damaged section.

The Silt Sock is an effective erosion control device. It's success relies on proper installation and maintenance. Greater protection can be acomplished by layering sock in pyramid style.

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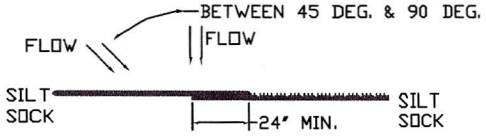
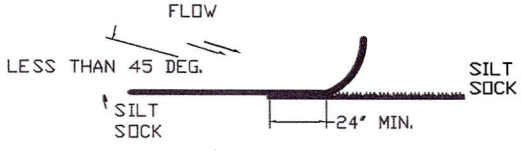
Installation Details

Silt Sock Properly Installed

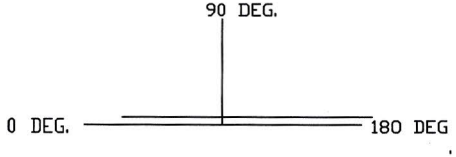


Upstream Silt Sock placed 45° to 90° from flow direction with 24" overlap.

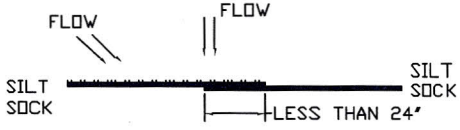


*Install another sock or use the upstream sock set 45° to 90° from flow direction with 24" overlap.

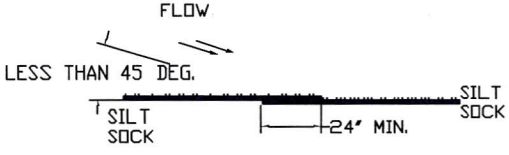
REFERENCE ANGLES



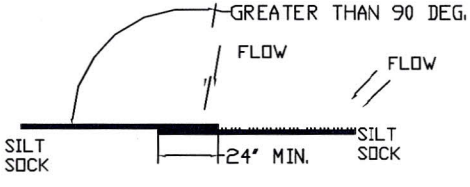
Silt Sock Not Properly Installed



Silt Sock overlaps less than 24"

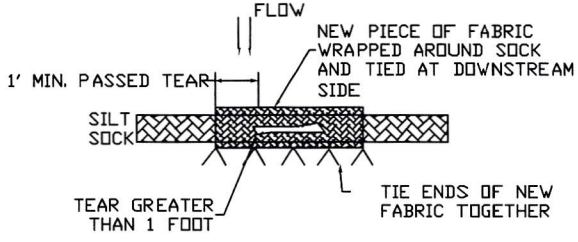


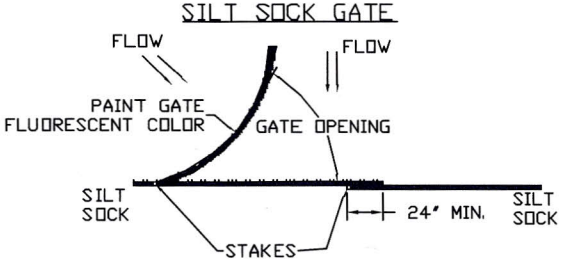
*Upstream sock placed less than 45° from flow direction



Upstream sock placed greater than 90° from flow direction

Silt Sock Repair for Tear Greater Than 1 Foot





US CONSTRUCTION FABRICS LLC
AND ENVIRONMENTAL PROTECTION SYSTEMS

P.O. Box 505 • Windham, NH 03087

US CONSTRUCTION FABRICS LLC
AND ENVIRONMENTAL PROTECTION SYSTEMS

P.O. Box 505 • Windham, NH 03087

Performance Data

Challenge #1

Parameter	Inlet Concentration Mg/Liter	Outlet Concentration Mg/Liter	Percent Reduction
Total Suspended Solids	5,221	695.8	86.7%
Total Phosphorous	1.51	1.08	28.5%
Total Nitrogen	1.68	1.27	24.4%
Chloride	0.59	0.43	27.1%
Sulfate	0.62	0.40	35.5%
Petroleum Residue	588	67.3	88.6%
Arsenic	1.1	0.89	19%
Iron	18.2	6.7	63%
Calcium	253.9	199.6	21.4%
Lead	13.3	6.6	50.4%
Zinc	9.9	4.5	54.5%
Copper	7.8	3.9	50.0%
Ph	8.4	8.2	

Challenge #2

Parameter	Inlet Concentration Mg/Liter	Outlet Concentration Mg/Liter	Percent Reduction
Total Suspended Solids	5,193	471.2	90.9%
Total Phosphorous	1.63	1.08	33.7%
Total Nitrogen	1.77	1.30	26.5%
Chloride	0.65	0.41	36.9%
Sulfate	0.59	0.33	44.1%
Petroleum Residue	603	71.5	88.1%
Arsenic	1.0	0.63	37%
Iron	17.6	4.7	73.3%
Calcium	245.1	134.4	45.2%
Lead	18.5	5.2	71.9%
Zinc	12.8	4.1	68%
Copper	8.9	3.5	60.7%
Ph	8.4	8.2	

Independent Testing Done By Legend Technical Services www.legend-group.com

A QUANTITATIVE ASSESSMENT OF 8” Silt Sock

November 2009

Prepared for:
Silt Sock Erosion Control

By:
American Excelsior Company

STUDY SITE

All testing conducted for this study was completed at ErosionLab, which is a large-scale erosion and sediment control research laboratory located near Rice Lake, WI. More specifically, the Sediment Control Facility (SCF) was utilized. The facility contains five test plots that are 10.7 m (35.0 ft) long by 2.4 m (8.0 ft) wide at an 8H:1V (12.5%) slope and are filled with a veneer of topsoil. Each plot is surrounded by 10 rainfall riser holders in which portable rainfall simulator risers are placed. The simulator can produce rainfall events up to 20.3 cm/hr (8.0 in/hr). Water is pumped from an onsite pond, which provides a constant flow of water to the simulator.

METHODS

Test BMPs installed at the toe of a slope by utilizing simulated rainfall and compare soil loss data to bare soil control data set following, “Needed Information: Testing, Analyses, and Performance Values for Slope Interruption and Perimeter Control BMPs” authored by Kurt Kelsey, Tony Johnson, and Ryan Vavra (Kelsey, etc. al., 2006).

Erosion Plot Preparation

Each plot tested for this study was prepared the same way. Plots were tilled up and down slope with a walk-behind roto-tiller. The plots were hand-raked to a uniform surface after tilling. If a BMP was to be tested, the installation zone was compacted to approximately 90% of standard Proctor density then the BMP was installed at the toe of the slope. Bare soil control tests were conducted without a BMP installed at the toe of the slope. The plots were not manipulated between storm increments. All plots were reconditioned following the final storm increment applied to the test plot.

Simulated Rainfall Testing

Each BMP was exposed to the same target rainfall series, which was replicated three times for the BMP. A target 5.1 cm/hr (2.0 in/hr) event was first applied to a plot. All soil and water that exited the test plot was collected and measured following the 20 minute long event. Next, a target 10.2 cm/hr (4.0 in/hr) event lasting 30 minutes was applied to the plot as soon as all data from the first segment were collected.

Laboratory Analyses

Grab samples that were obtained during testing were analyzed for sediment concentration, which measures the ratio of the mass of dry sediment in a water-sediment mixture to the mass of the mixture.

Runoff samples were used to determine the moisture content of the soil lost from the plots. The Microwave Method, ASTM #4643, was followed (ASTM, 2000). After the moisture content of the sample was known, the ratio of dry to wet soil was used to calculate the equivalent amount of dry soil that was collected during the test.

Bare Soil Controls

A series of bare soil control tests were conducted before any BMPs were tested. Plot preparation remained consistent with BMP tests and no BMP was installed at the toe of the slope. Data from BMP tests are compared to bare soil control tests to give a baseline performance level of the BMPs versus utilizing no practice at all. Figure 1 presents the bare soil control data set that was used for this study. The soil erodibility rate of K = .08 was used in the calculation of the P factor for the BMP tested.

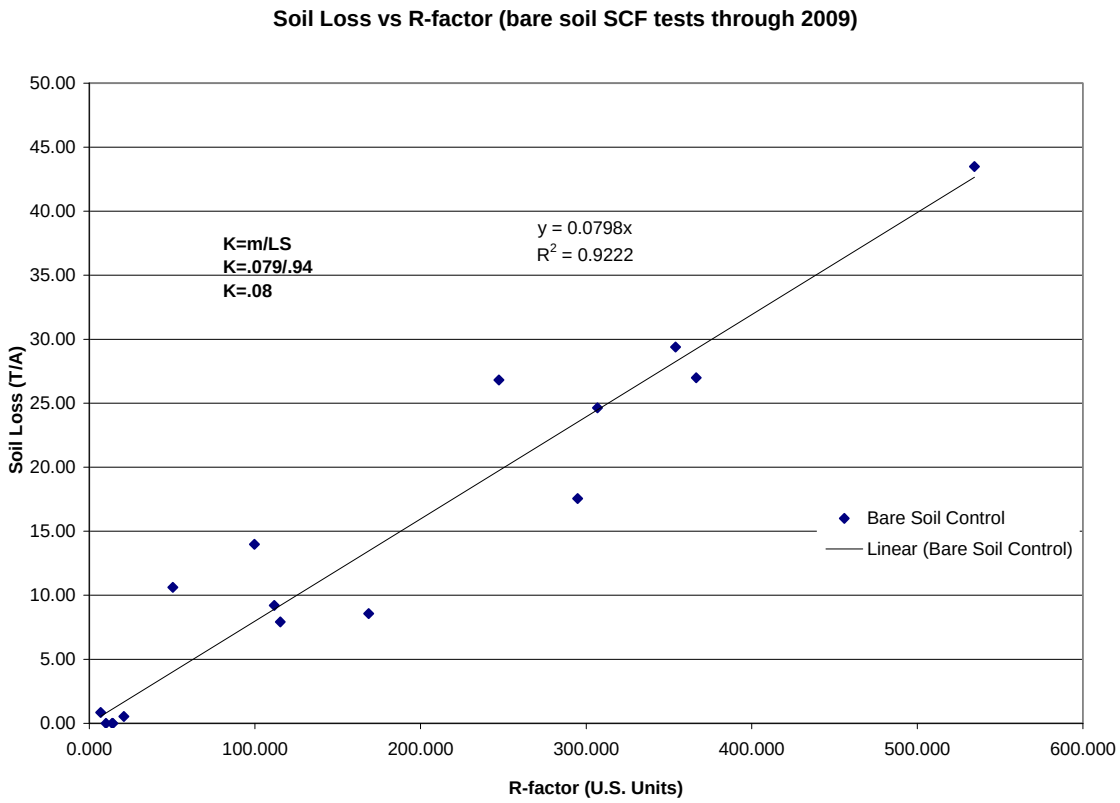


Figure 1. Soil Loss vs RUSLE R factor regression of bare soil control data set.

BMP EVALUATED

Testing was completed on Silt Sock Erosion Control's 8" Silt Sock. Table 1 contains the material properties of the three 8" Silt Socks that were tested.

Table 1. Material properties of 8” Silt Socks tested.

Product*	Average Diameter (in)	Length (ft)	Cubic Feet	Weight (lb)	Density (lb/ft^3)
G	8.13	13	4.69	103	21.98
H	8.00	13.25	4.63	82	17.73
I	8.00	13	4.54	91	20.05

*Product G was installed for test SS-L03-102609, H for SS-L02-102609, and I for SS-L01-101209

BMP Installation

All three Silt Socks tested were installed into an approximate 5.1 cm (2.0 in) trench (see Figure 2). The down slope side of the tubular BMP was installed 45.7 cm (18.0 in) from the end of the test slope. The Silt Socks covered the entire width of the test plot in an even, straight line, perpendicular to the slope and 1” x 1” x 30” stakes were used to anchor the product every 1.2 m (4.0 ft) (see Figure 3).

Figure 2. Trench on erosion plot prior to 8” Silt Sock installation.

Figure 3. 8” Silt Sock installed on test plot (following testing).

DATA ANALYSES

Data were analyzed according to Kelsey et. al. 2006 to determine the BMPs' ability to reduce rainfall erosion as compared to bare soil controls.

It should be noted that RUSLE P factors are time varying over the course of a year and P factors developed within this study produce event-based values (Renard et. al, 1997). This important fact needs to be considered when reviewing the results. The P values listed for the BMPs tested are soil loss ratios that were calculated over varying rainfall intensities and durations using the RUSLE framework.

RESULTS

Table 2 contains the summary of rainfall erosivity (R factor) and soil loss for the 8" Silt Sock tests that were conducted.

Table 2. Summary of rainfall erosivity (R factor) and soil loss for 8" Silt Sock tests.

Test Name*	Target Intensity (in/hr)	Duration (minutes)	Measured Intensity (in/hr)	Cumulative R Factor (U.S. Customary Units)	Cumulative Dry Soil Loss (lb)	Cumulative Dry Soil Loss (T/A)
SS-L01-2in-101209	2.0	20	1.8	7.60	0	0
SS-L01-4in-101209	4.0	30	3.7	95.97	12.38	0.96
SS-L02-2in-102609	2.0	20	2.3	12.23	0	0
SS-L02-4in-102609	4.0	30	4.7	158.79	38.78	3.02
SS-L03-2in-102609	2.0	20	1.8	7.08	0	0
SS-L03-4in-102609	4.0	30	3.8	100.68	27.79	2.16

*Last six numbers in test name are the date of the test in 00 month, 00 day, 00 year format.

Table 3 contains the results of the P factor (soil loss ratio) that was calculated from the regression graph for the 8" Silt Sock (see Figure 4). In addition, the percent soil retained is presented in Table 3. Percent soil retained is simply one minus the soil loss ratio multiplied by 100. Table 4 contains the average and peak sediment concentration results for all 8" Silt Sock test segments.

Table 3. P factor value for 8" Silt Sock.

BMP	**P factor**	**% Soil Retained**
8" Silt Sock	.23	77

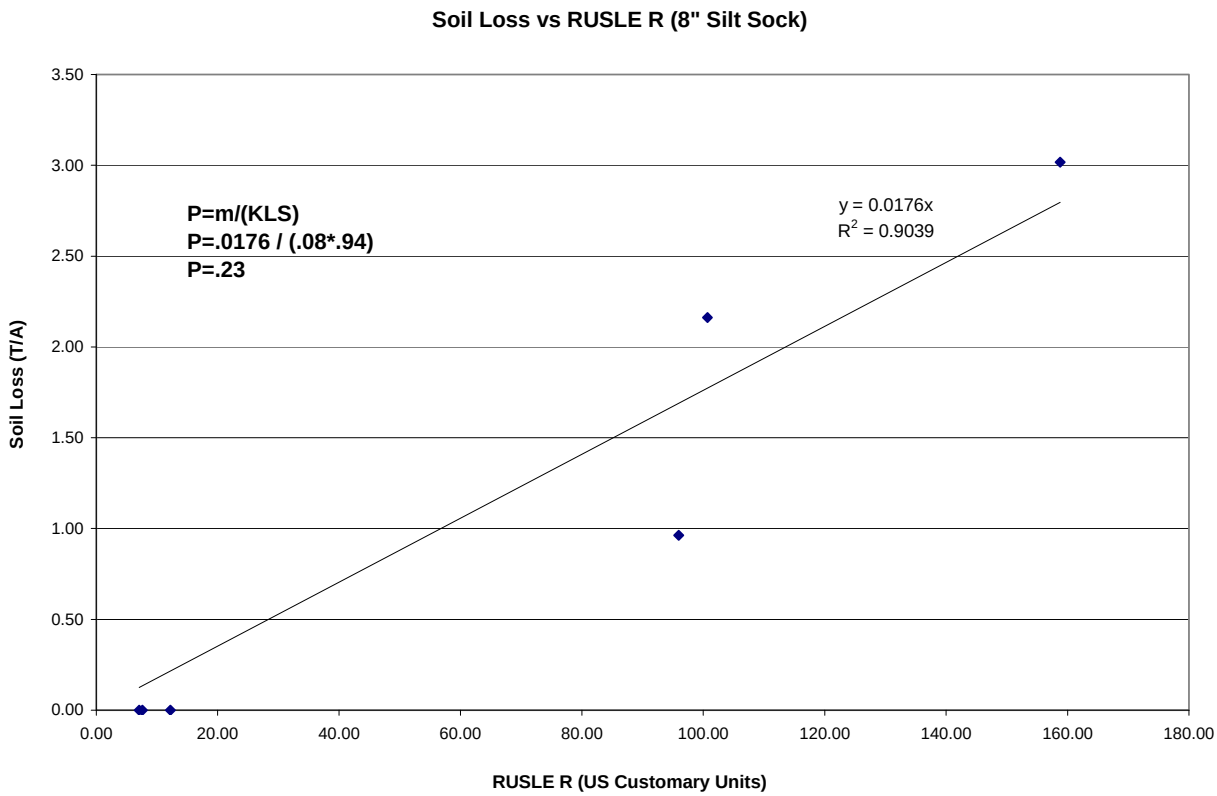


Figure 4. Soil Loss vs RUSLE R factor regression of 8” Silt Sock data set.

Table 4. Average and peak sediment concentration results for all 8” Silt Sock test segments.

Test	Average Sediment Concentration (mg/L)	Peak Sediment Concentration (mg/L)
SS-L01-2in-101209	13,552	19,584
SS-L01-4in-101209	14,372	31,104
SS-L02-2in-102609	19,614	25,539
SS-L02-4in-102609	25,192	34,439
SS-L03-2in-102609	25,970	30,788
SS-L03-4in-102609	13,337	17,986

OBSERVATIONS

- Soil accumulated in front of the 8” Silt Socks during and after the 2 in/hr and 4 in/hr portions of the test series (see Figures 5 - 7)

Figure 5. Sediment accumulating in front of 8” Silt Sock during 4 in/hr segment.

Figure 6. 8” Silt Sock test plot post 4 in/hr segment.

Figure 7. Accumulated sediment after removal of 8" Silt Sock post 4 in/hr segment.

WORKS CITED

American Society of Testing and Materials (ASTM). 2000. ASTM Annual Book of ASTM Standards–2000: Section 4, Construction. Vol. 04.08. ASTM, West Conshohocken, PA.

Kelsey, K., T. Johnson, and R. Vavra. 2006. "Needed Information: Testing, Analyses, and Performance Values for Slope Interruption and Perimeter Control BMPs." IECA Conference Proceedings. P. 171-181.

Renard, K.G., G.R. Foster, G.A. Weesies, D.K. McCool, and D.C. Yoder. 1997. "Predicting Soil Erosion by Water: A Guide to Conservation Planning with the Revised Universal Soil Loss Equation - USDA Agric. Handb. 703." Gov. Print. Office, Washington, D.C.

D.A. COLLINS COMPANIES

W.R. Grace Superfund Site, Acton MA. – Operable Unit No. 3 / Sediment Remedy

REQUEST FOR INFORMATION (RFI)

RFI #	**003**	**Reference Documents, Drawings, Specifications**
Date:	7/15/11	**Drawing** **Sediment Processing Pad, DWG #4, Detail 1** **Approved Submittal 31 32 001A**
Subject:	Sediment Processing Pad	
To:	Clayton Smith, CM de maximis	
Copy To:	Jeffrey Holden, PE Arcadis	

Information or Clarification Requested

DAC proposes to construct the following revised Sediment Processing Pad.
Using existing DAC constructed Processing Pad (140' x 140') install the following liner system overtop of the existing asphalt

- Layer 1-Base layer on asphalt will be 8 oz. non woven geo textile fabric
- Layer 2-Second layer welded 40 mil HDPE polyethylene liner
- Layer 3- 8 oz. non woven geo textile fabric

The liner system will be placed over top of the existing asphalt pad, asphalt curb and over top of the existing one foot containment berm at the perimeter of the processing pad.
The liner system once installed will have 6-inches of MADOT Dense Grade fill placed and compacted in one 6-inch lift. The dense grade will be placed up to the inside face of the asphalt curb. The asphalt curb will be protected by a continuous line of connected Jersey Barrier

-

Justification:
Proposed new pad will be placed over top of existing previously placed asphalt.
Attachments:

- Processing Pad Cross Section Detail
- Proposed Fabric and Liner Materials

Reason for Request

Design Ambiguity	☐	Operability	☐
Constructability	x	Weather	☐
Cost	☐	Other:	☐
Schedule	X		

Response/Solution (with attachments as necessary)

Signatures/Dates

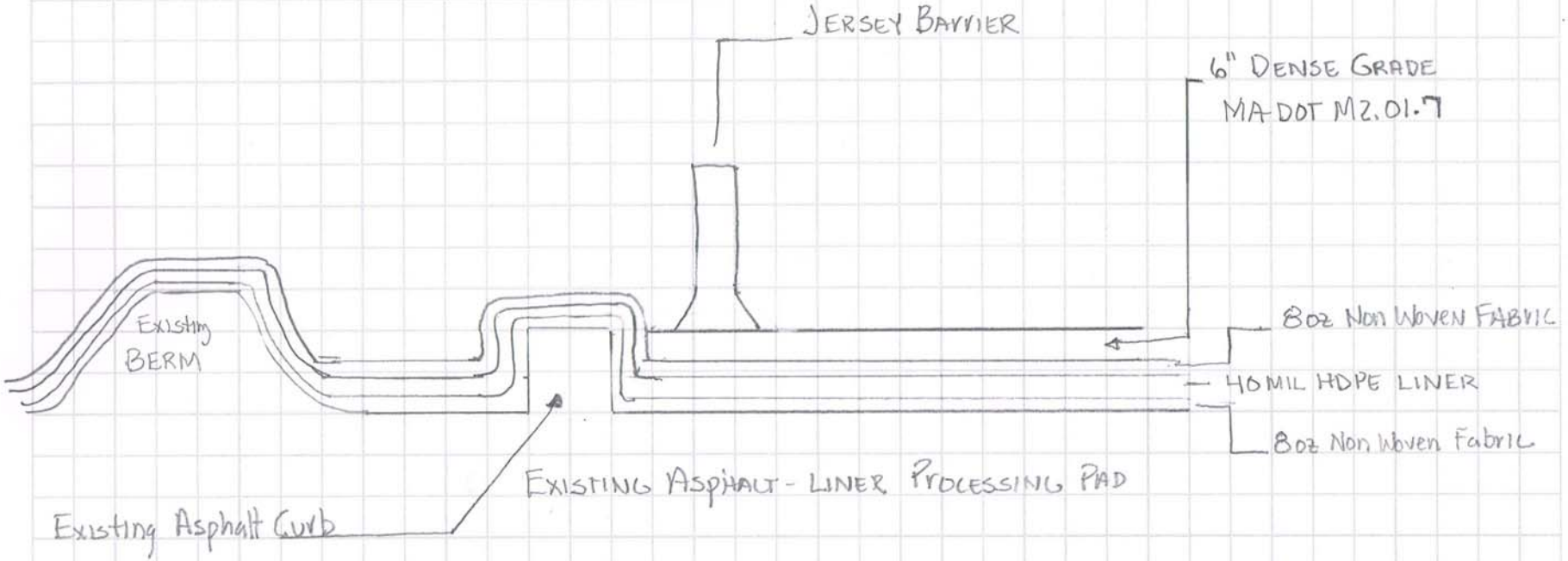
Originated by:	Bruce C. Hebbel, P.G., D.A. Collins	7/15/11
Prepared by:	Bruce C. Hebbel, P.G., D.A. Collins	7/15/11
Responded by:	Mark O. Gravelding, P.E.	7/20/11

146721

The revised staging area design is acceptable to the Engineer with the understanding that USEPA verbally approved the modification on 7/18/11, inspections will be made periodically to ensure that operations do not compromise the dense-grade layer such that liner becomes exposed, DAC will collect water at low points within the staging area, and that a 60-mil liner will be used in lieu of a 40-mil liner (per RFI #4 dated 7/19/11).

REVISED SEDIMENT PROCESSING PAD

NOT TO SCALE



D.A. Collins Environmental
JULY 15, 2011
PREPARED BY BCH

Carthage Mills **Product Data**

FX®–80HS

Carthage Mills' FX®–80HS is a multipurpose nonwoven geotextile of 100% polypropylene staple fibers which are formed into a random network, needlepunched and heatset for dimensional stability. Carthage Mills' FX®–80HS is inert to biological degradation and resistant to naturally encountered chemicals, alkalis, and acids.

AASHTO M 288-06: FX®–80HS exceeds the geotextile requirements for SEPARATION/CLASS 1 (NONWOVEN), STABILIZATION/CLASS 1 (NONWOVEN) and PERMANENT EROSION CONTROL/CLASS 1 (NONWOVEN – ALL SOIL TYPES).

PROPERTY	TEST METHOD	DATA	
		METRIC	ENGLISH
☐ **Mechanical** Grab Tensile Strength	ASTM D 4632	0.91 kN	205 lbs
Grab Tensile Elongation		50%	
Mullen Burst	ASTM D 3786	2410 kPa	350 psi
Trapezoidal Tear	ASTM D 4533	0.36 kN	80 lbs
Puncture	ASTM D 4833	0.49 kN	110 lbs
CBR Puncture	ASTM D 6241	2.34 kN	525 lbs
☐ **Endurance** UV Resistance	ASTM D 4355	70% @ 500 hrs	
☐ **Hydraulics / Filtration** Permittivity [1]	ASTM D 4491	1.40 sec^{-1}	
Water Flow Rate [1]		3657 lpm/m^2	90 gpm/ft^2
Apparent Opening Size (AOS) [1]	ASTM D 4751	0.180 mm	80 US Std. Sieve
☐ **Physical** Mass Per Unit Area (Typical)	ASTM D 5261	271.2 g/m^2	8.0 oz/yd^2
Thickness (Typical)	ASTM D 5199	2.16 mm	85 mils
Standard Roll Sizes / Packaging / Weight	Measured (Typical)	3.81 m x 109.7 m 418 m^2 127.0 kg	12.5 ft x 360 ft 500 yd^2 280 lbs
		4.57 m x 91.5 m 418 m^2 127.0 kg	15.0 ft x 300 ft 500 yd^2 280 lbs

[1] At the time of manufacturing. Handling, storage and shipping may change these properties.

- Unless otherwise stated, all values stated here are Minimum Average Roll Values (MARV), are calculated as the Typical minus two standard deviations and are based on a 97.7% confidence level.
- The properties reported above are effective 07/14/09 and are subject to change without notice.

Seller makes no warranty, expressed or implied, concerning the product furnished hereunder other than at the time of delivery it shall be of the quality and specification stated herein. Any implied warranty of fitness for a particular purpose is expressly excluded, and, to the extent that it is contrary to the foregoing sentence, any implied warranty of merchantability is expressly excluded. Any recommendations made by seller concerning the uses or applications of said product are believed reliable and seller makes no warranty of results to be obtained. If the product does not meet Carthage Mills current published specifications, and the customer gives notice to Carthage Mills before installing the product, then Carthage Mills will replace the product without charge or refund the purchase price.

4243 Hunt Road
Cincinnati, OH 45242
www.carthagemills.com
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800-543-4430 TOLL FREE
513-794-3434 FACSIMILE
info@carthagemills.com

POLY-FLEX, INC.

An Engineering Approach to Groundwater Protection

REFERENCE MANUAL

2. MATERIAL SPECIFICATIONS

2.1 Materials

1. The geomembrane shall be High-Density Polyethylene (HDPE) or Linear Low Density Polyethylene (LLDPE).
2. Gasket material shall be neoprene, closed cell medium, 1/4-inch thick, 2 inches wide with adhesive on one side, or other compatible gasket materials as required.
3. Metal battens or banding and hardware shall be stainless steel.
4. Water cut-off mastic shall be Neoprene Flashing Cement as supplied by Poly-Flex, Inc., or as required.
5. Sealant shall be General Electric Silicone, RTV 103, or equivalent.

2.2 Geomembrane Raw Materials

The geomembrane shall be manufactured of polyethylene resins produced in the United States and shall be compounded and manufactured specifically for the intended purpose. The resin manufacturer shall certify each lot for the following properties.

The natural polyethylene resin without the carbon black shall meet the following requirements:

Property	Test Method	HDPE Requirements	LLDPE Requirements
Density, g/cc	ASTM D 1505 or ASTM D 792	0.935 - 0.940	0.915 - 0.926
Melt Index, g/10 min.	ASTM D 1238	<0.4	<0.6

2.3 Rolls

The geomembrane shall be a minimum 23.0 ft seamless width, as manufactured by Poly-Flex, Inc. (2000 W. Marshall Dr., Grand Prairie, TX 75051, 888-765-9359). Carbon black shall be added to the resin if the resin is not compounded for ultra-violet resistance.

The surface of the smooth geomembrane shall not have striations, roughness, pinholes, or bubbles.

The geomembrane shall be supplied in rolls. Labels on each roll shall identify the thickness of the material, the length and width of the roll, lot and roll numbers, and name of manufacturer.

The geomembrane rolls shall meet the following specifications:

SMOOTH HDPE GEOMEMBRANE
ENGLISH UNITS

POLY-FLEX
POLYETHYLENE GEOMEMBRANES

Property	Test Method	Minimum Average Values 30 mil	40 mil	60 mil	80 mil	100 mil
Thickness, mils	ASTM D 5199					
minimum average		30	40	60	80	100
lowest individual reading		27	36	54	72	90
Sheet Density, g/cc	ASTM D 1505/D 792	0.940	0.940	0.940	0.940	0.940
Tensile Properties[1]	ASTM D 6693					
1. Yield Strength, lb/in		63	84	126	168	210
2. Break Strength, lb/in		114	152	228	304	380
3. Yield Elongation, %		12	12	12	12	12
4. Break Elongation, %		700	700	700	700	700
Tear Resistance, lb	ASTM D 1004	21	28	42	56	70
Puncture Resistance, lb	ASTM D 4833	54	72	108	144	180
Stress Crack Resistance[2], hrs	ASTM D 5397 (App.)	300	300	300	300	300
Carbon Black Content[3], %	ASTM D 1603	2.0 - 3.0	2.0 - 3.0	2.0 - 3.0	2.0 - 3.0	2.0 - 3.0
Carbon Black Dispersion	ASTM D 5596			--Note 4--		
Oxidative Induction Time (OIT)						
Standard OIT, minutes	ASTM D 3895	100	100	100	100	100
Oven Aging at 85°C	ASTM D 5721					
High Pressure OIT - % retained after 90 days	ASTM D 5885	80	80	80	80	80
UV Resistance[5]	GRI GM11					
High Pressure OIT[6] - % retained after 1600 hrs	ASTM D 5885	50	50	50	50	50
Seam Properties	ASTM D 6392 (@ 2 in/min)					
1. Shear Strength, lb/in		57	80	120	160	200
2. Peel Strength, lb/in - Hot Wedge		45	60	91	121	151
- Extrusion Fillet		39	52	78	104	130
Roll Dimensions						
1. Width (feet):		23	23	23	23	23
2. Length (feet)		1000	750	500	375	300
3. Area (square feet):		23,000	17,250	11,500	8,625	6,900
4. Gross weight (pounds, approx.)		3,470	3,470	3,470	3,470	3,470

1 Machine direction (MD) and cross machine direction (XMD) average values should be on the basis of 5 test specimens each direction. Yield elongation is calculated using a gauge length of 1.3 inches; Break elongation is calculated using a gauge length of 2.0 inches.
2 The yield stress used to calculate the applied load for the SP-NCTL test should be the mean value via MQC testing.
3 Other methods such as ASTM D 4218 or microwave methods are acceptable if an appropriate correlation can be established.
4 Carbon black dispersion for 10 different views: Nine in Categories 1 and 2 with one allowed in Category 3.
5 The condition of the test should be 20 hr. UV cycle at 75°C followed by 4 hr. condensation at 60°C.
6 UV resistance is based on percent retained value regardless of the original HP-OIT value.

This data is provided for informational purposes only and is not intended as a warranty or guarantee. Poly-Flex, Inc. assumes no responsibility in connection with the use of this data. These values are subject to change without notice. REV. 11/06

D.A. COLLINS COMPANIES

W.R. Grace Superfund Site, Acton MA. – Operable Unit No. 3 / Sediment Remedy

REQUEST FOR INFORMATION (RFI)

RFI #	**004**	**Reference Documents, Drawings, Specifications**
Date:	7/19/11	**Drawing** **Sediment Processing Pad, DWG #4, Detail 1** **Approved Submittal 31 32 001A** **DAC RFI #003**
Subject:	Sediment Processing Pad	
To:	Clayton Smith, CM de maximis	
Copy To:	Jeffrey Holden, PE Arcadis	

Information or Clarification Requested

DAC requests substitution of 40 mil HDPE Liner with 60 mil HDPE Liner for the Sediment Processing Pad. The purpose of this request is a result of available stock by DAC Liner installation subcontractor, and to maintain schedule. Currently 40 mil liner is on back order from the manufacturer with a lead time of 7 to 10 days.

Justification: Maintain schedule

Use of 60 mil liner in lieu of 40 mil liner is acceptable to Engineer

Reason for Request

Design Ambiguity	☐	Operability	☐
Constructability		Weather	☐
Cost	☐	Other:	☐
Schedule	X		

Response/Solution (with attachments as necessary)

Signatures/Dates

Originated by:	Bruce C. Hebbel, P.G., D.A. Collins	7/19/11
Prepared by:	Bruce C. Hebbel, P.G., D.A. Collins	7/19/11
Responded by:	Mark O. Gravelding, P.E.	7/20/11

W.R. Grace Superfund Site, Acton MA. – Operable Unit No. 3 / Sediment Remedy

REQUEST FOR INFORMATION (RFI)

RFI #	005	Reference Documents, Drawings, Specifications
Date:	9/7/11	Drawing Detail 3 Typical Check Dam Drawing Page 13
Subject:	Sinking Pond Temporary Check Dam	
To:	Clayton Smith, CM de maximis	
Copy To:	Jeffrey Holden, PE Arcadis	

Information or Clarification Requested

DAC requests modification to the construction of the temporary check dam at Sinking Pond. Specifically DAC requests to use of a row of staked haybales and silt fence in lieu of the temporary check shown on Drawing page 13 Detail #3. The haybale/silt fence configuration will be installed in the approximate location of where the temporary check dam is shown on Drawing page 5. The haybale/silt fencing will be installed immediately following removal of sediment located in Dredge Area #1. The haybale/silt fence will be fitted tightly around the bypass piping and secured with a wrapped sleeve of geotextile fabric and secured with straps and banding clamps.

The reason for this request is:

- The haybale/silt fence configuration will allow groundwater and surface water that may accumulate in Dredge Area#1 to follow the natural water course into Sinking Pond and minimize ponding in the up gradient areas.
- The by-pass piping from the existing concrete outfall passes through the area where the temporary check dam is located.
- The current water level of Sinking Pond is below the existing mounded sediments at the mouth of the inlet channel (Dredge Area #5) to Sinking Pond acting as a natural barrier between Sinking Pond water levels and the existing inlet channel.
- Following sediment removal of Dredge Area #5, the last area of Sinking Pond scheduled for sediment removal, the permanent check dam shall be installed. The proposed configuration will minimize the amount of re-work that may be necessary to convert the temporary check dam into the permanent check dam (ie. removal and backfill of the bypass pipe penetrations.).

Reason for Request

Design Ambiguity	☐	Operability	☐
Constructability	**X**	Weather	☐
Cost	☐	Other:	☐
Schedule	X		

Response/Solution (with attachments as necessary)

Modification to the construction of the temporary check dam is acceptable to the Engineer.

Signatures/Dates

Originated by:	Bruce C. Hebbel, P.G., D.A. Collins	9/7/11
Prepared by:	Bruce C. Hebbel, P.G., D.A. Collins	9/7/11
Responded by:	Mark O. Gravelding, P.E.	09/08/11

D.A. COLLINS COMPANIES

W.R. Grace Superfund Site, Acton MA. – Operable Unit No. 3 / Sediment Remedy

REQUEST FOR INFORMATION (RFI)

RFI #	**006**	**Reference Documents, Drawings, Specifications**
Date:	9/29/11	
Subject:	Sinking Pond Survey Tolerance	**Spec Section 01 32 23 – Survey Control**
To:	Clayton Smith, CM de maximis	Proposed approach is acceptable with the condition that DAC provides CAD-based calculation of removal thickness at any additional points requested.
Copy To:	Jeffrey Holden, PE Arcadis	

Information or Clarification Requested

Background: The full time on-site surveyor (Thew Associates) has the instrumentation to obtain survey measurements within the specified accuracy tolerances (0.1' horizontal,, 0.01' vertical). However, when trying to duplicate shots at a previously surveyed location, the horizontal precision of rod placement is complicated by the difficulties of working from a boat, rather than on land.

Request: DAC requests consideration of relief to the ±0.1' **horizontal** tolerance of survey measurement between pre-construction survey and post-dredge confirmation survey point locations in the water which are performed on the 10' x 10' grid for Sinking Pond. Specifically, DAC proposes the following:

- Where the horizontal distance between pre-construction and post-dredge points falls within a 0.33' tolerance, the change in elevation between the points (i.e. the dredge cut) shall be used to determine if the minimum cut has been achieved.
- Where the horizontal distance between pre-construction and post-dredge points exceeds the proposed 0.33' tolerance, the dredge cut shall be calculated by the difference between the post-dredge point elevation and the pre-construction surface elevation (as derived from the CAD surface prepared by the licensed surveyor).

A sample page from a survey data table illustrating this approach is attached. It highlights those points that exceed the proposed horizontal tolerance of 0.33', and the revised dredge cut calculation when compared to the pre-construction surface. The final CAD file will be submitted with the project completion documentation.

All other aspects of the Specification and DAC Survey plan will be met. The dredge area limits along the exposed shoreline of Sinking Pond will meet the ±0.1' horizontal tolerance as referenced in the specification. All pre and post confirmation survey points will meet the ±0.01' **vertical** tolerance.

The reason for this request is:

- Trying to locate and replicate in the water pre and post survey pond bottom locations from a boat is challenging, due to wind, nominal precision of steering and propulsion with a tillered outboard motor, watercraft stability and the coordination between boat captain and rod man.

Design Ambiguity		Operability	
Constructability	X	Weather	
Cost		Other:	X
Schedule	X		

Response/Solution (with attachments as necessary)

Signatures/Dates

Originated by:	David MacDougall, D.A. Collins	9/29/11
Prepared by:	David MacDougall, D.A. Collins	9/29/11
Responded by:	[signature]	10/4/11

Sinking Pond
W.R. Grace Superfund Site
Elevation Spreadsheet

Point ID	Pre-Construction Northing	Pre-Construction Easting	Pre-Construction Elevation (feet)	Post-Dredge Northing	Post-Dredge Easting	Δ Horizontal Distance Pre-Construction Pt. to Post-Dredge Pt.	Post-Dredge Point Elevation (feet)	Δ Elevation from Pre-Construction Point	Δ Elevation from Pre-Construction Surface
1536	2,989,189.69	675,545.39	131.94						
1537	2,989,189.86	675,552.49	130.02						
1538	2,989,190.44	675,559.39	127.33						
1542	2,989,178.34	675,559.61	127.59						
1544	2,989,178.48	675,552.62	130.69						
1545	2,989,176.34	675,543.60	133.03						
1546	2,989,175.66	675,534.97	134.78						
1547	2,989,166.50	675,534.27	135.02						
1548	2,989,168.15	675,539.44	133.86						
1549	2,989,167.07	675,548.42	131.60						
1550	2,989,168.78	675,556.42	128.37						
1555	2,989,159.19	675,551.55	130.62	2,989,158.73	675,551.85	0.55	128.63	1.99	1.85
1556	2,989,157.67	675,546.39	131.82	2,989,157.48	675,546.67	0.33	130.17	1.65	1.56
1557	2,989,155.53	675,536.08	134.34	2,989,155.41	675,536.11	0.12	132.67	1.67	
1558	2,989,156.55	675,532.14	135.24	2,989,156.39	675,532.34	0.26	134.16	1.08	
1559	2,989,144.97	675,529.58	136.53	2,989,145.11	675,529.40	0.22	134.53	2.00	
1560	2,989,146.18	675,534.25	134.21	2,989,146.27	675,533.88	0.39	133.02	1.19	1.38
1561	2,989,147.22	675,538.58	133.05	2,989,148.09	675,538.81	0.90	131.20	1.85	1.84
1562	2,989,149.32	675,544.75	131.39	2,989,149.90	675,544.73	0.59	129.68	1.71	1.78
1563	2,989,149.58	675,555.18	129.01	2,989,150.44	675,554.87	0.92	127.95	1.06	1.20
1566	2,989,138.94	675,560.38	127.73	2,989,138.58	675,559.86	0.64	126.58	1.15	1.27
1567	2,989,137.49	675,549.70	129.97	2,989,137.08	675,549.62	0.42	128.49	1.48	1.52
1568	2,989,136.60	675,542.09	131.66	2,989,136.67	675,543.14	1.05	129.88	1.78	1.55
1569	2,989,136.19	675,535.74	133.53	2,989,136.63	675,535.46	0.52	131.70	1.83	1.97
1570	2,989,135.15	675,529.07	136.11	2,989,135.37	675,529.17	0.25	134.23	1.88	
1571	2,989,125.34	675,528.15	135.05	2,989,125.40	675,528.44	0.30	134.05	1.00	
1572	2,989,126.63	675,536.15	133.42	2,989,126.55	675,536.21	0.10	132.20	1.22	
1573	2,989,128.29	675,543.24	131.84	2,989,128.12	675,544.44	1.21	130.63	1.21	0.97
1574	2,989,129.01	675,550.98	130.15	2,989,128.50	675,551.59	0.79	128.96	1.19	1.07
1575	2,989,130.22	675,559.20	128.26	2,989,131.01	675,559.77	0.98	127.12	1.14	0.98
1580	2,989,120.10	675,566.47	127.78	2,989,119.67	675,566.60	0.45	126.55	1.23	1.22
1582	2,989,118.91	675,550.71	130.85	2,989,119.20	675,550.57	0.31	129.65	1.20	
1583	2,989,117.97	675,541.17	132.41	2,989,118.25	675,541.73	0.63	131.39	1.02	0.92
1584	2,989,116.71	675,531.16	134.35	2,989,116.70	675,531.58	0.41	133.35	1.00	0.92
1585	2,989,105.13	675,528.18	135.20	2,989,104.98	675,527.71	0.49	134.18	1.02	1.18
1586	2,989,106.92	675,536.98	133.57	2,989,105.94	675,537.04	0.98	132.57	1.00	1.01
1587	2,989,108.40	675,544.38	132.28	2,989,108.64	675,543.54	0.88	131.28	1.00	1.13
1588	2,989,111.91	675,550.80	130.99	2,989,111.81	675,551.64	0.85	129.74	1.25	1.11
1589	2,989,113.94	675,558.36	129.26	2,989,113.57	675,558.34	0.36	128.24	1.02	1.08
1590	2,989,114.38	675,564.48	128.25	2,989,113.09	675,564.29	1.30	127.23	1.02	1.22
1595	2,989,105.82	675,568.42	128.93	2,989,106.53	675,568.17	0.75	127.35	1.58	1.51
1596	2,989,102.07	675,561.18	130.41	2,989,102.53	675,560.51	0.81	128.46	1.95	1.99
1598	2,989,097.58	675,542.67	132.97	2,989,097.12	675,541.72	1.06	131.94	1.03	1.20

D.A. COLLINS COMPANIES

W.R. Grace Superfund Site, Acton MA. – Operable Unit No. 3 / Sediment Remedy

REQUEST FOR INFORMATION (RFI)

RFI #	007	Reference Documents, Drawings, Specifications
Date:	10/17//11	**Spec Section 31 23 23 – Select Fill Materials Part 2 Section 2.01 E. Clay and Drawing Detail 3 Typical Check Dam Drawing Page 13**
Subject:	Permanent Check Dam at Sinking Pond	
To:	Clayton Smith, CM de maximis	
Copy To:	Jeffrey Holden, PE Arcadis	

Information or Clarification Requested

Background: Project plans and specifications call for a permanent check dam to be constructed at the inlet channel to Sinking Pond. The main body of the structure is to be constructed with clay. After extensive searches by DAC with large and small scale sand gravel and aggregate suppliers within the region a source that will meet the proposed specification could not be found.

Request: DAC requests consideration of alternate materials for construction of the Check Dam to Sinking Pond.

Specifically, DAC proposes the following:

- In lieu of clay using a silty/clayey sand material in conjunction with a textured 40 mil polyethylene flexible liner and fabric to construct the check dam generally in accordance with the proposed design drawings. A sketch of the proposed check dam construction is attached.

The reason for this request is:

- Locating proposed clay material ~250 CY that meets project specification both for geo-technical and environmental analysis and/or specification related requirements could not be found/met. (One large mass excavation in greater Boston is removing Boston Blue Clay that would be suitable for this project geotechnically however this clay is typically found to have high concentrations of arsenic (see attached publication page 88) and does not meet the specification requirement of "Materials shall not be obtained from an industrial site…"

Design Ambiguity		Operability	
Constructability	X	Weather	
Cost		Other:	X
Schedule	X		

Response/Solution (with attachments as necessary)

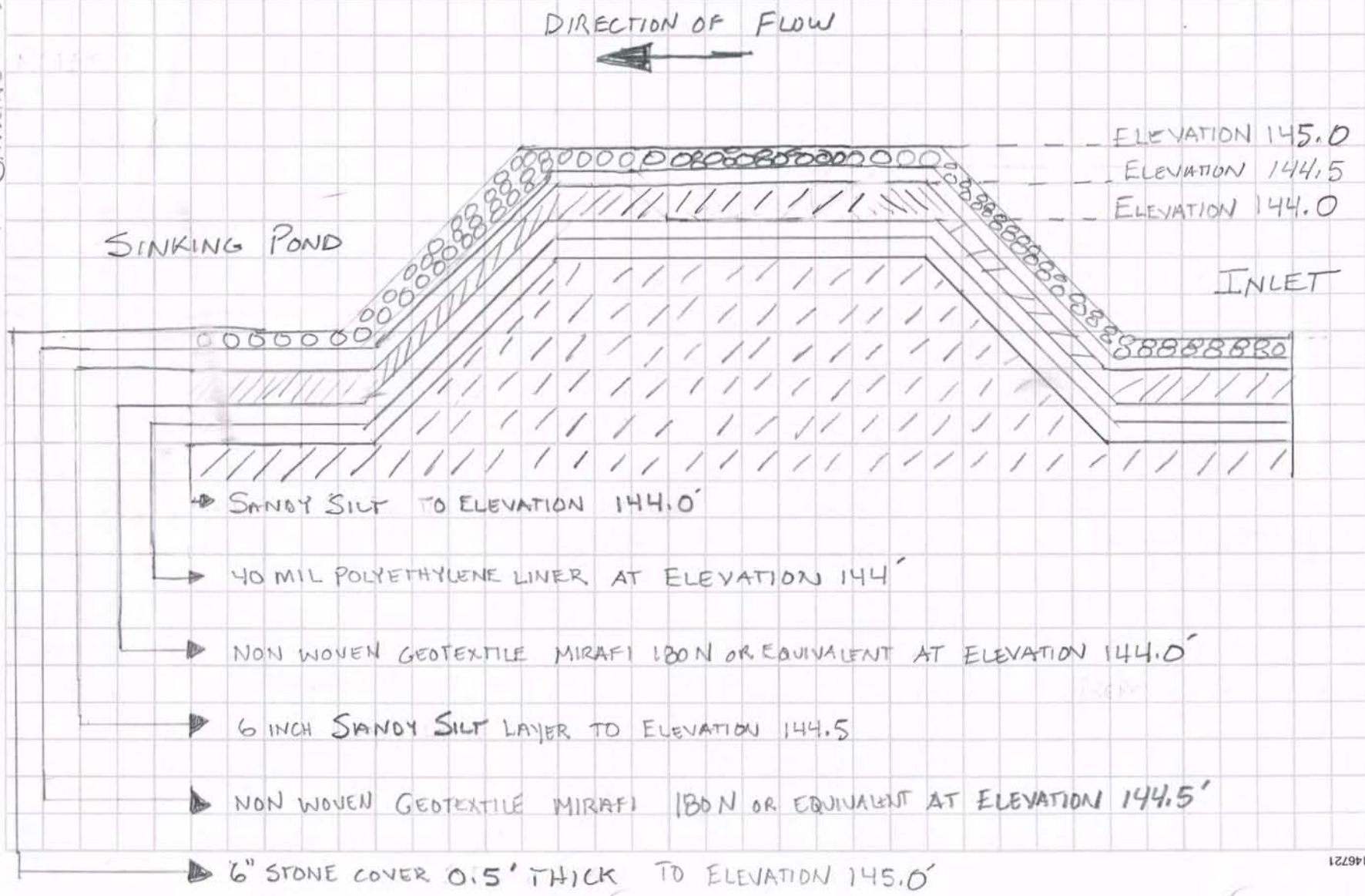
Signatures/Dates

Originated by:	Bruce C. Hebbel, P.G.	10/17/11
Prepared by:	Bruce C. Hebbel, P.G.	10/17/11
Responded by:		10/18/11

BY BCH DATE 10/7/11 SHEET NO. 1 OF 2
CHKD. BY ..... DATE ..... JOB NO. .....
SUBJECT ALTERNATIVE MATERIALS FOR CHECK DAM AT SINKING POND

SINKING POND INLET CHANNEL
ALTERNATIVE MATERIALS FOR CHECK DAM CONSTRUCTION

"NOT TO SCALE"



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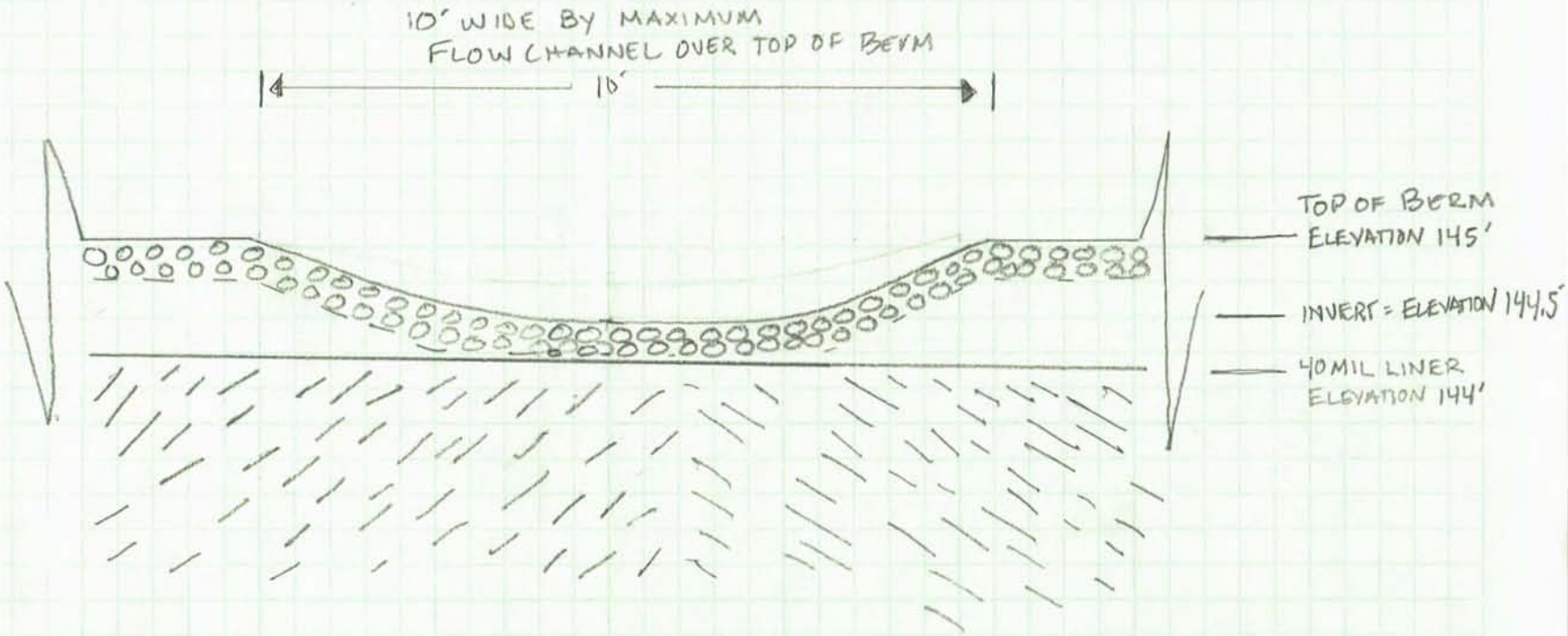

SINKING POND INLET CHANNEL
CHECK DAM
CROSS SECTION

NOT TO SCALE

DURA•SKRIM® K36BT, K40BT & K45BT

Textured Scrim Reinforced Polyethylene

RAVEN INDUSTRIES

Product Description

DURA♦SKRIM® K36BT, K40BT and K45BT are unique textured scrim reinforced cast geomembranes manufactured using high strength virgin grade polyethylene resins. DURA♦SKRIM® textured K-Series is reinforced with a dense scrim reinforcement to maximize tear and puncture resistance. Both the single and double side textured K-Series are manufactured utilizing a cast extrusion process to achieve a consistent friction surface with uniform asperity heights. Raven's exclusive GeoGrip™ Technology consists of durable random spikes and bidirectional bars for uniform stabilization and support.

DURA♦SKRIM® textured K-Series combines both the exceptional performance characteristics of our smooth K-Series with the integrated GeoGrip™ surface texture providing a highly versatile geomembrane for use in many applications.

Product Use

DURA♦SKRIM® textured K-Series high strength reinforcement along with the GeoGrip™ friction surface provides design engineers with new solutions for the most challenging projects. The GeoGrip™ texture provides increased friction between various soil and geosynthetic layers allowing for steeper slope designs. This is ideal for applications requiring exceptional slope stability such as landfill caps, mining leach pads and containment ponds.

Design professionals commonly perform direct shear tests with site soils and recommend geosynthetic materials to assure the best possible results.

Size & Packaging

DURA♦SKRIM® K36BT, K40BT and K45BT are available in a variety of widths and lengths to meet the project requirements. Large diameter mill rolls are available to assure an efficient seaming process. Factory welded panels are accordion folded and tightly rolled on a heavy-duty core for ease of handling and time saving installation.

Containment Pond Liner

Product	Part #
DURA♦SKRIM	K36BT1
DURA♦SKRIM	K40BT2
DURA♦SKRIM	K45BT1
DURA♦SKRIM	K45BT2

APPLICATIONS

- Waste Lagoon Liners
- Landfill Caps
- Canal Liners
- Disposal Pit Liners
- Water Containment Ponds
- Heap Leach Liners
- Tunnel Liners
- Earthen Liners
- Interim Landfill Covers
- Mining Tailing Ponds

DURA•SKRIM® K36BT, K40BT & K45BT

Textured Scrim Reinforced Polyethylene

ISO 9001:2008 CERTIFIED MANAGEMENT SYSTEM

PRO-FORMA DATA SHEET

PROPERTIES	TEST METHOD	K36BT1 (1-Side)		K40BT2 (2-Side)		K45BT1 (1-Side)		K45BT2 (2-Side)	
		Minimum Roll Averages	Typical Roll Averages	Minimum Roll Averages	Typical Roll Averages	Minimum Roll Averages	Typical Roll Averages	Minimum Roll Averages	Typical Roll Averages
Appearance		Black	Black	Black	Black	Black	Black	Black	Black
Thickness		30 mil	32 mil	36 mil	40 mil	40 mil	45 mil	40 mil	45 mil
Asperity Height (per side)	ASTM D 7466		>20 mil		>20 mil		>20 mil		>20 mil
Weight LBS/MSF, (OZ/YD^2)		164 (23.6)	170 (24.4)	193 (27.8)	206 (29.7)	203 (29.2)	217 (31.2)	212 (30.5)	227 (32.7)
Construction		Textured Scrim Reinforced Polyethylene							
*Ply Adhesion - LBF/IN	ASTM D 6636	31 or FTB	35 or FTB	31 or FTB	36 or FTB	32 or FTB	36 or FTB	32 or FTB	36 or FTB
Tensile Strength - LBF/IN	ASTM D 7003	182 MD 148 TD	193 MD 173 TD	186 MD 165 TD	198 MD 185 TD	198 MD 169 TD	201 MD 186 TD	183 MD 180 TD	197 MD 193 TD
Tensile Elongation at Break % (FILM BREAK)	ASTM D 7003	415 MD 306 TD	441 MD 413 TD	441 MD 312 TD	460 MD 452 TD	350 MD 309 TD	422 MD 379 TD	356 MD 362 TD	488 MD 410 TD
Tensile Elongation at Break % (SCRIM BREAK)	ASTM D 7003	32 MD 32 TD	35 MD 35 TD	32 MD 32 TD	35 MD 35 TD	32 MD 32 TD	35 MD 35 TD	32 MD 32 TD	35 MD 35 TD
Tongue Tear Strength - LBF	ASTM D 5884	168 MD 130 TD	175 MD 140 TD	172 MD 152 TD	175 MD 163 TD	148 MD 126 TD	155 MD 135 TD	152 MD 140 TD	177 MD 165 TD
Grab Tensile - LBF (SCRIM BREAK)	ASTM D 7004	310 MD 285 TD	318 MD 300 TD	280 MD 270 TD	300 MD 290 TD	315 MD 300 TD	327 MD 309 TD	332 MD 320 TD	341 MD 331 TD
Grab Tensile Elongation at Break % (SCRIM BREAK)	ASTM D 7004	24	30	24	30	24	30	24	30
High Pressure OIT (HPOIT)	ASTM D 5885	1000 min	2400 min	1000 min	2400 min	1000 min	2400 min	1000 min	2400 min
Puncture Resistance - LBF	ASTM D 4833	124	129	125	130	120	133	137	144
Maximum Use Temperature		180° F		180° F		180° F		180° F	
Minimum Use Temperature		-70° F		-70° F		-70° F		-70° F	

*Raven modified QC procedure

PRO-FORMA Sheet Contents:

The data listed in this Pro-Forma data sheet is representative of initial production runs. These values may be revised at anytime without notice as additional test data becomes available.

DURA♦SKRIM® K36BT, K40BT and K45BT are unique textured scrim reinforced geomembranes manufactured using high strength virgin grade polyethylene resins. DURA♦SKRIM® K36BT, K40BT and K45BT are reinforced with a dense scrim reinforcement to maximize tear and puncture resistance. Both the single and double side textured K-Series are manufactured utilizing a cast extrusion process to achieve a consistent friction surface with uniform asperity heights. Raven's exclusive GeoGrip™ Technology consists of durable random spike pattern and bidirectional bars for uniform stabilization.

Note: To the best of our knowledge, unless otherwise stated, these are typical property values and are intended as guides only, not as specification limits. Chemical resistance, odor transmission, longevity as well as other performance criteria is not implied or given and actual testing must be performed for applicability in specific applications and/or conditions. RAVEN INDUSTRIES MAKES NO WARRANTIES AS TO THE FITNESS FOR A SPECIFIC USE OR MERCHANTABILITY OF PRODUCTS REFERRED TO, no guarantee of satisfactory results from reliance upon contained information or recommendations and disclaims all liability for resulting loss or damage.

RAVEN INDUSTRIES

Engineered Films Division
P.O. Box 5107
Sioux Falls, SD 57117-5107
Ph: (605) 335-0174 • Fx: (605) 331-0333

Toll Free: **800-635-3456**
Email: **efdsales@ravenind.com**
www.ravenefd.com

Limited Warranty available at www.RavenEFD.com

TENCATE
Mirafi®

Drainage Separation

Mirafi® 180N

Mirafi® 180N is a needlepunched nonwoven geotextile composed of polypropylene fibers, which are formed into a stable network such that the fibers retain their relative position. Mirafi® 180N geotextile is inert to biological degradation and resists naturally encountered chemicals, alkalis, and acids.

Mechanical Properties	Test Method	Unit	Minimum Average Roll Value	
			MD	CD
Grab Tensile Strength	ASTM D4632	lbs (N)	205 (912)	205 (912)
Grab Tensile Elongation	ASTM D4632	%	50	50
Trapezoid Tear Strength	ASTM D4533	lbs (N)	80 (356)	80 (356)
CBR Puncture Strength	ASTM D6241	lbs (N)	500 (2224)	
Apparent Opening Size (AOS) [1]	ASTM D4751	U.S. Sieve (mm)	80 (0.18)	
Permittivity	ASTM D4491	sec^{-1}	1.4	
Flow Rate	ASTM D4491	$gal/min/ft^2$ ($l/min/m^2$)	95 (3870)	
UV Resistance (at 500 hours)	ASTM D4355	% strength retained	70	

[1] ASTM D4751: AOS is a Maximum Opening Diameter Value

Physical Properties	Unit	Typical Value	
Roll Dimensions (width x length)	ft (m)	12.5 x 360 (3.8 x 110)	15 x 300 (4.5 x 91)
Roll Area	yd^2 (m^2)	500 (418)	
Estimated Roll Weight	lb (kg)	265 (120)	

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TENCATE
materials that make a difference

FGS000351
ETQR38

GeoTesting
EXPRESS

125 Nagog Park
Acton, MA 01720
978 635 0424 Tel
978 635 0266 Fax

RECEIVED
SEP 09 2011
DA Collins Construction

Transmittal

TO:
Bruce Hebbel
D.A. Collins Environmental
269 Ballard Road
Wilton, NY 12831

DATE: 9/2/2011	GTX NO: 10893
RE: WR Grace	

COPIES	DATE	DESCRIPTION
	9/2/2011	**August - September 2011 Laboratory Test Report**

REMARKS:

SIGNED: Joe Tomei, Laboratory Manager

CC:

APPROVED BY: Nancy Hubbard, Project Manager

GeoTesting
EXPRESS

Boston
Atlanta
New York
www.geotesting.com

September 2, 2011

Bruce Hebbel
D.A. Collins Environmental
269 Ballard Road
Wilton, NY 12831

RE: WR Grace, Acton, MA (GTX-10893)

Dear Bruce:

Enclosed are the test results you requested for the above referenced project. GeoTesting Express, Inc. (GTX) received three samples from you between 8/29/2011 and 8/31/2011. These samples were labeled as follows:

NLW-TS005
SPCLAY001HF
SPCLAY002BX

GTX performed the following tests on these samples:

1 ASTM D 2974 - Organic Content
2 ASTM D 422 - Grain Size Analysis with Hydrometer
1 ASTM D 422 - Grain Size Analysis (sieve only)
2 ASTM D 4318 - Atterberg Limits
1 ASTM D 4972 - pH
2 ASTM D 5084 - Flexible Wall Permeability

A copy of your test request is attached.

The results presented in this report apply only to the items tested. This report shall not be reproduced except in full, without written approval from GeoTesting Express. The remainder of these samples will be retained for a period of sixty (60) days and will then be discarded unless otherwise notified by you. Please call me if you have any questions or require additional information. Thank you for allowing GeoTesting Express the opportunity of providing you with testing services. We look forward to working with you again in the future.

Respectfully yours,

Joe Tomei
Laboratory Manager

GeoTesting
EXPRESS

125 Nagog Park
Acton, MA 01720
978 635 0424 Tel
978 635 0266 Fax

Geotechnical Test Report

9/2/2011

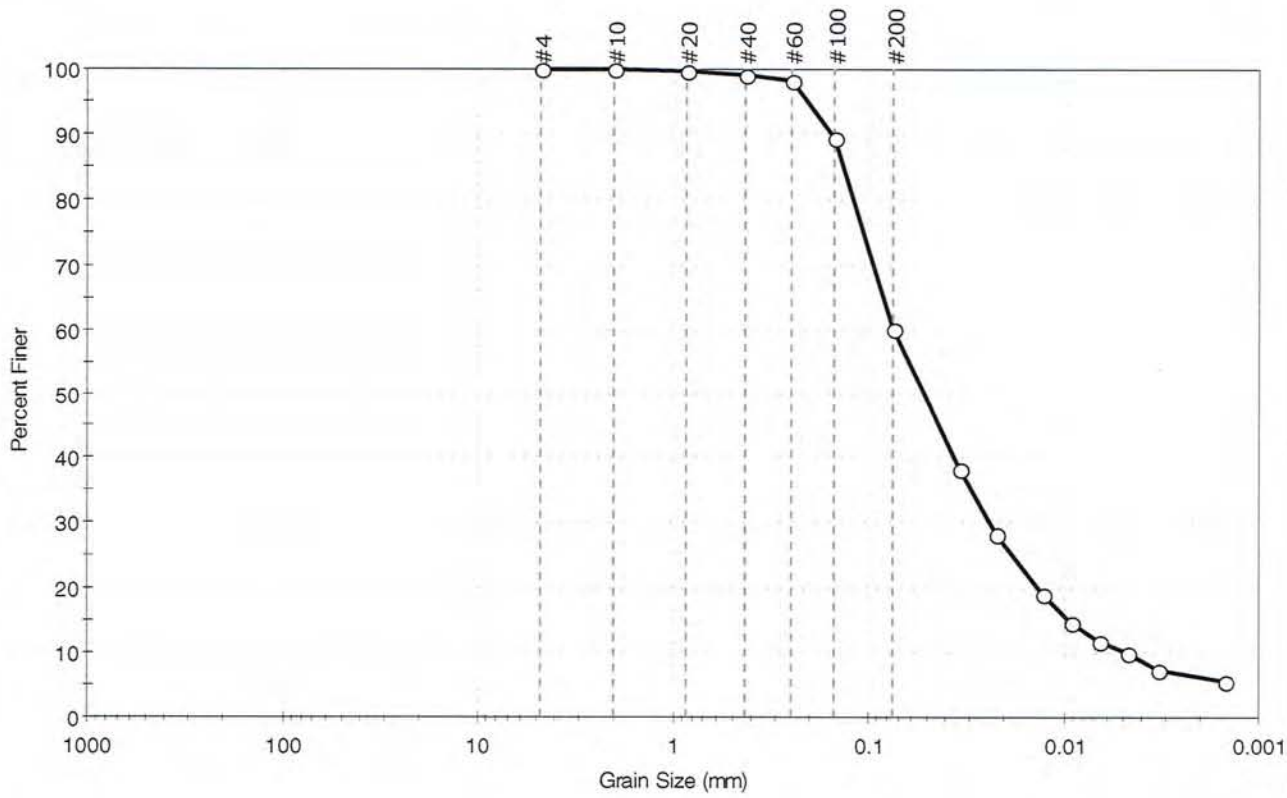
GTX-10893
WR Grace
Acton, MA

Prepared for:

D.A. Collins Environmental

Client:	D.A. Collins Environmental				
Project:	WR Grace				
Location:	Acton, MA			Project No:	GTX-10893
Boring ID: ---		Sample Type:	bucket	Tested By:	jbr
Sample ID:SPCLAY001HF		Test Date:	09/01/11	Checked By:	jdt
Depth : ---		Test Id:	216739		
Test Comment:	---				
Sample Description:	Moist, yellowish brown sandy silt				
Sample Comment:	---				

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	39.7	60.3

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	98		
#100	0.15	89		
#200	0.075	60		
---	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0346	38		
---	0.0221	28		
---	0.0130	19		
---	0.0092	15		
---	0.0065	12		
---	0.0047	10		
---	0.0033	7		
---	0.0015	5		

Coefficients

D_{85} = 0.1355 mm	D_{30} = 0.0238 mm
D_{60} = 0.0742 mm	D_{15} = 0.0094 mm
D_{50} = 0.0521 mm	D_{10} = 0.0047 mm
C_u = N/A	C_c = N/A

Classification

ASTM Sandy silt (ML)

AASHTO Silty Soils (A-4 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

Client:	D.A. Collins Environmental				
Project:	WR Grace				
Location:	Acton, MA			Project No:	GTX-10893
Boring ID: ---		Sample Type:	bucket	Tested By:	cam
Sample ID:	SPCLAY001HF	Test Date:	08/31/11	Checked By:	jdt
Depth :	---	Test Id:	216737		
Test Comment:	---				
Sample Description:	Moist, yellowish brown sandy silt				
Sample Comment:	---				

Atterberg Limits - ASTM D 4318-05

Sample Determined to be non-plastic

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
*	SPCLAY001HF	---	---	24	n/a	n/a	n/a	n/a	Sandy silt (ML)

1% Retained on #40 Sieve

Dry Strength: NONE

Dilentancy: RAPID

Toughness: LOW

The sample was determined to be Non-Plastic

GeoTesting EXPRESS

Client:	D.A. Collins Environmental		
Project Name:	WR Grace		
Project Location:	Acton, MA		
GTX #:	10893		
Start Date:	8/31/2011	Tested By:	ema
End Date:	9/2/2011	Checked By:	jdt
Boring #:	---		
Sample #:	SPCLAY001HF		
Depth:	---		
Visual Description:	Moist, yellowish brown sandy silt		

Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter by ASTM D 5084

Constant Gradient

Sample Type:	remolded	Permeant Fluid:	de-aired tap water
Orientation:	Vertical	Cell #:	3/9

Sample Preparation: Test specimen compacted with moderate effort at the as-received moisture content. Trimmings moisture content = 22.9%.

Parameter	Initial	Final
Height, in	2.56	2.50
Diameter, in	2.85	2.87
Area, in^2	6.38	6.47
Volume, in^3	16.3	16.2
Mass, g	513	521
Bulk Density, pcf	119	123
Moisture Content, %	21.8	23.9
Dry Density, pcf	98.0	98.9
Degree of Saturation, %	---	97

B COEFFICIENT DETERMINATION

Cell Pressure, psi:	95.0	Pressure Increment, psi:	5.04
Sample Pressure, psi:	90.0	B Coefficient:	0.96

FLOW DATA

Date	Time, sec	Pressure, psi Cell	Inlet	Outlet	Gradient	Flow Volume, cc In	Out	Δ In	Δ Out	Temp, °C	R_t	Permeability K @ 20 °C, cm/sec
9/1	---	90.0	85.5	84.5	11.1	10.80	14.00	---	---	---	---	---
9/1	210	90.0	85.5	84.5	11.1	13.90	10.90	3.10	3.10	20	1.000	3.2E-05
9/1	----	90.0	85.5	84.5	11.1	11.10	13.90	---	---	---	---	---
9/1	225	90.0	85.5	84.5	11.1	14.50	10.50	3.40	3.40	20	1.000	3.3E-05
9/1	----	90.0	85.5	84.5	11.1	11.10	13.90	---	---	---	---	---
9/1	190	90.0	85.5	84.5	11.1	14.10	10.90	3.00	3.00	20	1.000	3.4E-05
9/1	----	90.0	85.5	84.5	11.1	11.00	14.00	---	---	---	---	---
9/1	185	90.0	85.5	84.5	11.1	14.00	11.10	3.00	2.90	20	1.000	3.5E-05

PERMEABILITY AT 20° C: 3.3 x 10^{-5} cm/sec (@ 5 psi effective stress)

GeoTesting EXPRESS

SOIL CHAIN OF CUSTODY & TEST REQUEST

CLIENT	
Company: D.A. Collins Environmental Services	
Address: 269 BALLARD RD	
City, State, Zip: WILTON NY 12831	
Contact: BRUCE HEBBEL	E-mail: bhebbel@dacollins.com
Phone: 518-817 2692	Fax:

PROJECT	
Project Name: WR GRACE ACTON MA	
Address:	Client Project #:
City, State, Zip:	
On-site Contact:	E-mail:
Phone:	Fax:

GeoTesting Express, Inc.
125 Nagog Park
Acton, MA 01720
800 434 1062 Toll Free
978 635 0266 Fax

2662 Holcomb Bridge Road, Suite 310
Alpharetta, GA 30022
770 645 6575 Tel
770 645 6570 Fax

www.geotesting.com

INVOICE (complete if different from client)	
Company:	
Address: SAME	
City, State, Zip:	
Contact:	E-mail:
Phone:	Fax:

GENERAL	
Purchase Order #:	GTX Sales Order #:
Shipped By:	Date Shipped:
Mode of Shipment:	Requested Turnaround:
Send Results To: ☐ CLIENT OFFICE ☐ PROJECT OFFICE	
Send Results Via: ☐ E-MAIL ☐ FAX ☐ VERBAL ☐ HARD COPY	

SOIL *please include boring # and depth if known	Sample ID	Atterberg Limits (ASTM D 4318)	California Bearing Ratio (ASTM D 1883) *specify conditions below	USCS – Classification (ASTM D 2487)	Density (ASTM D 2937)	Direct Shear (ASTM D 3080) *specify conditions below	Direct Simple Shear (ASTM D 6528) *specify conditions below	Electrical Resistivity (ASTM G 57)	Grain Size (ASTM D 422) ~~Sieve Only~~ / Sieve & Hydrometer please circle one	Incremental Consolidation (ASTM D 2435)	Moisture Content (ASTM D 2216)	Organic Content (ASTM D 2974)	Permeability/ Hydraulic Conductivity (Fixed Wall - ASTM D 2434) (Flexible Wall – ASTM D 5084) please circle one	Ph (ASTM D 4972)	Proctor Compaction (Standard – ASTM D 698) (Modified – ASTM D 1557) please circle one	Specific Gravity (ASTM D 854)	Triaxial Shear (UU – ASTM D 2850) (CU – ASTM D 4767) (CD – US COE EM1110) *specify conditions below please circle one	Unconfined Compression (ASTM D 2166)	Other:	Other:
1	SPCLAY 001 HF	✓							✓				✓							
2	SPCLAY 002 BX	✓							✓				✓							
3																				
4																				
5																				
6																				
7																				

*Specify Test Conditions (Undisturbed or Remolded, Density and moisture, Test Normal Loads, Test Confining Stresses, etc.):

MODERATE EFFORT; AS RECEIVED FOR COMPACTION RUSH AS POSSIBLE

AUTHORIZE BY SIGNING AND DATING:

SIGNATURE: [signature] PRINT NAME: BRUCE C. HEBBEL DATE: 8/29/2011

Incoming Sample Inspection Performed ☐
Adverse conditions: _____

Relinquished By:	DATE:	Received By:	DATE:
	TIME:		TIME:
Relinquished By:	DATE:	Received By:	DATE:
	TIME:		TIME:

GeoTesting EXPRESS

WARRANTY and LIABILITY

GeoTesting Express (GTX) warrants that all tests it performs are run in general accordance with the specified test procedures and accepted industry practice. GTX will correct or repeat any test that does not comply with this warranty. GTX has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GTX may report engineering parameters that require us to interpret the test data. Such parameters are determined using accepted engineering procedures. However, GTX does not warrant that these parameters accurately reflect the true engineering properties of the *in situ* material. Responsibility for interpretation and use of the test data and these parameters for engineering and/or construction purposes rests solely with the user and not with GTX or any of its employees.

GTX's liability will be limited to correcting or repeating a test which fails our warranty. GTX's liability for damages to the Purchaser of testing services for any cause whatsoever shall be limited to the amount GTX received for the testing services. GTX will not be liable for any damages, or for any lost benefits or other consequential damages resulting from the use of these test results, even if GTX has been advised of the possibility of such damages. GTX will not be responsible for any liability of the Purchaser to any third party.

Commonly Used Symbols

A	pore pressure parameter for $\Delta\sigma_1 - \Delta\sigma_3$
B	pore pressure parameter for $\Delta\sigma_3$
CIU	isotropically consolidated undrained triaxial shear test
CR	compression ratio for one dimensional consolidation
C_c	coefficient of curvature, $(D_{30})^2 / (D_{10} \times D_{60})$
C_u	coefficient of uniformity, D_{60}/D_{10}
C_c	compression index for one dimensional consolidation
C_α	coefficient of secondary compression
c_v	coefficient of consolidation
c	cohesion intercept for total stresses
c'	cohesion intercept for effective stresses
D	diameter of specimen
D_{10}	diameter at which 10% of soil is finer
D_{15}	diameter at which 15% of soil is finer
D_{30}	diameter at which 30% of soil is finer
D_{50}	diameter at which 50% of soil is finer
D_{60}	diameter at which 60% of soil is finer
D_{85}	diameter at which 85% of soil is finer
d_{50}	displacement for 50% consolidation
d_{90}	displacement for 90% consolidation
d_{100}	displacement for 100% consolidation
E	Young's modulus
e	void ratio
e_c	void ratio after consolidation
e_o	initial void ratio
G	shear modulus
G_s	specific gravity of soil particles
H	height of specimen
PI	plasticity index
i	gradient
K_o	lateral stress ratio for one dimensional strain
k	permeability
LI	Liquidity Index
m_v	coefficient of volume change
n	porosity
PI	plasticity index
P_c	preconsolidation pressure
p	$(\sigma_1 + \sigma_3) / 2$, $(\sigma_v + \sigma_h) / 2$
p'	$(\sigma'_1 + \sigma'_3) / 2$, $(\sigma'_v + \sigma'_h) / 2$
p'_c	p' at consolidation
Q	quantity of flow
q	$(\sigma_1 - \sigma_3) / 2$
q_f	q at failure
q_o, q_i	initial q
q_c	q at consolidation
S	degree of saturation
SL	shrinkage limit
s_u	undrained shear strength
T	time factor for consolidation
T	temperature
t	time
U, UC	unconfined compression test
UU, Q	unconsolidated undrained triaxial test
u_a	pore gas pressure
u_e	excess pore water pressure
u, u_w	pore water pressure
V	total volume
V_g	volume of gas
V_s	volume of solids
V_v	volume of voids
V_w	volume of water
V_o	initial volume
v	velocity
W	total weight
W_s	weight of solids
W_w	weight of water
w	water content
w_c	water content at consolidation
w_f	final water content
w_l	liquid limit
w_n	natural water content
w_p	plastic limit
w_s	shrinkage limit
w_o, w_i	initial water content
α	slope of q_f versus p_f
α'	slope of q_f versus p_f'
γ_t	total unit weight
γ_d	dry unit weight
γ_s	unit weight of solids
γ_w	unit weight of water
ε	strain
ε_{vol}	volume strain
ε_h, ε_v	horizontal strain, vertical strain
μ	Poisson's ratio, also viscosity
σ	normal stress
σ'	effective normal stress
σ_c, σ'_c	consolidation stress in isotropic stress system
σ_h, σ'_h	horizontal normal stress
σ_v, σ'_v	vertical normal stress
σ_1	major principal stress
σ_2	intermediate principal stress
σ_3	minor principal stress
τ	shear stress
φ	friction angle based on total stresses
φ'	friction angle based on effective stresses
φ'_r	residual friction angle
φ_{ult}	φ for ultimate strength

AMRO Environmental Laboratories Corp.

Date: *08-Sep-11*

CLIENT: D.A. Collins Construction
Project: W.R. Grace - Acton
Lab Order: 1109014
Date Received: 9/6/2011

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Collection Date	Collection Time
1109014-01A	NLW SP Clay 001HF	9/6/2011	12:00 AM
1109014-01B	NLW SP Clay 001HF	9/6/2011	12:00 AM
1109014-01C	NLW SP Clay 001HF	9/6/2011	12:00 AM
1109014-01D	NLW SP Clay 001HF	9/6/2011	12:00 AM
1109014-02A	NLW SP Clay 002BX	9/6/2011	12:00 AM
1109014-02B	NLW SP Clay 002BX	9/6/2011	12:00 AM
1109014-02C	NLW SP Clay 002BX	9/6/2011	12:00 AM
1109014-02D	NLW SP Clay 002BX	9/6/2011	12:00 AM

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DATA COMMENT PAGE

Organic Data Qualifiers

ND	Indicates compound was analyzed for, but not detected at or above the reporting limit.
J	Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed, or when the data indicates the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit but greater than the method detection limit.
H	Method prescribed holding time exceeded.
E	This flag identifies compounds whose concentrations exceed the calibration range of the instrument for that specific analysis.
B	This flag is used when the analyte is found in the associated blank as well as in the sample.
R	RPD outside accepted recovery limits
RL	Reporting limit; defined as the lowest concentration the laboratory can accurately quantitate.
S	Spike Recovery outside accepted recovery limits.
#	See Case Narrative

Micro Data Qualifiers

TNTC	Too numerous to count

Inorganic Data Qualifiers

ND or U	Indicates element was analyzed for, but not detected at or above the reporting limit.
J	Indicates a value greater than or equal to the method detection limit, but less than the quantitation limit.
H	Indicates analytical holding time exceedance.
B	Indicates that the analyte is found in the associated blank, as well as in the sample.
MSA	Indicates value determined by the Method of Standard Addition
E	This flag identifies compounds whose concentrations exceed the calibration range of the instrument for that specific analysis.
R	RPD outside accepted recovery limits
RL	Reporting limit; defined as the lowest concentration the laboratory can accurately quantitate.
S	Spike Recovery outside accepted recovery limits.
W	Post-digestion spike for Furnace AA analysis is out of control limits (85-115), while sample absorbance is less than 50% of spike absorbance.
*	Duplicate analysis not within control limits.
+	Indicates the correlation coefficient for the Method of Standard Addition is less than 0.995
#	See Case Narrative

Report Comments:

1. Soil, sediment and sludge sample results are reported on a "dry weight" basis.
2. Reporting limits are adjusted for sample size used, dilutions and moisture content, if applicable.

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AMRO Environmental Laboratories Corp.

Date: *08-Sep-11*

CLIENT: D.A. Collins Construction
Project: W.R. Grace - Acton
Lab Order: 1109014

Lab ID: 1109014-01
Collection Date: 9/6/2011
Collection Time:
Client Sample ID: NLW SP Clay 001HF
Matrix: SOIL

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
ICP METALS TOTAL SW-846 - 3051/6010		**SW6010B**				Analyst: **AL**
Arsenic	23.1	7.42		mg/Kg-dry	1	9/7/2011 2:17:22 PM
Barium	75.1	14.8		mg/Kg-dry	1	9/7/2011 2:17:22 PM
Cadmium	ND	0.742		mg/Kg-dry	1	9/7/2011 2:17:22 PM
Chromium	28.9	1.48		mg/Kg-dry	1	9/7/2011 2:17:22 PM
Copper	22.5	3.71		mg/Kg-dry	1	9/7/2011 2:17:22 PM
Iron	20,800	29.7		mg/Kg-dry	1	9/7/2011 2:17:22 PM
Lead	8.35	5.93		mg/Kg-dry	1	9/7/2011 2:17:22 PM
Manganese	452	2.97		mg/Kg-dry	1	9/7/2011 2:17:22 PM
Selenium	ND	17.8		mg/Kg-dry	1	9/7/2011 2:17:22 PM
Silver	ND	2.08		mg/Kg-dry	1	9/7/2011 2:17:22 PM
PERCENT MOISTURE		**D2216**				Analyst: **SK**
Percent Moisture	17.4	0		wt%	1	9/7/2011

Lab ID: 1109014-02
Collection Date: 9/6/2011
Collection Time:
Client Sample ID: NLW SP Clay 002BX
Matrix: SOIL

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
ICP METALS TOTAL SW-846 - 3051/6010		**SW6010B**				Analyst: **AL**
Arsenic	10.4	6.97		mg/Kg-dry	1	9/7/2011 2:23:31 PM
Barium	65.4	13.9		mg/Kg-dry	1	9/7/2011 2:23:31 PM
Cadmium	ND	0.697		mg/Kg-dry	1	9/7/2011 2:23:31 PM
Chromium	75.5	1.39		mg/Kg-dry	1	9/7/2011 2:23:31 PM
Copper	24.3	3.48		mg/Kg-dry	1	9/7/2011 2:23:31 PM
Iron	24,000	27.9		mg/Kg-dry	1	9/7/2011 2:23:31 PM
Lead	ND	5.57		mg/Kg-dry	1	9/7/2011 2:23:31 PM
Manganese	302	2.79		mg/Kg-dry	1	9/7/2011 2:23:31 PM
Selenium	ND	16.7		mg/Kg-dry	1	9/7/2011 2:23:31 PM
Silver	ND	1.95		mg/Kg-dry	1	9/7/2011 2:23:31 PM
PERCENT MOISTURE		**D2216**				Analyst: **SK**
Percent Moisture	12.5	0		wt%	1	9/7/2011

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AMRO Environmental Laboratories Corp.

Date: *08-Sep-11*

CLIENT:	D.A. Collins Construction	**Client Sample ID:**	NLW SP Clay 001HF
Lab Order:	1109014	**Collection Date:**	9/6/2011
Project:	W.R. Grace - Acton	**Matrix:**	SOIL
Lab ID:	1109014-01A		

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
VOLATILE ORGANIC COMPOUNDS BY MCP MET SW8260B						Analyst: **SK**
Acetone	ND	340		µg/Kg-dry	1	9/7/2011 1:46:00 PM
Tertiary Amyl Methyl Ether	ND	68		µg/Kg-dry	1	9/7/2011 1:46:00 PM
Benzene	ND	34		µg/Kg-dry	1	9/7/2011 1:46:00 PM
Bromobenzene	ND	34		µg/Kg-dry	1	9/7/2011 1:46:00 PM
Bromochloromethane	ND	34		µg/Kg-dry	1	9/7/2011 1:46:00 PM
Bromodichloromethane	ND	34		µg/Kg-dry	1	9/7/2011 1:46:00 PM
Bromoform	ND	68		µg/Kg-dry	1	9/7/2011 1:46:00 PM
Bromomethane	ND	68		µg/Kg-dry	1	9/7/2011 1:46:00 PM
sec-Butylbenzene	ND	34		µg/Kg-dry	1	9/7/2011 1:46:00 PM
n-Butylbenzene	ND	34		µg/Kg-dry	1	9/7/2011 1:46:00 PM
tert-Butylbenzene	ND	34		µg/Kg-dry	1	9/7/2011 1:46:00 PM
Carbon disulfide	ND	68		µg/Kg-dry	1	9/7/2011 1:46:00 PM
Carbon tetrachloride	ND	34		µg/Kg-dry	1	9/7/2011 1:46:00 PM
Chlorobenzene	ND	34		µg/Kg-dry	1	9/7/2011 1:46:00 PM
Dibromochloromethane	ND	34		µg/Kg-dry	1	9/7/2011 1:46:00 PM
Chloroethane	ND	68		µg/Kg-dry	1	9/7/2011 1:46:00 PM
Chloroform	ND	34		µg/Kg-dry	1	9/7/2011 1:46:00 PM
Chloromethane	ND	68		µg/Kg-dry	1	9/7/2011 1:46:00 PM
2-Chlorotoluene	ND	34		µg/Kg-dry	1	9/7/2011 1:46:00 PM
4-Chlorotoluene	ND	34		µg/Kg-dry	1	9/7/2011 1:46:00 PM
1,2-Dibromo-3-chloropropane	ND	170		µg/Kg-dry	1	9/7/2011 1:46:00 PM
1,2-Dibromoethane	ND	34		µg/Kg-dry	1	9/7/2011 1:46:00 PM
Dibromomethane	ND	34		µg/Kg-dry	1	9/7/2011 1:46:00 PM
1,3-Dichlorobenzene	ND	34		µg/Kg-dry	1	9/7/2011 1:46:00 PM
1,2-Dichlorobenzene	ND	34		µg/Kg-dry	1	9/7/2011 1:46:00 PM
1,4-Dichlorobenzene	ND	34		µg/Kg-dry	1	9/7/2011 1:46:00 PM
Dichlorodifluoromethane	ND	68		µg/Kg-dry	1	9/7/2011 1:46:00 PM
1,1-Dichloroethane	ND	34		µg/Kg-dry	1	9/7/2011 1:46:00 PM
1,2-Dichloroethane	ND	34		µg/Kg-dry	1	9/7/2011 1:46:00 PM
1,1-Dichloroethene	ND	34		µg/Kg-dry	1	9/7/2011 1:46:00 PM
cis-1,2-Dichloroethene	ND	34		µg/Kg-dry	1	9/7/2011 1:46:00 PM
trans-1,2-Dichloroethene	ND	34		µg/Kg-dry	1	9/7/2011 1:46:00 PM
1,2-Dichloropropane	ND	34		µg/Kg-dry	1	9/7/2011 1:46:00 PM
1,3-Dichloropropane	ND	34		µg/Kg-dry	1	9/7/2011 1:46:00 PM
2,2-Dichloropropane	ND	34		µg/Kg-dry	1	9/7/2011 1:46:00 PM
1,1-Dichloropropene	ND	34		µg/Kg-dry	1	9/7/2011 1:46:00 PM
cis-1,3-Dichloropropene	ND	34		µg/Kg-dry	1	9/7/2011 1:46:00 PM
trans-1,3-Dichloropropene	ND	34		µg/Kg-dry	1	9/7/2011 1:46:00 PM
Diethyl ether	ND	340		µg/Kg-dry	1	9/7/2011 1:46:00 PM

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AMRO Environmental Laboratories Corp.

Date: *08-Sep-11*

CLIENT:	D.A. Collins Construction	**Client Sample ID:**	NLW SP Clay 001HF
Lab Order:	1109014	**Collection Date:**	9/6/2011
Project:	W.R. Grace - Acton	**Matrix:**	SOIL
Lab ID:	1109014-01A		

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Diisopropyl ether	ND	68		µg/Kg-dry	1	9/7/2011 1:46:00 PM
1,4-Dioxane	ND	1,700		µg/Kg-dry	1	9/7/2011 1:46:00 PM
Ethyl Tertiary Butyl Ether	ND	68		µg/Kg-dry	1	9/7/2011 1:46:00 PM
Ethylbenzene	ND	34		µg/Kg-dry	1	9/7/2011 1:46:00 PM
Hexachlorobutadiene	ND	68		µg/Kg-dry	1	9/7/2011 1:46:00 PM
2-Hexanone	ND	340		µg/Kg-dry	1	9/7/2011 1:46:00 PM
Isopropylbenzene	ND	34		µg/Kg-dry	1	9/7/2011 1:46:00 PM
4-Isopropyltoluene	ND	34		µg/Kg-dry	1	9/7/2011 1:46:00 PM
2-Butanone	ND	340		µg/Kg-dry	1	9/7/2011 1:46:00 PM
4-Methyl-2-pentanone	ND	340		µg/Kg-dry	1	9/7/2011 1:46:00 PM
Methyl tert-butyl ether	ND	34		µg/Kg-dry	1	9/7/2011 1:46:00 PM
Methylene chloride	ND	68		µg/Kg-dry	1	9/7/2011 1:46:00 PM
Naphthalene	ND	68		µg/Kg-dry	1	9/7/2011 1:46:00 PM
n-Propylbenzene	ND	34		µg/Kg-dry	1	9/7/2011 1:46:00 PM
Styrene	ND	34		µg/Kg-dry	1	9/7/2011 1:46:00 PM
1,1,1,2-Tetrachloroethane	ND	34		µg/Kg-dry	1	9/7/2011 1:46:00 PM
1,1,2,2-Tetrachloroethane	ND	34		µg/Kg-dry	1	9/7/2011 1:46:00 PM
Tetrachloroethene	ND	34		µg/Kg-dry	1	9/7/2011 1:46:00 PM
Tetrahydrofuran	ND	340		µg/Kg-dry	1	9/7/2011 1:46:00 PM
Toluene	ND	34		µg/Kg-dry	1	9/7/2011 1:46:00 PM
1,2,4-Trichlorobenzene	ND	34		µg/Kg-dry	1	9/7/2011 1:46:00 PM
1,2,3-Trichlorobenzene	ND	34		µg/Kg-dry	1	9/7/2011 1:46:00 PM
1,1,1-Trichloroethane	ND	34		µg/Kg-dry	1	9/7/2011 1:46:00 PM
1,1,2-Trichloroethane	ND	34		µg/Kg-dry	1	9/7/2011 1:46:00 PM
Trichloroethene	ND	34		µg/Kg-dry	1	9/7/2011 1:46:00 PM
Trichlorofluoromethane	ND	68		µg/Kg-dry	1	9/7/2011 1:46:00 PM
1,2,3-Trichloropropane	ND	34		µg/Kg-dry	1	9/7/2011 1:46:00 PM
1,2,4-Trimethylbenzene	ND	34		µg/Kg-dry	1	9/7/2011 1:46:00 PM
1,3,5-Trimethylbenzene	ND	34		µg/Kg-dry	1	9/7/2011 1:46:00 PM
Vinyl chloride	ND	34		µg/Kg-dry	1	9/7/2011 1:46:00 PM
o-Xylene	ND	34		µg/Kg-dry	1	9/7/2011 1:46:00 PM
m,p-Xylene	ND	34		µg/Kg-dry	1	9/7/2011 1:46:00 PM
Surr: Dibromofluoromethane	127	70-130		%REC	1	9/7/2011 1:46:00 PM
Surr: 1,2-Dichloroethane-d4	128	70-130		%REC	1	9/7/2011 1:46:00 PM
Surr: Toluene-d8	133	70-130	S	%REC	1	9/7/2011 1:46:00 PM
Surr: 4-Bromofluorobenzene	139	70-130	S	%REC	1	9/7/2011 1:46:00 PM

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AMRO Environmental Laboratories Corp.

Date: *08-Sep-11*

CLIENT:	D.A. Collins Construction	**Client Sample ID:**	NLW SP Clay 001HF
Lab Order:	1109014	**Collection Date:**	9/6/2011
Project:	W.R. Grace - Acton	**Matrix:**	SOIL
Lab ID:	1109014-01B		

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
SEMIVOLATILE ORGANIC COMPOUNDS BY MCP SW8270C						Analyst: **KAM**
Acenaphthene	ND	300		µg/Kg-dry	1	9/7/2011 1:52:00 PM
Acenaphthylene	ND	300		µg/Kg-dry	1	9/7/2011 1:52:00 PM
Acetophenone	ND	300		µg/Kg-dry	1	9/7/2011 1:52:00 PM
Aniline	ND	300		µg/Kg-dry	1	9/7/2011 1:52:00 PM
Anthracene	ND	300		µg/Kg-dry	1	9/7/2011 1:52:00 PM
1,2-Diphenylhydrazine (as Azobenzene)	ND	300		µg/Kg-dry	1	9/7/2011 1:52:00 PM
Benz(a)anthracene	ND	300		µg/Kg-dry	1	9/7/2011 1:52:00 PM
Benzo(a)pyrene	ND	300		µg/Kg-dry	1	9/7/2011 1:52:00 PM
Benzo(b)fluoranthene	ND	300		µg/Kg-dry	1	9/7/2011 1:52:00 PM
Benzo(k)fluoranthene	ND	300		µg/Kg-dry	1	9/7/2011 1:52:00 PM
Benzo(g,h,i)perylene	ND	300		µg/Kg-dry	1	9/7/2011 1:52:00 PM
4-Bromophenyl phenyl ether	ND	300		µg/Kg-dry	1	9/7/2011 1:52:00 PM
Butyl benzyl phthalate	ND	300		µg/Kg-dry	1	9/7/2011 1:52:00 PM
Di-n-butyl phthalate	ND	300		µg/Kg-dry	1	9/7/2011 1:52:00 PM
4-Chloroaniline	ND	300		µg/Kg-dry	1	9/7/2011 1:52:00 PM
Bis(2-chloroethoxy)methane	ND	300		µg/Kg-dry	1	9/7/2011 1:52:00 PM
Bis(2-chloroethyl)ether	ND	300		µg/Kg-dry	1	9/7/2011 1:52:00 PM
Bis(2-chloroisopropyl)ether	ND	300		µg/Kg-dry	1	9/7/2011 1:52:00 PM
2-Chloronaphthalene	ND	300		µg/Kg-dry	1	9/7/2011 1:52:00 PM
2-Chlorophenol	ND	300		µg/Kg-dry	1	9/7/2011 1:52:00 PM
Chrysene	ND	300		µg/Kg-dry	1	9/7/2011 1:52:00 PM
Dibenz(a,h)anthracene	ND	300		µg/Kg-dry	1	9/7/2011 1:52:00 PM
Dibenzofuran	ND	300		µg/Kg-dry	1	9/7/2011 1:52:00 PM
1,2-Dichlorobenzene	ND	300		µg/Kg-dry	1	9/7/2011 1:52:00 PM
1,3-Dichlorobenzene	ND	300		µg/Kg-dry	1	9/7/2011 1:52:00 PM
1,4-Dichlorobenzene	ND	300		µg/Kg-dry	1	9/7/2011 1:52:00 PM
3,3'-Dichlorobenzidine	ND	300		µg/Kg-dry	1	9/7/2011 1:52:00 PM
2,4-Dichlorophenol	ND	300		µg/Kg-dry	1	9/7/2011 1:52:00 PM
Diethyl phthalate	ND	300		µg/Kg-dry	1	9/7/2011 1:52:00 PM
Dimethyl phthalate	ND	300		µg/Kg-dry	1	9/7/2011 1:52:00 PM
2,4-Dimethylphenol	ND	300		µg/Kg-dry	1	9/7/2011 1:52:00 PM
2,4-Dinitrophenol	ND	610		µg/Kg-dry	1	9/7/2011 1:52:00 PM
2,4-Dinitrotoluene	ND	300		µg/Kg-dry	1	9/7/2011 1:52:00 PM
2,6-Dinitrotoluene	ND	300		µg/Kg-dry	1	9/7/2011 1:52:00 PM
Bis(2-ethylhexyl)phthalate	ND	300		µg/Kg-dry	1	9/7/2011 1:52:00 PM
Fluoranthene	ND	300		µg/Kg-dry	1	9/7/2011 1:52:00 PM
Fluorene	ND	300		µg/Kg-dry	1	9/7/2011 1:52:00 PM
Hexachlorobenzene	ND	300		µg/Kg-dry	1	9/7/2011 1:52:00 PM

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AMRO Environmental Laboratories Corp.

Date: *08-Sep-11*

CLIENT:	D.A. Collins Construction	**Client Sample ID:**	NLW SP Clay 001HF
Lab Order:	1109014	**Collection Date:**	9/6/2011
Project:	W.R. Grace - Acton	**Matrix:**	SOIL
Lab ID:	1109014-01B		

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Hexachlorobutadiene	ND	300		µg/Kg-dry	1	9/7/2011 1:52:00 PM
Hexachloroethane	ND	300		µg/Kg-dry	1	9/7/2011 1:52:00 PM
Indeno(1,2,3-cd)pyrene	ND	300		µg/Kg-dry	1	9/7/2011 1:52:00 PM
Isophorone	ND	300		µg/Kg-dry	1	9/7/2011 1:52:00 PM
2-Methylnaphthalene	ND	300		µg/Kg-dry	1	9/7/2011 1:52:00 PM
2-Methylphenol	ND	300		µg/Kg-dry	1	9/7/2011 1:52:00 PM
4-Methylphenol	ND	300		µg/Kg-dry	1	9/7/2011 1:52:00 PM
Naphthalene	ND	300		µg/Kg-dry	1	9/7/2011 1:52:00 PM
Nitrobenzene	ND	300		µg/Kg-dry	1	9/7/2011 1:52:00 PM
2-Nitrophenol	ND	300		µg/Kg-dry	1	9/7/2011 1:52:00 PM
4-Nitrophenol	ND	610		µg/Kg-dry	1	9/7/2011 1:52:00 PM
Di-n-octyl phthalate	ND	300		µg/Kg-dry	1	9/7/2011 1:52:00 PM
Pentachlorophenol	ND	610		µg/Kg-dry	1	9/7/2011 1:52:00 PM
Phenanthrene	ND	300		µg/Kg-dry	1	9/7/2011 1:52:00 PM
Phenol	ND	300		µg/Kg-dry	1	9/7/2011 1:52:00 PM
Pyrene	ND	300		µg/Kg-dry	1	9/7/2011 1:52:00 PM
1,2,4-Trichlorobenzene	ND	300		µg/Kg-dry	1	9/7/2011 1:52:00 PM
2,4,5-Trichlorophenol	ND	300		µg/Kg-dry	1	9/7/2011 1:52:00 PM
2,4,6-Trichlorophenol	ND	300		µg/Kg-dry	1	9/7/2011 1:52:00 PM
Surr: 2-Fluorophenol	56.1	30-130		%REC	1	9/7/2011 1:52:00 PM
Surr: Phenol-d5	55.1	30-130		%REC	1	9/7/2011 1:52:00 PM
Surr: Nitrobenzene-d5	49.7	30-130		%REC	1	9/7/2011 1:52:00 PM
Surr: 2-Fluorobiphenyl	47.8	30-130		%REC	1	9/7/2011 1:52:00 PM
Surr: 2,4,6-Tribromophenol	58.2	30-130		%REC	1	9/7/2011 1:52:00 PM
Surr: 4-Terphenyl-d14	69.4	30-130		%REC	1	9/7/2011 1:52:00 PM

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AMRO Environmental Laboratories Corp.

Date: *08-Sep-11*

CLIENT:	D.A. Collins Construction	**Client Sample ID:**	NLW SP Clay 001HF
Lab Order:	1109014	**Collection Date:**	9/6/2011
Project:	W.R. Grace - Acton	**Matrix:**	SOIL
Lab ID:	1109014-01B		

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA 8081A CHLORINATED PESTICIDES BY MCP SW8081A						Analyst: **KAM**
Aldrin	ND	0.97		µg/Kg-dry	1	9/7/2011 5:42:00 PM
alpha-BHC	ND	0.97		µg/Kg-dry	1	9/7/2011 5:42:00 PM
beta-BHC	ND	0.97		µg/Kg-dry	1	9/7/2011 5:42:00 PM
gamma-BHC	ND	0.97		µg/Kg-dry	1	9/7/2011 5:42:00 PM
delta-BHC	ND	0.97		µg/Kg-dry	1	9/7/2011 5:42:00 PM
Technical Chlordane	ND	30		µg/Kg-dry	1	9/7/2011 5:42:00 PM
4,4´-DDD	ND	1.9		µg/Kg-dry	1	9/7/2011 5:42:00 PM
4,4´-DDE	ND	1.9		µg/Kg-dry	1	9/7/2011 5:42:00 PM
4,4´-DDT	ND	1.9		µg/Kg-dry	1	9/7/2011 5:42:00 PM
Dieldrin	ND	1.9		µg/Kg-dry	1	9/7/2011 5:42:00 PM
Endosulfan I	ND	0.97		µg/Kg-dry	1	9/7/2011 5:42:00 PM
Endosulfan II	ND	1.9		µg/Kg-dry	1	9/7/2011 5:42:00 PM
Endosulfan sulfate	ND	1.9		µg/Kg-dry	1	9/7/2011 5:42:00 PM
Endrin	ND	1.9		µg/Kg-dry	1	9/7/2011 5:42:00 PM
Endrin ketone	ND	1.9		µg/Kg-dry	1	9/7/2011 5:42:00 PM
Heptachlor	ND	0.97		µg/Kg-dry	1	9/7/2011 5:42:00 PM
Heptachlor epoxide	ND	0.97		µg/Kg-dry	1	9/7/2011 5:42:00 PM
Hexachlorobenzene	ND	0.97		µg/Kg-dry	1	9/7/2011 5:42:00 PM
Methoxychlor	ND	9.7		µg/Kg-dry	1	9/7/2011 5:42:00 PM
Surr: Tetrachloro-m-xylene	81.1	30-131		%REC	1	9/7/2011 5:42:00 PM
Surr: Decachlorobiphenyl	82.2	30-150		%REC	1	9/7/2011 5:42:00 PM
POLYCHLORINATED BIPHENYLS BY MCP METH SW8082						Analyst: **KAM**
Aroclor 1016	ND	30		µg/Kg-dry	1	9/7/2011 3:28:00 PM
Aroclor 1221	ND	30		µg/Kg-dry	1	9/7/2011 3:28:00 PM
Aroclor 1232	ND	30		µg/Kg-dry	1	9/7/2011 3:28:00 PM
Aroclor 1242	ND	30		µg/Kg-dry	1	9/7/2011 3:28:00 PM
Aroclor 1248	ND	30		µg/Kg-dry	1	9/7/2011 3:28:00 PM
Aroclor 1254	ND	30		µg/Kg-dry	1	9/7/2011 3:28:00 PM
Aroclor 1260	ND	30		µg/Kg-dry	1	9/7/2011 3:28:00 PM
Aroclor 1262	ND	30		µg/Kg-dry	1	9/7/2011 3:28:00 PM
Aroclor 1268	ND	30		µg/Kg-dry	1	9/7/2011 3:28:00 PM
Surr: Tetrachloro-m-xylene	81.8	30-127		%REC	1	9/7/2011 3:28:00 PM
Surr: Decachlorobiphenyl	96.5	30-136		%REC	1	9/7/2011 3:28:00 PM

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AMRO Environmental Laboratories Corp.

Date: *08-Sep-11*

CLIENT:	D.A. Collins Construction	**Client Sample ID:**	NLW SP Clay 001HF
Lab Order:	1109014	**Collection Date:**	9/6/2011
Project:	W.R. Grace - Acton	**Matrix:**	SOIL
Lab ID:	1109014-01B		

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
MADEP EPH REVISION 1.1		**MAEPH**				Analyst: **KAM**
C9-C18 Aliphatic Hydrocarbons	ND	12		mg/Kg-dry	1	9/7/2011 9:34:00 PM
C19-C36 Aliphatic Hydrocarbons	ND	12		mg/Kg-dry	1	9/7/2011 9:34:00 PM
C11-C22 Aromatic Hydrocarbons	ND	12		mg/Kg-dry	1	9/7/2011 10:10:00 PM
Naphthalene	ND	0.12		mg/Kg-dry	1	9/7/2011 10:10:00 PM
2-Methylnaphthalene	ND	0.12		mg/Kg-dry	1	9/7/2011 10:10:00 PM
Acenaphthylene	ND	0.12		mg/Kg-dry	1	9/7/2011 10:10:00 PM
Acenaphthene	ND	0.12		mg/Kg-dry	1	9/7/2011 10:10:00 PM
Fluorene	ND	0.12		mg/Kg-dry	1	9/7/2011 10:10:00 PM
Phenanthrene	ND	0.12		mg/Kg-dry	1	9/7/2011 10:10:00 PM
Anthracene	ND	0.12		mg/Kg-dry	1	9/7/2011 10:10:00 PM
Fluoranthene	ND	0.12		mg/Kg-dry	1	9/7/2011 10:10:00 PM
Pyrene	ND	0.12		mg/Kg-dry	1	9/7/2011 10:10:00 PM
Benz(a)anthracene	ND	0.12		mg/Kg-dry	1	9/7/2011 10:10:00 PM
Chrysene	ND	0.12		mg/Kg-dry	1	9/7/2011 10:10:00 PM
Benzo(b)fluoranthene	ND	0.12		mg/Kg-dry	1	9/7/2011 10:10:00 PM
Benzo(k)fluoranthene	ND	0.12		mg/Kg-dry	1	9/7/2011 10:10:00 PM
Benzo(a)pyrene	ND	0.12		mg/Kg-dry	1	9/7/2011 10:10:00 PM
Dibenz(a,h)anthracene	ND	0.12		mg/Kg-dry	1	9/7/2011 10:10:00 PM
Indeno(1,2,3-cd)pyrene	ND	0.12		mg/Kg-dry	1	9/7/2011 10:10:00 PM
Benzo(g,h,i)perylene	ND	0.12		mg/Kg-dry	1	9/7/2011 10:10:00 PM
Surr: 1-Chlorooctadecane	50.7	40-140		%REC	1	9/7/2011 9:34:00 PM
Surr: 2-Bromonaphthalene	57.8	40-140		%REC	1	9/7/2011 10:10:00 PM
Surr: 2-Fluorobiphenyl	66.2	40-140		%REC	1	9/7/2011 10:10:00 PM
Surr: o-Terphenyl	53.8	40-140		%REC	1	9/7/2011 10:10:00 PM

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AMRO Environmental Laboratories Corp.

Date: *08-Sep-11*

CLIENT: D.A. Collins Construction
Project: W.R. Grace - Acton
Lab Order: 1109014

Lab ID: 1109014-01
Collection Date: 9/6/2011
Collection Time:
Client Sample ID: NLW SP Clay 001HF
Matrix: SOIL

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
MADEP VPH REVISION 1.1		**MAVPH1.1**				Analyst: **SK**
C5-C8 Aliphatic Hydrocarbons	ND	2.8		mg/Kg-dry	1	9/7/2011 3:59:00 PM
C9-C12 Aliphatic Hydrocarbons	ND	2.8		mg/Kg-dry	1	9/7/2011 3:59:00 PM
C9-C10 Aromatic Hydrocarbons	ND	2.8		mg/Kg-dry	1	9/7/2011 3:59:00 PM
Benzene	ND	0.056		mg/Kg-dry	1	9/7/2011 3:59:00 PM
Ethylbenzene	ND	0.056		mg/Kg-dry	1	9/7/2011 3:59:00 PM
Methyl tert-butyl ether	ND	0.056		mg/Kg-dry	1	9/7/2011 3:59:00 PM
Naphthalene	ND	0.056		mg/Kg-dry	1	9/7/2011 3:59:00 PM
Toluene	ND	0.056		mg/Kg-dry	1	9/7/2011 3:59:00 PM
m,p-Xylene	ND	0.056		mg/Kg-dry	1	9/7/2011 3:59:00 PM
o-Xylene	ND	0.056		mg/Kg-dry	1	9/7/2011 3:59:00 PM
Surr: 2,5-Dibromotoluene-PID	120	70-130		%REC	1	9/7/2011 3:59:00 PM
Surr: 2,5-Dibromotoluene-FID	135	70-130	S	%REC	1	9/7/2011 3:59:00 PM

Lab ID: 1109014-02
Collection Date: 9/6/2011
Collection Time:
Client Sample ID: NLW SP Clay 002BX
Matrix: SOIL

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
MADEP VPH REVISION 1.1		**MAVPH1.1**				Analyst: **SK**
C5-C8 Aliphatic Hydrocarbons	ND	2.4		mg/Kg-dry	1	9/7/2011 4:57:00 PM
C9-C12 Aliphatic Hydrocarbons	ND	2.4		mg/Kg-dry	1	9/7/2011 4:57:00 PM
C9-C10 Aromatic Hydrocarbons	ND	2.4		mg/Kg-dry	1	9/7/2011 4:57:00 PM
Benzene	ND	0.048		mg/Kg-dry	1	9/7/2011 4:57:00 PM
Ethylbenzene	ND	0.048		mg/Kg-dry	1	9/7/2011 4:57:00 PM
Methyl tert-butyl ether	ND	0.048		mg/Kg-dry	1	9/7/2011 4:57:00 PM
Naphthalene	ND	0.048		mg/Kg-dry	1	9/7/2011 4:57:00 PM
Toluene	ND	0.048		mg/Kg-dry	1	9/7/2011 4:57:00 PM
m,p-Xylene	ND	0.048		mg/Kg-dry	1	9/7/2011 4:57:00 PM
o-Xylene	ND	0.048		mg/Kg-dry	1	9/7/2011 4:57:00 PM
Surr: 2,5-Dibromotoluene-PID	123	70-130		%REC	1	9/7/2011 4:57:00 PM
Surr: 2,5-Dibromotoluene-FID	139	70-130	S	%REC	1	9/7/2011 4:57:00 PM

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PHOENIX
Environmental Laboratories, Inc.

Friday, September 09, 2011

Attn: Ms. Nancy Stewart
AMRO Environmental Laboratories
111 Herrick Street
Merrimack, NH 03054

Project ID: WR GRACE ACTON
Sample ID#s: BA72753 - BA72754

This laboratory is in compliance with the QA/QC procedures outlined in EPA 600/4-79-019, Handbook for Analytical Quality in Water and Waste Water, March 1979, SW846 QA/QC and NELAC requirements of procedures used.

This report contains results for the parameters tested, under the sampling conditions described on the Chain Of Custody, as received by the laboratory.

A scanned version of the COC form accompanies the analytical report and is an exact duplicate of the original.

If you have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext. 200.

Sincerely yours,

Phyllis Shiller

Phyllis Shiller
Laboratory Director

NELAC - #NY11301
CT Lab Registration #PH-0618
MA Lab Registration #MA-CT-007
ME Lab Registration #CT-007
NH Lab Registration #213693-A,B
NJ Lab Registration #CT-003
NY Lab Registration #11301
PA Lab Registration #68-03530
RI Lab Registration #63
VT Lab Registration #VT11301

587 East Middle Turnpike, P.O. Box 370, Manchester, CT 06040
Telephone (860) 645-1102 Fax (860) 645-0823

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

ACCREDITED IN ACCORDANCE WITH nelac NY # 11301

Analysis Report

September 09, 2011

FOR: Attn: Ms. Nancy Stewart
AMRO Environmental Laboratories
111 Herrick Street
Merrimack, NH 03054

Sample Information		Custody Information		Date	Time
Matrix:	SOIL	Collected by:		09/06/11	0:00
Location Code:	AMRO | SP CLAY HF	Received by:	LDF	09/07/11	13:31
Rush Request:	RUSH24	Analyzed by:	see "By" below		
P.O.#:	61250				

Laboratory Data

SDG ID: GBA72753
Phoenix ID: BA72753

Project ID: WR GRACE ACTON

Client ID: SP CLAY 001 HF

Parameter	Result	RL	Units	Date	Time	By	Reference
Percent Solid	83		%	09/07/11		JL	E160.3
Soil Extraction for Herbicide	Completed			09/07/11		MB/D	SW8151
Chlorinated Herbicides							
2,4,5-T	ND	10	ug/Kg	09/08/11		KCA	SW8151
2,4,5-TP (Silvex)	ND	10	ug/Kg	09/08/11		KCA	SW8151
2,4-D	ND	10	ug/Kg	09/08/11		KCA	SW8151
2,4-DB	ND	80	ug/Kg	09/08/11		KCA	SW8151
Dalapon	ND	10	ug/Kg	09/08/11		KCA	SW8151
Dicamba	ND	20	ug/Kg	09/08/11		KCA	SW8151
Dichloroprop	ND	10	ug/Kg	09/08/11		KCA	SW8151
Dinoseb	ND	20	ug/Kg	09/08/11		KCA	SW8151
MCPA	ND	3000	ug/Kg	09/08/11		KCA	SW8151
MCPP	ND	3000	ug/Kg	09/08/11		KCA	SW8151
QA/QC Surrogates							
% DCAA	111		%	09/08/11		KCA	30 - 150 %

Comments:

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

ND=Not detected BDL=Below Detection Level RL=Reporting Level

This report must not be reproduced except in full as defined by the attached chain of custody.

Phyllis Shiller

Phyllis Shiller, Laboratory Director
September 12, 2011

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

ACCREDITED IN ACCORDANCE WITH nelac NY # 11301

QA/QC Report

September 12, 2011

QA/QC Data

SDG I.D.: GBA72753

Parameter	Blank	LCS %	LCSD %	LCS RPD	MS Rec %	MS Dup Rec %	RPD	% Rec Limits	% RPD Limits	
QA/QC Batch 184162, QC Sample No: BA72669 (BA72753, BA72754)										
Chlorinated Herbicides										
2,4,5-T	ND	46	47	2.2	49	48	2.1	40 - 140	20	
2,4,5-TP (Silvex)	ND	72	77	6.7	78	77	1.3	40 - 140	20	
2,4-D	ND	59	57	3.4	67	67	0.0	40 - 140	20	
2,4-DB	ND	66	74	11.4	82	81	1.2	40 - 140	20	
Dalapon	ND	75	73	2.7	71	77	8.1	40 - 140	20	
Dicamba	ND	84	86	2.4	89	87	2.3	40 - 140	20	
Dichloroprop	ND	85	95	11.1	101	109	7.6	40 - 140	20	
Dinoseb	ND	101	125	21.2	108	87	21.5	10 - 110	20	l,r
MCPA	ND	116	122	5.0	130	134	3.0	40 - 140	20	
MCPP	ND	117	98	17.7	102	106	3.8	40 - 140	20	
% DCAA (Surrogate Rec)	83	85	90	5.7	90	90	0.0	30 - 150	20	

Comment:

MCP 8151 additional criteria: 10% of compounds can be outside of acceptance criteria as long as recovery is at least 10%.

l = This parameter is outside laboratory lcs/lcsd specified recovery limits.
r = This parameter is outside laboratory rpd specified recovery limits.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

RPD - Relative Percent Difference
LCS - Laboratory Control Sample
LCSD - Laboratory Control Sample Duplicate
MS - Matrix Spike
MS Dup - Matrix Spike Duplicate
NC - No Criteria

Phyllis Shiller

Phyllis Shiller, Laboratory Director
September 12, 2011

Requested Criteria: CAM, S1

Sample Criteria Exceedences Report

GBA72753

SampNo	LocCode	Acode	Phoenix Analyte	Criteria Units	ST	State Category	Criteria Name	Result	RL	Factored Criteria	Factored RL Criteria	Analysis Units

*** No Data to Display ***

Phoenix Laboratories does not assume responsibility for the data contained in this report. It is provided as an additional tool to identify requested criteria exceedences. All efforts are made to ensure the accuracy of the data (obtained from appropriate agencies). A lack of exceedence information does not necessarily suggest conformance to the criteria. It is ultimately the site professional's responsibility to determine appropriate compliance.

AMRO Environmental Laboratories Corporation
111 Herrick Street
Merrimack, NH 03054

CHAIN-OF-CUSTODY RECORD

Office: (603) 424-2022
Fax: (603) 429-8496
web: www.amrolabs.com

Project No.:	Project Name: WR GRACE ALTON	Project State: MA	Project Manager:	Samplers (Signature):	AMRO Project No.:
P.O.#:	Results Needed by:				
QUOTE #:	Seal Intact? Yes No N/A				

Sample ID.:	Date/Time Sampled	Matrix	Total # of Cont. & Size	Comp.	Grab	HERBILIDES	Remarks
SPClay001HF	9/6/11	SOIL	1	X		✓	72753
SPClay002Bx	9/6/11	SOIL	1	X		✓	72754

REQUESTED ANALYSES

24 HR TAT

Preservative: Cl-HCl, MeOH, N-HN03, S-H2SO4, Na-NaOH, O- Other

Send Results To: AMRO Attn Nancy Stewart

PRIORITY TURNAROUND TIME AUTHORIZATION
Before submitting samples for expedited TAT, you must *have a coded AUTHORIZATION NUMBER*
AUTHORIZATION No.: BY:

METALS 8 RCRA ☐ 13 PP ☐ 23 TAL ☐ 14 MCP ☐
Method: 6010 ☐ 200.7 ☐ Other Metals:
Dissolved Metals Field Filtered? YES ☐ NO ☐

PHONE #: FAX #:
E-mail:

MCP Presumptive Certainty Required? YES ☐ NO ☐
MCP Methods Needed: YES ☐ NO ☐
Required Reporting Limits: S-1 ✓ GW-1 ☐ S-2 ☐ GW-2 ☐ S-3 ☐ GW-3 ☐
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PART IV: Brownfields

Chapter 8

URBAN FILL CHARACTERIZATION AND RISK-BASED MANAGEMENT DECISIONS - A PRACTICAL GUIDE

Draft

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Abstract: This paper examines contaminants in urban fill soil via background concentrations, disposal facility parameters and limits, and no-significant risk limits for site closure. It provides a guide when considering what might be expected at brownfields sites and how the findings at a site may be used to make practical soil management decisions. The approach is based on experience in Massachusetts following Massachusetts Department of Environmental Protection (MassDEP) regulations and guidance.

It is evident that urban fill soil may be expected to contain contaminants, in particular, heavy metals and polynuclear aromatic hydrocarbons, from specific releases and background sources. Natural concentrations and background concentrations are important sorting and selection criteria in evaluating which chemicals should be selected for analysis and which should be considered background. This paper discusses lead, arsenic, carcinogenic polynuclear aromatic hydrocarbons, dioxins, polychlorinated biphenyls, and asbestos. The authors outline each contaminant, the usual range in natural and urban fill soils, and its risk-based or related thresholds, with emphasis on the New England area. The outcome is a range of concentrations that can be used as a guide when considering brownfields sites such that their information may be compared to the ranges and brought into meaningful focus.

Key words: lead, arsenic, carcinogenic polynuclear aromatic hydrocarbons, dioxins, polychlorinated biphenyls, and asbestos

1. INTRODUCTION

The evaluation of numerous sites characterized by the presence of urban fill has revealed that there are several key contaminants, particularly, lead, arsenic, and polynuclear aromatic hydrocarbons (PAHs) that are consistently present at a high frequency. Other key contaminants, such as polychlorinated biphenyls (PCBs), may be detected less frequently. Dioxin, which is analyzed relatively infrequently, may also drive potential human health risks when present in urban fill. These constituents are also subject to environmental regulations at the national, state, and sometimes at the local level.

To determine if the concentration of a particular key contaminant is relatively "high" or "low," there are three status areas or zones that may be defined based on the potential for human health risk. The first zone is a No Significant Risk level. From a human health perspective, a condition of No Significant Risk has been achieved if cumulative noncancer risk is calculated at a Hazard Index of one

and if cumulative cancer risk is at a level of not more than one additional cancer occurrence per 100,000 persons. Any given background concentration, either naturally occurring or anthropogenic, may fall into the risk-based No Significant Risk zone or could potentially fall into the second Probable (Potential) Risk zone. Further along the scale are "acute" levels such as would cause a risk if present for a short-period of time (called an Imminent Hazard by (Massachusetts Department of Environmental Protection (MassDEP)) or the upper concentration limit (UCL), defined by MassDEP as a potential long-term or future risk to public welfare—health, safety, and the environment. In this assessment, each of the key urban fill contaminants is defined by these zones or status areas: using a "green" zone, within which there is little likelihood of significant risk; a "yellow," or cautionary zone, where risk may occur, but might be dealt with by institutional controls—or capping, venting, and containment; and a "red" zone, where remedial actions in the form of reduction, removal, or very robust, costly impediments to contact are required. Nothing about these ranges is absolute—they are based on the judgment of the authors and are thresholds or guiding values for an initial assessment or interpretation, subject to refinement by a professional risk assessor and the specifics of applicable regulations.

The selection of these zones is based on an extensive literature search of the following:

1. Background levels in the literature based on either naturally occurring concentrations or widespread anthropogenic occurrence;
2. Risk-based concentrations based on residential direct contact with soil computed using MassDEP methods (MassDEP, 2006);
3. State and federal standards and Preliminary Remediation Goals (PRGs) based on either human health risk, background, achievable detection limits, or other considerations; and
4. Upper bound levels or cut-off limits above which a risk is considered inevitable based on a short-term exposure scenario or a long-term potential or acute threat to the environment.

2. MATERIAL AND METHODS FOR SELECTION OF KEY CONTAMINANTS

The following selected parameters/contaminants are presented in the paper in alphabetical order: arsenic, asbestos, dioxin, lead, PAHs, and PCBs. These parameters/contaminants were selected because they represent key contaminants with background and risk-based concentrations of interest to brownfields, particularly PAHs and lead.

Reasons for contaminant selection are as follows:

- Arsenic and lead are the most problematic of the metals based on our experience with fill in old urban areas and with railroad beds and rural areas affected by historical pesticide use. Some generalizations based on experience are that in urban fill, lead is the metal of concern in a majority of the cases where metals are an issue, including toxicity characteristic leaching procedure (TCLP) failures. Arsenic may occur naturally and was used in lead arsenate pesticides on orchards and herbicides along railroads. Decaying treated timber is another arsenic source. It is rare to find an urban fill site dominated by other metals without one or the other of these metals playing a significant role.
- Asbestos, currently being studied by MassDEP, is soon to be more precisely regulated as an urban fill soil contaminant. The concept of background is worthy of mention in regard to the latest research. It had widespread use for several decades and appears quite regularly in urban fill.
- Dioxin is typically present in urban fill, though not often analyzed for. Its consideration was of interest especially in old urban areas with a long history of burning, especially by waste incineration, up to about 35 years ago.

- PAHs are generally present in urban fill and often affect the overall site risk. When assessing urban releases, their presence from a myriad of sources is often a confounding factor.
- PCBs are generally present, but often at levels below normal cleanup goals or detection limits. However, the regulatory position, persistence, and disposal cost impacts associated with PCBs made them worthy of inclusion in this document.

Hence, arsenic, lead, and PAHs are the primary contaminants of concern in urban fill. PCBs, asbestos, and dioxin have been included to give a more complete and balanced picture. While petroleum contaminants may be widespread constituents in urban fill soils, volatile organic compounds (VOCs) and petroleum contaminants are generally not considered significant risk drivers. Since there are no naturally occurring sources, VOCs tend to volatilize in soil rather than adhere to soil particulates, and heavier petroleum contaminants generally have a relatively low toxicity compared to the other risk drivers. We note, however, that total petroleum hydrocarbon concentrations may be a factor in soil disposal as it is a key regulated disposal parameter.

3. RESULTS BACKGROUND

The literature suggests there are a number of definitions that can be applied to the term "background." One is strictly natural soil that has been unaltered by humans. Such soil would be natural soil in an excavation or pit that had not previously been worked, excavated, affected by air pollution fallout, or affected by contaminated groundwater flow through. The second is natural soil that has been altered by its presence in the urban environment or in widespread agricultural activity. The third is soil in the urban environment that has been extensively altered and contains evident or noticeable debris; asbestos containing material, coal ash, or wood ash, often being locations of old landfills. MassDEP (MassDEP, 2002) has developed well-supported background concentrations, viewed as statistical upper limits for the second and third definitions above and as referenced by contaminant below.

Background can be further described as follows:

1. Truly natural materials, especially arsenic and asbestos mineral groups that can be widespread and of health risk concern, with significant impact potential, not to be ignored on the basis of "natural."
2. Widespread impacts, such as lead, PCBs, or dioxins that can be at low concentrations in soil over a large area due to the airborne nature of the delivery.
3. "Widespread polluted fill" (CTDEP, RSRs) due to landfilling to dispose of waste to "create land" in urban areas, such as the entire Boston waterfront. When severe fires occurred, the building debris was used as fill, and, sometimes, fire debris or just demolition debris was simply built over. Lead and PAHs are often the risk drivers in this setting. Asbestos may also appear, depending on when landfilling occurred. The most intense use of asbestos occurred from the industrial revolution through the 1970s.

Of the literature values available, PAHs as characterized by benzo(a)pyrene in this effort, seemed the most problematic in terms of defining thresholds. Based on our experience in the Boston urban environment and eastern Massachusetts, this difficulty in defining thresholds was somewhat unexpected. MassDEP (MassDEP, 2002) has established some well-supported background concentrations, but those appear higher than standards or background values in other areas. Since Boston is an older city compared to a number of other locations, these concentrations are probably due to anthropogenic buildup related the longer time period involved in the accumulation or "banking" of the material and substantial burned debris in the fill. In many respects, excepting natural materials, the urban east should usually be above average in this regard.

The terms, "high," "low," and so forth when used herein, are relative with reference to risk-based concentrations.

There is no exact number for background that stands out under any listed parameter, as the levels will vary somewhat from location to location. However, some general consensus within an order of magnitude is generally possible and will point the user into "danger (red) and comfort (green) zones."

All referenced or derived soil concentrations shown on the figures are milligrams/kilogram (mg/kg) (or parts per million (ppm)) dry weight basis except for dioxin which is nanogram/kilogram (ng/kg) (or parts per trillion (ppt)) dry weight basis. As noted, several of the figures (Figures 1, 3, 4, and 5) are color coded, green generally meant to represent an acceptable limit (background or risk based), yellow to represent a caution or problematic concentration limit, and red serves to denote concentrations that are at unacceptable levels. While necessarily imperfect due to the array of sources and approaches, the figures serve as a useful guide to risk-based levels, as well as a guide to background levels in the urban environment. A horizontal arrow on the figure notes that the range may extend across one or both of the established boundaries.

4. RISK-BASED CONCENTRATIONS

The residential risk-based concentrations that were calculated for the key contaminants (other than asbestos) employed exposure assumptions used in the derivation of MassDEP Soil Standards. The values were set at a 1E-05 (1 excess cancer risk in a population of 100,000 persons). For the evaluation of cancer risk for arsenic, PAHs, dioxin, and PCBs, a 30-year cumulative risk was calculated for three age groups: young children ages 1-8 years, older children 8-18 years old, and adults 18-31 years old. For the evaluation of noncancer risk for lead, the most sensitive age group, young children ages 1-8 years old, were evaluated. For each age group evaluated for the direct contact exposures, including incidental ingestion of soil and dermal contact, it was assumed that exposure occurs approximately 5 times per week for 30 weeks, totaling 150 exposure events per year. For the calculation of dermal risk, a skin surface area was calculated assuming the face, hands, forearms, lower legs and feet would be exposed to soil.

5. DISCUSSION (BY SELECTED CONSTITUENT)

In the discussion below, we present background values established by others, provide summary comments, a computed risk number and relevant regulatory site remediation, and off-site disposal/or reuse criteria. Each chemical has an associated figure showing the key information. Where the available information was sufficient, the figure is provided with a scale at the bottom indicating three levels with two dividing concentrations. The green level at the lower left is a zone where risk-based and background parameters dominate. Collectively considered these suggest a low potential risk, or at least a tolerable risk. The yellow level between the end of the green to the next number is the zone where there is an appreciable potential risk and some measures will need to be taken. The red level contains the criteria where there is potential for short-term, acute, substantial, or imminent hazard impacts. The red zone contains numbers well above all but rare natural background conditions, such as arsenic-containing rock or natural asbestos.

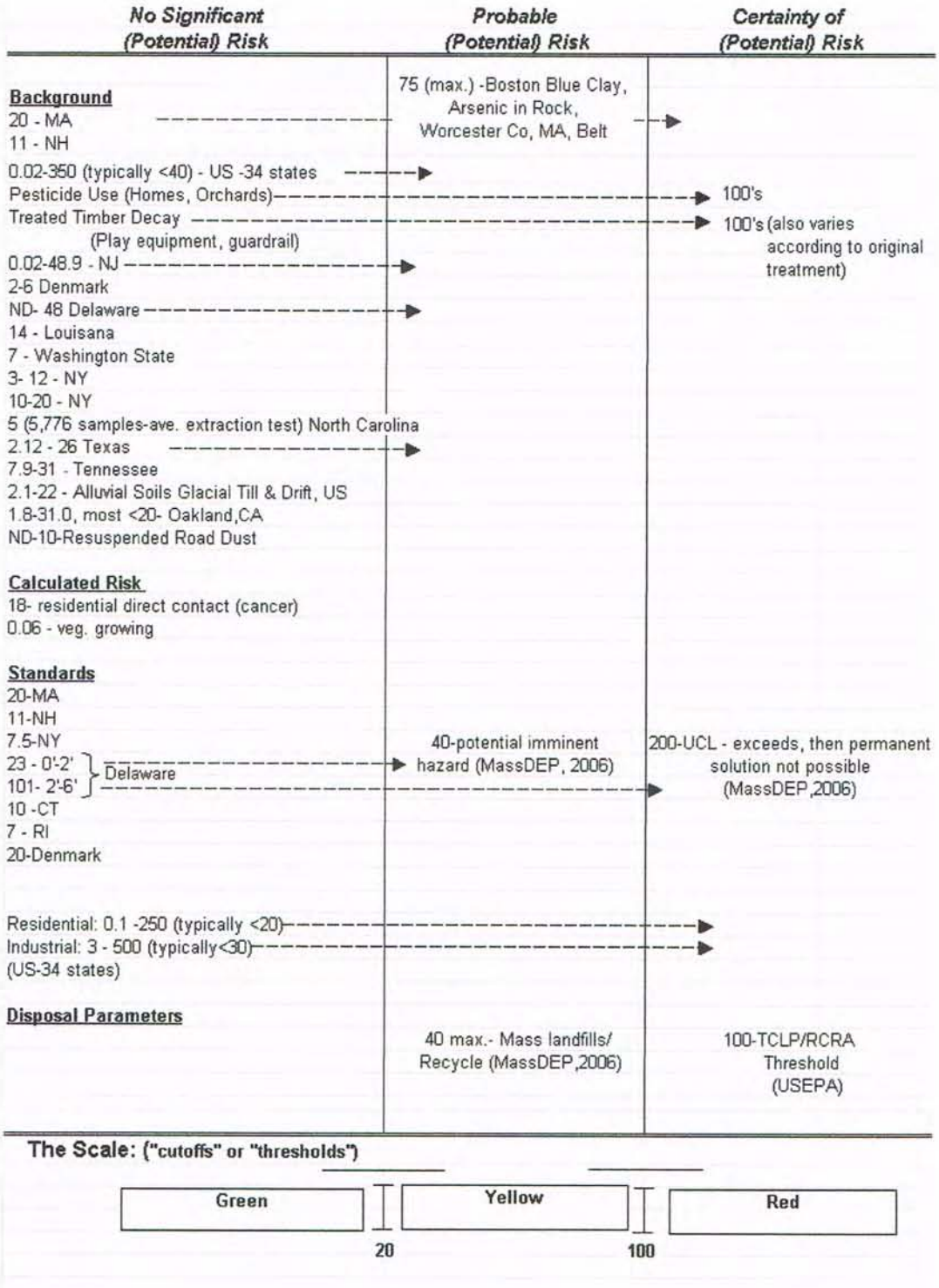

Figure 1. Arsenic

Arsenic is a common contaminant in urban fill soils. Arsenic is naturally occurring in soil, but the primary source of widespread contamination is likely from pesticide use. In various urban park projects in Boston totaling more than 300 samples, arsenic was detected in approximately 90 percent

of the fill soil samples collected to characterize the sites. Due to the nature of arsenic's high toxicity to human health (a known carcinogen (EPA, 2006)), natural background and fill background concentrations (at 20 mg/kg) may be higher than actual risk-based concentrations. For example, a residential risk-based concentration at the No Significant Risk level is 18 mg/kg based on direct contact exposures. If the consumption of homegrown produce is considered an additional exposure pathway, then the risk-based concentration is 0.06 mg/kg.

By contrast, background levels may exceed risk-based levels and may even extend into the Potential/Probable Risk zone. The MassDEP background concentration for both natural soils and urban fill soils is 20 mg/kg, slightly higher than the residential risk-based concentration of 18 mg/kg. The 20 mg/kg fill background value was developed from approximately 750 soil samples from downtown Boston as well as some other studies. Natural soils vary from a few mg/kg to more than 40 mg/kg in an arsenic belt in Worcester County, Massachusetts. A concentration of 40 mg/kg is considered significant in Massachusetts as 40 mg/kg may constitute an Imminent Hazard condition, if the arsenic is present in surface soils accessible to young children such as in a residential back yard or a school or playground. Arsenic levels in Boston Blue Clay are often in excess of 40 mg/kg due to its natural mineral content. Soils affected by lead arsenate pesticides are often in excess of 40 mg/kg ranging up to hundreds of mg/kg. The 40 mg/kg limit also applies to soil reuse at Massachusetts in-state lined and unlined landfills under Policy COMM 97-001(MassDEP, 1997).

As noted on the figure, regulatory standards set to be protective of human health risk are 20 mg/kg in Massachusetts (based on background), 11 mg/kg in New Hampshire (based on background), 10 mg/kg in Connecticut, and 7 mg/kg in Rhode Island. As a useful guide, any concentration less than 10 mg/kg is likely attributable to background, while a concentration greater than 20 mg/kg is likely indicative of a site release, high natural soil depending on local geology, or pesticide use if there is a history of agricultural use. Natural soil would be defined by deeper, undisturbed, native material, while pesticides would likely reside in topsoil.

The MassDEP upper concentration limit (MassDEP, 2006) is 200 mg/kg, at and above which a permanent solution is not possible without further action.

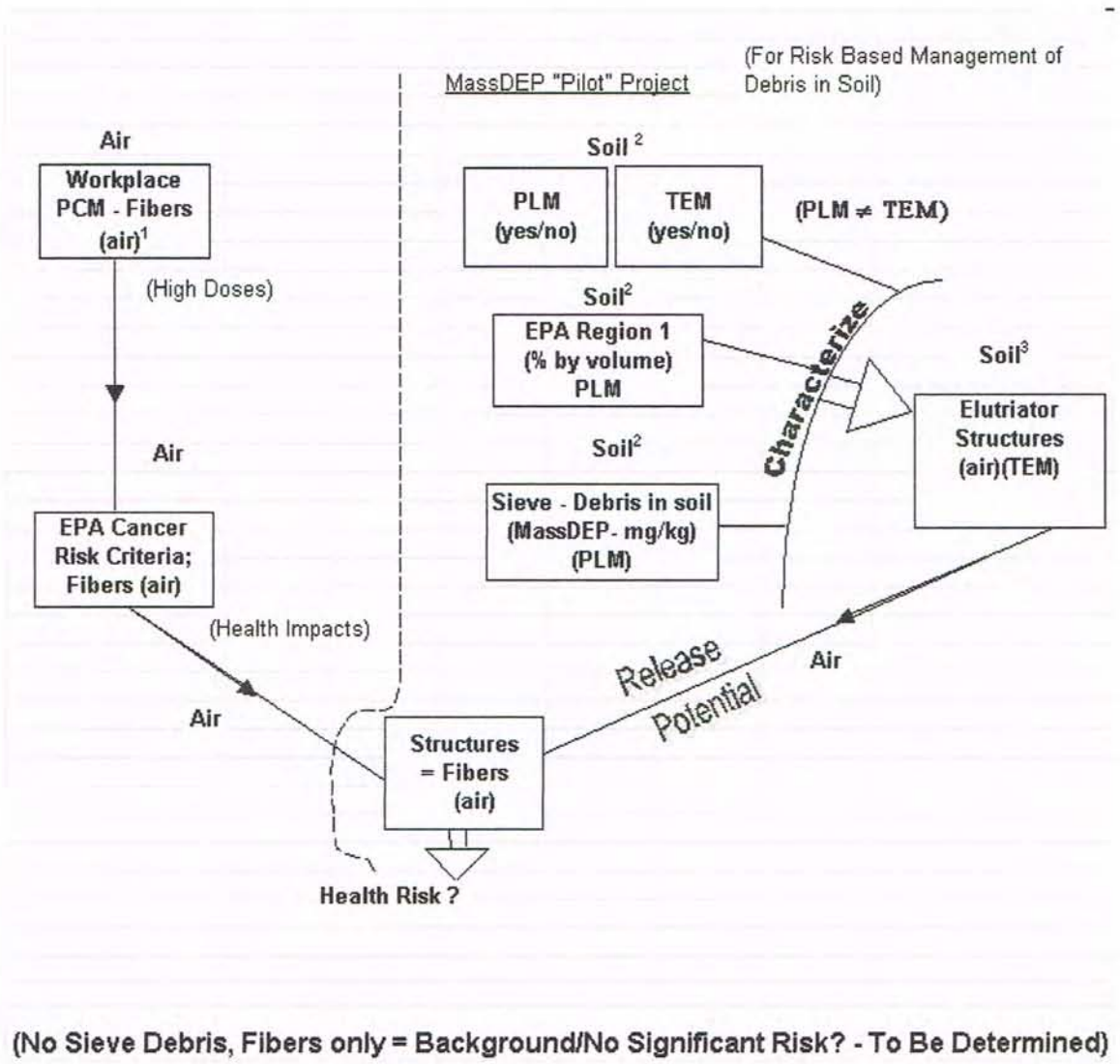

Figure 2. Asbestos

Notes
1.) Standards are available for "cleanup."
2.) No existing standards, MassDEP currently uses ND as "cleanup criteria."
3.) Possible standard development.

PCM - Phase Contrast Microscopy
PLM - Polarized Light Microscopy
TEM - Transmission Elctron Microscopy

Air: 0.00001 to 0.0001 fibers/milliliter is "background." (ATSDR 2001)

The singular background value available is an air concentration noted for urban air quality. Otherwise, the information on Figure 2 illustrates our understanding of the MassDEP approach to sampling and analysis in preparation for additional asbestos regulations regarding impacted soil management and disposal. On the left of the Figure is the U.S. Environmental Protection Agency (USEPA) risk approach/numeric developed by phase contrast microscopy (PCM) data, and to the right is a representation by the authors of their understanding of the latest (draft) MassDEP method coming together as a soil management approach. Some key notes: Three analytical methods are used

and while all microscopy, are not equal. The MassDEP approach is quite functional, but the USEPA numeric is not necessarily comparable. However, all things considered, the approach is the most comprehensive available and is applicable to urban fill soil. As data is generated, more will be known. At this time, scattered fibers without any identifiable debris would probably serve as background.

There is no established background volume percentage or unit weight value in soil and various types of asbestos occur naturally throughout the world. Asbestos is a mineral fiber and comes in different sizes and shapes. Measurement techniques have evolved with microscopic viewing of building material, more recently applied to soil. Generally, if building material contains asbestos at less than 1 percent by volume, it is not considered asbestos containing. MassDEP is well along in establishing protocols for management of urban fill soil with asbestos debris and results to date are well developed but not final. There have been some air background numbers that might relate to soils, but we are not aware of a studied link.

There are large, natural deposits of these physically and chemically varied mineral fibers, particularly in California but with some in New England, notably asbestos mines in Vermont. There have been background or baseline numbers suggested for air, but, not to our knowledge, for soil. The diagram of Figure 2 illustrates the current study approach by MassDEP for urban fill soil containing asbestos debris and having the potential to release fibers to ambient (outdoor) air. While of a preliminary nature, it would appear that if no identified asbestos-containing material (ACM) debris can be sieved out of the soil sample, then there are not likely to be enough fibers present in the soil too cause a concern. The fibers present would be considered background in that respect. The presence of debris would constitute a source material beyond that expected of urban fill soil at background levels, with questions remaining as noted on the figure. A key issue is that USEPA's risk-parameter development is based on results from one measurement approach that does not necessarily correlate with the current methods to detect asbestos in soil or in particular in air generated in the elutriator device.

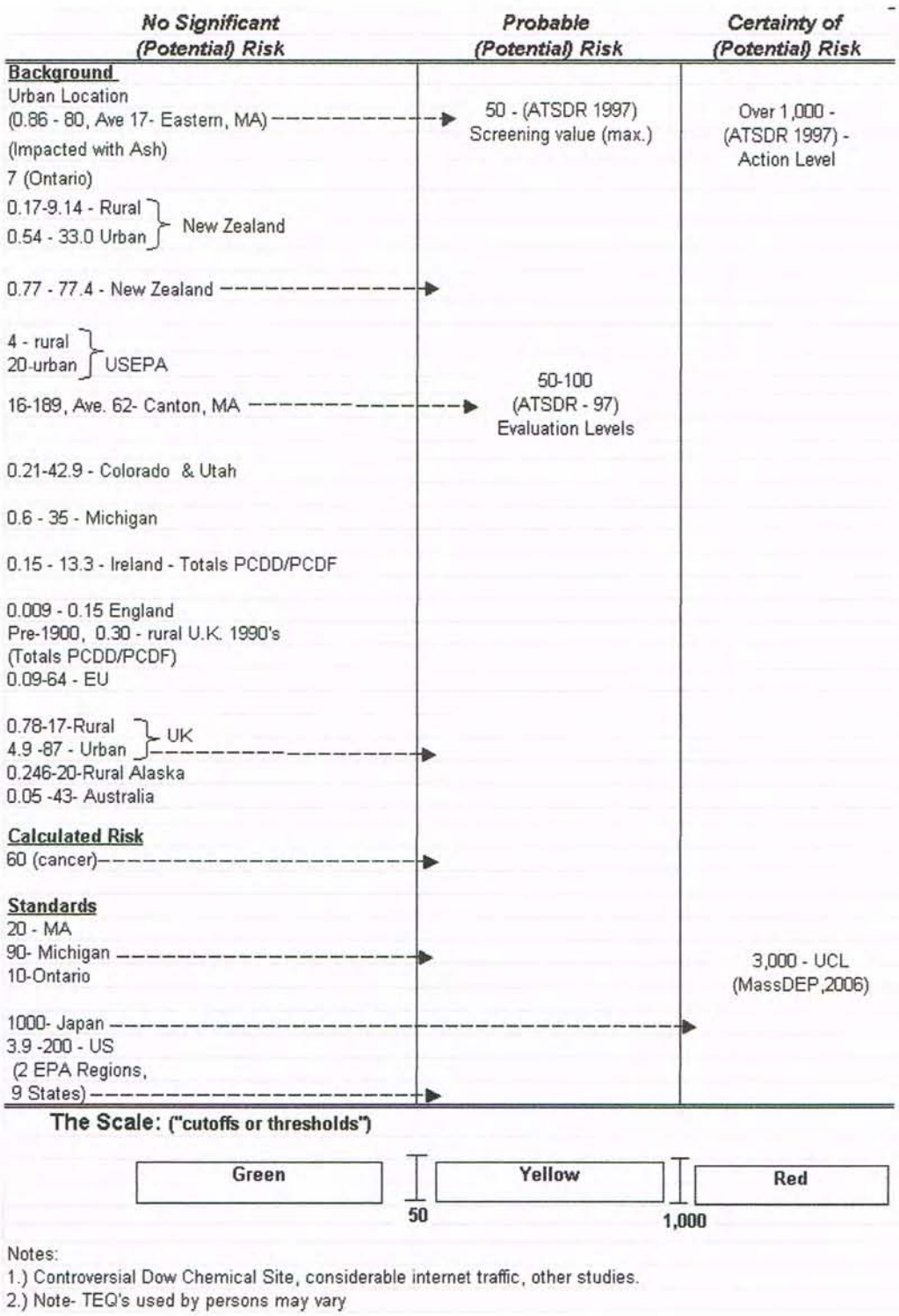

Figure 3. Dioxin (Generally as 2,3,7,8 TCDD Equivalent)

Dioxin is less commonly analyzed for than other urban fill parameters, probably partly due to its high analytical cost per sample. Natural background sources of dioxin include brush and forest fires and volcanic eruptions, although the contribution from natural sources is relatively small compared

with anthropogenic sources (USEPA, 2006b). The greatest environmental source is from historical industrialization that occurred from the 1920s through the 1970s. Airborne releases from commercial and municipal waste incineration, the manufacture and use of herbicides, and the land application of wastewater treatment sludge from pulp and paper plants resulted in major environmental releases (USEPA, 2006b). While strict controls have dramatically reduced industrial sources, the chemical's slow breakdown has resulted in its common presence in urban fill material.

Dioxins are a complex mixture of chlorine-containing compounds with differing toxicities and are assessed following a toxic equivalency approach by assigning a toxicity factor relative to the most toxic form - 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD). These numerical factors transform concentrations of dioxin compounds into equivalent concentrations of 2,3,7,8-TCDD (USEPA, 2004a).

MassDEP has not established a background number for 2,3,7,8-TCDD, but samples collected in Canton, Massachusetts, a number of years ago provided an average value of 60 ng/kg. The value of 60 ng/kg is also the 1E-05 residential risk-based direct contact value. This number was a useful guide but never officially adopted. Recent private/independent work for a site outside of Boston involving the evaluation of old incinerator ash blended in urban fill soil yielded results ranging from 0.86 to 80 ng/kg, with an average of 17 ng/kg based on a 44 sample data set. USEPA (Rodan, 1997) established value of 20 ng/kg (2,3,7,8-TCDD) equivalent background, which was recently adopted by MassDEP as the basis of the residential S-1 soil standard.

We suggest a value of 20 ng/kg or less as generally background, and any value more than 100 ng/kg indicates a potential site release specific situation.

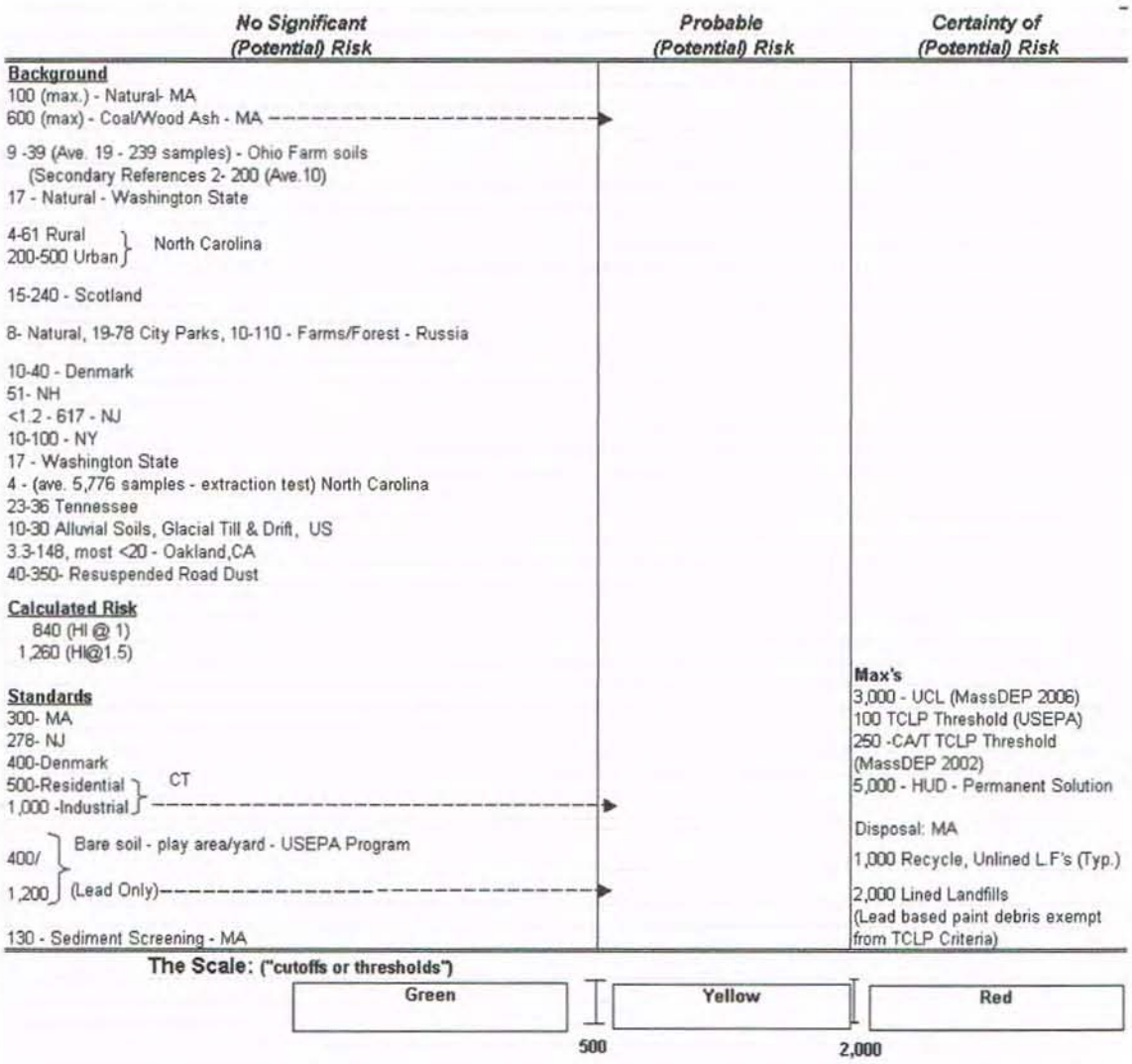

Figure 4. Lead

Lead has a high frequency of detection in urban fill soils. For example, lead was detected in 98 percent of the more than 300 samples collected to characterize various urban park sites in Boston. Lead is ubiquitous in urban fill soils due to its natural occurrence and anthropogenic sources, such as the historical use of leaded gasoline, leaded paint on building construction materials (including steel beams), and its presence in pipes and in solder.

Risk-based concentrations for lead are generally calculated based on noncarcinogenic health effects using the Integrated Exposure Uptake Biokinetic (IEUBK) Model based on an established blood level endpoint, as the USEPA has not established an oral reference dose (RfD) to calculated risks. MassDEP, however, has established an RfD to calculate lead risk as an alternative to using the model (MassDEP, 1992). Using this toxicity value, a residential risk-based value of 500 mg/kg is calculated based on direct contact. However, the actual residential soil standard is 300 mg/kg adopted from the land application of sludge regulations.

In general, concentrations considered to be at a No Significant Risk level are generally set in the 300 mg/kg to 500 mg/kg range. The Massachusetts residential standard for lead in soil is 300 mg/kg; the USEPA Region IX preliminary remediation goal (PRG) is 400 mg/kg (USEPA, 2004b); and the residential soil standard for Connecticut is 500 mg/kg. While natural background concentrations are generally 100 mg/kg or less and fall below the No Significant Risk level, MassDEP's background

concentration for fill soils containing coal or wood ash is 600 mg/kg. This value falls within the 500 mg/kg to 2,000 mg/kg Potential/Probable Risk range. Lead concentrations in the 500 mg/kg to 2,000 mg/kg range are generally acceptable for adult-only industrial use type exposure scenarios. The EPA Region IX Industrial PRG for lead is 800 mg/kg (USEPA, 2004b). Lead concentrations in urban fill typically fall within this range.

Upper bound limits of 3,000 mg/kg and 5,000 mg/kg have been established by MassDEP (MassDEP, 2006) and the Federal Department of Housing and Urban Development (HUD, 1995), respectively. At these concentrations, lead-contaminated soil must be removed, controlled, or contained.

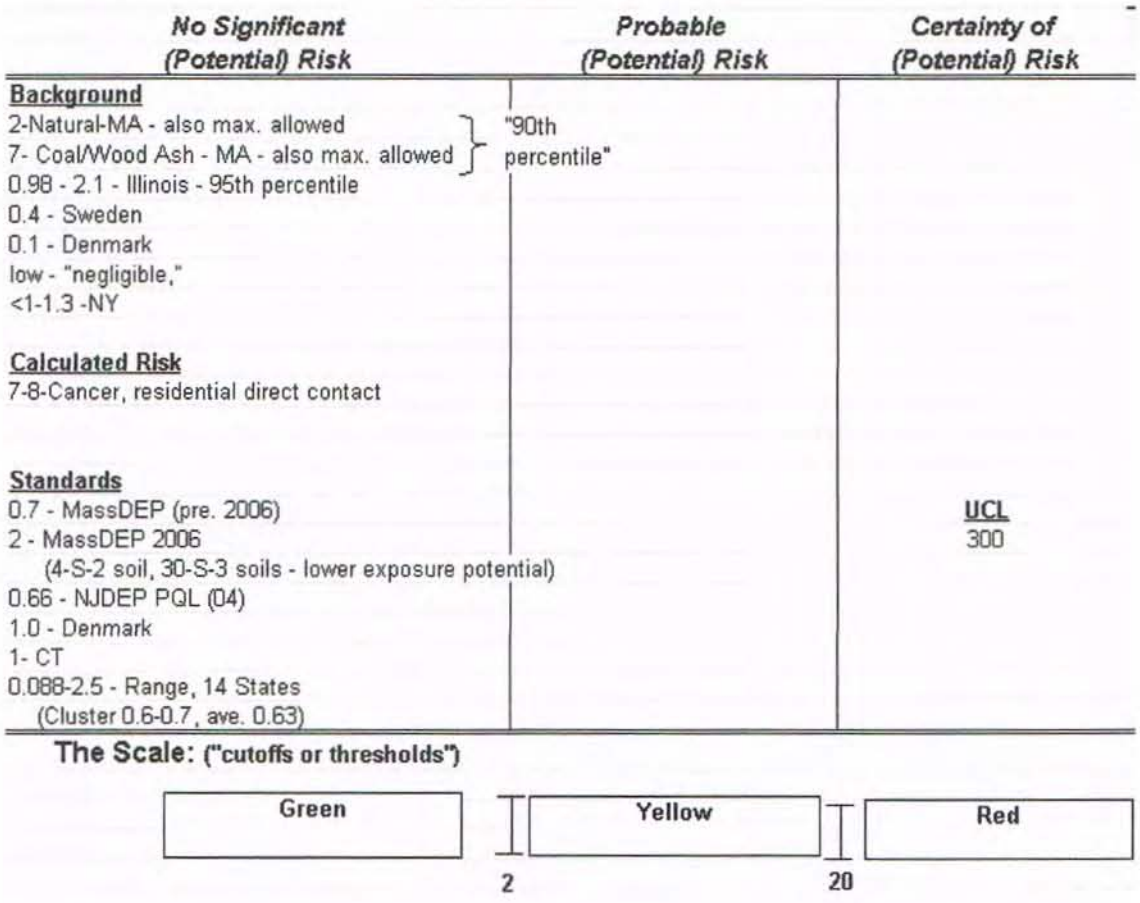

Figure 5. PAHs

PAHs as represented by benzo(a)pyrene, like metals, are ubiquitous in urban fill soils. Because PAHs are the product of incomplete combustion, they are detected in non-urban soils from fallout from forest fires and even volcanoes. They are particularly prominent in urban soils due to anthropogenic sources, such as gasoline and diesel exhaust, petroleum oils, and asphalt binders.

Benzo(a)pyrene is classified as a carcinogen (USEPA, 2006) and calculated, risk-based concentrations at No Significant Risk levels are often very low compared to concentrations of benzo(a)pyrene in fill soils. While the MassDEP 1 in 100,000-excess-lifetime-cancer-risk, risk-based residential direct contact standard for benzo(a)pyrene is 7.8 mg/kg, risk-based concentrations using USEPA guidance are an order of magnitude lower, due to different factors used in the calculations. The primary differences between these state and federal values are due to differences in dermal absorption factors and adherence factors and the omission of inhalation risks.

For example, residential risk-based PRGs calculated at a 1E-05 risk level from EPA Region III and Region IX are 0.87 mg/kg and 0.62 mg/kg, respectively (USEPA, 2006c) (USEPA, 2004b). Even PRGs calculated based on industrial exposures are relatively low with values of 3.9 mg/kg (Region III) and 2.1 mg/kg (Region IX) (USEPA, 2006c) (USEPA, 2004b). Since benzo(a)pyrene is considered mutagenic, these values may decrease further now that USEPA has issued guidance (USEPA, 2005a) for the assessment of mutagenic compounds that applies additional toxicity factors for the carcinogenic risk assessment of early life stages.

Given the very low risk-based values (less than detection limits in many cases), defining an appropriate background concentration for PAHs in fill is essential to achieve a condition of No Significant Risk. Therefore, it is essential to be able to distinguish between PAH concentrations attributable to background versus concentrations representative of a release. MassDEP evaluated several fill data sets, particularly the large 750 sample Central Artery/Tunnel project database and determined that the 7 mg/kg is an appropriate background concentration for benzo(a)pyrene in urban fill affected with coal and wood ash. In addition, 2 mg/kg was set as natural background and the residential standard was also recently adjusted accordingly to 2 mg/kg from 0.7 mg/kg based on background. Evaluating this data collectively, the No Significant Risk level is 2 mg/kg or less. The Potential/Probable Risk range is 2 mg/kg to 10 mg/kg, given the fill background value of 7 mg/kg. The upper bound value, is 300 mg/kg based solely on MassDEP's upper concentration limit (MassDEP, 2006).

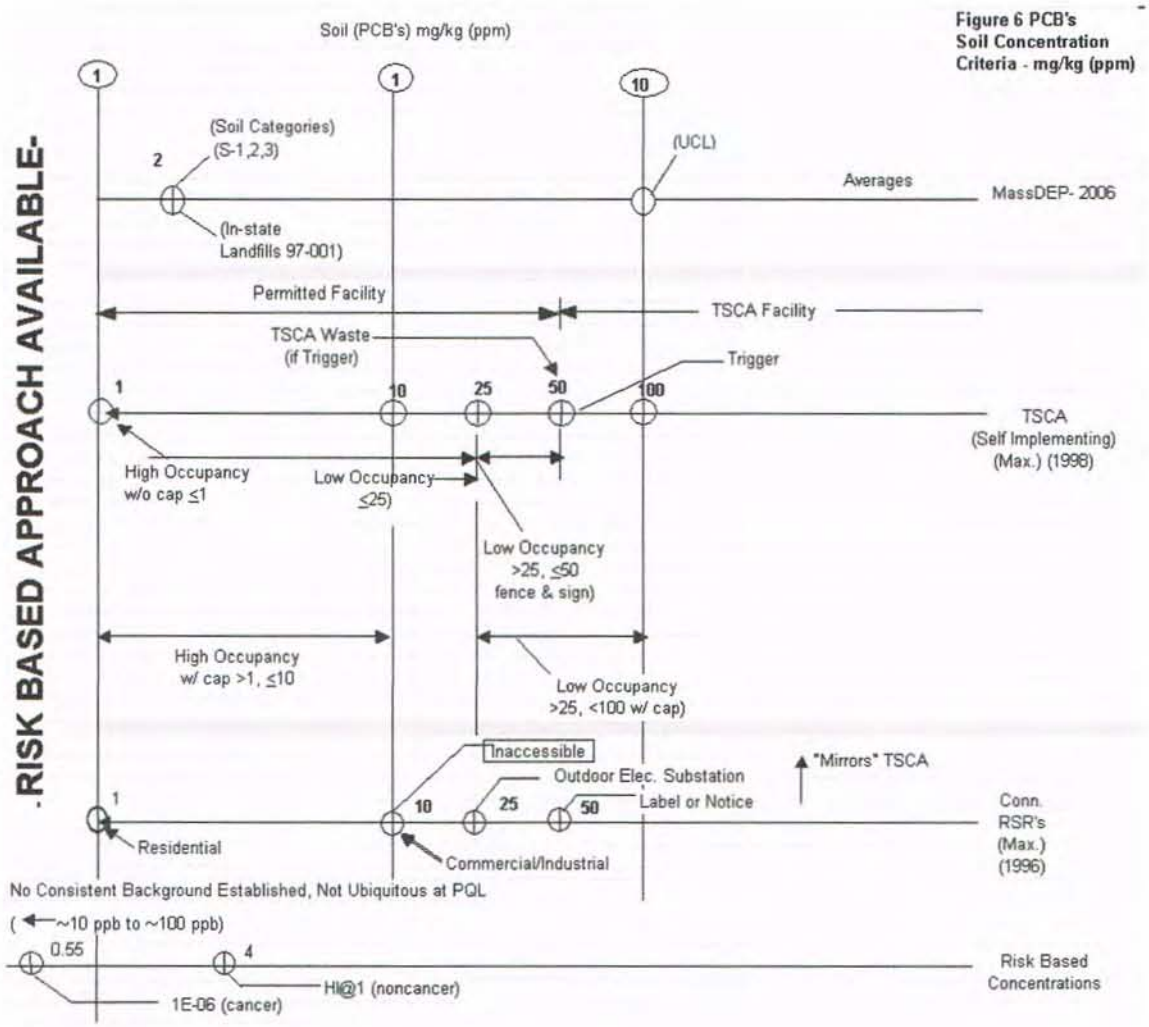

Figure 6. PCBs

For sites in industrialized areas with a history of PCB use, a determination of background levels is important due to the persistence and pervasiveness of PCBs. Concentrations ranging from 0.1 (1E-06 risk level) mg/kg to 1 mg/kg (1E-05 risk level) may be considered background (USEPA, 1990). However, because their presence may involve a multiple regulatory framework of both state regulators and USEPA under the Toxic Substances Control Act (TSCA), it was decided to provide a summary plot illustrating a range of values. This effort appears on Figure 6. The most important regulatory "trigger" is the 50 mg/kg TSCA limit. Its application depends on the date of release, but if one is doing remediation, any exceedance of the number means the activity is subject to TSCA and cleanup will be either 1 mg/kg maximum allowed of any point or a risk-based cleanup goal. (USEPA, 2005b) (Tisa, 2006)

The USEPA residential PRG of 1 mg/kg is based on very conservative exposure assumptions. For example, the ingestion rates for children and adults are two times greater than MassDEP ingestion rates; the inhalation pathway assumes that someone is on the site 24 hours per day for 30 years; and concentrations of PCBs in the air of a home will be the same as ambient air. Consequently, site specific, risk-based concentrations can be greater than 1 mg/kg. The MassDEP residential soil standard is 2 mg/kg (although adopted from land application of sludge regulations) and the calculated residential risk-based direct contact value is 5.5 mg/kg.

For industrial settings, the USEPA recognizes values ranging from 10 to 25 mg/kg as risk-based remedial goals (USEPA, 1990). At Superfund sites, these higher values are considered sufficiently protective for workers, since they are still within the acceptable range of 1E-04 using residential assumptions.

To put high end concentrations in perspective, the USEPA has guidelines for selecting remedial options based on whether PCB concentrations are considered either a principal threat or a low threat. It is expected that principal threats should be treated and includes soils with PCBs detected at greater than 100 mg/kg in residential locations and greater than 500 mg/kg in industrial locations. Consideration of containment should be given to low threat soils with concentrations 100 mg/kg or less. (USEPA, 1990)

6. CONCLUSIONS

Constituents	*Air (Esp. Indoor)*	*Soil as Addressed in this Document*
Benzene, other gasoline related organics	✓	–
Chlorinated organics	✓	–
Metals (As/Pb)	–	(✓)
PAHs (Benzo(a)pyrene)	–	(✓)
Asbestos	✓	(✓)
Dioxin	–	(✓)
PCBs	–	(✓)
Pesticides	–	–

Figure 7. Background Information Availability

1. Figure 7 summarizes all the constituents initially considered relative to urban background and a host of criteria. Gasoline-related hydrocarbons and chlorinated organics/degradation byproducts have background values for indoor air, but not for soil. This paper addressed the key metals arsenic and lead, PAHs by focus on benzo(a)pyrene, plus asbestos, dioxin, and PCBs, all related to soil. Pesticides were not addressed.
2. The authors reviewed the literature, examined available background criteria, displayed example standards, and computed current risk based numbers.
3. The authors selected two thresholds or concentration criteria. The first would cross from below standards, background, no significant risk, into a cautionary area of potential/probable risk. The second would cross onto a certainty of risk, a distinctly unacceptable situation requiring comprehensive action, potentially costly.
4. Finally, as illustrated at the bottom of Figures 1 through 6, the authors have provided a scale or key allowing the user to make an initial screening of site-specific data. Detailed or final analysis, however, must be accomplished by a professional risk assessor.

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D.A. COLLINS COMPANIES

W.R. Grace Superfund Site, Acton MA. – Operable Unit No. 3 / Sediment Remedy

REQUEST FOR INFORMATION (RFI)

RFI #	008	Reference Documents, Drawings, Specifications
Date:	10/26/11	Spec Section 32 – 72 – 00 –SITE RESTORATION
Subject:	Sinking Pond Shoreline Restoration Erosion Control Matting	
To:	Clayton Smith, CM de maximis	
Copy To:	Jeffrey Holden, PE Arcadis	

Information or Clarification Requested

Background: Current Design Plans and Specifications call for post dredged Sinking Pond shoreline slopes to bee seeded and an erosion control blanket (North American Green SC 150 BN or equivalent) to be placed over seeded embankments to pond surface water interface. Selected areas of sloped shore line within Areas III and IV are particularly steep >60 degrees in some cases. Given these steep slopes and evidence of past slope erosion and repairs (prior to site work 2011) DAC would like to ensure to the extent possible current site restoration work/stabilization and prevent erosion and washouts related to weather events

Request: DAC requests consideration for use of an alternate erosion control material for selected steeped slopes within the Area III and IV shoreline. The alternate material is a Bonded Fiber Matrix (BFM) and is applied with the same methodology as hydroseeding. This material and its application methodology is better suited to adhering to the restored steep surface contour of the pond shoreline and also ensures added worker safety by not requiring installers to work on the steep slopes where the chances of slips trips and falls are increased.

Application of this product mixture will be thru a hydroseeder deployed on a DAC floating platform. Application will be in accordance with the manufacturer specifications. A specification sheet for BFM is included with this RFI.

Design Ambiguity	☐	Operability	☐X
Constructability	X	Weather	☐
Cost	☐	Other:	
Schedule			

Response/Solution (with attachments as necessary)

Signatures/Dates

Originated by:	Bruce C. Hebbel, P.G., D.A. Collins	10/26/11
Prepared by:	Bruce C. Hebbel, P.G., D.A. Collins	10/26/11
Responded by:	[signature]	10/28/11

ARCADIS Response: The use of tackifier is approved for the steeper sloped portions of the Sinking Pond perimeter. However, the more robust Flexterra HP-FGM is preferred in lieu of the proposed Hydro-Blanket BFM. The associated product sheet is attached to this RFI approval.

Hydro-Blanket® BFM

Bonded Fiber Matrix

The Best Slope Protection at the Lowest Overall Cost

HYDRO-BLANKET® BFM BONDED FIBER MATRIX CONTROLS EROSION ON STEEP SLOPES IN A QUICK, SAFE, EASY HYDRAULIC APPLICATION.

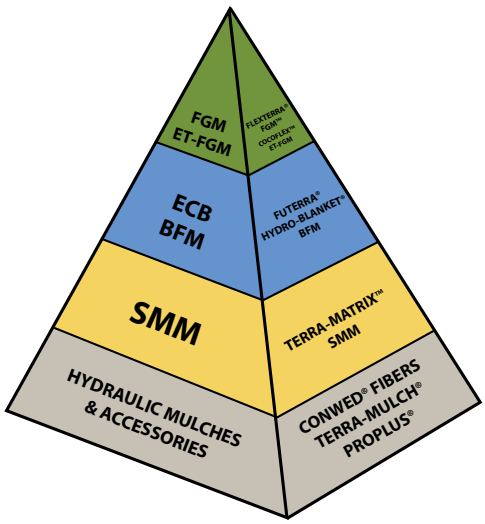
It is less expensive and faster to install than blankets or sod and more effective than blankets, competitive BFMs and conventional hydraulic mulches. Extensive testing proves that Hydro-Blanket BFM controls erosion more completely than competitive BFMs on steep slopes subjected to heavy rains. The combination of Thermally Refined® wood fibers and multi-dimensional tackifiers provides greater water holding capacity for more complete germination and faster vegetation establishment. Proprietary cross-linked, hydro-colloidal tackifiers and activators anchor the fiber mulch matrix to the soil surface.

HYDRO-BLANKET® BFM

- Dries to form a breathable, built-in-place blanket
- Contours with the surface to maintain intimate soil contact
- Less expensive and faster to install versus blankets or sod
- Non-toxic, environmentally safe and biodegradable
- Greater coverage than other BFMs for more cost-efficient application

YOUR TRUSTED PARTNER IN SOIL SOLUTIONS™

By creating products using Green Design Engineering,™ Profile Products has become the world's largest combined supplier of hydraulically applied erosion control products, hydraulic mulch and agronomic accessories, turf reinforcement mats and erosion control blankets. We are a leader in erosion control and revegetation science and many of today's industry standards were innovations introduced by Profile. Our leadership continues through on-site consultative services, aggressive research and development, active support of trade associations and educational forums designed to advance the industry's effectiveness and professionalism.



THE PROFILE PERFORMANCE PYRAMID

Hydro-Blanket is the industry's most effective BFM.

Hydro-Blanket® BFM Specification

The Bonded Fiber Matrix (BFM) shall be a hydraulically applied flexible erosion control blanket composed of long strand, thermally processed wood fibers and a proprietary crosslinked, hydro-colloid tackifier. The BFM may require a 24-48 hour curing period to achieve maximum performance. Once cured, the BFM forms an intimate bond with the soil surface to create a continuous, absorbent, flexible and biodegradable erosion resistant blanket that allows for rapid germination and accelerated plant growth.

The BFM shall be Hydro-Blanket® BFM, and conform to the following property values when uniformly applied at a rate of 3500 pounds per acre (3900 kilograms/hectare) under laboratory conditions.

	TEST METHOD	ENGLISH	SI
PHYSICAL			
Mass Per Unit Area	ASTM D6566[1]	11.5 oz/yd^2	390 g/m^2
Thickness	ASTM D6525[1]	0.12 in	3 mm
% Ground Cover	ASTM D6567[1]	99%	99%
Water Holding Capacity	ASTM D7367	1350%	1350%
Cure Time	Observed	24-48 hr	24-48 hr
Color (fugitive dye)	Observed	Green	Green
ENDURANCE			
Functional Longevity[2]	Observed	≤ 12 months	≤ 12 months
PERFORMANCE			
Cover Factor[3] (6 in/hr event)	ASTM D7101[1]	0.10	0.10
% Effectiveness[4]	ASTM D7101[1]	90%	90%
Cover Factor[3] (5 in/hr event)	Large Scale[5]	0.10	0.10
% Effectiveness[4]	Large Scale[5]	90%	90%
Vegetation Establishment	ASTM D7322[1]	600%	600%

1. ASTM test methods developed for Rolled Erosion Control Products and have been modified to accommodate hydraulically applied erosion control products.

2. Functional longevity depends on moisture, light and environmental conditions.

3. Cover Factor is calculated as soil loss ratio of treated surface versus an untreated control surface.

4. % Effectiveness = One minus Cover Factor multiplied by 100%.

5. Large scale testing conducted at Utah Water Research facility using rainfall simulator on 2.5H:1V slope, sandy-loam soil, at a rate of 5" per hour for a duration of 60 minutes.

COMPOSITION

All components of the BFM shall be pre-packaged by the Manufacturer to assure both material performance, and compliance with the following values. **Under no circumstances will field mixing of additives or components be accepted.**

Thermally Processed Wood Fibers – 79.5% ± 2.5%
Proprietary Crosslinked Hydro-Colloidal Tackifier – 10% ± 1%
Moisture Content – 10.5% ± 1.5%

INSTALLATION

Strictly comply with Manufacturer's installation instructions and recommendations. Use approved hydro-spraying machines with fan-type nozzle (50-degree tip) whenever possible to achieve best soil coverage. Apply BFM from opposing directions to assure 95% soil surface coverage. Slope interruption devices or water diversion techniques are recommended when slope lengths exceed 70 ft (21m).

Erosion Control and Revegetation:
For maximum performance, apply BFM in a two-step process:

Step One: Apply fertilizer, other soil amendments and 50% of seed with a small amount of BFM for visual metering.

Step Two: Mix balance of seed and apply BFM at a rate of 50 lb per 125 gallons (23 kg/475 liters) of water over freshly seeded surfaces. Confirm loading rates with equipment manufacturer. Do not leave seeded surfaces unprotected, especially if precipitation is imminent.

Depending upon site conditions BFM may be applied in a one-step process where all components may be mixed together in single tank loads. Consult with Manufacturer for further details.

SLOPE GRADIENT/CONDITION	ENGLISH	SI
≤ 3H to 1V	3000 lb/ac	3400 kg/ha
> 3H to 1V and ≤ 2H to 1V	3500 lb/ac	3900 kg/ha
> 2H to 1V and ≤ 1H to 1V	4000 lb/ac	4500 kg/ha
Below ECB or TRM	1500 lb/ac	1700 kg/ha
As infill for TRM	3500 lb/ac	3900 kg/ha

Consult comprehensive CSI formatted BFM specification for additional details.

PACKAGING

Bags: Net Weight - 50 lb, UV and weather-resistant plastic film.
Pallets: Weather-proof, stretch-wrapped with UV resistant pallet cover, 40 bags/pallet, 1 ton/pallet.

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ECTC Erosion Control Technology Council Directing Member

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Flexterra® HP-FGM™

600% GREATER GERMINATION,
NEARLY PERFECT EROSION CONTROL,
NOW 100% BIODEGRADABLE.

New patent-pending Flexterra® High Performance-Flexible Growth Medium™ (HP-FGM™) takes the near-perfect performance of the original Flexterra FGM to an even higher level. Introduced in 2004, Flexterra FGM rapidly set a new standard of excellence for controlling erosion and establishing vegetation on severe slopes. It outperformed blankets and led the movement toward more cost-effective, environmentally responsible hydraulically applied techniques. Flexterra HP-FGM represents the next generation in Flexible Growth Media and is proven to surpass the original's outstanding performance.

NEW FLEXTERRA HP-FGM DELIVERS:

- The highest germination and growth establishment
- Greater than 99% erosion control effectiveness immediately upon application
- 100% biodegradability
- Greater safety for even the most sensitive aquatic environment because it's non-toxic
- Near-perfect erosion control and denser vegetation while protecting the natural environment

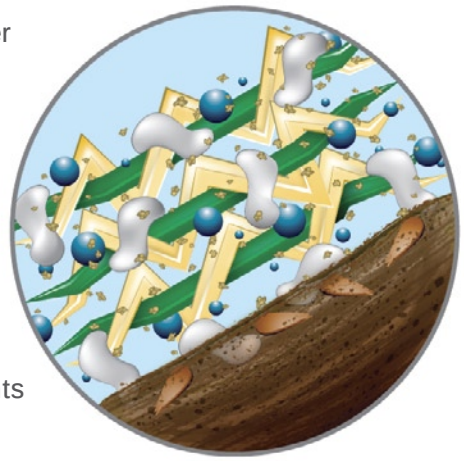
NEW HP TECHNOLOGY: GREENER BY DESIGN

Revolutionary Micro-Pore particles optimize water and nutrient retention

100% recycled Thermally Refined® wood fibers not only produce the highest yield and coverage per pound, they are also phyto-sanitized, eliminating weed seeds and pathogens

100% biodegradable interlocking man-made fibers help increase wet bond strength

100% non-toxic biopolymers and water absorbents further enhance performance



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Your Trusted Partner In Soil Solutions

SETTING THE BAR EVEN HIGHER.

surface. Its flexible yet stable matrix retains > 99% of soil, vastly reducing turbidity of runoff for up to 18 months. HP also features greater wet bond strength yielding

outperforms traditional Flexterra FGM with 600% better initial germination and 250% increased biomass due to a combination of optimized water and

Flexterra HP-FGM has no nets or threads to endanger wildlife. It uses 100% biodegradable crimped interlocking fibers and 100% recycled and phyto-sanitized wood fibers. Flexterra HP-FGM is 100% safe for aquatic and terrestrial life forms.

TECHNICAL DATA

PHYSICAL PROPERTIES*	TEST METHOD	UNITS	MINIMUM VALUE
Mass/Unit Area	ASTM D6566[1]	g/m^2 (oz/yd^2)	407 (12)
Thickness	ASTM D6525[1]	mm (in)	5.6 (0.22)
Wet Bond Strength	ASTM D6818[1]	N/m (lb/ft)	131 (9)
Ground Cover	ASTM D6567[1]	%	99
Water-Holding Capacity	ASTM D7367	%	1700
Material Color	Observed	n/a	Green
ENVIRONMENTAL PROPERTIES*	**TEST METHOD**	**UNITS**	**TYPICAL VALUE**
Biodegradability	ASTM D5338	%	100
Functional Longevity[2]	ASTM D5338	n/a	Up to 18 months
Ecotoxicity	EPA 2021.0	%	96-hr LC50 > 100%
Bc«rbkq Qro_fafqv	I^odb P`^ib[3]	NTU	< 100
PERFORMANCE PROPERTIES*	**TEST METHOD**	**UNITS**	**VALUE**
Cover Factor[4]	Large Scale[3]	n/a	< 0.01
Percent Effectiveness[5]	Large Scale[3]	%	> 99
Cure Time	Observed	hours	0-2
Vegetation Establishment	ASTM D7322[1]	%	> 800
PRODUCT COMPOSITION			**TYPICAL VALUE**
Thermally Processed Wood Fibers[6] (within a pressurized vessel)			80% ± 3%
Cross-Linked Biopolymers and Water Absorbents			10% ± 1%
Crimped, Man-Made Biodegradable Interlocking Fibers			5% ± 1%
Proprietary Mineral Activator			5% ± 1%

* When uniformly applied at a rate of 3900 kg/ha (3500 lbs/ac) under laboratory conditions.

1. ASTM test methods developed for Rolled Erosion @lkqolimolar`qp qe^q e^sb _bbk j lafaba ql accommodate Hydraulic Erosion Control Products.
2. Functional Longevity is the estimated time period, _^pba rmlk abia l_pbos^qflkp) qe^q ^ j ^qbof^i `^k _b anticipated to provide erosion control and agronomic _bkbaqp ^p fk«rbk`ba _v `l j mlpfqflk) ^p t bii ^p pfqb*pmb`fa` `lkafqflkp) fk`irafkd8 _rq klq if j fqba to—temperature, moisture light conditions, soils, biological activity, vegetative establishment and other environmental factors.
3. Large scale testing conducted at Utah Water Research l^_lo^qlov+ Clo pmb`fa` qbpqfkd fkclo j ^qflk mib^pb `lkq^`q ^ Molaib qb`ekf`^i pbosf`b obmobpbkq^qfsb at 866-325-6262.
4. Cover Factor is calculated as soil loss ratio of treated surface versus an untreated control surface.
5. % Effectiveness = One minus Cover Factor multiplied by 100%.
6. Heated to a temperature greater than 193 degrees C (380 degrees F) for 5 minutes at a pressure greater than 345 kPa (50 psi) in order to be Thermally Obakba®/Processed and to achieve phyto-sanitization.

Green Design Engineering™ is a holistic approach, combining environmentally _bkba`f^i abpfdk ^ka b`lildf`^iiv sound products with agronomic and erosion control expertise, to provide the most effective, customized and `lpq*bcafbkq plirqflkp clo bolpflk control and vegetative establishment.

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Put Green Design Engineering into action. PS^3 fp qeb fkarpqov$p aopq and only web-based design and selection tool that integrates erosion and sediment control engineering with agronomic excellence. Log on ql t t t+Molaibmpo+`l j ql aka qeb right solution for any site.

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