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December 8, 2017

Mr. Tracy Smith, Project Manager
New York State Department of Environmental Conservation
Remedial Bureau D
625 Broadway - 12th Floor
Albany, New York 12233-7016

Re: Wastebed B/Harbor Brook Consent Order #D-7-0001-00-02 Site #734075
Revised Final Feasibility Study Report

Dear Mr. Smith:

This letter provides an electronic copy of the Revised Final Wastebed B/Harbor Brook Feasibility Study Report prepared by OBG. Hard copies of the report will be distributed next week. Please contact Jennifer Reymond of OBG at (315) 956-6446 or me if you have any questions or comments.

Sincerely,

John P. McAuliffe by CCC

John P. McAuliffe
Program Director, Syracuse

Attachments (2 copies, 1 CD)

cc:	Robert Nunes	USEPA (ec or CD)
	Donald Hesler	NYSDEC (ec)
	Harry Warner	NYSDEC Region 7 (1 copy, 1 CD)
	Maureen Schuck	NYSDOH (ec)
	Mark Sergott	NYSDOH (1 copy, 1 CD)
	Brian D. Israel, Esq.	Arnold & Porter (CD)
	Argie Cirillo, Esq.	USEPA (ec)
	Margaret Sheen, Esq.	NYSDEC, Region 7 (ec)
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	Curtis Waterman	HETF (CD)
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	Steve Miller	Honeywell (ec or CD)
	Tom Conklin	OBG (ec)
	Jennifer Reymond	OBG (ec)
	Christopher Calkins	OBG (ec)

Comment 1: General Comment. Due to the presence of tar at the surface of the Penn-Can property a granular cover is not appropriate in this area. The FS will need to be revised to include alternatives to address this.

Response to Comment 1: Alternatives 3, 4, and 5 have been revised to include remedial components to address and provide long-term isolation of impacted soil/fill material on the Penn-Can Property. The Revised FS Report also includes provisions for a pre-design investigation (PDI) to evaluate the presence of asphalt tar in shallow fill materials. Based on the PDI, additional design features will be incorporated into the engineered cover system, if necessary, in limited areas where surficial asphalt tar is present, such that the material is effectively addressed. The pre-design work will also evaluate the effectiveness of methodologies applied at other sites to control mobility of the asphalt tar at the Penn-Can Property. Should the evaluation conclude that the engineered cover system would not be implementable or effective, other technologies such as targeted excavation or *in situ* treatment would be considered.

Comment 2: According to available GIS data, a portion of the periphery of the project area is located within the 100-year floodplain as defined by the Federal Emergency Management Agency. Accordingly, EO 11988, "Floodplain Management," Executive Order 13690, "Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input;" and EPA's 1985 Statement of "Policy on Floodplains/Wetlands Assessments for CERCLA Actions" may be applicable for this portion of the subsite. If Alternative 3, 4, 5, 6a or 6b is selected, a floodplain assessment will be required, to minimize or avoid the adverse effects of the 100-year and 500-year flooding events, as well as to protect against the spread of contaminants and the long term disabling of remedial treatment systems due to flooding events. This assessment should include:

- *a delineation of the 100-year and 500-year floodplain in the project area;*
- *a description of the proposed action;*
- *the effects of the proposed action on the floodplain;*
- *a description of the other remedial alternatives considered and their effects on the floodplain; and*
- *measures to mitigate potential harm to the floodplain if there is no practicable alternative to locating in or affecting the floodplain, including impacts to the proposed remedial action from flooding events during and after implementation of the remedy.*

Response to Comment 2: Table 3-1 (Potentially Applicable or Relevant and Appropriate Requirements (ARARs) and to be Considered (TBC) Materials) has been revised as appropriate to clarify that a floodplain assessment would be required if remedial activities have the potential to impact the floodplain. The need and scope of a floodplain assessment would be evaluated and developed during pre-design activities.

Comment 3. General Comment. A one-acre wetland would be created in the vicinity of wetland WL2 under Alternatives 4 and 5 to compensate for wetlands lost during the East Flume IRM. However, it is not clear from the various figures in the FS what the current conditions are. For example, Wetland WL2 is shown on Figure 1-2, but other figures show no wetlands in the area slated for wetland construction and/or restoration. Consequently, some clarification as to the current and proposed extent of wetlands under these alternatives should be provided.

Response to Comment 3: Revisions to labels and legends in Figures 1-2 and 1-3 have been incorporated to provide clarification between historical wetland areas, Interim Remedial Measure (IRM) impacts to wetlands (*i.e.*, differentiation between pre- and post-IRM construction wetlands), and outboard transitional wetlands now part of Onondaga Lake.

Comment 4: General Comment. A summary of completed jurisdictional wetlands delineations and/or an assessment of the wetlands should be included in the report. A discussion and a summary table of wetland mitigation (due to the IRMs constructed) should be included.

Response to Comment 4: A summary table of delineated wetlands was added to the report in Section 1.1.7, and includes a reference to the *Jurisdictional Wetland Survey, Lakeshore Area, Harbor Brook Site, Geddes, New York* (OBG 2001) and the *Jurisdictional Wetland Delineation Report, Harbor Brook Site, Geddes, New York* (OBG 2003). In addition, a discussion of compensatory wetland construction was added to the report in Section 1.2.7. A wetland assessment may be performed during the pre-design phase.

Comment 5: General Comment. The FS notes that the National Historic Preservation Act is a potential ARAR for this project. However, the report does not include any information as to the exact areas that may be sensitive for the presence of cultural resources, or what studies will be needed for compliance with Section 106 of the National Historic Preservation Act. Our cursory review of the project area indicates that it has been subject to extensive prior disturbance.

Accordingly, it is recommended that once an alternative has been selected, the need for and scope of any required cultural resource surveys should be specified.

Response to Comment 5: Text has been added to Section 4.2.2 to indicate that the need for and scope of cultural resources surveys, in accordance with the National Historic Preservation Act, will be evaluated during the remedial design.

Comment 6: Page VI, Paragraph 1, Sentence 1, Executive Summary and Page 1, Paragraph 1, Sentence 1, Section 1. The purpose of the FS report is to identify and evaluate remedial alternatives, not to make progress toward achieving the goals of the Administrative Consent Order ACO. The ACO is the mechanism for performing the effort. Please revise.

Response to Comment 6: The text in the Executive Summary has been revised to remove this phrase.

Comment 7: Page VI, bullets. The May 2011 East Wall IRM RAD should be referenced (similar to the reference to the Outboard IRM). In addition, surface water and sediment was also partially addressed by the West Wall (East Flume) and East Wall (HB channel outboard of the wall) IRMs. Please revise.

Response to Comment 7: The text bullets in the Executive Summary have been revised accordingly to reference the May 2011 East Wall IRM Response Action Document (RAD). Additionally, text bullets related to surface water and sediment IRMs were added to include the West Wall and East Wall IRMs.

Comment 8: Page VI, Paragraph 1, Sentence 3, Executive Summary; Page 1, Paragraph 1, Sentence 2, Section 1. The text should state that site deep groundwater will be addressed regionally in a separate FS report. Please clarify.

Response to Comment 8: The text in the Executive Summary and Section 1 has been revised accordingly to reflect that deep groundwater will be addressed regionally in a separate FS Report.

Comment 9: Page VIII, Bullet 1, Executive Summary; Page 32, Section 3.1.3. Under "RAOs for Public Health Protection," it is suggested that the second RAO be revised to read: "Prevent, or reduce to the extent practicable, inhalation of or exposure to contaminants volatilizing from contaminated soil/fill material and any inhalation

threat associated with soil vapor."

Response to Comment 9: The Remedial Action Objective (RAO) related to vapor instruction has been revised as such in the Executive Summary and Section 3.1.3: "Prevent, or reduce to the extent practicable, inhalation of or exposure to contaminants volatilizing from contaminated soil/fill material and unacceptable inhalation exposure associated with soil vapor."

Comment 10: Page VIII and Page 32, Section 3.1.3 (RAOs for Environmental Protection). To minimize contaminant migration from inside the waste management area (WMA) to areas outside it, the following RAO should be included: "Minimize or eliminate contaminant migration from contaminated soil/fill and groundwater within the WMA to groundwater outside the WMA."

Response to Comment 10: Comment noted. The RAO related to off-site migration of contaminants, as written, is intended to address erosion/migration of contaminated soil/fill material and groundwater within the WMA to Onondaga Lake and Harbor Brook. As discussed with NYSDEC, the RAO related to contaminant migration was revised as such in the Executive Summary and Section 3.1.3: "Prevent, or reduce, to the extent practicable, the release of site-related contaminant to groundwater, surface water and sediment that may cause unacceptable adverse effects on groundwater, surface water or sediment quality in Harbor Brook or Onondaga Lake."

Comment 11: Page 2, Table 1-1. Please make the following revisions to this table:

- *"Onondaga Lake Remediation" should be added before "Material Staging and Support Areas"*
- *The Outboard Area IRM and Upper Harbor Brook IRM also addressed soil/fill material*
- *The East Wall IRM addressed sediment in the Harbor Brook channel*
- *The Outboard Area IRM addressed a portion of Harbor Brook*
- *The East and West Wall IRMs did not address AOS #2*

Response to Comment 11: Table 1 (formerly in-text Table 1-1) has been revised accordingly to reflect the suggested edits.

Comment 12: Page 8, Section 1.3. Since it would be inappropriate to discontinue the IRMs under any circumstances, it should be noted here and/or Section 4 that the IRMs will continue to be implemented and the IRM objectives established in the DEC/EPA co-issued decision documents will still need to be met even if a no action alternative were to be selected.

Response to Comment 12: Continued operations and maintenance of IRMs addressing shallow and intermediate groundwater and DNAPL (*i.e.,* East Flume IRM sewer maintenance, West Wall and Upper Harbor Brook IRM groundwater collection systems and treatment at the Willis-Semet Groundwater Treatment Plant, DNAPL collection system and disposal, and the existing capped areas addressed by the IRMs) is included in each of the FS alternatives (Alternatives 1 through 6). Alternatives 1 through 6 would continue to meet the IRM objectives and FS RAOs relative to groundwater and DNAPL discharge, as described in text in Sections 4.2.1 and 4.2.3. Operation and maintenance of the East Wall IRM would be performed pursuant to the *East Barrier Wall Interim Remedial Measure, Response Action Document*, issued in 2011 by NYSDEC and USEPA.

Comment 13: Page 12, Paragraph 6, Section 1.3.5. In this paragraph and throughout the document the text should be revised to reflect the completion of the capping in the Outboard Area.

Response to Comment 13: The text in Section 1.3.5 and throughout the document has been revised accordingly to reflect completion of capping in the Outboard Area.

Comment 14: Page 13, Paragraph 2, Section 1.3.6. The third and fourth sentences of this paragraph should be revised or removed as appropriate.

Response to Comment 14: The text in Section 1.3.6 has been revised accordingly to clarify quantities of excavated materials placed on Wastebed B.

Comment 15: Page 13, Paragraph 3, Section 1.3.6. Insert ''with" after "accordance."

Response to Comment 15: The text in Section 1.3.6 has been revised accordingly.

Comment 16: Page 13, Paragraph 5, Section 1.3.6. Please revise the first sentence to state "Grading and vegetated cover installation activities continued in the 2016 construction season."

Response to Comment 16: The text is Section 1.3.6 has been revised accordingly to clarify that grading and vegetated cover installation activities continued in the 2016 construction season. Grading and cover installation activities were not conducted during the 2017 construction season.

Comment 17: Page 14, Section 1.3.9. The second sentence should be revised to state "Specifically, Site DNAPL is contained and shallow and intermediate groundwater are being addressed by the barrier walls, the liner in Harbor Brook, and the groundwater collection systems."

Response to Comment 17: The text in Section 1.3.9 has been revised accordingly.

Comment 18: Page 17, Paragraph 3, Bullet 1. In this bullet it should be clarified that the Outboard Area will not be further evaluated in this FS.

Response to Comment 18: The text in Section 2.3 has been revised accordingly to clarify that the Outboard Area has been subject to a response action that was authorized by NYSDEC and USEPA under the Wastebed B/Harbor Brook IRM and will not be evaluated further in the Revised FS Report.

Comment 19: Page 20, Paragraph 2, Section 2.3.1. In the discussion of the Railroad Area COCs, barium is indicated as exceeding the Part 375 Commercial SCO, but is not listed as exceeding the Unrestricted Use SCO. If it exceeds the Commercial Use SCO, barium should also be included in the list of contaminants exceeding Unrestricted Use SCOs. Please clarify.

Response to Comment 19: The text in Section 2.3.1 has been revised accordingly to include barium in the list of contaminants exceeding the Part 375 Unrestricted Use SCOs.

Comment 20: Page 24, last paragraph, Section 2.3.4. This section discusses the nature and extent of surface water contamination. Several of the subsections discuss contaminant concentrations in various surface water bodies, including the presence of BTEX compounds, PAHs, phenol, 4.4'-DDD, cyanide and aluminum detected above Class C SGV levels in the 1-690 drainage ditch. These exceedances are then discounted in the next sentence of the FS, which states "The surface water impacts have been addressed by the sediment removal and lining installed as part of the Upper Harbor Brook IRM." The report should cite a reference for surface water data collected post-installation of the IRM, to support this conclusion. This approach to discussing surface water

results is consistent for the other areas of the site, and each area should be revised as appropriate.

Response to Comment 20: A sentence pertaining to the Upper Harbor Brook IRM Annual Reports for 2014, 2015, and 2016 was added to the document discussion as noted, and associated references were included in the References section. Surface water data collected as part of the annual Performance Verification program demonstrated that surface water impacts have been addressed by the Upper Harbor Brook IRM sediment removal and lining.

Comment 21: Page 26, Paragraph 3, Sentence 3, Section 2.3.6. This is the first instance where principal threat waste is cited. A definition of principal threat waste should be provided here. This may be satisfied by adding a footnote stating, "Principal threat wastes are source materials considered to be highly toxic or highly mobile that generally cannot be reliably contained or would present a significant risk to human health or the environment should exposure occur." Please revise accordingly.

Response to Comment 21: The text in Section 2.3.6 has been updated accordingly to include the definition of principal threat waste.

Comment 22: Page 25, Paragraph 5, Sentence 2, Section 2.3.6. The sentence should be revised as follows. ''Migration of this This DNAPL has been addressed ...". Please revise accordingly.

Response to Comment 22: The text in Section 2.3.6 has been revised accordingly.

Comment 23: Page 27, Paragraph 4, Bullet 1, Section 2.4.1. The text here lists benzo(a)pyrene and PAHs as risk-driving chemicals identified in the HHRA. Since benzo(a)pyrene is a PAH, it is confusing as to why it is listed individually. Please confirm that the list is correct, then reconsider removing benzo(a)pyrene if appropriate.

Response to Comment 23: The list of risk-driving chemicals identified in Section 2.4.1 of the Revised FS Report has been revised in accordance with HHRA Tables 7.4 (Summary of Drivers for Site-Wide Cancer Risk) and 7.5 (Summary of Drivers for Non-Cancer Hazards). Benzo(a)pyrene is the only chemical driving human health risks associated with exposure to surface soils. The HHRA concluded that there were no unacceptable human health risks due to exposure to subsurface soils. Risk drivers associated with potential surface and subsurface sediment exposure were also revised, as appropriate.

Comment 24: Page 28, Section 2.4.2. The ecological risk summaries of the various areas are based upon exposures prior to the IRMs being implemented. It would be useful to identify the potential pathways and risks to ecological receptors present after the IRMs that have been implemented since it does not appear that ecological risk is being considered due to the industrial nature of this Site.

Response to Comment 24: The text in Section 2.4.2 has been updated as appropriate to include a brief discussion of potential ecological risks addressed by IRMs and remaining risks to be addressed by FS remedial measures.

Comment 25: Page 32, Paragraph 4, RAOs for Environmental Protection, Section 3.1.3. It is unclear why the discussion focuses on attainment of human health SCOs to "ascertain acceptable concentrations for a given anticipated site use." The RAO is for protection of biota, yet the means of attaining this protectiveness is achievement of an RAO for the protection of human health. Revision and/or additional clarifying language is recommended.

Response to Comment 25: The final paragraph in Section 3.1.3 is intended to document rationale implemented in selecting SCOs. For clarity, the paragraph was moved to the third paragraph in Section 3.1.3.

Comment 26: Pages 32-33, Section 3.1.4. Additional details such as a description of the boundaries or a figure of the WMA will be needed to supplement the information presented here.

Response to Comment 26: A figure (in text Figure 12) presenting the boundary of the waste management area and groundwater point of compliance is included in Section 3.1.4.

Comment 27: Page 33, Paragraph 1, Section 3.1.4. A discussion of the contaminated Solvay waste and fill materials and how their presence affects the practicability of restoring the shallow and intermediate groundwater should be included. If the Solvay waste and/or fill materials are continuing sources of COCs, it should be so stated. In addition, while not practical, remediation to remove this continuing source is included as Alternative 6B. A discussion and/or reference to this should be included.

Response to Comment 27: The text in Section 3.1.4 has been updated as appropriate to reflect that due to the presence of Solvay Waste and historical fill materials (*i.e.,* containing COCs), restoration of shallow and intermediate groundwater within the limits of the Site is not practicable. The development of an alternative to address restoration of the Site to pre-disposal conditions (Alternative 6B) is also referenced in Section 3.1.4.

Comment 28: Page 38, Section 3.4.3. It is not appropriate to discontinue the IRMs under any circumstances. The introductory text should indicate that the IRMs are common to all of the alternatives, including no further action.

Response to Comment 28: The text in Section 3.4.3 has been revised accordingly to indicate that under the No Further Action process option, O&M of the IRM cover systems and groundwater and NAPL control and collection/treatment systems would continue.

Comment 29: Page 39, Section 3.4.3. Natural recovery was identified as a response action for soil/fill material and shallow/intermediate groundwater. Please clarify that natural recovery may be applicable outside of the WMA. Evidence that natural recovery is occurring should be provided.

Response to Comment 29: Based on recent shallow and intermediate groundwater sampling activities and an evaluation for degradation/natural attenuation, site groundwater data has demonstrated evidence of degradation/natural attenuation. Similar conditions are expected to be present outside of the WMA. The degradation/natural attenuation evaluation is being documented in a separate report in connection with regional deep groundwater. Notation, as such, will be provided in the Table 3-3 for clarification.

Comment 30: Page 39, Section 3.4.3. It should be noted here that natural attenuation of shallow/ intermediate groundwater outside of the WMA would need to be demonstrated by monitoring results. Please revise accordingly.

Response to Comment 30: The text in Section 3.5.2 (Monitoring subsection) has been revised accordingly to reflect that, because Site shallow and intermediate groundwater discharge, if any, from the WMA to Onondaga Lake and Harbor Brook, would be evaluated in connection with the Onondaga Lake remedy via monitoring of the porewater and surface water monitoring. Monitoring would be conducted as a means of monitoring natural attenuation outboard of the IRM barrier walls and groundwater collection systems (*i.e.,* WMA boundary and POC).

Comment 31: Page 43, Section 3.5.2. As noted above, the introductory text should indicate that the IRMs are common to all of the alternatives. Given this, it is suggested that the discussion of the IRMs be eliminated here.

Response to Comment 31: Comment noted. The IRMs are common to all of the alternatives with discussion carried through the Revised FS Report for the purpose of documenting effectiveness, continued implementation and attainment of shallow/intermediate groundwater RAOs.

Comment 32: Page 43, Paragraph 3, Section 3.5.2. Delete the text regarding 5 year reviews in this paragraph since this is included later in this section.

Response to Comment 32: The text in Section 3.5.2 has been revised accordingly to remove the text regarding five year reviews in the first paragraph.

Comment 33: Page 43, Section 3.5.3, Page 45, Section 3.5.4 and Page 46, Section 3.5.5. In these sections, as appropriate, discuss installing cover areas to help save existing trees.

Response to Comment 33: The text in Section 3.5.3 was revised to indicate that the final Site cover would be installed to support and preserve existing mature trees (*e.g.,* via application of modified vegetation enhancements, placement of gravel around existing trees), to the extent practicable. The text in Section 3.5.4 and 3.5.5 indicates that the enhanced engineered cover system would also be constructed to support existing mature trees and incorporate existing IRMs with final Site grading.

Comment 34: Page 43, Paragraph 2, Sentence 4, Section 3.5.1; Page 43, Paragraph 3, Sentence 3. Section 3.5.2; Page 43, Paragraph 2, Sentence 3, Section 3.5.2; Page 51, last paragraph, Sentence 1, Section 3.5.6. In order to be consistent with the Wastebeds 1-8 OU1 ROD and use of these terms consistent with CERCLA regarding the need for conducting five year reviews, replace "unrestricted use and unlimited exposure" with "unlimited use and unrestricted exposure." Please revise accordingly.

Response to Comment 34: The text in Sections 3.5.1, 3.5.2, 3.5.6, and 4.2.1 has been revised for consistency with the Wastebeds 1-8 OU-1 ROD and CERCLA to indicate that for alternatives resulting in contaminants remaining above levels that allow for unlimited use and unrestricted exposure, CERCLA requires that a Site be reviewed at least once every five years.

Comment 35: Page 45, Section 3.5.3. The title of this alternative, Alternative 3, should be revised to read "Engineered Cover System" and the discussion of the IRMs should be removed.

Response to Comment 35: Comment noted. Based on additional comments receive from NYSDEC and USEPA on December 1, 2017, the title for Alternative 3 has not been revised. Alternative 3 includes continued operation and maintenance of the shallow and intermediate groundwater and DNAPL IRMs as indicated in Section 3.5.3 as a means of addressing these media in support of attainment of IRM objectives and FS RAOs. Reference to the IRMs has been retained in the Alternative 3 title.

Comment 36: Page 46, Section 3.5.4. The title of this alternative, Alternative 4, should be revised to read "Enhanced Engineered Cover System with Wetland Construction/Restoration" and the discussion of the IRMs should be removed.

Response to Comment 36: Comment noted. Based on additional comments received from NYSDEC and USEAP on December 1, 2017, the title for Alternative 4 has not been revised. Alternative 4 includes continued operation and maintenance of the shallow and intermediate groundwater and DNAPL IRMs as indicated in Section 3.5.4 as a means of addressing these media in support of attainment of IRM objectives and FS RAOs. Reference to the IRMs has been retained in the Alternative 4 title.

Comment 37: Page 46, Section 3.5.4. It should be clarified whether the wetland would be constructed near or on impacted soil. In addition, was consideration given to removing the DNAPL-impacted soil and fill material prior to construction of a wetland? This should be included in the screening tables as appropriate.

Response to Comment 37: As described in Section 3.5.4, Paragraph 5 and Wetland Construction/Restoration subsection, the wetland footprint proposed in Alternatives 4 and 5 would be constructed over an area of DNAPL-impacted soil/fill material. A geotechnical stability evaluation was performed to evaluate the stability of various excavation depths and potential impacts on the stability and integrity of the IRM barrier walls immediately north and east of the proposed wetland.

As described in Table 3-2 (Screening and Evaluation of Remedial Technologies and Process Options for Soil/Fill Material and DNAPL), the implementability of excavations in the immediate vicinity of the IRM barrier walls is limited. The proposed low permeability liner and *in situ* geochemical stabilization in Alternatives 4 and 5, respectively, would reduce infiltration to DNAPL-impacted soil/fill material in addition to reducing the discharge of impacted groundwater to surface water during seasonally high water levels concurrent with high lake levels.

Comment 38: Page 48, Paragraph 3, Section 3.5.4 and page 49, Paragraph 6, Section 3.5.5. The discussion of the compensatory wetland should note the restoration ratio.

Response to Comment 38: In conjunction with responses to Comments 3 and 4, to provide clarification related to wetlands and wetland construction, reference to the wetland construction/restoration along the northeastern portion of the Lakeshore Area as a "compensatory wetland" has been removed in Sections 3.5.4 and 3.5.5. A comprehensive plan has been developed to ensure that wetland mitigation requirements along the Onondaga Lake shoreline are met, as presented in the *Draft Onondaga Lake Maintenance and Monitoring Plan* (Parsons 2017).

Comment 39: Page 48; Section 3.5.5. The title of this alternative, Alternative 5, should be revised to read "Enhanced Engineered Cover System with Wetland Construction/Restoration, and In-situ Treatment" and the discussion of the IRMs should be removed.

Response to Comment 39: Comment noted. The title for Alternative 5 has not been revised. Alternative 5 includes continued operation and maintenance of the shallow and intermediate groundwater and DNAPL IRMs as indicated in Section 3.5.5 as a means of addressing these media in support of attainment of IRM objectives and FS RAOs. Reference to the IRMs has been retained in the Alternative 5 title.

Comment 40: Page 52, last paragraph, Section 3.5.6. Please revise "hon-hazardous" to "non- hazardous."

Response to Comment 40: The typographic error in Section 3.5.6 has been revised accordingly.

Comment 41: Pages 55 (table) and 63 (text), Section 4.2.10. The "Community acceptance" discussion should note that this criterion refers to the public's general response to the alternatives described in the Proposed Plan and the RI/FS reports, and that it will be assessed in the Record of Decision (ROD).

Response to Comment 41: The discussion related to the "Community Acceptance" criterion in Table 6 (formerly in-text Table 4-1) and text in Section 4.2.10 have been revised accordingly.

Comment 42: Page 56, Paragraph 1, Section 4.2.1 and Page 59, Paragraph 3, Section 4.2.5. In these sections it is stated that Alternatives 6A and 68 would not be consistent with current, intended, and reasonably anticipated future use of the Site since these alternatives would require removal of soil/fill on the Lakeshore Area with intended and future use for a public recreation trail and/or potential future community redevelopment opportunities. However, it is not clear why these alternatives are inconsistent with anticipated use. The remedies discussed would involve excavation and replacement of geologic material and restoration of land to original grades and form. The anticipated land uses can be realized following remedy completion as no drastic alterations to the land would have occurred. It is true that during implementation of such a remedy, plans to establish a trail and/or park would be temporarily disrupted; but this would be applicable during any active remedy. Please revise and/or clarify as appropriate.

Response to Comment 42: The text in Sections 4.2.1 and 4.2.5 have been revised accordingly to indicate that Alternatives 6A and 6B would support current, intended or anticipated future land use; however, removal of soil/fill material over the course of the estimated 4- to 6-year construction timeframe would delay the intended and anticipated future redevelopment of portions of the Lakeshore area for the passive recreation trail. Implementation of extensive Site-wide soil removal under Alternatives 6A and 6B would also impact potential redevelopment opportunities for other Site areas.

Comment 43: Page 62, Table 4-2, Section 4.2.7. Under Alternative 1, it is not appropriate to discontinue the IRM under any circumstances. The parenthetical "Discontinued O&M of IRMs" should be deleted but costs should remain $0 in accordance with EPA guidance. A footnote for clarification can be included.

Response to Comment 43: The Revised FS Report text and associated in-text and attached Tables 4-1 and 4-2 have been revised accordingly to present the "No Further Action" alternative to include continued operation and maintenance of IRMs. As such, capital costs and operation and maintenance costs are reported as $0. Operation and maintenance of IRMs will continue under existing IRM decision documents.

Comment 44: Table 3-1. Potentially Applicable or Relevant and Appropriate Requirements (ARARs) and To Be Considered (TBC). Materials, soil/fill material. Although EPA ecological screening levels are listed on this table, they are not referred to within the RAOs. Please clarify the reference to these soil values.

Response to Comment 44: The United States Environmental Protection Agency Ecological Screening Levels are listed on Table 3-1 as "potential TBC", as ecological screening levels are not promulgated criteria. Ecological risks were evaluated in the Site Baseline Ecological Risk Assessment, as summarized in Section 2.4.2. Additionally, as described in Section 3.1.3, given the anticipated future commercial use of the property, the Site is not anticipated to represent habitat for ecological receptors. Therefore, NYSDEC Part 375 soil cleanup objectives for the protection of ecological resources were not considered during the development of RAOs.

Comment 45: Page 62, Table 4-2. In this table two footnotes are referenced (2 and 3) but only footnote 3 is included. Please revise.

Response to Comment 45: Table 7 (formerly in-text Table 4-2) has been revised accordingly to exclude footnotes as they are no longer relevant.

Comment 46: Tables 4-5 and 4-6. For these alternatives, which include the construction of a 1- acre wetland, costs associated with the construction and monitoring of wetland vegetation over the five-year review period should be considered. In addition, costs associated with the potential need to replant vegetation and control of invasive species should also be considered.

Response to Comment 46: Tables 4-5 and 4-6 have been revised accordingly to include operation & maintenance costs associated with monitoring of vegetative health, as well as periodic replanting of wetland vegetation and invasive species control.

OBG

REVISED FINAL REPORT

Feasibility Study Report
Wastebed B/Harbor Brook Site
Geddes, New York

Honeywell

January 2017
Revised Final December 2017

DECEMBER 8, 2017 | 1164 | 61858

REVISED FINAL REPORT

Feasibility Study Report
Wastebed B/Harbor Brook Site

Prepared for:

Honeywell

DOUGLAS M. CRAWFORD, PE, VP
O'BRIEN & GERE ENGINEERS, INC.

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LIST OF APPENDICES

LIST OF ACRONYMS

ACO	Administrative Consent Order
AOS	Area of Study
ARAR	Applicable or Relevant and Appropriate Requirement
B&B	Blasland & Bouck
BBL	Blasland, Bouck & Lee
BERA	Baseline Ecological Risk Assessment
BEHP	bis(2-ethylhexyl) phthalate
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, and xylene
C&D	construction and demolition
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COC	Constituent of Concern
CPOI	Chemical Parameter of Interest
cy	cubic yards
DDD	dichlorodiphenyldichloroethane
DER	Division of Environmental Remediation
DNAPL	Dense Non-Aqueous Phase Liquid
DSA	Dredge Spoils Area
ESD	Explanation of Significant Differences
FS	Feasibility Study
Ft	feet or foot
GPS	global positioning system
GRA	General Response Action
GWTP	Groundwater Treatment Plant
HHRA	Human Health Risk Assessment
Honeywell	Honeywell International Inc.
I-690	Interstate 690
ILWD	In-lake Waste Deposit
IRM	Interim Remedial Measure
ISGS	*in situ* geochemical stabilization
LEF	Lower East Flume
Metro	Metropolitan Wastewater Treatment Plant
MPE	multi-phase extraction
MtCO2e	million metric tons of carbon dioxide equivalent
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
6 NYCRR	Title 6 of the New York Codes, Rules and Regulation
NYS	New York State
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health

NYSDOT	New York State Department of Transportation
OBG	O'Brien & Gere
OCDWEP	Onondaga County Department of Water Environmental Protection
O&M	Operation and Maintenance
OSHA	Occupational Safety and Health Administration
OSWER	Office of Solid Waste and Emergency Response
P.A.	Picric acid
PAH	Polycyclic Aromatic Hydrocarbon
PCB	Polychlorinated Biphenyl
PCDD/Fs	Polychlorinated Dioxins and Furans
PDI	Pre-Design Investigation
POC	Point of Compliance
PSA	Preliminary Site Assessment
RAD	Response Action Document
RAO	Remedial Action Objective
RI	Remedial Investigation
ROD	Record of Decision
SCO	Soil Cleanup Objective
SGV	Standards or Guidance Values
SPDES	State Pollutant Discharge Elimination System
SVOC	Semi-volatile Organic Compound
TBC	to be considered
TCDD	tetrachlorodibenzodioxin
UEF	Upper East Flume
USGS	United States Geological Survey
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compound
WMA	Waste Management Area

EXECUTIVE SUMMARY

This Report documents the Feasibility Study (FS) that was conducted to develop and evaluate remedial alternatives to address Wastebed B/Harbor Brook Site (Site) soil/fill material and shallow and intermediate groundwater. The Site areas to be addressed by this FS include the Lakeshore Area, Penn-Can Property, Railroad Area, Area of Study (AOS) #1, AOS #2, and Harbor Brook. Site deep groundwater will be addressed regionally in a separate FS Report. A wetland area, designated SYW-12, was also included as part of the Wastebed B/Harbor Brook Site, and will be addressed in a separate FS Report as Operable Unit 2 (OU 2)(Honeywell 2014, NYSDEC 2014). The Wastebed B/Harbor Brook Site areas are depicted on **Figure ES-1** to the right and on attached **Figure 1-2**. This FS was prepared to develop and evaluate remedial alternatives to: address Site media; provide long-lasting protection to the local community and environment; and restore the Onondaga Lake shoreline.

Figure ES-1: Wastebed B/Harbor Brook Site Location

Development of this FS follows the completion of the Remedial Investigation (RI) for the Site, in which the nature and extent of the contamination at the Site, and the potential risks posed to public health and the environment were evaluated. This FS also follows the construction of several Interim Remedial Measures (IRMs) that were completed to prevent migration of contaminants into Onondaga Lake and allow the Onondaga Lake remediation to move forward. The following IRM's were implemented to prevent discharge of shallow and intermediate groundwater and dense non-aqueous phase liquid (DNAPL) into Onondaga Lake and Harbor Brook:

- West Wall Portion of the Wastebed B/Harbor Brook IRM (West Wall IRM) (Parsons 2014a)
- East Wall Portion of the Wastebed B/Harbor Brook IRM (East Wall IRM) (Parsons 2014b) [NYSDEC and United States Environmental Protection Agency (USEPA) 2011]
- Upper Harbor Brook Portion of the Wastebed B/Harbor Brook IRM (Upper Harbor Brook IRM) (OBG 2014a)
- East Flume IRM (OBG 2014b and Parsons 2014a).

Additionally, Site surface water and sediment was addressed by the following IRMs:

- Upper Harbor Brook IRM
- East Flume IRM
- Outboard Area IRM (NYSDEC and USEPA 2012)
- West Wall IRM (*i.e.,* East Flume) (Parsons 2014a)
- East Wall IRM (*i.e.,* Outboard Harbor Brook Channel) (Parsons 2014b).

Collectively, based on field measurements and observations, these IRM's have mitigated shallow and intermediate groundwater and DNAPL discharge to Onondaga Lake.

Additional efforts have also been undertaken to minimize the potential for erosion and migration of contaminants and avoid adverse effects on surface water or sediment quality. In addition to the IRM materials managed under the *Wastebed B/Harbor Brook Materials Management, Grading, and Disposal Plan* [O'Brien & Gere (OBG) 2013, 2016], clean-fill materials were placed on the western portion of Wastebed B and a portion of the Penn-Can Property to support the Onondaga Lake capping effort (**Figure 1-2**). Fill materials were also placed on the Penn-Can Property by the former tenant.

The focus of this FS is to address potential risks to human health and the environment associated with constituents in Site-wide soil/fill material and shallow and intermediate groundwater such that the property can be returned to productive use.

During the RI, potential risks and hazards resulting from exposure of receptors to Site soil/fill materials and groundwater were evaluated and documented in the *Revised Human Health Risk Assessment (HHRA) Report* (OBG 2009) and the *Revised Baseline Ecological Risk Assessment (BERA) Report* (OBG 2011). Specifically, potentially unacceptable risks and hazards were identified for human receptors that could be exposed to constituents of concern in soil/fill material, sediment, surface water, fish tissue, and groundwater as a potable water source. Potentially unacceptable risks to ecological receptors were identified relative to constituents in surface soil/fill material, surface water, and sediment. Based on the RI, constituents of concern identified for the Site include benzene, toluene, ethylbenzene, xylene (BTEX), chlorinated benzenes, naphthalene and assorted polycyclic aromatic hydrocarbons (PAHs), phenolic compounds, polychlorinated biphenyls (PCBs), polychlorinated dioxins and furans (PCDD/PCDFs), and inorganics.

The current, intended, and reasonably anticipated future land uses for the Site were evaluated consistent with 6 NYCRR 375-1.8 (f) and DER-10 4.2 (i). The 78-acre Site is currently multi-zoned by the Town of Geddes and City of Syracuse. The Wastebed B/Harbor Brook Site areas, including the Penn-Can Property, Railroad Area, AOS #1 and AOS #2, are currently zoned for industrial use in the Town of Geddes and City of Syracuse. The eastern extent of the Lakeshore Area along the Onondaga Lake shoreline (45 acres) is zoned as parkland within the City of Syracuse. Based on the land use evaluation, the reasonably anticipated future uses for the Site will be industrial or commercial, with passive recreation for a trail.

Figure ES-2: Artistic Rendering of Passive Recreation Trail

Specifically, agreements are in place with Onondaga County such that a 2.2-mile trail extension of the Onondaga County Loop the Lake Trail is being planned, an approximately ¾-mile section of which will cross a portion of the Wastebed B site along the lakeshore (**Figure ES-2**). This will also complete a missing link in the Empire State Trail from Buffalo to Albany.

Remedial Action Objectives (RAOs) for soil/fill material and shallow and intermediate groundwater at the Site were developed to be protective of human health and the environment. The RAOs were based on consideration of potentially applicable or relevant and appropriate requirements (ARARs), the nature and extent of contamination, potentially unacceptable risks, and the current, intended and reasonably anticipated future use of the Site and its surroundings. The RAOs are as follows:

RAOs for Public Health Protection

- Prevent, or reduce to the extent practicable, ingestion/direct contact with contaminated soil/fill material.
- Prevent, or reduce to the extent practicable, inhalation of or exposure to contaminants volatilizing from contaminated soil/fill material and unacceptable inhalation exposure associated with soil vapor.
- Prevent potential unacceptable risks to human health associated with ingestion of groundwater with contaminant levels exceeding drinking water standards.
- Prevent potential unacceptable risks to human health associated with contact with, or inhalation of volatiles from contaminated groundwater.

RAOs for Environmental Protection

- Prevent, or reduce, to the extent practicable, the release of site-related contaminants to groundwater, surface water and sediment that may cause unacceptable adverse effects on groundwater, surface water or sediment quality in Harbor Brook or Onondaga Lake.
- Prevent, or reduce to the extent practicable, adverse impacts to biota from ingestion/direct contact with contaminated soil/fill material causing toxicity or impacts from bioaccumulation through the terrestrial food chain.

Due to the presence of Solvay waste, historic fill and DNAPL at the Site, thus, the Site can be characterized as a waste management area (WMA). Restoration of shallow and intermediate groundwater within the limits of the Site within a reasonable timeframe is not practicable given the volume and characteristics (*i.e.,* low permeability, heterogeneity) of the soil/fill material. Therefore, the groundwater point of compliance for meeting ARARs is anticipated to be at the WMA edge.

Technologies and process options including containment, *in situ* and *ex situ* treatment, removal and/or disposal to address soil/fill material and shallow and intermediate groundwater were screened and evaluated. Remedial alternatives were assembled based on the findings of the screening processes. In light of the Site's location, nearby property use and recent economic development in the area, development of the Site has also been considered during the assembly of remedial alternatives. Given that parts of the property are directly on State Fair Boulevard, the proximity to the New York State Fairgrounds, the recent construction of the Lakeview Point Amphitheater, and recent commitments to economic development in the vicinity; this property is a candidate for redevelopment. As such, reasonable and specific development scenarios were incorporated into some alternatives.

The range of assembled alternatives included a no further action alternative (Alternative 1), as required by the *National Oil and Hazardous Substances Pollution Contingency Plan* (NCP) and DER-10. In addition, consistent with DER-10, a pre-disposal alternative (Alternative 6A/B) was included in the range of alternatives. A list of the remedial alternatives and their components evaluated in this FS is presented in **Tables ES-1** and **ES-2** below:

Table ES-1: Wastebed B/Harbor Brook FS Remedial Alternatives	Alternative 1 No Further Action [with Continued Operation and Maintenance (O&M) of IRMs]	Alternative 2 Limited Action (with Continued O&M of IRMs)	Alternative 3 Engineered Cover System (with Continued O&M of IRMs)
Alternative 4 Enhanced Engineered Cover System and Wetland Construction/Restoration (with Continued O&M of IRMs)	Alternative 5 Enhanced Engineered Cover System with Wetland Construction/Restoration and *In Situ* treatment (with Continued O&M of IRMs)	Alternative 6A Partial Excavation with Off-Site Disposal	Alternative 6B Excavation with Off-Site Disposal

Table ES-2: Components of Remedial Alternatives

Remedial Component		Remedial Alternative 1	2	3	4	5	6A	6B
No further action		●						
Institutional controls/limited actions ▪ Institutional controls, site management plan, periodic reviews, monitoring and natural attenuation			●	●	●	●	●	●
O&M of existing IRMs ▪ Wastebed B/Harbor Brook IRM components, including the West Wall IRM and Upper Harbor Brook IRM, groundwater collection and treatment at the Willis-Semet GWTP. ▪ Existing engineered covers		●	●	●	●	●	●	●
Engineered cover pre-design investigation (Penn-Can Property)				●	●	●		
Containment	Engineered cover			●	●	●		
	Vegetation enhancement			●	●	●		
	Isolation cover			●	●	●		
***In situ* treatment**	Chemical oxidation					●		
	Solidification/stabilization					●		
Removal	Mechanical excavation						●	●
Disposal	Off-site treatment/disposal						●	●

The assembled alternatives were analyzed in detail using the evaluation criteria as required by state and federal regulations and guidance. The detailed analysis of alternatives shows the following:

- Alternative 1, the no further action alternative, would include continued O&M of IRM elements, but does not fully comply with applicable regulatory requirements.
- Alternative 2 would include continued O&M of IRM elements and institutional controls; however, it would not be protective of human health and the environment because it does not sufficiently address direct exposure to and erosion of uncovered soil/fill material.
- Alternative 3 is an engineered cover system alternative that would be protective of human health and the environment through implementation of an engineered cover system and continued O&M of IRMs with institutional controls. Direct exposure to soil/fill material is addressed through implementation of a 1-foot (ft) cover system, while continued O&M of IRMs provide for continued mitigation of shallow and intermediate groundwater and DNAPL discharges to Harbor Brook and Onondaga Lake. Monitoring and institutional controls in Alternative 3 would provide a means for monitoring constituent concentrations in media, while restricting site access and use. Alternative 3 also includes

placement of a 1-ft thick soil/granular or asphalt cover on the Penn-Can Property to provide long-term isolation of underlying impacted soils. As part of the pre-design investigation and design, incorporation of additional design features will be evaluated, if necessary, in the limited areas where surficial asphalt tar materials have been observed, such that this material is effectively addressed.

- Alternative 4 is an enhanced engineered cover system alternative that would provide added protectiveness compared to Alternative 3 through more robust covers (*i.e.*, minimum 1 ft, up to 2 ft thick enhanced engineered soil cover) in areas of anticipated passive recreational use, while allowing for integration of in-place IRM covers and establishment of final Site grades for drainage, aesthetics and support of tree plantings and existing mature trees. Additional protectiveness would also be provided in Alternative 4 through construction/restoration of a wetland with a low permeability liner in an area of DNAPL-impacted soil/fill material on the northeastern shoreline of Wastebed B for the purpose of reducing infiltration and groundwater discharge to surface water during seasonally high groundwater levels, concurrent with high lake levels.
- Alternative 5 is an enhanced engineered cover system alternative and, similar to Alternative 4, would provide added protectiveness compared to Alternative 3 through more robust covers (*i.e.*, minimum 1 foot, up to 2 feet thick enhanced engineered soil cover). Alternative 5 also includes construction/restoration of a wetland on the northeastern shoreline of Wastebed B with *in situ* treatment of DNAPL-impacted soil/fill material surrounding the area of the proposed wetland. Application of a low permeability liner and *in situ* treatment within the proposed wetland in Alternatives 4 and 5, respectively, are equally protective.
- Alternatives 6A and 6B, the removal alternatives, include mechanical excavation and off-site treatment disposal of soil/fill material exceeding Unrestricted Use SCOs. Alternative 6A is a partial removal alternative, with major infrastructure (*e.g.*, I-690, railroads) remaining in place, while Alternative 6B is a full removal alternative and would include removal of nearby infrastructure. Alternatives 6 A and B would attain RAOs; however, they are not readily implementable given these alternatives would be difficult to construct, there would be implementability limitations associated with off-site disposal/management capacity, existing utilities and transportation infrastructure, and there would be significant impacts to the surrounding community. Specifically, Alternatives 6A and 6B would require excavation of approximately 3.1 to 3.4 million cubic yards of soil/fill material. These volumes would result in a significant increase in truck traffic on surrounding roadways and negative impacts to the community (*e.g.*, potential accidents, rerouting of traffic, noise and odors). Alternatives 6A and 6B would support current, intended, or anticipated land use upon remedy completion and restoration; however, removal of soil/fill material would delay construction of the proposed public recreation trail and potential redevelopment opportunities for the Site. Alternative 6B would also involve significant removal and rerouting of portions of I-690, State Fair Boulevard, and the CSX railroad line that traverse the Site.

The detailed analysis of alternatives indicates that Alternative 4 would be protective of human health and the environment through implementation of an enhanced engineered cover system and continued O&M of IRMs with institutional controls. Direct exposure to soil/fill material is addressed through implementation of a 1- to 2-ft cover system, while continued O&M of IRMs provide for continued mitigation of shallow and intermediate groundwater and DNAPL discharges to Harbor Brook and Onondaga Lake. Monitoring and institutional controls in Alternative 4 would provide a means for monitoring constituent concentrations in media, while restricting site access and use. In addition, through the construction/restoration of a wetland on the northeastern shoreline of Wastebed B, Alternative 4 also provides added protectiveness compared to Alternative 3 with the installation of a low permeability liner that would be extended beyond the wetland boundary over an area of NAPL-impacted soil/fill material subject to lake flooding and associated high groundwater levels for the purpose of reducing infiltration and groundwater discharge to surface water. Alternative 4 also includes placement of a 1-ft thick engineered soil/granular or asphalt cover on the Penn-Can Property. As part of

the pre-design investigation and design, additional design features will be incorporated, if necessary, in the limited areas where surficial asphalt tar material is present, such that this material is effectively addressed. Alternative 4 is more protective than Alternatives 2 and 3, equally protective and less costly than Alternative 5, and more practicable and implementable than Alternatives 6A/B.

This FS Report documents the development and evaluation of remedial alternatives in sufficient detail such that risk management decision makers may select a remedy for the Site. Following review of the evaluations documented in this FS Report, NYSDEC and USEPA will document the preferred remedial action in a Proposed Plan. Following receipt of public comments on the Proposed Plan, the selected remedial alternative will be documented in a Record of Decision (ROD).

1. INTRODUCTION

This report documents the Wastebed B/Harbor Brook Site (Site) Feasibility Study (FS) that was conducted to develop and evaluate potential remedial alternatives to address soil/fill material[1] and shallow and intermediate groundwater at the Site. Site deep groundwater will be addressed regionally in a separate FS Report. A wetland area, designated SYW-12, was also included as part of the Wastebed B/Harbor Brook Site, and will be addressed in a separate FS Report as Operable Unit 2 (Honeywell 2014, NYSDEC 2014).

Figure 1: Wastebed B/Harbor Brook Site Location

The Site is located in Geddes and Syracuse, New York; a Site Location Map is included as attached **Figure 1-1** and above as **Figure 1**. This FS was conducted pursuant to the Administrative Consent Order (ACO) (D-7-0001-00-02) between the New York State Department of Environmental Conservation (NYSDEC) and Honeywell International Inc. (Honeywell) dated April 10, 2000 (NYSDEC 2000). This FS evaluates alternatives that restore the Onondaga Lake shoreline to provide long-lasting protection to the local community and environment and allows the adjacent property to return to productive use.

Potential impacts from the Site to Onondaga Lake have been addressed by Interim Remedial Measures (IRMs) including the construction of a series of barrier walls and collection systems along the lakeshore and Harbor Brook. The completed IRMs and evaluations of performance are summarized in this FS Report. This FS documents the development and evaluation of remedial alternatives such that a final remedy may be selected to address Site soil/fill material and groundwater.

Remedial activities commenced at the Site in 2006 in the form of various IRMs. Most notably, Site media was addressed by IRMs implemented for several areas of the Site, as summarized below in **Table 1**.

[1] Portions of the Site were historically used for the deposition of Solvay waste, an inert material consisting largely of calcium carbonate, calcium silicate, and magnesium hydroxide. The term "soil/fill material" throughout this document refers to Solvay waste, fill materials (*e.g.,* gravel) that have been placed, and soil that has formed above the Solvay waste.

Table 1: IRM and Site Media Summary

	East Flume IRM	West Wall IRM	East Wall IRM	Upper Harbor Brook IRM	Outboard Area IRM	Materials Management, Grading, and Disposal Plan	Onondaga Lake Remediation Material Staging and Support Areas
Site Media							
Surface Water	●	●	●	●	●		
Shallow and Intermediate Groundwater		●	●	●			
Soil/Fill Material			●	●	●	●	●
Sediment	●	●	●	●	●		
NAPL		●	●	●			
Site Area							
Lakeshore Area	●	●	●	●	●	●	●
Penn-Can Property				●			●
Railroad Area				●			
AOS #1		●	●		●		
AOS #2				●			
Harbor Brook			●	●	●		

This FS Report contains five sections. The remainder of this section (**Section 1**) presents a brief description of the Site and its history. **Section 2** presents a summary of previous environmental investigations and studies, including a summary of the Remedial Investigation (RI) and human health and ecological risk evaluations. Existing IRMs are described in **Section 1.3**. The development and screening of remedial alternatives and the detailed analysis of alternatives are documented in **Sections 3 and 4**, respectively. The report conclusions are presented in **Section 5**.

1.1 SITE AREAS

This section describes the Wastebed B/Harbor Brook Site areas. Subsequent sections of this FS describe the history of areas in more detail. The Wastebed B/Harbor Brook Site consists of six areas:

- Lakeshore Area (including Wastebed B, the former East Flume, Dredge Spoils Areas (DSAs) #1 and #2, and Interstate 690 (I-690) Drainage Ditch),
- Penn-Can Property,
- Railroad Area,
- Area of Study (AOS) #1,
- AOS #2, and
- Harbor Brook.

A Site Plan is included as shown on attached **Figure 1-2** and on **Figure 2** below. The Wastebed B/Harbor Brook Site areas, including Penn-Can Property, Railroad Area, AOS #1, and AOS #2 are currently multi-zoned by the Town of Geddes and City of Syracuse. The portion of the Lakeshore Area located in the Town of Geddes is currently zone for industrial use, while the eastern extent of the Lakeshore Area along the Onondaga Lake shoreline is zoned as parkland within the City of Syracuse. The remainder of the property is industrially zoned. It is reasonably anticipated that future property use will be industrial or commercial, with the portion of the property proximate to Onondaga Lake anticipated to be used for passive recreation as part of the extension of the approximately ¾-mile Onondaga County West Shore Trail Extension (public recreation trail). The public recreation trail serves as an extension to the progressing Onondaga County Loop the Lake Trail as well as the Empire State Trail.

Figure 2: Wastebed B/Harbor Brook Site Plan

1.1.1 Lakeshore Area

The Lakeshore Area is approximately 45 acres in size and is comprised of four sub-areas, as shown on **Figure 3**.

This area is approximately 3,200 feet (ft) east to west and 800 ft north to south and is situated along the southern shore of Onondaga Lake, near the southwest corner of the lake. The northern boundary of the Lakeshore Area is Onondaga Lake. The former Upper East Flume (UEF) defines the western extent of this area, and the eastern extent is defined by Harbor Brook near its confluence with Onondaga Lake. The

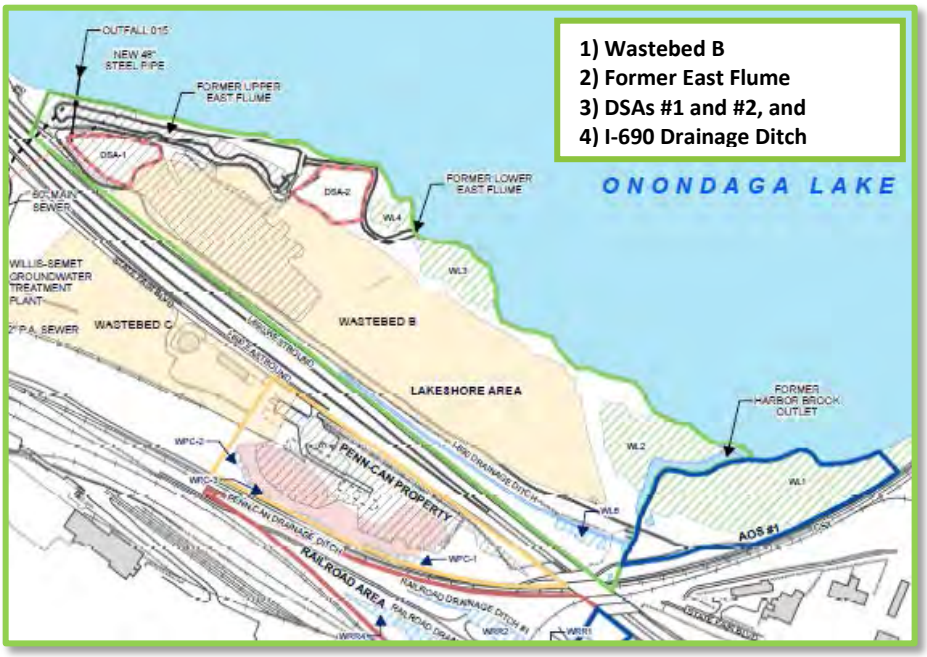

Figure 3: Lakeshore Area Site Plan

southern extent of the Lakeshore Area is defined by I-690. The ecological communities in the Lakeshore Area are representative of successional old field, successional northern hardwoods, ditch/artificial intermittent stream, and freshwater wetland habitats (including wetland areas WL2 through WL4). Topography of the Lakeshore Area is generally flat with a relatively significant slope to the north in the north-central portion of the area due to the presence of a constructed berm. Several important IRM's have been conducted in the Lakeshore Area including the West Wall IRM, East Wall IRM, Upper Harbor Brook IRM, Outboard Area IRM, and the *Wastebed B/Harbor Brook Materials Management, Grading and Disposal Plan* (OBG 2013a) (discussed in **Section 1.3**). The western portion of Wastebed B was used as a materials staging and support area for Onondaga Lake remedial efforts (*i.e.*, Lake Support Area).

Wastebed B

Wastebed B covers approximately 28 acres, including the relatively flat area between the pre-Wastebed B/Harbor Brook IRM Onondaga Lake shoreline and the raised, bermed portion of the wastebed [Blasland and Bouck (B&B) 1989]. Some of the material excavated from the Outboard Area, Harbor Brook, and Site ditches and wetland areas has been staged on top of the wastebed on the eastern portion of this area (**Figure 1-3**).

Former East Flume

The former East Flume was located on an approximate 3.5-acre parcel, situated near the western extent of the Site along the southern shore of Onondaga Lake (**Figure 1-2**) and discharged to the lake. Two associated storm sewers [42-inch picric acid (P.A.) Sewer and 60-inch Main Sewer] formerly flowed into the western end of the former UEF, and Onondaga Lake via the Lower East Flume (LEF). The former East Flume was addressed by the East Flume IRM as discussed in **Section 1.3**. The East Flume is being addressed as part of the Wastebed B/Harbor Brook RI/FS, while the 42-inch P.A. Sewer and 60-inch Main Sewer continue to be addressed as part of the Willis Avenue Site.

The two associated storm sewers are still in operation and have been subject to IRMs (discussed in **Section 1.3**). Currently, the 42-inch P.A. Sewer conveys storm water and non-contact cooling water from the area around the Rock Tenn, General Chemical, and former Suez facilities to the rehabilitated 60-inch Main Sewer located along Willis Avenue before discharging to Onondaga Lake.

DSAs #1 and #2

DSAs #1 and #2 are located in the northwestern portion of the Lakeshore Area. DSA #1 is situated to the south of the former UEF and is approximately 300 ft by 300 ft at its widest points (**Figure 1-2**). DSA #2 is located to the east of the former UEF and south of the former LEF and is approximately 350 ft by 350 ft and bermed to the north and east.

I-690 Drainage Ditch

The I-690 Drainage Ditch serves as a storm water drainage feature for the interstate and is maintained by the New York State Department of Transportation (NYSDOT) (OBG 2001a). The drainage ditch parallels the westbound lane of I-690 at the southern border of the Lakeshore Area. The ditch flows west to east, and discharges to Harbor Brook. Near the midpoint of the ditch, an outfall from the storm drainage system beneath I-690 discharges to the ditch. Portions of the drainage ditch are vegetated with *Phragmites australis*, goldenrod (*Solidago* sp.), and grasses (*Graminae*). The substrate of the drainage ditch primarily consisted of weathered Solvay waste. The I-690 Drainage Ditch was subject to the Upper Harbor Brook IRM (discussed in **Section 1.3**).

1.1.2 Penn-Can Property

Figure 4: Penn-Can Property and Railroad Area Site Plan

The Penn-Can Property is situated to the south of the Lakeshore Area and south of I-690, as shown on **Figure 4** and on attached **Figure 1-2**. The area is approximately 1,600 ft east to west and 450 ft north to south and consists of a gravel parking lot, with vegetated areas around the periphery of the property. Four buildings, formerly located on the Penn-Can Property, were demolished in October 2013, and Honeywell completed its purchase of the Penn-Can Property in November 2013 from Penn-Can Road Materials, Inc. (now Tonodo). A shallow drainage swale runs along the southern and eastern perimeter of the property. The cover type in this area is classified as *urban structure interior*. Clean-fill materials associated with the Onondaga Lake capping effort were staged on a portion of the Penn-Can Property (**Figure 1-2**). The Penn-Can Property drainage ditch and wetland areas were remediated during the Upper Harbor Brook portion of the Wastebed B/Harbor Brook IRM (discussed in **Section 1.3**).

1.1.3 Railroad Area

The Railroad Area, owned by CSX, is situated to the south of the Penn-Can Property and is bounded to the north, south and east by rail tracks (**Figure 4** and attached **Figure 1-2**). The area is approximately 1,400 ft east to west and 400 ft north to south. The cover type in this area is classified as *successional shrubland* in the southern portion and *urban structure interior* in the northern portion. The Railroad Area Drainage Ditches and wetland areas were subject to the Upper Harbor Brook IRM (discussed in **Section 1.3**).

1.1.4 AOS #1

AOS #1 is a wetland area (*i.e.,* WL1) situated east of Harbor Brook and adjacent to the Lakeshore Area (**Figure 4** and attached **Figure 1-2**). This area was delineated during the Jurisdictional Wetland Survey and Delineation (OBG 2001b; OBG 2003) conducted as part of the RI and is part of New York State (NYS) wetland SYW-19 (NYSDOT 1973). AOS #1 was subject to the East Wall and Outboard Area IRMs (discussed in **Section 1.3**).

1.1.5 AOS #2

AOS #2 is situated east of Harbor Brook and south of I-690 between Harbor Brook and the western dike of Wastebeds D and E (**Figure 4** and attached **Figure 1-2**). AOS #2 consists of approximately 2.2 acres. The drainage ditch on AOS #2 was remediated as part of the Upper Harbor Brook portion of the Wastebed B/Harbor Brook IRM (discussed in **Section 1.3**).

1.1.6 Harbor Brook

The portion of Harbor Brook subject to this RI/FS is classified as a Class C stream by NYSDEC. Harbor Brook originates southeast of Syracuse, NY in the Town of Onondaga and flows through the western side of Syracuse passing Wastebeds D and E, and discharges to the southwest corner of Onondaga Lake

adjacent to the eastern end of Wastebed B (depicted in the figures above and **Figure 1-2**). Harbor Brook drains a watershed of approximately 13.2 square miles and has an average flow rate of 14.3 cubic feet per second (B&B 1989). The extent of Harbor Brook adjacent to the Site was subject to the East Wall IRM, Upper Harbor Brook IRM, and Outboard Area IRM (discussed in **Section 1.3**).

1.1.7 Wetlands

A jurisdictional wetland delineation was conducted at the Site in the summers of 2000 and 2003. Fifteen wetlands, totaling approximately 16.3 ac, were identified on the Site. Two of these wetlands were located in the vicinity of the NYSDEC regulated wetland SYW-19 and a palustrine emergent wetland habitat identified on the USFWS NWI Map for the Syracuse West Quadrangle. Many of these wetlands border the aquatic portions of the Site that include Onondaga Lake, Harbor Brook, the East Flume, and small drainage swales tributary to Harbor Brook. The findings of the wetland delineation are documented in the *Jurisdictional Wetland Survey, Lakeshore Area, Harbor Brook Site, Geddes, New York* (OBG. 2003). A summary of delineated wetlands on the Site is provided in **Table 2**.

TABLE 2: Summary of Delineated Wetlands

Wetland ID	Area (acres)	Location
WL1	7.140	AOS #1
WL2	2.757	Lakeshore Area
WL3	1.671	
WL4	0.488	
WL5	0.259	
WL6	0.352	
WL7	0.998	
WPC1	0.206	Penn Cann Property
WPC2	0.354	
WPC3	0.334	
WRR1	0.046	Railroad Area
WRR2	0.210	
WRR3	1.214	
WRR4	0.190	
WRR5	0.038	

1.2 SITE HISTORY

1.2.1 Lakeshore Area

The historical uses of the Lakeshore Area are discussed below. This area was used as a support area for the Onondaga Lake capping effort (**Figure 1-2**). Material staging and support areas are further evaluated in this FS.

Wastebed B. Historical use of Wastebed B was for the deposition of Solvay waste, a non-hazardous waste consisting primarily of calcium carbonate, calcium silicate and magnesium hydroxide with lesser amounts of carbonates, sulfates, salts, and metal oxides. Wastebed B was engineered to receive waste by construction of a bulkhead into Onondaga Lake and received Solvay waste from approximately 1898 to 1926 (B&B 1989). Between approximately 1898 and 1908, the filling of Wastebed B was initiated by construction of wooden bulkheads in the lake and placement of Solvay waste out to the bulkhead line. Coke plant waste from the former Main Plant Site may have been disposed of concurrent with the Solvay waste. Additionally, sewage sludge disposal occurred on the southeast portion of the bed in the late 1950s and early 1960's (B&B 1989). Modification of the Onondaga Lake shoreline has occurred due to erosional and depositional forces, as well as historical discharges from the former East Flume.

Wastebed B was subject to an IRM directed toward mitigating discharges of contaminated groundwater and dense non-aqueous phase liquid (DNAPL) into Harbor Brook and Onondaga Lake. The Wastebed B/Harbor Brook IRM is discussed below in **Section 1.3**. Portions of Wastebed B are also being used to stage and contain excavated materials from the IRMs as described in the *Wastebed B/Harbor Brook Materials Management, Grading, and Disposal Plan* (**Figure 1-3,** OBG 2013a, 2016).

East Flume. The East Flume was originally an excavated drainage ditch that received process cooling waters from the former Main and Willis Avenue Plants. In addition to cooling waters, the East Flume also carried a combined (Solvay, sanitary, mercury, and organic) waste stream from the Main and Willis Avenue Plants to Onondaga Lake. The East Flume historically received storm water from Solvay Paperboard, General Chemical Corporation, Landis Plastics and the Village of Solvay. It also received process waters from the Trigen Syracuse Energy Corporation. Water depths within the flume typically

ranged between 2 ft and 6 ft and channel width varied approximately from a minimum of 20 ft to a maximum of 150 ft. The banks of the flume were vegetated primarily with *Phragmites australis*.

In 1977, the UEF was re-constructed to serve as a holding pond for the process cooling waters prior to their entry into a thermal diffuser and subsequent discharge to the lake. The LEF was not modified during the 1977 re-construction and maintained the original channelized drainage ditch configuration. A high level overflow dam and a berm to the north separated the UEF from the LEF and Onondaga Lake, respectively. Honeywell was required under the terms of its New York State Pollution Discharge Elimination System (SPDES) discharge permit (No. 0002275) to collect monthly and quarterly samples of surface water from downstream of the dam.

The East Flume was abandoned as part of three IRMs including the East Flume IRM (Order on Consent #D7-0002-01-09), West Wall IRM (Order on Consent #D7-0008-01-09), and Outboard Area IRM (Order on Consent # D7-0008-01-09). These IRMs focused on the elimination (to the extent practicable within the IRM scope) of potential impacts to wildlife resources, transport of contaminants to Onondaga Lake via East Flume sediment, and exposure to trespassers via dermal contact with UEF and LEF sediments.

Dredge Spoils Areas. The areas received dredge spoils from the former UEF and from Onondaga Lake, respectively. DSA #1 was created in 1979 to hold sediments removed from the UEF that had been deposited within the UEF subsequent to the 1977 construction. A berm was created around the perimeter of the area and sediments were pumped into the bermed area. The average depth of these sediments is 2 ft. Beneath the spoil materials, a layer approximately 1 to 2 ft thick of ash and cinders has been observed (OBG 2014c). DSA #2 received sediments from the lake, which were removed during installation of the thermal diffuser pipe in 1977. The spoils in this area are approximately 3 to 5 ft thick and are underlain by Solvay waste.

I-690 Drainage Ditch. Based on the United States Geological Survey (USGS) map for the area, historical aerial photographs of the area, and a Site reconnaissance (2000), it appears that the ditch was constructed on portions of wastebed. At the time of the Site reconnaissance, the NYSDOT had recently removed accumulated sediments from the drainage ditch to allow for less restricted flow of intermittent surface water. This ditch has been subsequently remediated as part of the Upper Harbor Brook portion of the Wastebed B/Harbor Brook IRM.

1.2.2 Penn-Can Property

This property has historically been used for the production and storage of asphalt products. In 1919, the Barrett Division of the Semet Solvay Company of Allied Chemical Corporation began operations. Barrett produced various asphalt emulsions and some coal tar based products used in road construction (*i.e.,* asphalt tar materials). The primary constituents of these materials were asphalt, coal tar, caustic soda and muriatic acid. Until 1975, the operation included a barge loading facility, which transferred emulsions to vessels on Onondaga Lake via above ground pipelines. These pipelines were removed, as well as the above ground storage tanks, during the 1978 decommissioning of the Barrett facility. In 1978, approximately 750 to 1,000 cubic yards (cy) of asphalt tank bottoms were buried on-site in a pit. The tank bottoms were covered with 2 ft of low permeability fill, a geotextile, and 2 ft of fill. The pit was subsequently covered with a layer of crushed stone. The locations of historical tanks, and structures, and the approximate location of the pit, are shown on **Figure 1-4**. The approximate location of the pit was provided by Honeywell during the TI. The pit location will be verified as part of pre-design activities. In 1983, the property was purchased by Penn-Can Road Materials, Inc. Until recently, the property was being used by Spano Container Corporation for the storage of equipment and, during this timeframe, fill material of unknown quality was placed on the southern portion of the property. The buildings on-site were demolished in October 2013, and Honeywell completed its purchase of the Penn-Can Property in November 2013 from Penn-Can Road Materials, Inc. (now Tonodo). This area is currently being used to support the adjacent site remedial construction efforts, with imported stone and soil materials stored

on-site. The property drainage ditch and wetlands areas were remediated as part of the Upper Harbor Brook IRM. Material staging and support areas are further evaluated in this FS. Additionally, localized areas of surficial asphalt tar materials were observed on the Penn-Can Property during a Summer 2017 Site visit. Asphalt tar material controls are further evaluated in this FS.

1.2.3 Railroad Area

Historical uses of this area are not known. Based on review of historical aerial photographs, the area (**Figure 1-2**) appears to have been a vacant lot and has not been used for production purposes in the past. However, Solvay waste was observed in subsurface borings in the northern portion of the Railroad Area. Subsequent to the RI investigation, the area ditches, associated wetlands, and the length of Harbor Brook along the Railroad Area were remediated as part of the Upper Harbor Brook IRM.

1.2.4 AOS #1

Based on review of historical aerial photographs, this area (**Figure 1-2**) is a floodplain created by deposition of Onondaga Lake and Harbor Brook sediments during the 1950's and 1960's. There is also evidence that non-Solvay waste fill was likely placed during this time. Subsequent to the RI investigations, the lower portion of Harbor Brook was re-routed through AOS #1 as part of the Wastebed B/Harbor Brook IRM, and a vertical sheetpile barrier wall and collection system was installed through AOS #1.

1.2.5 AOS #2

Aerial photos indicate that Wastebeds D and E were inactive by 1926 (B&B 1989). Several buildings were constructed on the eastern end of Wastebed D between 1959 and 1966. Currently, the eastern end of Wastebeds D and E is occupied by multiple car dealerships. The Wastebed D/E Drainage Ditch on AOS #2 was remediated as part of the Upper Harbor Brook portion of the Wastebed B/Harbor Brook IRM (discussed in **Section 1.3**).

1.2.6 Harbor Brook

Under the East Wall IRM and Upper Harbor Brook IRM, the lower portion of Harbor Brook (**Figure 1-2**) was re-routed through AOS #1, and the extent along the Site was remediated. Additionally, the length of Harbor Brook passes through the City of Syracuse and has historically received sewage and stormwater via combined sewer overflows during storm events with flows exceeding the capacity of the sewers serving the area around Harbor Brook (CH2MHill and Clough, Harbour Associates 2011). Per the 1998 Amended Consent Judgement to improve lake and tributary water quality, Onondaga County agreed to design and construct a series of engineering improvements to the Syracuse Metropolitan Wastewater Treatment Plant (Metro). The improvements impacting Harbor Brook included the Interim Floatables Control Facility (completed in 2000), Harbor Brook Interceptor Sewer (2012), replacement of the Harbor Brook Interceptor Sewer (2013), and Lower Harbor Brook Storage Facility (2013) [Onondaga County Department of Water Environment Protection (OCDWEP) 2015].

1.2.7 Mitigation Wetlands

As described in **Section 1.1.7** above, a total of 16.3 acres of delineated jurisdictional wetlands were present on the Site. Remediation efforts completed in association with the Onondaga Lake remedy, as well as upland remedies including the IRMs discussed in **Section 1.3** below, impacted portions of these wetlands. As a result, approximately 7.2 acres of Inland Wetlands and 2.3 acres of Connected Wetland were constructed at the Wastebeds 1-8 Site as part of the Integrated IRM completed at that site (OBG. 2013b).

Mitigation wetlands have been replaced in-kind or mitigated elsewhere along Onondaga Lake and its tributaries. A comprehensive plan has been developed to ensure that wetland mitigation requirements

along the Onondaga Lake shoreline are met, as presented in the *Draft Onondaga Lake Maintenance and Monitoring Plan* (Parsons 2017).

1.3 INTERIM REMEDIAL MEASURES

Remedial activities have been conducted in alignment with the schedules for remediation of Onondaga Lake. As a result, portions of the Site were addressed in IRMs and/or response actions. It is necessary to consider these various activities during identification of media to be considered in the FS and during the technology evaluation phase of the FS.

IRM objectives with respect to groundwater and NAPL discharge to Onondaga Lake and Harbor Brook were (NYSDEC and USEPA 2011, 2012; Parsons 2014a, 2014b; OBG 2014a):

- Eliminate, to the extent practicable, within the scope of the IRM, the discharge of contaminated groundwater and NAPL (and collect NAPLs, as feasible) into Harbor Brook and Onondaga Lake.
- Eliminate, to the extent practicable, within the scope of the IRM, the potential human health and ecological impacts associated with site constituents of concern.
- Eliminate, to the extent practicable, within the scope of the IRM, potential impacts to fish and wildlife resources associated with on-going discharges of contaminants of concern from the Site.

The Site-related IRMs and response actions are discussed below and a brief summary is presented in **Table 1-1**. The IRMs are depicted on **Figure 1-3**. The manner in which media is addressed in the FS are identified in **Section 3.3**. As described below, collectively, based on field measurements and observations, these actions have been demonstrated to be achieving protectiveness through hydraulic control and hence mitigation of potential shallow and intermediate groundwater and DNAPL discharge to Onondaga Lake (Parsons and OBG 2013a, 2014, 2017). In addition, outfall quality has improved, showing no SPDES permit exceedances. As such, the IRMs have addressed the corresponding IRM objectives.

1.3.1 East Flume IRM

The objective of the East Flume IRM was to eliminate to the extent practicable the potential impacts to fish and wildlife resources. The East Flume IRM was completed in two phases. The first phase of East Flume IRM–Storm Sewer Outfall Relocation and Modifications Project redirected storm water and process water flow that discharged to the East Flume directly to Onondaga Lake and the East Flume was eliminated as part of the lakeshore restoration. The second phase consisted of abandoning the 42-inch P.A. Sewer section through the Site and installation of an alternative storm and process water system that bypasses the 42-inch P.A. Sewer and redirects flow to the rehabilitated Main Sewer (**Figure 5**). Approximately 1,500 cy of soil excavated during construction of the East Flume IRM was placed on Wastebed B and managed under the *Wastebed B/Harbor Brook Materials Management, Grading, and Disposal Plan* (OBG 2013a).

Figure 5: Installation of East Flume IRM Storm Sewer Modifications

The *Interim Remedial Measure Construction Completion Report West Wall Portion of the Wastebed B/Harbor Brook IRM* (Parsons 2014a) provides a detailed discussion of the East Flume efforts. The *East Flume Interim Remedial Measure Construction Completion Report* (OBG 2014b) details the relocation

Figure 6: Installation of West Wall Portion of the Subsurface Sheet Pile Barrier Wall

efforts. The location of the East Flume, relocated piping, and P.A. Sewer are illustrated on **Figure 1-3**. Since the IRM was completed in April 2014 the water quality at New York State SPDES Permit No. 0002275 Outfall 015 has improved with respect to both mercury and chlorinated benzenes, and there have been no SPDES permit exceedances of these constituents minimizing ongoing discharge of Site-related contaminants to Onondaga Lake.

1.3.2 West Wall IRM

The *Interim Remedial Measure Construction Completion Report West Wall Portion of the Wastebed B/Harbor Brook IRM* (Parsons 2014a) provides a detailed discussion of the construction of the subsurface sheet pile barrier wall (**Figure 6**) and groundwater collection trench from the eastern end of the Willis Avenue/Semet Tar Beds (Willis/Semet) IRM Barrier Wall to the western bank of Lower Harbor Brook. The West Wall IRM was designed and constructed to eliminate, to the extent practicable, the discharge of contaminated groundwater and NAPL (and collect NAPLs, as feasible) into Onondaga Lake and Harbor Brook. Grading and backfilling of portions of Wastebed B and Site restoration followed the installation of the barrier wall and collection trench. This IRM is also part of a larger hydraulic control system consisting of the Willis/Semet IRM (Parsons 2012) and the Wastebed B/Harbor Brook IRM (Parsons 2014b) to address area groundwater. The locations of the barrier walls and collection systems are presented on **Figure 1-3.** Approximately 37,250 cy of material removed during West Wall IRM construction was placed on Wastebed B and managed under the *Wastebed B/Harbor Brook Materials Management, Grading, and Disposal Plan* (OBG 2013a).

The *Source Control Summary for the Onondaga Lake Bottom Subsite* (Parsons and OBG 2013, 2014, 2017) documented observations on containment of groundwater provided by the barrier wall and containment system, and addressed concerns related to the potential recontamination of the Onondaga Lake remedy. Specifically, the documents indicated that the ability of the barrier wall and collection system to contain groundwater has been demonstrated for this IRM and that hydraulic control at the Site continues to be achieved. As such, the West Wall portion of the Wastebed B/Harbor Brook IRM addressed the corresponding IRM objectives listed above, with respect to groundwater and NAPL discharges to Onondaga Lake and Harbor Brook.

1.3.3 East Wall IRM

The *Interim Remedial Measure Construction Completion Report East Wall Portion of the Wastebed B/Harbor Brook IRM* (Parsons 2014b) provides a detailed discussion of the construction of the subsurface sheet pile barrier wall and groundwater collection trench from the eastern end of the West Wall, crossing Harbor Brook, and extending northeast along the lakeshore for approximately 1,150 ft. This will be referred to as an IRM throughout the document but is a "non-time-critical removal action under Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S.C. §§ 9601-9675 (CERCLA)" (NYSDEC and USEPA 2012). The East Wall IRM was designed and constructed to eliminate, to the extent practicable, the discharge of contaminated groundwater and NAPL (and collect NAPLs, as feasible) into Harbor Brook and Onondaga Lake. The locations of the barrier walls and collection systems are presented on **Figure 1-3.**

The East Wall IRM included the following components:

- Temporary re-routing of a section of Lower Harbor Brook including excavation of the new channel and backfilling of the former channel
- Replacement of a downstream culvert located in Harbor Brook
- Installation of the sheet pile barrier wall and groundwater collection system
- Grading and backfilling of portions of Wastebed B
- Site restoration (**Figure 7**).

The re-routed section of Lower Harbor Brook was temporary, and the final restoration of Lower Harbor Brook was included in the lake capping and dredging project and in accordance with the lake-wide plan for habitat restoration. This IRM is also part of a larger hydraulic control system consisting of the Willis/Semet IRM and the Wastebed B/Harbor Brook IRM to address area groundwater.

Figure 7: View of Lower Harbor Brook Restoration

In 2015, the East Wall Collection Trench Optimization was completed and included the following components:

- Grading and installation of a minimum 2-ft cover over 2.2 acres.
- Installation of approximately 870 linear ft of clay liner along the barrier wall extending from the barrier wall inland to the access pathway.
- Extension of the access pathway approximately 900 linear ft.
- Restoration of approximately 2.0 acres with topsoil, mulch, and seeding to establish grassland cover.
- Raised electrical utility man ways, piezometers, vaults, and cleanouts to the proposed grade.
- Installation of additional cleanouts on the groundwater collection trench force main.
- Installation of protection for the existing inclinometers on the barrier wall.

The *Source Control Summary for the Onondaga Lake Bottom Subsite* (Parsons and OBG 2013a, 2014, 2017) documented observations on containment of groundwater provided by the barrier wall and containment system, and addressed concerns related to the potential recontamination of the Onondaga Lake remedy. Specifically, the documents indicated that the ability of the barrier wall and collection system to contain groundwater has been demonstrated for this IRM and that hydraulic control at the Site continues to be achieved. As such, the East Wall portion of the Wastebed B/Harbor Brook IRM addressed the corresponding IRM objectives listed above, with respect to groundwater and NAPL discharges to Onondaga Lake and Harbor Brook. Continued O&M of the East Wall IRM is conducted pursuant to the *East Barrier Wall Interim Remedial Measure, Response Action Document* (NYSDEC and USEPA 2011).

1.3.4 Upper Harbor Brook IRM

The *Upper Harbor Brook IRM Construction Completion Report* (OBG 2014a) provides a detailed discussion of the efforts completed as the Upper Harbor Brook portion of the Wastebed B/Harbor Brook IRM. The Upper Harbor Brook IRM design included the following components and are presented in **Figure 1-3**.

- Installation of three groundwater collection trench sections adjacent to Harbor Brook for hydraulic control of impacted groundwater discharging to Harbor Brook.
- Excavation of sediments, installation of a geomembrane liner or concrete, and restoration of the substrate in open water areas OW-1, 2, 3, and 4 in Harbor Brook.
- Cleaning of Culvert 5 in Harbor Brook and two culverts in Railroad Ditch-1 and -2. Cleaning and sealing of Culvert-2, 3 (east and west), and 4 in Harbor Brook.
- Excavation of sediments from the I-690 Drainage Ditch, Penn-Can Property Drainage Ditch, Wastebed D/E Drainage Ditch, Railroad Ditch-1 and 2, and restoration of the ditch substrate.
- Installation of a geomembrane liner (**Figure 8**) and groundwater collection trench beneath the I-690 Drainage Ditch.
- Installation of 150 ft of geomembrane liner under the downstream section of the Wastebed D/E Drainage Ditch (starting at OW-3).
- Excavation of sediments from Penn-Can wetland areas WPC1, WPC2, and WPC3, with these areas not restored as wetlands but substrate was restored (**Figure 9**).
- Excavation of sediment and restoration of substrate in Railroad Area wetlands WRR1, WRR2, WRR3, WRR4, WRR5, and WL6, with WRR1, WRR2, WRR3, and WRR4 expanded to provide compensatory acreage for WPC1, WPC2, and WPC3 (**Figure 9**).
- Cleaning and televising of sections of the I-690 storm sewer conveyance system that discharge to the I-690 Drainage Ditch.
- Installation of a passive NAPL collection system in OW-1, 3, and 4.
- Approximately 40,000 cy of excavated material generated during construction of the Upper Harbor Brook IRM was placed on Wastebed B and managed under the *Wastebed B/Harbor Brook Materials Management, Grading, and Disposal Plan* (OBG 2013a).

Figure 8: Installation of Geomembrane Liner

Figure 9: Excavation and Restoration of Site Ditches

The Upper Harbor Brook IRM was designed and constructed to eliminate, to the extent practicable, the discharge of impacted groundwater and NAPL (and collect NAPLs, as feasible) into Harbor Brook and Onondaga Lake. The *Source Control Summary for the Onondaga Lake Bottom Subsite* (Parsons and OBG 2014, 2017) documented observations on containment of groundwater provided by the containment

system and addressed concerns related to the potential recontamination of the Onondaga Lake remedy. Specifically, the document indicates that the ability of the collection system to contain groundwater has been demonstrated for this IRM and that hydraulic control at the Site continues to be achieved. As such, the Upper Harbor Brook IRM addressed the corresponding IRM objectives listed above, with respect to groundwater and NAPL discharges to Onondaga Lake and Harbor Brook.

1.3.5 Outboard Area IRM

The Outboard Area IRM is a response action that was authorized by the NYSDEC and USEPA under the Wastebed B/Harbor Brook IRM as selected in the *Outboard Area Interim Remedial Measure, Response Action Document* (RAD, NYSDEC and USEPA 2012). This will be referred to as an IRM throughout the document but is a "non-time-critical removal action under CERCLA, 42 U.S.C. § 9601-9675".

The selected response action included the removal of contaminated soil and sediments and the placement of an isolation cap, which achieved final grades lower than the existing grade elevations to facilitate habitat restoration (**Figure 10**). Based on the anticipated cap thicknesses and target final grades for the western and eastern Outboard Areas, the majority of the excavation was conducted to depths typically ranging from 5 to 10 ft with additional hot spot excavation/dredging to a maximum depth of 15 ft of Outboard Area materials where concentrations of select contaminants exceed the hot-spot criteria developed for the Onondaga Lake remedy. The cap was designed to isolate contamination in remaining sediments and soils.

Figure 10: View of Onondaga Lake Outboard Area Excavation

Habitat restoration in the Outboard Area created emergent wetland areas and habitat that is more suitable for northern pike reproduction. The restoration design considered deeper pools for nursery habitat that coincide with the hot spot removal areas as a means of creating variable topography. As appropriate, additional fill materials were placed within the Outboard Area to achieve the final post-cap target grades.

A total of 229,500 cy of material was removed under the selected response action. Approximately 64,000 cy of dry material was relocated to an area inboard of the barrier wall and managed under the *Wastebed B/Harbor Brook Materials Management, Grading, and Disposal Plan* (OBG 2013a). The remaining 165,500 cy was managed with the dredged Onondaga Lake sediments at the Sediment Consolidation Area at Wastebed 13.

Capping of soil/sediment/fill materials left in-place for the purpose of isolating the remaining contamination, as part of the Onondaga Lake remedy, was completed in Fall 2016. Maintenance and monitoring of the Outboard Area IRM is included under the *Draft Onondaga Lake Maintenance and Monitoring Plan* (Parsons 2017). Based on the removal and capping of the Outboard Area, the analytical data for the remaining soil/sediment/fill materials has been excluded from the FS dataset (**Appendix A**).

1.3.6 Wastebed B/Harbor Brook Materials Management, Grading, and Disposal Plan

The *Wastebed B/Harbor Brook Materials Management, Grading, and Disposal Plan* (OBG 2013a) provides a detailed discussion of the procedures for handling materials during execution of the work at the Site. The procedures in this plan are also laid out to minimize contamination of clean materials or areas,

minimize recontamination of cleaned areas, minimize tracking of contaminated material to uncontaminated areas, minimize double handling of materials, and provide a plan to place materials in an efficient manner.

These excavated materials were placed on Wastebed B in designated placement areas (**Figure 1-3**) based on the source of the excavated material. Sources of excavated materials included the Upper Harbor Brook IRM construction (40,000 cy) and the West Wall and East Wall construction and Outboard Area excavation (102,750 cy). These placed materials and cover extend over a 12-acre area on Wastebed B. These materials are further evaluated in this FS.

Subsequent to final placement, these materials were graded in accordance with a contour plan that provided for aesthetics on-site and future use of the Site and covered with 2 ft of clean material and seeded with native plant species.

A field modification to the *Wastebed B/Harbor Brook Materials Management, Grading, and Disposal Plan* (OBG 2013a) was submitted to NYSDEC in a letter dated June 7, 2016 (OBG 2016a). The field modification proposed clearing, sub-grading and placement of 6 inches of material over a 3.4-acre area, of which, 1.2 acres would consist of designated tree areas (**Figure 1-3**).

Grading and vegetated cover installation activities continued in the 2016 construction season. Grading and cover installation activities were not conducted during the 2017 construction season. A Construction Completion Report will be prepared to document the materials management, grading and restoration efforts.

1.3.7 Material Staging and Support Areas

In addition to the IRM materials managed under the *Wastebed B/Harbor Brook Materials Management, Grading, and Disposal Plan* (OBG 2013a), material staging and support areas were established on the western portion of Wastebed B and a portion of the Penn-Can Property to support the Onondaga Lake dredging and capping efforts (attached **Figure 1-2** and **Figure 11**). Restoration and final cover thickness will be evaluated during Site remedial efforts. Existing cover thickness may be supplemented with additional cover material, as necessary, and incorporated into the final Site remedy for the purpose of maintaining Site grading, support of tree plantings, and protection of human health and the environment.

Figure 11: View of Vegetated Cover

1.3.8 Clean Fill Material Placed On-Site

Clean fill was brought to the Site as cover material for the excavated areas of the West Wall IRM, East Wall IRM, Upper Harbor Brook IRM, and Outboard Area IRM and surface areas associated with the *Wastebed B/Harbor Brook Materials Management, Grading, and Disposal Plan* (OBG 2013a, 2016), and Onondaga Lake remedy support area (**Figures 1-2 and 1-3**). The clean fill materials were analyzed for Part 375 parameters prior to placement on-site.

1.3.9 IRM Considerations for the FS

As described above, several IRMs have been implemented at the Site and address media at the Site. Specifically, Site DNAPL shallow and intermediate groundwater discharges to Onondaga lake and Harbor Brook are being addressed by barrier walls, a liner in Harbor Brook, and groundwater collection systems. These systems have been implemented to mitigate potential shallow and intermediate

groundwater and DNAPL discharge to Onondaga Lake and Harbor Brook. Subsequent monitoring and observations have demonstrated that these potential discharges of shallow and intermediate groundwater and DNAPL have been mitigated (Parsons and OBG 2013, 2014, 2017) and address IRM objectives related to discharges of groundwater and NAPL to Onondaga Lake. Consequently, it is anticipated that groundwater will continue to be addressed through the operation of these IRMs, and these IRMs will be considered as a part of each remedial alternative being developed and evaluated for this Site. **Table 1-1** provides a summary of each IRM as it relates to media addressed in the FS.

2. SITE CHARACTERIZATION

This section presents the Site conditions as they relate to this FS. As described in **Section 1**, this FS addresses soil/fill material and groundwater. As summarized below, Site conditions have been evaluated during a series of investigations that are described in detail in the *Revised RI Report* (OBG 2015a).

2.1 PREVIOUS INVESTIGATIONS

Together with historical usage of the Site, previous geologic and hydrogeologic studies provided the framework for the selection of sampling locations and the initial analytical parameters for samples collected during the RI. Additional studies at the Site include:

- Monitoring wells installed during the Hydrogeologic Assessment of the Allied Wastebeds (B&B 1989)
- Monitoring well installation and hydropunch samples collected during the Willis Avenue RI (OBG 2014c)
- LEF sediment sampling performed by PTI Environmental Services as part of the Onondaga Lake RI (PTI Environmental Services 1994)
- Harbor Brook surface water and sediment sampling performed by NYSDEC in November 1996 and October 1997
- Harbor Brook surface water and sediment sampling by OBG in November 1996
- East Flume/DSAs sampling during the Willis Avenue RI (OBG 2014c)
- Harbor Brook seep sample (OBG 2014c)
- Harbor Brook Sediment IRM Investigation [Blasland, Bouck & Lee (BBL) 2001]
- Onondaga Lake RI/FS Phase 2A Investigation (Exponent 2001)
- Onondaga Lake Wetland/Floodplain Assessment Final Report (OBG and Parsons 2010)
- Onondaga Wetlands Subsurface Investigation (C&S Companies 2001)

Description of these studies are presented in **Section 1.5** of the *Revised RI Report* (OBG 2015a). A Site History Report containing previous study analytical data was submitted to NYSDEC on May 26, 2000 (Honeywell 2000), and a letter dated January 9, 2004 was submitted by Honeywell to NYSDEC outlining relevant documents that have been submitted to the NYSDEC subsequent to May 26, 2000 (Honeywell 2004).

2.2 REMEDIAL INVESTIGATION

The RI was performed pursuant to an ACO (D-7-0001-00-02) between the NYSDEC and Honeywell dated April 10, 2000 (NYSDEC 2000), and in accordance with the *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA* (USEPA 1988) and Part 300.68 of the *National Contingency Plan*, CERCLA as amended by the Superfund Amendments and Reauthorization Act of 1986.

The data generated during the RI were used to evaluate the nature and extent of chemical parameters of interest (CPOIs) and identify potential source areas. This information was used to develop the IRMs. The RI information was also used in the development of the alternatives in this FS.

The evaluation of the analytical data and field observations from the RI and Site-related IRMs indicates that the sources of impacted Site media are related to historical activities at the Penn-Can Property, Willis Avenue Chlorobenzene Site, historic East Flume discharges, Solvay waste disposal, the likely co-disposal of coke plant waste products; the placement of fill materials in several areas (AOS #1, DSAs #1

and #2, and wetland area WL2) at the Site; and undigested sewage sludge placed on the eastern portion of Wastebed B by Onondaga County and the City of Syracuse during the late 1950s and early 1960s.

As presented in the *Revised RI Report*, the conceptual site model is presented on **Figures 2-1 and 2-2**. Based on the Site geologic and hydrogeologic data collected during previous investigations, the following conclusions have been developed:

- The Site geology consists of fill, Solvay waste, marl, silt and clay, silt and fine-grained sand/basal sand and gravel, till, and bedrock.
  - The marl layer pinches out to the south away from the lake.
  - The silt and clay confining unit pinches out beneath the Penn-Can Property, which provided a pathway for the downward migration of DNAPL.
- The Site has three distinct groundwater zones including:
  - a shallow zone that includes the fill layer and underlying Solvay waste (when present);
  - an intermediate zone within the marl layer; and
  - a deep zone that encompasses the silt and fine grained sand deposits and the basal sand and gravel deposits (when present) located below the silt and clay confining unit.
- Shallow and intermediate groundwater generally flow toward, and discharges into Onondaga Lake and Harbor Brook.
- A small component of shallow and intermediate groundwater flows radially outward and discharges to surface water bodies (on-site drainage ditches and Harbor Brook and, historically, to the East Flume).
- There is an upward vertical hydraulic gradient on the Lakeshore Area from the deep groundwater to the intermediate groundwater and Onondaga Lake; however, due to the low hydraulic conductivity of the silt and clay confining layer above the deep groundwater; there is little deep groundwater movement vertically through this confining layer to intermediate groundwater and Onondaga Lake.
- Deep groundwater under Onondaga Lake and under portions of the Site contain a naturally occurring halite brine.
- CPOIs at the Site include benzene, toluene, ethylbenzene, xylene (BTEX), chlorinated benzenes, naphthalene and assorted polycyclic aromatic hydrocarbons (PAHs), phenolic compounds, polychlorinated biphenyls (PCBs), polychlorinated dioxins and furans (PCDD/PCDFs), and inorganics.
  - CPOIs in soil/fill material vary between the sub-areas.
    - Chlorinated benzenes and mercury tend to be more prevalent on the western portion of the Lakeshore Area near the former East Flume.
    - Chlorinated benzenes are more prevalent in soils impacted by historic East Flume discharges.
    - Naphthalene and assorted PAHs tend to be more prevalent on the eastern portion of the Lakeshore Area, AOS #1, and the Penn-Can Property than other portions of the Site.
  - CPOIs are randomly distributed within the materials deposited in areas DSA #1, DSA #2, wetland areas along the lakeshore (WL2 through WL4), and AOS #1.

  - CPOIs in shallow and intermediate groundwater were similar throughout the Site, with dominant CPOIs of BTEX, PAHs and naphthalene, phenolic compounds, and inorganics; chlorinated benzenes were also observed in Lakeshore Area shallow and intermediate groundwater wells.

- The nature and extent of DNAPL and stained soils at the Site is defined.
  - The source of the coal tar-like DNAPL is related to historic activities on the Penn-Can Property (Barrett Paving) and occurs in the fill, marl and deep (coarse sand above the till) units on the Penn-Can Property, the marl unit on the eastern portion of the Lakeshore Area, the eastern portion of the Railroad Area, beneath Harbor Brook, and the western portion of AOS #1.
  - The source of the chlorobenzene DNAPL in HB-SB-01 on the western portion of the Lakeshore Area is related to operations at the former Willis Avenue Chlorobenzene Plant and historic East Flume discharges.
  - Stained soils are observed in DSA #1, DSA #2, wetland areas WL2 through WL4, and AOS #1, which are most likely related to historic discharges from the former East Flume associated with the In-lake Waste Deposit (ILWD).

2.3 NATURE AND EXTENT OF CONTAMINATION

This section provides a summary of the nature and extent of contamination at the Site. The Wastebed B/Harbor Brook subsite areas were used for the following purposes:

- Lakeshore Area: Wastebed B; former East Flume to conduct a combined waste stream to the lake; DSAs for placement of dredge spoils from the UEF and Onondaga Lake; and stormwater drainage to Harbor Brook from the I-690 storm sewers.
- Penn-Can Property: Production and storage of asphalt products.
- Railroad Area: Historical uses are not known.
- AOS #1: Placement of fill material and depositional area for Onondaga Lake and Harbor Brook.
- AOS #2: Wastebed D and E.

Based on RI data, the CPOIs identified for the Site include BTEX compounds, chlorinated benzenes, naphthalene and assorted PAHs, phenolic compounds, PCBs, PCDD/PCDFs, and inorganics. The nature and extent of these CPOIs are described for each of the Site media are provided in the *Revised RI Report* (OBG 2015a).

As described in **Section 1.3** and summarized in **Table 1-1**, a number of IRMs have been conducted at the Site. As a result of remedial activities, the extent of the Site, nature and extent of contamination, and on-Site cover materials have been modified since investigation activities have been completed.

- The Outboard Area remedy was selected in the Outboard Area RAD. Excavation was performed in these areas and the remaining Outboard Area material was capped to isolate the contamination; therefore, this analytical data has been excluded from the Site dataset and the Outboard Area will not be further evaluated in this FS.
- The Onondaga Lake remedy support areas have placed cover material as shown on **Figure 1-2**, and therefore historic surface soil/fill material samples have become subsurface soil/fill material. Existing Onondaga Lake remedy support area covers will be further evaluated in this FS.
- For the West Wall IRM and East Wall IRM, the excavated material associated with the barrier walls and groundwater collection systems was replaced with clean fill. Therefore, soil data within these removal depths was removed from the Site dataset.

- For the Upper Harbor Brook IRM, soil/sediment/fill material samples areas that were excavated have been removed from the dataset, and the subsurface sediments that were covered/capped are now subsurface soils.
- Under the *Wastebed B/Harbor Brook Materials Management, Grading, and Disposal Plan* (OBG 2013a, 2016):
  - Excavated material from the West Wall IRM, East Wall IRM, and Upper Harbor Brook IRM, as well as some excavated material from the Outboard Area has been staged on Wastebed B (**Figure 1-3**), and this data is now included as subsurface soil/fill material in the Site dataset. The nature of these materials is discussed below.
  - Surface soil/fill material samples below this placed material have become subsurface soil/fill material.
- Site access roads are constructed with 1 to 1.5 ft of cover material, and surface soil/fill material samples between 1 and 2 ft bgs are now subsurface soil/fill material samples. Site access road covers will be evaluated further in this FS.
- A portion of the Penn-Can Property (former Tonodo Property) was covered with fill material. The placement of this fill covered surface soil sample locations, and these data are now considered subsurface soil data.
- A portion of AOS #1 was covered in 2015 by a response action with at least 2 ft of clean fill material (**Figure 1-3**), and surface soil samples within this area have become subsurface soils.

These changes have modified the use of affected samples and analytical data from the discussion of nature and extent presented in the *Revised RI Report* (OBG 2015a). **Figure 1-3** depicts the IRMs and physical changes to the Site. **Appendix A** identifies the change in soil/sediment/fill material sample locations and data usage based on IRM and response action activities. A discussion of these Site modifications and the post-IRM nature and extent of contamination to be addressed in the FS is reflected below.

The reasonably anticipated future land use for the Site is industrial or commercial (which includes passive recreational use). Therefore, for the purpose of identifying areas to be addressed in this FS and to support the development and evaluation of potential remedial alternatives, analytical results for soil/fill material were compared to Title 6 of the New York Codes, Rules, and Regulation (6 NYCRR) Part 375 Soil Cleanup Objectives (SCOs) for Industrial and Commercial Use. For the purposes of evaluating a pre-disposal conditions alternative, analytical results for soil/fill material were also compared to SCOs for Unrestricted Use. Consistent with applicable classifications, Class GA groundwater standards or guidance values (SGVs) were compared to groundwater analytical results. Due to the presence of multiple classifications of surface waters present on Site, the most conservative classification – Class C surface water SGVs – were compared to surface water analytical results.

Constituents that exceed these criteria are considered constituents of concern (COCs) for the FS. Based on these considerations, the post-IRM nature and extent of contamination discussion below is presented in the context of these criteria.

2.3.1 Surface Soil/Fill Material

Surface soil/fill material samples were collected as part of the Preliminary Site Assessment (PSA), RI, Supplemental RI, and IRM-related investigations and are considered any sample collected between 0 and 2 ft below ground surface (bgs). The analytical results were compared to the Part 375 SCOs for Commercial, Industrial, and Unrestricted Uses.

Lakeshore Area

Based on the Site data, volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides, PCBs, and metals were detected in the surface soil/fill material on the Lakeshore Area.

The estimated area of surface soil/fill material exceeding the Part 375 Industrial, Commercial, or Unrestricted Use SCOs extends over the majority of the 54.2 acres of the pre-IRMs Lakeshore Area. The area to be evaluated in the FS and discussed below for COCs was reduced to 30.0 acres. This reduction is due to implementation of the West Wall IRM, East Wall IRM, Upper Harbor Brook IRM, Outboard Area IRM (16.2 acres within the Outboard Area), the East Flume IRM (3 acres), and the *Wastebed B/Harbor Brook Materials Management, Grading, and Disposal Plan* (12 acres) (OBG 2013a, 2016; discussed above in **Section 1.3**), which have collectively resulted in the removal of material and/or placement of a 1 to 2 ft layer of clean fill over the balance of the Lakeshore Area.

The COCs exceeding the Part 375 Commercial Use SCOs predominantly included benzo(a)pyrene, dibenzo(a,h)anthracene, Aroclor 1260, barium, cadmium, copper, and mercury, while COCs exceeding the Part 375 Industrial Use SCOs were predominantly due to benzo(a)pyrene, cadmium, and mercury. COCs exceeding the Part 375 Unrestricted Use SCOs included acetone, chlorinated benzenes, PAHs, Aroclor 1260, and metals. These COCs were detected in samples throughout the Lakeshore Area including along the post-IRM lakeshore near the former East Flume and wetland area WL2. These were likely related to the historic East Flume discharges and placement of fill material in wetland area WL2 and Wastebed B; however, the source of the PCBs is unknown.

Penn-Can Property

An investigation was also conducted for the Tonodo Property (Penn-Can Property) in 2013 as part of Honeywell's due diligence investigation of the property prior to its purchase. This investigation was conducted because subsequent to the completion of the Wastebed B/Harbor RI field program, and prior to Honeywell purchasing the property, fill material was imported to the property (*i.e.,* Tonodo Property Fill, **Figure 1-2**). Surface soil samples were collected from this fill material and included in the discussion below for the Penn-Can Property. The placement of this fill material has covered PSA and RI surface soil sample locations, and these sample data are now considered subsurface soil data (**Appendix A**) and are discussed below.

Based on the Site data, VOCs, SVOCs, pesticides, PCBs, and metals were detected in the surface soil/fill material on the Penn-Can Property.

The estimated area of surface soil/fill material exceeding the Part 375 Industrial, Commercial, or Unrestricted Use SCOs extends over the majority of the 13.5 acres of the pre-IRM Penn-Can Property. The Upper Harbor Brook IRM (discussed above in **Section 1.3**) addressed particular areas of the surface soils/surface sediments/fill material, which reduced the area that will be evaluated in the FS and discussed below for COCs to 12.7 acres.

The COCs exceeding the Part 375 Industrial and Commercial Use SCOs predominantly included arsenic, mercury, and PAHs, with the elevated PAHs distributed across the Penn-Can Property and maximum concentrations at HB-HB-17D (near the former Barrett facility) and HB-PSD-02 (eastern end of this area). For Part 375 Unrestricted Use SCOs, COC exceedances predominantly included arsenic, lead, mercury, and assorted PAHs but did include some PCBs and pesticides. These COCs were distributed throughout the Penn-Can Property.

Railroad Area

Based on the Site data, VOCs, SVOCs, pesticides, PCBs, and metals were detected in the surface soil/fill material on the Railroad Area.

The estimated area of surface soil/fill material exceeding the Part 375 Industrial, Commercial, or Unrestricted Use SCOs extends over the majority of the 13.9 acres of the pre-IRM Railroad Area. The Upper Harbor Brook IRM (discussed above in **Section 1.3**) addressed some areas of the surface soils/surface sediments/fill material, which reduced the area evaluated in the FS and discussed for COCs below to 11.4 acres.

The COC exceeding its Part 375 Commercial SCO is barium, with no COCs exceeding Part 375 Industrial SCOs. Assorted PAHs and metals were regularly detected throughout the Railroad Area. The COCs exceeding the Part 375 Unrestricted Use SCOs included barium, lead, mercury, acetone, and assorted PAHs. These COCs were present in the western half of the Railroad Area.

AOS #1

Based on the Site data, VOCs, SVOCs, pesticides, PCBs, PCDD/Fs, and metals were detected in the surface soil/fill material on AOS #1.

The estimated area of surface soil/fill material exceeding the Part 375 Industrial, Commercial, or Unrestricted Use SCOs extends over the majority of the 8.4 acres of pre-IRMs AOS #1. The area that will be evaluated in the FS and discussed below for COCs was reduced to 3.6 acres due to the Onondaga Lake Remedy, East Wall IRM, Outboard Area IRM, and 2015 response action under the Wastebed B/Harbor Brook IRM (discussed above in **Section 1.3**).

The COCs exceeding the Part 375 Industrial and Commercial Use SCOs predominantly included mercury and PAHs, with chlorobenzene and assorted PAHs, PCBs, and metals regularly detected in the northeastern end of AOS #1. For Part 375 Unrestricted Use SCOs, the COC exceedances predominantly included chlorinated benzenes, PAHs, Aroclor 1248 and 1260, and assorted metals (including mercury). These COCs were present in the northeastern end of AOS #1.

AOS #2

Based on the Site data, VOCs, SVOCs, and metals were detected in the surface soil/fill material on AOS #2. Few COCs exceeded the Part 375 Industrial and Commercial Use SCOs and included PAHs (benzo(a)anthracene, benzo(a)pyrene, and dibenzo(a,h)anthracene). Assorted PAHs and metals were regularly detected in surface soil/fill material at HB-RISB-10 on AOS #2. Additionally, acetone, assorted PAHs, lead, and mercury exceeded the Part 375 Unrestricted Use SCOs. Few samples were collected within AOS #2; therefore, the exceedances and elevated concentrations are considered indicative of AOS #2.

The estimated area of surface soil/fill material exceeding the Part 375 Industrial, Commercial, or Unrestricted Use SCOs extends over the majority of the 2.2 acres of AOS #2. A portion of the AOS #2 surface soil/fill material was addressed in the vicinity of the Wastebed D/E Drainage Ditch as part of the Upper Harbor Brook portion of the Wastebed B/Harbor Brook IRM, reducing the area to be considered in this FS to 2.1 acres.

2.3.2 Subsurface Soil/Fill Material

Subsurface soil/fill material samples were collected as part of the PSA, RI, Supplemental RI, and IRM-related investigations and are considered any sample collected from depths greater than 2 ft bgs. The analytical results were compared to the Part 375 SCOs for Commercial, Industrial, and Unrestricted Uses.

Lakeshore Area

Based on the Site data, VOCs, SVOCs, pesticides, PCBs, and metals were detected in the subsurface soil/fill material on the Lakeshore Area. The estimated area of subsurface soil/fill material exceeding the Part 375 Industrial, Commercial, or Unrestricted Use SCOs extends over the majority of the 54.2 acres of the pre-IRMs Lakeshore Area. Due to the Onondaga Lake Remedy, West Wall IRM, East Wall IRM, Upper

Harbor Brook IRM, and Outboard Area IRM (9.2 acres within the Outboard Area, discussed above in **Section 1.3**), the area to be evaluated in the FS and discussed below for COCs was reduced to 45.0 acres. The subsurface soil/fill material now includes samples collected below the former East Flume and former Harbor Brook channel.

The COCs exceeding the Part 375 Commercial and Industrial Use SCOs predominantly included benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenzo(a,h)anthracene, arsenic, barium, Aroclor 1260, and mercury. While these COCs were detected in samples throughout the Lakeshore Area, BTEX, chlorinated benzenes, and PAHs were typically higher near DSA #1 and the eastern portion (former Harbor Brook flowpath and wetland area WL2). These were likely related to the historic East Flume discharges and placement of fill material in wetland area WL2 and Wastebed B. In the eastern portion of the Lakeshore Area, BTEX compounds, chlorinated benzenes, and PAHs were observed at elevated concentrations and are likely due to the previous activities at the Penn-Can Property. The COCs exceeding the Part 375 Unrestricted Use SCOs included chlorinated benzenes, BTEX, PAHs, phenolic compounds, pesticides, PCBs, and metals.

As described above, soils and sediments were excavated during the West Wall IRM, East Wall IRM, Upper Harbor Brook IRM, and Outboard Area IRM. Some of these materials were placed on Wastebed B within the Lakeshore Area and managed under the *Wastebed B/Harbor Brook Materials Management, Grading, and Disposal Plan* (OBG 2013a, 2016). This data is now included as subsurface soil/fill material within the Site dataset.

Based on the data, VOCs, SVOCs, pesticides, PCBs, PCDD/Fs, and metals were detected in the Wastebed B staged materials. The COCs exceeding the Part 375 Commercial and Industrial SCOs predominantly included benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene, Aroclor 1260, arsenic, and mercury. For Part 375 Unrestricted SCOs, the COC exceedances included chlorinated benzenes, BTEX compounds, PAHs, phenolic compounds, and assorted metals, with some pesticide and PCB exceedances.

Penn-Can Property

Based on the Site data, VOCs, SVOCs, pesticides, PCBs, and metals were detected in the subsurface soil/fill material on the Penn-Can Property.

The COCs exceeding the Part 375 Industrial and Commercial Use SCOs predominantly included benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and naphthalene, with multiple exceedances observed for benzene and total xylenes, assorted PAHs, and arsenic. The elevated PAHs are distributed across the Penn-Can Property between HB-HB-11I (near the former Barrett Paving facility) and HB-TP-32 (eastern end of this area) along the northern half of this area. These are likely related to the previous activities at the Penn-Can Property. For Part 375 Unrestricted Use SCO, the COCs exceeding the Part 375 Unrestricted Use SCOs were predominantly BTEX compounds, PAHs, assorted metals, and also included some pesticides and PCBs.

The estimated area of subsurface soil/fill material exceeding the Part 375 Industrial, Commercial, or Unrestricted Use SCOs extends over the majority of the 13.5 acres of the Penn-Can Property. Penn-Can Property subsurface soil/fill material area was not reduced as a result of IRM implementation.

Railroad Area

Based on the Site data, VOCs, SVOCs, pesticides, PCB (Aroclor 1260), and metals were detected in the subsurface soil/fill material on the Railroad Area. There were few COCs exceeding the Part 375 Industrial and Commercial Use SCOs, and these included benzo(a)anthracene, benzo(a)pyrene, and arsenic. BTEX compounds, assorted PAHs, and metals were regularly detected throughout the Railroad Area. The highest BTEX and PAH concentrations were observed in the eastern end of this area, which is likely related to the previous activities at the Penn-Can Property. The COCs exceeding the Part 375

Unrestricted Use SCOs included BTEX compounds, assorted PAHs, three pesticides, and assorted metals. These COCs were present throughout Railroad Area.

The estimated area of subsurface soil/fill material exceeding the Part 375 Industrial, Commercial, or Unrestricted Use SCOs extends over the majority of the 13.9 acres of the Railroad Area. Railroad Area subsurface soil/fill material area was not reduced as a result of IRM implementation.

AOS #1

Based on the Site data, VOCs, SVOCs, PCBs, and metals were detected in the subsurface soil/fill material on AOS #1.

The estimated area of subsurface soil/fill material exceeding the Part 375 Industrial, Commercial, or Unrestricted Use SCOs extends over the majority of the 8.4 acres of AOS #1. Due to the Onondaga Lake Remedy, East Wall IRM, and Outboard Area IRM (discussed above in **Section 1.3**), the area that will be evaluated in the FS covers 3.6 acres.

The COCs exceeding the Part 375 Industrial and Commercial Use SCOs predominantly included mercury and PAHs. Since AOS #1 is situated adjacent to the ILWD in Onondaga Lake, it is likely this area has impacts related to the former East Flume discharges to the lake; AOS #1 is also believed to have received fill material of unknown nature. The COCs exceeding the Part 375 Unrestricted Use SCOs were predominantly PAHs and assorted metals (including mercury), with some exceedances for BTEX compounds, PCBs, and chlorinated benzenes.

AOS #2

Based on the Site data, VOCs, SVOCs, pesticide (4,4-DDE), and metals were detected in the subsurface soil/fill material on AOS #2. However, only acetone exceeded its Part 375 Unrestricted Use SCO, and there were no exceedances of the Part 375 Commercial or Industrial Use SCOs.

The estimated area of subsurface soil/fill material exceeding the Part 375 Unrestricted Use SCOs extends over the majority of the 2.2 acres of AOS #2. AOS #2 subsurface soil/fill material area was not reduced as a result of IRM implementation.

2.3.3 Groundwater

Groundwater discharges to Onondaga Lake, Harbor Brook, East Flume, and on-site drainage ditches have been addressed by IRMs (discussed in **Section 1.3**). Groundwater quality was evaluated for the Site during the PSA, RI, Supplemental RI, and IRM-related investigations from the shallow and intermediate groundwater zones. The analytical data were compared to the NYS Class GA groundwater SGVs.

Shallow and Intermediate Groundwater

Lakeshore Area

Based on Site data, VOCs, SVOCs, and inorganics were detected in Lakeshore Area shallow and intermediate groundwater.

The COCs detected and exceeding the Class GA SGVs for shallow and intermediate groundwater included:

- VOCs: BTEX compounds, chlorinated benzenes, acetone, and styrene
- SVOCs: chlorinated benzenes, PAHs, and phenolic compounds
- Inorganics: sodium, iron, chloride, mercury, and magnesium

Elevated VOC and SVOC concentrations (especially BTEX compounds, PAHs, and phenolic compounds) in shallow groundwater were observed in the eastern portion of the Lakeshore Area, downgradient of the Penn-Can Property, and in the western portion along the former East Flume and in DSA #2. These are related to either the previous activities at the Penn-Can Property or sediments from the former East Flume and Onondaga Lake (western portion). The elevated concentrations of mercury in shallow groundwater occurred along the former East Flume and are related to its sediments and discharges. The other inorganic compounds (*i.e.*, sodium, iron, magnesium, etc.) are either related to Solvay waste or the native halite brine.

For the intermediate groundwater, BTEX compounds, PAHs, and phenolics were highest downgradient of the Penn-Can Property, while chlorinated benzenes were highest near the former East Flume. Inorganic compounds were variable over the entire area.

As described in **Section 1.3**, the shallow and intermediate groundwater are being addressed by the barrier walls and/or collection systems installed as part of the West Wall IRM, East Wall IRM, and Upper Harbor Brook IRM. The Outboard Area IRM remediated the portion of the Lakeshore Area outboard of the West Wall IRM and East Wall IRM barrier walls (Outboard Area). As part of this IRM, an isolation cap was placed over the remaining Outboard Area soil/sediment.

Penn-Can Property

The COCs detected and exceeding the Class GA SGVs for shallow and intermediate groundwater included:

- VOCs: BTEX compounds
- SVOCs: PAHs and phenolic compounds
- Inorganics: sodium, iron, manganese, chromium, and lead

Elevated VOC and SVOC concentrations (especially BTEX compounds, PAHs, and phenolic compounds) in shallow and intermediate groundwater were observed in the eastern half of the Penn-Can Property, with the highest concentrations observed in the intermediate groundwater. These are related to the previous operations associated with the Barrett Paving facility on-site.

As described in **Section 1.3**, the shallow and intermediate groundwater are being addressed by the barrier walls and/or collection systems installed as part of the West Wall IRM, East Wall IRM, and Upper Harbor Brook IRM.

Railroad Area

The COCs detected and exceeding the Class GA SGVs for shallow and intermediate groundwater included:

- VOCs: acetone and benzene (shallow); BTEX compounds and styrene (intermediate)
- SVOCs: bis(2-ethylhexyl)phthalate (BEHP) and naphthalene (shallow); phenolic compounds and PAHs (Intermediate)
- Inorganics: sodium, iron, chloride, and magnesium

Few VOC and SVOC COCs exceeded their Class GA SGVs in the shallow groundwater, but the intermediate groundwater in the eastern end (only sample location) had VOC and SVOC concentrations and exceedances that were similar to intermediate groundwater on the Penn-Can Property. These COCs are likely related to previous activities at the Penn-Can Property. As described in **Section 1.3**, the shallow and intermediate groundwater are being addressed by the barrier walls and/or collection systems installed as part of the West Wall IRM, East Wall IRM, and Upper Harbor Brook IRM.

AOS #1

The COCs detected and exceeding the Class GA SGVs for shallow and intermediate groundwater included:

- VOCs: benzene and toluene (shallow); acetone and chloroethane (intermediate)
- SVOCs: phenolic compounds and naphthalene
- Inorganics: chloride, sodium, iron, manganese, and barium

Elevated COC concentrations and exceedances were observed in the Outboard Area and inboard of the barrier wall, with variable distribution. These groundwater zones were likely due to impacted sediments deposition from historical former East Flume discharges and Harbor Brook discharges. Additionally, the nature of the fill material in AOS #1 is unknown.

As described in **Section 1.3**, the shallow and intermediate groundwater are being addressed by the barrier walls and/or collection systems installed as part of the East Wall IRM and Upper Harbor Brook IRM. The Outboard Area IRM remediated the portion of AOS #1 outboard of the East Wall IRM barrier wall (Outboard Area). As part of this IRM, an isolation layer was placed over the remaining Outboard Area soil/sediment.

AOS #2

Intermediate groundwater at AOS #2 [only one sample location on-site (northern end)] had similar COCs exceeding the Class GA SGVs as the eastern corner of the Railroad Area. These included BTEX compounds, naphthalene, and inorganics (*i.e.*, chloride, iron, manganese, sodium, etc.). The organics are likely related to previous activities at the Penn-Can Property, while the inorganics are likely related to Solvay waste or native brine. The intermediate groundwater from AOS #2 is being addressed by the Upper Harbor Brook IRM collection system.

2.3.4 Surface Water

Surface waters that discharge to Onondaga Lake from Harbor Brook and East Flume, as well as the on-site drainage ditches, have been addressed by IRMs (discussed in **Section 1.3**). Surface water quality was evaluated for the Site during the PSA, RI, Supplemental RI, and IRM-related investigations from the on-site drainage ditches, East Flume, and Harbor Brook. These analytical data were compared to the NYS Class C surface water SGVs, with the exception of the East Flume.

Lakeshore Area - East Flume

The former East Flume received storm water and was sampled under a SPDES program. The data for this program was provided in the *Revised RI Report* (OBG 2015a). Under the West Wall IRM, East Flume IRM, and Outboard Area IRM, this waterway was abandoned and either covered or removed, and no longer exists on-site.

Lakeshore Area - I-690 Drainage Ditch

Based on Site data, VOCs, SVOCs, one pesticide, and inorganics were detected in the Lakeshore Area I-690 Drainage Ditch surface water. Elevated COC concentrations and Class C SGV exceedances were observed in the I-690 Drainage Ditch surface water included BTEX compounds, PAHs, phenol, 4,4'-dichlorodiphenyldichloeoethane (DDD), cyanide, and aluminum. The surface water impacts have been addressed by the sediment removal and lining installed as part of the Upper Harbor Brook IRM. After completion of the Upper Harbor Brook IRM, surface water samples have been collected annually in the I-690 Drainage Ditch as part of the Performance Verification program. Surface water data for these events demonstrated that surface water impacts have been addressed by the Upper Harbor Brook IRM sediment removal and lining, as documented in the *Upper Harbor Brook 2014 Annual Report* (OBG

2015b), *Upper Harbor Brook 2015 Annual Report* (OBG 2016b), and *Upper Harbor Brook 2016 Annual Report* (OBG 2017).

Potential impacts to the I-690 Drainage Ditch remain as a result of I-690 storm water discharges to the Drainage Ditch.

Penn-Can Property

Based on Site data, VOCs, SVOCs, and inorganics were detected in the Penn-Can Property Drainage Ditch surface water. In the drainage ditch adjacent to the CSX mainline on the Penn-Can Property, there were few VOC and SVOC COCs that exceeded the Class C SGVs and included naphthalene and assorted PAHs. Inorganic COCs that exceeded the SGVs included iron, cyanide, and aluminum. These COCs are likely related to runoff from the adjacent Penn-Can Property and radial shallow groundwater flow. The surface water impacts have been addressed by the sediment removal and liner installed as part of the Upper Harbor Brook IRM. After completion of the Upper Harbor Brook IRM, surface water samples have been collected annually in the Penn-Can Property Drainage Ditch as part of the Performance Verification program. Surface water data for these events are provided in the *Upper Harbor Brook 2014 Annual Report* (OBG 2015b), *Upper Harbor Brook 2015 Annual Report* (OBG 2016b), and *Upper Harbor Brook 2016 Annual Report* (OBG 2017).

Railroad Area

Based on Site data, VOCs, SVOCs, and inorganics were detected in the Railroad Area Drainage Ditch surface water. In the two drainage ditches on the Railroad Area, there were few SVOC COCs that exceeded the Class C SGVs, no VOC COC exceedances, and included one exceedance each for benzo(a)anthracene, benzo(a)pyrene, and BEHP. Inorganic COCs that exceeded the SGVs included iron, cyanide, and aluminum. These COCs are likely related to sediments in the ditches, as well as either runoff from the Railroad Area and/or runoff and radial shallow groundwater flow. The surface water impacts have been addressed by the sediment removal and liner installed as part of the Upper Harbor Brook IRM. After completion of the Upper Harbor Brook IRM, surface water samples have been collected annually in the two ditches on the Railroad Area as part of the Performance Verification program. Surface water data for these events are provided in the *Upper Harbor Brook 2014 Annual Report* (OBG 2015b), *Upper Harbor Brook 2015 Annual Report* (OBG 2016b), and *Upper Harbor Brook 2016 Annual Report* (OBG 2017).

Harbor Brook

Based on Site data, VOCs, SVOCs, and inorganics were detected in the Harbor Brook surface water. The VOC and SVOC COC exceedances observed in the Harbor Brook surface water included naphthalene, assorted PAHs, as well as aluminum and iron for inorganic COCs. These are likely due to Harbor Brook sediment, on-site drainage ditches discharging into the brook, groundwater interaction with Harbor Brook, and upstream inputs. The surface water impacts have been addressed by the sediment removal and lining installed as part of the Upper Harbor Brook IRM. Potential impacts to Harbor Brook remain as a result of upstream sources. After completion of the Upper Harbor Brook IRM, surface water samples have been collected annually in three open water areas or Harbor Brook (OW-01, OW-03, and OW-04), as part of the Performance Verification program. Surface water data for these events are provided in the *Upper Harbor Brook 2014 Annual Report* (OBG 2015b), *Upper Harbor Brook 2015 Annual Report* (OBG 2016b), and *Upper Harbor Brook 2016 Annual Report* (OBG 2017).

2.3.5 Sediment

Sediments in waterbodies that discharge to Onondaga Lake (Harbor Brook and East Flume), as well as the on-site drainage ditches and wetland areas, have been addressed by IRMs (discussed in **Section 1.3**). The IRMs addressed the sediments by removal and placement of cover material and/or isolation layer or placement of a cover and/or isolation layer.

2.3.6 DNAPL and Stained Soils

DNAPL and stained soils were encountered in soil borings and test pits advanced during the PSA, RI, Harbor Brook Sediment IRM (BBL 2001), I-690 Limited Investigation, Supplemental RI, and Wastebed B/Harbor Brook IRM. In general, there are six areas of DNAPL, DNAPL-stained soils, or other visibly contaminated materials that were encountered on the Site. Potential migration of this DNAPL has been addressed by IRMs, as discussed in **Section 1.3**. Some of these materials may exhibit characteristics of principal threat waste[2]. These areas are discussed briefly below and in depth in **Section 4.11** of the *Revised RI Report* (OBG 2015a).

Coal tar-like DNAPL associated with the Penn-Can Property

The coal tar-like DNAPL is found primarily on the Penn-Can Property and downgradient on Wastebed B. To a lesser extent it is found on the Railroad Area, AOS #2, beneath Harbor Brook, and in the western portion of AOS #1. This DNAPL has a naphthalene chemical signature, and its physical characteristics and chemistry are provided on **Tables 324 through 326** of the *Revised RI Report* (OBG 2015a). The coal tar-like DNAPL and stained soil/fill material on the Penn-Can Property likely originated from the former facility operations, such as tanks, process lines, ditches, and waste tile drains.

The approximate extent of DNAPL found in the fill and marl is presented on **Figure 109** of the *Revised RI Report* (OBG 2015a). Cross sections were developed to evaluate the extent of DNAPL, DNAPL-stained material, and the subsurface lithology as depicted on **Figures 19 through 27** of the *Revised RI Report*. The coal tar-like DNAPL was also observed in the deep unit on the Penn-Can Property where this unit is closer to the surface and not overlain by the silt and clay confining layer. The DNAPL in the deep unit occurs in the coarse sand above the till/bedrock unit in several locations. The solid yellow shading in **Figure 111** of the *Revised RI Report* illustrates the interpreted extent of this DNAPL in the deep unit.

The depositional structure of the marl unit and the initial driving DNAPL head on the Penn-Can Property were the most likely factors controlling the DNAPL migration.

Surficial Tar associated with the Penn-Can Property

Since development of the *Revised RI Report* (OBG 2015a), localized areas of surficial asphalt tar materials were observed on the Penn-Can Property. As described below in **Section 3.5**, a pre-design investigation (PDI) is proposed for the purpose of evaluating the extent and potential mobility of surficial asphalt tar. Information obtained during the PDI will be considered during the remedial design.

Stained soils associated with AOS #1 and Wetland Area WL2

Black stained material identified on the Site is identified by the black tarry staining found in the shallow fill material on the Lakeshore Area (wetland area WL2) and AOS #1. The approximate extent of the stained soils is presented on **Figure 112** of the *Revised RI Report* (OBG 2015a). The staining in the shallow fill in these areas is often tarry in appearance and is composed of PAHs. The stained fill material is incorporated in the fill and occurs above the marl, which suggests that the stained material has a different origin than the coal tar-like DNAPL.

Based on review of historical aerial photography and site borings, it appears that fill may also have been deposited in these low-lying areas sometime between 1959 and 1967. The nature of fill materials that may have been placed in this area is unknown. This black tarry material causing the staining appears to be adsorbed to and entrained in the fill.

[2] "Principal threat wastes are those source materials considered to be highly toxic or highly mobile that generally cannot be reliably contained or would present a significant risk to human health or the environment should exposure occur." (USEPA 1991)

These stained materials were predominantly located within the Outboard Area and were either excavated or capped and covered under the Outboard Area IRM. Some of these materials were also addressed by the installation of the West Wall IRM and East Wall IRM barrier walls and groundwater collections systems. Stained shallow fill material inboard of the barrier wall will be evaluated in this FS.

Chlorobenzene DNAPL in soil boring HB-SB-01 at 34 to 36 ft bgs

The chlorobenzene DNAPL is related to operations at the former Willis Avenue plant. This DNAPL has been addressed by the Willis/Semet IRM Barrier Wall (Parsons 2012) and the West Wall portion of the Wastebed B/Harbor Brook IRM (Parsons 2014a).

"Black-stained organic material" associated with the DSAs

The black stained organic material was encountered in the shallow fill along the Upper and Lower (former) East Flume (**Figure 113** of the *Revised RI Report*) in DSA #1 and DSA #2. The origin of this material is believed to be dredge material from the former East Flume and Onondaga Lake that was generated during the installation of the diffuser building intake pipe. This material is similar in chemical characteristics to the stained material in AOS #1 and the wetland areas near the mouth of Harbor Brook except that chlorobenzenes tend to be more prevalent.

DSA #1 is located under the area formerly used to support the Onondaga Lake dredging and capping (Onondaga Lake remedy support area) and will be addressed in this FS. DSA #2 is predominantly in the Outboard Area with most materials excavated or already addressed under the Outboard Area IRM, while the remaining DSA #2 material was removed as part of West Wall IRM or will be addressed in this FS.

Tar-like material in Test Pit HB-TP-18 identified at approximately 4 ft bgs

Tar-like material observed in test pit HB-TP-18 appeared to be isolated to this location. The source of this material is unknown but is likely related to historic operations at the Barrett Paving facility, undigested sewage sludge placed on the eastern portion of Wastebed B during the 1950's and early 1960's, or was co-disposed with the Solvay waste during the operation of Wastebed B. Test pit HB-TP-18 is located below the 12-acre area currently utilized for the staged materials on Wastebed B.

2.4 HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENTS

The risk assessments were performed using conservative regulatory methodologies prescribed in the CERCLA guidance and other applicable or relevant and appropriate requirements (ARARs) are provided in the *Revised HHRA and BERA Reports* (OBG 2009 and OBG 2011, respectively). Both the *Revised HHRA and BERA Reports* have been submitted and approved by the NYSDEC. The final *Revised HHRA Report* was approved by the NYSDEC on May 19, 2010. The final *Revised BERA Report* was approved by the NYSDEC on September 13, 2011. Summaries of the HHRA and BERA findings are presented below.

The risks discussed below have been or will be mitigated by the IRMs.

- The East Flume IRM, West Wall IRM, and Outboard Area IRM removed the East Flume and mitigated the risks associated with the East Flume surface water and sediment.
- The East Wall IRM and Upper Harbor Brook IRM have mitigated exposure to surface water and sediment in Harbor Brook along the Site and in the Site drainage ditches.
- The West Wall IRM, East Wall IRM, and Upper Harbor Brook IRM have mitigated migration of contaminated shallow and intermediate groundwater to Onondaga Lake and Harbor Brook via installation of collection systems.
- Placement of clean material across most of the Site under the West Wall IRM, East Wall IRM and Upper Harbor Brook IRM, as well as the *Wastebed B/Harbor Brook Materials Management, Grading,*

and Disposal Plan (OBG 2013a, 2016), have mitigated (and will mitigate) risks posed to ecological receptors due to exposure to surface soil.

2.4.1 HHRA

As part of the HHRA, current and future land use scenarios were identified (OBG 2009). Potential receptors (older child and adult trespassers, utility worker, surveillance worker, drainage ditch worker, railroad worker, commercial/industrial worker, construction worker, child and adult resident, and child and adult recreators) were identified based on land use scenarios and evaluated using current USEPA risk assessment guidance. Unacceptable cancer risk and non-cancer hazard drivers were identified for the following media and constituents:

- ***Surface soils***: benzo(a)pyrene
- ***Surface and subsurface sediment, surface water and fish tissue***: benzo(a)pyrene, benzo(a)anthracene, benzo(b)fluoranthene, dibenzofuran, 2-methylnaphthalene, mercury, naphthalene, PCBs, and 2,3,7,8-TCDD equivalent.
- ***Site groundwater***: benzene, benzo(a)pyrene, and dibenzo(a,h)anthracene

As documented in the *Revised HHRA Report*, groundwater at the Site is not used as a drinking or industrial water supply and is highly unlikely to be used as a drinking or industrial supply in the future, since the area is supplied by municipal water from Onondaga County Water Authority. Soil and groundwater exposure is expected in relation to Site development, but exposure to cancer risk and non-cancer hazards identified above for surface water, sediment, and fish tissue have been mitigated by the Upper Harbor Brook IRM, East Wall IRM, and Outboard Area IRM.

Risk/hazard drivers were carried through the FS, as discussed above.

2.4.2 BERA

The Site BERA identified current and future habitat use and potential ecological receptors at the Site (OBG 2011). Based on the ecological receptors identified, unacceptable risk was driven by the following constituents by receptor for each Exposure Area:

- ***Main Site Exposure Area***, including the Lakeshore Area, Penn-Can Property, Railroad Area, included delineated wetlands not contiguous with Onondaga Lake, AOS #1 and #2:
  - Potential risk to terrestrial plants is driven by metals (primarily chromium, mercury, and silver) via exposure to surface soils.
  - Potential risk to soil invertebrates is driven by chromium via exposure to surface soils.
  - Potential bioaccumulation based on community screening drives the risk for the upper-level trophic receptors (insectivorous birds and mammals, carnivorous mammals), and their risks are primarily driven by barium, chromium, mercury, methyl mercury, BEHP, hexachlorobenzene, pyrene, and avian and mammalian dioxin equivalent.
  - Potential risks for aquatic organisms, fish, and carnivorous birds based on community screening are considered low to marginal with no particular driving constituents based shallow groundwater compared against surface water criteria for aquatic organisms and fish and community screening for the carnivorous bird (modeled on the red-tailed hawk).

As presented in **Section 1-3** and on **Figure 1-3,** the West Wall IRM, East Wall IRM, Upper Harbor Brook IRM, as well as the *Wastebed B/Harbor Brook Material Management, Grading, and Disposal Plan* (OBG 2013a, 2016) have mitigated (or will mitigate) risks posed to ecological receptors associated with

exposure to shallow and intermediate groundwater (via discharge to surface water), sediment and select areas of surface soil. This FS evaluates measures to address remaining areas of exposed surface soils.

Aquatic Exposure Area, including the former East Flume, Harbor Brook, and Site drainage ditches:

- Aquatic organisms had no to marginal potential risk due to exposure to surface water.
- Potential risk to Harbor Brook/Site ditches benthic invertebrates via exposure to sediment was not driven by any particular constituent or category of constituents, while potential risk to East Flume benthic invertebrates via exposure to sediment was driven by PAHs.
- Based on community screening, potential risk to Harbor Brook/Site ditches fish is primarily driven by dissolved levels of pesticides and SVOCs (mostly PAHs) in surface water and multiple categories of constituents in sediment.
- Potential risk to East Flume fish is primarily driven by PAHs in sediment based on community screening.
- There is no unacceptable risk for piscivorous birds based on community screening.
- Based on community screening, potential risk to piscivorous mammals is driven by bioaccumulation of dibenzo(a,h)anthracene and total PCBs via ingestion of prey.

Potential ecological risks associated with the former East Flume, Harbor Brook along the Site, and Site drainage ditches have been mitigated by Site IRMs. As presented in **Section 1-3** and on **Figure 1-3,** the East Flume IRM, West Wall IRM, East Wall IRM, and Upper Harbor Brook IRM have mitigated (or will mitigate) risks posed to ecological receptors associated with exposure to surface water and sediment in Harbor Brook along the Site and in Site drainage ditches. Additionally, risks posed to ecological receptors resulting from exposure to shallow and intermediate groundwater (via discharge to surface water) has been mitigated by the Upper Harbor Brook IRM.

- ***Lakeshore Wetland Exposure Area***, including delineated wetlands located contiguous with Onondaga Lake on the Lakeshore Area:
  - Potential risks to terrestrial plants and soil invertebrates is primarily driven by metals.
  - Based on community screening, potential risk to aquatic organisms is primarily driven by dissolved metals and SVOCs.
  - Potential risk to benthic invertebrates via exposure to sediment was not driven by any particular constituent or category of constituents.
  - Based on community screening, potential risk to fish is primarily driven by metals and SVOCs.
  - There is no unacceptable risk for piscivorous birds based on community screening.
  - Based on community screening, potential risk to piscivorous mammals is driven by bioaccumulation of PAHs and BEHP via ingestion of prey.

As presented on **Section 1-3** and on **Figure 1-3,** the West Wall IRM, East Wall IRM, Upper Harbor Brook IRM, Outboard Area IRM as well as the *Wastebed B/Harbor Brook Material Management, Grading, and Disposal Plan* (OBG 2013a, 2016) have mitigated (or will mitigate) risks posed to ecological receptors associated with exposure to shallow and intermediate groundwater (via discharge to surface water) and select areas of surface soil. This FS evaluates measures to address areas of exposed surface soil not previously addressed by IRMs.

3. DEVELOPMENT OF REMEDIAL ALTERNATIVES

This section documents the development of remedial alternatives for soil/fill material and groundwater at the Site, consistent with the *Guidance for Conducting Remedial Investigation and Feasibility Studies Under CERCLA* (USEPA 1988*), NYSDEC's Division of Environmental Remediation (DER) Technical Guidance for Site Investigation and Remediation (DER-10)* (NYSDEC 2010a), and the RI/FS Work Plan (OBG 2002). As part of the development of remedial alternatives, remedial action objectives (RAOs) and general response actions (GRAs) were identified for the FS. In addition, the areas and volumes of media to be addressed by the remedial alternatives and specific remedial technologies that, following screening, were used to develop the range of remedial alternatives evaluated in this FS are documented. In addition, consistent with NYSDEC's *DER-31 – Green Remediation* (NYSDEC 2011) and USEPA's *Superfund Green Remediation Strategy* (USEPA 2010a), green remediation concepts were considered during the development of alternatives in this FS.

3.1 DEVELOPMENT OF REMEDIAL ACTION OBJECTIVES (RAOs)

RAOs are media-specific goals for protecting human health and the environment. RAOs form the basis for the FS by providing overall goals for site remediation. The RAOs are considered during the identification of appropriate remedial technologies and development of remedial potential alternatives for the Site, and later during the evaluation of remedial alternatives.

RAOs are based on professional and engineering judgment, risks identified in the *Revised HHRA* and *BERA Reports* (OBG 2009 and 2011, respectively), potential ARARs, and migration potential. Additionally, the current, intended, and reasonably anticipated future land use of the Site and its surroundings; the nature and extent of COCs exceeding chemical-specific ARARs and potential impact(s) to nearby Sites were considered during the development of the RAOs. Documentation of the rationale employed in the development of RAOs for Site media is presented below.

As described in **Section 1.3**, remedial objectives were developed with respect to groundwater and NAPL discharge to Onondaga Lake and Harbor Brook as part of the IRMs. Also as described in **Section 1.3**, the IRMs have been demonstrated to address these IRM objectives. As discussed below, conditions are such that it is appropriate for the point of compliance for groundwater ARARs to be at the location of these IRMs. As such, the development of RAOs focuses on soil/fill material and shallow and intermediate groundwater at the point of compliance. Documentation of the rationale employed in the development of RAOs for Site media is presented below.

3.1.1 Identification of ARARs

There are three types of ARARs: chemical-specific, location-specific, and action-specific. Chemical-specific ARARs are health- or risk-based numerical values, or methodologies which when applied to site-specific conditions result in numerical values. These values establish the acceptable amount or concentration of a chemical that may be found in, or discharged to the ambient environment. Location-specific ARARs set restrictions on activities based on the characteristics of the land on which the activity is to be performed. Action-specific ARARs set controls or restrictions on particular types of remedial actions once the remedial actions have been identified as part of a remedial alternative. The identification of potential ARARs is documented in **Table 3-1**. The rationale for the selection of chemical-specific ARARs related to 6 NYCRR 375 SCOs and land use is further described below.

3.1.2 Land Use and Selection of Soil Cleanup Objectives

Consistent with 6 NYCRR 375-1.8 (f) and DER-10 4.2 (i) the current, intended, and reasonably anticipated future uses of the Site are considered when selecting SCOs. The Site is primarily owned by Honeywell (*i.e.*, the Lakeshore Area, Harbor Brook area, Penn-Can Property, and AOS #1). AOS #2 is

owned by two private entities and New York State Department of Transportation, while the Railroad Area is a parcel owned by CSX. The following property use information is relevant to the Site:

- The Wastebed B/Harbor Brook Site areas, including the Penn-Can Property, Railroad Area, AOS #1 and AOS #2 are currently zoned for industrial use in the Town of Geddes and City of Syracuse, while the eastern extent of the Lakeshore Area along the Onondaga Lake shoreline is zoned as parkland within the City of Syracuse.
- Agreements are in place with Onondaga County such that approximately ¾-mile of the Onondaga County Loop the Lake Trail Extension will cross portions of the Lakeshore Area and AOS #1, and as such is anticipated to be used for passive recreation.
- It is reasonably anticipated that the portions of the property south of I-690 (Penn-Can Property, AOS #2, and Railroad Area) will continue to be used for industrial or commercial purposes for the foreseeable future. In addition, a portion of the Penn-Can Property is anticipated to be used for overflow parking for the New York State Fairgrounds.

Given that the reasonably anticipated future use for the Site will be for industrial or commercial purposes, and a portion of the property (Lakeshore Area and AOS #1) may be used for passive recreational purposes, the following 6 NYCRR Part 375 Restricted Use SCOs are identified as appropriate SCOs for the Site:

- 6 NYCRR Part 375 SCOs for Industrial Use
  - Industrial use, as defined in 6 NYCRR Part 375-1.8(g)(2)(iv) includes land which shall only be considered for the primary purpose of manufacturing, production, fabrication, or assembly process and ancillary services.
  - SCOs for Industrial Use are proposed for areas where current or anticipated industrial use may occur.
- 6 NYCRR Part 375 SCOs for Commercial and Passive Recreational Use
  - Commercial use, as defined in 6 NYCRR Part 375-1.8(g)(2)(iv) includes passive recreation uses, which are public uses with limited potential for soil contact.
  - SCOs for Commercial Use are proposed for added flexibility for redevelopment of the property and anticipating future use of the Lakeshore Area and AOS #1. The planned public recreation trail is considered in this FS to be a passive recreational use area.

For purposes of evaluating a required pre-disposal conditions alternative, analytical results for soil/fill material were also compared to SCOs for Unrestricted Use.

3.1.3 RAOs for Soil/Fill Material and Groundwater

Potential chemical-specific ARARs and human health and ecological risks identified for soil/fill material and groundwater at the Site were considered during the development of RAOs and remedial alternatives. As described in **Section 2.3**, soil/fill material and groundwater samples exhibit concentrations above chemical-specific ARARs and or TBCs in certain areas of the Site. Though shallow and intermediate groundwater at the Wastebed B/Harbor Brook Site is not used as a drinking or industrial water supply and is highly unlikely to be used as a drinking or industrial supply in the future, groundwater exceedances of ARARs were considered. Potential unacceptable risks for human exposures to Site COCs in soil/fill material and groundwater were identified in relation to future Site development (*i.e.,* future utility and construction workers). In addition, potential risks related to human exposures to soil/fill material and groundwater include cancer and non-cancer risks.

Potential risks were identified that related to terrestrial ecological receptor exposures to soil/fill material. However, given the anticipated future commercial use of the property, it is not anticipated to represent habitat for ecological receptors.

As presented in NYSDEC and New York State Department of Health's (NYSDOH) *New York State Brownfield Cleanup Program Development of Soil Cleanup Objectives Technical Support Document* (NYSDEC and NYSDOH 2006), the document that presents the assumptions, rationale, algorithms and calculations utilized to develop the SCOs, the SCOs were developed by NYSDEC and NYSDOH based on potential health effects to human and ecological receptors, rural soil background concentrations, and maximum acceptable soil concentrations. Thus, the promulgated SCOs for the protection of human health were used to ascertain acceptable concentrations for a given anticipated site use. Attainment of these SCOs was assumed to constitute acceptable protectiveness and, therefore, the SCOs were used as a measure for achievement of the corresponding RAOs.

As described in **Section 1.3**, shallow and intermediate groundwater discharge to Onondaga Lake and Harbor Brook is currently addressed by the West Wall IRM, East Wall IRM, and Upper Harbor Brook IRM barrier walls and collection systems. IRM objectives with respect to groundwater and NAPL discharge to Onondaga Lake and Harbor Brook and human and ecological impacts have been achieved as a result of continued IRM implementation and are presented above in **Section 1.3**. Accordingly, the following RAOs were developed for this FS.

RAOs for Public Health Protection

Based on consideration of potential chemical-specific ARARs, nature and extent of contamination, potentially unacceptable risks, and the current, intended and reasonably anticipated future use of the Site and its surroundings, the following RAOs for soil/fill material and shallow and intermediate groundwater were developed for the protection of human health:

- Prevent, or reduce to the extent practicable, ingestion/direct contact with contaminated soil/fill material.
- Prevent, or reduce to the extent practicable, inhalation of or exposure to contaminants volatilizing from contaminated soil/fill material and unacceptable inhalation exposure associated with soil vapor.
- Prevent potential unacceptable risks to human health associated with ingestion of groundwater with contaminant levels exceeding drinking water standards.
- Prevent potential unacceptable risks to human health associated with contact with, or inhalation of volatiles from contaminated groundwater.

RAOs for Environmental Protection

Based on consideration of potential chemical-specific ARARs, nature and extent of contamination, and the current, intended and reasonably anticipated future use of the Site and its surroundings, the following RAOs for soil/fill material and shallow and intermediate groundwater were developed for protection of the environment:

- Prevent, or reduce, to the extent practicable, the release of site-related contaminants to groundwater, surface water and sediment that may cause unacceptable adverse effects on groundwater, surface water or sediment quality in Harbor Brook or Onondaga Lake.
- Prevent, or reduce to the extent practicable, adverse impacts to biota from ingestion/direct contact with contaminated soil/fill material causing toxicity or impacts from bioaccumulation through the terrestrial food chain.

3.1.4 Groundwater Point of Compliance

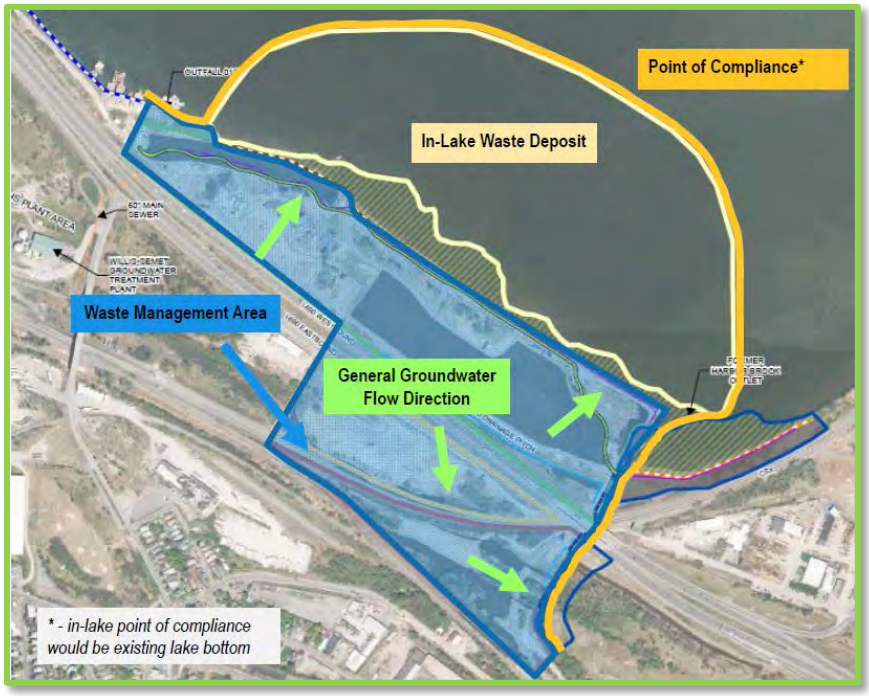

Figure 12: Wastebed B/Harbor Brook Site Waste Management Area and Groundwater Point of Compliance

As summarized in **Table 3-1**, the NYS Class GA groundwater standards are potentially applicable for the Site. Also, as described in **Sections 2.2** and **2.3**, Solvay waste, historical fill and DNAPL are present at the Site, thus, the Site can be characterized as a waste management area (WMA).

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) (40 CFR Part 300.430) preamble language sets forth the USEPA's policy that, for groundwater, "remediation levels generally should be attained throughout the contaminant plume, or at and beyond the edge of the waste management area when waste is left in place." The NCP preamble also indicates that, in certain situations, it may be appropriate to address the contamination as one WMA for purposes of the groundwater point of compliance (POC). Groundwater POCs for meeting ARARs are established at the WMA edge and within the ILWD (*i.e.,* to consist of the existing lake bottom).

Due to the presence of Solvay waste, historical fill materials disposed of at the Site, coal tar-like DNAPL associated with the Penn-Can Property, and stained soils found in shallow fill material on the Lakeshore Area and AOS#1, as discussed in **Section 2.3.6**, shallow and intermediate groundwater restoration within the limits of the Site within a reasonable timeframe is not practicable. Specifically, the volume of soil/fill material containing COCs, combined with the low permeability and heterogeneity of the soil/fill material at the Site Area, limit the ability to restore shallow and intermediate groundwater to the extent necessary to meet ARARs at this time or for the foreseeable future. Therefore, conformity to ARARs at the Site is technically impracticable from an engineering and scientific perspective. The groundwater POC is anticipated to consist of the lake cap over the ILWD and the area within the Site boundary is considered a WMA (see **Figure 12**).

Consistent with NYSDEC's DER-10, an alternative will be developed to address restoration of the Site to pre-disposal conditions. Under such an alternative soil/fill materials containing COCs would not be present and the WMA and associated POC would not be applicable.

3.2 DEVELOPMENT OF GENERAL RESPONSE ACTIONS

GRAs are media-specific actions which may, either alone or in combination, form alternatives to satisfy the RAOs and SCOs. GRAs identified for soil/fill material and shallow and intermediate groundwater, based on the RAOs, are summarized as follows:

Soil/Fill Material

- ***No further action.*** No action must be considered in the FS, as required by the *National Oil and Hazardous Substances Pollution Contingency Plan* (NCP) (40 Code of Federal Regulations (CFR) Part 300.430) and DER-10 **Sections 4.1(d) and (b)**, as a baseline against which other actions are evaluated.
- ***Institutional controls/limited actions.*** Actions that provide site access and use restrictions and provisions for continued operation of the remedy.
- ***Natural recovery.*** Actions that rely on natural processes to attenuate contaminants in soil/fill material.
- ***Containment actions.*** Actions that minimize the potential for direct contact with and erosion of surface soil/fill material.
- ***In situ treatment actions.*** Actions that treat soil/fill material in place to reduce mobility or toxicity.
- ***Removal actions.*** Actions to excavate soil/fill material or recover DNAPL.
- ***Ex situ treatment actions.*** Actions that treat soil/fill material following removal, to reduce mobility or toxicity.
- ***Disposal actions.*** Actions that dispose of soil/fill material or recovered DNAPL on-site or off-site.

Shallow and Intermediate Groundwater

- ***No further action.*** No action must be considered in the FS, as required by NCP (40 CFR Part 300.430) and DER-10 **Sections 4.1 (d) and 4.4 (b)**, as a baseline against which other actions are evaluated.
- ***Institutional controls/limited actions.*** Actions that provide use restrictions, monitoring, and provisions for continued operation of the remedy.
- ***Natural recovery.*** Actions that rely on natural processes to attenuate contaminants in groundwater.
- ***Hydraulic control.*** Actions that collect and/or control groundwater flow, minimizing further migration.
- ***Treatment.*** *In situ* or *ex situ* actions that treat groundwater to reduce mobility or toxicity related to Site COCs.

The GRAs for this FS are identified in **Tables 3-2** and **3-3**.

3.3 IDENTIFICATION OF VOLUMES OR AREAS OF MEDIA

Volumes and areas of soil/fill material and Site shallow and intermediate groundwater to be addressed in this FS were estimated based on Site conditions, the nature and extent of contamination, RAOs, and potential chemical-specific ARARs. The areal extents of these media are described below.

As discussed in **Section 1.3**, portions of the Site soil/fill material, shallow and intermediate groundwater, surface water, and sediment have been addressed in IRMs completed at and in the vicinity of the site. Specifically, groundwater discharging to Onondaga Lake and Harbor Brook or infiltrating into storm sewers has been addressed as follows:

- Shallow and intermediate groundwater discharging to Onondaga Lake and Harbor Brook has been addressed by the West Wall IRM, East Wall IRM, and Upper Harbor Brook IRM through groundwater collection trenches and barrier walls that have been installed along the lakeshore. Collected groundwater is treated at the Willis-Semet Groundwater Treatment Plant (GWTP).
- Groundwater infiltrating into storm sewers and Site ditches have been addressed by rehabilitation or sewer pipe replacement as part of the Upper Harbor Brook IRM and East Flume IRM.
- Soil/fill material on portions of the Site has been addressed by the Wastebed B/Harbor Brook IRM and response actions, including the *Wastebed B/Harbor Brook Material Management, Grading, and Disposal Plan* (OBG 2013a, 2016).
- Soil/fill material outboard of the East and West Walls has been addressed by the Outboard Area IRM.
- DNAPL present on the Lakeshore Area and in the vicinity of Harbor Brook has been contained by the East and West Wall barriers and groundwater collection systems and the Upper Harbor Brook groundwater collection system.

As a result of the IRMs and response actions implemented at the Site, shallow and intermediate groundwater at the Lakeshore Area and in the vicinity of Harbor Brook and sediment and surface water in Harbor Brook were not considered in the development of areas and media to be addressed further in this FS.

Soil/Fill Material

The Wastebed B/Harbor Brook Site includes a total area of approximately 92.2 acres comprising the Lakeshore Area, Penn-Can Property, Railroad Area, AOS #1, and AOS #2. Approximately 14 of the 92.2 acres lay outboard of the Lakeshore and AOS #1 areas within the current Onondaga Lake footprint, and were addressed under the Outboard Area IRM. Outboard areas will not be evaluated further in this FS.

As described in **Section 2.3.1**, certain surface areas at the Site exhibit concentrations of VOCs, SVOCs, PCBs, pesticides, inorganics, PCDD/Fs, and mercury that are greater than Industrial and Commercial Use SCOs. The surface soil/fill material concentrations in samples (between 0 and 2 ft bgs) throughout much of the Site exceed Commercial and Industrial, and/or Unrestricted Use SCOs, including locations still remaining but covered by IRMs. The upland areas addressed by IRMs and response actions and remedial areas of impacted soil/fill material to be evaluated further by this FS are summarized as follows:

Table 3: Summary of IRM and FS Areas

Site Area	Total Area (acres)	Total Area Addressed by IRMs (acres)	Total Area to be Evaluated in FS (acres)
Lakeshore Area	45.0	15.0	30.0
Penn-Can Property	13.5	0.80	12.7
Railroad Area	13.9	2.5	11.4
AOS #1	3.6	3.6	0
AOS #2	2.2	0.1	2.1
Total	**78.2**	**22.0**	**56.2**

Subsurface soil/fill material samples (greater than 2 ft bgs) also exhibited concentrations exceeding Commercial and Industrial Use SCOs to varying extents across the Site with much of the existing subsurface soil/fill material exceeding Unrestricted Use SCOs. Subsurface material in the northeastern corner of the Lakeshore Area are impacted by observable NAPL from approximately 2 to 10 ft bgs. In total, it is estimated that approximately 3.1 million cy of soil/fill material exceeding Unrestricted Use SCOs remain in the upland site areas, including approximately 25,000 cy that exhibit NAPL.

Material Staging and Support Areas

As described in **Section 1.3.6**, soil/fill material excavated during the construction of various IRMs was consolidated and staged on the eastern portion of Wastebed B (**Figure 1-3**), accounting for 64,000 cy in addition to the in-place soil/fill inboard of the West Wall. This material covers an approximate 12-acre footprint and currently resides beneath a 2-ft cover with designated tree areas installed as part of the *Wastebed B/Harbor Brook Materials Management, Grading and Disposal Plan* (OBG 2013a).

In addition to the IRM materials managed under the *Wastebed B/Harbor Brook Materials Management, Grading, and Disposal Plan* (OBG 2013a), clean material staging areas were established on the western portion of Wastebed B and a portion of the Penn-Can Property to support the Onondaga Lake dredging and capping efforts (**Figures 1-2** and **1-3**). The Wastebed B staging area is approximately 11.1 acres in size (including 3 acres filled with clean fill during completion of the East Flume IRM), while the Penn-Can Property staging area is approximately 6.0 acres in size.

Restoration and final cover thickness will be evaluated during pre-design activities. Existing cover thickness may be supplemented with additional cover material, as necessary, and incorporated into the final Site remedy for the purpose of maintaining Site grading, support of tree plantings, and protection of human health and the environment.

3.4 IDENTIFICATION, SCREENING AND EVALUATION OF REMEDIAL TECHNOLOGIES AND PROCESS OPTIONS

Potentially applicable remedial technologies and process options for each GRA were identified and then screened on the basis of technical implementability. Technical implementability for each identified process option was evaluated with respect to contaminant information, physical characteristics, and areas and volumes of affected media summarized in **Section 3.3**.

3.4.1 Identification of Remedial Technologies and Process Options

Descriptions for retained technologies and process options identified for the FS are presented in **Tables 3-2** and **3-3** and summarized as follows.

Soil/Fill Material

- No further action
- Monitoring (DNAPL monitoring)
- Access/use restrictions/administrative control(s) (institutional controls)
- Site controls (site management plan)
- Periodic reviews (periodic site reviews)
- Natural attenuation
- Cover system (vegetation enhancement, engineered cover, isolation cover)
- *In situ* treatment (chemical oxidation, solidification/stabilization)
- Excavation (mechanical excavation)
- DNAPL extraction [extraction wells, collection trench, multi-phase extraction (MPE)]
- On-site disposal (on-site consolidation)
- Off-site treatment/disposal (commercial treatment/disposal facility)

Shallow and Intermediate Groundwater

- No further action

- Monitoring
- Access/use restrictions/administrative control(s) (institutional controls)
- Site controls (site management plan)
- Periodic reviews (periodic site reviews)
- Natural attenuation
- Physical barrier wall (sheet piles)
- Groundwater extraction (extraction wells, collection trench, MPE)
- *Ex situ* treatment (Willis-Semet GWTP)

3.4.2 Screening and Evaluation of Remedial Technologies and Process Options

The remedial technologies and process options were evaluated further according to the criteria of effectiveness, implementability, and cost. The effectiveness criterion included the evaluation of:

- Potential effectiveness of the process option in meeting the RAOs and accommodating the estimated lengths, areas, and/or volumes of media summarized in **Section 3.3**
- Potential effects on human health and the environment during implementation (including, as appropriate, construction and operation)
- Reliability of the process options for Site COCs and conditions.

Technical and institutional aspects of implementing the process options were assessed for the implementability criterion. The capital and operation and maintenance (O&M) costs of each process option were evaluated as to whether they were high, medium, or low relative to the other process options of the same technology type. Based on the evaluation, the more favorable process options of each technology type were chosen as representative process options. The selection of representative process options simplifies the assembly and evaluation of potential alternatives, but does not eliminate other process options for consideration. The representative process option provides a basis for conceptual design during the FS, without limiting flexibility during the remedial design phase. An alternative process option may be selected during the remedial design phase as a result of design evaluations or testing. The screening and evaluation of technologies is summarized in **Tables 3-2** and **3-3**.

Soil/Fill Material

Most *in situ* treatment technologies addressing soil/fill material were not retained because of limited implementability and/or effectiveness due to the following Site conditions:

- Low permeability and heterogeneity of subsurface materials
- Depths at which materials requiring treatment are located
- Access limitations, utility and transportation infrastructure, including fiber-optic and water force mains, I-690, State Fair Boulevard, CSX Railroad lines
- Potential for flooding would limit implementability within specific areas of the Site

Additionally, *in situ* treatment technologies addressing soil/fill material are generally not practicable given the variety of COCs present with non-discrete source areas. As a result of the screening and evaluation of technologies for soil/fill material (**Table 3-2**), the following *in situ* technologies/process options were evaluated, but not retained:

- *In situ* biological treatment via enhanced bioremediation, bioventing, and phytoremediation
  - *In situ* treatment via enhanced bioremediation was not retained due to low permeability and heterogeneous subsurface conditions at the Site which would preclude effective distribution of enhanced bioremediation amendments. Additionally, subsurface geochemical conditions, including high pH, do not provide for favorable conditions to sustain organisms capable of biodegradation.
  - *In situ* treatment via bioventing was not retained due to low permeability and heterogeneous subsurface conditions at the Site which would preclude the effective and even distribution of oxygen flow resulting in the inability to stimulate and sustain *in situ* biodegradation activity. Additionally, subsurface conditions (*i.e.,* high pH) does not provide favorable conditions to sustain organisms capable of biodegradation.
  - Phytoremediation was not retained due to limited implementability. Soil/fill material below the root zone would not be addressed. Furthermore, non-growing seasons would limit year-round implementability and effectiveness of phytoremediation.
- *In situ* physical/chemical treatment via soil vapor extraction, flushing, and electrokinetics separation
  - Soil vapor extraction was not retained due to low permeability soil/fill material. Subsurface conditions would limit the ability to effectively apply a vacuum and subsequently extract vapors. Additionally, soil vapor extraction is not effective for treatment of SVOCs and for saturated soil/fill material.
  - *In situ* soil flushing and electrokinetic separation were not retained due to the limited ability to effectively distribute and recover the treatment solutions resulting in areas of untreated soil/fill material due to low permeability Site soil/fill material.
- *In situ* thermal treatment via hot water or steam injection, electrical resistance heating, radio frequency heating, thermal conduction, and vitrification
  - *In situ* thermal treatment technologies were generally not retained given the variety of COCs present with non-discrete source areas. Additionally, subsurface heating of soil/fill material could reduce the structural integrity of the wastebed due to high moisture content, limiting current, intended, and anticipated Site use and redevelopment opportunities.

Ex situ treatment technologies addressing soil/fill material were generally not retained because of limitations in implementability due to lack of effectiveness on all contaminants and the excessive volumes of material requiring treatment and associated restoration. As a result of the screening and evaluation of technologies for soil/fill material (**Table 3-2**), the following *ex situ* technologies/process options were evaluated, but not retained:

- *Ex situ* biological treatment via biopiles, landfarming, and slurry-phase bioreactor
- *Ex situ* physical/chemical treatment via chemical oxidation, extraction/washing, dehalogenation, particle-size separation, and solidification/stabilization
- *Ex situ* thermal treatment via low temperature thermal desorption, pyrolysis, and incineration

Shallow and Intermediate Groundwater

In situ treatment technologies addressing groundwater were generally not retained because of limited implementability and/or effectiveness due to low permeability and heterogeneity of subsurface materials at the Site, depths at which materials requiring treatment are located, access limitations, utility and transportation infrastructure, and potential for flooding within areas along the Lakeshore. As a result of the screening and evaluation of technologies for shallow and intermediate groundwater (**Table 3-3**), the following technologies/process options were evaluated, but not retained:

- Hydraulic control via slurry wall
  - Slurry wall was not retained due to depth of the confining layer (*i.e.,* approximately 45 ft below grade) and incompatibility of bentonite with the high chloride Site conditions.
- *In situ* biological treatment via enhanced bioremediation
- *In situ* chemical treatment via chemical oxidation
- *In situ* physical treatment via in-well air stripping, air sparging, and circulation wells
- *In situ* treatment via permeable reactive barrier
  - Permeable reactive barrier was also not retained for shallow and intermediate groundwater at the Site because of limited effectiveness for the variety of constituents requiring treatment and potential for fouling due to Site groundwater characteristics.
- *Ex situ* biological/physical treatment via constructed treatment wetland
  - Constructed treatment wetland was not retained due to seasonal limitations, and ineffectiveness for treatment of constituents in groundwater.

3.4.3 Representative Process Options

A description of the representative process options for retained technologies, by GRA and technology for soil/fill material and shallow and intermediate groundwater, is presented in the following sections.

No Further Action

No further action was identified as a representative process option for soil/fill material and shallow and intermediate groundwater. The no action alternative must be considered in the FS, as required by the NCP (40 CFR Part 300.430) and DER-10 Section 4.4(b)3 (NYSDEC 2010a). Under this process option, no further remedial actions addressing Site soil/fill material and shallow and intermediate groundwater would be conducted beyond the currently ongoing IRMs. The current O&M of the cover systems and groundwater and NAPL control and collection/treatment IRMs would be continued.

Institutional Controls/Limited Actions

Institutional controls, site management plan, and periodic site reviews were identified as representative process options associated with the institutional controls/limited actions GRA for soil/fill material and shallow and intermediate groundwater.

- ***Institutional controls***. Access/use restrictions (*e.g.*, institutional controls) would be recorded for the Site documenting land use restrictions, and requiring that activities that would potentially expose contaminated materials (and require health and safety precautions) be performed in accordance with the Site management plan. The institutional controls would also provide provisions to evaluate and address, if necessary, potential soil vapor intrusion if buildings are constructed at the Site.
- ***Site management plan***. A Site management plan would document Site institutional and engineering controls and any physical components of the selected remedy requiring operation, maintenance, and monitoring to provide for continued effectiveness of the remedy. The Site management plan would also present provisions for periodic site reviews.
- ***Periodic site reviews***. Periodic review and certification is required by 6 NYCRR Part 375 where institutional and engineering controls, monitoring, and/or O&M activities are required at the Site.
- In accordance with 6 NYCRR Part 375-1.8(h)(3), the frequency of periodic reviews should be annual, unless a different frequency is approved by NYSDEC. Periodic site reviews would also include the performance of Five Year Reviews in accordance with 40 CFR 300.430(f)(4)ii.

DNAPL monitoring was identified as a representative process option associated with the institutional controls/limited actions GRA for soil/fill material.

- ***DNAPL monitoring***. DNAPL monitoring would involve periodic monitoring for the presence and thickness of DNAPL. Monitoring of DNAPL could provide a means of detecting changes in DNAPL thickness. In the event recoverable DNAPL is encountered, DNAPL would be recovered (see removal GRA below).

Monitoring was also identified as a representative process option associated with the institutional controls/limited actions GRA for shallow and intermediate groundwater.

- ***Monitoring***. Monitoring would involve periodic sampling and analysis of media. Monitoring could provide a means of evaluating the effectiveness of the selected groundwater remedies.

Containment

Vegetation enhancement, engineered cover, and isolation cover were identified as representative process options associated with the containment GRA for soil/fill material. Containment systems provide a sustainable means of minimizing erosion of soil/fill material on the Site resultant from surface water flow, minimize the potential for contact with the soil/fill material on the Site, and would also serve to reduce infiltration.

- ***Vegetation enhancement***. Vegetation enhancement would reduce erosion of and contact with exposed surface soil/fill material. Vegetative plantings can be applied using pneumatic processes and/or hydroseeding techniques and can be mixed with wood or paper mulch during application. This cover would be considered to supplement existing vegetation while reducing erosion of surface soil/fill material. Pilot testing at nearby sites identified mulch materials and seed mixes that provide successful vegetation enhancement and erosion control for various terrains.
- ***Engineered cover***. An engineered cover would consist of a soil layer of an appropriate thickness, or other surface such as gravel, pavement or buildings, over existing soil/fill material. Grading and cover installation would be performed such that drainage is promoted, erosion is minimized, and cover integrity is preserved. This cover would be considered for areas where surface soils exhibit concentrations above applicable 6 NYCRR Part 375 SCOs. This cover is effective at preventing erosion of, and contact with exposed surface soil and soil/fill material. Routine cover maintenance, consisting of mowing of vegetation or repairs to paving and inspections for integrity, would be necessary.
- ***Isolation cover***. An isolation cover would consist of a low permeability clay or geomembrane system, impermeable composite, sand/granular and/or reactive/amended components. Vegetation, asphalt, or gravel may be utilized as the top layer based upon site use and restoration requirements within the covered area. This cover would be considered for areas where surface soils exhibit concentrations above applicable 6 NYCRR Part 375 SCOs and/or in areas containing DNAPL-impacted soil/fill material or surficial asphalt tar material. The effectiveness would be dependent on maintaining the integrity of the cover system. Grading and cover installation would be performed such that drainage is promoted, erosion is minimized, and cover integrity is protected. This cover is effective at reducing infiltration while preventing erosion of, and contact with, exposed surface soil, subsurface soil/fill material, DNAPL-impacted soil/fill material, and asphalt tar materials. Routine cover maintenance, consisting of mowing of vegetation or repairs to asphalt and/or granular surfaces and inspections for integrity, would be necessary.

Hydraulic Control

Sheet piles and collection trench were identified as the representative process option associated with the hydraulic control GRA for shallow and intermediate groundwater. Extraction wells and MPE were also evaluated and retained for consideration. A hydraulic control system is an engineered system that is

designed to intercept and collect shallow and intermediate groundwater and DNAPL. Hydraulic control systems are installed at the Site as IRMs and consist of a combination of collection trenches and sheet pile barrier walls as described in **Section 1.3**.

- ***Sheet piles***. A sheet pile wall would be installed along or around the area of contamination to mitigate groundwater or other material from discharge or migration to other resources. Sheet pile material used to construct these vertical barrier walls can include high density polyethylene, fiberglass, vinyl and steel. Sheet pile barrier walls may extend into a confining layer if modeling deems necessary. It may be necessary to monitor or hydraulically control the groundwater level within the vertical barrier wall to control overflow around or over the vertical barrier. Sheet pile barrier walls were installed in conjunction with groundwater collection trenches as part of the West Wall IRM and East Wall IRM.
- ***Collection trench***. Collection trenches are buried conduits that would intercept and collect groundwater and DNAPL. Collection trenches are typically installed perpendicular to groundwater and DNAPL flow and generally consist of pipe drains and permeable granular backfill material. The West Wall IRM, East Wall IRM, and Upper Harbor Brook IRM consist of a series of groundwater collection trenches. Groundwater collected by these collection systems is currently conveyed to the Willis-Semet GWTP for *ex situ* treatment.

In Situ Treatment

In situ chemical oxidation and solidification/stabilization were identified as representative process options associated with the *in situ* treatment GRA for soil/fill material. *In situ* treatment processes are impractical to address Site-wide soil/fill material; however, chemical oxidation and solidification/stabilization may alone or in combination [*i.e., in situ* geochemical stabilization (ISGS)] be implementable as a focused treatment option to address localized impacted soil/fill material and DNAPL.

- ***Chemical oxidation***. Reagent addition to chemically oxidize compounds in soil, resulting in the production of harmless byproducts. Typically injected into wells installed to reach dissolved and undissolved compounds, or mixed into the subsurface with an auger. The major liquid oxidants used are permanganate, persulfate, and hydrogen peroxide liquids. Catalysts are sometimes used to increase reaction time. The effectiveness of chemical oxidation is dependent upon achieving contact with the compounds to be treated and would need evaluation in a treatability study.
- ***Solidification/stabilization***. Reagent addition to physically bind (solidify) and/or chemically react with (stabilize) compounds in soil, resulting in a solidified or stabilized mass with reduced constituent toxicity, mobility and leachability. Additives can consist of cement or fly ash reagents to solidify, reducing contact with groundwater and surface water, or chemical reagents to stabilize, the mass. The effectiveness and reagent mix for solidification/stabilization would need to be evaluated in a treatability study.

Removal

Mechanical excavation was identified as the representative process option associated with the removal GRA for soil/fill material and DNAPL extraction using extraction wells or a collection trench were identified as representative process options for recoverable DNAPL. Extraction wells and MPE were also evaluated for the purpose of DNAPL removal and retained for consideration.

- ***Mechanical excavation***. Mechanical excavation of soil is generally implemented using construction equipment such as backhoes and front-end loaders. Excavated areas are backfilled, graded, and restored based on restoration requirements. Sloping techniques, benching, and/or engineering controls (*i.e.*, sheet piling) would be necessary during excavation to maintain stability of excavation walls. Geotechnical stability evaluations would need to be conducted to evaluate implementability

and safe methods for excavation. Dewatering of excavations and management of water would also be necessary.

- ***DNAPL extraction wells***. Removal of recoverable DNAPL from wells using recovery methods such as bailers, pumps, or absorbent media. In the event that recoverable DNAPL were encountered, recovery could be implemented using bailers.
- ***DNAPL collection trench***. A collection trench installed to remove mobile DNAPL that intercepts the groundwater collection trench. Collection trenches are installed as part of the Wastebed B/Harbor Brook IRM and East and West Wall IRMs. Recoverable DNAPL has not been encountered to date in the Wastebed B or Harbor Brook IRM collection trenches during periods of operation.

Disposal

On-site consolidation and disposal at off-site commercial treatment/disposal facilities were identified as a representative process option associated with the disposal GRA for soil/fill material. Off-site commercial treatment/disposal was identified as a representative process option for recovered DNAPL.

- ***On-site consolidation (soil/fill material)***. Coupled with mechanical removal, excavated soil/fill material would be consolidated on-site. Following soil consolidation, the area would be restored with a soil layer of an appropriate thickness, or other surface such as gravel, pavement or buildings, over consolidated soil/fill material.
- ***Off-site commercial treatment/disposal facility (soil/fill material)***. Coupled with mechanical removal, excavated soil/fill material would be transported to regulated, commercial off-site facilities for subsequent treatment/disposal. Excavated soil/fill material identified as non-hazardous would be disposed at an off-site facility, while excavated soil/fill material identified as hazardous may require treatment to meet land disposal restrictions prior to disposal. Waste characterization sampling and analysis would be completed, and a Waste Manifest would be submitted to, and approved by the landfills prior to disposal. Due to the exceedingly large volume of soil/fill material, multiple transportation mechanisms and off-site disposal facilities may need to be identified.
- ***Off-site commercial treatment/disposal facility (DNAPL)***. Coupled with DNAPL recovery, DNAPL would be transported to regulated, commercial off-site facilities for subsequent treatment/disposal.

Ex Situ Treatment

Off-site treatment at the Willis-Semet GWTP was identified as the representative process option associated with the *ex situ* treatment GRA for shallow and intermediate groundwater.

- ***Willis-Semet GWTP***. Collected groundwater would be conveyed to the Willis-Semet GWTP for physical/chemical treatment. The Willis-Semet GWTP was constructed to treat groundwater, process water, and construction water associated with Honeywell's remedial sites. The Willis-Semet GWTP provides treatment of water using metals precipitation, filtration, pH adjustment, air stripping, and carbon adsorption. Effluent from the Willis-Semet GWTP is discharged to the OCDWEP Metro or directly to Onondaga Lake.

3.5 ASSEMBLY OF REMEDIAL ALTERNATIVES

Seven remedial alternatives were developed by assembling GRAs and representative process options into combinations that address RAOs for soil/fill material and shallow and intermediate groundwater. A summary of the alternatives and their components is presented in **Tables 4 and 5** below.

Table 4: Wastebed B/Harbor Brook FS Remedial Alternatives	Alternative 1 No Further Action (with Continued O&M of IRMs)	Alternative 2 Limited Action (with Continued O&M of IRMs)	Alternative 3 Engineered Cover System (with Continued O&M of IRMs)
Alternative 4 Enhanced Engineered Cover System and Wetland Construction/Restoration (with Continued O&M of IRMs)	Alternative 5 Enhanced Engineered Cover System with Wetland Construction/Restoration and *in situ* treatment (with Continued O&M of IRMs)	Alternative 6A Partial Excavation with Off-Site Disposal	Alternative 6B Excavation with Off-Site Disposal

Table 5: Components of Remedial Alternatives

Remedial Component		Remedial Alternative						
		1	2	3	4	5	6A	6B
No further action		●						
Institutional controls/limited actions ▪ Institutional controls, site management plan, periodic reviews, monitoring and natural attenuation			●	●	●	●	●	●
O&M of existing IRMs ▪ Wastebed B/Harbor Brook IRM components, including the West Wall IRM and Upper Harbor Brook IRM, groundwater collection and treatment at the Willis-Semet GWTP. ▪ Existing engineered covers		●	●	●	●	●	●	●
Engineered cover pre-design investigation (Penn-Can Property)				●	●	●		
Containment	Engineered cover			●	●	●		
	Vegetation enhancement			●	●	●		
	Isolation cover			●	●	●		
***In situ* treatment**	Chemical oxidation					●		
	Solidification/stabilization					●		
Removal	Mechanical excavation						●	●
Disposal	Off-site treatment/disposal						●	●

A description of each alternative is included in the following subsections.

3.5.1 Alternative 1 – No Further Action (with Continued O&M of IRMs)

Alternative 1 is the no further action alternative. The no further action alternative is required to be considered by the NCP and NYSDEC DER-10 Section 4.4(b)3 (NYSDEC 2010a) and serves as a benchmark for the evaluation of action alternatives. This alternative provides for an assessment of the environmental conditions if no further remedial actions are implemented. Under Alternative 1, O&M of the IRM elements would continue. Because this alternative would result in contaminants remaining above levels that allow for unlimited use and unrestricted exposure, CERCLA requires that the Site be reviewed at least once every five years. If justified by the review, remedial actions may be implemented to remove, treat, or contain contaminated media. This alternative also includes ongoing natural attenuation.

Continued Operation, Maintenance and Monitoring of IRMs

As part of this alternative, the following systems installed as IRMs would continue to be maintained in accordance with NYSDEC and USEPA decision documents: the East Flume IRM sewer maintenance, West Wall and Upper Harbor Brook IRM groundwater collection systems and treatment at the Willis-Semet GWTP, DNAPL collection system and disposal, and the existing capped areas addressed by the IRMs. O&M of the East Wall IRM would continue pursuant to the 2011 NYSDEC and USEPA *East Barrier Wall Interim Remedial Measure, Response Action Document*. Surface water monitoring in Harbor Brook and Site ditches would also continue under the Upper Harbor Brook IRM. The elements of existing IRMs are depicted on **Figure 3-1**.

3.5.2 Alternative 2 – Limited Action (with Continued O&M of IRMs)

Alternative 2 provides for an assessment of the environmental conditions if no further remedial actions are implemented. Under Alternative 2, O&M of the IRM elements would continue. This alternative also includes ongoing natural attenuation. The elements of existing IRMs are depicted on **Figure 3-1**.

Alternative 2 would also include the following remedial components, as described below.

- Institutional controls
- Site management plan
- Periodic site reviews
- Monitoring
- Continued operation, maintenance and monitoring of existing IRMs

The remedial components of Alternative 2 are also common to Alternatives 3 through 6 (**Sections 3.5.3** through **3.5.6**) and are described below in this section.

Institutional Controls

Administrative control(s) such as an institutional control (*e.g.*, environmental easements, deed restrictions, and environmental notices) would be recorded for the Site to require the continued management of engineering controls to maintain protectiveness of human health and the environment. The institutional controls would limit Site and groundwater use and require maintenance of remedial elements such as covers and groundwater collection systems. Evaluation and possible mitigation of potential vapor intrusion would be required under provisions specified in the institutional controls. Where necessary, preventative measures may be included in the design and construction of buildings at the Site to mitigate the potential for exposure to constituents that may be present in soil vapor. Such measures may include the use of a vapor barrier or the installation of a venting system. Restrictions would preclude activities that would potentially expose soil/fill materials and soil vapor that might cause vapor intrusion, or impair the integrity of the engineered cover systems without prior review and approval by NYSDEC. As described above in **Section 3.1**, the reasonably anticipated future land use for the Site is industrial and/or commercial and potentially includes passive recreational use at the Lakeshore Area. The institutional controls would reflect these Site uses.

Site Management Plan

A site management plan would guide future activities at the Site by documenting institutional and engineering controls and by developing requirements for periodic site reviews, the implementation of required O&M activities for the selected remedy, and future development on the Site. In addition, consistent with 6 NYCRR Part 375-1.8(h)(3), annual certification of institutional and engineering controls would be required in the site management plan.

Periodic Site Reviews

Periodic site reviews would be conducted in accordance with the site management plan to evaluate the Site with regard to continuing protection of human health and the environment as evidenced by information such as documentation of field inspections. 6 NYCRR Part 375-1.8(h)(3) specifies that the frequency of periodic site reviews and certification of institutional and engineering controls should be annual, unless a different frequency is approved by NYSDEC; it is assumed that annual reviews would be conducted at the Site. Because this alternative would result in contaminants remaining above levels that allow for unlimited use and unrestricted exposure, CERCLA (40 CFR 300.430(f)(4)ii) requires that the Site be reviewed at least once every five years. If justified by the review, remedial actions may be implemented to remove, treat, or contain the contaminated soils.

Monitoring

Monitoring would be included to evaluate ongoing protectiveness outside the limits of the WMA at the POC. Because shallow and intermediate discharge, if any, from the portion of the WMA outside the hydraulic control systems (*i.e.,* ILWD) is to Onondaga Lake and Harbor Brook, the POC in this area would consist of the lake cap over the ILWD. Thus, monitoring is conceptually envisioned to consist of porewater and surface water long-term monitoring being conducted in connection with the Onondaga Lake remedy. This monitoring would provide a means of evaluating the hydraulic control system (East Wall, West Wall and associated groundwater collection systems; Upper Harbor Brook IRM groundwater collection system). The final monitoring program would be established during design.

Continued Operation, Maintenance and Monitoring of IRMs

As part of this alternative, the following systems installed as IRMs would continue to be maintained: the East Flume IRM sewer maintenance, West Wall and Upper Harbor Brook IRM groundwater collection systems and treatment at the Willis-Semet GWTP, DNAPL collection system and disposal, and the existing capped areas addressed by the IRMs. O&M of the East Wall IRM would continue pursuant to the 2011 NYSDEC and USEPA *East Barrier Wall Interim Remedial Measure, RAD*. Surface water monitoring in Harbor Brook and Site ditches would also continue under the Upper Harbor Brook IRM. The elements of existing IRMs are depicted on **Figure 3-1**.

3.5.3 Alternative 3 – Engineered Cover System (with Continued O&M of IRMs)

Alternative 3 is a containment alternative that includes implementation of an engineered cover system with vegetation enhancement based on potential chemical-specific ARARs and reasonably anticipated future land uses at the Site for industrial or commercial use. This alternative also includes continuation of O&M for IRMs that have been implemented at the Site and an evaluation of the presence of DNAPL at the Penn-Can Property. This alternative would also include ongoing natural attenuation.

Consistent with NYSDEC DER-10, the engineered soil cover would include a 1-ft thick soil/granular cover (or maintained paved surfaces and buildings), over 35 acres for the purposes of minimizing erosion and mitigating potentially unacceptable exposure of human receptors to constituents exceeding SCOs in soil/fill material. Vegetation enhancement would be implemented over approximately 21 acres for the purpose of supplementing existing vegetation to reduce erosion of surface soil/fill material. Alternative 3 also includes placement of a 1-ft thick soil/granular or asphalt cover on the Penn-Can Property to provide long-term isolation of underlying impacted soils. As part of the PDI and design, additional design features will be incorporated, if necessary, in the limited areas where surficial asphalt tar material is present, such that this material is effectively addressed. The engineered cover system and vegetation enhancements would require routine maintenance and inspection to maintain cover integrity.

The conceptual extent of the Site cover system is depicted on **Figure 3-2**. Because Site development plans are not determined for portions of the Site, the exact boundaries of the covers are conceptual and

presented for the purposes of cost estimation in this FS. A portion of the Penn-Can Property is anticipated to be used for overflow parking for the New York State Fairgrounds, while an approximate ¾-mile extension of the Onondaga Loop the Lake trail will cross a portion of the Lakeshore Area and AOS #1. The extent of covers will be revisited during the design phase.

Consistent with the remedial components described above in Alternative 2, Alternative 3 would also include the following common remedial components:

- Institutional controls
- Site management plan
- Periodic site reviews
- Monitoring
- Continued operation, maintenance and monitoring of existing IRMs.

The remedial components specific to Alternative 3 are described below in this section.

It is estimated that greenhouse gas emissions associated with import of materials and on-site construction of a 37.6 acre 1-ft engineered cover system, 15.8 acres of vegetation enhancement, and 1.5 acres containing an isolation layer under this alternative would be approximately 395 metric tons of carbon dioxide equivalent (MtCO2e). This represents the annual emission of approximately 83 cars.

Vegetation Enhancement

Vegetation enhancement would consist of supplementing existing vegetation and reduce erosion of surface soil/fill material. Seeds would be mixed with wood fiber mulch/compost and fertilizer as appropriate. Native species would be applied. In an effort to minimize disturbance to established vegetation, the application of vegetation enhancements would be conducted with minor clearing and grubbing of existing mature vegetation. For the purpose of the FS, vegetation enhancement is anticipated to be applied to areas of the Site with steep terrain or areas where existing clean fill meets the applicable SCOs and/or engineered soil cover system requirements (*i.e.,* Lake Support Area) over an assumed area of 15.8 acres (3 acres of which includes the East Flume IRM footprint). Pilot testing conducted on nearby sites has identified mulch materials and seed mixes that provide successful vegetation enhancement and erosion control for the various terrains at the Site. For the purposes of cost estimation, the thickness of the mulch and seed application is anticipated to be approximately 2.5 inches. For the purpose of cost estimation in the FS, the boundaries and thickness of vegetation enhancement (**Figure 3-2**) are conceptual and will be revisited during the design phase.

Engineered Soil Cover

Consistent with the current and reasonably anticipated future land uses for the Site, an engineered cover system would be implemented in areas of the Site, as illustrated on **Figure 3-2**. As described in **Section 3.1.2**, the current, intended and reasonably anticipated future land uses for the Site are commercial, including passive recreational use, and industrial. Consistent with NYSDEC's DER-10, the engineered cover system would include a 1-ft thick soil/granular or asphalt cover (or maintained paved surfaces and buildings) for the purposes of mitigating potentially unacceptable exposure risks and surface soil erosion in support of the reasonably anticipated future use of the Site and its surroundings.

A 1-ft thick soil/granular or asphalt cover would be installed on the Penn-Can Property to provide long-term isolation of underlying impacted soils. As part of the pre-design investigation and design, additional design features will be incorporated, if necessary, in the limited areas where surficial asphalt tar material is present, such that this material is effectively addressed. For the purpose of developing FS cost estimates, 1.5 acres of additional isolation/control was assumed for surficial asphalt tar material containment. Additionally, engineered covers installed in areas of passive recreation (*i.e.,* along

Onondaga Lake) are anticipated to include an approximate 20-foot buffer, as necessary, for added protectiveness. The final engineered cover would be graded to match existing surrounding roadways, IRM cover system grades provide for adequate Site drainage and aesthetics. The final cover would also be installed and graded to support and preserve existing mature trees at the Site (*e.g.,* application of modified vegetation enhancements, placement of gravel around existing trees), to the extent practicable.

As described in **Sections 1.3.7** and **3.3**, materials staging and support areas were established on the western portion of Wastebed B and a portion of the Penn-Can Property to support the Onondaga Lake dredging and capping efforts. Existing clean fill within support areas is anticipated to meet the engineered cover system requirements. For the purpose of developing FS cost estimates, 12.4 acres were assumed to be suitably established with a minimum of 1-ft of granular fill at present. Additional cover, if any, in these areas will be evaluated during the design.

Because development plans are yet unknown for portions of the Site, the exact boundaries of the engineered covers and seed application mixes within the anticipated footprint illustrated on **Figure 3-2** are conceptual. A portion of the Penn-Can Property is anticipated to be used for overflow parking for the New York State Fairgrounds; therefore, a granular cover is assumed to support the anticipated redevelopment of the Penn-Can Property. The extent of and thickness of covers will be revisited during the design phase to allow for consideration of future development.

Engineered Cover PDI

As described in **Sections 1.2.2** and **2.3.6**, the Penn-Can Property has historically been used for the production and storage of asphalt material, resulting in impacts to shallow fill materials on the Penn-Can Property, including surficial asphalt tar material. For the purposes of this FS, this investigation is anticipated to focus on the following objectives:

- Refine the extents of asphalt tar material in the shallow fill material and verify location of historic asphalt tank bottoms, as discussed in **Section 1.2.2**, in areas of historic asphalt production and storage (**Figure 1-4**);
- Evaluate potential mobility of asphalt tar material;
- Evaluate compatibility of surface cover materials with Site subsurface conditions; and
- Evaluate implementability and effectiveness of the proposed engineered cover system to control asphalt tar migration, where necessary. Should the evaluation conclude that the engineered cover system would not be implementable or effective, other technologies such as targeted excavation or *in situ* treatment would be considered.

The scope of the investigation would be further refined during preliminary design. The results of the PDI and design evaluations would be utilized to incorporate additional design features, if necessary, in the limited areas where surficial asphalt tar material is present.

NAPL Evaluation and Recovery

As described in **Section 2**, evidence of coal tar-like DNAPL was observed in the deep unit on the Penn-Can Property. Site data suggest that DNAPL is not migrating because DNAPL has reached residual saturation under the existing conditions. While these monitoring data are supported by the lack of DNAPL migration into Site monitoring wells under static groundwater conditions, as well as the lack of observation of DNAPL in the passive NAPL collection system in Harbor Brook, a pre-design study will be conducted to evaluate the potential for the presence of recoverable coal tar-like DNAPL on the Penn-Can Property. For purposes of this FS, this investigation is assumed to focus on the northern and southern boundaries of the Penn-Can Property coal-tar like DNAPL area (*Revised RI Report,* **Figures 109 and 111**, OBG 2015a) and consist of installation of monitoring wells within the deep unit. The scope of this investigation would be further refined during the design phase.

Following completion of the DNAPL investigation, in the event that recoverable DNAPL is encountered, DNAPL will be recovered using deep recovery wells or other applicable methods.

3.5.4 Alternative 4 – Enhanced Engineered Cover System with Wetland Construction/Restoration (with Continued O&M of IRMs)

Alternative 4 is a containment alternative that includes implementation of an enhanced engineered cover system with vegetation enhancement and construction/restoration of a wetland (*i.e.,* wetland area WL2) with a low permeability liner on the northeastern shoreline of Wastebed B. Under this alternative, an enhanced cover system, based on reasonably anticipated future land uses at the Site, would provide additional protectiveness. The alternative also includes continuation of O&M for IRMs that have been implemented at the Site and ongoing natural attenuation.

The enhanced engineered cover system would consist of a minimum 1-ft with up to 2-ft thick soil/granular cover (or maintained paved surfaces and buildings), applied and graded over 35 acres for the purposes of minimizing erosion and mitigating potentially unacceptable exposure of human receptors to constituents exceeding SCOs in soil/fill material. In accordance with DER-10 and current, intended and reasonably anticipated future land uses for the Site, the enhanced engineered cover system in Alternative 4 is anticipated to include a minimum 1-ft thick cover placed over soil/fill material exceeding SCOs. Up to a 2-ft thick engineered soil cover would be installed for added protectiveness, specifically for the purpose of tree support, incorporation of existing IRMs with final Site grading, and aesthetics. Vegetation enhancement would be implemented over approximately 21 acres, consistent with Alternative 3, for the purpose of supplementing existing vegetation to reduce erosion of surface soil/fill material.

Consistent with Alternative 3, this alternative also includes placement of a 1-ft thick soil/granular or asphalt cover on the Penn-Can Property to provide long-term isolation of underlying impacted soils. As part of the PDI and design, additional design features will be incorporated, if necessary, in the limited areas where surficial asphalt tar material is present, such that this material is effectively addressed. For the purpose of developing FS cost estimates, 1.5 acres of additional isolation/control was assumed for surficial asphalt tar material containment. The enhanced engineered cover system and vegetation enhancements would require routine maintenance and inspection to maintain cover integrity.

The conceptual boundaries of the Site cover systems are illustrated on **Figure 3-3**. Because Site development plans are not determined for portions of the Site, the exact boundaries of the covers are conceptual and presented for the purposes of cost estimation in this FS. A portion of the Penn-Can Property is anticipated to be used for overflow parking for the New York State Fairgrounds, while an approximate ¾-mile extension of the Onondaga Loop the Lake trail will cross a portion of the Lakeshore Area and AOS #1. The extent and thickness of covers will be revisited during the design phase for consideration of future development.

Alternative 4 would also include construction/restoration of a wetland in the vicinity of wetland area WL2 on the northeastern shoreline of Wastebed B. Wetland construction/restoration would total approximately 1 acre and include installation of a low permeability liner system beyond the wetland footprint within an area of DNAPL-impacted soil/fill material (**Section 2.3.6**) for the purpose of reducing infiltration and discharge of groundwater to surface water during seasonally high groundwater levels concurrent with high lake levels.

Consistent with the remedial components described above in Alternative 3, Alternative 4 would also include the following common remedial components:

- Evaluation for the presence of recoverable DNAPL in the deep unit on the Penn-Can Property
- Institutional controls

- Site management plan
- Periodic site reviews
- Monitoring
- Continued operation, maintenance and monitoring of existing IRMs

Remedial components specific to Alternative 4 are described below.

It is estimated that greenhouse gas emissions associated with import of materials and on-site construction of a 33.4 acre enhanced engineered cover system, 21 acres of vegetation enhancement, 1.6 acres of an engineered soil cover with isolation layer, and a 1 acre wetland with 1.2 acres of low permeability liner under this alternative would be approximately 508 MtCO2e. This represents the annual emission of approximately 107 cars.

Vegetation Enhancement

Vegetation enhancement would consist of supplementing existing vegetation and reduce erosion of surface soil/fill material. Seeds would be mixed with wood fiber mulch/compost and fertilizer as appropriate. Native species would be applied. In an effort to minimize disturbance to established vegetation, the application of vegetation enhancements would be conducted with minor clearing and grubbing of existing mature vegetation. For the purpose of the FS, vegetation enhancement is anticipated to be applied to areas of the Site with steep terrain or areas where existing clean fill meets the applicable SCOs and/or engineered soil cover system requirements (*i.e.,* Lake Support Area) over an assumed area of 21 acres (3 acres of which includes the East Flume IRM footprint). Pilot testing conducted on nearby sites has identified mulch materials and seed mixes that provide successful vegetation enhancement and erosion control for the various terrains at the Site. For the purposes of cost estimation, the thickness of the mulch and seed application is anticipated to be approximately 2.5 inches. For the purpose of cost estimation in the FS, the boundaries and thickness of vegetation enhancement (**Figure 3-3**) are conceptual and will be revisited during the design phase.

Enhanced Engineered Soil Cover

Consistent with the current and reasonably anticipated future land uses for the Site, an enhanced engineered cover system would be implemented, as illustrated on **Figure 3-3**. As described in **Section 3.1.2**, the current, intended and reasonably anticipated future land uses for the Site are commercial, including passive recreational use, and industrial. The engineered cover system would include a minimum 1-ft cover, in accordance with DER-10, for the purposes of mitigating potentially unacceptable exposure risks and surface erosion in support of current and anticipated commercial (with passive recreation) and industrial Site uses. Up to 2-ft thick soil/granular cover would be placed under Alternative 4 for the purposes of incorporating IRM covers placed to date and future construction of the public recreation trail with final Site drainage and grading plans. Additional cover thickness would provide for added protectiveness, support of existing mature trees and aesthetics (*e.g.,* application of modified vegetation enhancements, placement of gravel around existing trees), to the extent practicable. Existing grades and IRM cover thickness would be considered during final engineered cover design for the purpose of establishing final cover thickness.

As described in **Sections 1.3.7** and **3.3**, materials staging and support areas were established on the western portion of Wastebed B and a portion of the Penn-Can Property to support the Onondaga Lake dredging and capping efforts. Existing clean fill within support areas is anticipated to meet the engineered cover system requirements. For the purpose of developing FS cost estimates, 17 acres were assumed to be suitably established with a minimum of 1-ft granular fill at present. Additional cover, if any, in these areas will be evaluated during the design.

Because development plans are yet unknown for portions of the Site, the exact boundaries of the engineered covers and seed application mixes within the anticipated footprint illustrated on **Figure 3-3** are conceptual. The extent of covers will be revisited during the design and construction phases to allow for consideration of the configuration of future development.

Wetland Construction/Restoration

A 1-acre wetland would be constructed with hydraulic connection to Onondaga Lake. The wetland would consist of a low permeability liner system to prevent infiltration into the underlying soil/fill and be vegetated with appropriate wetland species. The low permeability liner would extend beyond the wetland footprint for an additional 1.2 acres to prevent infiltration to DNAPL-impacted soil/fill material (**Section 2.3.6**), in addition to reducing the discharge of impacted groundwater to surface water during seasonally high water levels concurrent with high lake levels. The low permeability liner would also reduce infiltration of water into the IRM collection trench during high lake levels.

3.5.5 Alternative 5 - Enhanced Engineered Cover System with Wetland Construction/Restoration and *In situ* Treatment (with Continued O&M of IRMs)

Alternative 5 is a containment alternative that includes implementation of an enhanced engineered cover system with vegetation enhancement and targeted *in situ* treatment with construction/restoration of a wetland (*i.e.,* wetland area WL2) on the northeastern shoreline of Wastebed B. Under this alternative, an enhanced cover system, based on reasonably anticipated future land uses at the Site, would provide additional protectiveness. The alternative also includes continuation of O&M for IRMs that have been implemented at Site and ongoing natural attenuation.

Consistent with the enhanced engineered cover system in Alternative 4, the enhanced cover system would consist of a minimum 1-ft with up to 2-ft engineered soil/granular cover, applied over approximately 35 acres for the purpose of minimizing erosion and mitigating potentially unacceptable exposure of human receptors to constituents exceeding SCOs in soil/fill material, while supporting existing mature trees and incorporating existing IRMs with final Site grading. Consistent with Alternative 4, vegetation enhancement would be applied over approximately 21acres (3 acres of which includes the East Flume IRM footprint), for the purpose of supplementing existing vegetation and minimizing erosion.

Consistent with the Penn-Can Property cover systems in Alternatives 3 and 4, this alternative also includes placement of a 1-ft thick soil/granular or asphalt cover on the Penn-Can Property to provide long-term isolation of underlying impacted soils. As part of the PDI and design, additional design features will be incorporated, if necessary, in the limited areas where surficial asphalt tar material is present, such that this material is effectively addressed. For the purpose of developing FS cost estimates, 1.5 acres of additional isolation/control was assumed for surficial asphalt tar material containment. The enhanced engineered cover system and vegetation enhancements would require routine maintenance and inspection to maintain cover integrity.

The conceptual boundaries of the Site cover systems are illustrated on **Figure 3-4**. Because Site development plans are not determined for portions of the Site, the exact boundaries of the covers are conceptual and presented for the purposes of cost estimation in this FS. A portion of the Penn-Can Property is anticipated to be used for overflow parking for the New York State Fairgrounds, while an approximate ¾-mile extension of the Onondaga Loop the Lake trail will cross a portion of the Lakeshore Area and AOS #1. The extent of covers will be revisited during the design phase for consideration of future development.

Alternative 5 would also include targeted *in* situ treatment of DNAPL-impacted soil/fill material followed by construction/restoration of a wetland in the vicinity of wetland area WL2 on the northeastern shoreline of Wastebed B.

Consistent with the remedial components described above in Alternatives 3 and 4, Alternative 5 would also include the following common remedial components:

- Evaluation for the presence of recoverable DNAPL in the deep unit on the Penn-Can Property
- Institutional controls
- Site management plan
- Periodic site reviews
- Monitoring
- Continued operation, maintenance and monitoring of existing IRMs

Remedial components specific to Alternative 5 are described below.

It is estimated that greenhouse gas emissions associated with import of materials and on-site construction of a 33.4 acre enhanced engineered cover system, 21 acres of vegetation enhancement, 1.6 acres of an engineered soil cover with isolation layer, 2.2 acres of ISGS via soil mixing, and construction of a 1-acre wetland under this alternative would be approximately 1,673 MtCO2e. This represents the annual emission of approximately 350 cars.

In Situ Chemical Oxidation/Stabilization

In situ treatment of DNAPL-impacted soil/fill material (**Section 2.3.6**) would be completed over an approximately 2.2-acre area coinciding with the footprint and perimeter of the proposed area of wetland construction/restoration. For purposes of the FS, ISGS has been assumed. ISGS provides partial mass destruction through chemical oxidation while also generating mineral precipitates to encapsulate remaining NAPL-impacted surfaces to reduce the mobility of remaining mass. The reagents would be applied by soil mixing to a depth of 10 ft bgs, based on the approximate extent of DNAPL-impacted soil/fill material.

Wetland Construction/Restoration

Wetland construction/restoration would be implemented as described above in Alternative 4, however, the additional 1.2-acre low permeability liner footprint would not be necessary due to the reduced mobility provided by the *in situ* chemical oxidation/stabilization treatment included in this alternative.

3.5.6 Alternative 6 – Excavation with Off-Site Disposal

Alternative 6 is an excavation and off-site management alternative that includes mechanical excavation of soil/fill material. The presence of I-690, the CSX railroad line, and various major utility corridors over portions of the Site merit evaluation of partial removal and full removal. These options are presented in variations of Alternative 6, as Alternatives 6A and 6B, as follows:

- Alternative 6A represents partial removal of soil/fill material above Unrestricted Use SCOs, as a portion of I-690, State Fair Boulevard and the CSX railroad line traversing the Site would remain in place allowing for continued, undisturbed use of these transportation features. Excavated material would be transported off-site for treatment/disposal. Restoration of the excavated areas would constitute restoration to the current existing extents and grades, replacement of vegetated soil covers over soil/fill material remaining in the vicinity of the highway and railroad features. Restoration would also include reinstallation of East Wall and West Wall collection systems, Harbor Brook surface water conveyance structures, and repair of a portion of the Onondaga Lake Remedy for the purpose of supporting the effectiveness of the Onondaga Lake remedies and maintaining Site stability. Long-term maintenance of vegetated areas would be included in this option. In the event that materials exhibiting concentrations greater than SCOs were to remain, this option would include institutional controls (*e.g.,* environmental easements, deed restrictions, and environmental notices)

in addition to a site management plan and periodic reviews consistent with those described above in Alternatives 2 through 5. Additionally, Alternative 6A would also include an evaluation for the presence of recoverable DNAPL in the deep unit on the Penn-Can Property and monitoring, consistent with the remedial components described above in Alternatives 3 through 5.

- Alternative 6B represents restoration to pre-disposal conditions through full removal of soil/fill material above Unrestricted Use SCOs and would remove and replace portions of I-690, State Fair Boulevard and the CSX railroad line to facilitate removal of soil/fill below those transportation features. Excavated material would be transported off-site for treatment/disposal. Restoration would include backfill and restoration to the existing areas and grades and include rebuilding the removed portions of the highway and rail systems. Restoration would also include reinstallation of the East Wall and West Wall collection systems, Harbor Brook surface water conveyance structures, and repair of a portion of the Onondaga Lake Remedy for the purpose of supporting the effectiveness of the Onondaga lake remedies and maintaining Site stability. Long-term maintenance of vegetated areas would be included in this option. Institutional controls, a site management plan, and periodic reviews, consistent with those described above in Alternatives 2 through 5, would also be included in this option. Additionally, Alternative 6B would also include evaluation for the presence of recoverable DNAPL in the deep unit on the Penn-Can Property and monitoring, consistent with the remedial components described above in Alternatives 3 through 5.

Excavation depths and volumes required to achieve pre-disposal conditions are anticipated to present the following constructability and community concerns:

- Damage to the existing IRM barrier walls and collection systems and the Lake Cap
- Large volumes of construction water requiring management
- Rerouting of traffic on I-690 and State Fair Boulevard during the 4- to 6-year duration of construction
- Relocation of existing CSX railroad line that may require purchase of adjacent properties
- Rerouting of active sanitary sewer lines, water lines, fiber optic lines, and a natural gas line
- Inability to secure sufficient capacity for off-site management of excavated soil/fill materials

Excavation, management, restoration and O&M components for Alternative 6 are described below. This alternative is depicted on **Figure 3-5**.

Mechanical Excavation and Off-Site Disposal of Soil/Fill for Alternative 6A

Mechanical excavation would be conducted to remove Site-wide soil/fill material, while retaining existing I-690, State Fair Boulevard and the CSX railroad line.

For cost estimating purposes, it was assumed that soil/fill material would be removed from existing grade to depths ranging from 14 to 45 ft below grade depending on Site area. No soil removal is assumed within 30-ft of highway or rail structures, and excavation would be conducted to achieve a minimum temporary slope of 1:2 where possible, with sheet piling installed along select portions such as the Lakeshore Area. Based on these approximate elevations, the total volume of soil/fill material in Alternative 6A is estimated at approximately 3.1 million cy *in situ*. Due to the required setbacks and sloping from adjacent features (*e.g.*, railways and roadways) some impacted material would remain following excavation under Alternative 6A. Alternative 6A also includes removal of the staged and capped materials on the Lakeshore area.

Installation of a temporary bulkhead wall within Onondaga Lake will be necessary to support excavation activities and provide for water control in the excavation when excavating below lake level. Effectiveness of the temporary bulkhead wall within Onondaga Lake to support excavation activities and

contain DNAPL migration during excavation would need to be further evaluated. It has been assumed that dewatering a portion of the soil/fill material would be required prior to off-site transportation. The volumes of construction water estimated for the project necessitate the construction of a temporary water treatment plant, as it is anticipated that the Willis-Semet GWTP would not have sufficient treatment capacity and a temporary water treatment system has been assumed. Excavation of soil/fill material from the Lakeshore Area also necessitates the measures to provide for continuous service to three Onondaga County sanitary sewers. For purposes of this FS, it is assumed temporary bypass sewers will need to be installed during excavation activities, and replaced following excavation.

As part of Alternative 6A, the following systems installed as IRMs would be removed and subsequently replaced and maintained: the East Flume IRM sewer maintenance, and the East Wall and West Wall groundwater collection systems and treatment at the Willis-Semet GWTP.

Off-Site Transportation for Alternative 6A

For remedial alternative cost estimation purposes, it was assumed a total estimated 3.6 million tons of excavated soil/fill material would be transported off site in Alternative 6A for hon-hazardous disposal. In addition, a volume of 75,000 cy was assumed to require off-site incineration due to the presence of DNAPL.

Based on a daily production rate of 2,400 cy per day for 10 months of the year; it is estimated that the material would be shipped off-site in three to four construction seasons resulting in approximately 185,000 truckloads (145 truckloads per day) for Alternative 6A.

Site Restoration for Alternative 6A

Clean backfill would be transported via trucks from an off-site borrow source to the Site, requiring an estimated 2 million cy (approximately 135,000 truck trips), to restore excavated areas to near existing grades under Alternative 6A. It is also assumed that the barrier and collection systems would be replaced for the purpose of groundwater collection and maintenance of Site stability.

For purposes of the FS, it is assumed that the Railroad and Penn-Can sites will be restored to existing grades, but that the lakeshore will be filled only to the extent necessary to suitably support I-690, utilities and allow for the reinstallation of the groundwater collection system components with the overall affect being an increase in lake surface. It is assumed that in-lake capping will be necessary to repair (required in connection with the bulkhead barrier installation and subsequent removal) and expand the existing in-lake cap for the increased area requiring approximately 350,000 cy of capping materials (23,000 truck trips). Onondaga County sanitary sewers would also be replaced as part of restoration activities following excavation.

Because this alternative would result in certain constituents remaining above levels that allow for unlimited use and unrestricted exposure, CERCLA requires that the Site be reviewed at least once every five years. If justified by the review, remedial actions may be implemented to remove, treat, or contain the impacted soils.

Implementation of Alternative 6A is estimated to require 4 construction seasons. It is estimated that greenhouse gas emissions associated with on-site construction (excavation, dewatering, sheeting, roadway demolition and reinstallation, etc.), offsite transportation of excavated soil/fill, and import of materials for Site restoration in Alternative 6A would produce approximately 85,000 MtCO2e. This represents the annual emission of approximately 18,000 cars.

Mechanical Excavation and Off-Site Disposal of Soil/Fill for Alternative 6B

Mechanical excavation would be conducted to remove Site-wide soil/fill material. To support excavation in Alternative 6B, portions of I-690 and State Fair Boulevard would be removed and rerouted to allow for the soil/fill assumed present beneath to be excavated.

For cost estimating purposes, it was assumed that soil/fill material would be removed from existing grade to depths ranging from 14 to 45 ft below grade depending on Site area. Excavation would be conducted to achieve a minimum temporary slope of 1:2 where possible, with sheet piling installed along select portions such as the Lakeshore Area. The total volume of soil/fill in Alternative 6B is estimated at approximately 3.4 million cy *in situ*. Alternative 6B also includes removal of the staged and capped materials on the Lakeshore area.

Installation of a temporary bulkhead wall within Onondaga Lake will be necessary to support excavation activities and provide for water control in the excavation when excavating below lake level. Effectiveness of the temporary bulkhead wall within Onondaga Lake to support excavation activities and contain DNAPL migration during excavation would need to be further evaluated. It has been assumed that dewatering a portion of the soil/fill material would be required prior to off-site transportation. The volumes of construction water estimated for the project necessitate the construction of a temporary water treatment plant, as it is anticipated that the Willis-Semet GWTP would not have sufficient treatment capacity and a temporary water treatment system has been assumed. Excavation of soil/fill material from the Lakeshore Area also necessitates the measures to provide for continuous service to three Onondaga County sanitary sewers. For purposes of this FS, it is assumed temporary bypass sewers will need to be installed during excavation activities, and replaced following excavation.

Given the volume of traffic on this portion of I-690 (estimated at over 50,000 cars each day [NYSDOT 2011]), re-routing to local streets for the duration of construction is not anticipated to be feasible or permitted, therefore, it is anticipated that the construction of a temporary highway bypass over the Penn-Can Property would be required for Alternative 6B. An approximately one mile section of I-690 and State Fair Boulevard has been assumed for removal and reinstallation with installation and subsequent removal of an approximately two mile temporary I-690 bypass, resulting in an additional quantity of approximately 180,000 tons of construction and demolition (C&D) material for disposal. Additionally, it is assumed that approximately 3 miles of railway will be rerouted during construction with the existing tracks removed as part of excavation.

As part of Alternative 6B, the following systems installed as IRMs would be removed and subsequently replaced and maintained: the East Flume IRM sewer maintenance, and the East Wall and West Wall groundwater collection systems and treatment at the Willis-Semet GWTP.

Off-Site Transportation for Alternative 6B

For remedial alternative cost estimation purposes, it was assumed a total estimated 3.94 million tons of excavated soil/fill material would be transported off site in Alternative 6B for non-hazardous disposal, as well as approximately 180,000 tons of C&D material for disposal resulting from roadway and railway demolition. In addition, a volume of 75,000 cy was assumed to require incineration due to the presence of DNAPL.

Based on a daily production rate of 2,400 cy per day for 10 months of the year; it is estimated that the material would be shipped off-site in three to four construction seasons resulting in approximately 210,000 truckloads (145 truckloads per day) for Alternative 6B.

Site Restoration for Alternative 6B

Clean backfill would be transported via trucks from an off-site borrow source to the Site, requiring an estimated 2.3 million cy (approximately 150,000 truck trips), to restore excavated areas to near existing grades under Alternative 6B. It is also assumed that the barrier and collection systems would be replaced for the purpose of groundwater collection and maintenance of Site stability.

For purposes of the FS, it is assumed that the Railroad and Penn-Can sites will be restored to existing grades, but that the lakeshore will be filled only to the extent necessary to suitably support I-690, utilities and allow for the reinstallation of the groundwater collection system components with the

overall affect being an increase in lake surface. It is assumed that in-lake capping will be necessary to repair (required in connection with the bulkhead barrier installation and subsequent removal) and expand the existing in-lake cap for the increased area requiring approximately 350,000 cy of capping materials (23,000 truck trips). Highway I-690 and State Fair Boulevard would be rebuilt in the existing alignments, resulting in an additional approximately 8,000 truck trips to deliver the approximately 120,000 cy of materials to restore those facilities to match adjacent grades. Onondaga County sanitary sewers would also be replaced as part of restoration activities following excavation. Because this alternative would result in certain constituents remaining above levels that allow for unlimited use and unrestricted exposure, institutional controls may be required.

Implementation of Alternative 6B is estimated to require 6 construction seasons. It is estimated that greenhouse gas emissions associated with on-site construction (excavation, dewatering, sheeting, roadway demolition and reinstallation, etc.), offsite transportation of excavated soil/fill, and import of materials for Site restoration in Alternative 6B would produce approximately 98,000 MtCO2e. This represents the annual emission of approximately 21,000 cars.

4. DETAILED ANALYSIS OF ALTERNATIVES

This section documents the detailed analysis of seven remedial alternatives developed during the assembly of remedial alternatives. The detailed analysis of the remedial alternatives was conducted consistent with NYSDEC's *DER-10 Technical Guidance for Site Investigation and Remediation* (NYSDEC 2010a), the *Guidance for Developing Remedial Investigation and Feasibility Studies under CERCLA* (USEPA 1988) and consistent with the *RI/FS Work Plan* (OBG 2002). This section describes the individual and comparative analysis of the remedial alternatives with respect to ten evaluation criteria that embody the specific statutory requirements that must be evaluated to satisfy the CERCLA remedy selection process.

4.1 INDIVIDUAL ANALYSIS OF ALTERNATIVES

NYSDEC DER-10 Section 4.2 indicates that, during remedy selection, ten evaluation criteria should be categorized into three groups: threshold criteria, primary balancing criteria, and modifying criteria. The threshold criteria must be satisfied in order for an alternative to be eligible for selection. The primary balancing criteria are used to balance the differences between the alternatives. The modifying criteria are formally considered during NYSDEC review of, and public comment on the Proposed Plan. The criteria are described below:

Table 6: Remedial Alternative Evaluation Criteria

Criterion	Considerations
Threshold Criteria	
Overall protectiveness of human health and the environment	■ Achievement and maintenance of adequate protection ■ Elimination, reduction, or control of site risks through treatment, engineering, or institutional controls ■ Assessment relative to the current, intended, and reasonably anticipated future use of the Site and its surroundings.
Compliance with ARARs	■ Attainment of chemical-, location-, and action-specific ARARs ■ Grounds for invoking a waiver, if necessary.
Primary Balancing Criteria	
Long-term effectiveness and permanence	■ Magnitude of potential residual risk from materials remaining at the conclusion of the remedial activities. ■ Adequacy and reliability of controls necessary to manage materials left on Site.
Reduction of toxicity, mobility, or volume through treatment	■ Treatment or recycling processes employed and materials treated ■ Amount of hazardous substances, pollutants, or contaminants treated or recycled ■ Degree of expected reduction of mobility, toxicity, or volume of the waste due to treatment or recycling ■ Degree to which treatment would be irreversible ■ Type and quantity of residuals that would remain following treatment, considering the persistence, toxicity, mobility, and propensity to bioaccumulate ■ Degree to which treatment would reduce the inherent hazards posed by the Site.
Short-term effectiveness	■ Short-term potential risks to the community during implementation ■ Potential impacts to workers and effectiveness/reliability of protective measures ■ Potential environmental impacts and the effectiveness/reliability of mitigative measures ■ Time until protection would be achieved.
Implementability	■ Technical difficulties and unknowns ■ Reliability of the technology ■ Ease of undertaking additional remedial actions ■ Ability to monitor the effectiveness of the remedy ■ Activities needed to coordinate with other offices and agencies ■ Ability and time required to obtain any necessary agency approvals and permits ■ Availability of adequate off-site treatment, storage, and disposal capacity/services

Table 6: Remedial Alternative Evaluation Criteria	
Criterion	**Considerations**
	■ Availability of necessary equipment and specialists ■ Provisions to obtain necessary additional resources ■ Availability of prospective technologies.
Cost	■ Capital costs ■ Annual O&M costs ■ Periodic O&M costs ■ Present worth cost.
Land Use[3]	■ Consistency with land use
Modifying Criteria	
State acceptance	■ Indicates whether, based on its review of the RI/FS reports and the Proposed Plan, the state supports, opposes, and/or has identified any reservations with the preferred response measure.
Community acceptance	■ Summarizes the public's general response to the response measures described in the Proposed Plan and the RI/FS reports. Community acceptance will be assessed in the Record of Decision (ROD) and includes determining which of the response measures the community supports, opposes, and/or has reservations about.

The objective of the detailed analysis of alternatives was to analyze and present sufficient information to allow the alternatives to be compared and a remedy selected. The analysis consisted of an individual assessment of each alternative with respect to the evaluation criteria that encompass statutory requirements and overall feasibility and acceptability. The summary of this analysis is presented in **Table 4-1**.

4.2 COMPARATIVE ANALYSIS OF ALTERNATIVES

The detailed analysis of alternatives also included a comparative evaluation designed to consider the relative performance of the alternatives and identify major trade-offs among them. The comparative evaluation of alternatives is presented in the following subsections. In the comparative analysis of alternatives, the performance of each alternative relative to the others was evaluated for each criterion. As noted in **Section 4.1**, the detailed evaluation with respect to the FS criteria for each of the alternatives is presented in **Table 4-1**.

4.2.1 Overall Protection of Human Health and the Environment

Alternative 1, the no further action alternative, and Alternative 2, due to absence of controls resulting in the continued potential for exposure to uncovered soil/fill material, are not expected to provide protection of human health and the environment within a reasonable timeframe and would not offer additional protection of the environment beyond that provided through continued operation of the IRMs. Alternatives 3 through 6 would be protective of human health and the environment following implementation. Alternatives 3, 4 and 5 provide protectiveness through institutional controls, monitoring, and engineered soil covers. As described below, Alternatives 4 and 5 would provide added protectiveness as compared to Alternative 3 through added thickness of engineered covers. Alternatives 3, 4, and 5 include implementation of an engineered soil/granular or asphalt cover on the Penn-Can Property, with long-term isolation of underlying impacted soil/fill material and addressing surficial asphalt tar material. Furthermore, Alternatives 4 and 5 include targeted implementation of a low permeability cover and *in situ* treatment on the northeastern Lakeshore Area, respectively, for added

[3] Land use is not a criterion under the NCP; however, it is a primary balancing criterion under NYSDEC's guidance entitled *DER-10/Technical Guidance for Site Investigation and Remediation* (NYSDEC 2010a). For this reason, it is retained as a primary balancing criterion for the detailed analysis of alternatives at this Site.

protection of the environment. Alternatives 6A and 6B provides protectiveness through institutional controls and soil/fill material removal.

Consistent with 6 NYCRR-1.8(f) and DER-10 4.2(i), the current, intended, and reasonably anticipated future use of the Site was considered when selecting SCOs. The engineered cover system in Alternatives 3 through 5 were selected to address soil/fill material exceeding SCOs consistent with current, intended, and reasonably anticipated future use of the Site. Alternatives 1 and 2 would not be consistent with current, intended, and reasonably anticipated future use of the Site. Alternatives 1 and 2 would be protective of the environment through continued operation of the IRMs; however, effects from soil/fill material (in areas not currently covered) on human health and the environment would not be controlled under these alternatives. Alternative 6A and 6B would support the current, intended, or anticipated future use land use; however, removal of soil/fill material would delay the intended and future use of the Lakeshore Area for the Onondaga County West Shore Trail Extension and potential future redevelopment opportunities for other portions of the Site.

Alternatives 1 through 6 would continue to meet IRM objectives for human and environmental health protection (**Section 1.3**) through ongoing O&M of the IRM barrier walls and collection systems. Alternatives 3 through 5, would be protective of human health and the environment and would meet RAOs through the use of engineered cover systems which would control erosion of, and direct contact with, soil/fill material as well as control the inhalation of dust. Institutional controls, a site management plan, monitoring and continued inspection and maintenance of the existing groundwater and DNAPL collection system IRMs would provide for continued protection of the environment and provide a means to evaluate continued protectiveness. Additional protection of human health and the environment would be afforded in Alternatives 4 and 5 through added engineered cover thickness. Alternatives 6A and 6B would be protective of the environment through removal of soil/fill material and would meet RAOs while allowing for unlimited use of the Site by addressing soil/fill material exceeding SCOs for Unrestricted Use. Institutional controls, a site management plan, monitoring, and continued inspection and maintenance of the existing groundwater and DNAPL collection system IRMs would provide for continued protection of the environment and provide a means to evaluate continued protectiveness.

In summary, Alternatives 3 through 6 would satisfy the threshold criteria by providing protection of human health and the environment and by addressing RAOs. Alternatives 3 through 5 are consistent with current, intended, and reasonably anticipated future use of the Site. Alternatives 6A and 6B would support current, intended, and reasonably anticipated future land use; however, they would present significant short and long-term impacts to the surrounding community and result in substantial environmental impacts (*e.g.,* heavy truck traffic, significant rerouting of traffic, noise and emissions). While Alternative 3 would provide protectiveness of human health and the environment and is consistent with current, intended and reasonably anticipated future use of the Site, the added cover thickness and low permeability liner installation on the northeastern portion of the Lakeshore Area in Alternative 4 would provide added protectiveness. Alternative 5 would provide equal protectiveness to Alternative 4; however, as summarized below, with added cost and implementability challenges associated with *in situ* ISGS on the northeastern Lakeshore Area.

4.2.2 Compliance with ARARs

Chemical-, location-, and action-specific ARARs identified for consideration in the FS are summarized in **Table 3-1**. As described in **Section 3.1.4**, attainment of chemical-specific groundwater ARARs is at the edge of a WMA thus the POC for this Site is the northern and eastern boundaries of the Site, coincident with the East Wall, West Wall and Upper Harbor Brook IRMs and groundwater collection systems (**Section 3.1.4**, **Figure 12**). Although off-site shallow and intermediate groundwater (present under Harbor Brook and Onondaga Lake) is not currently or anticipated to be used, Alternatives 1 through 6 would address chemical-specific ARARs through hydraulic control afforded by the IRMs via reduced

loading and control of Site shallow and intermediate groundwater discharge to off-site resources, coupled with natural attenuation processes.

Alternatives 1 through 6 address the discharge of shallow and intermediate groundwater exceeding chemical-specific ARARs to Onondaga Lake through continued O&M of IRMs. Additionally, potential exposures to shallow and intermediate groundwater exceeding chemical-specific ARARs would be addressed by institutional controls under Alternatives 2 through 6. Alternatives 1 and 2 do not provide a means of addressing potential erosion of and exposure to soil/fill material exceeding chemical-specific ARARs in areas not covered by current grading activities. For Alternatives 3, 4, 5, and 6A, chemical-specific ARARs are addressed through limiting potential for exposures to soil/fill material exceeding chemical-specific ARARs through the use of engineered cover systems, a site management plan, monitoring, institutional controls, and continued O&M of IRMs. Alternatives 3, 4, 5, and 6 also address recoverable DNAPL (potential principal threat waste), if present, through DNAPL monitoring and recovery. In addition to the measures included in Alternative 3, Alternatives 4 and 5 include enhanced engineering cover systems, while Alternative 4 includes focused implementation of a low permeability cover (northeastern Lakeshore Area) and Alternative 5 includes focused *in situ* treatment (northeastern Lakeshore Area) to address chemical-specific ARARs. Alternative 6 addresses chemical-specific ARARs through removal of soil/fill material.

With the exception of transportation, disposal, and discharge requirements associated with the continued O&M of IRMs and compliance with Occupational Safety and Health Administration (OSHA) requirements during O&M activities, no action- or location-specific ARARs were identified for Alternatives 1 and 2. Construction methods and safety procedures would be implemented to adhere to the location- and action-specific ARARS identified for Alternatives 3, 4, 5, and 6. Specifically, institutional controls would be implemented in Alternatives 2 through 6 in general conformance with NYSDEC's guidance DER-33 (NYSDEC 2010b). Additionally, engineered cover systems in Alternatives 2, 3, 4, and 5 would prevent erosion and exposure to soil/fill material. Engineered cover systems would be implemented in general conformance with NYSDEC's guidance DER-10 (NYSDEC 2010a). Construction and O&M activities in Alternatives 2 through 6 would be conducted in compliance with OSHA requirements. Procedures would be implemented to adhere to the location-specific ARARs related to federal and state requirements for cultural, archeological, and historical resources. Additionally, proposed actions would be conducted in a manner consistent with Fish and Wildlife Coordination Act requirements for protection of Onondaga Lake. The need for a scope of cultural resources surveys, as required by the National Historic Preservation Act will be evaluated during the remedial design. As necessary, proposed actions under Alternatives 3, 4, 5, and 6 would be implemented in general conformance with state and federal wetland and floodplain assessment requirements. With respect to action-specific ARARs, proposed engineered cover system and excavation activities would be conducted consistent with applicable standards; earth moving/excavation activities would be conducted consistent with air quality standards; transportation and disposal activities would be conducted in accordance with applicable State and Federal requirements, by licensed and permitted haulers; and Site construction activities would be conducted in accordance with OSHA safety requirements.

4.2.3 Long-term Effectiveness and Permanence

Alternatives 1 and 2 would not provide long-term effectiveness and permanence in a reasonable time frame, whereas Alternatives 3 through 6 would. Continued operation of the IRMs is included in Alternatives 1, while limited additional controls are included in Alternative 2, including continued operation of the IRMs, institutional controls, monitoring, site management plan and periodic reviews. Therefore, with respect to the magnitude of residual risk, potentially unacceptable human health risks associated with human exposure to soil/fill material (in areas not currently covered) would remain in Alternatives 1 and 2, but would be addressed via engineered cover systems, institutional controls, site management plan, monitoring, periodic reviews and continued O&M of IRMs in Alternatives 3 through 5,

and soil/fill material excavation in Alternative 6. Additional engineered cover thickness in Alternatives 4 and 5 results in added effectiveness relative to addressing potential human health risks and potential for erosion of soil/fill material. Inclusion of targeted implementation of a low permeability cover in Alternative 4 (wetland construction/restoration) provides additional effectiveness relative to addressing potential risks associated with discharge of impacted groundwater to surface water, concurrent with high lake levels at the Lakeshore Area; however, addition of targeted *in situ* treatment of soil/fill materials in Alternative 5, in the vicinity of the constructed/restored wetland, does not result in added effectiveness relative to addressing discharge of impacted groundwater to surface water, concurrent with high lake levels. Alternatives 3, 4 and 5 also include installation of an engineered soil/granular or asphalt cover on the Penn-Can Property, with long-term isolation of underlying impacted soil/fill material for the purpose of reducing infiltration and controlling potentially unacceptable risks associated with impacted soil/fill material. Based on the results of the PDI, additional design features will be incorporated, if necessary, where surficial asphalt tar material is present, such that this material is effectively addressed. Alternative 4 would provide more reliable control of residual risk through added thickness of engineered cover system and targeted implementation of a low permeability cover on the northeastern portion of the Lakeshore Area.

Limited controls are included in Alternative 1, including continued O&M of IRMs. Continued O&M of the IRMs in conjunction with institutional controls, site management plan, and periodic reviews included in Alternatives 2 through 6 would be adequate and reliable controls of potential risks associated with exposure to constituents in shallow and intermediate groundwater. Off-site treatment at the Willis-Semet GWTP is an adequate and reliable means of treating collected groundwater. Monitoring included in Alternatives 2 through 6 would also provide an adequate and reliable means of monitoring conditions at the Site and evaluating potential natural attenuation over the long-term. Maintained engineered cover systems included in Alternatives 3 through 5 would be adequate and reliable controls of potential risks associated with erosion of and exposure to constituents in soil/fill material at the Site. Additionally, continued O&M of the IRM systems and engineered cover systems in Alternatives 3 through 5 and the removal of soil/fill material in Alternatives 6A and 6B would provide an adequate and reliable means to support the long-term effectiveness and permanence of the Onondaga Lake and Harbor Brook remedies. Additionally, continuation of the IRMs provide an adequate and reliable means of addressing DNAPL and groundwater impacts.

Alternatives 1 through 6 currently meet RAOs (and IRM objectives) related to shallow and intermediate groundwater discharge to Harbor Brook and Onondaga Lake and potential human and ecological impacts through continued O&M of the IRM groundwater collection systems. Alternatives 3, 4, and 5 will meet RAOs for areas where vegetation is applied within 3 years of application, which is the estimated timeframe for vegetation to reach maturity. Alternative 3 is anticipated to meet RAOs for the protection of human health, surface water and sediment quality within 1 to 2 years, the estimated timeframe for construction of the engineered cover system, while Alternatives 4 and 5 are anticipated to meet RAOs for the protection of human health, surface water and sediment quality within 2 to 3 years, the estimated timeframe for construction of the engineered cover system and targeted low permeability cover and *in situ* treatment, respectively. Due to the volume of soil/fill material, Alternatives 6A and 6B would require a significantly longer timeframe to implement as partial and complete excavations are estimated to take place over approximately 4 years and 6 years, respectively.

Each alternative offers long-term sustainability, though implementation of Alternative 5, specifically due to ISGS, would result in greater impacts to greenhouse gas emissions than Alternatives 1, 2, 3, or 4. Construction of Alternatives 6A and 6B would result in significantly greater greenhouse gas emissions than the other alternatives. Long-term O&M requirements in Alternatives 1 through 5 would result in minimal impact to the environment. Consistent with NYSDEC and USEPA policies on green remediation, sustainability considerations alone should not be used to justify implementation of a no further action alternative or a less comprehensive alternative.

In summary, Alternatives 3 through 6 would provide long-term effectiveness and permanence, while Alternatives 1 and 2 would not. Residual risks associated with Alternatives 3 through 6 are adequately and reliably addressed through institutional controls. In addition, continued operation of the DNAPL and groundwater collection systems are adequate and reliable methods of providing long-term effectiveness and permanence with respect to DNAPL and groundwater impacts from the Site. Alternatives 2, 3, 4 and 5 result in minimal long-term fuel/energy consumption, greenhouse gas emissions, and impacts to water, ecology, workers or the community associated with long-term maintenance of the remedies.

4.2.4 Reduction of Toxicity, Mobility, or Volume through Treatment

Alternatives 1 through 6 would reduce toxicity and mobility of COCs in shallow and intermediate groundwater through O&M of IRM groundwater and DNAPL (potential principal threat waste) collection systems. Alternatives 1 and 2 would not provide for reduction in toxicity, mobility, or volume in soil/fill material through treatment or containment measures in areas not addressed by IRM cover systems. Alternatives 3 through 5 would result in a reduction in mobility (*i.e.*, erosion) of COCs in soil/fill material through engineered cover systems. Based on the results of the deep DNAPL pre-design study, Alternatives 3 through 6 may provide another measure to reduce the toxicity, mobility and volume through passive recovery of DNAPL. Alternative 5 provides the greatest level of soil/fill material treatment. Alternatives 6A and 6B would reduce toxicity, mobility, and volume of COCs in soil/fill material through the excavation and off-site management of material.

4.2.5 Short-term Effectiveness

Alternative 1, the no further action alternative, does not provide short-term effectiveness with respect to soil/fill material. Additionally, there are no active components in Alternatives 1 and 2 beyond continued operation, maintenance and monitoring of the groundwater and DNAPL collection IRMs.

Alternatives 3, 4, 5, and 6 would be constructed using proper protective equipment to manage potential risks to on-site workers, and proper precautions and monitoring to be protective of the general public and the environment. Alternatives 1 through 6 currently meet RAOs related to shallow and intermediate groundwater discharge to Harbor Brook and Onondaga Lake through continued O&M of the IRM groundwater collection systems. Alternatives 3, 4, and 5 will meet RAOs for areas where vegetation is applied within 3 years of application, which is the estimated timeframe for vegetation to reach maturity. Alternative 3 is anticipated to meet RAOs for the protection of human health, surface water and sediment quality within 1 to 2 years, the estimated timeframe for construction of the engineered cover system, while Alternatives 4 and 5 are anticipated to meet RAOs for the protection of human health, surface water and sediment quality within 2 to 3 years, the estimated timeframe for construction of the enhanced engineered cover system and targeted low permeability cover and *in situ* treatment (northeastern Lakeshore Area), respectively. Due to the volume of soil/fill material, Alternatives 6A and 6B would require significantly longer timeframe to implement as partial and complete excavations are estimated to take place over approximately 4 years and 6 years, respectively.

Impacts to the community resulting from the construction of Alternatives 3, 4, and 5 would primarily be due to increased truck traffic and increased noise for the 2- to 3-year duration of construction. Alternative 5 would have similar traffic and noise impacts to the community as Alternatives 3 and 4 with the potential for additional dust and possible emissions resulting from disturbance of soils in the wetland construction/restoration area during *in situ* soil mixing activities. Short-term impacts as a result of continued O&M of the IRM groundwater and DNAPL collection systems under Alternatives 1 through 5 are not anticipated as the collection systems are currently constructed and operating. Added short-term impacts as a result of replacement of the East Wall and West Wall collection systems, Harbor Brook surface water conveyance structures, and a portion of the Onondaga Lake remedy is anticipated under Alternatives 6A and 6B. The implementation of the excavation and off-site disposal included in Alternative 6A and 6B would result in far greater impacts to the community, including substantially

increased traffic, as well as increased noise for the 4- to 6-year duration of construction. In addition, Alternatives 6A and 6B would involve removal and temporary rerouting of a portion of I-690, State Fair Boulevard, and the CSX railroad during construction for up to 4 to 6 years.

As it relates to traffic, transportation of excavated materials in Alternatives 6A and 6B are anticipated to result in approximately 320,000 and 391,000 truck trips, respectively, to and from the Site as compared to 4,100 to 5,400 truck trips necessary for cover construction included in Alternatives 3, 4, and 5.

With respect to sustainability, there is an environmental footprint inherent in implementation of each alternative as it relates to construction and operation as well as impacts to the community (as described above). The implementation of the excavation and off-site disposal included in Alternatives 6A and 6B would result in far greater direct emissions and fuel consumption, as compared to importing construction materials and construction of engineered cover systems included in Alternatives 3, 4, and 5, in addition to low permeability liner and *in situ* treatment associated with wetland construction/restoration in Alternatives 4 and 5, respectively. It is estimated that greenhouse gas emissions associated with construction and transportation needs for Alternatives 6A and 6B would be approximately 85,000 and 98,000 MtCO2e, respectively, as compared to an estimated 395 to 508 MtCO2e for cover construction included in Alternatives 3, 4, and 5. Implementation of ISGS via soil mixing in Alternative 5 would account for an additional 1,165 MtCO2e, for a total of 1,673 MtCO2e emitted in Alternative 5. Alternatives 3, 4, and 5 would represent the equivalent of the annual emissions of approximately 83 to 350 cars; however, excavation of materials in Alternatives 6A and 6B would represent adding annual emissions of an additional 18,000 to 21,000 cars.

Green remediation techniques, as detailed in NYSDEC's *Green Remediation Program Policy - DER-31* (NYSDEC 2011) and the EPA Region 2's *Clean and Green Policy* (USEPA 2010b), would be considered for each alternative to reduce short-term environmental impacts. Green remediation best practices such as the following may be considered:

- Use of renewable energy and/or purchase of renewable energy credits to power energy needs during construction and/or O&M of the remedy
- Reduction in vehicle idling, including both on and off road vehicles and construction equipment during construction and/or O&M of the remedy
- Design of cover systems, to the extent possible, to be usable for alternate uses, require minimal maintenance (*e.g.*, less mowing), allow for infiltration of storm water, as applicable, and/or be integrated with the planned use of the property
- Beneficial reuse of material that would otherwise be considered a waste
- Use of Ultra Low Sulfur Diesel.

The engineered cover system and continued O&M of IRM groundwater and DNAPL collection system included in Alternative 3 would be consistent with current and reasonably anticipated future use. Furthermore, continued O&M of IRM collection systems, enhanced engineered cover systems, and installation of a low permeability liner and *in situ* treatment in the vicinity of wetland construction/restoration included in Alternatives 4 and 5, respectively, would be consistent with current, intended, and reasonably anticipated future use. Alternatives 1 and 2 would not be consistent with current, intended, and reasonably anticipated future use since it would not be protective and would therefore not be consistent. Alternative 6A and 6B would support the current, intended, and reasonably anticipated future use of the Site upon completion and restoration. Removal of land mass on the Lakeshore Area would delay the intended and future use for a public recreation trail and potential future community redevelopment opportunities on other portions of the Site.

4.2.6 Implementability

Alternatives 1 through 5 are implementable. Alternatives 3, 4, and 5 can be readily constructed and operated; the materials necessary for the construction of these alternatives are reasonably available. The IRM groundwater and DNAPL collection systems in Alternatives 1 through 5 are constructed and continued operation would be readily implementable. However, under Alternatives 6A and 6B, the East Wall and West Wall collection systems, Harbor Brook surface water conveyance structures, and a portion of the Onondaga Lake Remedy would require replacement following Site-wide excavation. Engineered cover systems in Alternatives 3, 4, and 5 would incorporate constructible and reliable technologies. The necessary equipment and specialists would be available for these alternatives. Monitoring the effectiveness of Alternatives 3, 4, and 5 would be accomplished through engineered cover systems inspections and maintenance to verify continued cover integrity, visual signs of erosion, and condition of the cover systems. Alternatives 3, 4, 5, and 6 would require coordination with other agencies, including NYSDEC, NYSDOT, NYSDOH, USEPA, the Town of Geddes, and Onondaga County. In addition, implementation of these alternatives would require coordination with property owners for implementation of institutional controls. The installation of the low permeability liner and perimeter *in situ* treatment in the vicinity of the wetland construction/restoration in Alternatives 4 and 5, respectively, would be readily constructible; however, *in situ* treatment in the vicinity of the wetland in Alternative 5 would result in additional implementability challenges, compared to installation of the low permeability liner in Alternative 4. Specifically, reduced permeability as a result of ISGS could result in changes to subsurface groundwater flow and IRM groundwater collection system effectiveness. Monitoring the effectiveness of the liner and wetland system in Alternatives 4 and 5 would be accomplished through inspection and maintenance to verify continued liner integrity, visual signs of erosion or groundwater discharge at the surface, condition of wetland vegetation, and presence of invasive species.

Alternatives 6A and 6B are not implementable for the following reasons:

- Excavation and off-site management of 3.1 to 3.4 million cy of soil/fill material associated with Alternatives 6A and 6B would be impracticable. The two alternatives would be significantly more difficult to implement than the cover placement contemplated in Alternatives 3 and 4, or cover and *in situ* treatment in Alternative 5. Specifically, there are significant implementability limitations associated with excavation, transportation, and obtaining appropriate disposal capacity for this very large volume of material. Additionally, DNAPL- impacted soil/fill material is assumed to require *ex situ* treatment via thermal treatment (*e.g.,* incineration) prior to disposal.
- Excavation considerations that limit the implementability of Alternatives 6A and 6B include construction water management, slope stability, and existing utilities:
  - Construction water management would be problematic during excavation since large volumes are anticipated due to the presence of permeable fill and excavations in proximity of Onondaga Lake and Harbor Brook. Construction water treatment capacity is not likely to be available at the Willis-Semet GWTP, therefore, a temporary treatment system would be required.
  - Excavations in the vicinity of active railroads are anticipated to limit the implementability of excavations in certain areas and require the costly design, procurement and installation of shoring under Alternative 6A, while Alternative 6B would require removal and relocation of the existing CSX railroad line. Excavations in the vicinity of IRM barrier walls and collection systems at Wastebed B and along Harbor Brook are anticipated to further limit implementability of Alternative 6, relative to potential for damage or need to replace the collection systems and barrier walls. Specifically, similar stability concerns as those identified relative to DNAPL removal at depth described in the December 2006 Explanation of Significant Differences (ESD) for the Onondaga Lake Bottom Subsite of the Onondaga Lake Superfund Site (NYSDEC and USEPA 2006)

and supporting documentation (Parsons 2006) suggest that excavation of DNAPL to 45 ft bgs may adversely impact the barrier walls and collection systems and I-690. As documented in the ESD the most appropriate remedy to address DNAPLs in this vicinity within Onondaga Lake was containment and DNAPL recovery, as has been implemented for this area. As part of the supporting geotechnical evaluations, installation of sheet piling to support excavations in this area was evaluated and would have required installation to depths that would penetrate the lower clay confining unit and, thus, potentially allow a pathway for vertical migration of DNAPL.

  - Excavation at Wastebed B and the Penn-Can Property are also anticipated to be significantly limited by the presence of utilities in this area. Utilities in this area include two active Onondaga County sewer force mains. In addition, a high pressure gas line, fiber optic lines, and water lines are present along State Fair Boulevard in the vicinity of the Penn-Can Property.

- Transportation considerations that severely limit the implementability of Alternative 6 include significantly increased traffic, fuel usage and adverse effects on both air quality and community safety. Based on the estimated number of truck trips required for export of excavated material and import of clean fill and other materials, this would equate to approximately 1 truck entering or leaving the Site every 2 minutes during a 10-hour work day for a period of 4 to 6 years. In addition to the potentially significant adverse effects on local air quality and community traffic patterns, traffic of this magnitude is anticipated to result in significant adverse effects on conditions of roadways.

In summary, Alternatives 1 through 5 are readily implementable. The necessary equipment and specialists would be available for each alternative. Cover system and wetland area construction and treatment materials are anticipated to be available. Alternatives 6A and 6B are not practical or implementable for the reasons cited above.

4.2.7 Cost

Detailed cost estimates for the alternatives are included as **Tables 4-2 through 4-8**. The costs associated with Alternatives 1 through 6A/B are summarized as follows:

Table 7: Summary of Remedial Alternative Cost Estimates

Alternative	Total estimated capital present worth cost	Total estimated present worth of O&M (30 years)	Total estimated net present worth cost
1 – No Further Action (with Continued O&M of IRMs)	$0	$0	$0
2 – Limited Action (with Continued O&M of IRMs)	$101,000	$372,000	$473,000
3 – Engineered Cover System	$9.6 M	$0.9 M	$10.5 M
4 – Enhanced Engineered Cover System with Wetland Construction/Restoration	$11.8 M	$0.9 M	$12.7 M
5 – Enhanced Engineered Cover System with Wetland Construction/Restoration, *In situ* treatment	$19.6M	$0.9 M	$20.5 M
6A – Partial Excavation with Off-Site Disposal of Soil/Fill Material	$1,161 M	$0.3 M	$1,162 M
6B – Full Excavation with Off-Site Disposal of Soil/Fill Material	$1,303 M	$0.3 M	$1,304 M

4.2.8 Land Use

Implementation of Alternatives 1 and 2 would not be consistent with current, intended, and reasonably anticipated future uses of the Site. Engineered cover systems included in Alternatives 3 through 5 would be consistent with current, intended, and reasonably anticipated future use of the property.

Alternatives 6A and 6B would significantly disrupt current land use and traffic patterns, and the duration of remedy implementation would delay construction of the proposed public recreation trail and potential redevelopment opportunities for other portions of the Site.

4.2.9 State Acceptance

Evaluation of the state acceptance criterion indicates whether, based on its review of the RI/FS reports and the Proposed Plan, the NYSDEC supports, opposes, and/or has identified any reservations with the preferred response measure.

4.2.10 Community Acceptance

Evaluation of the community acceptance criterion summarizes the public's general response to the response measures described in the Proposed Plan and the RI/FS reports. Community acceptance will be assessed in the ROD and includes determining which of the response measures the community supports, opposes, and/or has reservations about.

5. CONCLUSIONS

To provide long-lasting protection to human health and environment, seven remedial alternatives were developed and evaluated for the Site in this FS Report. Specifically, this FS Report documents the development of RAOs for the protection of human health and the environment to address contaminants identified for the Site. Consistent with DER-10 and the NCP, the seven remedial alternatives developed to address these RAOs were subjected to a detailed evaluation based on required evaluation criteria and in sufficient detail such that risk management decision makers may select a remedy for the Site.

As discussed in **Section 4**, Alternatives 1 and 2 would not satisfy the threshold criteria, while Alternatives 3 through 6 would satisfy the threshold criteria by providing protection to human health and the environment, and by addressing the identified ARARs. Therefore, with the exception of Alternatives 1 and 2, each alternative would be eligible for further evaluation and selection as the final remedy. The relative comparison based on the primary balancing criteria (long-term effectiveness and permanence; reduction of toxicity, mobility, or volume through treatment; short-term effectiveness; implementability; land use; and cost) concludes that Alternatives 3, 4, 5, and 6 would satisfy the primary balancing criteria, as these alternatives would provide for adequate and reliable means of mitigating potentially unacceptable risks to human health and the environment.

Alternative 1, the no further action alternative, would not satisfy the threshold criteria as this alternative would not provide protection of human health and the environment relative to exposure to Site soil/fill material and groundwater. Alternative 2 would include continued O&M of the IRM elements; however, also does not satisfy the threshold criteria as this alternative does not provide sufficient protection of human health and the environment relative to exposure to and erosion of exposed soil/fill material. Alternatives 3, 4, and 5 are engineered cover system alternatives, and as indicated above, would provide protection to human health and the environment and address the identified ARARs. Alternative 3 would be protective of human health and the environment through implementation of an engineered cover system and continued O&M of IRMs with institutional controls. Direct exposure to soil/fill material is addressed through implementation of a 1-ft cover system, while continued O&M of IRMs provide for continued mitigation of shallow and intermediate groundwater and DNAPL discharges to Harbor Brook and Onondaga Lake. Monitoring and institutional controls in Alternative 3 would provide a means for monitoring constituent concentrations in media, while restricting site access and use.

Alternatives 4 and 5 would provide added protectiveness compared to Alternative 3 given proposed implementation of a minimum 1-ft engineered cover system with up to a 2-ft soil cover installed in areas of the Site for the purpose of minimizing erosion and mitigating exposure of human receptors. Alternatives 3, 4 and 5 include placement of a 1-ft thick soil/granular or asphalt cover on the Penn-Can Property to provide long-term isolation of underlying impacted soils, with incorporation of additional design features, if necessary, to address surficial asphalt tar material, based on the results of the PDI. Alternatives 4 and 5 also include construction/restoration of a wetland on the northeastern shoreline of Wastebed B. Wetland construction/restoration in Alternative 4 would include installation of a low permeability liner in an area of shallow NAPL-impacted soil/fill material for the purpose of reducing infiltration and groundwater discharge to surface water during seasonally high groundwater levels, concurrent with high lake levels. Wetland construction/restoration in Alternative 5 would also include *in situ* treatment of NAPL-impacted soil/fill material surrounding the area proposed for the wetland.

The detailed analysis of alternatives indicates that Alternative 4 would be protective of human health and the environment through implementation of an enhanced engineered cover system and continued O&M of IRMs with institutional controls. Direct exposure to soil/fill material is addressed through implementation of a 1- to 2-ft cover system, while continued O&M of IRMs provide for continued mitigation of shallow and intermediate groundwater and DNAPL discharges to Harbor Brook and Onondaga Lake. Monitoring and institutional controls in Alternative 4 would provide a means for

monitoring constituent concentrations in media, while restricting Site access and use. In addition, Alternative 4 would provide added protectiveness compared to Alternative 3 with the installation of a low permeability liner on the northeastern shoreline of Wastebed B that would be extended beyond the wetland boundary over an area of NAPL-impacted soil/fill material subject to lake flooding and associated high groundwater levels for the purpose of reducing infiltration and groundwater discharge to surface water. Alternative 4 is more protective than Alternatives 2 and 3, equally protective and less costly than Alternative 5, and more practicable and implementable than Alternatives 6A/B.

As part of the process established for remedial alternatives under the ACO, following review of the evaluations documented in this FS Report, NYSDEC and USEPA will identify an alternative to propose as the preferred remedy to be documented in a Proposed Plan for the Site. Following receipt of public comments on the Proposed Plan, the selected remedial alternative will be documented in a ROD for the Site.

REFERENCES

Blasland & Bouck (B&B). 1989. *Hydrogeologic Assessment of the Allied Waste Beds in the Syracuse Area, Solvay, New York*. Blasland, Bouck & Lee, Syracuse, New York. 1989.

Blasland, Bouck & Lee (BBL). 2001. *Harbor Brook Sediment IRM Investigation Report*. Blasland, Bouck & Lee, Inc., Syracuse, New York. 2001.

C&S Companies (C&S). 2001. Transmittal to Ms. Susan Benjamin of the NYSDEC with copies of an August 3, 2000 memorandum titled "Summary of Wetland Subsurface Investigation Analytical Data" prepared by C&S. Syracuse, New York. 2001.

CH2MHill and Clough, Harbour Associates. 2011. *Basis of Design Report, Harbor Brook CSO 018, Constructed Wetlands Pilot Treatment System.* Prepared for Onondaga County Department of Water Environmental Protection (OCDWEP). May 2011.

Exponent. 2001. *Onondaga Lake RI/FS Phase 2 Investigation*. Exponent, Bellevue, Washington. 2001.

Honeywell International Inc. (Honeywell). 2014. Letter to Tracy Smith of the NYSDEC from John P. McAuliffe of Honeywell recommending the preparation of separate FSs for the Wastebed B/Harbor Brook Site and SYW-12. February 21, 2014.

Honeywell. 2004. Letter to Tracy A. Smith of the NYSDEC from John P. McAuliffe of Honeywell regarding the 2000 Site History Document and other documents representing the currently available information for Wastebed B/Harbor Brook Site. January 9, 2004.

Honeywell. 2000. *Harbor Brook Site History Document*. May 26, 2000.

New York State Department of Environmental Conservation (NYSDEC). 2014. Letter to John. P. McAuliffe of Honeywell from Tracy Smith of the NYSDEC approving the preparation of separate FSs for the Wastebed B/Harbor Brook Site and SYW-12. February 28, 2014.

NYSDEC. 2011. Division of Environmental Remediation (DER) *Green Remediation (DER-31)*. NYSDEC Program Policy. August 11, 2010. Revised January 20, 2011.

NYSDEC. 2010a. DER *Technical Guidance for Site Investigation and Remediation (DER-10).* NYSDEC Program Policy. May 3, 2010.

NYSDEC. 2010b. DER *Institutional Controls: A Guide to Drafting and Recording Institutional Controls (DER-33)*. NYSDEC Program Policy. December 3, 2010.

NYSDEC. 2000. Consent Order Case No. D-7-0001-00-02 (Harbor Brook Investigation). 2000.

NYSDEC and New York State Department of Health (NYSDOH). 2006. *New York State Brownfield Cleanup Program Development of Soil Cleanup Objectives Technical Support Document*. 2006.

NYSDEC and United States Environmental Protection Agency (USEPA). 2012. *Outboard Area Interim Remedial Measure, Response Action Document*. NYSDEC and USEPA. March 2012.

NYSDEC and USEPA. 2011. *Wastebed B/Harbor Brook Site, East Barrier Wall IRM, Response Action Document.* NYSDEC and USEPA. May 2011.

NYSDEC and USEPA. 2006. Explanation of Significant Differences – Onondaga Lake Bottom Subsite of the Onondaga Lake Superfund Site. December 2006.

New York State Department of Transportation (NYSDOT). 2011. 2011 Traffic Data Report of New York State. NYSDOT Highway Data Services Bureau, Traffic Monitoring Section. 2011.

NYSDOT. 1973. New York State Freshwater Wetlands Map (Map 9 of 21). Syracuse West Quadrangle. Second edition. 1973.

O'Brien & Gere Engineers, Inc. (OBG). 2017. *Upper Harbor Brook IRM 2016 Annual Report.* O'Brien & Gere Engineers, Inc., Syracuse, New York. 2017.

OBG. 2016a. *Wastebed B/Harbor Brook Materials Management, Grading, and Disposal Plan Field Modification.* O'Brien & Gere Engineers, Inc., Syracuse, New York. 2016a.

OBG. 2016b. *Upper Harbor Brook IRM 2015 Annual Report.* O'Brien & Gere Engineers, Inc., Syracuse, New York. 2016b.

OBG. 2015a. *Wastebed B/Harbor Brook Revised Remedial Investigation Report.* O'Brien & Gere Engineers, Inc., Syracuse, New York. 2015a.

OBG. 2015b. *Upper Harbor Brook IRM 2014 Annual Report.* O'Brien & Gere Engineers, Inc., Syracuse, New York. 2015b.

OBG. 2014a. *Upper Harbor Brook Interim Remedial Measure Construction Completion Report*. O'Brien & Gere Engineers, Inc., Syracuse, New York. 2014a.

OBG. 2014b. *East Flume Interim Remedial Measure Construction Completion Report.* O'Brien & Gere Engineers, Inc., Syracuse, New York. 2014b.

OBG. 2014c. *Willis Avenue Chlorobenzene Site Revised Remedial Investigation Report*. O'Brien & Gere Engineers, Inc. Syracuse, NY. September 2014.

OBG. 2013a. *Wastebed B/Harbor Brook Materials Management, Grading, and Disposal Plan.* O'Brien & Gere Engineers, Inc., Syracuse, New York. 2013a.

OBG. 2013b. *Integrated IRM, Mitigation Wetlands, and Remediation Area A Hydraulic Control System Revised Final 100% Design Report for Wastebeds 1-8.* O'Brien & Gere Engineers, Inc., Syracuse, New York. January 2013.

OBG. 2011. *Revised Baseline Ecological Risk Assessment Report. Wastebed B/Harbor Brook Site. Geddes and Syracuse, New York*. O'Brien & Gere Engineers, Inc., Syracuse, New York. 2011.

OBG. 2009. *Revised Human Health Risk Assessment Report. Wastebed B/Harbor Brook Site. Geddes and Syracuse, New York*. O'Brien & Gere Engineers, Inc., Syracuse, New York. 2009.

OBG. 2003. *Jurisdictional Wetland Delineation Report. Harbor Brook Site. Geddes, New York*. O'Brien & Gere Engineers, Inc., Syracuse, New York. 2003.

OBG. 2002. *RI/FS Work Plan, Geddes, New York*. O'Brien & Gere Engineers, Inc., Syracuse, New York. 2002.

OBG. 2001a. Telephone conversation between Ron Chiarello of OBG and Doug Hill of NYSDOT. January 25, 2001.

OBG. 2001b. *Jurisdictional Wetland Survey, Lakeshore Area, Harbor Brook Site, Geddes, New York.* O'Brien & Gere Engineers, Inc. Syracuse, New York. 2001b.

OBG. 2000. *Preliminary Site Assessment, Harbor Brook Site Work Plan, Geddes, New York*. O'Brien & Gere Engineers, Inc., Syracuse, New York. 2000.

OBG and Parsons. 2010. *Onondaga Lake Wetland/Floodplain Assessment Final Report*. O'Brien & Gere and Parsons, Syracuse, New York. 2010.

OCDWEP. 2015. *Onondaga Lake Ambient Monitoring Program, 2013 Annual Report*. OCDWEP. March 2015.

Parsons. 2017. *Draft Onondaga Lake Maintenance and Monitoring Plan.* Parsons, Liverpool, New York. November 2017.

Parsons. 2014a. *Interim Remedial Measure Construction Completion Report, West Wall Portion of the Wastebed B/Harbor Brook IRM*. Parsons, Liverpool, New York. March 2014.

Parsons. 2014b. *Interim Remedial Measure Construction Completion Report, East Wall Portion of the Wastebed B/Harbor Brook IRM*. Parsons, Liverpool, New York. May 2014.

Parsons. 2012. *IRM Report for the Willis Avenue/Semet Tar Beds Site*. *Solvay, New York*. Parsons, Liverpool, New York. 2012.

Parsons. 2006. *Onondaga Lake: Technical Support Document for Explanation of Significant Differences*. August 2006.

Parsons and OBG. 2017. *2015-2016 Source Control Summary for the Onondaga Lake Bottom Subsite.* Parsons and OBG, Syracuse, New York. 2017.

Parsons and OBG. 2014. *2014 Source Control Summary for the Onondaga Lake Bottom Subsite*. Parsons and OBG, Syracuse, New York. 2014.

Parsons and OBG. 2013. *2012 and 2013 Source Control Summary for the Onondaga Lake Bottom Subsite*. Parsons and OBG, Syracuse, New York. 2013.

PTI Environmental Services (PTI). 1994. *Supplemental Sediment Sampling at Onondaga Lake – East Flume*. PTI Environmental Services, Waltham, Massachusetts. 1994.

USEPA. 2010a. *Superfund Green Remediation Strategy.* 2010a.

USEPA. 2010b. *EPA Region 2 Clean and Green Policy.* 2010b.

USEPA. 1991. *A Guide to Principal Threat and Low Level Threat Wastes.* Superfund Publication: 9380.3-06FS. November 1991.

USEPA. 1988. *Guidance for Conducting Remedial Investigations and Feasibility Studies Under Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)*. *Interim Final*. Publication EPA/540/G-89/004. Office of Emergency and Remedial Response. Washington, D.C. October 1988.

USEPA. 1988. *Guidance on Remedial Actions for Contaminated Ground Water at Superfund Sites. Interim Final.* Publication EPA/540/G-88/003. Office of Solid Waste and Emergency Response Directive 9283.1-02. Washington, D.C. December 1988.

Tables

TABLE 1-1. INTERIM REMEDIAL MEASURE AND RESPONSE ACTION SUMMARY

Site Media	Site Area	IRM, Response Action, or Investigation	Component Description	Media Addressed
Shallow and Intermediate Groundwater	Lakeshore Area	West Wall Portion of the WBB/HB IRM (West Wall IRM)	West Wall barrier wall and groundwater collection system installed to capture and contain impacted shallow and intermediate groundwater, to eliminate, to the extent practicable, discharge to Onondaga Lake.	Discharge of shallow and intermediate groundwater is being addressed through current IRMs. Monitoring still required.
	Lakeshore Area, Harbor Brook, AOS #1	East Wall Portion of the WBB/HB IRM (East Wall IRM)	East Wall barrier wall and groundwater collection system installed to capture and contain impacted shallow and intermediate groundwater, to eliminate, to the extent practicable, discharge to Onondaga Lake and Harbor Brook.	Discharge of shallow and intermediate groundwater is being addressed through current IRMs. Monitoring still required.
	Harbor Brook, Lakeshore Area, Railroad Area, AOS #2	Upper Harbor Brook Portion of the WBB/HB IRM (Upper Harbor Brook IRM)	Three groundwater collections systems installed and operating adjacent to Harbor Brook (one beneath I-690 Drainage Ditch, one along Harbor Brook on the Lakeshore Area, and one along Harbor Brook on the Railroad Area). Sediment excavated from I-690 Drainage Ditch, Harbor Brook (OW-1, 2, 3, and 4), and Wastebed D/E Drainage Ditch, with full or partial installation of concrete or geomembrane over the excavated areas prior to restoration of sediment substrate with clean material. Harbor Brook culverts cleaned and sealed to prevent groundwater infiltration.	Discharge of shallow and intermediate groundwater is being addressed through current IRMs. Monitoring still required.
NAPL	Lakeshore Area Penn-Can Property, Railroad Area, AOS #1, AOS #2, and Harbor Brook	West Wall IRM/East Wall IRM/Upper Harbor Brook IRM	Passive NAPL collection system (collection sump and observation port) installed and functioning in OW-1, 3, and 4, located adjacent to Harbor Brook (one beneath I-690 Drainage Ditch, one along Harbor Brook on the Lakeshore Area, and one along Harbor Brook on the Railroad Area). East and West Wall barrier walls and passive NAPL collection systems installed to eliminate, to the extent practicable, discharge of NAPL into Harbor Brook and Onondaga Lake, and collect NAPL as feasible.	Discharge of NAPL to Harbor Brook and Onondaga Lake, is being addressed through current IRMs. Monitoring still required.
Soil/Fill Material	Lakeshore Area	WBB/HB Materials Management, Grading, and Disposal Plan	Excavated materials from site IRMs placed in designated areas on Wastebed B, graded to DEC-approved contours, and restored with 2-ft soil cover and native species vegetation.	Exposure to surface soil, in Lakeshore Area, is being addressed through current WBB/HB Materials Management, Grading, and Disposal Plan.
	AOS #1	East Wall Collection Trench Optimization	A cover, with a minimum 2-ft thickness, was graded and restored with vegetation.	Exposure to surface soil behind the East Wall is being addressed through the East Wall Collection Trench Optimization.
	Penn-Can Property	Tonodo Property Investigation	2013 investigation performed as part of Honeywell's property purchase indicated that fill material was placed over a significant area of the southern portion of the property, by property tenant prior to 2013 (observed to be 8 to 16 ft thickness).	Placement of fill material on southern portion of the Penn-Can Property was not conducted as part of IRM or response action activities.
Wetland Sediment	Penn-Can Property, Railroad Area, and Lakeshore Area	Upper Harbor Brook IRM	Sediment excavated and clean substrate placed in wetland areas on Lakeshore Area (WL6), Penn-Can Property (WPC1, 2, and 3), and Railroad Area (WRR1, 2, 3, 4, and 5). The Lakeshore Area and Railroad Area wetlands restored as wetland area. WPC1, 2, and 3 not restored as wetlands; WRR1, 2, 3, and 4 were enlarged to compensate for the loss of WPC1, 2, and 3.	Sediment removal and wetland restoration in wetland areas WL6, WPC1 through 3; and WRR1 through 5 addressed through current IRMs.
Surface Water, Sediment, and Storm Water	Lakeshore Area: East Flume	West Wall IRM/East Flume IRM	Storm water rerouted directly to Onondaga Lake instead of to East Flume, and SPDES Outfall 015 relocated to Lakeshore Property after rerouting of associated piping system. P.A. Sewer through the Willis Avenue Site abandoned. Sediment outboard of the West Wall was removed. Sediment inboard of the West Wall, within the Upper East Flume, was covered as part of West Wall IRM activities. East Flume completely removed, with restoration of area (placement of geotextile fabric, imported backfill with engineered fill and gravel). Downgradient groundwater collection via WBB/HB IRM.	Surface water, sediment, and storm water associated with the former East Flume addressed through current IRMs. Maintenance and monitoring still required.
	Lakeshore Area, Penn-Can Property, Railroad Area, AOS #2	Upper Harbor Brook IRM	Sediment removed from the I-690 Drainage Ditch, Penn-Can Property Drainage Ditch, Harbor Brook (OW-1, 2, 3, and 4), and Wastebed D/E Drainage Ditch, with full or partial installation of concrete or geomembrane over the excavated areas prior to restoration of sediment substrate with clean material. Sediment removed from the Railroad Ditch -1 and 2 with restoration of sediment substrate with clean material. The I-690 stormwater conveyance system discharging to the I-690 Drainage Ditch cleaned prior to sediment removal and lining.	Surface water, sediment, and storm water in Upper Harbor Brook addressed through current IRMs. Maintenance and monitoring still required.
Surface Water and Sediment	Harbor Brook	East Wall IRM	Lower Harbor Brook channel rerouted by creating a new channel to the east in AOS#1, backfilling the former channel with engineered fill and construction debris, and demolition and replacement of the existing downstream culvert. New channel lined with a 1-ft layer of clayey shale material and covered with 6-inches of granular fill.	Surface water and sediment in Lower Harbor Brook addressed through current IRMs.
		Upper Harbor Brook IRM	Sediment removed from open water areas in Harbor Brook (OW-1, 2, 3, and 4), with concrete or geomembrane fully or partially installed over the excavated areas prior to restoration of the sediment substrate with clean material. The Harbor Brook culverts were cleaned and sealed.	Surface water and sediment in Upper Harbor Brook addressed through current IRMs.
	Lakeshore Area, AOS #1	Outboard Area IRM (Response Action)	Soil and sediment outside of the East and West Walls removed to a typical depth between 5 to 10 ft bgs with hot-spot removal of an additional 3 to 4 ft bgs and placement of an isolation cap. Subsequent habitat restoration, towards creating emergent wetland areas and habitat for northern pike reproduction, will be implemented.	Surface water and sediment in the Outboard Area addressed through current IRMs.

Note:
The location of the IRMs and remedial actions is illustrated on **Figure 1-3**.

TABLE 3-1. POTENTIALLY APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARs) AND TO BE CONSIDERED (TBC) MATERIALS

Medium/Location/Action	Citation	Requirements	Comments	Potential ARAR	Potential TBC
Potential Chemical-Specific ARARs and TBCs					
Groundwater	6 NYCRR 700.1 - Definitions	Promulgated state regulation that provides groundwater definitions.	Fresh groundwater is defined as groundwater with a chloride concentration equal to or less than 250 mg/L or a total dissolved solids concentration (TDS) equal to or less than 1,000 mg/L. Saline groundwater is defined as groundwater with a chloride concentration greater than 250 mg/L or a TDS concentration greater than 1,000 mg/L.	Yes	No
	6 NYCRR 701 - Classifications - Surface Waters and Groundwaters	Promulgated state regulation that provides groundwater classifications.	6 NYCRR Part 701.15 states that Class GA groundwater is fresh groundwater, and the best use of Class GA groundwater is potable use. 6 NYCRR Part 701.16 states that Class GSA groundwater is saline groundwater, and the best use of Class GSA groundwater is as a source of potable mineral waters, conversion to fresh potable waters, or as raw material for the manufacture of sodium chloride or its derivatives or similar products. 6 NYCRR Part 701.18 states that the groundwater classifications defined in Sections 701.15 (Class GA fresh groundwaters) and 701.16 (Class GSA saline groundwaters) are assigned to all the groundwaters of New York State. The Class GSB shall not be assigned to any groundwater of the State, unless the commissioner finds that adjacent and tributary groundwaters and the best usages thereof will not be impaired by such classification.	Yes	No
Shallow/intermediate groundwater	6 NYCRR Part 703 - Class GA groundwater quality standards	Promulgated water quality standards for fresh groundwater, including narrative and constituent-specific standards.	Not applicable to shallow or intermediate groundwater within the limits of the Site due to the presence of Solvay waste, historic fill materials disposed of at the Site, coal tar-like DNAPL associated with the Penn-Can Property, and stained soils found in shallow fill material on the Lakeshore Area and AOS #1. Potentially applicable for shallow and intermediate groundwater beyond the limits of the Site boundary.	Yes	No
	6 NYCRR Part 703 - Class GSA groundwater quality standards	Promulgated water quality standards for saline groundwater, consisting of narrative standards for taste-, color-, and odor-producing, and toxic and other deleterious substances, and thermal discharges.	Potentially applicable for saline groundwater.	No	Yes
	NYS TOGS 1.1.1 – Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations	Guidance that summarizes groundwater standards and guidance values.	Not applicable to shallow or intermediate groundwater within the limits of the Site due to the presence of Solvay waste, historic fill materials disposed of at the Site, coal tar-like DNAPL associated with the Penn-Can Property, and stained soils found in shallow fill material on the Lakeshore Area and AOS #1. Potentially applicable for shallow and intermediate groundwater beyond the limits of the Site boundary.	Yes	No
	40 CFR Part 141 - Drinking Water Standards	Establishes Maximum Contaminant Levels (MCLs) for public water supplies.	Not applicable to shallow or intermediate groundwater within the limits of the Site due to the presence of Solvay waste, historic fill materials disposed of at the Site, coal tar-like DNAPL associated with the Penn-Can Property, and stained soils found in shallow fill material on the Lakeshore Area and AOS #1. Potentially applicable for shallow and intermediate groundwater beyond the limits of the Site boundary. Shallow and intermediate groundwater is not used as a drinking water source as municipal water is available, nor is it suitable for a drinking water source (due to salinity).	Yes	No
Soil/fill material	6 NYCRR Part 375-6 Remedial Program Soil Cleanup Objectives (SCOs)	Promulgated state regulation that documents SCOs for various restricted property uses (industrial, commercial, restricted residential, and residential), for the protection of groundwater and ecological resources, and for unrestricted property use. Commercial use includes passive recreational use that refers to recreational uses with limited potential for soil contact, such as: (1) artificial surface fields; (2) outdoor tennis or basketball courts; (3) other paved recreational facilities used for roller hockey, roller skating, shuffle board, etc.; (4) outdoor pools; (5) indoor sports or recreational facilities; (6) golf courses; and (7) paved (raised) bike or walking paths (DER-10 (NYSDEC 2010)). Industrial use includes land use for the primary purpose of manufacturing, production, fabrication or assembly processes and ancillary services. The industrial use category allows the use of the site only for industrial purposes with access to the site limited to workers and occasional visitors [DER-10 (NYSDEC 2010)].	SCOs for restricted use (industrial, commercial) are potentially relevant and appropriate to site soil/fill material given the current and reasonably anticipated future land use as a commercial or industrial property. SCOs for the protection of groundwater may not be applicable, relevant or appropriate because migration of Site groundwater is currently being controlled. SCOs for unrestricted use may not be applicable, relevant or appropriate given the current and reasonably anticipated future land use of the Site; however, were considered for the purpose of evaluating pre-disposal conditions.	Yes	No
	USEPA Soil Screening Guidance: User's Guide (1996)	Guidance that provides methodology for developing site-specific soil screening levels. Also provides generic soil screening levels based on default assumptions.	Potentially relevant and appropriate to Site soil.	No	Yes
	USEPA Guidance on Remedial Actions for Superfund Sites with PCB Contamination (1990)	Guidance that describes recommended approach to evaluate and remediate sites with PCB contaminations	Potentially applicable to PCBs in Site soil.	No	Yes
	USEPA Regional Screening Levels	Guidance that provides human health risk-based screening values for soil at industrial sites. Screening levels are calculated based on human health exposure assumptions and toxicity data.	Industrial soil screening levels are potentially applicable for the screening of soil/fill material.	No	Yes
	USEPA Ecological Screening Levels	Guidance that provides ecological risk-based screening values. Screening values are based on ecological exposure assumptions and toxicity data.	To be considered. Ecological screening values are not promulgated cleanup levels.	No	Yes

TABLE 3-1. POTENTIALLY APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARs) AND TO BE CONSIDERED (TBC) MATERIALS

Medium/Location/Action	Citation	Requirements	Comments	Potential ARAR	Potential TBC
Potential Location-Specific ARARs and TBCs					
Construction of Buildings/Indoor Air	NYSDOH's October 2006 Guidance for Evaluating Soil Vapor Intrusion in the State of New York	Guidance document that provides thresholds for indoor air and subslab soil vapor above which vapor mitigation is required.	Not currently applicable, because no occupied buildings are present on the Site. Potentially applicable if future buildings are constructed at the Site.	No	Yes
	OSWER Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air, OSWER Publication 9200.2-154, June 2015	Technical guidance that provides recommendations on assessment of vapor intrusion pathways that pose an unacceptable risk to human health.	Not currently applicable, because no occupied buildings are present on the Site. Potentially applicable if future buildings are constructed at the Site.	No	Yes
Water Bodies	33 CFR 320 - 330 - Navigation and Navigable Waters	Regulatory policies and permit requirements for work affecting waters of the United States and navigable waterways.	Substantive, non-administrative requirements potentially applicable to work affecting Harbor Brook or Onondaga Lake.	Yes	No
	16 USC 661 - Fish and Wildlife Coordination Act	Requires protection of fish and wildlife in a stream or other water body when performing activities that modify a stream or river.		Yes	No
Wetlands	6 NYCRR 663 - Freshwater wetland permit requirements	Actions occurring in a designated freshwater wetland (within 100 feet) must be approved by NYSDEC or its designee. Activities occurring adjacent to freshwater wetlands must: be compatible with preservation, protection, and conservation of wetlands and benefits; result in no more than insubstantial degradation to or loss of any part of the wetland; and be compatible with public health and welfare.	Potentially applicable to remedial actions within 100 ft of Site wetlands as designated freshwater wetland regulated by NYSDEC.	Yes	No
	Clean Water Act Section 404 33 CFR Parts 320 - 330	Regulatory policies and permit requirements for work affecting waters of the United States, including wetlands.	Potentially applicable to Site wetlands.	Yes	No
	Clean Water Act Section 404 40 CFR Parts 230-231	Provides for restoration and maintenance of integrity of waters of the United States, including wetlands, through the control of dredged or fill material discharge.		Yes	No
	Executive Order 11990 - Protection of Wetlands	Executive order requires federal agencies to avoid, to the extent possible, the long- and short-term adverse impacts associated with the destruction or loss of wetlands if a practical alternative exists.		Yes	No
Wetlands & Floodplains	Policy on Floodplains and Wetland Assessments for CERCLA Actions (OSWER Directive 9280.0-2; 1985)	Policy and guidance requiring Superfund actions to meet substantive requirements of Executive Orders 11988 (Floodplain Management) and 11990 (Protection of Wetlands). Describes requirements for floodplain assessment during remedial action planning.	To be considered during the remedial design. Potentially applicable for Site wetlands. Potentially applicable as a portion of the Site is within the 100-year and 500-year floodplains.	No	Yes
	Statement of Procedures on Floodplains Management and Wetlands Protection (January 5, 1979, https://www.epa.gov/nepa/floodplain-management-and-wetland-guidance-national-environmental-policy-act-reviews)	Policy and guidance for implementing Executive Orders 11988 and 11990. Requires federal agencies to evaluate the potential effects of action proposed in wetlands and floodplains to avoid, to the extent possible, adverse effects. Federal agencies are required to evaluate alternatives to actions in wetlands and floodplains to avoid or minimize adverse impacts if no practical alternatives exist.	To be considered during the remedial design. Potentially applicable for Site wetlands. Potentially applicable as a portion of the Site is within the 100-year and 500-year floodplains. Requires a floodplain assessment if the selected alternative includes remedial activities that would potentially impact the floodplain.	No	Yes
Floodplains	6 NYCRR 373-2.2 - Location standards for hazardous waste treatment, storage, and disposal facilities -100-yr floodplain	Hazardous waste treatment, storage, or disposal facilities located in a 100-year floodplain must be designed, constructed, operated and maintained to prevent washout of hazardous waste during a 100-year flood.	Not applicable or relevant and appropriate. Site is located in the 100-year floodplain; however, no hazardous waste treatment, storage, or disposal facilities are planned to be located on Site.	No	No
	40 CFR Part 264.18(b) - Location Standards - Floodplains	Hazardous waste treatment, storage, or disposal facilities located in a 100-year floodplain must be designed, constructed, operated and maintained to prevent washout of hazardous waste during a 100-year flood.	Not applicable or relevant and appropriate. Site is located in the 100-year floodplain; however, no hazardous waste treatment, storage, or disposal facilities are planned to be located on Site.	No	No
	Executive Order 11988 - Floodplain Management	USEPA is required to conduct activities to avoid, to the extent possible, the long- and short-term adverse impacts associated with the occupation or modification of floodplains. The procedures also require USEPA to avoid direct or indirect support of floodplain development wherever there are practicable alternatives and minimize potential harm to floodplains when there are no practicable alternatives.	Potentially applicable or relevant. The Site is located within a 100-year and 500-year floodplains. Requires a floodplain assessment if the selected alternative includes remedial activities that would potentially impact the floodplain.	Yes	No
	Executive Order 13690 - Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input	Executive order establishes a Federal Flood Risk Management Standard (FFRMS), a Process for Further Soliciting and Considering Stakeholder Input, and amends Executive Order 11988. The FFRMS establishes a construction standard and framework for Federally funded projects constructed in, and affecting, floodplains, to reduce the risks and cost of floods. Under the FFRMS, federal agency management is expanded from the current base flood level to a higher vertical elevation and corresponding horizontal floodplain to address current and future flood risk to increase resiliency of projects funded with federal funds. The Executive Order also sets forth a process for solicitation and consideration of public input, prior to implementation of the FFRMS.	Potentially applicable or relevant. The Site is located within a 100-year and 500-year floodplains. Requires a floodplain assessment if the selected alternative includes remedial activities that would potentially impact the floodplain.	Yes	No
	6 NYCRR 500 - Floodplain Management Regulations Development Permits	Promulgated state regulations providing permit requirements for development in areas of special flood hazard (floodplain within a community subject to a one percent or greater chance of flooding in any given year).	Requires remedial activities to be conducted in accordance with the statutory requirements of the Town of Geddes Flood Protection Ordinance if conducted within the 100-year and/or 500-year floodplains as defined by FEMA. The 100-year and 500-year floodplains exist along the general lakeshore area immediately adjacent to Onondaga Lake and includes portions of Harbor Brook.	Yes	No
	Town of Geddes Flood Protection Ordinance	Permit requirements for work in areas of special flood hazard.	Requires remedial activities to be conducted in accordance with the statutory requirements of the Town of Geddes Flood Protection Ordinance if conducted within the 100-year and/or 500-year floodplains as defined by FEMA. The 100-year and 500-year floodplains exist along the general lakeshore area immediately adjacent to Onondaga Lake and includes portions of Harbor Brook.	Yes	No

TABLE 3-1. POTENTIALLY APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARs) AND TO BE CONSIDERED (TBC) MATERIALS

Medium/Location/Action	Citation	Requirements	Comments	Potential ARAR	Potential TBC
Potential Location-Specific ARARs and TBCs (continued)					
Within 61 meters (200 feet) of a fault displaced in Holocene time	40 CFR Part 264.18(a) - Location Standards - Seismic considerations	New treatment, storage, or disposal of hazardous waste is not allowed.	Not applicable or relevant and appropriate. Site is not located within 200 feet of a fault displaced in Holocene time, as listed in 40 CFR 264 Appendix VI. None listed in New York State.	No	No
Within salt dome or bed formation, underground mine, or cave	40 CFR Part 264.18 (c) - Location standards; salt dome formations, salt bed formations, underground mines and caves.	Placement of non-containerized or bulk liquid hazardous waste is not allowed.	Not applicable or relevant and appropriate. No salt dome formations, salt bed formations, underground mines or caves present at Site.	No	No
Habitat of an endangered or threatened species	6 NYCRR 182	Promulgated state regulation that provides requirements to minimize damage to habitat of an endangered species.	Not applicable or relevant and appropriate. No endangered or threatened wildlife species, rare plants or significant habitats were identified at the site. One threatened plant within 2 miles of Site on north shore of Onondaga Lake not anticipated to be impacted by Site activities.	No	No
	Endangered Species Act	Provides a means for conserving various species of fish, wildlife, and plants that are threatened with extinction.	Not applicable or relevant and appropriate. No federally listed or proposed endangered or threatened species exist within two miles of the site.	No	No
	50 CFR Part 17 - Endangered and Threatened Wildlife and Plants and 50 CFR Part 402 - Interagency Cooperation	Promulgated federal regulation that requires that federal agencies ensure authorized, funded, or executed actions will not destroy or have adverse modification of critical habitat.		No	No
Historical property or district	National Historic Preservation Act 36 CFR 800- Preservation of Historic Properties Owned by a Federal Agency	Remedial actions are required to account for the effects of remedial activities on any historic properties included on or eligible for inclusion on the National Register of Historic Places.	To be considered during remedial design.	No	Yes
	National Historic Preservation Act 36 CFR Part 65 - National Historic Landmarks Program	Promulgated federal regulation requiring that actions must be taken to preserve and recover historical/archeological artifacts found.	To be considered during remedial design.	No	Yes
	New York State Historic Preservation Act of 1980 9 NYCRR Parts 426 - 428	State law and regulations requiring the protection of historic, architectural, archeological and cultural property.	To be considered during remedial design.	No	Yes
Wildlife refuge	National Wildlife Refuge System Administration Act 50 CFR Part 27 - Prohibited Acts	Provides for protection of areas designated as part of National Wildlife Refuge System.	Not applicable or relevant and appropriate. Site not located in wildlife refuge.	No	No
Wilderness area	Wilderness Act 50 CFR Part 35 - Wilderness Preservation and Management	Provides for protection of federally-owned designated wilderness areas.	Not applicable or relevant and appropriate. Site not located in wilderness area.	No	No
Wild, scenic, or recreational river	Wild and Scenic Rivers Act	Provides for protection of areas specified as wild, scenic, or recreational.	Not applicable or relevant and appropriate. Site not located near wild, scenic or recreational river.	No	No
Coastal zone	Coastal Zone Management Act	Requires activities be conducted consistent with approved State management programs.	Not applicable or relevant and appropriate. Site not located in coastal zone.	No	No
Coastal barrier	Coastal Barrier Resources Act	Prohibits any new Federal expenditure within the Coastal Barrier Resource System.	Not applicable or relevant and appropriate. Site not located in coastal barrier.	No	No
Protection of waters	33 U.S.C. 1341 - Clean Water Act Section 401, State Water Quality Certification Program	States have the authority to veto or place conditions on federally permitted activities that may result in water pollution.	Potentially applicable to site wetlands.	Yes	Yes

TABLE 3-1. POTENTIALLY APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARs) AND TO BE CONSIDERED (TBC) MATERIALS

Medium/Location/Action	Citation	Requirements	Comments	Potential ARAR	Potential TBC
Potential Action-Specific ARARs and TBCs					
Institutional controls	NYSDEC DER-33 Institutional Controls: A Guide to Drafting and Recording Institutional Controls, December 2010	Technical guidance document that provides guidelines for proper development and recording of institutional controls as part of a site remedial program.	Potentially applicable TBC when institutional controls are implemented as a component of the selected remedy.	No	Yes
Cover systems	NYSDEC DER-10 Technical Guidance for Site Investigation and Remediation, May 2010	Technical guidance document that provides guidelines for cover thicknesses as they relate to property use in areas where exposed surface soil exceeds NYCRR Part 375 SCOs. Specifically, where the exposed surface soil at the site exceeds the applicable soil cleanup objective for protection of human health and/or ecological resources, the soil cover for restricted residential use, is to be two feet; for commercial or industrial use, is to be one foot; or when an ecological resource has been identified is to be a minimum of two feet; and when such a concern is identified by NYSDEC, consideration should be given to supplementing the demarcation layer to serve as an impediment to burrowing.	Potentially applicable TBC for cover components of alternatives.	No	Yes
Landfill	40 CFR Part 257 - Criteria for Classification of Solid Waste Disposal Facilities and Practices	Promulgated federal regulation that provides criteria for solid waste disposal facilities to protect health and the environment.	Landfilling of wastes may be applicable for the Site. Potentially applicable for treatment residuals or soil/fill material consolidated on-Site in a containment unit.	Yes	No
	40 CFR Parts 264 and 265, Subpart N - Landfills	Promulgated federal regulation that provides requirements for hazardous waste landfill units.		Yes	No
Generation and management of solid waste	6 NYCRR 360 - Solid Waste Management Facilities	Promulgated state regulation that provides requirements for management of solid wastes, including disposal and closure of disposal facilities.	Potentially applicable to alternatives including disposal of residuals generated by treatment processes.	Yes	No
Land disposal	6 NYCRR 376 - Land Disposal Restrictions	Promulgated federal and state regulations that provide treatment standards to be met prior to land disposal of hazardous wastes.	Potentially applicable to residuals generated by treatment processes if found to be hazardous wastes and disposed at a landfill. Applicable for off-site treatment and disposal of soil/fill material.	Yes	No
	40 CFR Part 268 - Land Disposal Restrictions				
	62 CFR 25997 - Phase IV Supplemental Proposal on Land Disposal of Mineral Processing Wastes				
Green remediation	NYSDEC DER-31 Green Remediation Program Policy, January 2011	State and federal technical guidance documents that provide guidelines for the development of site remediation strategies in a manner that minimizes environmental impacts and applies green remediation concepts (e.*g.*, reduction in green house gas emissions, energy consumption and resource use, promotion of recycling of materials and conservations of water, land and habitat).	Potentially applicable TBC.	No	Yes
	Superfund Green Remediation Strategy, September 2010				
General excavation	6 NYCRR 200-203, 211-212 - Prevention and Control of Air Contamination and Air Pollution	Provides requirements for air emission sources.	Portions potentially applicable to volatile emissions during excavation	Yes	No
	6 NYCRR 257 - Air Quality Standards	Promulgated state regulation that provides specific limits on generation of SO_2, particulates, CO_2, photochemical oxidants, hydrocarbons (non-methane), NO_2, fluorides, beryllium and H_2S from point sources.	Not applicable or relevant and appropriate. Dust emissions would not be generated from a point source. Potential TBC during dust generating activities such as earth moving, grading and excavation.	No	Yes
	40 CFR Part 50.1 - 50.12 - National Ambient Air Quality Standards	Promulgated federal regulation that provides air quality standards for pollutants considered harmful to public health and the environment. The six principle pollutants are carbon monoxide, lead, nitrogen dioxide, particulates, ozone, and sulfur oxides.	Potentially applicable to alternatives during which dust generation may result, such as during earth moving, grading, and excavation.	Yes	No
	NYS TAGM 4031 - Dust Suppressing and Particle Monitoring at Inactive Hazardous Waste Disposal Sites	State guidance document that provides limitations on dust emissions.	To be considered material where more stringent than air-related ARARs.	No	Yes
Construction	29 CFR Part 1910.120 - Occupational Safety and Health Standards - Hazardous Waste Operations and Emergency Response	Promulgated federal regulation requiring that remedial activities must be in accordance with applicable OSHA requirements.	Potentially applicable for construction activities.	Yes	No
	29 CFR Part 1926 - Safety and Health Regulations for Construction	Promulgated federal regulation requiring that remedial construction activities must be in accordance with applicable OSHA requirements.	Potentially applicable for construction activities.	Yes	No

TABLE 3-1. POTENTIALLY APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARs) AND TO BE CONSIDERED (TBC) MATERIALS

Medium/Location/Action	Citation	Requirements	Comments	Potential ARAR	Potential TBC
Potential Action-Specific ARARs and TBCs (continued)					
Discharge to surface water and injection to groundwater	6 NYCRR 750 through 758 - State Pollutant Discharge Elimination System (SPDES) Regulations	Substantive requirements associated with discharge to a water body (limitations and monitoring requirements) would be set by NYSDEC.	Treated groundwater recovered by IRM groundwater collection systems would be treated by the Willis-Semet Groundwater Treatment Plant, with subsequent discharge to the Onondaga County Department of Water Environment Protection Metro Wastewater Treatment Plan or directly to Onondaga Lake.	Yes	No
	6 NYCRR 701 - Classifications- Surface Waters and Groundwaters	Promulgated state regulation that establishes classifications of surface water and groundwater in New York State. Provides general condition that discharges shall not cause impairment of the best usages of the receiving water as specified by the water classifications at the location of discharge and at other locations that may be affected by such discharge. Also establishes that groundwater classifications apply to all groundwaters of the state.	Potentially applicable.	Yes	No
	6 NYCRR 703 - Surface Water and Groundwater Quality Standards and Groundwater Effluent Limitations	Promulgated state regulation that provides water quality standards for surface water and groundwater. Also provides Maximum Allowable Concentrations for discharge to Class GA groundwaters of the state.	Potentially applicable.	Yes	No
	40 CFR 136 - Guidelines Establishing Test Procedures for The Analysis Of Pollutants	Federal guidance providing test procedures for NPDES programs.	Potentially applicable.	Yes	No
	40 CFR 144 - Underground Injection Control (UIC) Program	Permit not required for Class V wells, which are approved by rule under federal UIC program. Substantial compliance with Class V permit requirements must be demonstrated.	Injection of *in situ* treatment amendments not included as part of alternatives.	No	No
Discharge to publicly owned treatment works (POTW)	Clean Water Act Pretreatment Regulations (40 CFR Part 403)	Pretreatment requirements for discharges to POTWs.	Potentially applicable for treated groundwater discharged to the Onondaga County Metropolitan Wastewater Treatment Plant from the Willis-Semet Groundwater Treatment Plant.	Yes	No
Construction storm water management	NYSDEC General permit for storm water discharges associated with construction activities. Pursuant to Article 17 Titles 7 and 8 and Article 70 of the Environmental Conservation Law.	The regulation prohibits discharge of materials other than storm water and all discharges that contain a hazardous substance in excess of reportable quantities established by 40 CFR 117.3 or 40 CFR 302.4, unless a separate NPDES permit has been issued to regulate those discharges. A permit must be acquired if activities involve disturbance of 5 acres or more. If the project is covered under the general permit, the following are required: development and implementation of a storm water pollution prevention plan; development and implementation of a monitoring program; all records must be retained for a period of at least 3 years after construction is complete.	Potentially applicable. Construction could result in clearing/disturbance of more than 5 acres.	Yes	No
Transportation	6 NYCRR 364 - Waste Transporter Permits	Promulgated state regulation requiring that hazardous waste transport must be conducted by a hauler permitted under 6 NYCRR 364.	Potentially applicable for off-site transport of hazardous waste.	Yes	No
	49 CFR 107, 171-174 and 177-179 - Department of Transportation Regulations	Promulgated federal regulation requiring that hazardous waste transport to off-site disposal facilities must be conducted in accordance with applicable Department of Transportation requirements.	Potentially applicable for off-site transport of hazardous waste to off-site treatment/disposal facilities.	Yes	No

Notes:
ARARs - Applicable or Relevant and Appropriate Requirements
CERLA - Comprehensive Environmental Response, Compensation, and Liability Act
CFR - Code of Federal Regulations
DER - Division of Environmental Remediation
FEMA - Federal Emergency Management Agency
FS - Feasibility Study
mg/L - milligrams per liter
NYCRR - New York Code of Rules and Regulations
NYS - New York State
NYSDEC - New York State Department of Environmental Conservation
NYSDOH - New York State Department of Environmental Conservation
OSHA - Occupational Safety and Health Administration
OSWER - Office of Solid Waste and Emergency Response
PCB - Polychlorinated biphenyls
SCOs - Soil Cleanup Objectives
TAGM - Technical and Administrative Guidance Memorandum (NYSDEC)
TBC - To be Considered
USC - United States Code
USEPA or EPA - United States Environmental Protection Agency
Shaded cells - not identified as Potential ARARs or TBCs

TABLE 3-2. SCREENING AND EVALUATION OF REMEDIAL TECHNOLOGIES AND PROCESS OPTIONS FOR SOIL/FILL MATERIAL AND DNAPL

General Response Action	Remedial Technology	Process Option	Description	Implementability	Effectiveness	Relative Cost	Screening and Evaluation Comments
No further action	No further action	No further action*	No further remedial action addressing Site soil/fill material would be conducted beyond current IRMs.	Readily implementable.	Not effective in mitigating the potential for migration of and contact with COCs in exposed soil/fill material. Effective in mitigating the potential for DNAPL discharge to Onondaga Lake and Harbor Brook.	No capital Low O&M	Potentially applicable. Retained for further consideration. No action required for consideration by the NCP (40 CFR Part 300.430) and NYSDEC DER-10 Technical Guidance for Site Investigation and Remediation.
Institutional controls/Limited actions	Monitoring	DNAPL monitoring*	Periodic monitoring of DNAPL presence and thickness as a means of detecting changes in DNAPL occurrence in the subsurface. If DNAPL is observed, passive recovery of DNAPL may be implemented.	Implementable. A pre-design study would be necessary to evaluate monitoring well placement.	Effective method for monitoring the presence/absence of DNAPL over time. Effective for passive recovery of DNAPL, if present.	Low capital Low O&M	Potentially applicable for targeted DNAPL monitoring and passive recovery. Would require access agreement with other property owners for Railroad Area and AOS #2. Retained for further consideration in areas where DNAPL is encountered.
	Access/use restrictions/ administrative control(s)	Institutional controls*	Implementation and documentation of access and land use restrictions that would require activities that would potentially disturb or expose contaminated soil/fill material (and require health and safety precautions) be conducted in accordance with the site management plan. Institutional controls would also provide provisions to evaluate and address potential soil vapor intrusion, as necessary, if a new building(s) is constructed at the Site.	Readily implementable. Would require property owner agreement/implementation for Railroad Area and AOS #2.	Effective means of controlling site access and documenting use restrictions.	Low capital No O&M	Potentially applicable. Would require access agreement with other property owners for Railroad Area and AOS #2. Retained for further consideration.
	Site controls	Site management plan*	Documentation of site restrictions and provisions for continued operation and maintenance of the remedy. Presents site engineering and institutional controls and physical components of the selected remedy requiring operation, maintenance and monitoring to provide continued effectiveness. The site management plan would also present provisions for periodic site reviews.	Readily implementable. Would require property owner agreement/implementation for Railroad Area and AOS #2.	Effective means of controlling site use restrictions and communicating soil management/handling procedures. Effective means of documenting remedy components, including operation, maintenance, and monitoring requirements.	Low capital No O&M	Potentially applicable. Would require access agreement with other property owners for Railroad Area and AOS #2. Retained for further consideration.
	Periodic reviews	Periodic site reviews*	Periodic reviews are required by 6 NYCRR Part 375 and DER-10 where institutional and engineering controls, monitoring plans, and/or operations and maintenance activities are implemented on a site. The purpose of the reviews is to evaluate the areas in regard to the continuing protection of human health and the environment and to provide documentation of remedy effectiveness. In accordance with 6 NYCRR Part 375-1.8(h)(3), the frequency of periodic reviews should be annual, unless a different frequency is	Readily implementable.	Effective means of evaluating continued protection to human health and the environment.	No capital Low O&M	Potentially applicable. Retained for further consideration.

TABLE 3-2. SCREENING AND EVALUATION OF REMEDIAL TECHNOLOGIES AND PROCESS OPTIONS FOR SOIL/FILL MATERIAL AND DNAPL

General Response Action	Remedial Technology	Process Option	Description	Implementability	Effectiveness	Relative Cost	Screening and Evaluation Comments
			approved the by NYSDEC. Periodic site reviews would include performance of supplemental Five Year Reviews in accordance with 40 CFR 300.430(f)(4)ii.				
Natural recovery	Natural attenuation	Natural attenuation	The natural degradation of contaminants by *in situ* physical, chemical and/or biological processes. Over time, contaminants' toxicity, mobility and/or volume can be reduced by processes that include biodegradation, sorption, dilution, volatilization, and/or transformation.	Potentially implementable.	Attenuation processes potentially effective for reduction of contaminant concentrations over the long-term; however existing Site data is inconclusive.	No capital No O&M	Potentially applicable. Naturally occurring attenuation processes are likely occurring; however, current Site data is inconclusive
Containment	Cover system	Vegetation enhancement*	Use of enhanced vegetative growth to reduce erosion of surface soil/fill material. Can be applied using hydroseeding techniques (*i.e.*, blown or sprayed on), and can be mixed with wood or paper mulch during application.	Implementable. Routine cover maintenance and inspection would be necessary to maintain cover system integrity.	Effective for reducing surface soil/fill material erosion due to surface water/storm water flow or wind. Thick vegetation is effective at inhibiting contact with soil/fill material. Potentially effective means of improving evapotranspiration. Effectiveness relies on maintaining integrity of cover system.	Low capital Low O&M	Potentially applicable. Retained for further consideration where surface soils exhibit concentration above NYCRR Part 375 SCOs corresponding to site use.
		Engineered cover*	Use of vegetated soil/granular material, gravel or asphalt to reduce erosion of surface soil/fill material and prevent direct contact with soil/fill material. Grading would be performed such that drainage is promoted, erosion is minimized, and cover integrity is protected.	Implementable. Routine cover maintenance and inspection would be necessary to maintain cover system integrity.	Effective means of minimizing erosion of, and contact with exposed surface soil and soil/fill material. Effective means of minimizing erosion of soil/fill material that could result in surface water contamination. Potentially effective means of improving evapotranspiration. Effectiveness relies on maintaining integrity of cover system.	Medium capital Medium O&M	Potentially applicable. Part of Site IRMs and response actions. Retained for further consideration in areas where surface soils exhibit concentrations above NYCRR Part 375 SCOs corresponding to site use.
		Isolation cover*	Use of a cover system to minimize surface water infiltration, encourage runoff and control erosion, and isolate and contain impacted soil/fill material, DNAPL-impacted soil/fill material, and/or surficial asphalt tar. Isolation cover components may consist of low permeability clay or geomembrane system, impermeable composite, sand/granular and/or reactive/amended components. Vegetation, asphalt, or gravel may be utilized as the top layer based upon site use and restoration requirements within the covered area.	Implementable. Routine cover maintenance and inspection would be necessary to maintain cover system integrity. A pre-design investigation would be necessary to evaluate migration potential and compatibility of isolation materials.	Effective means of minimizing erosion of, and contact with exposed soil/fill material and surficial asphalt tar. Effective means of minimizing erosion of soil/fill material that could result in surface water contamination. Results in reduction in infiltration that could reduce leaching of contaminants in soil/fill material, DNAPL-impacted soil/fill material, and/or surficial asphalt tar to groundwater, and reduce mobilization of COCs. Potentially effective means of improving evapotranspiration. Effectiveness relies on maintaining integrity of cover system.	High capital Medium O&M	Potentially applicable. Retained for further consideration in areas where surface soils exhibit concentrations above NYCRR Part 375 SCOs corresponding to site use and/or in areas of DNAPL-impacted soil/fill material (Lakeshore Area) and surficial asphalt tar (Penn-Can Property). Potentially applicable for surficial asphalt tar control.

TABLE 3-2. SCREENING AND EVALUATION OF REMEDIAL TECHNOLOGIES AND PROCESS OPTIONS FOR SOIL/FILL MATERIAL AND DNAPL

General Response Action	Remedial Technology	Process Option	Description	Implementability	Effectiveness	Relative Cost	Screening and Evaluation Comments
In situ treatment	Biological	Enhanced bioremediation	Injection of microbial populations and potential nutrient sources/electron donors into subsurface to enhance biological degradation of organic constituents.	Absence of discrete source areas of COCs renders this technology not practicable across much of the Site. Implementability limited due to low permeability and heterogeneous subsurface conditions, access limitations, and subsurface utilities. Subsurface heterogeneity would likely require advanced delivery techniques (*i.e., in situ* mixing, tight injection point spacing). Extensive injection well network potentially required to address areal extent and depth of DNAPL and impacted soils due to low permeability soil/fill material. *In situ* mixing not implementable on Penn-Can Property due to heterogeneous mixed fill material. *In situ* mixing potentially implementable on other Site areas. Not implementable in the immediate vicinity of WBB/HB IRM barrier walls and associated groundwater collection systems on the Lakeshore Area, Railroad Area, AOS #1 and AOS #2, and in the vicinity of Harbor Brook due to potential fouling and/or operation impacts to pumps, force mains, and/or *ex situ* treatment processes associated with introduction of enhanced bioremediation amendments. Implementability limitations in the immediate vicinity of I-690, subsurface utilities and the railroad tracks. Consideration of surface stability and equipment access required in areas prone to flooding/high groundwater levels.	Not effective for treatment of inorganics. Does not directly treat DNAPL, but can increase dissolution, therefore limited effectiveness for treatment of residual DNAPL. Potential limited effectiveness for VOCs and SVOCs in saturated and unsaturated soil/fill material. A treatability study would be necessary to evaluate effectiveness. Results of a site-specific microcosm study performed on similar wastebed soil/fill material showed a lack of biological degradation in microcosms constructed using groundwater and soil/fill material. High pH of soil/fill material does not provide favorable conditions to sustain organisms capable of biodegradation. Effectiveness potentially limited by low permeability and heterogeneous subsurface conditions, which could result in uneven distribution and limited contact of electron donors and/or microorganisms, resulting in areas of untreated contaminants (via injection or mixing techniques). Effectiveness also potentially limited by presence of underground utilities and obstructions, which may provide preferential pathways or obstructions for fluids injected into the overburden preventing complete contact. Large obstructions present in Penn-Can Property fill material (*e.g.,* concrete slabs, rebar, and large rocks) would limit effectiveness of *in* situ mixing and could potentially damage *in situ* mixing equipment.	High capital Low O&M	Not retained for further consideration, because not practicable for site-wide treatment of non-discrete source areas of COCs, and subsurface conditions likely to limit implementability and treatment effectiveness.

TABLE 3-2. SCREENING AND EVALUATION OF REMEDIAL TECHNOLOGIES AND PROCESS OPTIONS FOR SOIL/FILL MATERIAL AND DNAPL

General Response Action	Remedial Technology	Process Option	Description	Implementability	Effectiveness	Relative Cost	Screening and Evaluation Comments
In situ treatment (continued)	Biological (continued)	Bioventing	Introduction of low air flow rates to the subsurface to provide enough oxygen to sustain microbial activity, thereby stimulating the natural *in situ* biodegradation of aerobically degradable compounds in soil.	Absence of discrete source areas of COCs renders this technology not practicable across much of the Site. Implementability limited due to low permeability conditions at the Site, presence of heterogeneous subsurface conditions, access limitations, and subsurface utilities. Heterogeneity of subsurface materials would result in uneven oxygen flow. Implementability limitations in the immediate vicinity of I-690, subsurface utilities and the railroad tracks and in areas prone to flooding (Lakeshore and Harbor Brook).	Not effective for degradation of inorganics or DNAPL. Potentially effective for degradation of petroleum hydrocarbons and non-chlorinated solvents in the unsaturated zone. A treatability study would be necessary to evaluate effectiveness. Results of a site-specific microcosm study performed on similar wastebed soil/fill material showed a lack of biological degradation in microcosms constructed using groundwater and soil/fill material. High pH of soil/fill material does not provide favorable conditions to sustain organisms capable of biodegradation. Low permeability and heterogeneous materials limit effective distribution of air flow within the subsurface, resulting in areas of untreated soil/fill material. Effectiveness also potentially limited by presence of underground utilities and obstructions, which may provide preferential pathways or obstructions to air flow.	Medium capital Low O&M	Not retained for further consideration, because not practicable for site-wide treatment of non-discrete source areas of COCs, and subsurface conditions likely to limit implementability and treatment effectiveness.
		Phytoremediation	Use of plants to remove, transfer, stabilize, or destroy contaminants in shallow soil.	Potentially implementable for shallow soil/fill material. Non-growing seasons would limit implementability.	Potentially effective for reducing VOCs, SVOC, and inorganic concentrations in shallow soil/fill material. Not effective for treatment of DNAPL. Not effective at depths below plant root zone.	Low capital Low O&M	Not retained for further consideration based on limitations (seasonal implementability and depths within root zone).

TABLE 3-2. SCREENING AND EVALUATION OF REMEDIAL TECHNOLOGIES AND PROCESS OPTIONS FOR SOIL/FILL MATERIAL AND DNAPL

General Response Action	Remedial Technology	Process Option	Description	Implementability	Effectiveness	Relative Cost	Screening and Evaluation Comments
In situ treatment (continued)	Physical/ Chemical	Chemical oxidation*	*In situ* treatment of soil/fill material using oxidants such as ozone, hydrogen peroxide, hypochlorites, permanganate, and/or sodium persulfide. Oxidation reactions chemically convert constituents to non-hazardous or less toxic compounds that are more stable, less mobile, and/or inert. Oxidation agents can be applied to the subsurface via injection points, deep soil mixing, or soil fracturing.	Absence of discrete source areas of COCs renders this technology not practicable across much of the Site. Implementability limited due to low permeability conditions at the Site, presence of heterogeneous subsurface conditions, access limitations and subsurface utilities. Implementability via injection points limited due to low permeability conditions at the Site. Extensive injection well network potentially required to address areal extent and depth of DNAPL and impacted soils due to low permeability soil/fill material. Subsurface heterogeneity would likely require advanced delivery techniques (*i.e.*, *in situ* mixing, tight injection point spacing). *In situ* mixing is not implementable on the Penn-Can Property due to heterogeneous mixed fill material. Targeted i*n situ* mixing potentially implementable on other Site areas. *In situ* injection of oxidants not implementable in the immediate vicinity of WBB/HB IRM barrier walls and associated groundwater collection systems on the Lakeshore Area, Railroad Area, AOS #1 and AOS #2, and in the vicinity of Harbor Brook due to potential fouling and/or operation impacts to pumps, force mains, and/or *ex situ* treatment processes associated with introduction of oxidant. Implementability limitations would also exist in areas in the immediate vicinity of I-690, subsurface utilities, and the railroad tracks. Surface stability and equipment access would require consideration in areas prone to flooding/high groundwater levels (Lakeshore and Harbor Brook). Large quantities of oxidant potentially required to address areal extent of DNAPL. Potential for health and safety issues when handling large volumes of oxidant chemicals and working in the vicinity of potentially aggressive reactions.	Not effective for treatment of inorganics. Potentially effective for treatment of soluble VOCs and SVOCs in the unsaturated and saturated zones and in the reduction of residual DNAPL. A treatability study would be necessary to evaluate effectiveness. Effectiveness potentially limited by low permeability and heterogeneous subsurface conditions, which could result in uneven distribution of the oxidant, resulting in areas of untreated contaminants via injection methods; mixing potentially effective for improving oxidant distribution. Effectiveness also potentially limited by presence of underground utilities, obstructions, and heterogeneous mixed fill material (Penn-Can Property) which may provide preferential pathways or obstructions for oxidation agents mixed into the overburden, preventing complete contact. Large obstructions present in Penn-Can Property fill material (*e.g.,* concrete slabs, rebar, and large rocks) would limit effectiveness of *in* situ mixing and could potentially damage *in situ* mixing equipment. Could potentially disrupt natural attenuation processes. Potential for production of hazardous intermediates if incomplete oxidation occurs. Potential for mobilization of DNAPL with injection of fluids.	Medium capital Low to medium O&M	Not retained for site-wide treatment of non-discrete source areas of COCs, and subsurface conditions likely to limit implementability and treatment effectiveness. Targeted i*n situ* mixing potentially implementable. Retained for further consideration for focused treatment for residual DNAPL on the Lakeshore Area, AOS #1 and #2, or Railroad Area.

TABLE 3-2. SCREENING AND EVALUATION OF REMEDIAL TECHNOLOGIES AND PROCESS OPTIONS FOR SOIL/FILL MATERIAL AND DNAPL

General Response Action	Remedial Technology	Process Option	Description	Implementability	Effectiveness	Relative Cost	Screening and Evaluation Comments
In situ treatment (continued)	Physical/ Chemical (continued)	Soil-vapor extraction (SVE)	Vacuum is applied through extraction wells within the vadose zone to create a pressure/concentration gradient that induces organics sorbed on the soil/fill material, and/or dissolved in pore water to volatilize. Extracted vapors are removed through extraction wells and treated *ex situ* as needed.	Absence of discrete source areas of COCs renders this technology not practicable across much of the Site. Implementability limited due to low permeability conditions at the Site, presence of heterogeneous subsurface conditions, access limitations and subsurface utilities. Not implementable below the water table. Limitations to implementability of SVE and associated dewatering (if necessary) would exist due to low permeability of soil/fill material and limited radius of influent of SVE points. A pilot/pumping test would be necessary to identify radius of influence and implementability in low permeability soil/fill material. Implementability limitations in the immediate vicinity of I-690, subsurface utilities, the railroad tracks and in areas prone to flooding (Lakeshore and Harbor Brook).	Not effective for treatment of SVOCs, inorganics, or DNAPL. Potentially effective for treatment of VOCs in the unsaturated zone. A treatability study would be necessary to evaluate effectiveness. Effectiveness limited by low permeability soil/fill and subsurface heterogeneity. Underground utilities may provide preferential pathways for vapor migration, potentially causing short circuiting, and affecting treatment effectiveness. Effectiveness dependent on application of pressure/concentration gradient, which would be limited by subsurface heterogeneity.	Medium capital Medium O&M	Not retained for site-wide treatment of non-discrete source areas of COCs, and subsurface conditions likely to limit implementability and treatment effectiveness.
		Solidification/ Stabilization*	Contaminants are physically bound or enclosed within a stabilized mass (solidification), and/or chemical reactions are induced between stabilizing agent and contaminants to reduce their mobility (stabilization), toxicity and leachability.	Absence of discrete source areas of COCs renders this technology not practicable across much of the Site. Implementability limited due to access limitations and subsurface utilities. Heterogeneity and low permeability of subsurface materials would likely require advanced delivery techniques (*i.e.*, *in situ* mixing, tight injection point spacing). *In situ* mixing is not implementable across the extent of the Penn-Can Property due to heterogeneous mixed fill material. Targeted *in situ* mixing potentially implementable on other Site areas and as a mean of addressing targeted areas of surficial asphalt tar on the Penn-Can Property. *In situ* injections or mixing not implementable in the immediate vicinity of WBB/HB IRM barrier walls and groundwater collection systems on the Lakeshore Area, Railroad Area, AOS #1 and AOS #2, and in the vicinity of	Potentially effective for the *in situ* stabilization and reduction in mobility of VOCs, SVOCs, inorganics and DNAPL in the unsaturated and saturated zones. Effective for reducing the permeability of the treatment zone. A treatability study would be necessary to evaluate effectiveness and selection of reagents. Effectiveness potentially limited by low permeability and heterogeneous subsurface conditions, which could result in uneven distribution of the reagents, resulting in areas of untreated contaminants via injection methods; mixing potentially effective for improving reagent distribution. Effectiveness also potentially limited by presence of underground utilities, obstructions, and heterogeneous mixed fill material (Penn-Can Property) may provide preferential pathways or obstructions for solidification/stabilizing agents mixed into the overburden, preventing complete contact. Large obstructions present in Penn-Can Property fill material (*e.g.*, concrete slabs, rebar,	High capital No O&M	Not practicable for site-wide treatment of non-discrete source areas of COCs. Variety of COCs in soil/fill material could limit effectiveness. Retained for further consideration for focused treatment; *in situ* mixing of solidification/stabilization reagents is a potentially effective and implementable means of addressing Site constituents and residual DNAPL on the Lakeshore Area, AOS #1 and #2, or Railroad Area. Potentially effective means of addressing targeted areas of surficial asphalt tar on the Penn-Can Property.

TABLE 3-2. SCREENING AND EVALUATION OF REMEDIAL TECHNOLOGIES AND PROCESS OPTIONS FOR SOIL/FILL MATERIAL AND DNAPL

General Response Action	Remedial Technology	Process Option	Description	Implementability	Effectiveness	Relative Cost	Screening and Evaluation Comments
				Harbor Brook. Implementability limitations in the immediate vicinity of I-690, subsurface utilities and the railroad tracks. *In situ* mixing using a grid/phased approach potentially implementable in the immediate vicinity or the IRM barrier wall, soil piles, and roadways for the purpose of maintaining subsurface stability. Excavation of surficial soil/fill material potentially required to account for volume increase with agent addition. Surface stability and equipment access would require consideration in areas prone to flooding/high groundwater levels.	and large rocks) would limit effectiveness of *in* situ mixing and could potentially damage *in situ* mixing equipment.		
In situ treatment (continued)	Physical/ Chemical (continued)	Flushing	Water, aqueous solution, surfactants, or cosolvents are injected into the soil or groundwater. The extraction fluid is utilized to enhance contaminant solubility. Contaminants are leached into the groundwater and subsequently removed through a collection system and treated *ex situ.*	Absence of discrete source areas of COCs renders this technology not practicable across much of the Site. Implementability limited due to low permeability conditions at the Site, presence of heterogeneous subsurface conditions, access limitations and subsurface utilities. Injected fluid and mobilized DNAPL would require recovery and treatment/management. Not implementable in the immediate vicinity of WBB/HB IRM barrier walls and associated groundwater collection systems on the Lakeshore Area, Railroad Area, AOS #1 and AOS #2, and in the vicinity of Harbor Brook due to potential fouling and/or operation impacts associated with introduction of flushing solution to pumps, force mains, and/or *ex situ* treatment processes. Implementability limitations in the immediate vicinity of I-690, subsurface utilities and the railroad tracks.	Potentially effective for treatment of VOCs, SVOCs, and inorganics in the saturated and unsaturated zones. Potentially effective for treatment of DNAPL. A treatability study would be necessary to evaluate effectiveness. Effectiveness potentially limited by low permeability and heterogeneous subsurface conditions, which could result in uneven distribution and recovery of the flushing solution. Effectiveness also potentially limited by presence of underground utilities and obstructions, which may provide preferential pathways or obstructions to solution injection and recovery, preventing complete contact.	Medium capital No O&M	Not retained for further consideration, because not practicable for site-wide treatment of non-discrete source areas of COCs, and subsurface conditions likely to limit implementability and treatment effectiveness.

TABLE 3-2. SCREENING AND EVALUATION OF REMEDIAL TECHNOLOGIES AND PROCESS OPTIONS FOR SOIL/FILL MATERIAL AND DNAPL

General Response Action	Remedial Technology	Process Option	Description	Implementability	Effectiveness	Relative Cost	Screening and Evaluation Comments
In situ treatment (continued)	Physical/ Chemical (continued)	Electrokinetic separation	A low-intensity current is passed through the contaminated soil between ceramic electrodes. Electrochemical and electrokinetic processes cause inorganics and organic contaminants to desorb from low permeability materials. A processing solution, concentrated with contaminants, is then extracted and treated *ex situ.*	Absence of discrete source areas of COCs renders this technology not practicable across much of the Site. Implementability limited due to low permeability conditions at the Site, presence of heterogeneous subsurface conditions, access limitations and subsurface utilities. Mobilized DNAPL would require recovery and treatment/management. Implementability limitations in the immediate vicinity of I-690, subsurface utilities and the railroad tracks and in areas prone to flooding (Lakeshore and Harbor Brook).	Not effective for treatment of DNAPL. Potentially effective for treatment of polar organics and inorganics in the saturated and unsaturated zones. A treatability study would be necessary to evaluate effectiveness. Effectiveness potentially limited by low permeability and heterogeneous subsurface conditions, which could result in uneven recovery of processing solution and/or mobilized DNAPL. Effectiveness also potentially limited by underground utilities and obstructions may provide preferential pathways or obstructions for processing solution and/or mobilized DNAPL recovery.	Medium capital Medium O&M	Not retained for further consideration, because not practicable for site-wide treatment of non-discrete source areas of COCs, and subsurface conditions likely to limit implementability and treatment effectiveness.
	Thermal	Hot water injection	Injection of hot water through injection wells to enhance the recovery of organic constituents. The injected hot water heats the subsurface, increasing dissolution of organic contaminants, with subsequent collection and treatment through a series of groundwater and vapor extraction wells.	Absence of discrete source areas of COCs renders this technology not practicable across much of the Site. Implementability limited due to low permeability conditions at the Site, presence of heterogeneous subsurface conditions, access limitations and subsurface utilities. Potentially requires implementation in conjunction with SVE or multi-phase extraction system for vapor and mobilized DNAPL recovery and/or hydraulic control system to maintain temperatures in the treatment area. Off-gas treatment likely required. Implementability limitations in the immediate vicinity of I-690, subsurface utilities and the railroad tracks and in areas prone to flooding (Lakeshore and Harbor Brook). Risk of producing uncontrolled migration of DNAPL and vapors.	Not effective for treatment of inorganics. Potentially effective for treatment of VOCs, SVOCs, and residual DNAPL in the unsaturated and saturated zones. A treatability study would be necessary to evaluate effectiveness. Effectiveness potentially limited by low permeability and heterogeneous subsurface conditions which could limit effectiveness of SVE or MPE systems, resulting in areas of untreated soil/fill material and unrecovered vapor and DNAPL. Potential for increased mobilization resulting in uncontrolled vertical and horizontal DNAPL migration.	Very High capital No O&M	Not retained for further consideration, because not practicable for site-wide treatment of non-discrete source areas of COCs, and subsurface conditions likely to limit implementability and treatment effectiveness and risk of uncontrolled migration of DNAPL and vapors.

TABLE 3-2. SCREENING AND EVALUATION OF REMEDIAL TECHNOLOGIES AND PROCESS OPTIONS FOR SOIL/FILL MATERIAL AND DNAPL

General Response Action	Remedial Technology	Process Option	Description	Implementability	Effectiveness	Relative Cost	Screening and Evaluation Comments
In situ treatment (continued)	Thermal (continued)	Steam injection	Injection of steam through injection wells to enhance the recovery of organic contaminants. The injected steam heats the surrounding subsurface, volatilizing, mobilizing, or oxidizing organic contaminants, with subsequent collection and treatment through a series of water and vapor extraction wells.	Absence of discrete source areas of COCs renders this technology not practicable across much of the Site. Implementability limited due to low permeability conditions at the Site, presence of heterogeneous subsurface conditions, access limitations and subsurface utilities. Potentially requires implementation in conjunction with SVE system and IRM groundwater collection system for vapor and mobilized DNAPL recovery and/or hydraulic control system to maintain temperatures in the treatment area. Off-gas treatment likely required. Implementability limitations in the immediate vicinity of I-690, subsurface utilities and the railroad tracks and in areas prone to flooding (Lakeshore and Harbor Brook). Potential implementability challenges associated with loss of geotechnical structural integrity of wastebed. Risk of producing uncontrolled migration of DNAPL and vapors.	Not effective for treatment of inorganics. Potentially effective for treatment of VOCs, SVOCs and residual DNAPL in the unsaturated and saturated zones. A treatability study would be necessary to evaluate effectiveness. Effectiveness potentially limited by low permeability and heterogeneous subsurface conditions which could limit effectiveness of SVE or MPE systems, resulting in areas of untreated soil/fill material and unrecovered vapor and DNAPL. Potential for increased mobilization resulting in uncontrolled vertical and horizontal DNAPL migration and release of hazardous vapors to the atmosphere.	Very high capital No O&M	Not retained for further consideration, because not practicable for site-wide treatment of non-discrete source areas of COCs, subsurface conditions likely to limit implementability and treatment effectiveness, and risk of uncontrolled migration of DNAPL and vapors.
		Electrical resistance heating	A series of electrodes are installed around a central neutral electrode. Volatilized contaminants, produced by the heating of the subsurface surrounding the electrodes, are recovered using extraction wells and subsequently treated at the surface.	Absence of discrete source areas of COCs renders this technology not practicable across much of the Site. Requires implementation in conjunction with SVE system and IRM groundwater collection system for vapor, groundwater, and mobilized DNAPL recovery and/or hydraulic control system to maintain temperatures in the treatment area. Implementability limited due to low permeability conditions at the Site, presence of heterogeneous subsurface conditions, access limitations and subsurface utilities. Implementability limitations in the immediate vicinity of I-690, subsurface utilities and the railroad tracks and in areas prone to flooding (Lakeshore and Harbor Brook). Potential implementability challenges associated with loss of geotechnical structural	Not effective for treatment of inorganics. Potentially effective for treatment of VOCs, SVOCs and DNAPL in the unsaturated and saturated zones. A treatability study would be necessary to evaluate effectiveness. Effectiveness potentially limited by low permeability and heterogeneous subsurface conditions which could limit effectiveness of SVE or MPE systems, resulting in areas of untreated soil/fill material and unrecovered vapor and DNAPL.	High capital No O&M	Not retained for further consideration, because not practicable for site-wide treatment of non-discrete source areas of COCs, subsurface conditions likely to limit implementability and treatment effectiveness, risk of uncontrolled migration of DNAPL and vapors, and potential loss of geotechnical structural integrity of wastebed as a result of subsurface heating.

TABLE 3-2. SCREENING AND EVALUATION OF REMEDIAL TECHNOLOGIES AND PROCESS OPTIONS FOR SOIL/FILL MATERIAL AND DNAPL

General Response Action	Remedial Technology	Process Option	Description	Implementability	Effectiveness	Relative Cost	Screening and Evaluation Comments
				integrity of wastebed. Could potentially cause soil fracturing. High energy requirements and potential for related hazards.			
In situ treatment (continued)	Thermal (continued)	Radio frequency heating	Heating of soil using a configuration of electrodes to enhance the recovery of organic constituents. Heated soil is bound by two rows of electrodes that act as ground electrodes. A third row of electrodes is implanted halfway between the ground rows, acting as a capacitor. Electromagnetic energy is applied, heating the surrounding soil volume, causing organic contaminants to vaporize. Extraction wells remove contaminant vapors for *ex situ* treatment.	Absence of discrete source areas of COCs renders this technology not practicable across much of the Site. Requires Implementation in conjunction with SVE system and IRM groundwater collection system for vapor, groundwater and mobilized DNAPL recovery and/or hydraulic control system to maintain temperatures in the treatment area. Implementability limited due to low permeability conditions at the Site, presence of heterogeneous subsurface conditions, access limitations and subsurface utilities. Potential implementability challenges associated with loss of geotechnical structural integrity of wastebed. Could potentially cause soil fracturing. High energy requirements and potential for related hazards.	Not effective for treatment of inorganics. Potentially effective for treatment of VOCs and SVOCs in the unsaturated zone. A treatability study would be necessary to evaluate effectiveness. Effectiveness potentially limited by low permeability and heterogeneous subsurface conditions which could limit effectiveness of SVE or MPE systems, resulting in areas of untreated soil/fill material and unrecovered vapor and DNAPL. Potential for increased DNAPL mobilization resulting in uncontrolled vertical and horizontal migration.	High capital No O&M	Not retained for further consideration, because not practicable for site-wide treatment of non-discrete source areas of COCs, subsurface conditions likely to limit implementability and treatment effectiveness, risk of uncontrolled migration of DNAPL and vapors, and potential loss of geotechnical structural integrity of wastebed as a result of subsurface heating.
		Thermal conduction	Heat is applied to the subsurface through steel wells or thermal blankets. Organic contaminants are volatilized through heating, and subsequently collected for treatment at the surface.	Absence of discrete source areas of COCs renders this technology not practicable across much of the Site. Requires implementation in conjunction with SVE system and IRM groundwater collection system for vapor, groundwater and mobilized DNAPL recovery and/or hydraulic control system to maintain temperatures in the treatment area. Implementability limited due to low permeability conditions at the Site, presence of heterogeneous subsurface conditions, access limitations and subsurface utilities. Limitations to implementability would exist in areas in the immediate vicinity of I-690, subsurface utilities and the railroad tracks and	Not effective for treatment of inorganics. Potentially effective for treatment of VOCs, SVOCs, and DNAPL in the unsaturated and saturated zones. A treatability study would be necessary to evaluate effectiveness. Effectiveness potentially limited by low permeability and heterogeneous subsurface conditions which could limit effectiveness of SVE or MPE systems, resulting in areas of untreated soil/fill material and unrecovered vapor and DNAPL. Potential for increased DNAPL mobilization resulting in uncontrolled vertical and horizontal migration.	High capital No O&M	Not retained for further consideration, because not practicable for site-wide treatment of non-discrete source areas of COCs, subsurface conditions likely to limit implementability and treatment effectiveness, risk of uncontrolled migration of DNAPL and vapors, and potential loss of geotechnical structural integrity of wastebed as a result of subsurface heating.

TABLE 3-2. SCREENING AND EVALUATION OF REMEDIAL TECHNOLOGIES AND PROCESS OPTIONS FOR SOIL/FILL MATERIAL AND DNAPL

General Response Action	Remedial Technology	Process Option	Description	Implementability	Effectiveness	Relative Cost	Screening and Evaluation Comments
				in areas prone to flooding (Lakeshore and Harbor Brook). Potential implementability challenges associated with loss of geotechnical structural integrity of wastebed. Could potentially cause soil fracturing. High energy requirements and potential for related hazards.			
In situ treatment (continued)	Thermal (continued)	Vitrification	An electric current is utilized to melt soil at extremely high temperatures (2,900 to 3,650 °F) and thereby immobilize most inorganics and destroy organics by pyrolysis.	Absence of discrete source areas of COCs renders this technology not practicable across much of the Site. Implementability limited due to access limitations and underground utilities. Potentially requires implementation in conjunction with SVE system and IRM groundwater collection system for vapor, groundwater and mobilized DNAPL recovery and/or hydraulic control system to maintain temperatures in the treatment are. Limitations to implementability would exist in areas in the immediate vicinity of I-690, subsurface utilities and the railroad tracks and in areas prone to flooding (Lakeshore and Harbor Brook). Potential implementability challenges associated with loss of geotechnical structural integrity of wastebed. Could potentially cause soil fracturing. High energy requirements and potential for related hazards.	Potentially effective for treatment of VOCs, SVOCs, DNAPL, and inorganics in the unsaturated zone. Effectiveness potentially limited by low permeability and heterogeneous subsurface conditions which could limit effectiveness of SVE or MPE systems, resulting in areas of untreated soil/fill material and unrecovered vapor and DNAPL. A treatability study would be necessary to evaluate effectiveness.	Very high capital No O&M	Not retained for further consideration, because not practicable for site-wide treatment of non-discrete source areas of COCs, subsurface conditions likely to limit implementability and treatment effectiveness, and potential loss of geotechnical structural integrity of wastebed as a result of subsurface heating.
Removal	Excavation	Mechanical excavation*	Use of construction equipment to remove soil/fill material. Due to physical characteristics of soil/fill material and presence below groundwater table, dewatering and water treatment would likely be required. It is anticipated that in addition to dewatering, sludge management may also be required to render the excavated material sufficiently dry for management and transportation. Excavated areas would be backfilled, graded and restored based on restoration requirements. Soil/fill material	Implementability of soil/fill material excavation is limited by depth of impacted materials, need for sloping or shoring, and large quantities of soil/fill material. Implementability of asphalt tar excavation would be evaluated during pre-design investigations although it is anticipated to be limited due to discontinuous nature of the asphalt tar in conjunction with presence of	Effective means of reducing the toxicity, mobility, and volume of impacted soil/fill material and DNAPL (where accessible). Dewatering and/or stabilization may be required prior to management, treatment, and disposal.	High capital No O&M	Not practicable for site-wide removal of non-discrete areas of COCs. Not implementable in the immediate vicinity of I-690, subsurface utilities, the railroad tracks, and IRM barrier walls and associated collection systems. Potentially applicable for targeted removal of soil/fill material and shallow DNAPL. Retained for further consideration.

TABLE 3-2. SCREENING AND EVALUATION OF REMEDIAL TECHNOLOGIES AND PROCESS OPTIONS FOR SOIL/FILL MATERIAL AND DNAPL

General Response Action	Remedial Technology	Process Option	Description	Implementability	Effectiveness	Relative Cost	Screening and Evaluation Comments
			would be transported and disposed off-site. Treated water would be discharged locally to a water body.	heterogeneous mixed fill materials on the Penn-Can Property. Implementability limited by presence of buildings, roads, railroad tracks, and subsurface utilities. Implementability limited with increased depth (particularly beneath the water table). Limitations to implementability would exist in areas in the immediate vicinity of I-690, subsurface utilities, the railroad tracks, and in the vicinity of the IRM barrier walls. Additional excavation sloping and benching required in the immediate vicinity of the IRM barrier walls and soil piles for the purpose of maintaining subsurface stability and integrity of IRMs. Dewatering of excavations and subsequent water management/treatment would also be required. Further management of excavated soil/fill material would be required. Backfilling and/or regrading would be required to accommodate future site use/development.			
Removal (continued)	DNAPL extraction	Extraction wells (vertical or horizontal)*	Removal of mobile DNAPL from one or more recovery wells.	Potentially implementable for local use in areas of mobile DNAPL.	DNAPL recovery test conducted during the RI produced limited DNAPL and concluded that Site DNAPL has limited mobility.	Medium capital High O&M	Potentially applicable. Retained for further consideration.
		Collection trench*	Collection trench installed to remove mobile DNAPL that intercepts the collection trench.	Readily implementable. Collection trenches are installed as part of the WBB/HB IRM. Limitations to implementability would exist in the immediate vicinity of I-690, subsurface utilities and the railroad tracks.	Effective for recovery of mobile DNAPL. DNAPL recovery test conducted during the RI produced limited DNAPL and concluded that Site DNAPL has limited mobility.	Medium capital Medium O&M	Potentially applicable. Part of WBB/HB IRM. Retained for further consideration.

TABLE 3-2. SCREENING AND EVALUATION OF REMEDIAL TECHNOLOGIES AND PROCESS OPTIONS FOR SOIL/FILL MATERIAL AND DNAPL

General Response Action	Remedial Technology	Process Option	Description	Implementability	Effectiveness	Relative Cost	Screening and Evaluation Comments
Removal (continued)	DNAPL extraction	Multi-phase extraction	Simultaneous extraction of groundwater, DNAPL, and/or soil vapor from one or more MPE wells.	Potentially implementable for local use in areas of mobile DNAPL; however low permeability conditions, access limitations and underground utilities limit implementability at the Site. A pilot/pumping test would be necessary to identify radius of influence and implementability in low permeability soil/fill material. Limitations to implementability would also exist in areas in the immediate vicinity of I-690, subsurface utilities and the railroad tracks.	DNAPL recovery test conducted during the RI produced limited DNAPL and concluded that Site DNAPL has limited mobility. Effectiveness of groundwater, DNAPL, and vapor recovery would be limited due to low permeability and subsurface heterogeneity conditions at the Site, resulting in areas of untreated soil/fill material and unrecovered vapor and DNAPL. Long-term maintenance would likely be required due to the effects of groundwater geochemistry. A treatability study would be necessary to evaluate effectiveness of DNAPL recovery.	Medium capital High O&M	Potentially applicable for local use in areas of mobile DNAPL. Retained for further consideration.
Ex situ treatment	Biological	Biopiles	Excavated soil/fill material is mixed with soil amendments and placed in aboveground enclosures. Compost is formed into piles and aerated with blowers or vacuum pumps using an aerated static pile composting process.	Space limitations to complete both the excavation and treatment area render on-site *ex situ* treatment impracticable for site-wide soil/fill material. Potential community and local government acceptance issues related to noise, and odor/dust/emissions. Control and treatment of emissions from *ex situ* treatment process may be required. Treated soil/fill material would require further off-site management unless allowed to be re-used as fill material and/or consolidated on-site. Design, construction and testing of a pilot system would be necessary to evaluate implementability.	Potentially effective for degradation of VOCs, SVOCs, and DNAPL in excavated soil/fill material. Not effective for treatment of inorganics. A treatability study and identification of effective soil amendments would be required. High pH of soil/fill material does not provide favorable conditions to sustain organisms capable of biodegradation.	High capital Medium O&M	Not practicable for site-wide treatment of non-discrete source areas of COCs. *Ex situ* soil treatment potentially incompatible with anticipated Site use/redevelopment. Variety of COCs in soil/fill material would limit effectiveness. Not applicable for treatment of inorganics. Not retained for further consideration.
		Landfarming	Contaminated soil/fill material is excavated, applied into lined beds, and periodically turned over or tilled to aerate the waste.	Space limitations to complete both the excavation and treatment area render on-site *ex situ* treatment impracticable for site-wide soil/fill material. Potential community and local government acceptance issues related to noise, and odor/dust/emissions. Control and treatment of emissions from *ex situ* treatment process may be required. Treated soil/fill material would require further off-site management unless allowed to be re-used as fill material and/or consolidated on-site. Design, construction and testing of a pilot system would be necessary to evaluate implementability.	Potentially effective for degradation of VOCs, SVOCs, and DNAPL in excavated soil/fill material. Not effective for treatment of inorganics. A treatability study and identification of effective soil amendments would be required. High pH of soil/fill material does not provide favorable conditions to sustain organisms capable of biodegradation.	High capital Medium O&M	Not practicable for site-wide treatment of non-discrete source areas of COCs. *Ex situ* soil treatment potentially incompatible with anticipated Site use/redevelopment. Variety of COCs in soil/fill material would limit effectiveness. Not applicable for treatment of inorganics. Not retained for further consideration.

TABLE 3-2. SCREENING AND EVALUATION OF REMEDIAL TECHNOLOGIES AND PROCESS OPTIONS FOR SOIL/FILL MATERIAL AND DNAPL

General Response Action	Remedial Technology	Process Option	Description	Implementability	Effectiveness	Relative Cost	Screening and Evaluation Comments
Ex situ treatment (continued)	Biological (continued)	Slurry-phase bioreactor	An aqueous slurry is created by combining soil/fill material with water and other additives. The slurry is mixed to keep solids suspended and microorganisms in contact with the soil contaminants. The slurry is dewatered and the treated soil disposed of upon completion of the process.	Space limitations to complete both the excavation and treatment area render on-site *ex situ* treatment impracticable for site-wide soil/fill material. Potential community and local government acceptance issues related to noise, and odor/dust/emissions. Control and treatment of emissions from *ex situ* treatment process may be required. Treated soil/fill material would require further off-site management unless allowed to be re-used as fill material and/or consolidated on-site. Design, construction and testing of a pilot system would be necessary to evaluate implementability.	Potentially effective for degradation of VOCs, SVOCs, and DNAPL in excavated soil/fill material. Not effective for treatment of inorganics. A treatability study and identification of effective soil amendments would be required. High pH of soil/fill material does not provide favorable conditions to sustain organisms capable of biodegradation.	High capital Medium O&M	Not practicable for site-wide treatment of non-discrete source areas of COCs. *Ex situ* soil treatment potentially incompatible with anticipated Site use/redevelopment. Variety of COCs in soil/fill material would limit effectiveness. Not applicable for treatment of inorganics. Not retained for further consideration.
	Physical/ Chemical	Chemical Oxidation	*Ex situ* treatment of contaminated soil/fill material using oxidants such as ozone, hydrogen peroxide, hypochlorites, permanganate, and/or persulfate. Oxidation reactions chemically convert constituents to non-hazardous or less toxic compounds that are more stable, less mobile, and/or inert.	Space limitations to complete both the excavation and treatment area render on-site *ex situ* treatment impracticable for site-wide soil/fill material. Potential community and local government acceptance issues related to noise, and odor/dust/emissions. Control and treatment of emissions from *ex situ* treatment process may be required. Treated soil/fill material would require further off-site management unless allowed to be re-used as fill material and/or consolidated on-site. Design, construction and testing of a pilot system would be necessary to evaluate implementability.	Potentially effective for treatment of VOCs, SVOCs and DNAPL in excavated soil/fill material. Not effective for treatment of inorganics. A treatability study and oxidant demand study would be necessary to evaluate effectiveness.	High capital Low O&M	Not practicable for site-wide treatment of non-discrete source areas of COCs. *Ex situ* soil treatment potentially incompatible with anticipated Site use/redevelopment. Variety of COCs in soil/fill material would limit effectiveness. Not applicable for treatment of inorganics. Not retained for further consideration.
		Extraction/ washing	Soil/fill material and extractant are mixed in an extractor, thereby dissolving the contaminants. The extracted solution is then placed in a separator, where the contaminants and extractant are separated for treatment and further use. Fine materials containing organics are also separated from coarse materials using this process. Treated soil/fill material could be re-used as backfill.	Space limitations to complete both the excavation and treatment area render on-site *ex situ* treatment impracticable for site-wide soil/fill material. Potential community and local government acceptance issues related to noise, and odor/dust/emissions. Control and treatment of emissions from *ex situ* treatment process may be required. Treated soil/fill material would require further off-site management unless allowed to be re-used as fill material and/or consolidated on-site. Extraction solution treatment/management would also be required. Design, construction and testing of a pilot system would be necessary to evaluate implementability.	Potentially effective for removal of VOCs, SVOCs, inorganics, and DNAPL from excavated soil/fill material. Heterogeneous soil/fill material may reduce effectiveness. A treatability study would be necessary to evaluate effectiveness.	High capital Low O&M	Not practicable for site-wide treatment of non-discrete source areas of COCs. *Ex situ* soil treatment potentially incompatible with anticipated Site use/redevelopment. Not retained for further consideration.

TABLE 3-2. SCREENING AND EVALUATION OF REMEDIAL TECHNOLOGIES AND PROCESS OPTIONS FOR SOIL/FILL MATERIAL AND DNAPL

General Response Action	Remedial Technology	Process Option	Description	Implementability	Effectiveness	Relative Cost	Screening and Evaluation Comments
		Dehalogenation	Reagents are added to soil/fill material contaminated with halogenated organics, then heated in a reactor. The dehalogenation process is achieved by either the replacement of the halogen molecules or decomposition and partial volatilization of the contaminants.	Space limitations to complete both the excavation and treatment area render on-site *ex situ* treatment impracticable for site-wide soil/fill material. Potential community and local government acceptance issues related to noise, and odor/dust/emissions. Control and treatment of emissions from *ex situ* treatment process may be required. Treated soil/fill material would require further off-site management unless allowed to be re-used as fill material and/or consolidated on-site. Reagent treatment/management would also be required. Design, construction and testing of a pilot system would be necessary to evaluate implementability.	Potentially effective for treatment of chlorinated benzenes from excavated soil/fill material. Not effective for treatment of other VOCs, SVOCs, inorganics, and DNAPL. A treatability study would be necessary to evaluate effectiveness.	High capital Medium O&M	Not practicable for site-wide treatment of non-discrete source areas of COCs. *Ex situ* soil treatment potentially incompatible with anticipated Site use/redevelopment. Variety of COCs in soil/fill material would limit effectiveness. Not applicable for treatment of certain VOCs, SVOCs, and inorganics. Not retained for further consideration.
Ex situ treatment (continued)	Physical/ Chemical (continued)	Particle size separation	Sieves and screens of different sizes are used to concentrate contaminants in smaller volumes. Most organic and inorganic contaminants tend to bind, either chemically or physically, to other soil/fill particles. Separating the fine particles from the coarser particles will effectively concentrate the contaminants into a smaller volume of soil that could be further treated or disposed.	Space limitations to complete both the excavation and treatment area render on-site *ex situ* treatment impracticable for site-wide soil/fill material. Potentially implementable. Further treatment and management of separated soil/fill material would be required.	Effective for separation of particle sizes and debris removal for further treatment and disposal. Not effective for management of recovered DNAPL.	Low capital Low O&M	Not practicable for site-wide treatment of non-discrete source areas of COCs. *Ex situ* soil treatment potentially incompatible with anticipated Site use/redevelopment. Not effective for variety of COCs; would require further treatment. Not retained for further consideration.
		Solidification/ stabilization	Contaminants are physically bound or enclosed within a stabilized mass (solidification), or chemical reactions are induced between stabilizing agent and contaminants to reduce their mobility (stabilization). Solidification and stabilization involve mixing treatment agents with the contaminated soil yielding a crystalline, glassy, or polymeric framework around the contaminants.	Space limitations to complete both the excavation and treatment area render on-site *ex situ* treatment impracticable for site-wide soil/fill material. Potential community and local government acceptance issues related to noise, and odor/dust/emissions. Control and treatment of emissions from *ex situ* treatment process may be required. Treated soil/fill material would require further off-site management unless allowed to be re-used as fill material and/or consolidated on-site.	Potentially effective for reducing the mobility of VOCs, SVOCs, inorganics, and DNAPL. A treatability study would be necessary to evaluate effectiveness.	High capital Low O&M	Not practicable for site-wide treatment of non-discrete source areas of COCs. *Ex situ* soil treatment potentially incompatible with anticipated Site use/redevelopment. Not retained for further consideration.

TABLE 3-2. SCREENING AND EVALUATION OF REMEDIAL TECHNOLOGIES AND PROCESS OPTIONS FOR SOIL/FILL MATERIAL AND DNAPL

General Response Action	Remedial Technology	Process Option	Description	Implementability	Effectiveness	Relative Cost	Screening and Evaluation Comments
Ex situ treatment (continued)	Thermal	Low temperature thermal desorption	Use of direct or indirect heat to volatilize organic contaminants at temperatures generally between 200 and 600 °F. Further treatment of vapor phase potentially required.	Control and treatment of emissions from thermal treatment processes would be required. Significant permitting issues and potential community and local government acceptance issues related to noise, and odor/dust/emissions. Treated soil/fill material would require further off-site management unless allowed to be re-used as fill material and/or consolidated on-site.	Potentially effective for treatment of VOCs, SVOCs, and DNAPL. Not effective for treatment of inorganics. A treatability study would be necessary to evaluate effectiveness.	High capital Medium O&M	Not retained due to implementability limitations and community acceptance. *Ex situ* soil treatment potentially incompatible with anticipated Site use/redevelopment. Variety of COCs in soil/fill material would limit effectiveness. Not applicable for treatment of inorganics. Not retained for further consideration.
		Pyrolysis	Chemical decomposition of organic materials is induced by heat in the absence of oxygen at temperatures around 800 °F. Organic materials are transformed into gaseous components and solid residue (coke) containing fixed carbon and ash.	Control and treatment of emissions from thermal treatment processes would be required. Significant permitting issues and potential community and local government acceptance issues related to noise, and odor/dust/emissions. Treated soil/fill material would require further off-site management unless allowed to be re-used as fill material and/or consolidated on-site.	Potentially effective for treatment of VOCs, SVOCs, and DNAPL. Not effective for treatment of inorganics. A treatability study would be necessary to evaluate effectiveness.	High capital High O&M	Not retained due to implementability limitations and community acceptance. *Ex situ* soil treatment potentially incompatible with anticipated Site use/redevelopment. Variety of COCs in soil/fill material would limit effectiveness. Not applicable for treatment of inorganics. Not retained for further consideration.
		Incineration	Combustion of organic contaminants present in soil/fill material in commercial incinerator at temperature generally between 1,600 and 2,200 °F.	Control and treatment of emissions from thermal treatment processes would be required. Significant permitting issues and potential community and local government acceptance issues related to noise, and odor/dust/emissions. Treated soil/fill material would require further off-site management unless allowed to be re-used as fill material and/or consolidated on-site.	Potentially effective for treatment of VOCs, SVOCs, and DNAPL. Not effective for treatment of inorganics. A treatability study would be necessary to evaluate effectiveness.	High capital High O&M	Not retained due to implementability limitations and community acceptance. *Ex situ* soil treatment potentially incompatible with anticipated Site use/redevelopment. Variety of COCs in soil/fill material would limit effectiveness. Not applicable for treatment of inorganics. Not retained for further consideration.
Disposal	On-site disposal	On-site consolidation*	Disposal of excavated soil/fill material in an on-site containment system.	Potentially implementable for limited quantities of excavated/treated soil/fill material that meet Part 365 SCOs based on land use.	Effective means for management of excavated/treated soil/fill material on-site. Not effective for management of recovered DNAPL. Excavated soil/fill material may require treatment prior to on-site consolidation.	Low capital No O&M	Potentially applicable. Retained for further consideration.
	Off-site treatment/ disposal	Commercial treatment/ disposal facility(soil/fill)*	Excavated soil/fill material would be transported to a permitted commercial landfill, if it meets land disposal restriction requirements. Due to physical characteristics of soil/fill material and presence below groundwater table, dewatering and water treatment would likely be required. It is anticipated that in addition to dewatering, sludge management may also be required to render the excavated material sufficiently dry for management and transportation. Excavated areas would be backfilled, graded	Potentially implementable for limited quantities of soil/fill material that does not meet land disposal restrictions.	Effective for treatment and management of excavated soil/fill material. A treatability study would be required to evaluate treatment capabilities and capacities of off-site commercial treatment/disposal facilities.	Very high capital No O&M	Potentially applicable. Retained for further consideration.

TABLE 3-2. SCREENING AND EVALUATION OF REMEDIAL TECHNOLOGIES AND PROCESS OPTIONS FOR SOIL/FILL MATERIAL AND DNAPL

General Response Action	Remedial Technology	Process Option	Description	Implementability	Effectiveness	Relative Cost	Screening and Evaluation Comments
			and restored based on restoration requirements. Soil/fill material would be transported and disposed off-site. Treated water would be discharged locally to a water body.				
Disposal (continued)	Off-site treatment/ disposal (continued)	Commercial treatment/ disposal facility (DNAPL)*	Recovered DNAPL would be transported to a permitted commercial facility for treatment	Potentially implementable for recovered DNAPL.	Effective for treatment and management of recovered DNAPL. A treatability study would be required to evaluate treatment capabilities and capacities of off-site commercial treatment/disposal facilities.	No capital No O&M	Potentially applicable. Retained for further consideration.

Notes:
* Representative Process Option
Shaded cells – Process option not retained for further consideration.

Abbreviations/Acronyms:
AOS – Area of Study
CFR - Code of Federal Regulations
COC – Constituent of Concern
DER - Division of Environmental Remediation
DNAPL – Dense non-aqueous phase liquid
°F - degrees Fahrenheit
IRM – Interim Remedial Measure
I-690 – Interstate 690
MPE – Multi-phase extraction
NYCRR - New York Code of Rules and Regulations
NYSDEC – New York State Department of Environmental Conservation
NCP - National Oil and Hazardous Substances Pollution Contingency Plan
O&M – Operation and Maintenance
SCO – Soil cleanup objective
SVOC – Semi-Volatile Organic Compound
VOC – Volatile Organic Compound
WBB/HB – Wastebed B/Harbor Brook

TABLE 3-3. SCREENING AND EVALUATION OF REMEDIAL TECHNOLOGIES AND PROCESS OPTIONS FOR SHALLOW AND INTERMEDIATE GROUNDWATER

General Response Action	Remedial Technology	Process Option	Description	Implementability	Effectiveness	Relative Cost	Screening And Evaluation Comments
No further action	No further action	No further action*	No further remedial action addressing shallow and intermediate groundwater would be conducted beyond the current IRMs.	Readily implementable.	Not effective in mitigating the potential for exposure to groundwater. Effective for mitigating shallow and intermediate groundwater discharge to Onondaga Lake and Harbor Brook.	No capital Low O&M	Potentially applicable. Retained for further consideration. No action required for consideration by the NCP (40 CFR Part 300.430) and NYSDEC DER-10 Technical Guidance for Site Investigation and Remediation.
Institutional controls/Limited actions	Monitoring	Monitoring*	Periodic sampling and analysis of media as a means of evaluating attenuation. Provides a means of evaluating the effectiveness of selected groundwater remedies.	Implementable.	Effective method for monitoring changes in constituent concentrations over time and evaluation of natural attenuation. Effective means for monitoring remedy effectiveness.	Low capital Low O&M	Potentially applicable. Potentially applicable. Would require access agreement with other property owners for Railroad Area and AOS #2. Retained for further consideration.
	Access/use restrictions/ administrative control(s)	Institutional controls*	Implementation and documentation of groundwater use, access and land use restrictions that would require activities that would potentially disturb or expose contaminated groundwater (and require health and safety precautions) be conducted in accordance with the site management plan. Institutional controls would also provide provisions to evaluate and address potential soil vapor intrusion, as necessary, if a new building(s) is constructed at the Site.	Readily implementable. Would require property owner agreement/ implementation for Railroad Area and AOS #2.	Effective means of controlling use of groundwater and site use.	Low capital No O&M	Potentially applicable. Potentially applicable. Would require access agreement with other property owners for Railroad Area and AOS #2. Retained for further consideration.
	Site controls	Site management plan*	Documentation of site restrictions and provisions for continued operation and maintenance of the remedy. Presents site engineering and institutional controls and physical components of the selected remedy requiring operation, maintenance and monitoring to provide continued effectiveness. The site management plan would also present requirements for groundwater monitoring and provisions for periodic site reviews.	Readily implementable. Would require property owner agreement/ implementation for Railroad Area and AOS #2.	Effective means of documenting site use restrictions and remedy components, including operation, maintenance, and monitoring requirements.	Low capital No O&M	Potentially applicable. Potentially applicable. Would require access agreement with other property owners for Railroad Area and AOS #2. Retained for further consideration.
	Periodic reviews	Periodic site reviews*	Periodic reviews are required by 6 NYCRR Part 375 and DER-10 where institutional and engineering controls, monitoring plans, and/or operations and maintenance activities are implemented on a site. The purpose of the reviews is to evaluate the areas in regard to the continuing protection of human health and the environment and to provide documentation of remedy effectiveness. In accordance with 6 NYCRR Part 375-	Readily implementable.	Effective means of evaluating continued protection to human health and the environment.	No capital Low O&M	Potentially applicable. Retained for further consideration.

TABLE 3-3. SCREENING AND EVALUATION OF REMEDIAL TECHNOLOGIES AND PROCESS OPTIONS FOR SHALLOW AND INTERMEDIATE GROUNDWATER

General Response Action	Remedial Technology	Process Option	Description	Implementability	Effectiveness	Relative Cost	Screening And Evaluation Comments
			1.8(h)(3), the frequency of periodic reviews should be annual, unless a different frequency is approved by NYSDEC. Periodic site reviews would include the performance of supplemental Five Year Reviews in accordance with 40 CFR 300.430(f)(4)ii.				
Natural recovery	Natural attenuation	Natural attenuation	The natural degradation of contaminants by *in situ* physical, chemical and/or biological processes. Over time, contaminants' toxicity, mobility and/or volume can be reduced by processes that include biodegradation, sorption, dilution, volatilization, and/or transformation.	Potentially implementable. Long-term monitoring of media could be included to evaluate natural attenuation.	Results of a site-specific microcosm study performed on similar wastebed soil/fill material and groundwater showed a lack of live microorganisms in microcosms. Other attenuation processes potentially effective for reduction of contaminant concentrations over the long-term; however, existing Site data is inconclusive. Recent information collected as part of the separate deep groundwater study suggests natural degradation is occurring.	No capital No O&M	Potentially applicable. Recent information collected as part of the separate deep groundwater study suggests natural degradation is occurring.
Hydraulic control	Physical barrier wall	Slurry wall	Soil- or cement-bentonite slurry wall placed along the perimeter of the area of contamination to contain shallow/ intermediate groundwater from discharge to other resources. Containment wall should extend into a confining layer.	Implementability limited due to depth of confining layer (approximately 50 feet). Compatibility testing indicated that bentonite was incompatible with groundwater at nearby sites.	Potentially effective at hydraulically containing groundwater discharge if used in conjunction with a groundwater extraction system.	High capital Low O&M	Implementability limited due to depth of confining layer. Not applicable since bentonite is not compatible with Site conditions based on results of compatibility testing at nearby sites. Not retained for further consideration.
		Sheet piles*	Sheet piles installed along the area of contamination to contain shallow/ intermediate groundwater discharge to other resources. Sheet pile materials include HDPE, fiberglass, vinyl and steel. Sheet piles should extend into a confining layer.	Implementable. Compatibility testing indicated that HDPE can be used with Site conditions. Steel has been used in IRM activities implemented at the Site. Limitations to implementability would exist in areas in the immediate vicinity of I-690, subsurface utilities and the railroad tracks.	Effective at hydraulically containing groundwater discharge if used in conjunction with a groundwater extraction system.	High capital Low O&M	Potentially applicable. Part of WBB/HB IRM. Retained for further consideration.
	Extraction	Extraction wells (vertical or horizontal)	Removal of shallow and intermediate groundwater by pumping from one or more recovery wells for hydraulic control.	Potentially implementable for limited use only due to low permeability subsurface conditions for most areas at the Site. A pilot/pumping test would be necessary to design extraction wells.	Effective at collecting groundwater and hydraulically controlling groundwater discharge; however, effectiveness would be limited due to low permeability subsurface conditions at the Site. Long-term maintenance would likely be required due to the effects of groundwater geochemistry.	Medium capital High O&M	Potentially applicable for limited use given low permeability conditions. Retained for further consideration.

TABLE 3-3. SCREENING AND EVALUATION OF REMEDIAL TECHNOLOGIES AND PROCESS OPTIONS FOR SHALLOW AND INTERMEDIATE GROUNDWATER

General Response Action	Remedial Technology	Process Option	Description	Implementability	Effectiveness	Relative Cost	Screening And Evaluation Comments
Hydraulic control (continued)	Extraction (continued)	Collection trench*	Collection trench installed to provide hydraulic control of groundwater that intercepts the collection trench.	Readily implementable. Collection trenches are installed as part of WBB/HB IRM. Limitations to implementability would exist in areas in the immediate vicinity of roadways, utilities, and the railroad tracks.	Effective for hydraulic control of groundwater. Long-term maintenance would likely be required due to the effects of groundwater geochemistry.	Medium capital Medium O&M	Potentially applicable. Part of WBB/HB IRM. Retained for further consideration.
		Multi-phase extraction (MPE)	Simultaneous extraction of groundwater, DNAPL, and/or soil vapor from one or more MPE wells.	Implementability limited due to low permeability conditions at the Site. Access limitations and underground utilities would also limit implementability at the Site. A pilot/pumping test would be necessary to identify radius of influence and implementability in low permeability soil/fill material. Limitations to implementability would also exist in areas in the immediate vicinity of I-690 and the railroad tracks.	DNAPL recovery test conducted during the RI produced limited DNAPL and concluded that Site DNAPL has limited mobility. Effectiveness of groundwater, DNAPL and soil/vapor recovery would be limited due to low permeability and subsurface heterogeneity conditions at the Site, resulting in areas of untreated groundwater and unrecovered vapor and DNAPL. Long-term maintenance would likely be required due to the effects of groundwater geochemistry. A treatability study would be necessary to evaluate effectiveness of DNAPL recovery.	Medium capital High O&M	Potentially applicable for local use given low permeability conditions. Retained for further consideration.
In situ treatment	Biological	Enhanced bioremediation	Injection of microbial populations and potentially nutrient sources/electron donors into shallow and intermediate groundwater to enhance biological degradation of organic constituents.	Implementability limited due low permeability conditions at the Site, potential for injection well fouling, and variability of geochemical conditions. Extensive injection well network potentially required to address areal extent due to low permeability subsurface conditions. Not implementable in the immediate vicinity of WBB/HB IRM barrier walls and associated groundwater collection systems on the Lakeshore Area, Railroad Area, AOS #1 and AOS #2, and in the vicinity of Harbor Brook due to potential fouling and/or operation impacts to pumps, force mains, and/or *ex situ* treatment processes associated with introduction of enhanced bioremediation amendments. Limitations to implementability would also exist in areas in the immediate vicinity of I-690, subsurface utilities and the railroad tracks.	Potentially effective for treatment of VOCs and SVOCs in groundwater. Not effective for treatment of inorganics. Low permeability and subsurface heterogeneity could cause uneven distribution of electron donors and/or microorganisms, resulting in areas of untreated contaminants. Biological treatment can move with the contaminant plume. Effectiveness dependent on donor microbial and culture making contact with treatment area, which would be limited due to subsurface heterogeneity. A treatability study would be necessary to evaluate effectiveness. Results of a site-specific microcosm study performed on similar wastebed soil/fill material showed a lack of biological degradation in microcosms constructed using groundwater and soil/fill material.	Medium capital Low O&M	Not implementable and not effective due to low permeability and heterogeneous conditions. Variety of COCs in shallow/ intermediate groundwater could limit effectiveness. Not applicable for treatment of inorganics. Not implementable in the immediate vicinity of WBB/HB IRM barrier walls and associated groundwater collection systems, I-690, subsurface utilities, and the railroad tracks. Microcosm studies demonstrated that Site shallow and intermediate groundwater does not provide favorable conditions for biodegradation. Not retained for further consideration.
	Chemical	Chemical oxidation	*In situ* treatment of shallow and intermediate groundwater using oxidants such as ozone, hydrogen peroxide, hypochlorites, permanganate, and/or sodium persulfide. Oxidation reactions chemically convert constituents to non-hazardous or less toxic compounds that are more stable, less mobile, and/or inert.	Implementability limited due to low permeability conditions at the Site, potential for injection well fouling, and variability of geochemical conditions. Potential for health and safety issues when handling large volumes of oxidant chemicals and	Potentially effective for treatment of VOCs and SVOCs in groundwater. Not effective for treatment of inorganics. Low permeability and subsurface heterogeneity could cause uneven distribution of the oxidant, resulting in areas of untreated contaminants. Effectiveness dependent on oxidant making	Medium capital Low to Medium O&M	Not implementable and not effective due to low permeability and heterogeneous conditions. Site conditions could uneven oxidant distribution, resulting in untreated contaminants. Variety of COCs in shallow and intermediate groundwater could limit

TABLE 3-3. SCREENING AND EVALUATION OF REMEDIAL TECHNOLOGIES AND PROCESS OPTIONS FOR SHALLOW AND INTERMEDIATE GROUNDWATER

General Response Action	Remedial Technology	Process Option	Description	Implementability	Effectiveness	Relative Cost	Screening And Evaluation Comments
				working in the vicinity of potentially aggressive reactions. Not implementable in the immediate vicinity of WBB/HB IRM barrier walls and associated groundwater collection systems on the Lakeshore Area, Railroad Area, AOS #1 and AOS #2, and in the vicinity of Harbor Brook due to potential fouling and/or operation impacts to pumps, force mains, and/or *ex situ* treatment processes associated with introduction of chemical oxidants. Limitations to implementability would also exist in areas in the immediate vicinity of I-690, subsurface utilities and the railroad tracks.	contact with treatment area, which would be limited due to subsurface heterogeneity. Could potentially disrupt natural attenuation processes. Potential for production of hazardous intermediates if incomplete oxidation occurs. Potential for mobilization of contamination with injection of fluids. A treatability study would be necessary to evaluate effectiveness and selection of oxidants.		effectiveness. Not applicable for treatment of inorganics. Not implementable in the immediate vicinity of WBB/HB IRM barrier walls and associated groundwater collection systems, I-690, subsurface utilities and the railroad tracks. Not retained for further consideration.
In situ treatment (continued)	Physical	In-well air stripping	Injection of air into the water column within a well to volatilize constituents. Groundwater circulation is performed *in situ*, with shallow and intermediate groundwater entering the well at one screen interval, and being discharged through a second screen interval. Air is collected and treated *ex situ* as needed.	Not implementable due to low permeability conditions at the Site, potential for injection/extraction well fouling, and variability of geochemical conditions. Injection of air would result in precipitation of ionic constituents that would result in further reduction of formation permeability. Low permeability conditions would limit radius of influence of air stripping wells. Limitations to implementability would also exist in areas in the immediate vicinity of I-690, subsurface utilities, the railroad tracks, and in areas prone to flooding (Lakeshore and Harbor Brook).	Potentially effective for volatilizing VOCs in the saturated zone. Not effective for treatment of SVOCs or inorganics. Limited effectiveness in shallow and intermediate groundwater due to low permeability conditions. Effectiveness of air injection and vapor collection potentially reduced due to low permeability of unsaturated zone. Effectiveness dependent on application of air into the water column, which would be limited but subsurface heterogeneity.	Medium capital Medium O&M	Variety of COCs in shallow and intermediate groundwater could limit effectiveness. Not applicable for treatment of SVOCs or inorganics. Not implementable and not effective due to low permeability and heterogeneous conditions. Not retained for further consideration.
		Air sparging	Injection of air into the saturated zone to volatilize constituents within shallow and intermediate groundwater. Emissions are then collected in the unsaturated zone using a soil vapor extraction system.	Not implementable due to low permeability conditions at the Site, potential for fouling, and variability of geochemical conditions. Injection of air would result in precipitation of ionic constituents that would further reduce formation permeability. Limitations to implementability would also exist in areas in the immediate vicinity of I-690, subsurface utilities, the railroad tracks, and in areas prone to flooding (Lakeshore and Harbor Brook).	Potentially effective for volatilizing VOCs in saturated zone. Not effective for treatment of SVOCs or inorganics. Limited effectiveness in shallow and intermediate groundwater due to low permeability conditions. Collection of volatilized contaminants may be difficult due to low permeability of unsaturated zone.	Medium capital Medium O&M	Variety of COCs in shallow and intermediate groundwater could limit effectiveness. Not applicable for treatment of SVOCs and inorganics. Not implementable and not effective due to low permeability and heterogeneous conditions. Vapor recovery not effective in low permeability unsaturated zone. Not retained for further consideration.

TABLE 3-3. SCREENING AND EVALUATION OF REMEDIAL TECHNOLOGIES AND PROCESS OPTIONS FOR SHALLOW AND INTERMEDIATE GROUNDWATER

General Response Action	Remedial Technology	Process Option	Description	Implementability	Effectiveness	Relative Cost	Screening And Evaluation Comments
In situ treatment (continued)	Physical	Circulation wells	Shallow and intermediate groundwater is pumped to the surface and aerated, removing the majority of the volatile vapors, and the aerated groundwater is then used as recharge to the groundwater table within an area of contaminated soil. The aerated water carries oxygen to the subsurface soil, promoting biodegradation. The combined process of biological treatment and physical extraction reduces the time required to achieve remediation goals and lowers contaminant concentrations.	Not implementable due to low permeability conditions at the Site, potential for fouling, and variability of geochemical conditions. Injection of air would result in precipitation of ionic constituents that would further reduce formation permeability. Limitations to implementability would also exist in areas in the immediate vicinity of I-690, subsurface utilities, the railroad tracks, and in areas prone to flooding (Lakeshore and Harbor Brook).	Potentially effective for volatilizing VOCs in saturated zone. Not effective for treatment of SVOCs or inorganics. Limited effectiveness in shallow and intermediate groundwater due to low permeability conditions.	Medium to high capital Medium O&M	Variety of COCs in shallow and intermediate groundwater could limit effectiveness. Not applicable for treatment of SVOCs and inorganics. Not implementable and not effective due to low permeability and heterogeneous conditions. Not retained for further consideration.
	Treatment wall	Permeable reactive barrier	Construction of a reactive material wall, air sparging zone, or biobarrier to treat shallow and intermediate groundwater as it flows through the treatment zone.	Implementability limited due to access limitations, underground utilities, and depth of treatment zone. Limitations to implementability would exist in areas in the immediate vicinity of I-690, the railroad tracks. Not implementable in the immediate vicinity of WBB/HB IRM barrier walls and associated groundwater collection systems on the Lakeshore Property, Railroad Area, AOS #1 and AOS #2, and in the vicinity of Harbor Brook. Limitations to implementability would also exist in areas in the immediate vicinity of I-690, subsurface utilities and the railroad tracks.	Generally effective for treating VOCs, SVOCs and inorganics. Variety of dissolved constituents would limit effectiveness. There is a potential for fouling of reactive materials due to ionic waste constituent concentrations in groundwater. Periodic replacement of reactive material would be anticipated.	High capital High O&M	Not effective for variety of constituents and potential for fouling of reactive materials. Not retained for further consideration.
Ex situ treatment	Biological/Physical	Constructed treatment wetland	Engineered wetlands developed specifically to treat contaminants in collected shallow and intermediate groundwater that flows through them.	Implementable for treatment of soluble groundwater constituents. Non-growing season would limit implementability. Lack suitable footprint area for placement/location of a constructed wetland.	Effective for treating VOCs. Not effective for treatment of SVOCs and inorganics. Effectiveness limited by precipitation of calcite anticipated to be present in treated discharge water and seasonal nature of treatment wetlands.	Medium capital Low O&M	Not applicable and implementable due to seasonal nature of treatment wetlands, groundwater geochemistry, and variety of constituents. Not effective for treatment of SVOCs and inorganics. Not retained for further consideration.
	Off-site Physical/Chemical	Willis-Semet Groundwater Treatment Plant (GWTP) and/or Metro WWTP*	Treatment of collected shallow and intermediate groundwater at the Willis-Semet GWTP with subsequent discharge to the Metro WWTP or directly to Onondaga Lake.	Implementable. Discharge of treated water from the Willis-Semet GWTP to Metro WWTP and Onondaga Lake (during temporary Metro WWTP shutdowns) comply with pretreatment requirement identified in the Industrial Wastewater Discharge Permit issued by Onondaga County and direct discharge requirements identified in the SPDES requirements, respectively.	Effective for treating VOCs, SVOCs, and most inorganics.	Medium capital Low O&M	Potentially applicable. Part of WBB/HB IRM. Retained for further consideration.

TABLE 3-3. SCREENING AND EVALUATION OF REMEDIAL TECHNOLOGIES AND PROCESS OPTIONS FOR SHALLOW AND INTERMEDIATE GROUNDWATER

General Response Action	Remedial Technology	Process Option	Description	Implementability	Effectiveness	Relative Cost	Screening And Evaluation Comments

Notes:
* Representative Process Option
Shaded cells – Process option not retained for further consideration.

Abbreviations/Acronyms:
AOS – Area of Study
CFR - Code of Federal Regulations
COC – Constituent of Concern
DER - Division of Environmental Remediation
DNAPL – Dense Non-Aqueous Phase Liquid
GWTP – Groundwater Treatment Plant
HDPE – High Density Polyethylene
IRM – Interim Remedial Measure
I-690 – Interstate 690
Metro WWTP – Onondaga County Department of Water Environment Protection (OCDWEP) Metropolitan Wastewater Treatment Plant (WWTP)
NYCRR - New York Code of Rules and Regulations
NYSDEC – New York State Department of Environmental Conservation
NCP - National Oil and Hazardous Substances Pollution Contingency Plan
O&M – Operation and Maintenance
SPDES – State Pollutant Discharge Elimination System
SVOC – Semi-Volatile Organic Compound
VOC – Volatile Organic Compound
WBB/HB – Wastebed B/Harbor Brook

TABLE 4-1. DETAILED ANALYSIS OF REMEDIAL ALTERNATIVES FOR SOIL/FILL MATERIAL AND GROUNDWATER

Criterion	Alternative 1 No Further Action	Alternative 2 Limited Action	Alternative 3 Engineered Cover System	Alternative 4 Enhanced Engineered Cover System with Wetland Construction/Restoration	Alternative 5 Enhanced Engineered Cover System with Wetland Construction/Restoration, *in situ* treatment	Alternative 6A Partial Excavation with Off-Site Disposal	Alternative 6B Excavation with Off-Site Disposal
	• No further action • Continued O&M of IRMs	**Common Remedial Components for Alternatives 2 through 6A/B:** Continued O&M of IRMs, Institutional controls/limited actions, Site Management Plan/periodic reviews, monitoring, natural attenuation					
		• Continued O&M of IRMs	• Engineered cover system (1-ft thick) • Vegetation enhancement • Continued O&M of IRMs • Asphalt tar material PDI • DNAPL PDI and recovery • Staging area cover thickness PDI	• Enhanced engineered cover system (1- to 2-ft thick) • Vegetation enhancement • Wetland construction/restoration with low permeability cover • Continued O&M of IRMs • Asphalt tar material PDI • DNAPL PDI and recovery • Staging area cover thickness PDI	• Enhanced engineered cover system (1- to 2-ft thick) • Vegetation enhancement • Wetland construction/restoration with *in situ* geochemical stabilization (ISGS) • Continued O&M of IRMs • Asphalt tar material PDI • DNAPL PDI and recovery • Staging area cover thickness PDI	• Partial excavation of soil/fill material (Retains infrastructure and utilities) • Off-site disposal/treatment • Site restoration • Replacement and O&M of Lakeshore Barrier Wall/Collection System • DNAPL PDI and recovery	• Full Off-Site Disposal of soil/fill material • Removal of I-690, State Fair Boulevard, and CSX railroad • Off-site disposal/treatment • Site Restoration and replacement of I-690, State Fair Boulevard, and CSX railroad • Replacement and O&M of Lakeshore Barrier Wall/Collection System • DNAPL PDI and recovery
Overall protection of human health and the environment							
Overall protection of human health	Not protective of human health relative to potential exposure to soil/fill material. Alternative would not provide for mitigation of potentially unacceptable risks to human health associated with exposure to contaminated groundwater or soil/fill material in areas at the Site not addressed as part of grading activities or IRM cover systems. Alternative would not provide a means of limiting site use, restricting groundwater use, or monitoring constituent concentrations and the progress of natural attenuation.	Not protective of human health relative to potential exposure to soil/fill material. Alternative would not provide for mitigation of potentially unacceptable risks to human health associated with exposure to contaminated soil/fill in areas at the Site not addressed as part of grading activities. Long-term O&M of existing IRM cover systems would reduce risks associated with human exposure to impacted soil/fill material, where IRM cover systems are implemented. Maintenance of IRM components, access restrictions, site management plan, and periodic reviews would limit site use and minimize potentially unacceptable risks to human health associated with soil/fill material and groundwater exceeding ARARs. Groundwater use restrictions would minimize potentially unacceptable risks to human health associated with groundwater exceeding Class GA standards. Monitoring would be protective of human health as a means of monitoring constituent concentrations and the progress of natural attenuation.	Protection of human health would be provided. Engineered cover system would address potentially unacceptable risks to human health associated with inhalation of dust and direct exposure to soil/fill material. Maintenance of IRM components, engineered cover system, access restrictions, site management plan, and periodic reviews would limit site use and minimize potentially unacceptable risks to human health associated with soil/fill material and groundwater exceeding ARARs. Groundwater use restrictions would minimize potentially unacceptable risks to human health associated with groundwater exceeding Class GA standards. An engineered cover with installation of an additional isolation layer on the Penn-Can Property would reduce potentially unacceptable risks to human health associated with impacted soil/fill material. Areas where asphalt tar material is present would be addressed. Monitoring would be protective of human health as a means of monitoring constituent concentrations and the progress of natural attenuation.	Protection of human health would be provided. Engineered cover system would address potentially unacceptable risks to human health associated with inhalation of dust and direct exposure to soil/fill material. Maintenance of IRM components, engineered cover system, access restrictions, site management plan, and periodic reviews would limit site use and minimize potentially unacceptable risks to human health associated with soil/fill material and groundwater exceeding ARARs. Groundwater use restrictions would minimize potentially unacceptable risks to human health associated with groundwater exceeding Class GA standards. A low permeability liner and perimeter cover would support wetland (WL2) construction/ restoration and reduce discharge of impacted groundwater to surface water during seasonally high water levels concurrent with high lake levels, thereby reducing potentially unacceptable risks to human health associated with exposure to impacted soil/fill material and groundwater. An engineered cover with installation of an additional isolation layer on the Penn-Can Property would reduce potentially unacceptable risks to human health associated with impacted soil/fill material. Areas where asphalt tar material is present would be addressed. Monitoring would be protective of human health	Protection of human health would be provided. Engineered cover system would address potentially unacceptable risks to human health associated with inhalation of dust and direct exposure to soil/fill material. Maintenance of IRM components, engineered cover system, access restrictions, site management plan, and periodic reviews would limit site use and minimize potentially unacceptable risks to human health associated with soil/fill material and groundwater exceeding ARARs. Groundwater use restrictions would minimize potentially unacceptable risks to human health associated with groundwater exceeding Class GA standards. ISGS would support wetland (WL2) construction/ restoration and reduce discharge of impacted groundwater to surface water during seasonally high water levels concurrent with high lake levels, thereby reducing potentially unacceptable risks to human health associated with exposure to impacted soil/fill material and groundwater. An engineered cover with installation of an additional isolation layer on the Penn-Can Property would reduce potentially unacceptable risks to human health associated with impacted soil/fill material. Areas where asphalt tar material is present would be addressed. Monitoring would be protective of human health as a means of monitoring constituent	Protection of human health would be provided. Excavation of soil/fill material would address potentially unacceptable risks to human health associated with inhalation of dust and direct exposure to soil/fill material. Groundwater use restrictions and periodic reviews would minimize potentially unacceptable risks to human health associated with groundwater exceeding Class GA standards and soil/fill material remaining at the Site. Monitoring would be protective of human health as a means of monitoring constituent concentrations and the progress of natural attenuation.	Protection of human health would be provided. Excavation of soil/fill material would address potentially unacceptable risks to human health associated with inhalation of dust and direct exposure to soil/fill material. Groundwater use restrictions and periodic reviews would minimize potentially unacceptable risks to human health associated with groundwater exceeding Class GA standards. Monitoring would be protective of human health as a means of monitoring constituent concentrations and the progress of natural attenuation.

TABLE 4-1. DETAILED ANALYSIS OF REMEDIAL ALTERNATIVES FOR SOIL/FILL MATERIAL AND GROUNDWATER

Criterion	Alternative 1 No Further Action	Alternative 2 Limited Action	Alternative 3 Engineered Cover System	Alternative 4 Enhanced Engineered Cover System with Wetland Construction/Restoration	Alternative 5 Enhanced Engineered Cover System with Wetland Construction/Restoration, *in situ* treatment	Alternative 6A Partial Excavation with Off-Site Disposal	Alternative 6B Excavation with Off-Site Disposal
				as a means of monitoring constituent concentrations and the progress of natural attenuation.	concentrations and the progress of natural attenuation.		
Overall protection of the environment	Not protective of the environment relative to soil/fill material in areas of the Site not address by current grading. Alternative would not provide a means of monitoring constituent concentrations and the progress of natural attenuation. Continued maintenance of IRM components would provide for mitigation of potentially unacceptable effects to the environment associated with discharge of Site-related contaminants in groundwater that have the potential to adversely affect Harbor Brook and Onondaga Lake. Long-term O&M of existing IRM cover systems would reduce erosion of exposed soil/fill material, where IRM cover systems are implemented. Alternatives does not provide a means of monitoring constituent concentrations and the progress of natural attenuation.	Not protective of the environment relative to soil/fill material in areas of the Site not addressed by current grading. Continued maintenance of IRM components would provide for mitigation of potentially unacceptable effects to the environment associated with discharge of Site-related contaminants in groundwater that have the potential to adversely affect Harbor Brook and Onondaga Lake. Maintenance of remedy components, a site management plan and periodic reviews would minimize potential unacceptable risks to the environment associated with soil/fill material and groundwater exceeding ARARs. Long-term O&M of existing IRM cover systems would reduce erosion of exposed soil/fill material, where IRM cover systems are implemented. Monitoring would provide a means of monitoring constituent concentrations and the progress of natural attenuation.	Protection of the environment would be provided. Engineered cover system would address potentially unacceptable risks to the environment associated with potential erosion of soil/fill material to Harbor Brook and Onondaga Lake. Continued maintenance of IRM components would provide for mitigation of potentially unacceptable effects to the environment associated with discharge of Site-related contaminants in groundwater that have the potential to adversely affect Harbor Brook and Onondaga Lake. Maintenance of remedy components, a site management plan and periodic reviews would minimize potential unacceptable risks to the environment associated with soil/fill material and groundwater exceeding ARARs. An engineered cover with installation of an additional isolation layer on the Penn-Can Property would reduce potentially unacceptable risks to the environment associated with impacted soil/fill material and address areas where asphalt tar material is present. Monitoring would provide a means of monitoring constituent concentrations and the progress of natural attenuation.	Protection of the environment would be provided. Engineered cover system would address potentially unacceptable risks to the environment associated with potential erosion of soil/fill material to Harbor Brook and Onondaga Lake. Continued maintenance of IRM components would provide for mitigation of potentially unacceptable effects to the environment associated with discharge of Site-related contaminants in groundwater that have the potential to adversely affect Harbor Brook and Onondaga Lake. Maintenance of remedy components, a site management plan and periodic reviews would minimize potential unacceptable risks to the environment associated with soil/fill material and groundwater exceeding ARARs. A low permeability liner and perimeter cover would support wetland (WL2) construction/restoration and reduce discharge of impacted groundwater to surface water during seasonally high water levels concurrent with high lake levels, thereby reducing potentially unacceptable risks to the environment. An engineered cover with installation of an additional isolation layer on the Penn-Can Property would reduce potentially unacceptable risks to the environment associated with impacted soil/fill material and address areas where asphalt tar material is present. Monitoring would provide a means of monitoring constituent concentrations and the progress of natural attenuation.	Protection of the environment would be provided. Engineered cover system would address potentially unacceptable risks to the environment associated with potential erosion of soil/fill material to Harbor Brook and Onondaga Lake. Continued maintenance of IRM components would provide for mitigation of potentially unacceptable effects to the environment associated with discharge of Site-related contaminants in groundwater that have the potential to adversely affect Harbor Brook and Onondaga Lake. Maintenance of remedy components, a site management plan and periodic reviews would minimize potential unacceptable risks to the environment associated with soil/fill material and groundwater exceeding ARARs. ISGS would support wetland (WL2) construction/restoration and reduce discharge of impacted groundwater to surface water during seasonally high water levels concurrent with high lake levels, thereby reducing potentially unacceptable risks to the environment. An engineered cover with installation of an additional isolation layer on the Penn-Can Property would reduce potentially unacceptable risks to the environment associated with impacted soil/fill material and address areas where asphalt tar material is present. Monitoring would provide a means of monitoring constituent concentrations and the progress of natural attenuation.	Protection of the environment would be provided. Removal of soil/fill material would address potentially unacceptable risks to the environment. Replacement and continued maintenance of IRM components would provide for mitigation of potentially unacceptable effects to the environment associated with discharge of Site-related contaminants in groundwater that have the potential to adversely affect Harbor Brook and Onondaga Lake, while maintaining Site stability. Monitoring would provide a means of monitoring constituent concentrations and the progress of natural attenuation.	Protection of the environment would be provided. Removal of soil/fill material would address potentially unacceptable risks to the environment. Replacement and continued maintenance of IRM components would provide for mitigation of potentially unacceptable effects to the environment associated with discharge of Site-related contaminants in groundwater that have the potential to adversely affect Harbor Brook and Onondaga Lake, while maintaining Site stability. Monitoring would provide a means of monitoring constituent concentrations and the progress of natural attenuation.
Attainment of Remedial Action Objectives (RAOs)	RAOs for the protection of human health would not be addressed. RAOs related to migration (*e.g.,* erosion) of and exposure to contaminants in soil/fill material would not be addressed in areas not addressed by existing covers. Surface water and sediment quality in Harbor Brook and Onondaga Lake would be protected through continued operation of the	Alternative would partially address RAOs for the protection of human health through institutional controls and a Site Management Plan. RAOs related to migration (*e.g.,* erosion) of and exposure to contaminants in soil/fill material would not be addressed in areas not addressed by existing covers. Surface water and sediment quality in Harbor Brook and	Alternative would address RAOs for the protection of human health through placement of an engineered cover system and through institutional controls and a Site Management Plan. Alternative would address RAOs for the protection of surface water and sediment quality by continued operation of the existing IRMs and	Alternative would address RAOs for the protection of human health through placement of an engineered cover system and through institutional controls and a Site Management Plan. Alternative would address RAOs for the protection of surface water and sediment quality by continued operation of the existing IRMs, placement of an engineered cover	Alternative would address RAOs for the protection of human health placement of an engineered cover system and through institutional controls and a Site Management Plan. Alternative would address RAOs for the protection of surface water and sediment quality by continued operation of the existing IRMs, placement of an engineered cover	Alternative would address RAOs for the protection of human health through removal of the soil/fill material, and through institutional controls and a Site Management Plan. Alternative would attain RAOs for soil/fill material remaining at the Site (below and under engineered covers in the immediate vicinity of I-690, State Fair Boulevard, and remaining	Alternative would address RAOs for the protection of human health through removal of the soil/fill material, and through institutional controls and a Site Management Plan. Alternative would address RAOs for the protection of surface water and sediment quality through removal of soil/fill material and by continued

TABLE 4-1. DETAILED ANALYSIS OF REMEDIAL ALTERNATIVES FOR SOIL/FILL MATERIAL AND GROUNDWATER

Criterion	Alternative 1 No Further Action	Alternative 2 Limited Action	Alternative 3 Engineered Cover System	Alternative 4 Enhanced Engineered Cover System with Wetland Construction/Restoration	Alternative 5 Enhanced Engineered Cover System with Wetland Construction/Restoration, *in situ* treatment	Alternative 6A Partial Excavation with Off-Site Disposal	Alternative 6B Excavation with Off-Site Disposal
	existing IRMs which provide hydraulic control of groundwater discharges.	Onondaga Lake would be protected through continued operation of the existing IRMs which provide hydraulic control of groundwater discharges.	placement of an engineered cover system.	system, and wetland construction/restoration with a low permeability liner.	system, and wetland construction/restoration with ISGS.	subsurface utilities) by controlling erosion of and exposure to soil/fill material via engineered cover systems and institutional controls. Alternative would address RAOs for the protection of surface water and sediment quality through removal of soil/fill material and by continued operation of the remaining/replaced IRMs.	operation of the remaining/replaced IRMs.
Compliance with applicable, relevant and appropriate requirements (ARARs) and to be considered material (TBCs)							
Compliance with chemical-specific ARARs and consideration of TBCs	Alternative does not provide a means of addressing soil ARARs related to potential erosion of and exposure to soil/fill material exceeding SCOs in areas not currently covered by grading activities. Alternative provides a means of controlling migration of shallow and intermediate groundwater exceeding Class GA standards to receiving water bodies through hydraulic control and isolation actions. Attainment of Class GA groundwater standards for shallow and intermediate groundwater is at the edge of the WMA, thus the POC for the Site is at the northern and eastern boundary of the Site, coincident with the East Wall, West Wall and Upper Harbor Brook IRM and groundwater collection system. Continued operation of the existing IRMs would address groundwater ARARs via reduced loading and control of Site shallow and intermediate groundwater discharge to off-site resources.	Alternative does not provide a means of addressing soil ARARs related to potential erosion of and exposure to soil/fill material exceeding SCOs in areas not currently covered by grading activities. Alternative provides a means of controlling migration of shallow and intermediate groundwater exceeding Class GA standards to receiving water bodies through hydraulic control and isolation actions. Alternative provides a mean of monitoring remedy effectiveness and the progress of natural attenuation through monitoring. Attainment of Class GA groundwater standards for shallow and intermediate groundwater is at the edge of the WMA, thus the POC for the Site is at the northern and eastern boundary of the Site, coincident with the East Wall, West Wall and Upper Harbor Brook IRM and groundwater collection system. Continued operation of the existing IRMs would address groundwater ARARs via reduced loading and control of Site shallow and intermediate groundwater discharge to off-site resources.	Installation of the engineered cover system over areas of surface soil/fill material that exhibit exceedances of SCOs, isolation layer (portion of Penn-Can Property), institutional controls, site management plan and periodic reviews would address soil ARARs by minimizing the potential for erosion of soil/fill material and the potential for direct contact with Site soil/fill material and groundwater. Alternative provides a means of controlling migration of shallow and intermediate groundwater exceeding Class GA standards to receiving water bodies through hydraulic control and isolation actions. Alternative provides a mean of monitoring remedy effectiveness and the progress of natural attenuation through monitoring. Attainment of Class GA groundwater standards for shallow and intermediate groundwater is at the edge of the WMA, thus the POC for the Site is at the northern and eastern boundary of the Site, coincident with the East Wall, West Wall and Upper Harbor Brook IRM and groundwater collection system. Continued operation of the existing IRMs would address groundwater ARARs via reduced loading and control of Site shallow and intermediate groundwater discharge to off-site resources.	Installation of the engineered cover system over areas of surface soil/fill material that exhibit exceedances of SCOs, low permeability cover (northeast portion of Lakeshore Area), isolation layer (portion of Penn-Can Property), institutional controls, site management plan and periodic reviews would address soil ARARs by minimizing the potential for erosion of soil/fill material and the potential for direct contact with Site soil/fill material and groundwater. Alternative provides a means of controlling migration of shallow and intermediate groundwater exceeding Class GA standards to receiving water bodies through hydraulic control and isolation actions. Alternative provides a mean of monitoring remedy effectiveness and the progress of natural attenuation through monitoring. Attainment of Class GA groundwater standards for shallow and intermediate groundwater is at the edge of the WMA, thus the POC for the Site is at the northern and eastern boundary of the Site, coincident with the East Wall, West Wall and Upper Harbor Brook IRM and groundwater collection system. Continued operation of the existing IRMs would address groundwater ARARs via reduced loading and control of Site shallow and intermediate groundwater discharge to off-site resources.	Installation of the engineered cover system over areas of surface soil/fill material that exhibit exceedances of SCOs, isolation layer (portion of Penn-Can Property), ISGS, institutional controls, site management plan and periodic reviews would address soil ARARs by minimizing the potential for erosion of soil/fill material and the potential for direct contact with Site soil/fill material and groundwater. Alternative provides a means of controlling migration of shallow and intermediate groundwater exceeding Class GA standards to receiving water bodies through hydraulic control and isolation actions. Alternative provides a mean of monitoring remedy effectiveness and the progress of natural attenuation through monitoring. Attainment of Class GA groundwater standards for shallow and intermediate groundwater is at the edge of the WMA, thus the POC for the Site is at the northern and eastern boundary of the Site, coincident with the East Wall, West Wall and Upper Harbor Brook IRM and groundwater collection system. Continued operation of the existing IRMs would address groundwater ARARs via reduced loading and control of Site shallow and intermediate groundwater discharge to off-site resources.	Removal of Site soil/fill materials that exhibit exceedances of unrestricted use SCOs would address soil ARARs. Engineered cover system, institutional controls, site management plan and periodic reviews would address soil ARARs for soil/fill material remaining at the Site (below and in the immediate vicinity of I-690, State Fair Boulevard, and the CSX railroad tracks). Relies on natural attenuation to address soil/fill material ARARs. Attainment of Class GA groundwater standards for shallow and intermediate groundwater is at the edge of the WMA, thus the POC for the Site is at the northern and eastern boundary of the Site, coincident with the East Wall, West Wall and Upper Harbor Brook IRM and groundwater collection system. Continued operation of the existing IRMs would address groundwater ARARs via reduced loading and control of Site shallow and intermediate groundwater discharge to off-site resources.	Removal of Site soil/fill materials that exhibit exceedances of unrestricted use SCOs would address soil ARARs. Continued operation of the existing IRMs would address groundwater ARARs via reduced loading and control of Site shallow and intermediate groundwater discharge to off-site resources.
Compliance with location-specific ARARs and consideration of TBCs	No location-specific ARARs triggered for this alternative.	No location-specific ARARs triggered for this alternative.	Proposed actions would be conducted in a manner consistent with federal and state floodplain and wetland requirements. Activities would also be conducted consistent with federal and state requirements for cultural, archeological, and historical resources.	Proposed actions would be conducted in a manner consistent with federal and state floodplain and wetland requirements. Activities would also be conducted consistent with federal and state requirements for cultural, archeological, and historical resources.	Proposed actions would be conducted in a manner consistent with federal and state floodplain and wetland requirements. Activities would also be conducted consistent with federal and state requirements for cultural, archeological, and historical resources.	Proposed actions would be conducted in a manner consistent with federal and state floodplain and wetland requirements. Activities would also be conducted consistent with federal and state requirements for cultural, archeological, and historical resources.	Proposed actions would be conducted in a manner consistent with federal and state floodplain and wetland requirements. Activities would also be conducted consistent with federal and state requirements for cultural, archeological, and historical resources.

TABLE 4-1. DETAILED ANALYSIS OF REMEDIAL ALTERNATIVES FOR SOIL/FILL MATERIAL AND GROUNDWATER

Criterion	Alternative 1 No Further Action	Alternative 2 Limited Action	Alternative 3 Engineered Cover System	Alternative 4 Enhanced Engineered Cover System with Wetland Construction/Restoration	Alternative 5 Enhanced Engineered Cover System with Wetland Construction/Restoration, *in situ* treatment	Alternative 6A Partial Excavation with Off-Site Disposal	Alternative 6B Excavation with Off-Site Disposal
			Activities would be conducted consistent with Fish and Wildlife Coordination Act requirements for protection of Onondaga Lake, for areas proximate to Onondaga Lake. Activities would be conducted consistent with navigable waterway requirements.	Activities would be conducted consistent with Fish and Wildlife Coordination Act requirements for protection of Onondaga Lake, for areas proximate to Onondaga Lake. Activities would be conducted consistent with navigable waterway requirements.	Activities would be conducted consistent with Fish and Wildlife Coordination Act requirements for protection of Onondaga Lake, for areas proximate to Onondaga Lake. Activities would be conducted consistent with navigable waterway requirements.	Activities would be conducted consistent with Fish and Wildlife Coordination Act requirements for protection of Onondaga Lake, for areas proximate to Onondaga Lake. Activities would be conducted consistent with navigable waterway requirements.	Activities would be conducted consistent with Fish and Wildlife Coordination Act requirements for protection of Onondaga Lake, for areas proximate to Onondaga Lake. Activities would be conducted consistent with navigable waterway requirements.
Compliance with action-specific ARARs and Consideration of TBCs	Solid wastes (generated via O&M activities), if any, would be managed in accordance with applicable Federal and State regulations. Discharge of treated water to the Metro WWTP would need to comply with pretreatment requirements in the Industrial Wastewater Discharge Permit issued by Onondaga County and SPDES discharge requirement to Onondaga Lake for direct discharge during temporary Metro WWTP shutdowns. Treatment residuals would need to be managed in accordance with applicable state/federal requirements. O&M activities would be performed in accordance with OSHA requirements.	Institutional controls would be implemented in general conformance with NYSDEC DER-33 and USEPA guidance and policy. Solid wastes, if any, would be managed in accordance with applicable Federal and State regulations. Discharge of treated water to the Metro WWTP would need to comply with pretreatment requirements in the Industrial Wastewater Discharge Permit issued by Onondaga County and SPDES discharge requirement to Onondaga Lake for direct discharge during temporary Metro WWTP shutdowns. Treatment residuals would need to be managed in accordance with applicable state/federal requirements. O&M activities would be performed in accordance with OSHA requirements.	Proposed engineered cover system would be constructed consistent with applicable standards and DER-10. Solid wastes, if any, would be managed in accordance with applicable Federal and State regulations. Earth moving activities would be conducted consistent with air quality standards. Transportation activities would be completed in accordance with applicable State and Federal requirements, by licensed and permitted haulers. Site construction and O&M activities would be conducted in accordance with OSHA safety requirements. Institutional controls would be implemented in general conformance with NYSDEC DER-33 and USEPA guidance and policy. Discharge of treated water to the Metro WWTP would need to comply with pretreatment requirements in the Industrial Wastewater Discharge Permit issued by Onondaga County and SPDES discharge requirement to Onondaga Lake for direct discharge during temporary Metro WWTP shutdowns. Treatment residuals would need to be managed in accordance with applicable state/federal requirements.	Proposed engineered cover system would be constructed consistent with applicable standards and DER-10. Solid wastes, if any, would be managed in accordance with applicable Federal and State regulations. Earth moving activities would be conducted consistent with air quality standards. Transportation activities would be completed in accordance with applicable State and Federal requirements, by licensed and permitted haulers. Site construction and O&M activities would be conducted in accordance with OSHA safety requirements. Institutional controls would be implemented in general conformance with NYSDEC DER-33 and USEPA guidance and policy. Discharge of treated water to the Metro WWTP would need to comply with pretreatment requirements in the Industrial Wastewater Discharge Permit issued by Onondaga County and SPDES discharge requirement to Onondaga Lake for direct discharge during temporary Metro WWTP shutdowns. Treatment residuals would need to be managed in accordance with applicable state/federal requirements.	Proposed engineered cover system would be constructed consistent with applicable standards and DER-10. Solid wastes, if any, would be managed in accordance with applicable Federal and State regulations. Earth moving activities would be conducted consistent with air quality standards. Transportation activities would be completed in accordance with applicable State and Federal requirements, by licensed and permitted haulers. Site construction and O&M activities would be conducted in accordance with OSHA safety requirements. Institutional controls would be implemented in general conformance with NYSDEC DER-33 and USEPA guidance and policy. Discharge of treated water to the Metro WWTP would need to comply with pretreatment requirements in the Industrial Wastewater Discharge Permit issued by Onondaga County and SPDES discharge requirement to Onondaga Lake for direct discharge during temporary Metro WWTP shutdowns. Treatment residuals would need to be managed in accordance with applicable state/federal requirements.	Excavated soil/fill material, would be managed in accordance with applicable Federal and State regulations. Earth moving activities would be conducted consistent with air quality standards. Transportation activities would be completed in accordance with applicable State and Federal requirements, by licensed and permitted haulers. Site construction activities would be conducted in accordance with OSHA safety requirements. Institutional controls would be implemented in general conformance with NYSDEC DER-33 and USEPA guidance and policy. Engineered cover system would be constructed consistent with applicable standards and DER-10. Discharge of treated water to the Metro WWTP would need to comply with pretreatment requirements in the Industrial Wastewater Discharge Permit issued by Onondaga County and SPDES discharge requirement to Onondaga Lake for direct discharge during temporary Metro WWTP shutdowns. Treatment residuals would need to be managed in accordance with applicable state/federal requirements.	Excavated soil/fill material, would be managed in accordance with applicable Federal and State regulations. Earth moving activities would be conducted consistent with air quality standards. Transportation activities would be completed in accordance with applicable State and Federal requirements, by licensed and permitted haulers. Site construction activities would be conducted in accordance with OSHA safety requirements. Institutional controls would be implemented in general conformance with NYSDEC DER-33 and USEPA guidance and policy. Discharge of treated water to the Metro WWTP would need to comply with pretreatment requirements in the Industrial Wastewater Discharge Permit issued by Onondaga County and SPDES discharge requirement to Onondaga Lake for direct discharge during temporary Metro WWTP shutdowns. Treatment residuals would need to be managed in accordance with applicable state/federal requirements.
Long-term effectiveness and permanence							
Magnitude of residual risk	Residual risks associated with soil/fill material and groundwater exceeding ARARs would remain. Potential risks associated with migration of groundwater exceeding ARARs would be mitigated through hydraulic control/isolation actions. Potential risks associated with erosion of soil/fill material would remain.	Residual risks associated with soil/fill material and groundwater exceeding ARARs would remain. Continued O&M of IRMs, institutional controls, site management plan, and periodic reviews would minimize residual risks. Potential risks associated with migration of groundwater exceeding ARARs would be mitigated through hydraulic control/isolation actions. Potential risks associated with erosion of soil/fill material would remain.	Minimal residual risk. Residual risks associated with soil/fill material and groundwater would be mitigated through the engineered cover system, institutional controls, site management plan, periodic reviews, and O&M. The effectiveness of the Onondaga Lake and Harbor Brook remedies are supported through continuation of the IRMs. Residual risks associated with potential exposure to and discharge of impacted groundwater in the vicinity of WL2 would remain.	Minimal residual risk. Residual risks associated with soil/fill material and groundwater would be mitigated through the enhanced engineered cover system, institutional controls, site management plan, periodic reviews, and O&M. The effectiveness of the Onondaga Lake and Harbor Brook remedies are supported through continuation of the IRMs. Potential risks associated with discharge of impacted groundwater concurrent with high lake levels would be addressed through installation of a	Minimal residual risk. Residual risks associated with soil/fill material and groundwater would be mitigated through the enhanced engineered cover system, institutional controls, site management plan, periodic reviews, and O&M. The effectiveness of the Onondaga Lake and Harbor Brook remedies are supported through continuation of the IRMs. Potential risks associated with discharge of impacted groundwater concurrent with high lake levels would be	Minimal residual risk associated with soil/fill material remaining at the Site as a result of retaining roadway and railroad infrastructure. Residual risks associated with soil exceeding SCOs would be mitigated through engineered soil cover, institutional controls, site management plan, and periodic reviews. The effectiveness of the Onondaga Lake and Harbor Brook remedies are supported through removal of Site soil/fill material and replacement of IRM barrier wall and	Minimal residual risk. The effectiveness of the Onondaga Lake remedies is supported through removal of Site soil/fill material and replacement of IRM barrier wall and groundwater collection systems of the IRMs.

TABLE 4-1. DETAILED ANALYSIS OF REMEDIAL ALTERNATIVES FOR SOIL/FILL MATERIAL AND GROUNDWATER

Criterion	Alternative 1 No Further Action	Alternative 2 Limited Action	Alternative 3 Engineered Cover System	Alternative 4 Enhanced Engineered Cover System with Wetland Construction/Restoration	Alternative 5 Enhanced Engineered Cover System with Wetland Construction/Restoration, *in situ* treatment	Alternative 6A Partial Excavation with Off-Site Disposal	Alternative 6B Excavation with Off-Site Disposal
				lower permeability liner and cover in the vicinity of WL2.	addressed through implementation of ISGS in the vicinity of WL2.	groundwater collection systems of the IRMs.	
Adequacy and reliability of controls	Alternative does not provide adequate and reliable means of controlling erosion of or exposure to impacted soil/fill material. Continued operation and maintenance of IRMs would be an adequate and reliable control to support the effectiveness of the Onondaga Lake remedies and address DNAPL and groundwater impacts.	Alternative does not provide adequate and reliable means of controlling erosion of or exposure to impacted soil/fill material. Institutional controls are an adequate and reliable means of controlling site use and direct contact with Site soil/fill material. Continued operation and maintenance of IRMs would be an adequate and reliable control to support the effectiveness of the Onondaga Lake remedies and address DNAPL and groundwater impacts.	Placement and maintenance of engineered cover system would provide adequate and reliable means of controlling erosion of and exposures to soil/fill material. An isolation layer would provide a reliable means of reducing infiltration and controlling exposures to asphalt tar material. Institutional controls are an adequate and reliable means of controlling site use and direct contact with Site soil/fill material. Continued operation and maintenance of IRMs would be an adequate and reliable control to support the effectiveness of the Onondaga Lake remedies and address DNAPL and groundwater impacts. While added monitoring and collection of deep DNAPL on the Penn-Can property, if found, is included, existing controls are reliable and adequate, therefore added collection provides limited added effectiveness of this remedy.	Placement and maintenance of engineered cover system would provide adequate and reliable means of controlling erosion of and exposures to soil/fill material. An isolation layer would provide a reliable means of reducing infiltration and controlling exposures to asphalt tar material. Institutional controls are an adequate and reliable means of controlling site use and direct contact with Site soil/fill material. Continued operation and maintenance of IRMs would be an adequate and reliable control to support the effectiveness of the Onondaga Lake remedies and address DNAPL and groundwater impacts. A low permeability liner/cover would provide a reliable means of controlling discharge of impacted groundwater to surface water, concurrent with high lake levels. While added monitoring and collection of deep DNAPL on the Penn-Can property, if found, is included, existing controls are reliable and adequate, therefore added collection provides limited added effectiveness of this remedy.	Placement and maintenance of engineered cover system would provide adequate and reliable means of controlling erosion of and exposures to soil/fill material. An isolation layer would provide a reliable means of reducing infiltration and controlling exposures to asphalt tar material. Institutional controls are an adequate and reliable means of controlling site use and direct contact with Site soil/fill material. Continued operation and maintenance of IRMs would be an adequate and reliable control to support the effectiveness of the Onondaga Lake remedies and address DNAPL and groundwater impacts. ISGS would provide a reliable means of controlling discharge of impacted groundwater to surface water, concurrent with high lake levels. While added monitoring and collection of deep DNAPL on the Penn-Can property, if found, is included, existing controls are reliable and adequate, therefore added collection provides limited added effectiveness of this remedy.	Excavation and proper off-site management is an adequate and reliable means for controlling exposures to soil/fill material. Engineered soil cover and institutional controls are adequate and reliable means of controlling Site use and direct contact with residual Site soil/fill material associated with soil/fill material remaining as a result of retaining roadway and railroad infrastructure. Replacement and continued operation and maintenance of IRMs would be an adequate and reliable control to support the effectiveness of the Onondaga Lake remedies, address DNAPL and groundwater impacts, and maintain Site stability. While added monitoring and collection of deep DNAPL on the Penn-Can property, if found, is included, existing controls are reliable and adequate, therefore added collection provides limited added effectiveness of this remedy.	Excavation and proper off-site management is an adequate and reliable means for controlling exposures to soil/fill material. Replacement and continued operation and maintenance of IRMs would be an adequate and reliable control to support the effectiveness of the Onondaga Lake remedies, address groundwater impacts, and maintain Site stability. While added monitoring and collection of deep DNAPL on the Penn-Can property, if found, is included, existing controls are reliable and adequate, therefore added collection provides limited added effectiveness of this remedy.
Long-term sustainability	Minimal fuel/energy use/greenhouse gas emissions associated with long-term maintenance.	Minimal fuel/energy use/greenhouse gas emissions associated with long-term maintenance.	Minimal fuel/energy use/greenhouse gas emissions associated with long-term maintenance.	Minimal fuel/energy use/greenhouse gas emissions associated with long-term maintenance.	Minimal fuel/energy use/greenhouse gas emissions associated with long-term maintenance.	Minimal fuel/energy use/greenhouse gas emissions associated with long-term maintenance.	Minimal fuel/energy use/greenhouse gas emissions associated with long-term maintenance.
Reduction of toxicity, mobility, or volume through treatment							
Treatment process used and materials treated	Willis-Semet GWTP would treat collected shallow and intermediate groundwater via pH adjustment, filtration, and air stripping. pH adjustment neutralizes the influent water; carbon adsorption would remove metals and solids; air stripping would volatilize and remove VOCs in groundwater.	Willis-Semet GWTP would treat collected shallow and intermediate groundwater via pH adjustment, filtration, and air stripping. pH adjustment neutralizes the influent water; carbon adsorption would remove metals and solids; air stripping would volatilize and remove VOCs in groundwater.	Willis-Semet GWTP would treat collected shallow and intermediate groundwater via pH adjustment, filtration, and air stripping. pH adjustment neutralizes the influent water; carbon adsorption would remove metals and solids; air stripping would volatilize and remove VOCs in groundwater. If found, recoverable DNAPL may be treated.	Willis-Semet GWTP would treat collected shallow and intermediate groundwater via pH adjustment, filtration, and air stripping. pH adjustment neutralizes the influent water; carbon adsorption would remove metals and solids; air stripping would volatilize and remove VOCs in groundwater. If found, recoverable DNAPL may be treated.	Willis-Semet GWTP would treat collected shallow and intermediate groundwater via pH adjustment, filtration, and air stripping. pH adjustment neutralizes the influent water; carbon adsorption would remove metals and solids; air stripping would volatilize and remove VOCs in groundwater. If found, recoverable DNAPL may be treated. Soil/fill material in the vicinity of WL2 would be treated with *in situ* stabilization/solidification, permanently solidifying soil, reducing permeability and limiting contact of groundwater and surface water.	Willis-Semet GWTP would treat collected shallow and intermediate groundwater via pH adjustment, filtration, and air stripping. pH adjustment neutralizes the influent water; carbon adsorption would remove metals and solids; air stripping would volatilize and remove VOCs in groundwater. If found, recoverable DNAPL may be treated. Excavated soil exceeding LDRs would be treated.	Willis-Semet GWTP would treat collected shallow and intermediate groundwater via pH adjustment, filtration, and air stripping. pH adjustment neutralizes the influent water; carbon adsorption would remove metals and solids; air stripping would volatilize and remove VOCs in groundwater. If found, recoverable DNAPL would be treated. Excavated soil exceeding LDRs would be treated.
Amount of hazardous material destroyed or treated	Approximately 70 million gallons per year of collected groundwater would continue to be collected and treated at	Approximately 70 million gallons per year of collected groundwater would continue to be collected and treated at	Approximately 70 million gallons per year of collected groundwater would continue to be collected and treated at	Approximately 70 million gallons per year of collected groundwater would continue to be collected and treated at	Approximately 70 million gallons per year of collected groundwater would continue to be collected and treated at	Approximately 3.1 million cubic yards of soil/fill material would be excavated and transported off-site.	Approximately 3.4 million cubic yards of soil/fill material would be excavated and transported off-site.

TABLE 4-1. DETAILED ANALYSIS OF REMEDIAL ALTERNATIVES FOR SOIL/FILL MATERIAL AND GROUNDWATER

Criterion	Alternative 1 No Further Action	Alternative 2 Limited Action	Alternative 3 Engineered Cover System	Alternative 4 Enhanced Engineered Cover System with Wetland Construction/Restoration	Alternative 5 Enhanced Engineered Cover System with Wetland Construction/Restoration, *in situ* treatment	Alternative 6A Partial Excavation with Off-Site Disposal	Alternative 6B Excavation with Off-Site Disposal
	the Willis GWTP under the existing IRMs.	the Willis GWTP under the existing IRMs.	the Willis GWTP under the existing IRMs. Potential for recovery of DNAPL based on PDI.	the Willis GWTP under the existing IRMs. Potential for recovery of DNAPL based on PDI.	the Willis GWTP under the existing IRMs. Approximately 25,800 cy of soil/fill material would be treated by *in situ* stabilization/solidification, solidifying soil, reducing permeability and limiting contact of groundwater. Potential for recovery of DNAPL based on PDI.	Approximately 70 million gallons per year of collected groundwater would continue to be collected and treated at the Willis GWTP under the replaced IRMs, following excavation. Potential for recovery of DNAPL based on PDI.	Approximately 70 million gallons per year of collected groundwater would continue to be collected and treated at the Willis GWTP under the replaced IRMs, following excavation. Potential for recovery of DNAPL based on PDI.
Degree of expected reduction in toxicity, mobility, or volume	Toxicity, mobility and volume of groundwater and DNAPL (potential principal threat waste) containing COCs to Onondaga Lake and Harbor Brook is mitigated by existing IRMs. *Ex situ* treatment of collected groundwater at the Willis-Semet GWTP, including metals precipitation, filtration, pH adjustment, air stripping, and carbon adsorption, is expected to minimize the toxicity of contaminants in groundwater. Natural attenuation is expected to reduce contaminant concentrations over the long-term.	Toxicity, mobility and volume of groundwater and DNAPL (potential principal threat waste) containing COCs to Onondaga Lake and Harbor Brook is mitigated by existing IRMs. *Ex situ* treatment of collected groundwater at the Willis-Semet GWTP, including metals precipitation, filtration, pH adjustment, air stripping, and carbon adsorption, is expected to minimize the toxicity of contaminants in groundwater. Natural attenuation is expected to reduce contaminant concentrations over the long-term.	The mobility of COCs (*i.e.*, associated with erosion) in surface soil/fill material would be reduced by installation of the engineered cover system. Mobility of COCs in surface soil/fill material and potential asphalt tar material on the Penn-Can Property would be addressed as part of the design (*i.e.,* cover, removal, etc.). Toxicity, mobility and volume of groundwater and DNAPL (potential principal threat waste) containing COCs is mitigated by existing IRMs. *Ex situ* treatment of collected groundwater and seep water at the Willis-Semet GWTP, including metals precipitation, filtration, pH adjustment, air stripping, and carbon adsorption, is expected to minimize the toxicity of contaminants in groundwater. Potential for recovery of DNAPL based on PDI. Natural attenuation is expected to reduce contaminant concentrations over the long-term.	The mobility of COCs (*i.e.*, associated with erosion) in surface soil/fill material would be reduced by installation of the engineered cover system. Mobility of COCs in surface soil/fill material and potential asphalt tar material on the Penn-Can Property would be addressed as part of the design (*i.e.,* cover, removal, etc.). Mobility of COCs in groundwater and stained soil/fill material (WL2) would be reduced by installation a low permeability liner. Toxicity, mobility and volume of groundwater and DNAPL (potential principal threat waste) containing COCs is mitigated by existing IRMs. *Ex situ* treatment of collected groundwater and seep water at the Willis-Semet GWTP, including metals precipitation, filtration, pH adjustment, air stripping, and carbon adsorption, is expected to minimize the toxicity of contaminants in groundwater. Potential for recovery of DNAPL based on PDI. Natural attenuation is expected to reduce contaminant concentrations over the long-term.	The mobility of COCs (*i.e.*, associated with erosion) in surface soil/fill material would be reduced by installation of the engineered cover system. Mobility of COCs in surface soil/fill material and potential asphalt tar material on the Penn-Can Property would be addressed as part of the design (*i.e.,* cover, removal, etc.). Mobility of COCs in groundwater and stained soil/fill material (WL2) would be reduced by implementation of ISGS. Toxicity, mobility and volume of groundwater and DNAPL (potential principal threat waste) containing COCs is mitigated by existing IRMs. *Ex situ* treatment of collected groundwater and seep water at the Willis-Semet GWTP, including metals precipitation, filtration, pH adjustment, air stripping, and carbon adsorption, is expected to minimize the toxicity of contaminants in groundwater. Potential for recovery of DNAPL based on PDI. Natural attenuation is expected to reduce contaminant concentrations over the long-term.	Toxicity, mobility, and volume of soil/fill material would be reduced through removal of approximately 3.1 million cubic yards of soil/fill material. Toxicity, mobility and volume of groundwater and DNAPL (potential principal threat waste) containing COCs to Onondaga Lake and Harbor Brook is mitigated by existing/replaced IRMs. *Ex situ* treatment of collected groundwater and seep water at the Willis-Semet GWTP, including metals precipitation, filtration, pH adjustment, air stripping, and carbon adsorption, is expected to minimize the toxicity of contaminants in groundwater. Potential for recovery of DNAPL based on PDI. Natural attenuation is expected to reduce contaminant concentrations over the long-term.	Toxicity, mobility, and volume of soil/fill material would be reduced through removal of approximately 3.4 million cubic yards of soil/fill material. Toxicity, mobility and volume of groundwater and DNAPL (potential principal threat waste) containing COCs to Onondaga Lake and Harbor Brook is mitigated by existing/replaced IRMs. *Ex situ* treatment of collected groundwater and seep water at the Willis-Semet GWTP, including metals precipitation, filtration, pH adjustment, air stripping, and carbon adsorption, is expected to minimize the toxicity of contaminants in groundwater. Potential for recovery of DNAPL based on PDI. Natural attenuation is expected to reduce contaminant concentrations over the long-term.
Degree to which treatment is irreversible	Willis-Semet GWTP processes, natural attenuation, and DNAPL removal are considered irreversible.	Willis-Semet GWTP processes, natural attenuation, and DNAPL removal are considered irreversible.	Willis-Semet GWTP processes, natural attenuation, and DNAPL removal, are considered irreversible.	Willis-Semet GWTP processes, natural attenuation, and DNAPL removal are considered irreversible.	Willis-Semet GWTP processes, ISGS, natural attenuation and DNAPL removal, if implemented, are considered irreversible.	Excavation and off-site disposal, Willis-Semet GWTP processes, and natural attenuation are irreversible.	Excavation and off-site disposal, Willis-Semet GWTP processes, and natural attenuation are irreversible.
Type and quantity of residuals remaining after treatment	Minimal treatment residuals associated with continuing IRMs.	Minimal treatment residuals associated with continuing IRMs.	Minimal treatment residuals associated with continuing IRMs and potential DNAPL removal.	Minimal treatment residuals associated with continuing IRMs and potential DNAPL removal.	Minimal treatment residuals associated with continuing IRMs and potential DNAPL removal. No residuals are anticipated related to *in situ* treatment of soil/fill materials.	Minimal treatment residuals associated with continuing IRMs and potential deep DNAPL removal.	Minimal treatment residuals associated with continuing IRMs and potential deep DNAPL removal.
Short-term effectiveness							
Protection of community during remedial actions	No active components beyond the IRM are related to this alternative.	No active components beyond the IRM are related to this alternative.	Dust and volatile emissions, if any, would be controlled during construction activities. Cover construction would result in impacts to the community relative to truck traffic and noise during the construction.	Dust and volatile emissions, if any, would be controlled during construction activities. Cover and wetland construction would result in impacts to the community relative to truck traffic and noise during the construction.	Dust and volatile emissions, if any, would be controlled during construction activities. Cover and wetland construction and implementation of ISGS would result in impacts to the community relative to truck traffic and noise during the construction.	Dust and volatile emissions, if any, would be controlled during construction activities. Excavation and off-site disposal would result in significant impacts to the community relative to truck traffic and noise during the construction. Impacts to the	Dust and volatile emissions, if any, would be controlled during construction activities. Excavation and off-site disposal would result in significant impacts to the community relative to truck traffic and noise during the construction. Impacts to the

TABLE 4-1. DETAILED ANALYSIS OF REMEDIAL ALTERNATIVES FOR SOIL/FILL MATERIAL AND GROUNDWATER

Criterion	Alternative 1 No Further Action	Alternative 2 Limited Action	Alternative 3 Engineered Cover System	Alternative 4 Enhanced Engineered Cover System with Wetland Construction/Restoration	Alternative 5 Enhanced Engineered Cover System with Wetland Construction/Restoration, *in situ* treatment	Alternative 6A Partial Excavation with Off-Site Disposal	Alternative 6B Excavation with Off-Site Disposal
						community related to O&M activities are anticipated to be minimal.	community related to O&M activities are anticipated to be minimal.
Protection of workers during remedial actions	Proper health and safety measures would be established and implemented during remedial activities, and would be effective in protecting workers from exposure to contaminants.	Proper health and safety measures would be established and implemented during remedial activities, and would be effective in protecting workers from exposure to contaminants.	Proper health and safety measures would be established and implemented during remedial activities, and would be effective in protecting workers from exposure to contaminants.	Proper health and safety measures would be established and implemented during remedial activities, and would be effective in protecting workers from exposure to contaminants.	Proper health and safety measures would be established and implemented during remedial activities, and would be effective in protecting workers from exposure to contaminants.	Proper health and safety measures would be established and implemented during remedial activities, to protect workers from exposure to contaminants.	Proper health and safety measures would be established and implemented during remedial activities, to protect workers from exposure to contaminants.
Environmental impacts	No active components beyond the IRM are related to this alternative.	No active components beyond the IRM are related to this alternative.	Dust, volatile emissions, and surface runoff controls would be instituted to minimize impacts to the environment during implementation of this alternative. Minimal clearing would be required prior to engineered cover installation.	Dust, volatile emissions, and surface runoff controls would be instituted to minimize impacts to the environment during implementation of this alternative. Minimal clearing would be required prior to engineered cover installation.	Dust, volatile emissions, and surface runoff controls would be instituted to minimize impacts to the environment during implementation of this alternative. Minimal clearing would be required prior to engineered cover installation.	Dust, volatile emissions, and surface runoff controls would be instituted to minimize impacts to the environment during implementation of this alternative. Clearing would be required prior to excavation. Management of construction waste associated with remedy implementation would be performed to minimize impacts to the environment.	Dust, volatile emissions, and surface runoff controls would be instituted to minimize impacts to the environment during implementation of this alternative. Clearing would be required prior to excavation. Management of construction waste associated with remedy implementation would be performed to minimize impacts to the environment.
Time until remedial action objectives are achieved	Remedial action objectives related to public health protection and migration of contaminants in soil/fill material would not be met with this alternative. Continued operation of IRMs would address the discharge of shallow and intermediate groundwater and DNAPL to Harbor Brook or Onondaga Lake.	Remedial action objectives related to migration of contaminants in soil/fill material would not be met with this alternative. Continued operation of IRMs would address the discharge of shallow and intermediate groundwater and DNAPL to Harbor Brook or Onondaga Lake.	Remedial action objectives would be achieved for areas where vegetation is applied within 3 years of application (*i.e.*, timeframe for vegetation to reach maturity). Construction of Alternative 3 is anticipated to be completed within 1 to 2 years. Continued operation of IRMs would address the discharge of shallow and intermediate groundwater and DNAPL to Harbor Brook or Onondaga Lake.	Remedial action objectives would be achieved for areas where vegetation is applied within 3 years of application (*i.e.*, timeframe for vegetation to reach maturity). Construction of Alternative 4 is anticipated to be completed within 2 to 3 years. Continued operation of IRMs would address the discharge of shallow and intermediate groundwater and DNAPL to Harbor Brook or Onondaga Lake.	Remedial action objectives would be achieved for areas where vegetation is applied within 3 years of application (*i.e.*, timeframe for vegetation to reach maturity). Construction of Alternative 5 is anticipated to be completed within 2 to 3 years. Continued operation of IRMs would address the discharge of shallow and intermediate groundwater and DNAPL to Harbor Brook or Onondaga Lake.	Remedial action objectives would be achieved upon completion of the remedy. The remedy would be completed in approximately 4 to 6 construction seasons. Operation of IRMs would address the discharge of shallow and intermediate groundwater and DNAPL to Harbor Brook or Onondaga Lake.	Remedial action objectives would be achieved upon completion of the remedy. The remedy would be completed in approximately 4 to 6 construction seasons. Operation of IRMs would address the discharge of shallow and intermediate groundwater and DNAPL to Harbor Brook or Onondaga Lake.
Short-term sustainability	IRM is constructed. No fuel/energy consumption, greenhouse gas or pollutant emissions, no water or resource use, no impacts to water or ecology.	IRM is constructed. No fuel/energy consumption, greenhouse gas or pollutant emissions, no water or resource use, no impacts to water or ecology.	Greenhouse gas emissions associated with fuel/energy use by construction equipment and transportation of materials on-site during cover installation is estimated at approximately 395 $MTCO_2e$.	Greenhouse gas emissions associated with fuel/energy use by construction equipment and transportation of materials on-site during cover installation is estimated at approximately 508 $MTCO_2e$.	Greenhouse gas emissions associated with fuel/energy use by construction equipment and transportation of materials on-site during cover installation and ISGS treatment is estimated 1,673 $MTCO_2e$. Implementation of ISGS results in substantial greenhouse gas emissions.	Greenhouse gas emissions associated with fuel/energy use by construction equipment and transportation of materials on- and off-site during excavation, backfill, and Site restoration is estimated at approximately 85,000 $MTCO_2e$.	Greenhouse gas emissions associated with fuel/energy use by construction equipment and transportation of materials on- and off-site during excavation, backfill, and Site restoration is estimated at approximately 98,000 $MTCO_2e$.
Implementability							
Ability to construct and operate the technology	IRM is constructed and continued O&M would be readily implementable.	IRM is constructed and continued O&M would be readily implementable.	Engineered cover systems are readily constructible. Deep DNAPL monitoring wells are readily constructible. IRM is constructed and continued O&M would be readily implementable. Engineered cover system with asphalt tar material isolation layer installation on the Penn-Can Property is readily constructible	Engineered cover systems are readily constructible. Deep DNAPL monitoring wells are readily constructible. Low permeability liner in the vicinity of wetland construction/restoration are readily constructible when groundwater/surface water levels are low. Engineered cover system with asphalt tar material isolation layer installation on the Penn-Can Property is readily constructible. IRM is constructed and continued O&M would be readily implementable.	Engineered cover systems are readily constructible. Deep DNAPL monitoring wells are readily constructible. IRM is constructed and continued O&M would be readily implementable. ISGS in the vicinity of wetland construction/restoration are readily constructible when groundwater/surface water levels are low. Pilot testing would be necessary to refine soil mixing approach in heterogeneous subsurface conditions at the Site. Engineered cover system with asphalt tar material isolation	Not considered implementable. Excavation and off-site disposal of 3.1 million cubic yards of material is limited by landfill capacity and construction water management needs. Excavation to depths required in certain areas of Site result in significant implementability challenges. Specifically, excavation depths of 20- to 30-ft in the vicinity of I-690 and the railroad tracks may cause stability problems to those features as well as require removal and replacement of the IRM barrier wall and collection system IRMs and	Not considered implementable. Excavation and off-site disposal of 3.4 million cubic yards of material is limited by landfill capacity and construction water management needs. Removal and replacement of IRMs and portions of I-690, State Fair Boulevard and the CSX railroad would result in significant implementability challenges. Repair of the Onondaga Lake Remedy would also be required. Deep DNAPL monitoring wells are readily constructible.

TABLE 4-1. DETAILED ANALYSIS OF REMEDIAL ALTERNATIVES FOR SOIL/FILL MATERIAL AND GROUNDWATER

Criterion	Alternative 1 No Further Action	Alternative 2 Limited Action	Alternative 3 Engineered Cover System	Alternative 4 Enhanced Engineered Cover System with Wetland Construction/Restoration	Alternative 5 Enhanced Engineered Cover System with Wetland Construction/Restoration, *in situ* treatment	Alternative 6A Partial Excavation with Off-Site Disposal	Alternative 6B Excavation with Off-Site Disposal
					layer installation on the Penn-Can Property is readily constructible	repair of the Onondaga Lake remedy. Deep DNAPL monitoring wells are readily constructible.	
Reliability of technology	The groundwater and DNAPL collection system IRMs are reliable technologies to address migration to Harbor Brook and Onondaga Lake. Existing cover systems are reliable technologies.	The groundwater and DNAPL collection system IRMs are reliable technologies to address migration to Harbor Brook and Onondaga Lake. Existing cover systems are reliable technologies.	An engineered cover system (with asphalt tar material isolation layer on a portion of Penn-Can Property) is a reliable technology. The groundwater and DNAPL collection system IRMs are reliable technologies to address migration to Harbor Brook and Onondaga Lake.	An engineered cover system with a low permeability liner (northeast portion of Lakeshore Area) and asphalt tar material isolation layer (portion of Penn-Can Property) is a reliable technology. The groundwater and DNAPL collection system IRMs are reliable technologies to address migration to Harbor Brook and Onondaga Lake.	An engineered cover system (with asphalt tar material isolation layer on a portion of the Penn-Can Property) is a reliable technology. ISGS of DNAPL-stained soil/fill material is a reliable technology and has been demonstrated at full-scale. The groundwater and DNAPL collection system IRMs are reliable technologies to address migration to Harbor Brook and Onondaga Lake.	Excavation and disposal are reliable technologies. The groundwater collections system IRMs are reliable technologies to address migration to Harbor Brook and Onondaga Lake and maintain Site stability following excavation of soil/fill material.	Excavation and disposal are reliable technologies. The groundwater collections system IRMs are reliable technologies to address migration to Harbor Brook and Onondaga Lake and maintain Site stability following excavation of soil/fill material.
Ease of undertaking additional remedial actions, if necessary	Additional remedial actions, if necessary, would be readily implementable.	Additional remedial actions, if necessary, would be readily implementable.	Additional remedial actions, if necessary, would be implementable.	Additional remedial actions, if necessary, would be implementable.	Additional remedial actions, if necessary, would be implementable.	Additional remedial actions, if necessary, would be implementable.	Additional remedial actions, if necessary, would be implementable.
Ability to monitor effectiveness of remedy	Effectiveness of IRMs would continue to be performed in accordance with existing approved plans.	Effectiveness of IRMs would continue to be performed in accordance with existing approved plans. Site management plan, periodic reviews, and monitoring would provide means for monitoring remedy effectiveness.	Effectiveness of remedy could be monitored through inspection and maintenance of the engineered cover system to verify continued cover integrity, visual signs of erosion, and condition of the engineered cover. Effectiveness of IRMs would continue to be performed in accordance with existing approved plans. Site management plan, periodic reviews, and monitoring would provide means for monitoring remedy effectiveness.	Effectiveness of remedy could be monitored through inspection and maintenance of the engineered cover system to verify continued cover integrity, visual signs of erosion, and condition of the engineered cover. The wetland area would be monitored for signs of erosion, condition of vegetation and presence of invasive species. Effectiveness of IRMs would continue to be performed in accordance with existing approved plans. Site management plan, periodic reviews, and monitoring would provide means for monitoring remedy effectiveness.	Effectiveness of remedy could be monitored through inspection and maintenance of the engineered cover system to verify continued cover integrity, visual signs of erosion, and condition of the engineered cover. Effectiveness of ISGS could be monitored through inspection of the treatment area. The wetland area would also be monitored for signs of erosion, condition of vegetation and presence of invasive species. Effectiveness of IRMs would continue to be performed in accordance with existing approved plans. Site management plan, periodic reviews, and monitoring would provide means for monitoring remedy effectiveness.	Effectiveness of remedy could be monitored through inspection and maintenance of the engineered cover system to verify continued cover integrity, visual signs of erosion, and condition of the engineered cover. Effectiveness of IRMs would continue to be performed in accordance with existing approved plans. Site management plan, periodic reviews, and monitoring would provide means for monitoring remedy effectiveness.	Effectiveness of IRMs would continue to be performed in accordance with existing approved plans. Site management plan, periodic reviews, and monitoring would provide means for monitoring remedy effectiveness.

TABLE 4-1. DETAILED ANALYSIS OF REMEDIAL ALTERNATIVES FOR SOIL/FILL MATERIAL AND GROUNDWATER

Criterion	Alternative 1 No Further Action	Alternative 2 Limited Action	Alternative 3 Engineered Cover System	Alternative 4 Enhanced Engineered Cover System with Wetland Construction/Restoration	Alternative 5 Enhanced Engineered Cover System with Wetland Construction/Restoration, *in situ* treatment	Alternative 6A Partial Excavation with Off-Site Disposal	Alternative 6B Excavation with Off-Site Disposal
Coordination with other agencies and property owners	Coordination with property owners would be necessary.	Coordination with property owners would be necessary.	Coordination with other agencies including NYSDEC, USEPA, NYSDOH, NYSDOT, Town of Geddes, and Onondaga County would be necessary. Coordination with property owners would be necessary.	Coordination with other agencies including NYSDEC, USEPA, NYSDOH, NYSDOT, Town of Geddes, and Onondaga County would be necessary. Coordination with property owners would be necessary.	Coordination with other agencies including NYSDEC, USEPA, NYSDOH, NYSDOT, Town of Geddes, and Onondaga County would be necessary. Coordination with property owners would be necessary.	Coordination with other agencies including NYSDEC, USEPA, NYSDOH, NYSDOT, Town of Geddes, Onondaga County, and CSX would be necessary. Coordination with property owners would be necessary.	Coordination with other agencies including NYSDEC, USEPA, NYSDOH, NYSDOT, Town of Geddes, Onondaga County, and CSX would be necessary. Coordination with property owners would be necessary.
Availability of off-site treatment storage and disposal services and capacities	Disposal facility readily available for treatment residuals. Treatment capacity readily available. DNAPL disposal capacity readily available.	Disposal facility readily available for treatment residuals. Treatment capacity readily available. DNAPL disposal capacity readily available.	Disposal facility readily available for treatment residuals. Treatment capacity readily available. DNAPL disposal capacity readily available. Minimal disposal capacity required for sampling-related wastes.	Disposal facility readily available for treatment residuals. Treatment capacity readily available. DNAPL disposal capacity readily available. Minimal disposal capacity required for sampling-related wastes.	Disposal facility readily available for treatment residuals. Treatment capacity readily available. DNAPL disposal capacity readily available. Minimal disposal capacity required for sampling-related wastes.	Large quantities of soil/fill material requiring off-site disposal may require use of multiple landfills. Off-site treatment of construction water is available. DNAPL treatment/disposal capacity readily available. Minimal disposal capacity required for sampling-related wastes.	Large quantities of soil/fill material requiring off-site disposal may require use of multiple landfills. Off-site treatment of construction water is available. DNAPL treatment/disposal capacity readily available. Minimal disposal capacity required for sampling-related wastes.
Availability of necessary equipment, specialists, and materials	IRM already constructed and operating.	IRM already constructed and operating.	Equipment, specialists, and materials are available. IRM already constructed and operating.	Equipment, specialists, and materials are available. IRM already constructed and operating.	Equipment, specialists, and materials are available. IRM already constructed and operating.	Equipment, specialists, and materials are available. IRM already constructed and operating.	Equipment, specialists, and materials are available. IRM already constructed and operating.
Costs							
Total estimated capital cost	$0	$101,000	$9.6 million	$11.8 million	$19.6 million	$1,161 million	$1,303 million
Present worth of operation and maintenance cost (30 years, 7% discount factor)	$0	$372,000	$0.9 million	$0.9 million	$0.9 million	$0.3 million	$0.3 million
Total estimated net present worth cost	$0	$473,000	$10.5 million	$12.7 million	$20.5 million	$1,162 million	$1,304 million
Land Use							
Consistency with proposed future use	Not protective for current, intended and reasonably anticipated future uses of the Site.	Not protective for current, intended and reasonably anticipated future uses of the Site.	Engineered cover system and continued O&M of IRM components would be consistent with current, intended, and reasonably anticipated future uses of the Site. The cover system would also allow for a passive use public recreation trail.	Enhanced engineered cover system, wetland construction/restoration with a low-permeability liner, and continued O&M of IRM components would be consistent with current, intended, and reasonably anticipated future uses of the Site. The cover system would also allow for a passive use public recreation trail.	Enhanced engineered cover system, wetland construction/restoration with *in situ* treatment, and continued O&M of IRM components would be consistent with current, intended, and reasonably anticipated future uses of the Site. The cover system would also allow for a passive use public recreation trail.	Excavation of soil/fill material would support current, intended and reasonably anticipated future use upon remedy completion and Site restoration; however, significant disruption to current and planned land use and traffic patterns would be anticipated. Specifically, removal of soil/fill material would delay construction of the proposed public recreation trail and potential future redevelopment opportunities for other portions of the Site. Following restoration, conditions would be consistent with current, intended, and reasonably anticipated future uses of the Site. Duration of remedy	Full excavation requiring removal and replacement of I-690, State Fair Boulevard, and the railroad tracks would cause significant disruption to current land use and traffic patterns. Specifically, removal of soil/fill material would potentially delay construction of the proposed public recreation trail and potential future redevelopment opportunities for other portions of the Site. Following restoration, conditions would be consistent with current, intended, and reasonably anticipated future uses of the Site. Duration of remedy implementation may conflict with development plans.

TABLE 4-1. DETAILED ANALYSIS OF REMEDIAL ALTERNATIVES FOR SOIL/FILL MATERIAL AND GROUNDWATER

Criterion	Alternative 1 No Further Action	Alternative 2 Limited Action	Alternative 3 Engineered Cover System	Alternative 4 Enhanced Engineered Cover System with Wetland Construction/Restoration	Alternative 5 Enhanced Engineered Cover System with Wetland Construction/Restoration, *in situ* treatment	Alternative 6A Partial Excavation with Off-Site Disposal	Alternative 6B Excavation with Off-Site Disposal
						implementation may conflict with development plans.	

Notes:
ARAR – Applicable or Relevant and Appropriate Requirement
COC – Constituent of Concern
cy – Cubic Yard
DER – Division of Environmental Remediation
DNAPL – Dense Non-Aqueous Phase Liquid
GWTP – Groundwater Treatment Plant
IRM – Interim Remedial Measure
ISGS – *In situ* Geochemical Stabilization
LDR – Land Disposal Restrictions
MtCO2e - million metric tons of carbon dioxide equivalent
NYSDEC – New York State Department of Environmental Conservation
NYSDOH – New York State Department of Health
NYSDOT – New York State Department of Transportation
O&M – Operation and Maintenance
OSHA – Occupational Safety and Health Administration
PDI – Pre-Design Investigation
RAO – Remedial Action Objective
SCO – Soil Cleanup Objective
SPDES – State Pollutant Discharge Elimination System
USEPA – United States Environmental Protection Agency
VOC – Volatile Organic Compound
WWTP – Wastewater Treatment Plant

TABLE 4-2. ALTERNATIVE 1 COST ESTIMATE - No Further Action

COST ESTIMATE SUMMARY

Site:	Honeywell Wastebed B / Harbor Brook Site	Description:	No Further Action
Location:	Geddes, NY		
Phase:	Feasibility Phase (+50% / -25%)		
Base Year:	2017		

ITEM	UNIT	ESTIMATED QUANTITY	ESTIMATED UNIT COST	ESTIMATED COST	NOTES
Direct Capital Costs					
			SUBTOTAL (rounded):	**$0**	
			TOTAL ESTIMATED DIRECT CAPITAL COST (rounded):	**$0**	
			ENGINEERING/MANAGMENT, OBG OH&P	$0	6% and 5% respectively
			CONTINGENCY (25%)	$0	Scope Contingency
			TOTAL ESTIMATED CAPITAL COST (rounded):	**$0**	
Operation and Maintenance Costs					
Annual				**$0**	
Years 5, 10, 15, 20, 25, 30				**$0**	

Present Worth Analysis Years (1-30)		Discount Factor	**Present Worth ($)**	
Cost Type	Cost	Df=7	**(rounded)**	
Capital Cost - Year 0	$0	1.00	**$0**	
Annual O&M - Years 1-30	$0	0.41	**$0**	Average discount factor for years 1-30
Periodic O&M - Years 5, 10, 15, 20, 25, 30	$0	0.36	**$0**	Average discount factor for years 5, 10, 15, 20, 25 and 30
		TOTAL PRESENT WORTH ESTIMATED ALTERNATIVE COST (rounded):	**$0**	

TABLE 4-3. ALTERNATIVE 2 COST ESTIMATE - Limited Action (with Continued O&M of IRMs)

COST ESTIMATE SUMMARY

Site:	Honeywell Wastebed B / Harbor Brook Site	Description:	Continued Operation and Maintenance of IRMs
Location:	Geddes, NY		Institutional Controls and Site Management Plan
Phase:	Feasibility Phase (+50% / -25%)		
Base Year:	2017		

ITEM	UNIT	ESTIMATED QUANTITY	ESTIMATED UNIT COST	ESTIMATED COST	NOTES
Direct Capital Costs					
Environmental Easement	LS	1	$30,000	$30,000	
Site Management Plan	LS	1	$50,000	$50,000	
			SUBTOTAL (rounded):	**$80,000**	
			TOTAL ESTIMATED DIRECT CAPITAL COST (rounded):	**$80,000**	
			ENGINEERING/MANAGMENT, OBG OH&P	$8,800	6% and 5% respectively
			CONTINGENCY (15%)	$12,000	Scope Contingency
			TOTAL ESTIMATED CAPITAL COST (rounded):	**$101,000**	
Operation and Maintenance Costs					
Annual					
Reporting and Recordkeeping	EA	1	$20,000	$20,000	
Cover inspection	LS	1	$3,500	$3,500	Assumes 2 scientists/engineers, 1 days, 8 hours/day, annual inspections
Cap Maintenance					
Vegetation Maintenance	AC	1.2	$3,000	$3,600	Spot seeding; 10% of all areas annually
Soil Cover maintenance and incidental repairs	AC	1.2	$225	$270	Topsoil repair, 5 cy per acre annually
Years 5, 10, 15, 20, 25, 30					
Five Year Review	EA	1	$15,000	$15,000	

Present Worth Analysis Years (1-30)		Discount Factor	**Present Worth ($)**	
Cost Type	Cost	Df=7	**(rounded)**	
Capital Cost - Year 0	$101,000	1.00	**$101,000**	
Annual O&M - Years 1-30	$27,370	0.41	**$340,000**	Average discount factor for years 1-30
Periodic O&M - Years 5, 10, 15, 20, 25, 30	$15,000	0.36	**$32,000**	Average discount factor for years 5, 10, 15, 20, 25 and 30
		TOTAL PRESENT WORTH ESTIMATED ALTERNATIVE COST (rounded):	**$473,000**	

TABLE 4-4. ALTERNATIVE 3 COST ESTIMATE - Engineered Cover System

COST ESTIMATE SUMMARY

Site:	Honeywell Wastebed B / Harbor Brook Site	Conceptual Basis:	1-ft Engineered cover over remaining Lakeshore Areas
Location:	Geddes, NY		1-ft Engineered cover and Veg Enhancement over AOS #2, Penn-Can Area, and Railroad Area.
Phase:	Feasibility Phase (+50% / -25%)		Continued Operation and Maintenance of IRMs
Base Year:	2017		

ITEM	UNIT	ESTIMATED QUANTITY	ESTIMATED UNIT COST	ESTIMATED COST		NOTES
Direct Capital Costs						
General Conditions	WK	48	$18,000	$864,000		Trailer, fuel, small tools, consumables and safety
Air Monitoring	WK	48	$4,250	$204,000		
Surveys	WK	48	$3,000	$144,000		During capping
Irrigation	WK	8	$5,000	$40,000		Following seeding; 4 wks per season
Environmental Easement	LS	1	$30,000	$30,000		
Site Management Plan	LS	1	$50,000	$50,000		
				Item Subtotal (rounded):	**$1,332,000**	
Pre-Design Investigation						
Existing Cover thickness	LS	1	$141,000	$141,000		Lake Support Area (Lakeshore) and Staging area (Penn-Can)
DNAPL delineation	LS	1	$60,000	$60,000		2 observation wells and 5 probes
				Item Subtotal (rounded):	**$201,000**	
Site Preparation						
Clearing and Grubbing	AC	10.7	$2,600	$27,820		Railroad and portions Penn-Can areas to be prepared for engineered cap
Rough Grading	AC	43.4	$3,000	$130,200		All areas except IRM and Vegetation Enhancement Areas
				Item Subtotal (rounded):	**$158,000**	
QA/QC						
Materials QA/QC Testing - Topsoil	EA	53	$500	$26,297		1/500 cy of imported materials
Materials QA/QC Testing - Fill and Stone	EA	76	$400	$30,270		1/500 cy of imported materials
Performance QA/QC - Compaction	WK	48	$1,200	$57,600		
				Item Subtotal (rounded):	**$114,000**	`
Engineered Cover, 1-ft - Lakeshore Area						
Erosion and Sediment Control	LF	8,790	$4.00	$35,160		Reinforced silt fence; one replacement
Place Topsoil to 6-inch depth	CY	17,666	$58	$1,024,628		Placement by conventional equipment in 6-inch lifts
Place Imported Fill up to 6-inch depth	CY	14,923	$43	$641,703		Buffer layer; placement by conventional equipment in 6-inch lifts; 6 inches
Place Imported Granular Stone to 1-ft depth	CY	3,796	$37	$140,458		stone fill overlying geogrid; approx 2.5 acres in addition to soil cover
Place Clay Fill to 12-inches	CY	3,227	$50	$161,333		below engineeered cover layers for areas below El. 365 (high lake level); approx. 2 acres assumed
Seeding	AC	21.9	$18,000	$394,200		Modified old field successional with fertilizer; applied by hydroseeding
				Item Subtotal (rounded):	**$2,397,000**	`
Vegetate Existing Fill - Lakeshore, Lake Support Area						
Rip, disc and till existing soils	AC	8.1	$6,000	$48,600		prepare existing Lake support area grade for planting
Hydromulch installation	CY	2,700	$65	$175,500		Mulch/Seed placement by blown-in methods; 2.5 inch thickness assumed over 8.1 acres
				Item Subtotal (rounded):	**$224,000**	
Vegetate Existing Fill - Upper East Flume IRM Restoration						
Rip, disc and till existing soils	AC	3.0	$6,000	$18,000		prepare existing Lake support area grade for planting
Hydromulch installation	CY	1,000	$65	$65,000		Mulch/Seed placement by blown-in methods; 2.5 inch thickness assumed over 3 acres acres
				Item Subtotal (rounded):	**$83,000**	
Engineered Cover (Soil), 1-ft - Penn-Can Area						
Erosion and Sediment Control	LF	500	$4.00	$2,000		Reinforced silt fence; one replacement
Place Topsoil to 6-inch depth	CY	323	$58	$18,715		Placement by conventional equipment in 6-inch lifts
Place Imported Fill to 6-inch depth	CY	323	$43	$13,875		Placement by conventional equipment in 6-inch lifts
Seeding	AC	0.4	$18,000	$7,200		Modified old field successional with fertilizer; applied by hydroseeding
				Item Subtotal (rounded):	**$42,000**	
Engineered Cover (Granular), 1-ft - Penn-Can Area						
Erosion and Sediment Control	LF	2,000	$4.00	$8,000		Reinforced silt fence; one replacement
Place Subgrade stone to 12-inches	CY	10,487	$35	$367,033		
Geogrid stabilization	AC	6.5	$43,560.00	$283,140		assume $1/sf installed
LLDPE Liner and Geofabric	SF	65,340	$2	$104,544		40 mil LLDPE and single layer geofabric; 1.5 acre assumed
Geocushion	SF	65,340	$0.50	$32,670		1.5 acre assumed
				Item Subtotal (rounded):	**$795,000**	

TABLE 4-4. ALTERNATIVE 3 COST ESTIMATE - Engineered Cover System

COST ESTIMATE SUMMARY

Site:	Honeywell Wastebed B / Harbor Brook Site	Conceptual Basis:	1-ft Engineered cover over remaining Lakeshore Areas
Location:	Geddes, NY		1-ft Engineered cover and Veg Enhancement over AOS #2, Penn-Can Area, and Railroad Area.
Phase:	Feasibility Phase (+50% / -25%)		Continued Operation and Maintenance of IRMs
Base Year:	2017		

ITEM	UNIT	ESTIMATED QUANTITY	ESTIMATED UNIT COST	ESTIMATED COST		NOTES
Vegetated Enhancement - Penn-Can Area						
Erosion and Sediment Control	LF	1,800	$4.00	$7,200		Reinforced silt fence; one replacement
Hydromulch installation	CY	800	$65	$52,000		Mulch/Seed placement by blown-in methods; 2.5 inch thickness assumed over 1.5 acres
				Item Subtotal (rounded):	**$59,000**	
Engineered Cover, 1-ft - Railroad Area						
Erosion and Sediment Control	LF	8,640	$4.00	$34,560		Reinforced silt fence; one replacement
Provide Railroad Flagman	DA	26	$1,800	$45,938		
Place Topsoil to 6-inch depth	CY	8,309	$58	$481,903		Placement by conventional equipment in 6-inch lifts
Place Imported Fill to 6-inch depth	CY	8,309	$43	$357,273		Placement by conventional equipment in 6-inch lifts
Seeding	AC	10.3	$18,000	$185,400		Modified old field successional with fertilizer; applied by hydroseeding
				Item Subtotal (rounded):	**$1,105,000**	
Vegetated Enhancement - Railroad Area and AOS #2						
Erosion and Sediment Control	LF	1,700	$4.00	$6,800		Reinforced silt fence; one replacement
Provide Railroad Flagman	DA	4	$1,800	$7,200		
Hydromulch installation	CY	1,100	$65	$71,500		Mulch/Seed placement by blown-in methods; 2.5 inch thickness assumed over 3.2 acres
				Item Subtotal (rounded):	**$86,000**	
Monitoring Wells						
Install DNAPL Monitoring Well	VLF	280	$150	$42,000		2-inch fiberglass to 70-ft; 4 wells total
				Item Subtotal (rounded):	**$42,000**	39.1 15.8

TOTAL ESTIMATED DIRECT CAPITAL COST (rounded):	**$6,638,000**	
ENGINEERING/MANAGMENT, CONSTRUCTION OVERSIGHT, OBG OH&P	**$1,261,220**	6%, 8%, and 5% respectively
CONTINGENCY (25%)	**$1,659,500**	Scope Contingency
TOTAL ESTIMATED CAPITAL COST (rounded):	**$9,600,000**	

Operation and Maintenance Costs					
Annual					
Reporting and Recordkeeping	EA	1	$20,000	$20,000	
Cover inspection	LS	1	$12,480	$12,480	Assumes 2 scientists/engineers, 4 days, 8 hours/day, semi-annual inspections
Cap Maintenance					
Vegetation Maintenance	AC	7.8	$3,000	$23,460	Spot seeding; 10% of all areas annually
Soil Cover maintenance and incidental repairs	AC	49.4	$225	$11,115	Topsoil repair, 5 cy per acre annually
Groundwater Monitoring					
Sampling Labor	LS	1	$1,600	$1,600	
DNAPL and Water Level Monitoring	LS	1	$1,600	$1,600	
Years 5, 10, 15, 20, 25, 30					
Five Year Review	EA	1	$15,000	$15,000	

Present Worth Analysis Years (1-30)		Discount Factor	**Present Worth ($)**	
Cost Type	Cost	Df=7	**(rounded)**	
Capital Cost - Year 0	$9,600,000	1.00	**$9,600,000**	
Annual O&M - Years 1-30	$70,255	0.41	**$872,000**	Average discount factor for years 1-30
Periodic O&M - Years 5, 10, 15, 20, 25, 30	$15,000	0.36	**$32,000**	Average discount factor for years 5, 10, 15, 20, 25 and 30
TOTAL PRESENT WORTH ESTIMATED ALTERNATIVE COST (rounded):			**$10,504,000**	

TABLE 4-6. ALTERNATIVE 5 COST ESTIMATE - Enhanced Engineered Cover System with Wetland Construction/Restoration and In situ Treatment

COST ESTIMATE SUMMARY

Site:	Honeywell Wastebed B / Harbor Brook Site	Conceptual Basis:	Enhanced Engineered cover over remaining Lakeshore Areas (min. 1-ft, up to 2-ft)
Location:	Geddes, NY		1-ft Engineered cover and Veg Enhancement over AOS 2, Penn-Can Area, and Railroad Area.
Phase:	Feasibility Phase (+50% / -25%)		Wetland construction/restoration with Low-Perm Cover
Base Year:	2017		Continued Operation and Maintenance of IRMs

ITEM	UNIT	ESTIMATED QUANTITY	ESTIMATED UNIT COST	ESTIMATED COST		NOTES
Direct Capital Costs						
General Conditions	WK	69	$18,000	$1,242,000		Trailer, fuel, small tools, consumables and safety
Air Monitoring	WK	69	$4,250	$293,250		
Surveys	WK	69	$3,000	$207,000		During capping
Irrigation	WK	8	$5,000	$40,000		Following seeding; 4 wks per season
Environmental Easement	LS	1	$30,000	$30,000		
Site Management Plan	LS	1	$50,000	$50,000		
				Item Subtotal (rounded):	**$1,862,000**	
Pre-Design Investigation						
Existing Cover thickness	LS	1	$141,000	$141,000		Lake Support Area (Lakeshore) and Staging area (Penn-Can)
DNAPL delineation	LS	1	$60,000	$60,000		2 observation wells and 5 probes
				Item Subtotal (rounded):	**$201,000**	
Site Preparation						
Clearing and Grubbing	AC	10.7	$2,600	$27,820		Railroad and portions Penn-Cann areas exclusive of IRM footprints and Veg Enhancement Areas
Rough Grading	AC	43.4	$3,000	$130,200		All areas except IRM (Railroad and Penn-Can) and Vegetation Enhancement Areas
				Item Subtotal (rounded):	**$158,000**	
QA/QC						
Materials QA/QC Testing - Topsoil	EA	53	$500	$26,297		1/500 cy of imported materials
Materials QA/QC Testing - Fill and Stone	EA	124	$400	$49,565		1/500 cy of imported materials
Performance QA/QC - Compaction	WK	69	$1,200	$82,800		
				Item Subtotal (rounded):	**$159,000**	`
In Situ Geochemical Stabilization - Lakeshore Area						
Pre-Design Investigation						
Treatability Study	LS	1	$100,000	$100,000		bench-scale mix design
In situ Solidification						
Soil Mixing mobilization	LS	1	$250,000	$250,000		
Reagent	LBS	1,161,600	$0.75	$871,200		Reagent for 8-ft zone @ 4.5% ISGS Solution, 45#/cy
Mixing and labor	CY	25,813	$150	$3,872,000		Mixing by soil blending to 2- to 10-ft bgs
Verification Testing	EA	52	$35	$1,807		Assumes one permeability per 500-cy
Grade bulked/treated materials onsite	CY	1,291	$3.85	$4,969		assumes 5% by volume expansion for grading
				Item Subtotal (rounded):	**$5,100,000**	`
Engineered Cover, Enhanced - Lakeshore Area						*For purposes of cost estimating enhanced cover = 50% each of 1-ft and 2-ft thickness*
Erosion and Sediment Control	LF	8,790	$4.00	$35,160		Reinforced silt fence; one replacement
Place Topsoil to 6-inch depth	CY	16,859	$58	$977,841		Placement by conventional equipment in 6-inch lifts
Place Imported Fill up to 18-inch depth	CY	33,719	$43	$1,449,903		Buffer layer; placement by conventional equipment in 6-inch lifts; varies 6 to 18 inches
Place Imported Granular Stone to 1-ft depth	CY	3,796	$37	$140,458		stone fill overlying geogrid; approx 2.5 acres in addition to soil cover
Place Clay Fill to 12-inches	CY	3,227	$50	$161,333		below engineeered cover layers for areas below El. 365 (high lake level); approx. 2 acres assumed
Seeding	AC	20.9	$18,000	$376,200		Modified old field successional with fertilizer; applied by hydroseeding
				Item Subtotal (rounded):	**$3,141,000**	`
Constructed Wetland, 2.5-ft - Lakeshore Area						
Erosion and Sediment Control	LF	200	$4.00	$800		Reinforced silt fence
Excavation	CY	850	$9.25	$7,863		to 4-ft bgs along northwest corner of Lakeshore Area
Grade and Place Onsite	CY	850	$4	$3,400		place and grade on western portion of Lakeshore prior to 2-ft capping
Place and plant Constructed Wetland	AC	1.0	$450,000	$450,000		topsoil, subgrade fill, LLDPE/geofabric and carp gate
Place buffer and engineered layers	AC	1.2	$75,000	$90,000		6-inch subgrade fill, LLDPE/geofabric adjacent to wetland footprint
				Item Subtotal (rounded):	**$552,000**	
Vegetate Existing Fill - Lakeshore, Lake Support Area						
Rip, disc and till existing soils	AC	8.1	$6,000	$48,600		prepare existing Lake support area grade for planting
Hydromulch installation	CY	2,700	$65	$175,500		Mulch/Seed placement by blown-in methods; 2.5 inch thickness assumed over 8.1 acres
				Item Subtotal (rounded):	**$224,000**	

TABLE 4-5. ALTERNATIVE 4 COST ESTIMATE - Enhanced Engineered Cover System with Wetland Construction/Restoration

COST ESTIMATE SUMMARY

Site:	Honeywell Wastebed B / Harbor Brook Site	Conceptual Basis:	Enhanced Engineered cover over remaining Lakeshore Areas (min. 1-ft, up to 2-ft)
Location:	Geddes, NY		1-ft Engineered cover and Veg Enhancement over AOS 2, Penn-Can Area, and Railroad Area.
Phase:	Feasibility Phase (+50% / -25%)		Wetland construction/restoration with Low-Perm Cover
Base Year:	2017		Continued Operation and Maintenance of IRMs

ITEM	UNIT	ESTIMATED QUANTITY	ESTIMATED UNIT COST	ESTIMATED COST		NOTES
Direct Capital Costs						
General Conditions	WK	57	$18,000	$1,026,000		Trailer, fuel, small tools, consumables and safety
Air Monitoring	WK	57	$4,250	$242,250		
Surveys	WK	57	$3,000	$171,000		During capping
Irrigation	WK	8	$5,000	$40,000		Following seeding; 4 wks per season
Environmental Easement	LS	1	$30,000	$30,000		
Site Management Plan	LS	1	$50,000	$50,000		
				Item Subtotal (rounded):	**$1,559,000**	
Pre-Design Investigation						
Existing Cover thickness	LS	1	$141,000	$141,000		Lake Support Area (Lakeshore) and Staging area (Penn-Can)
DNAPL delineation	LS	1	$60,000	$60,000		2 observation wells and 5 probes
				Item Subtotal (rounded):	**$201,000**	
Site Preparation						
Clearing and Grubbing	AC	10.7	$2,600	$27,820		Railroad and portions Penn-Cann areas exclusive of IRM footprints and Veg Enhancement Areas
Rough Grading	AC	43.4	$3,000	$130,200		All areas except IRM (Railroad and Penn-Can) and Vegetation Enhancement Areas
				Item Subtotal (rounded):	**$158,000**	
QA/QC						
Materials QA/QC Testing - Topsoil	EA	51	$500	$25,491		1/500 cy of imported materials
Materials QA/QC Testing - Fill and Stone	EA	113	$400	$45,306		1/500 cy of imported materials
Performance QA/QC - Compaction	WK	57	$1,200	$68,400		
				Item Subtotal (rounded):	**$139,000**	`
Engineered Cover, Enhanced - Lakeshore Area						*For purposes of cost estimating enhanced cover = 50% each of 1-ft and 2-ft thickness*
Erosion and Sediment Control	LF	8,790	$4.00	$35,160		Reinforced silt fence; one replacement
Place Topsoil to 6-inch depth	CY	16,859	$58	$977,841		Placement by conventional equipment in 6-inch lifts
Place Imported Fill up to 18-inch depth	CY	33,719	$43	$1,449,903		Buffer layer; placement by conventional equipment in 6-inch lifts; varies 6 to 18 inches
Place Imported Granular Stone to 1-ft depth	CY	3,796	$37	$140,458		stone fill overlying geogrid; approx 2.5 acres in addition to soil cover
Place Clay Fill to 12-inches	CY	3,227	$50	$161,333		below engineeered cover layers for areas below El. 365 (high lake level); approx. 2 acres assumed
Seeding	AC	20.9	$18,000	$376,200		Modified old field successional with fertilizer; applied by hydroseeding
				Item Subtotal (rounded):	**$3,141,000**	`
Constructed Wetland, 2.5-ft - Lakeshore Area						
Erosion and Sediment Control	LF	200	$4.00	$800		Reinforced silt fence
Excavation	CY	850	$9.25	$7,863		to 4-ft bgs along northwest corner of Lakeshore Area
Grade and Place Onsite	CY	850	$4	$3,400		place and grade on western portion of Lakeshore prior to 2-ft capping
Place and plant Constructed Wetland	AC	1.0	$450,000	$450,000		topsoil, subgrade fill, LLDPE/geofabric and carp gate
Place buffer and engineered layers	AC	1.2	$75,000	$90,000		6-inch subgrade fill, LLDPE/geofabric adjacent to wetland footprint
				Item Subtotal (rounded):	**$552,000**	
Vegetate Existing Fill - Lakeshore, Lake Support Area						
Rip, disc and till existing soils	AC	8.1	$6,000	$48,600		prepare existing Lake support area grade for planting
Hydromulch installation	CY	2,700	$65	$175,500		Mulch/Seed placement by blown-in methods; 2.5 inch thickness assumed over 8.1 acres
				Item Subtotal (rounded):	**$224,000**	
Vegetate Existing Fill - Upper East Flume IRM Restoration						
Rip, disc and till existing soils	AC	3.0	$6,000	$18,000		prepare existing Lake support area grade for planting
Hydromulch installation	CY	1,000	$65	$65,000		Mulch/Seed placement by blown-in methods; 2.5 inch thickness assumed over 3 acres acres
				Item Subtotal (rounded):	**$83,000**	
Engineered Cover (Soil), 1-ft - Penn-Can Area						
Erosion and Sediment Control	LF	500	$4.00	$2,000		Reinforced silt fence; one replacement
Place Topsoil to 6-inch depth	CY	323	$58	$18,715		Placement by conventional equipment in 6-inch lifts
Place Imported Fill to 6-inch depth	CY	323	$43	$13,875		Placement by conventional equipment in 6-inch lifts
Seeding	AC	0.4	$18,000	$7,200		Modified old field successional with fertilizer; applied by hydroseeding
				Item Subtotal (rounded):	**$41,789**	

TABLE 4-5. ALTERNATIVE 4 COST ESTIMATE - Enhanced Engineered Cover System with Wetland Construction/Restoration

COST ESTIMATE SUMMARY

Site:	Honeywell Wastebed B / Harbor Brook Site	Conceptual Basis:	Enhanced Engineered cover over remaining Lakeshore Areas (min. 1-ft, up to 2-ft)
Location:	Geddes, NY		1-ft Engineered cover and Veg Enhancement over AOS 2, Penn-Can Area, and Railroad Area.
Phase:	Feasibility Phase (+50% / -25%)		Wetland construction/restoration with Low-Perm Cover
Base Year:	2017		Continued Operation and Maintenance of IRMs

ITEM	UNIT	ESTIMATED QUANTITY	ESTIMATED UNIT COST	ESTIMATED COST		NOTES
Engineered Cover (Granular), 1-ft - Penn-Can Area						
Erosion and Sediment Control	LF	2,000	$4.00	$8,000		Reinforced silt fence; one replacement
Place Subgrade stone to 12-inches	CY	10,486.7	$35	$367,033		
Geogrid stabilization	AC	6.5	$43,560.00	$283,140		assume $1/sf installed
LLDPE Liner and Geofabric	SF	65,340	$2	$104,544		40 mil LLDPE and single layer geofabric; 1.5 acre assumed
Geocushion	SF	65,340	$0.50	$32,670		1.5 acre assumed
				Item Subtotal (rounded):	**$795,000**	
Vegetated Enhancement - Penn-Can Area						
Erosion and Sediment Control	LF	1,800	$4.00	$7,200		Reinforced silt fence; one replacement
Hydromulch installation	CY	500	$65	$32,500		Mulch/Seed placement by blown-in methods; 2.5 inch thickness assumed over 1.5 acres acres
				Item Subtotal (rounded):	**$40,000**	
Engineered Cover, 1-ft - Railroad Area						
Erosion and Sediment Control	LF	8,640	$4.00	$34,560		Reinforced silt fence; one replacement
Provide Railroad Flagman	DA	26	$1,800	$45,938		
Place Topsoil to 6-inch depth	CY	8,309	$58	$481,903		Placement by conventional equipment in 6-inch lifts
Place Imported Fill to 6-inch depth	CY	8,309	$43	$357,273		Placement by conventional equipment in 6-inch lifts
Seeding	AC	10.3	$18,000	$185,400		Modified old field successional with fertilizer; applied by hydroseeding
				Item Subtotal (rounded):	**$1,105,000**	
Vegetated Enhancement - Railroad Area and AOC #2						
Erosion and Sediment Control	LF	1,700	$4.00	$6,800		Reinforced silt fence; one replacement
Provide Railroad Flagman	DA	3	$1,800	$5,891		
Hydromulch installation	CY	1,100	$65	$71,500		Mulch/Seed placement by blown-in methods; 2.5 inch thickness assumed over 3.2 acres acres
				Item Subtotal (rounded):	**$84,000**	
Monitoring Wells						
Install DNAPL Monitoring Well	VLF	280	$150	$42,000		2-inch fiberglass to 70-ft; 4 wells total
				Item Subtotal (rounded):	**$42,000**	

TOTAL ESTIMATED DIRECT CAPITAL COST (rounded):	**$8,164,789**	
ENGINEERING/MANAGMENT, CONSTRUCTION OVERSIGHT, OBG OH&P	**$1,551,310**	6%, 8%, and 5% respectively
CONTINGENCY (25%)	**$2,041,197**	Scope Contingency
TOTAL ESTIMATED CAPITAL COST (rounded):	**$11,800,000**	

TABLE 4-5. ALTERNATIVE 4 COST ESTIMATE - Enhanced Engineered Cover System with Wetland Construction/Restoration

COST ESTIMATE SUMMARY

Site:	Honeywell Wastebed B / Harbor Brook Site	Conceptual Basis:	Enhanced Engineered cover over remaining Lakeshore Areas (min. 1-ft, up to 2-ft)
Location:	Geddes, NY		1-ft Engineered cover and Veg Enhancement over AOS 2, Penn-Can Area, and Railroad Area.
Phase:	Feasibility Phase (+50% / -25%)		Wetland construction/restoration with Low-Perm Cover
Base Year:	2017		Continued Operation and Maintenance of IRMs

ITEM	UNIT	ESTIMATED QUANTITY	ESTIMATED UNIT COST	ESTIMATED COST	NOTES
Operation and Maintenance Costs					
Annual (Years 1-30)					
Reporting and Recordkeeping	EA	1	$20,000	$20,000	
Cover inspection	LS	1	$12,480	$12,480	Assumes 2 scientists/engineers, 4 days, 8 hours/day, semi-annual inspections, inc. wetland
Cap Maintenance					
Vegetation Maintenance	AC	7.7	$3,000	$23,160	Spot seeding; 10% of all areas annually
Soil Cover maintenance and incidental repairs	AC	48.4	$225	$10,890	Topsoil repair, 5 cy per acre annually
Groundwater Monitoring					
Sampling Labor	LS	1	$1,600	$1,600	
DNAPL and Water Level Monitoring	LS	1	$1,600	$1,600	
Annual (Years 1-5)					
Wetland Invasives Control	LS	1	$3,500	$3,500	hand pulling invasives; 2 scientists, 1 day, 8 hours/day
Wetland Plantings Replacement	LS	1	$2,500	$2,500	replacement of non-surviving plantings; assume 5% of area per year
Years 5, 10, 15, 20, 25, 30					
Five Year Review	EA	1	$15,000	$15,000	

Present Worth Analysis Years (1-30)		Discount Factor	**Present Worth ($)**	
Cost Type	Cost	Df=7	**(rounded)**	
Capital Cost - Year 0	$11,800,000	1.00	**$11,800,000**	
Annual O&M - Years 1-5	$75,730	0.82	**$311,000**	Average discount factor for years 1-5
Annual O&M - Years 6-30	$69,730	0.33	**$579,000**	Average discount factor for years 6-30
Periodic O&M - Years 5, 10, 15, 20, 25, 30	$15,000	0.36	**$32,000**	Average discount factor for years 5, 10, 15, 20, 25 and 30
		TOTAL PRESENT WORTH ESTIMATED ALTERNATIVE COST (rounded):	**$12,722,000**	

TABLE 4-6. ALTERNATIVE 5 COST ESTIMATE - Enhanced Engineered Cover System with Wetland Construction/Restoration and In situ Treatment

COST ESTIMATE SUMMARY

Site:	Honeywell Wastebed B / Harbor Brook Site	Conceptual Basis:	Enhanced Engineered cover over remaining Lakeshore Areas (min. 1-ft, up to 2-ft)
Location:	Geddes, NY		1-ft Engineered cover and Veg Enhancement over AOS 2, Penn-Can Area, and Railroad Area.
Phase:	Feasibility Phase (+50% / -25%)		Wetland construction/restoration with Low-Perm Cover
Base Year:	2017		Continued Operation and Maintenance of IRMs

ITEM	UNIT	ESTIMATED QUANTITY	ESTIMATED UNIT COST	ESTIMATED COST		NOTES
Vegetate Existing Fill - Upper East Flume IRM Restoration						
Rip, disc and till existing soils	AC	3.0	$6,000	$18,000		prepare existing Lake support area grade for planting
Hydromulch installation	CY	1,000	$65	$65,000		Mulch/Seed placement by blown-in methods; 2.5 inch thickness assumed over 3 acres acres
				Item Subtotal (rounded):	**$83,000**	
Engineered Cover (Soil), 1-ft - Penn-Can Area						
Erosion and Sediment Control	LF	500	$4.00	$2,000		Reinforced silt fence; one replacement
Place Topsoil to 6-inch depth	CY	323	$58	$18,715		Placement by conventional equipment in 6-inch lifts
Place Imported Fill to 6-inch depth	CY	323	$43	$13,875		Placement by conventional equipment in 6-inch lifts
Seeding	AC	0.4	$18,000	$7,200		Modified old field successional with fertilizer; applied by hydroseeding
				Item Subtotal (rounded):	**$42,000**	
Engineered Cover (Granular), 1-ft - Penn-Can Area						
Erosion and Sediment Control	LF	2,000	$4.00	$8,000		Reinforced silt fence; one replacement
Place Subgrade stone to 12-inches	CY	10,486.7	$35	$367,033		
Geogrid stabilization	AC	6.5	$43,560.00	$283,140		assume $1/sf installed
LLDPE Liner and Geofabric	SF	65,340	$2	$104,544		40 mil LLDPE and single layer geofabric; 1.5 acre assumed
Geocushion	SF	65,340	$0.50	$32,670		1.5 acre assumed
				Item Subtotal (rounded):	**$795,000**	
Vegetated Enhancement - Penn-Can Area						
Erosion and Sediment Control	LF	1,800	$4.00	$7,200		Reinforced silt fence; one replacement
Hydromulch installation	CY	500	$65	$32,500		Mulch/Seed placement by blown-in methods; 2.5 inch thickness assumed over 1.5 acres acres
				Item Subtotal (rounded):	**$40,000**	
Engineered Cover, 1-ft - Railroad Area						
Erosion and Sediment Control	LF	8,640	$4.00	$34,560		Reinforced silt fence; one replacement
Provide Railroad Flagman	DA	26	$1,800	$45,938		
Place Topsoil to 6-inch depth	CY	8,309	$58	$481,903		Placement by conventional equipment in 6-inch lifts
Place Imported Fill to 6-inch depth	CY	8,309	$43	$357,273		Placement by conventional equipment in 6-inch lifts
Seeding	AC	10.3	$18,000	$185,400		Modified old field successional with fertilizer; applied by hydroseeding
				Item Subtotal (rounded):	**$1,105,000**	
Vegetated Enhancement - Railroad Area and AOC #2						
Erosion and Sediment Control	LF	1,700	$4.00	$6,800		Reinforced silt fence; one replacement
Provide Railroad Flagman	DA	3	$1,800	$5,891		
Hydromulch installation	CY	1,100	$65	$71,500		Mulch/Seed placement by blown-in methods; 2.5 inch thickness assumed over 3.2 acres acres
				Item Subtotal (rounded):	**$84,000**	
Monitoring Wells						
Install DNAPL Monitoring Well	VLF	280	$150	$42,000		2-inch fiberglass to 70-ft; 4 wells total
				Item Subtotal (rounded):	**$42,000**	

TOTAL ESTIMATED DIRECT CAPITAL COST (rounded):	**$13,588,000**	
ENGINEERING/MANAGMENT, CONSTRUCTION OVERSIGHT, OBG OH&P	**$2,581,720**	6%, 8%, and 5% respectively
CONTINGENCY (25%)	**$3,397,000**	Scope Contingency
TOTAL ESTIMATED CAPITAL COST (rounded):	**$19,600,000**	

TABLE 4-6. ALTERNATIVE 5 COST ESTIMATE - Enhanced Engineered Cover System with Wetland Construction/Restoration and In situ Treatment

COST ESTIMATE SUMMARY

Site:	Honeywell Wastebed B / Harbor Brook Site	Conceptual Basis:	Enhanced Engineered cover over remaining Lakeshore Areas (min. 1-ft, up to 2-ft)
Location:	Geddes, NY		1-ft Engineered cover and Veg Enhancement over AOS 2, Penn-Can Area, and Railroad Area.
Phase:	Feasibility Phase (+50% / -25%)		Wetland construction/restoration with Low-Perm Cover
Base Year:	2017		Continued Operation and Maintenance of IRMs

ITEM	UNIT	ESTIMATED QUANTITY	ESTIMATED UNIT COST	ESTIMATED COST	NOTES
Operation and Maintenance Costs					
Annual (Years 1-30)					
Reporting and Recordkeeping	EA	1	$20,000	$20,000	
Cover inspection	LS	1	$12,480	$12,480	Assumes 2 scientists/engineers, 4 days, 8 hours/day, semi-annual inspections, inc. wetland
Cap Maintenance					
Vegetation Maintenance	AC	7.7	$3,000	$23,160	Spot seeding; 10% of all areas annually
Soil Cover maintenance and incidental repairs	AC	48.4	$225	$10,890	Topsoil repair, 5 cy per acre annually
Groundwater Monitoring					
Sampling Labor	LS	1	$1,600	$1,600	
DNAPL and Water Level Monitoring	LS	1	$1,600	$1,600	
Annual (Years 1-5)					
Wetland Invasives Control	LS	1	$3,500	$3,500	hand pulling invasives; 2 scientists, 1 day, 8 hours/day
Wetland Plantings Replacement	LS	1	$2,500	$2,500	replacement of non-surviving plantings; assume 5% of area per year
Years 5, 10, 15, 20, 25, 30					
Five Year Review	EA	1	$15,000	$15,000	

Present Worth Analysis Years (1-30)		Discount Factor	**Present Worth ($)**	
Cost Type	Cost	Df=7	**(rounded)**	
Capital Cost - Year 0	$19,600,000	1.00	**$19,600,000**	
Annual O&M - Years 1-5	$75,730	0.82	**$311,000**	Average discount factor for years 1-5
Annual O&M - Years 6-30	$69,730	0.33	**$579,000**	Average discount factor for years 6-30
Periodic O&M - Years 5, 10, 15, 20, 25, 30	$15,000	0.36	**$32,000**	Average discount factor for years 5, 10, 15, 20, 25 and 30
		TOTAL PRESENT WORTH ESTIMATED ALTERNATIVE COST (rounded):	**$20,522,000**	

TABLE 4-7. ALTERNATIVE 6a COST ESTIMATE - Partial Excavation with Off-Site Disposal

COST ESTIMATE SUMMARY

Site:	Honeywell Willis Avenue	Conceptual Basis:	Removal of soils greater than Unrestricted SCOs, backfill with clean soils and restore lake cap
Location:	Geddes, NY		(exclusive of I-690/State Fair Blvd) and Railway footprints)
Phase:	Feasibility Phase (+50% / -25%)		Off-site disposal of soil/fill and DNAPL impacted materials
Base Year:	2017		

ITEM	UNIT	ESTIMATED QUANTITY	ESTIMATED UNIT COST	ESTIMATED COST		NOTES
Direct Capital Costs						
General Conditions	WK	148	$25,000	$3,700,000		Trailer, fuel, small tools, consumables and safety
Air Monitoring	WK	148	$4,250	$629,000		
Surveys	WK	148	$3,000	$444,000		During excavation and backfill
Irrigation	WK	16	$5,000	$80,000		Following seeding; 4 wks per season
Environmental Easement	LS	1	$30,000	$30,000		
Site Management Plan	LS	1	$50,000	$50,000		
				Item Subtotal (rounded):	**$4,933,000**	
Site Preparation						
Clearing and Grubbing	AC	78	$2,600	$203,424		
Rough Grading	AC	78	$3,000	$234,720		Site grading and prep
Erosion and Sediment Control	LF	85,000	$4.00	$340,000		Reinforced silt fence; annual replacement
Temporary Bulkhead at West Wall	LF	4,000	$10,000	$40,000,000		Installed lakeside of West/East Walls; dual sheetpile to 60-ft, internal whalers and soil fill
Sheeting	SF	742,000	$40	$29,680,000		
Dewatering	WK	148	$10,000	$1,480,000		Dewatering pumps and frac tank equalization
On-site Water Treatment Plant	LS	1	$20,000,000	$20,000,000		Temporary water treatment plant for filtration with metals and organics treatment
On-site Water Treatment	GAL	1,279,000,000	$0.0125	$15,985,820		500 gpm from each of 2 pumps
Bypass Pumping - Harbor Brook	LS	1	$5,000,000	$5,000,000		
Reroute Barrier Wall Forcemains	LS	1	$1,000,000	$1,000,000		
Reroute County Sewers	LS	1	$6,800,000	$6,800,000		36-in, 30-in/24-in force main
				Item Subtotal (rounded):	**$120,724,000**	
QA/QC						
Materials QA/QC Testing - Topsoil	EA	79	$500	$39,672		1/500 cy of imported materials
Materials QA/QC Testing - Fill and Stone	EA	4,056	$400	$1,622,239		1/500 cy of imported materials
Performance QA/QC - Compaction	WK	148	$1,200	$177,600		
				Item Subtotal (rounded):	**$1,840,000**	
Excavation						
Lakeshore Property and AOC-1	CY	1,632,312	$9.25	$15,098,886		Conventional excavation up to 38-ft bgs (20-ft average)
Penn-Can	CY	980,826	$9.25	$9,072,641		Conventional excavation up to 45-ft bgs
Railroad and AOC-2	CY	475,207	$9.25	$4,395,668		Conventional excavation up to 26-ft bgs
				Item Subtotal (rounded):	**$28,567,000**	
Backfill and Restoration						
Place Topsoil to 6-inch depth	CY	39,672	$58	$2,300,968		Placement by conventional equipment in 6-inch lifts to existing grade (El. 370 to 390)
Place Imported Fill	CY	2,027,799	$43	$87,195,343		Placement by conventional equipment in 6-inch lifts to within 6-inch of existing grade
Seeding	AC	49	$18,000	$885,240		Modified old field successional with fertilizer and hydromulch
Remove Temp Bulkhead soil fill and lake cap	CY	148,148	$35	$5,185,185		Disposal of soils off-site as non haz; 4,000 ft by 50-ft section
Remove Temp Bulkhead sheets	LS	1	$7,200,000	$7,200,000		Removal of sheets from lakeside of West Wall
Restore/Replace sub-aqueous lake cap	CY	346,867	$100	$34,686,667		60-inch cap cross section installed from waterside; 42 acres (Lakeshore and AOS#1)
Reinstall West/East Wall Portion/LHCS collection	LS	1	$66,700,000	$66,700,000		Install new barrier wall and collection system; 3,500 LF
				Item Subtotal (rounded):	**$204,153,000**	
Monitoring Wells						
Install DNAPL Monitoring Well	VLF	280	$150	$42,000		2-inch fiberglass to 70-ft; 4 wells total
				Item Subtotal (rounded):	**$42,000**	
Transportation and Disposal						
T&D by Truck - Non-Hazardous	TON	3,616,381	$110	$397,801,923		Exc soil/fill material; 1.2 tons per cy; disposal at landfill as non-hazardous
T&D by Truck - Incineration	TON	74,694	$650	$48,551,360		For estimated DNAPL impacted soil/fill material
				Item Subtotal (rounded):	**$446,353,000**	

TABLE 4-7. ALTERNATIVE 6a COST ESTIMATE - Partial Excavation with Off-Site Disposal

COST ESTIMATE SUMMARY

Site:	Honeywell Willis Avenue	Conceptual Basis:	Removal of soils greater than Unrestricted SCOs, backfill with clean soils and restore lake cap
Location:	Geddes, NY		(exclusive of I-690/State Fair Blvd) and Railway footprints)
Phase:	Feasibility Phase (+50% / -25%)		Off-site disposal of soil/fill and DNAPL impacted materials
Base Year:	2017		

ITEM	UNIT	ESTIMATED QUANTITY	ESTIMATED UNIT COST	ESTIMATED COST		NOTES
			TOTAL ESTIMATED DIRECT CAPITAL COST (rounded):		**$806,612,000**	
			ENGINEERING/MANAGMENT, CONSTRUCTION OVERSIGHT, OBG OH&P		**$153,256,280**	6%, 8%, and 5% respectively
			CONTINGENCY (25%)		**$201,653,000**	Scope Contingency
			TOTAL ESTIMATED CAPITAL COST (rounded):		**$1,161,500,000**	
Operation and Maintenance Costs						
Annual						
Reporting and Recordkeeping	EA	1	$20,000	$20,000		
Groundwater Monitoring						
Sampling Labor	LS	1	$1,600	$1,600		
DNAPL and Water Level Monitoring	LS	1	$1,600	$1,600		
Years 5, 10, 15, 20, 25, 30						
Five Year Review	EA	1	$15,000	$15,000		

Present Worth Analysis Years (1-30)		Discount Factor	**Present Worth ($)**	
Cost Type	Cost	Df=7	**(rounded)**	
Capital Cost - Year 0	$1,161,500,000	1.00	**$1,161,500,000**	
Annual O&M - Years 1-30	$23,200	0.41	**$288,000**	Average discount factor for years 1-30
Periodic O&M - Years 5, 10, 15, 20, 25, 30	$15,000	0.36	**$32,000**	Average discount factor for years 5, 10, 15, 20, 25 and 30
		TOTAL PRESENT WORTH ESTIMATED ALTERNATIVE COST (rounded):	**$1,161,800,000**	

TABLE 4-8. ALTERNATIVE 6b COST ESTIMATE - Excavation with Off-Site Disposal

COST ESTIMATE SUMMARY

Site:	Honeywell Willis Avenue	Conceptual Basis:	Removal of soils greater than Unrestricted SCOs, backfill with clean soils and restore lake cap
Location:	Geddes, NY		Remove/Replace I-690/State Fair Blvd and Railway
Phase:	Feasibility Phase (+50% / -25%)		Off-site disposal of soil/fill and DNAPL impacted materials
Base Year:	2017		

ITEM	UNIT	ESTIMATED QUANTITY	ESTIMATED UNIT COST	ESTIMATED COST		NOTES
Direct Capital Costs						
General Conditions	WK	229	$25,000	$5,725,000		Trailer, fuel, small tools, consumables and safety
Air Monitoring	WK	229	$4,250	$973,250		
Surveys	WK	229	$3,000	$687,000		During excavation and backfill
Irrigation	WK	24	$5,000	$120,000		Following seeding; 4 wks per season
Environmental Easement	LS	1	$30,000	$30,000		
Site Management Plan	LS	1	$50,000	$50,000		
				Item Subtotal (rounded):	**$7,585,000**	
Site Preparation						
Clearing and Grubbing	AC	78	$2,600	$203,424		
Rough Grading	AC	78	$3,000	$234,720		Site grading and prep
Erosion and Sediment Control	LF	132,000	$4.00	$528,000		Reinforced silt fence; annual replacement
Temporary Bulkhead at West Wall	LF	4,000	$10,000	$40,000,000		Installed lakeside of West/East Walls; dual sheetpile to 60-ft, internal whalers and soil fill
Sheeting	SF	742,000	$40	$29,680,000		
Dewatering	WK	229	$10,000	$2,290,000		Dewatering pumps and frac tank equalization
On-site Water Treatment Plant	LS	1	$20,000,000	$20,000,000		Temporary water treatment plant for filtration with metals and organics treatment
On-site Water Treatment	GAL	1,979,000,000	$0.0125	$24,734,860		500 gpm from each of 2 pumps
Bypass Pumping - Harbor Brook	LS	1	$5,000,000	$5,000,000		
Reroute Barrier Wall Forcemains	LS	1	$1,000,000	$1,000,000		
Reroute County Sewers	LS	1	$6,800,000	$6,800,000		36-in, 30-in/24-in force main
Temporary 690 Detour	LS	1	$7,300,000	$7,300,000		2 miles single lane highway bypass on Penn-Can area/State Fair Blvd
Demolition I-690/State Fair Blvd	LM	1	$250,000	$250,000		Based on 1 linear mile of I-690 eastbound/westbound
				Item Subtotal (rounded):	**$138,021,000**	
QA/QC						
Materials QA/QC Testing - Topsoil	EA	79	$500	$39,672		1/500 cy of imported materials
Materials QA/QC Testing - Fill and Stone	EA	4,622	$400	$1,848,728		1/500 cy of imported materials
Performance QA/QC - Compaction	WK	229	$1,200	$274,800		
DOT Inspection	LS	1	$250,000	$250,000		
				Item Subtotal (rounded):	**$2,413,000**	
Excavation						
Lakeshore Property and AOC-1	CY	1,844,905	$9.25	$17,065,367		Conventional excavation up to 38-ft bgs (20-ft average)
Penn-Can	CY	980,826	$9.25	$9,072,641		Conventional excavation up to 45-ft bgs
Railroad and AOC-2	CY	545,726	$9.25	$5,047,964		Conventional excavation up to 26-ft bgs
				Item Subtotal (rounded):	**$31,186,000**	
Backfill and Restoration						
Place Topsoil to 6-inch depth	CY	39,672	$58	$2,300,968		Placement by conventional equipment in 6-inch lifts to existing grade (El. 370 to 390)
Place Imported Fill	CY	2,310,910	$43	$99,369,120		Placement by conventional equipment in 6-inch lifts to within 6-inch of existing grade
Seeding	AC	49	$18,000	$885,240		Modified old field successional with fertilizer and hydromulch
Remove Temp Bulkhead soil fill and lake cap	CY	148,148	$35	$5,185,185		Disposal of soils off-site as non haz; 4,000 ft by 50-ft section
Remove Temp Bulkhead sheets	LS	1	$7,200,000	$7,200,000		Removal of sheets from lakeside of West Wall
Restore/Replace sub-aqueous lake cap	CY	346,867	$100	$34,686,667		60-inch cap cross section installed from waterside; 42 acres (Lakeshore and AOS#1)
Reinstall West/East Wall Portion/LHCS collection	LS	1	$66,700,000	$66,700,000		Install new barrier wall and collection system; 3,500 LF
Install new railroad alignment	LM	3	$2,000,000	$6,000,000		in-kind with existing track (3 tracks total)
Reinstall I-690/State Fair Blvd	LM	1	$10,000,000	$10,000,000		2 lanes each direction, plus shoulder, median and guardrail
				Item Subtotal (rounded):	**$232,327,000**	
Monitoring Wells						
Install DNAPL Monitoring Well	VLF	280	$150	$42,000		2-inch fiberglass to 70-ft; 4 wells total
				Item Subtotal (rounded):	**$42,000**	
Transportation and Disposal						
T&D by Truck - Non-Hazardous	TON	3,956,114	$110	$435,172,590		Exc soil/fill material; 1.2 tons per cy; disposal at landfill as non-hazardous
T&D by Truck - Incineration	TON	74,694	$650	$48,551,360		For estimated DNAPL impacted soil/fill material
C&D Hauling by Truck	TON	180,000	$55	$9,900,000		1.5 tons per cy; landfill; roadway demo debris and misc C&D
				Item Subtotal (rounded):	**$493,624,000**	

TABLE 4-8. ALTERNATIVE 6b COST ESTIMATE - Excavation with Off-Site Disposal

COST ESTIMATE SUMMARY

Site:	Honeywell Willis Avenue	Conceptual Basis:	Removal of soils greater than Unrestricted SCOs, backfill with clean soils and restore lake cap
Location:	Geddes, NY		Remove/Replace I-690/State Fair Blvd and Railway
Phase:	Feasibility Phase (+50% / -25%)		Off-site disposal of soil/fill and DNAPL impacted materials
Base Year:	2017		

ITEM	UNIT	ESTIMATED QUANTITY	ESTIMATED UNIT COST	ESTIMATED COST		NOTES
			TOTAL ESTIMATED DIRECT CAPITAL COST (rounded):		**$905,198,000**	
			ENGINEERING/MANAGMENT, CONSTRUCTION OVERSIGHT, OBG OH&P		**$171,987,620**	6%, 8%, and 5% respectively
			CONTINGENCY (25%)		**$226,299,500**	Scope Contingency
			TOTAL ESTIMATED CAPITAL COST (rounded):		**$1,303,500,000**	
Operation and Maintenance Costs						
Annual						
Reporting and Recordkeeping	EA	1	$20,000	$20,000		
Groundwater Monitoring						
Sampling Labor	LS	1	$1,600	$1,600		
DNAPL and Water Level Monitoring	LS	1	$1,600	$1,600		
Years 5, 10, 15, 20, 25, 30						
Five Year Review	EA	1	$15,000	$15,000		

Present Worth Analysis Years (1-30)		Discount Factor	**Present Worth ($)**	
Cost Type	Cost	Df=7	**(rounded)**	
Capital Cost - Year 0	$1,303,500,000	1.00	**$1,303,500,000**	
Annual O&M - Years 1-30	$23,200	0.41	**$288,000**	Average discount factor for years 1-30
Periodic O&M - Years 5, 10, 15, 20, 25, 30	$15,000	0.36	**$32,000**	Average discount factor for years 5, 10, 15, 20, 25 and 30
		TOTAL PRESENT WORTH ESTIMATED ALTERNATIVE COST (rounded):	**$1,303,800,000**	

Figures

FIGURE 1-1

MAP LOCATION

HONEYWELL INTERNATIONAL INC.
WASTEBED B / HARBOR BROOK
FEASIBILITY STUDY
GEDDES AND SYRACUSE, NY

SITE LOCATION

N

0 1,000 2,000 4,000
Feet

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1:24,000

O'BRIEN & GERE ENGINEERS, INC.

PLOTDATE: 12/05/17 8:20:53 AM stantosa

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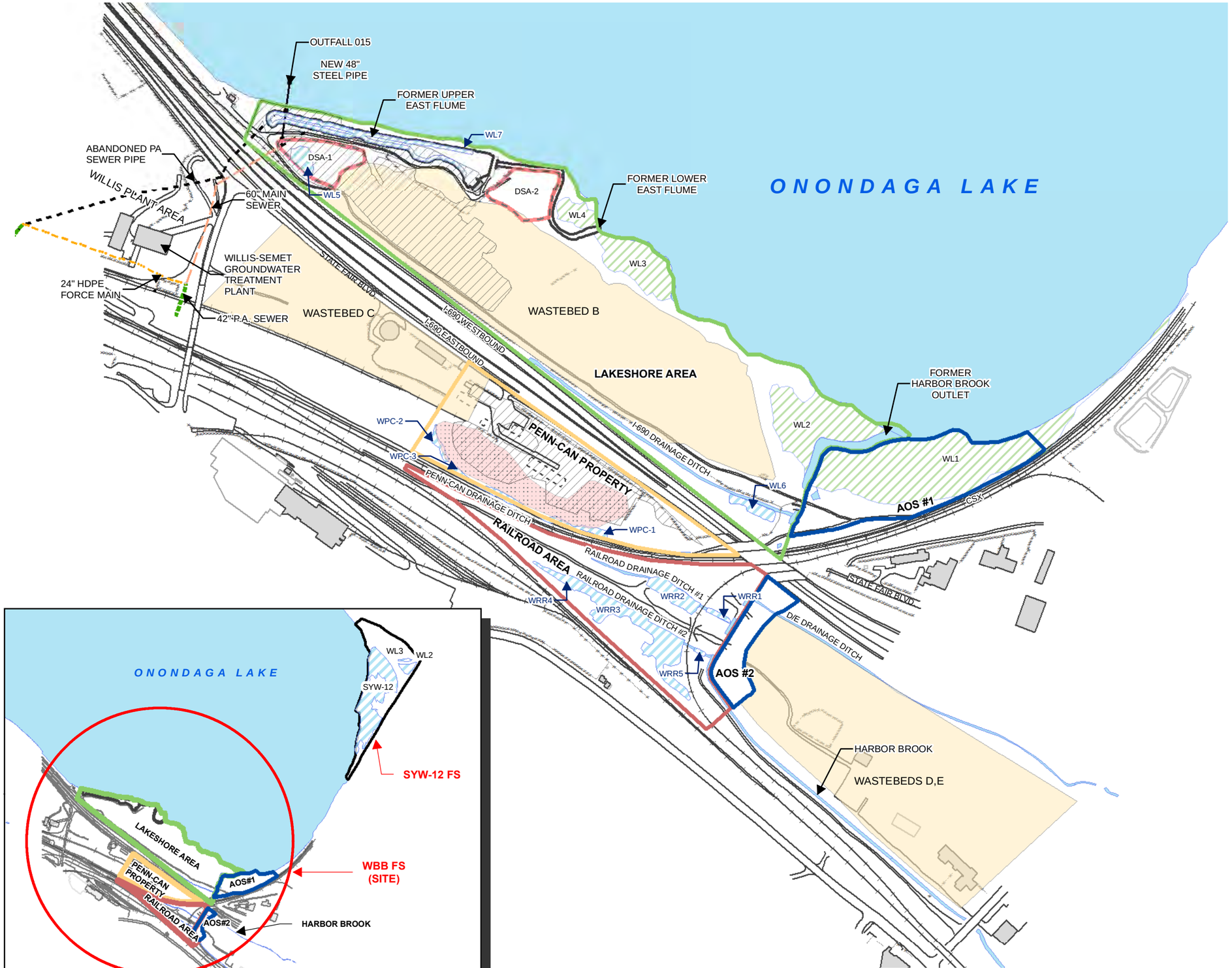


N

LEGEND

- LAKE REMEDY SUPPORT / STAGING AREA
- TONODO PROPERTY FILL
- DELINEATED WETLAND
- BUILDING
- FORMER BUILDING (CONCRETE PAD REMAINS)
- HISTORIC BUILDING
- WASTEBED
- DREDGE SPOIL AREA BOUNDARY
- WETLANDS

SITE BOUNDARIES

- RAILROAD AREA BOUNDARY
- LAKESHORE AREA BOUNDARY
- PENN-CAN PROPERTY BOUNDARY
- ADDITIONAL AREA OF STUDY BOUNDARY
- SYW-12

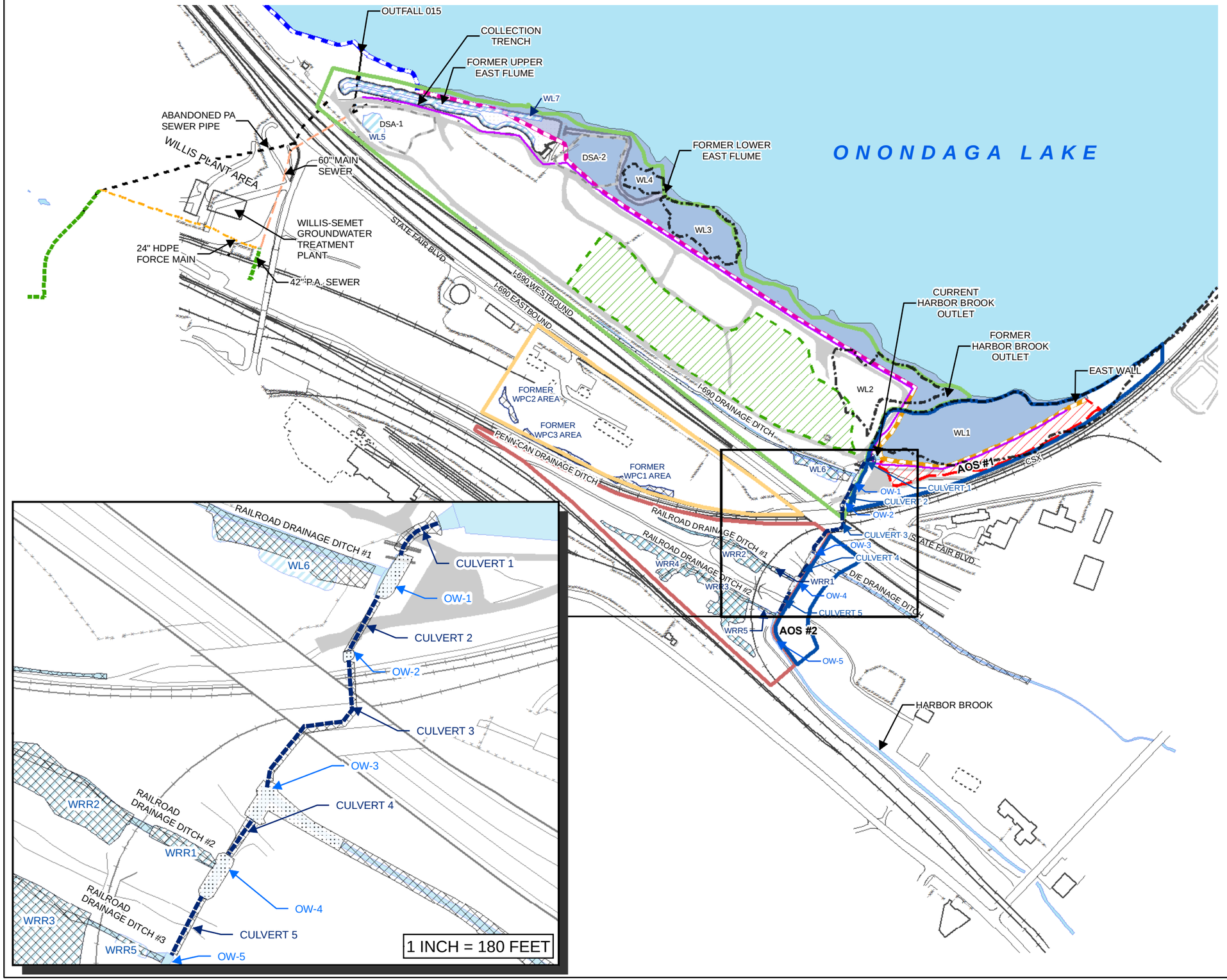
HONEYWELL INTERNATIONAL INC.
WASTEBED B / HARBOR BROOK FEASIBILITY STUDY
GEDDES AND SYRACUSE, NY

SITE PLAN

0 250 500 1,000
Feet

DECEMBER 2017
1163.61858

O'BRIEN & GERE ENGINEERS, INC.



N

LEGEND

IRM FEATURES
- COVER AREA
- STAGED MATERIAL
- SEDIMENT REMOVAL
- SEDIMENT REMOVAL WITH LINER
- OUTBOARD WETLAND TRANSITIONAL ZONE
- EAST WALL
- WEST WALL
- WILLIS BARRIER WALL
- COLLECTION TRENCH
- CULVERT

SITE FEATURES
- ACCESS PATHWAYS
- DELINEATED WETLAND
- BUILDING

HISTORIC FEATURES
- HISTORIC/FORMER BUILDING
- DREDGE SPOIL AREA BOUNDARY
- FORMER WETLANDS

SITE BOUNDARIES
- RAILROAD AREA BOUNDARY
- LAKESHORE AREA BOUNDARY
- PENN-CAN PROPERTY BOUNDARY
- ADDITIONAL AREA OF STUDY BOUNDARY

HONEYWELL
INTERNATIONAL INC.
WASTEBED B / HARBOR BROOK
FEASIBILITY STUDY
GEDDES AND SYRACUSE, NY

IRMs AND SITE CHANGES

0 250 500 1,000
Feet

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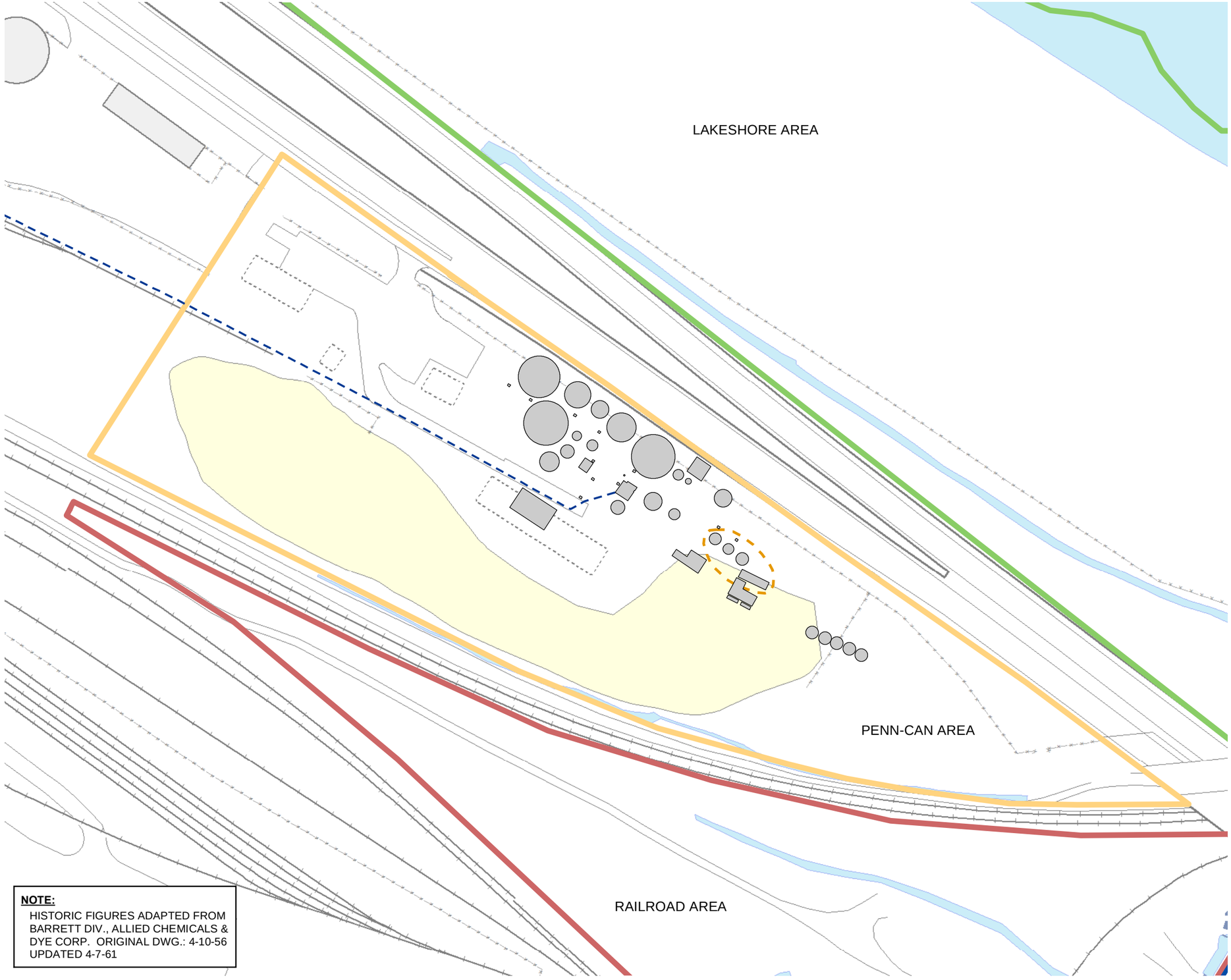
O'BRIEN & GERE ENGINEERS, INC.



NOTE:
HISTORIC FIGURES ADAPTED FROM BARRETT DIV., ALLIED CHEMICALS & DYE CORP. ORIGINAL DWG.: 4-10-56 UPDATED 4-7-61

N

LEGEND

- HISTORIC BARRETT PAVING PIPE (APPROXIMATE)
- EXISTING FENCELINE
- RAILROAD
- APPROXIMATE LOCATION OF FORMER BARRETT PAVING PIT
- HISTORIC BARRETT PAVING BUILDING LOCATION
- HISTORIC BARRETT PAVING TANK
- FORMER BUILDING (CONCRETE PAD REMAINS)
- HISTORIC BUILDING
- TONADO FILL AREA

SITE BOUNDARIES

- RAILROAD AREA BOUNDARY
- LAKESHORE AREA BOUNDARY
- PENN-CAN PROPERTY BOUNDARY

HONEYWELL
INTERNATIONAL INC.
WASTEBED B / HARBOR BROOK
FEASIBILITY STUDY
GEDDES AND SYRACUSE, NY

HISTORIC PENN-CAN PROPERTY FEATURES

0 75 150 300
Feet

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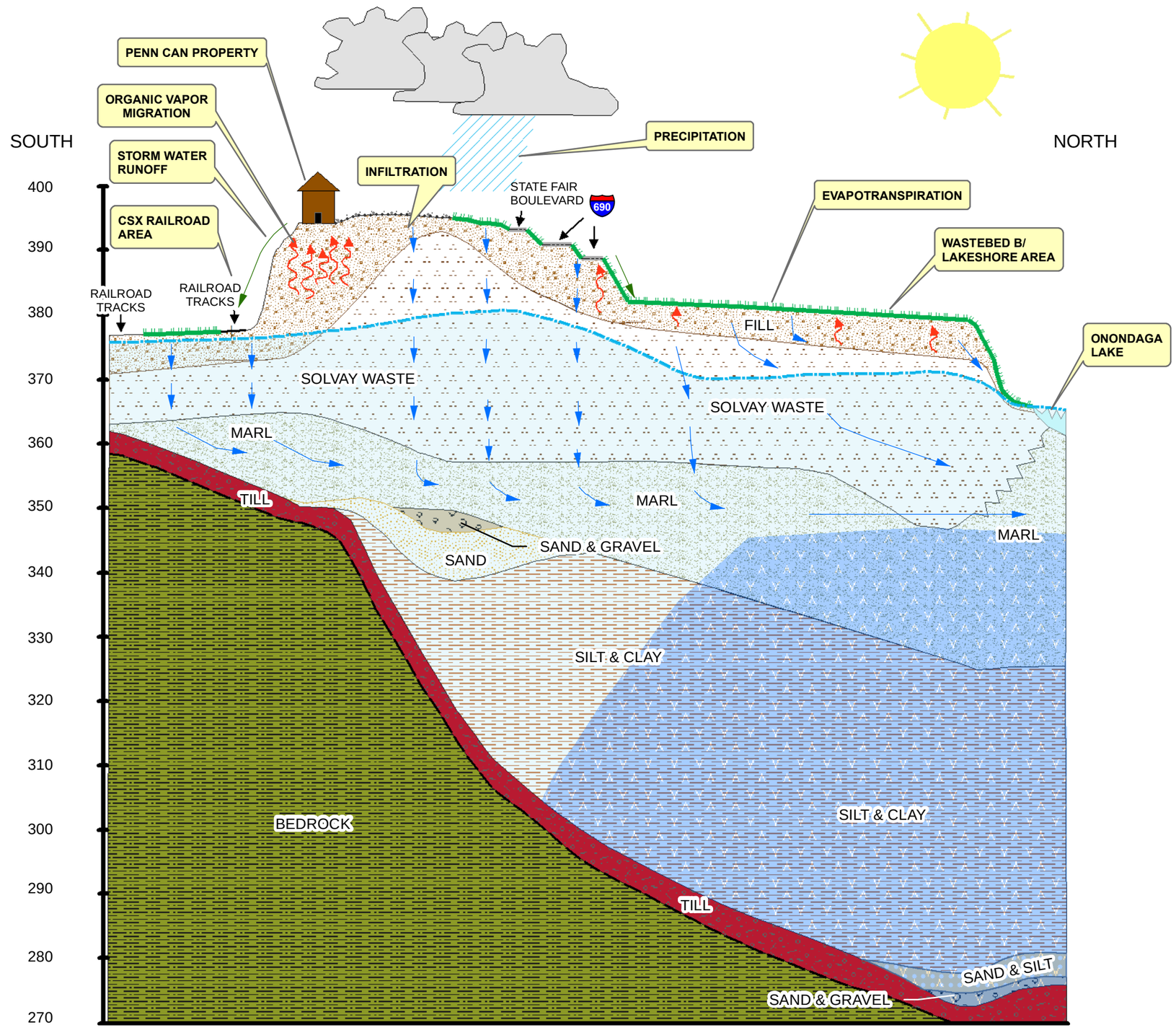
O'BRIEN & GERE ENGINEERS, INC.



LEGEND

- GROUNDWATER FLOW
- STORM WATER RUNOFF
- ORGANIC VAPOR MIGRATION
- WATER TABLE
- NATIVE BRINE
- SATURATED ZONE

LITHOLOGY

- BEDROCK
- ONONDAGA LAKE
- FILL
- SOLVAY WASTE
- MARL
- SILT AND CLAY
- SAND
- SAND AND GRAVEL
- TILL
- SAND & SILT

HONEYWELL
INTERNATIONAL INC.
WASTEBED B / HARBOR BROOK
FEASIBILITY STUDY
GEDDES AND SYRACUSE, NY

CONCEPTUAL SITE MODEL VIEW A

DECEMBER 2017
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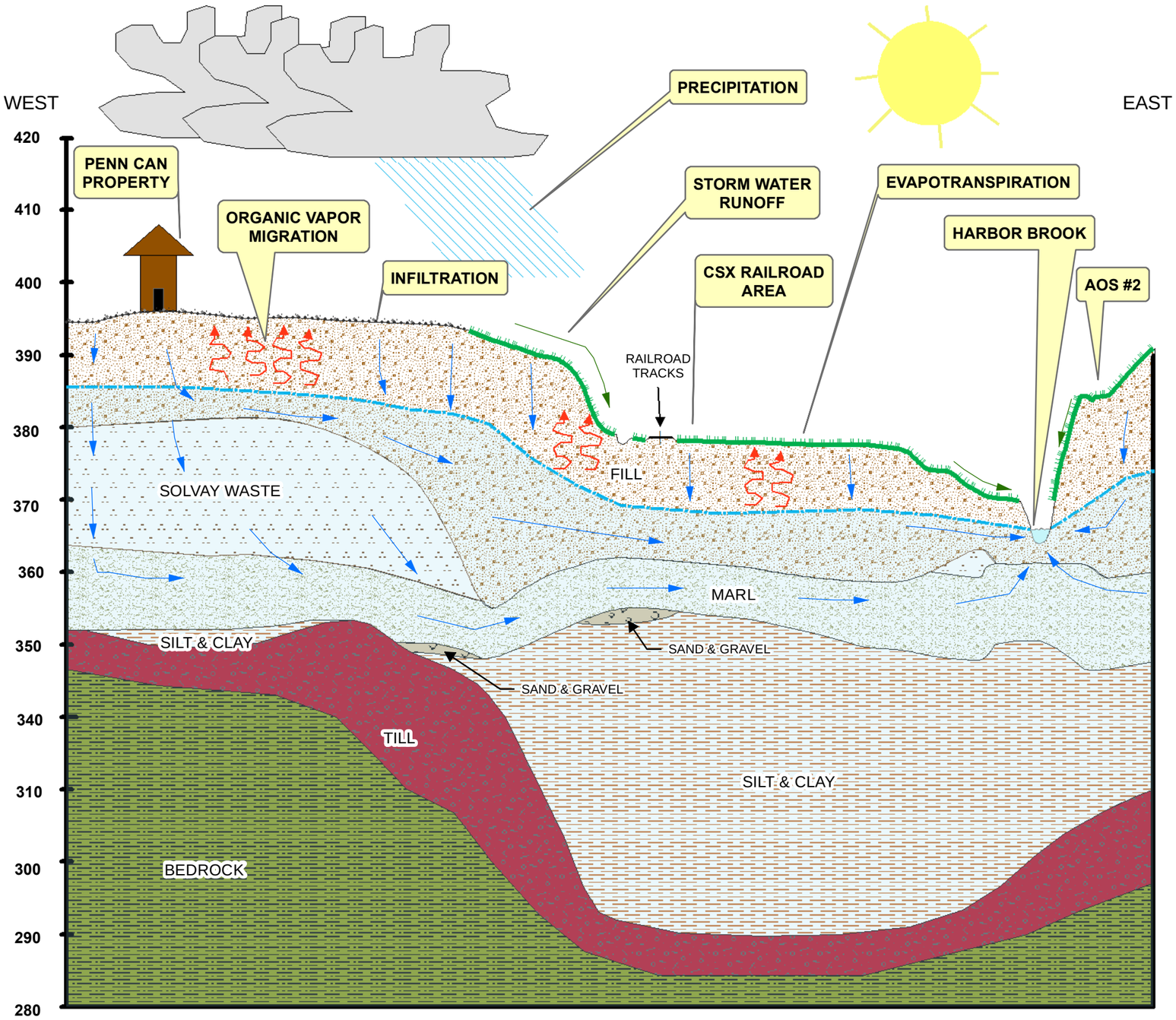
O'BRIEN & GERE ENGINEERS, INC.



LEGEND

- GROUNDWATER FLOW
- STORM WATER RUNOFF
- ORGANIC VAPOR MIGRATION
- WATER TABLE
- SATURATED ZONE

LITHOLOGY

- HARBOR BROOK
- FILL
- SOLVAY WASTE
- MARL
- SILT AND CLAY
- SAND AND GRAVEL
- TILL
- BEDROCK

HONEYWELL
INTERNATIONAL INC.
WASTEBED B / HARBOR BROOK
FEASIBILITY STUDY
GEDDES AND SYRACUSE, NY

CONCEPTUAL SITE MODEL VIEW B

DECEMBER 2017
1163.61858

O'BRIEN & GERE ENGINEERS, INC.

N

LEGEND

- EAST WALL
- WEST WALL
- WILLIS BARRIER WALL
- CULVERT
- GROUNDWATER COLLECTION PIPE
- COLLECTION TRENCH
- IRM AREA
- CONCEPTUAL ONONDAGA COUNTY WEST SHORE TRAIL (PROPOSED BY OTHERS)
- AREA ADDRESSED BY LAKE REMEDY

SITE BOUNDARIES

- RAILROAD AREA BOUNDARY
- LAKESHORE AREA BOUNDARY
- PENN-CAN PROPERTY BOUNDARY
- ADDITIONAL AREA OF STUDY BOUNDARY

HONEYWELL
INTERNATIONAL INC.
WASTEBED B / HARBOR BROOK
FEASIBILITY STUDY
GEDDES AND SYRACUSE, NY

ALTERNATIVE 2 - LIMITED ACTION (WITH CONTINUED O&M OF IRMS)

0 225 450 900
Feet

DECEMBER 2017
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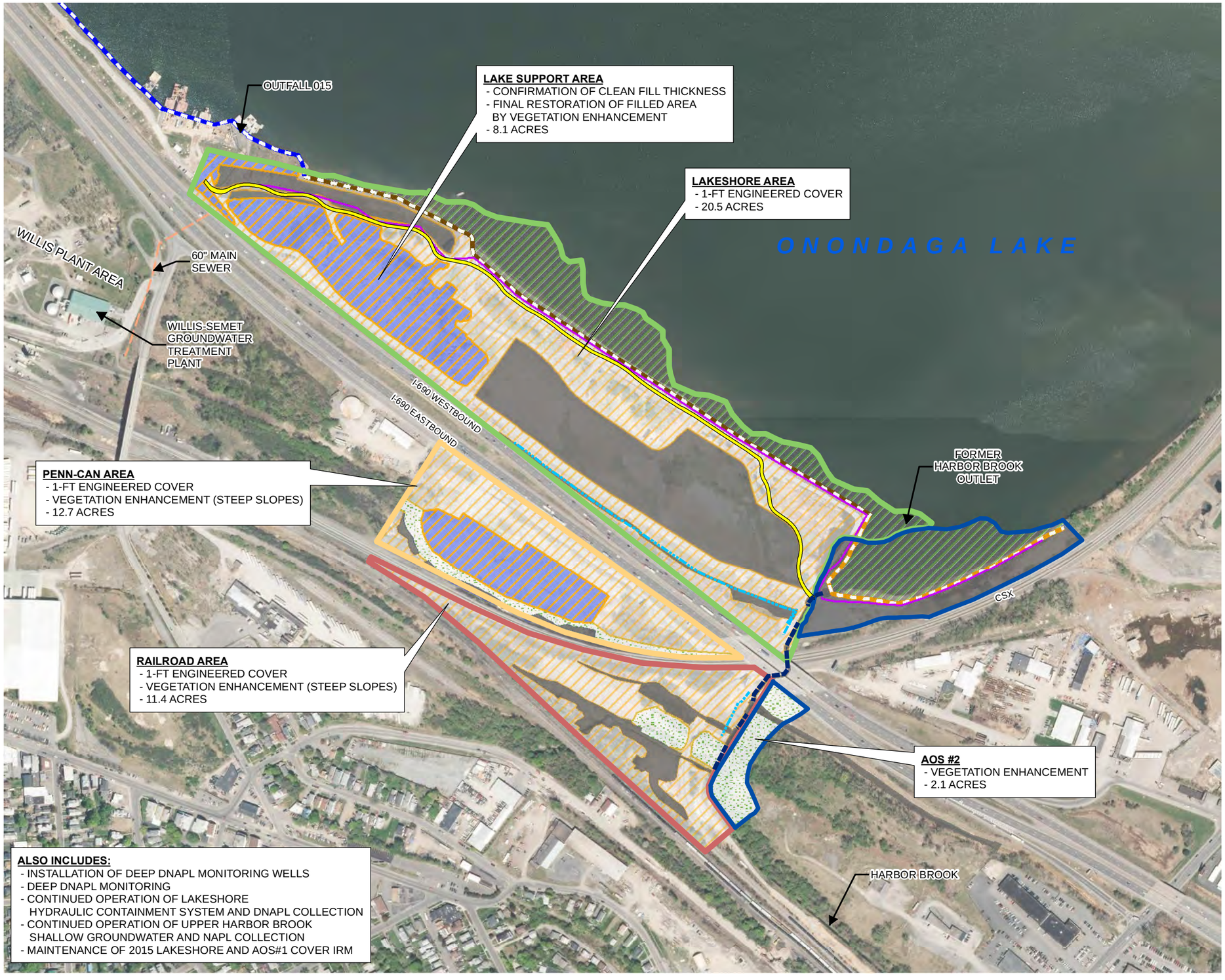
O'BRIEN & GERE ENGINEERS, INC.



N

LEGEND

- EAST WALL
- WEST WALL
- WILLIS BARRIER WALL
- CULVERT
- UPPER HARBOR BROOK COLLECTION PIPE
- COLLECTION TRENCH
- IRM AREA
- CONCEPTUAL ONONDAGA COUNTY WEST SHORE TRAIL (PROPOSED BY OTHERS)
- AREA ADDRESSED BY LAKE REMEDY
- 1-FT ENGINEERED COVER
- AREA ADDRESSED BY EXISTING FILL
- VEGETATION ENHANCEMENTS

SITE BOUNDARIES

- RAILROAD AREA BOUNDARY
- LAKESHORE AREA BOUNDARY
- PENN-CAN PROPERTY BOUNDARY
- ADDITIONAL AREA OF STUDY BOUNDARY

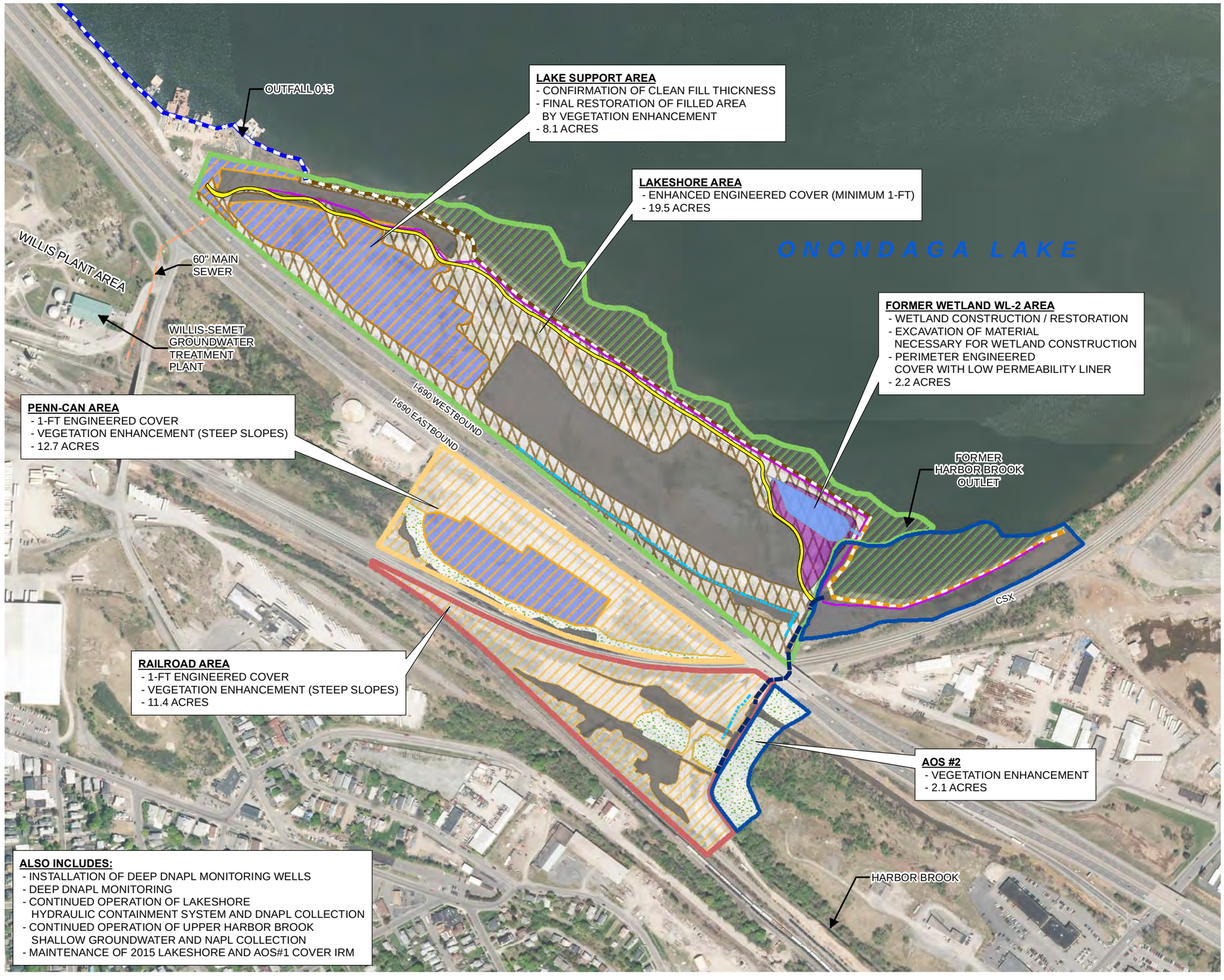
HONEYWELL
INTERNATIONAL INC.
WASTEBED B / HARBOR BROOK
FEASIBILITY STUDY
GEDDES AND SYRACUSE, NY

ALTERNATIVE 3 - ENGINEERED COVER SYSTEM

0 225 450 900
Feet

DECEMBER 2017
1163.61858

O'BRIEN & GERE ENGINEERS, INC.



N

LEGEND

- EAST WALL
- WEST WALL
- WILLIS BARRIER WALL
- CULVERT
- UPPER HARBOR BROOK COLLECTION PIPE
- COLLECTION TRENCH
- IRM AREA
- CONCEPTUAL ONONDAGA COUNTY WEST SHORE TRAIL (PROPOSED BY OTHERS)
- ENHANCED ENGINEERED COVER
- 1-FT ENGINEERED COVER
- AREA ADDRESSED BY EXISTING FILL
- VEGETATION ENHANCEMENTS
- AREA ADDRESSED BY LAKE REMEDY / IRM
- LOW PERMEABILITY LINER BELOW COVER
- WETLAND CONSTRUCTION / RESTORATION

SITE BOUNDARIES

- RAILROAD AREA BOUNDARY
- LAKESHORE AREA BOUNDARY
- PENN-CAN PROPERTY BOUNDARY
- ADDITIONAL AREA OF STUDY BOUNDARY

HONEYWELL
INTERNATIONAL INC.
WASTEBED B / HARBOR BROOK
FEASIBILITY STUDY
GEDDES AND SYRACUSE, NY

ALTERNATIVE 4 - ENHANCED ENGINEERED COVER SYSTEM WITH WETLAND CONSTRUCTION / RESTORATION

0 225 450 900
Feet

DECEMBER 2017
1163.61858

O'BRIEN & GERE ENGINEERS, INC.

N

LEGEND

- EAST WALL
- WEST WALL
- WILLIS BARRIER WALL
- CULVERT
- GROUNDWATER COLLECTION PIPE
- COLLECTION TRENCH
- IRM AREA
- CONCEPTUAL ONONDAGA COUNTY WEST SHORE TRAIL (PROPOSED BY OTHERS)
- ENHANCED ENGINEERED COVER
- 1-FT ENGINEERED COVER
- AREA ADDRESSED BY EXISTING FILL
- VEGETATION ENHANCEMENTS
- IN SITU TREATMENT
- AREA ADDRESSED BY LAKE REMEDY / IRM
- WETLAND CONSTRUCTION / RESTORATION

SITE BOUNDARIES

- RAILROAD AREA BOUNDARY
- LAKESHORE AREA BOUNDARY
- PENN-CAN PROPERTY BOUNDARY
- ADDITIONAL AREA OF STUDY BOUNDARY

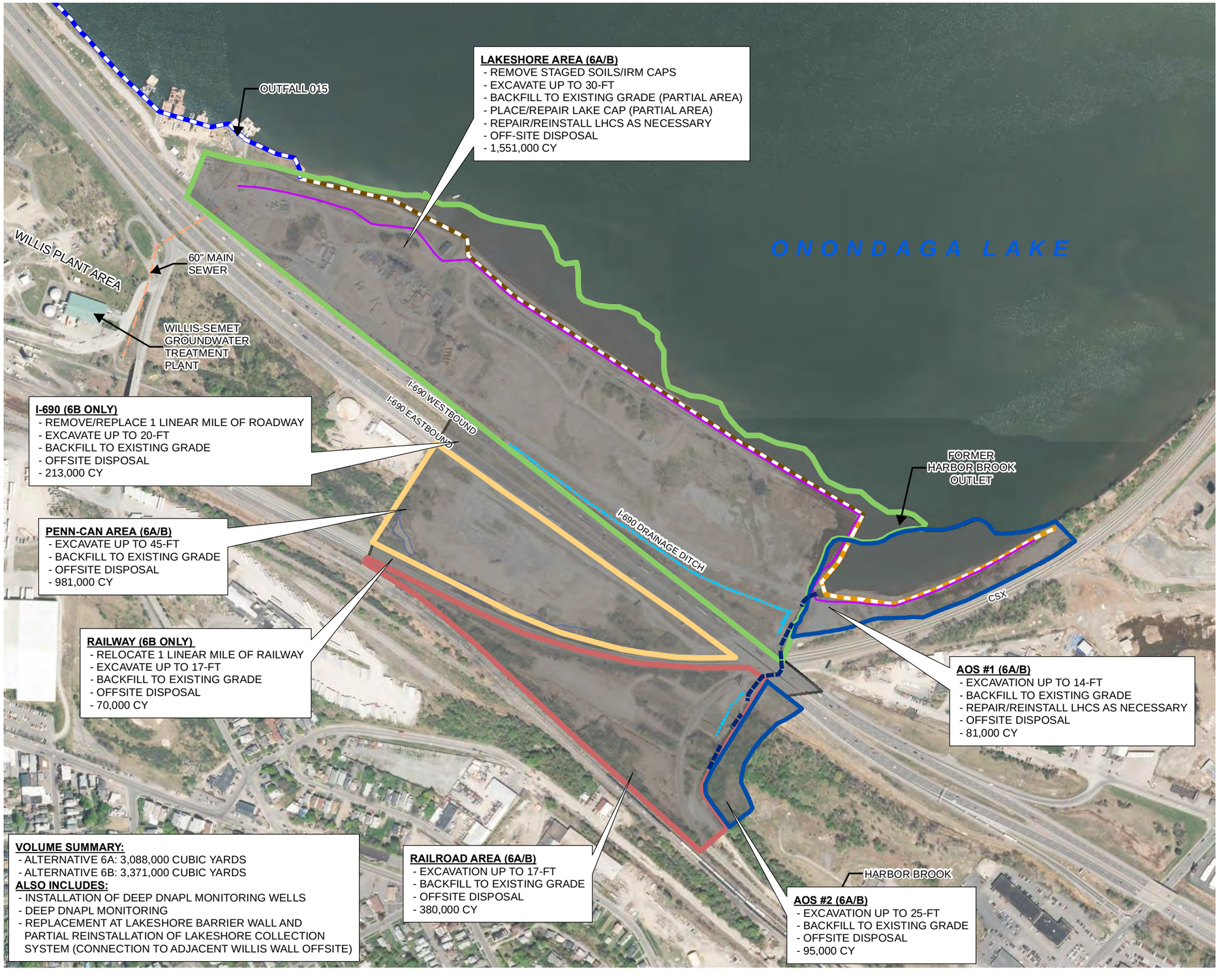
HONEYWELL
INTERNATIONAL INC.
WASTEBED B / HARBOR BROOK
FEASIBILITY STUDY
GEDDES AND SYRACUSE, NY

ALTERNATIVE 5 - ENHANCED ENGINEERED COVER SYSTEM WITH WETLAND CONSTRUCTION / RESTORATION AND IN SITU TREATMENT

0 225 450 900
Feet

DECEMBER 2017
1163.61858

O'BRIEN & GERE ENGINEERS, INC.



N

LEGEND

- EAST WALL
- WEST WALL
- WILLIS BARRIER WALL
- CULVERT
- UPPER HARBOR BROOK COLLECTION PIPE
- COLLECTION TRENCH
- EXCAVATION

SITE BOUNDARIES

- RAILROAD AREA BOUNDARY
- LAKESHORE AREA BOUNDARY
- PENN-CAN PROPERTY BOUNDARY
- ADDITIONAL AREA OF STUDY BOUNDARY

HONEYWELL
INTERNATIONAL INC.
WASTEBED B / HARBOR BROOK
FEASIBILITY STUDY
GEDDES AND SYRACUSE, NY

ALTERNATIVE 6A/B - EXCAVATION WITH OFF-SITE DISPOSAL

0 225 450 900
Feet

DECEMBER 2017
1163.61858

O'BRIEN & GERE ENGINEERS, INC.

Appendices

Appendix A
FS Dataset: Sample Locations, Samples, and Usage in the FS

Location ID	Subsite Name	East	North	Field Sample ID	Date Sampled	Sample Matrix	Sample Type	Sample Purpose	Sampling Company	Start Depth	End Depth	Depth Units	Notes	Include in Initial Dataset	Surface/Subsurface (Initial Dataset)	Change in Use for FS
Clay Topsoil	CLEAN COVER MATERIAL	NA	NA	UHB-3000-05	10/25/2012	SOIL	S-CONF	REG	OBG	NA	NA	NA	Clean cover material		Not Applicable	Surface Soil
Clay Topsoil	CLEAN COVER MATERIAL	NA	NA	UHB-3000-06	10/25/2012	SOIL	S-CONF	REG	OBG	NA	NA	NA	Clean cover material		Not Applicable	Surface Soil
Clay Topsoil	CLEAN COVER MATERIAL	NA	NA	UHB-3000-07	10/25/2012	SOIL	S-CONF	REG	OBG	NA	NA	NA	Clean cover material		Not Applicable	Surface Soil
Clay Topsoil	CLEAN COVER MATERIAL	NA	NA	UHB-3000-08	10/25/2012	SOIL	S-CONF	REG	OBG	NA	NA	NA	Clean cover material		Not Applicable	Surface Soil
Tri-State Topsoil	CLEAN COVER MATERIAL	NA	NA	UHB-3000-09	10/25/2012	SOIL	S-CONF	REG	OBG	NA	NA	NA	Clean cover material		Not Applicable	Surface Soil
Tri-State Topsoil	CLEAN COVER MATERIAL	NA	NA	UHB-3000-10	10/25/2012	SOIL	S-CONF	REG	OBG	NA	NA	NA	Clean cover material		Not Applicable	Surface Soil
Tri-State Topsoil	CLEAN COVER MATERIAL	NA	NA	UHB-3000-11	11/25/2012	SOIL	S-CONF	REG	OBG	NA	NA	NA	Clean cover material		Not Applicable	Surface Soil
Tri-State Topsoil	CLEAN COVER MATERIAL	NA	NA	UHB-3000-12	11/25/2012	SOIL	S-CONF	REG	OBG	NA	NA	NA	Clean cover material		Not Applicable	Surface Soil
Warners Topsoil	CLEAN COVER MATERIAL	NA	NA	UHB-3000-01	10/25/2012	SOIL	S-CONF	REG	OBG	NA	NA	NA	Clean cover material		Not Applicable	Surface Soil
Warners Topsoil	CLEAN COVER MATERIAL	NA	NA	UHB-3000-02	10/25/2012	SOIL	S-CONF	REG	OBG	NA	NA	NA	Clean cover material		Not Applicable	Surface Soil
Warners Topsoil	CLEAN COVER MATERIAL	NA	NA	UHB-3000-03	10/25/2012	SOIL	S-CONF	REG	OBG	NA	NA	NA	Clean cover material		Not Applicable	Surface Soil
Warners Topsoil	CLEAN COVER MATERIAL	NA	NA	UHB-3000-04	10/25/2012	SOIL	S-CONF	REG	OBG	NA	NA	NA	Clean cover material		Not Applicable	Surface Soil
UHB-PCD-01	PENN-CAN PROPERTY	NA	NA	UHB-1032-03	10/28/2014	SOIL	SED	REG	OBG	0	0.5	Ft	Clean cover material		Not Applicable	Surface Sediment
UHB-PCD-01	PENN-CAN PROPERTY	NA	NA	UHB-1032-04	10/28/2014	SOIL	SED	REG	OBG	0	0.5	Ft	Clean cover material		Not Applicable	Surface Sediment
UHB-RRD1-01	RAILROAD AREA	NA	NA	UHB-1029-07	10/27/2014	SOIL	SED	REG	OBG	0	0.5	Ft	Clean cover material		Not Applicable	Surface Sediment
UHB-RRD1-01	RAILROAD AREA	NA	NA	UHB-1029-08	10/27/2014	SOIL	SED	REG	OBG	0	0.5	Ft	Clean cover material		Not Applicable	Surface Sediment
UHB-RRD2-01	RAILROAD AREA	NA	NA	UHB-1030-03	10/27/2014	SOIL	SED	REG	OBG	0	0.5	Ft	Clean cover material		Not Applicable	Surface Sediment
UHB-RRD2-01	RAILROAD AREA	NA	NA	UHB-1030-04	10/27/2014	SOIL	SED	REG	OBG	0	0.5	Ft	Clean cover material		Not Applicable	Surface Sediment
UHB-DEDitch-01	WASTEBEDS D/E	NA	NA	UHB-1029-01	10/27/2014	SOIL	SED	REG	OBG	0	0.5	Ft	Clean cover material		Not Applicable	Surface Sediment
UHB-DEDitch-01	WASTEBEDS D/E	NA	NA	UHB-1029-02	10/27/2014	SOIL	SED	REG	OBG	0	0.5	Ft	Clean cover material		Not Applicable	Surface Sediment
UHB-OW03-01	HARBOR BROOK	NA	NA	UHB-1029-05	10/27/2014	SOIL	SED	REG	OBG	0	0.33	Ft	Clean cover material		Not Applicable	Surface Sediment
UHB-OW03-01	HARBOR BROOK	NA	NA	UHB-1029-06	10/27/2014	SOIL	SED	REG	OBG	0	0.33	Ft	Clean cover material		Not Applicable	Surface Sediment
UHB-OW04-01	HARBOR BROOK	NA	NA	UHB-1030-01	10/27/2014	SOIL	SED	REG	OBG	0	0.5	Ft	Clean cover material		Not Applicable	Surface Sediment
UHB-OW04-01	HARBOR BROOK	NA	NA	UHB-1030-02	10/27/2014	SOIL	SED	REG	OBG	0	0.5	Ft	Clean cover material		Not Applicable	Surface Sediment
HB-Brickyard-01	CLEAN COVER MATERIAL	NA	NA	HB-062315-01	06/23/2015	SOIL	S-SS	REG	OBG	NA	NA	NA	Clean cover material		Not Applicable	Surface Soil
HB-Brickyard-01	CLEAN COVER MATERIAL	NA	NA	HB-062315-02	06/23/2015	SOIL	S-SS	REG	OBG	NA	NA	NA	Clean cover material		Not Applicable	Surface Soil
HB-Brickyard-02	CLEAN COVER MATERIAL	NA	NA	HB-062315-03	06/23/2015	SOIL	S-SS	REG	OBG	NA	NA	NA	Clean cover material		Not Applicable	Surface Soil
HB-Brickyard-02	CLEAN COVER MATERIAL	NA	NA	HB-062315-04	06/23/2015	SOIL	S-SS	REG	OBG	NA	NA	NA	Clean cover material		Not Applicable	Surface Soil
HB-Brickyard-03	CLEAN COVER MATERIAL	NA	NA	HB-062315-05	06/23/2015	SOIL	S-SS	REG	OBG	NA	NA	NA	Clean cover material		Not Applicable	Surface Soil
HB-Brickyard-03	CLEAN COVER MATERIAL	NA	NA	HB-062315-06	06/23/2015	SOIL	S-SS	REG	OBG	NA	NA	NA	Clean cover material		Not Applicable	Surface Soil
HB-RICCELLI-TOPSOIL-01	CLEAN COVER MATERIAL	NA	NA	HB-082412-01	08/24/2012	SOIL	S-SS	REG	OBG	NA	NA	NA	Clean cover material		Not Applicable	Surface Soil
HB-RICCELLI-TOPSOIL-01	CLEAN COVER MATERIAL	NA	NA	HB-082412-02	08/24/2012	SOIL	S-SS	REG	OBG	NA	NA	NA	Clean cover material		Not Applicable	Surface Soil
UHB-BCreek Clay-1	CLEAN COVER MATERIAL	NA	NA	UHB-081012-01	08/10/2012	SOIL	S-SS	REG	OBG	NA	NA	NA	Clean cover material		Not Applicable	Surface Soil
UHB-Phelps Topsoil	CLEAN COVER MATERIAL	NA	NA	UHB-1004-01	10/12/2012	SOIL	S-SS	REG	OBG	NA	NA	NA	Clean cover material		Not Applicable	Surface Soil
UHB-Phelps Topsoil	CLEAN COVER MATERIAL	NA	NA	UHB-1004-02	10/12/2012	SOIL	S-SS	REG	OBG	NA	NA	NA	Clean cover material		Not Applicable	Surface Soil
UHB-Topsoil-31/57-01	CLEAN COVER MATERIAL	NA	NA	UHB-071015-01	07/10/2015	SOIL	S-SS	REG	OBG	NA	NA	NA	Clean cover material		Not Applicable	Surface Soil
UHB-Topsoil-31/57-01	CLEAN COVER MATERIAL	NA	NA	UHB-071015-02	07/10/2015	SOIL	S-SS	REG	OBG	NA	NA	NA	Clean cover material		Not Applicable	Surface Soil
UHB-Topsoil-31/57-02	CLEAN COVER MATERIAL	NA	NA	UHB-071015-03	07/10/2015	SOIL	S-SS	REG	OBG	NA	NA	NA	Clean cover material		Not Applicable	Surface Soil
UHB-Topsoil-31/57-02	CLEAN COVER MATERIAL	NA	NA	UHB-071015-04	07/10/2015	SOIL	S-SS	REG	OBG	NA	NA	NA	Clean cover material		Not Applicable	Surface Soil
UHB-Topsoil-31/57-03	CLEAN COVER MATERIAL	NA	NA	UHB-072815-01	07/28/2015	SOIL	S-SS	REG	OBG	0	0.5	Ft	Clean cover material		Not Applicable	Surface Soil
UHB-Topsoil-31/57-03	CLEAN COVER MATERIAL	NA	NA	UHB-072815-02	07/28/2015	SOIL	S-SS	REG	OBG	0	0.5	Ft	Clean cover material		Not Applicable	Surface Soil
UHB-Topsoil-31/57-04	CLEAN COVER MATERIAL	NA	NA	UHB-072815-03	07/28/2015	SOIL	S-SS	REG	OBG	0	0.5	Ft	Clean cover material		Not Applicable	Surface Soil
UHB-Topsoil-31/57-04	CLEAN COVER MATERIAL	NA	NA	UHB-072815-04	07/28/2015	SOIL	S-SS	REG	OBG	0	0.5	Ft	Clean cover material		Not Applicable	Surface Soil
HB-ANNEXA-P1	PLACED MATERIAL	NA	NA	HB-120611-01	12/06/2011	SOIL	WC	REG	OBG	NA	NA	NA	Placed on Wastebed B		Not Applicable	Wastebed B/Subsurface Soil
HB-ANNEXA-P1	PLACED MATERIAL	NA	NA	HB-120611-02	12/06/2011	SOIL	WC	REG	OBG	NA	NA	NA	Placed on Wastebed B		Not Applicable	Wastebed B/Subsurface Soil
HB-ANNEXA-P2	PLACED MATERIAL	NA	NA	HB-120611-03	12/06/2011	SOIL	WC	REG	OBG	NA	NA	NA	Placed on Wastebed B		Not Applicable	Wastebed B/Subsurface Soil
HB-ANNEXA-P2	PLACED MATERIAL	NA	NA	HB-120611-04	12/06/2011	SOIL	WC	REG	OBG	NA	NA	NA	Placed on Wastebed B		Not Applicable	Wastebed B/Subsurface Soil
HB-ANNEXA-P3	PLACED MATERIAL	NA	NA	HB-120611-05	12/06/2011	SOIL	WC	REG	OBG	NA	NA	NA	Placed on Wastebed B		Not Applicable	Wastebed B/Subsurface Soil
HB-ANNEXA-P3	PLACED MATERIAL	NA	NA	HB-120611-06	12/06/2011	SOIL	WC	REG	OBG	NA	NA	NA	Placed on Wastebed B		Not Applicable	Wastebed B/Subsurface Soil
HB-AnnexD-02	PLACED MATERIAL	NA	NA	HB-030212-01	03/02/2012	SOIL	WC	REG	OBG	NA	NA	NA	Placed on Wastebed B		Not Applicable	Wastebed B/Subsurface Soil
HB-AnnexD-02	PLACED MATERIAL	NA	NA	HB-030212-02	03/02/2012	SOIL	WC	REG	OBG	NA	NA	NA	Placed on Wastebed B		Not Applicable	Wastebed B/Subsurface Soil
HB-AnnexD-03	PLACED MATERIAL	NA	NA	HB-030212-03	03/02/2012	SOIL	WC	REG	OBG	NA	NA	NA	Placed on Wastebed B		Not Applicable	Wastebed B/Subsurface Soil
HB-AnnexD-03	PLACED MATERIAL	NA	NA	HB-030212-04	03/02/2012	SOIL	WC	REG	OBG	NA	NA	NA	Placed on Wastebed B		Not Applicable	Wastebed B/Subsurface Soil
HB-ANNEXD-INIT	PLACED MATERIAL	NA	NA	HB-120211-01	12/02/2011	SOIL	WC	REG	OBG	NA	NA	NA	Placed on Wastebed B		Not Applicable	Wastebed B/Subsurface Soil
HB-ANNEXD-INIT	PLACED MATERIAL	NA	NA	HB-120211-02	12/02/2011	SOIL	WC	REG	OBG	NA	NA	NA	Placed on Wastebed B		Not Applicable	Wastebed B/Subsurface Soil
HB-DSS-01/02	PLACED MATERIAL	NA	NA	HB-5138-01	03/25/2010	Soil	SED	REG	PAR	NA	NA	NA	Placed on Wastebed B		Not Applicable	Wastebed B/Subsurface Soil
HB-DSS-03/04	PLACED MATERIAL	NA	NA	HB-5138-02	03/25/2010	Soil	SED	REG	PAR	NA	NA	NA	Placed on Wastebed B		Not Applicable	Wastebed B/Subsurface Soil
HB-DSS-05/06	PLACED MATERIAL	NA	NA	HB-5138-03	03/25/2010	Soil	SED	REG	PAR	NA	NA	NA	Placed on Wastebed B		Not Applicable	Wastebed B/Subsurface Soil
HB-DSS-05/06	PLACED MATERIAL	NA	NA	HB-062910-01	06/29/2010	SOIL	S-SS	REG	OBG	NA	NA	NA	Placed on Wastebed B		Not Applicable	Wastebed B/Subsurface Soil
HB-DSS-07/08	PLACED MATERIAL	NA	NA	HB-5138-04	03/25/2010	Soil	SED	REG	PAR	NA	NA	NA	Placed on Wastebed B		Not Applicable	Wastebed B/Subsurface Soil
HB-DSS-09/10	PLACED MATERIAL	NA	NA	HB-5138-05	03/25/2010	Soil	SED	REG	PAR	NA	NA	NA	Placed on Wastebed B		Not Applicable	Wastebed B/Subsurface Soil
HB-DSS-09/10	PLACED MATERIAL	NA	NA	HB-5138-06	03/25/2010	Soil	SED	REG	PAR	NA	NA	NA	Placed on Wastebed B		Not Applicable	Wastebed B/Subsurface Soil
HB-DSS-11/12	PLACED MATERIAL	NA	NA	HB-5138-07	03/25/2010	Soil	SED	REG	PAR	NA	NA	NA	Placed on Wastebed B		Not Applicable	Wastebed B/Subsurface Soil
HB-DSS-13	PLACED MATERIAL	NA	NA	HB-5138-08	03/25/2010	Soil	SED	REG	PAR	NA	NA	NA	Placed on Wastebed B		Not Applicable	Wastebed B/Subsurface Soil

Location ID	Subsite Name	East	North	Field Sample ID	Date Sampled	Sample Matrix	Sample Type	Sample Purpose	Sampling Company	Start Depth	End Depth	Depth Units	Notes	Include in Initial Dataset	Surface/Subsurface (Initial Dataset)	Change in Use for FS
HB-WESTWALL-1	PLACED MATERIAL	NA	NA	HB-120211A-01	12/02/2011	SOIL	WC	REG	OBG	NA	NA	NA	Placed on Wastebed B		Not Applicable	Wastebed B/Subsurface Soil
HB-WESTWALL-1	PLACED MATERIAL	NA	NA	HB-120211A-02	12/02/2011	SOIL	WC	REG	OBG	NA	NA	NA	Placed on Wastebed B		Not Applicable	Wastebed B/Subsurface Soil
HB-WESTWALL-2	PLACED MATERIAL	NA	NA	HB-120211A-03	12/02/2011	SOIL	WC	REG	OBG	NA	NA	NA	Placed on Wastebed B		Not Applicable	Wastebed B/Subsurface Soil
HB-WESTWALL-2	PLACED MATERIAL	NA	NA	HB-120211A-04	12/02/2011	SOIL	WC	REG	OBG	NA	NA	NA	Placed on Wastebed B		Not Applicable	Wastebed B/Subsurface Soil
UHB-Ditch Soil Pile	PLACED MATERIAL	NA	NA	UHB-112612-01	11/26/2012	SOIL	WC	REG	OBG	NA	NA	NA	Placed on Wastebed B		Not Applicable	Wastebed B/Subsurface Soil
UHB-Ditch Soil Pile	PLACED MATERIAL	NA	NA	UHB-112612-02	11/26/2012	SOIL	WC	REG	OBG	NA	NA	NA	Placed on Wastebed B		Not Applicable	Wastebed B/Subsurface Soil
UHB-OW1-PILE-01	PLACED MATERIAL	NA	NA	UHB-1019-01	08/25/2013	SOIL	WC	REG	OBG	NA	NA	NA	Placed on Wastebed B		Not Applicable	Wastebed B/Subsurface Soil
UHB-OW1-PILE-01	PLACED MATERIAL	NA	NA	UHB-1019-02	08/28/2013	SOIL	WC	REG	OBG	NA	NA	NA	Placed on Wastebed B		Not Applicable	Wastebed B/Subsurface Soil
UHB-OW1-PILE-02	PLACED MATERIAL	NA	NA	UHB-1019-03	08/28/2013	SOIL	WC	REG	OBG	NA	NA	NA	Placed on Wastebed B		Not Applicable	Wastebed B/Subsurface Soil
UHB-OW1-PILE-02	PLACED MATERIAL	NA	NA	UHB-1019-04	08/28/2013	SOIL	WC	REG	OBG	NA	NA	NA	Placed on Wastebed B		Not Applicable	Wastebed B/Subsurface Soil
UHB-OW1-PILE-03	PLACED MATERIAL	NA	NA	UHB-1020-01	08/28/2013	SOIL	WC	REG	OBG	NA	NA	NA	Placed on Wastebed B		Not Applicable	Wastebed B/Subsurface Soil
UHB-OW4-PILE	PLACED MATERIAL	NA	NA	UHB-1012-01	03/20/2013	SOIL	WC	REG	OBG	NA	NA	NA	Placed on Wastebed B		Not Applicable	Wastebed B/Subsurface Soil
UHB-OW4-PILE	PLACED MATERIAL	NA	NA	UHB-1012-02	03/20/2013	SOIL	WC	REG	OBG	NA	NA	NA	Placed on Wastebed B		Not Applicable	Wastebed B/Subsurface Soil
UHB-OW4-PILE-02	PLACED MATERIAL	NA	NA	UHB-052313-01	05/23/2013	SOIL	WC	REG	OBG	NA	NA	NA	Placed on Wastebed B		Not Applicable	Wastebed B/Subsurface Soil
UHB-OW4-PILE-02	PLACED MATERIAL	NA	NA	UHB-052313-02	05/23/2013	SOIL	WC	REG	OBG	NA	NA	NA	Placed on Wastebed B		Not Applicable	Wastebed B/Subsurface Soil
UHB-OW4-PILE-03	PLACED MATERIAL	NA	NA	UHB-052313-03	05/23/2013	SOIL	WC	REG	OBG	NA	NA	NA	Placed on Wastebed B		Not Applicable	Wastebed B/Subsurface Soil
UHB-OW4-PILE-03	PLACED MATERIAL	NA	NA	UHB-052313-04	05/23/2013	SOIL	WC	REG	OBG	NA	NA	NA	Placed on Wastebed B		Not Applicable	Wastebed B/Subsurface Soil
UHB-OW4-PILE-03	PLACED MATERIAL	NA	NA	UHB-1018-03	08/21/2013	SOIL	WC	REG	OBG	NA	NA	NA	Placed on Wastebed B		Not Applicable	Wastebed B/Subsurface Soil
UHB-OW4-PILE-04	PLACED MATERIAL	NA	NA	UHB-052313-05	05/23/2013	SOIL	WC	REG	OBG	NA	NA	NA	Placed on Wastebed B		Not Applicable	Wastebed B/Subsurface Soil
UHB-OW4-PILE-04	PLACED MATERIAL	NA	NA	UHB-052313-06	05/23/2013	SOIL	WC	REG	OBG	NA	NA	NA	Placed on Wastebed B		Not Applicable	Wastebed B/Subsurface Soil
UHB-OW4-PILE-X1	PLACED MATERIAL	NA	NA	UHB-1018-01	08/21/2013	SOIL	WC	REG	OBG	NA	NA	NA	Placed on Wastebed B		Not Applicable	Wastebed B/Subsurface Soil
UHB-OW4-PILE-X2	PLACED MATERIAL	NA	NA	UHB-1018-02	08/21/2013	SOIL	WC	REG	OBG	NA	NA	NA	Placed on Wastebed B		Not Applicable	Wastebed B/Subsurface Soil
UHB-OW4-PILE-X4	PLACED MATERIAL	NA	NA	UHB-1018-04	08/21/2013	SOIL	WC	REG	OBG	NA	NA	NA	Placed on Wastebed B		Not Applicable	Wastebed B/Subsurface Soil
UHB-OW4-PILE-X5	PLACED MATERIAL	NA	NA	UHB-1018-05	08/21/2013	SOIL	WC	REG	OBG	NA	NA	NA	Placed on Wastebed B		Not Applicable	Wastebed B/Subsurface Soil
UHB-OW4-PILE-X6	PLACED MATERIAL	NA	NA	UHB-1018-06	08/21/2013	SOIL	WC	REG	OBG	NA	NA	NA	Placed on Wastebed B		Not Applicable	Wastebed B/Subsurface Soil
UHB-OW4-PILE-X7	PLACED MATERIAL	NA	NA	UHB-1018-07	08/21/2013	SOIL	WC	REG	OBG	NA	NA	NA	Placed on Wastebed B		Not Applicable	Wastebed B/Subsurface Soil
UHB-WRR2E-Pile-01	PLACED MATERIAL	NA	NA	UHB-1021-01	09/24/2013	SOIL	WC	REG	OBG	NA	NA	NA	Placed on Wastebed B		Not Applicable	Wastebed B/Subsurface Soil
UHB-WRR2E-Pile-01	PLACED MATERIAL	NA	NA	UHB-1021-02	09/24/2013	SOIL	WC	REG	OBG	NA	NA	NA	Placed on Wastebed B		Not Applicable	Wastebed B/Subsurface Soil
UHB-WRR2E-Pile-02	PLACED MATERIAL	NA	NA	UHB-1021-03	09/26/2013	SOIL	WC	REG	OBG	NA	NA	NA	Placed on Wastebed B		Not Applicable	Wastebed B/Subsurface Soil
UHB-WRR2E-Pile-02	PLACED MATERIAL	NA	NA	UHB-1021-04	09/26/2013	SOIL	WC	REG	OBG	NA	NA	NA	Placed on Wastebed B		Not Applicable	Wastebed B/Subsurface Soil
UHB-WRR2E-Pile-03	PLACED MATERIAL	NA	NA	UHB-1021-05	09/26/2013	SOIL	WC	REG	OBG	NA	NA	NA	Placed on Wastebed B		Not Applicable	Wastebed B/Subsurface Soil
UHB-WRR2E-Pile-03	PLACED MATERIAL	NA	NA	UHB-1021-06	09/26/2013	SOIL	WC	REG	OBG	NA	NA	NA	Placed on Wastebed B		Not Applicable	Wastebed B/Subsurface Soil
HB-HB-18S	AOS #1	926311.999999	1115851.01889	HB-1046-05	07/16/2008	SOIL	S-SS	REG	OBG	0	0.5	FT	Outboard Area	X	Surface Soil	Removed from dataset (Outboard Area)
HB-HB-18S	AOS #1	926311.999999	1115851.01889	HB-1046-06	07/16/2008	SOIL	S-SS	REG	OBG	0.5	1	FT	Outboard Area	X	Surface Soil	Removed from dataset (Outboard Area)
HB-HB-18S	AOS #1	926311.999999	1115851.01889	HB9645	12/19/2002	SOIL	S-SB	REG	OBG	22	24	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-HB-18S	AOS #1	926311.999999	1115851.01889	HB9812	08/29/2003	SOIL	S-SB	REG	OBG	0	0.5	Ft	Outboard Area	X	Surface Soil	Removed from dataset (Outboard Area)
HB-HB-18S	AOS #1	926311.999999	1115851.01889	HB9813	08/29/2003	SOIL	S-SB	REG	OBG	0.5	1	Ft	Outboard Area	X	Surface Soil	Removed from dataset (Outboard Area)
HB-HB-19S	AOS #1	926203.000002	1115998.80006	HB-1046-12	07/16/2008	SOIL	S-SS	REG	OBG	0	0.5	FT	Outboard Area	X	Surface Soil	Removed from dataset (Outboard Area)
HB-HB-19S	AOS #1	926203.000002	1115998.80006	HB-1047-01	07/16/2008	SOIL	S-SS	REG	OBG	0.5	1	FT	Outboard Area	X	Surface Soil	Removed from dataset (Outboard Area)
HB-HB-19S	AOS #1	926203.000002	1115998.80006	HB9648	12/30/2002	SOIL	S-SB	REG	OBG	0.5	1	Ft	Outboard Area	X	Surface Soil	Removed from dataset (Outboard Area)
HB-HB-19S	AOS #1	926203.000002	1115998.80006	HB9649	12/30/2002	SOIL	S-SB	REG	OBG	24	28	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-HB-19S	AOS #1	926203.000002	1115998.80006	HB9650	12/30/2002	SOIL	S-SB	REG	OBG	0	0.5	Ft	Outboard Area	X	Surface Soil	Removed from dataset (Outboard Area)
HB-HB-20D	AOS #1	926478	1116106.0001	HB-1046-01	07/16/2008	SOIL	S-SS	REG	OBG	0	0.5	FT	Outboard Area	X	Surface Soil	Removed from dataset (Outboard Area)
HB-HB-20D	AOS #1	926478	1116106.0001	HB-1046-02	07/16/2008	SOIL	S-SS	REG	OBG	0.5	1	FT	Outboard Area	X	Surface Soil	Removed from dataset (Outboard Area)
HB-HB-20D	AOS #1	926478	1116106.0001	HB9627	12/13/2002	SOIL	S-SB	REG	OBG	124	128	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-HB-20D	AOS #1	926478	1116106.0001	HB9644	12/19/2002	SOIL	S-SB	REG	OBG	10	14	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-HB-20D	AOS #1	926478	1116106.0001	HB9669	02/18/2003	SOIL	S-SB	REG	OBG	124	128	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-HB-20D	AOS #1	926478	1116106.0001	HB9810	08/29/2003	SOIL	S-SB	REG	OBG	0	0.5	Ft	Outboard Area	X	Surface Soil	Removed from dataset (Outboard Area)
HB-HB-20D	AOS #1	926478	1116106.0001	HB9815	08/29/2003	SOIL	S-SB	REG	OBG	0.5	1	Ft	Outboard Area	X	Surface Soil	Removed from dataset (Outboard Area)
HB-RISB-04	AOS #1	926662.6654	1116169.9654	HB-1046-03	07/16/2008	SOIL	S-SS	REG	OBG	0	0.5	FT	Outboard Area	X	Surface Soil	Removed from dataset (Outboard Area)
HB-RISB-04	AOS #1	926662.6654	1116169.9654	HB-1046-04	07/16/2008	SOIL	S-SS	REG	OBG	0.5	1	FT	Outboard Area	X	Surface Soil	Removed from dataset (Outboard Area)
HB-RISB-04	AOS #1	926662.6654	1116169.9654	HB9638	12/18/2002	SOIL	S-SB	REG	OBG	0.5	1	Ft	Outboard Area	X	Surface Soil	Removed from dataset (Outboard Area)
HB-RISB-04	AOS #1	926662.6654	1116169.9654	HB9639	12/18/2002	SOIL	S-SB	REG	OBG	0	0.5	Ft	Outboard Area	X	Surface Soil	Removed from dataset (Outboard Area)
HB-RISB-04	AOS #1	926662.6654	1116169.9654	HB9640	12/18/2002	SOIL	S-SB	REG	OBG	14	16	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-RISB-05	AOS #1	926582.5	1115835.9	HB-1047-08	07/16/2008	SOIL	S-SS	REG	OBG	0	0.5	FT	Covered in 2015	X	Surface Soil	Subsurface Soil
HB-RISB-05	AOS #1	926582.5	1115835.9	HB-1047-09	07/16/2008	SOIL	S-SS	REG	OBG	0.5	1	FT	Covered in 2015	X	Surface Soil	Subsurface Soil
HB-RISB-05	AOS #1	926582.5	1115835.9	HB9651	12/31/2002	SOIL	S-SB	REG	OBG	0.5	1	Ft	Covered in 2015	X	Surface Soil	Subsurface Soil
HB-RISB-05	AOS #1	926582.5	1115835.9	HB9652	12/31/2002	SOIL	S-SB	REG	OBG	0	0.5	Ft	Covered in 2015	X	Surface Soil	Subsurface Soil
HB-RISB-05	AOS #1	926582.5	1115835.9	HB9654	12/31/2002	SOIL	S-SB	REG	OBG	16	18	Ft	Covered in 2015	X	Subsurface Soil	None
HB-RISB-05	AOS #1	926582.5	1115835.9	HB9655	01/02/2003	SOIL	S-SB	REG	OBG	0.5	1	Ft	Covered in 2015	X	Surface Soil	Subsurface Soil
HB-RISB-05	AOS #1	926582.5	1115835.9	HB9656	01/02/2003	SOIL	S-SB	REG	OBG	16	18	Ft	Covered in 2015	X	Subsurface Soil	None
HB-RISB-05	AOS #1	926582.5	1115835.9	HB9657	01/02/2003	SOIL	S-SB	REG	OBG	0	0.5	Ft	Covered in 2015	X	Surface Soil	Subsurface Soil

Location ID	Subsite Name	East	North	Field Sample ID	Date Sampled	Sample Matrix	Sample Type	Sample Purpose	Sampling Company	Start Depth	End Depth	Depth Units	Notes	Include in Initial Dataset	Surface/Subsurface (Initial Dataset)	Change in Use for FS
HB-RISB-06	AOS #1	926858.1145	1115980.2583	HB-1047-06	07/16/2008	SOIL	S-SS	REG	OBG	0	0.5	FT	Covered in 2015	X	Surface Soil	Subsurface Soil
HB-RISB-06	AOS #1	926858.1145	1115980.2583	HB-1047-07	07/16/2008	SOIL	S-SS	REG	OBG	0.5	1	FT	Covered in 2015	X	Surface Soil	Subsurface Soil
HB-RISB-06	AOS #1	926858.1145	1115980.2583	HB9641	12/18/2002	SOIL	S-SB	REG	OBG	0.5	1	Ft	Covered in 2015	X	Surface Soil	Subsurface Soil
HB-RISB-06	AOS #1	926858.1145	1115980.2583	HB9642	12/18/2002	SOIL	S-SB	REG	OBG	0	0.5	Ft	Covered in 2015	X	Surface Soil	Subsurface Soil
HB-RISB-06	AOS #1	926858.1145	1115980.2583	HB9643	12/18/2002	SOIL	S-SB	REG	OBG	22	24	Ft	Covered in 2015	X	Subsurface Soil	None
HB-RISB-07	AOS #1	927037.8473	1116094.253	HB-1047-04	07/16/2008	SOIL	S-SS	REG	OBG	0	0.5	FT	Covered in 2015	X	Surface Soil	Subsurface Soil
HB-RISB-07	AOS #1	927037.8473	1116094.253	HB-1047-05	07/16/2008	SOIL	S-SS	REG	OBG	0.5	1	FT	Covered in 2015	X	Surface Soil	Subsurface Soil
HB-RISB-07	AOS #1	927037.8473	1116094.253	HB9635	12/17/2002	SOIL	S-SB	REG	OBG	0.5	1	Ft	Covered in 2015	X	Surface Soil	Subsurface Soil
HB-RISB-07	AOS #1	927037.8473	1116094.253	HB9636	12/17/2002	SOIL	S-SB	REG	OBG	20	22	Ft	Covered in 2015	X	Subsurface Soil	None
HB-RISB-07	AOS #1	927037.8473	1116094.253	HB9637	12/17/2002	SOIL	S-SB	REG	OBG	0	0.5	Ft	Covered in 2015	X	Surface Soil	Subsurface Soil
HB-RISB-11	AOS #1	926045.7975	1115832.99	HB-1046-08	07/16/2008	SOIL	S-SS	REG	OBG	0	0.5	FT	Covered in 2015	X	Surface Soil	Subsurface Soil
HB-RISB-11	AOS #1	926045.7975	1115832.99	HB-1046-11	07/16/2008	SOIL	S-SS	REG	OBG	0.5	1	FT	Covered in 2015	X	Surface Soil	Subsurface Soil
HB-RISB-11	AOS #1	926045.7975	1115832.99	HB9646	12/20/2002	SOIL	S-SB	REG	OBG	34	38	Ft	Covered in 2015	X	Subsurface Soil	None
HB-RISB-11	AOS #1	926045.7975	1115832.99	HB9811	08/29/2003	SOIL	S-SB	REG	OBG	0.5	1	Ft	Covered in 2015	X	Surface Soil	Subsurface Soil
HB-RISB-11	AOS #1	926045.7975	1115832.99	HB9814	08/29/2003	SOIL	S-SB	REG	OBG	0	0.5	Ft	Covered in 2015	X	Surface Soil	Subsurface Soil
HB-RISB-16	AOS #1	927206.6	1116212.8	HB-1047-02	07/16/2008	SOIL	S-SS	REG	OBG	0	0.5	FT	Uncovered; pending final Site remedy	X	Surface Soil	None
HB-RISB-16	AOS #1	927206.6	1116212.8	HB-1047-03	07/16/2008	SOIL	S-SS	REG	OBG	0.5	1	FT	Uncovered; pending final Site remedy	X	Surface Soil	None
HB-RISB-16	AOS #1	927206.6	1116212.8	HB9832	05/24/2004	SOIL	S-SB	REG	OBG	4	6	Ft	Uncovered; pending final Site remedy	X	Subsurface Soil	None
HB-RISB-16	AOS #1	927206.6	1116212.8	HB9835	05/25/2004	SOIL	S-SB	REG	OBG	0	0.5	Ft	Uncovered; pending final Site remedy	X	Surface Soil	None
HB-RISB-16	AOS #1	927206.6	1116212.8	HB9836	05/25/2004	SOIL	S-SB	REG	OBG	0.5	1	Ft	Uncovered; pending final Site remedy	X	Surface Soil	None
HB-RISB-17	AOS #1	927435.09	1116407.19	HB9833	05/25/2004	SOIL	S-SB	REG	OBG	0	0.5	Ft	Uncovered; pending final Site remedy	X	Surface Soil	None
HB-RISB-17	AOS #1	927435.09	1116407.19	HB9834	05/25/2004	SOIL	S-SB	REG	OBG	0.5	1	Ft	Uncovered; pending final Site remedy	X	Surface Soil	None
HB-RISB-17	AOS #1	927435.09	1116407.19	HB9837	05/25/2004	SOIL	S-SB	REG	OBG	6	8	Ft	Uncovered; pending final Site remedy	X	Subsurface Soil	None
HB-SB-103	AOS #1	926445.291	1115922.201	HB-5089-01	03/13/2008	SOIL	SED	REG	PAR	54	56	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-103	AOS #1	926445.291	1115922.201	HB-5089-02	03/13/2008	SOIL	SED	REG	PAR	66	68	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-107	AOS #1	926677.4165	1115906.6589	HB-5089-03	03/13/2008	SOIL	SED	REG	PAR	68	70	FT	Covered in 2015	X	Subsurface Soil	None
HB-SB-107	AOS #1	926677.4165	1115906.6589	HB-5089-04	03/13/2008	SOIL	SED	REG	PAR	78	80	FT	Covered in 2015	X	Subsurface Soil	None
HB-SB-244	AOS #1	926047.6268	1115936.5963	HB-5159-01	11/29/2010	Soil	SED	REG	PAR	0.0	2.0	FT	Outboard Area	X	Surface Soil	Removed from dataset (Outboard Area)
HB-SB-244	AOS #1	926047.6268	1115936.5963	HB-5159-02	11/29/2010	Soil	SED	REG	PAR	2.0	4.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-244	AOS #1	926047.6268	1115936.5963	HB-5159-03	11/29/2010	Soil	SED	REG	PAR	4.0	6.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-244	AOS #1	926047.6268	1115936.5963	HB-5159-04	11/29/2010	Soil	SED	REG	PAR	6.0	8.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-244	AOS #1	926047.6268	1115936.5963	HB-5159-05	11/29/2010	Soil	SED	REG	PAR	8.0	10.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-244	AOS #1	926047.6268	1115936.5963	HB-5159-06	11/29/2010	Soil	SED	REG	PAR	10.0	12.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-244	AOS #1	926047.6268	1115936.5963	HB-5159-07	11/29/2010	Soil	SED	REG	PAR	12.0	14.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-244	AOS #1	926047.6268	1115936.5963	HB-5159-08	11/29/2010	Soil	SED	REG	PAR	14.0	16.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-244	AOS #1	926047.6268	1115936.5963	HB-5159-09	11/29/2010	Soil	SED	REG	PAR	16.0	18.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-244	AOS #1	926047.6268	1115936.5963	HB-5159-10	11/29/2010	Soil	SED	REG	PAR	18.0	20.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-245	AOS #1	926373.2733	1116051.1403	HB-5158-01	11/23/2010	Soil	SED	REG	PAR	0.0	2.0	FT	Outboard Area	X	Surface Soil	Removed from dataset (Outboard Area)
HB-SB-245	AOS #1	926373.2733	1116051.1403	HB-5158-02	11/23/2010	Soil	SED	REG	PAR	2.0	4.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-245	AOS #1	926373.2733	1116051.1403	HB-5158-03	11/23/2010	Soil	SED	REG	PAR	4.0	6.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-245	AOS #1	926373.2733	1116051.1403	HB-5158-04	11/23/2010	Soil	SED	REG	PAR	6.0	8.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-245	AOS #1	926373.2733	1116051.1403	HB-5158-05	11/23/2010	Soil	SED	REG	PAR	8.0	10.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-245	AOS #1	926373.2733	1116051.1403	HB-5158-06	11/23/2010	Soil	SED	REG	PAR	10.0	12.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-245	AOS #1	926373.2733	1116051.1403	HB-5158-07	11/23/2010	Soil	SED	REG	PAR	12.0	14.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-245	AOS #1	926373.2733	1116051.1403	HB-5158-08	11/23/2010	Soil	SED	REG	PAR	14.0	16.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-245	AOS #1	926373.2733	1116051.1403	HB-5158-09	11/23/2010	Soil	SED	REG	PAR	16.0	18.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-245	AOS #1	926373.2733	1116051.1403	HB-5158-10	11/23/2010	Soil	SED	REG	PAR	18.0	20.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-246	AOS #1	926567.9492	1116156.3376	HB-5157-12	11/23/2010	Soil	SED	REG	PAR	0.0	2.0	FT	Outboard Area	X	Surface Soil	Removed from dataset (Outboard Area)
HB-SB-246	AOS #1	926567.9492	1116156.3376	HB-5157-13	11/23/2010	Soil	SED	REG	PAR	2.0	4.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-246	AOS #1	926567.9492	1116156.3376	HB-5157-14	11/23/2010	Soil	SED	REG	PAR	4.0	6.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-246	AOS #1	926567.9492	1116156.3376	HB-5157-15	11/23/2010	Soil	SED	REG	PAR	6.0	8.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-246	AOS #1	926567.9492	1116156.3376	HB-5157-16	11/23/2010	Soil	SED	REG	PAR	8.0	10.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-246	AOS #1	926567.9492	1116156.3376	HB-5157-17	11/23/2010	Soil	SED	REG	PAR	10.0	12.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-246	AOS #1	926567.9492	1116156.3376	HB-5157-18	11/23/2010	Soil	SED	REG	PAR	12.0	14.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-246	AOS #1	926567.9492	1116156.3376	HB-5157-19	11/23/2010	Soil	SED	REG	PAR	14.0	16.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-246	AOS #1	926567.9492	1116156.3376	HB-5157-20	11/23/2010	Soil	SED	REG	PAR	16.0	18.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-246	AOS #1	926567.9492	1116156.3376	HB-5157-21	11/23/2010	Soil	SED	REG	PAR	18.0	20.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-247	AOS #1	926662.6976	1116091.467	HB-5155-01	11/22/2010	Soil	SED	REG	PAR	0.0	2.0	FT	Outboard Area	X	Surface Soil	Removed from dataset (Outboard Area)
HB-SB-247	AOS #1	926662.6976	1116091.467	HB-5155-02	11/22/2010	Soil	SED	REG	PAR	2.0	4.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-247	AOS #1	926662.6976	1116091.467	HB-5155-03	11/22/2010	Soil	SED	REG	PAR	4.0	6.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-247	AOS #1	926662.6976	1116091.467	HB-5155-04	11/22/2010	Soil	SED	REG	PAR	6.0	8.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-247	AOS #1	926662.6976	1116091.467	HB-5155-05	11/22/2010	Soil	SED	REG	PAR	8.0	10.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-247	AOS #1	926662.6976	1116091.467	HB-5155-06	11/22/2010	Soil	SED	REG	PAR	10.0	12.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-247	AOS #1	926662.6976	1116091.467	HB-5155-07	11/22/2010	Soil	SED	REG	PAR	12.0	14.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-247	AOS #1	926662.6976	1116091.467	HB-5155-08	11/22/2010	Soil	SED	REG	PAR	14.0	16.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-247	AOS #1	926662.6976	1116091.467	HB-5155-09	11/22/2010	Soil	SED	REG	PAR	16.0	18.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-247	AOS #1	926662.6976	1116091.467	HB-5155-10	11/22/2010	Soil	SED	REG	PAR	18.0	20.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)

Location ID	Subsite Name	East	North	Field Sample ID	Date Sampled	Sample Matrix	Sample Type	Sample Purpose	Sampling Company	Start Depth	End Depth	Depth Units	Notes	Include in Initial Dataset	Surface/Subsurface (Initial Dataset)	Change in Use for FS
HB-SB-66	AOS #1	926035.3485	1116066.718	HB-0013-01	10/30/2006	SOIL	S-SB	REG	OBG	30	34	Ft	Covered by East Wall IRM	X	Subsurface Soil	None
HB-SB-66	AOS #1	926035.3485	1116066.718	HB-0013-02	10/30/2006	SOIL	S-SB	REG	OBG	30	34	Ft	Covered by East Wall IRM	X	Subsurface Soil	None
HB-SB-66	AOS #1	926035.3485	1116066.718	HB-0015-07	10/31/2006	SOIL	S-SB	REG	OBG	7	8	Ft	Covered by East Wall IRM	X	Subsurface Soil	None
HB-SB-66	AOS #1	926035.3485	1116066.718	HB-0015-08	10/31/2006	SOIL	S-SB	REG	OBG	7	8	Ft	Covered by East Wall IRM	X	Subsurface Soil	None
HB-SB-67	AOS #1	926108.9395	1116052.252	HB-0015-01	10/31/2006	SOIL	S-SB	REG	OBG	5	6	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-67	AOS #1	926108.9395	1116052.252	HB-0015-02	10/31/2006	SOIL	S-SB	REG	OBG	5	6	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-67	AOS #1	926108.9395	1116052.252	HB-0015-05	10/31/2006	SOIL	S-SB	REG	OBG	46	48	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-67	AOS #1	926108.9395	1116052.252	HB-0015-06	10/31/2006	SOIL	S-SB	REG	OBG	46	48	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-68	AOS #1	926004.3015	1115755.213	HB-0029-01	11/14/2006	SOIL	S-SB	REG	OBG	6	8	Ft	Covered in 2015	X	Subsurface Soil	None
HB-SB-68	AOS #1	926004.3015	1115755.213	HB-0029-02	11/14/2006	SOIL	S-SB	REG	OBG	6	8	Ft	Covered in 2015	X	Subsurface Soil	None
HB-SB-68	AOS #1	926004.3015	1115755.213	HB-0030-01	11/16/2006	SOIL	S-SB	REG	OBG	98	98.6	Ft	Covered in 2015	X	Subsurface Soil	None
HB-SB-68	AOS #1	926004.3015	1115755.213	HB-0030-02	11/16/2006	SOIL	S-SB	REG	OBG	98	98.6	Ft	Covered in 2015	X	Subsurface Soil	None
HB-SB-96	AOS #1	926141.4948	1115826.4016	HB-5087-01	02/27/2008	SOIL	SED	REG	PAR	56	58	FT	Covered in 2015	X	Subsurface Soil	None
HB-SB-96	AOS #1	926141.4948	1115826.4016	HB-5087-02	02/27/2008	SOIL	SED	REG	PAR	74	76	FT	Covered in 2015	X	Subsurface Soil	None
HB-STA-177 ALT	AOS #1	927156.11	1116244.08	HB-5122-01	08/26/2008	SOIL	S-SB	REG	PAR	0	4.0	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-177 ALT	AOS #1	927156.11	1116244.08	HB-5122-02	08/26/2008	SOIL	S-SB	REG	PAR	4.0	6.6	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-177 ALT	AOS #1	927156.11	1116244.08	HB-5122-03	08/26/2008	SOIL	S-SB	REG	PAR	6.6	9.9	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-177 ALT	AOS #1	927156.11	1116244.08	HB-5122-04	08/26/2008	SOIL	S-SB	REG	PAR	9.9	13.2	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-177 ALT	AOS #1	927156.11	1116244.08	HB-5122-05	08/26/2008	SOIL	S-SB	REG	PAR	13.2	16.5	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-177 ALT	AOS #1	927156.11	1116244.08	HB-5122-06	08/26/2008	SOIL	S-SB	REG	PAR	16.5	19.8	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-178 ALT	AOS #1	927029.43	1116168.05	HB-5119-01	08/25/2008	SOIL	S-SB	REG	PAR	0	4.0	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-178 ALT	AOS #1	927029.43	1116168.05	HB-5119-02	08/25/2008	SOIL	S-SB	REG	PAR	4.0	6.6	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-178 ALT	AOS #1	927029.43	1116168.05	HB-5119-03	08/25/2008	SOIL	S-SB	REG	PAR	6.6	9.9	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-178 ALT	AOS #1	927029.43	1116168.05	HB-5123-01	08/27/2008	SOIL	S-SB	REG	PAR	9.9	13.2	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-178 ALT	AOS #1	927029.43	1116168.05	HB-5123-02	08/27/2008	SOIL	S-SB	REG	PAR	13.2	16.5	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-178 ALT	AOS #1	927029.43	1116168.05	HB-5123-03	08/27/2008	SOIL	S-SB	REG	PAR	16.5	19.1	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-179	AOS #1	926718.72	1116138.68	HB-5118-06	08/22/2008	SOIL	S-SB	REG	PAR	0	3.3	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-179	AOS #1	926718.72	1116138.68	HB-5118-07	08/22/2008	SOIL	S-SB	REG	PAR	3.3	6.6	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-179	AOS #1	926718.72	1116138.68	HB-5118-08	08/22/2008	SOIL	S-SB	REG	PAR	6.6	9.9	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-179	AOS #1	926718.72	1116138.68	HB-5118-09	08/22/2008	SOIL	S-SB	REG	PAR	9.9	13.2	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-179	AOS #1	926718.72	1116138.68	HB-5123-04	08/27/2008	SOIL	S-SB	REG	PAR	13.2	14.7	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-179	AOS #1	926718.72	1116138.68	HB-5123-05	08/27/2008	SOIL	S-SB	REG	PAR	16.5	18.75	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-180	AOS #1	926639.74	1115985.69	HB-5118-01	08/22/2008	SOIL	S-SB	REG	PAR	0	3.3	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-180	AOS #1	926639.74	1115985.69	HB-5118-02	08/22/2008	SOIL	S-SB	REG	PAR	3.3	6.6	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-180	AOS #1	926639.74	1115985.69	HB-5118-03	08/22/2008	SOIL	S-SB	REG	PAR	6.6	9.9	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-180	AOS #1	926639.74	1115985.69	HB-5118-05	08/22/2008	SOIL	S-SB	REG	PAR	9.9	13.2	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-180	AOS #1	926639.74	1115985.69	HB-5125-13	08/28/2008	SOIL	S-SB	REG	PAR	13.2	16.5	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-180	AOS #1	926639.74	1115985.69	HB-5125-14	08/28/2008	SOIL	S-SB	REG	PAR	16.5	19.8	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-181	AOS #1	926515.34	1116064.17	HB-5116-01	08/21/2008	SOIL	S-SB	REG	PAR	0	3.3	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-181	AOS #1	926515.34	1116064.17	HB-5116-02	08/21/2008	SOIL	S-SB	REG	PAR	3.3	6.6	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-181	AOS #1	926515.34	1116064.17	HB-5116-03	08/21/2008	SOIL	S-SB	REG	PAR	6.6	9.9	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-181	AOS #1	926515.34	1116064.17	HB-5125-09	08/28/2008	SOIL	S-SB	REG	PAR	9.9	13.2	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-181	AOS #1	926515.34	1116064.17	HB-5125-10	08/28/2008	SOIL	S-SB	REG	PAR	13.2	16.5	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-181	AOS #1	926515.34	1116064.17	HB-5125-12	08/28/2008	SOIL	S-SB	REG	PAR	16.5	19.8	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-182	AOS #1	926445.82	1115921.98	HB-5114-05	08/20/2008	SOIL	S-SB	REG	PAR	0	3.3	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-182	AOS #1	926445.82	1115921.98	HB-5114-07	08/20/2008	SOIL	S-SB	REG	PAR	3.3	6.6	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-182	AOS #1	926445.82	1115921.98	HB-5114-08	08/20/2008	SOIL	S-SB	REG	PAR	6.6	9.9	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-182	AOS #1	926445.82	1115921.98	HB-5114-09	08/20/2008	SOIL	S-SB	REG	PAR	9.9	13.2	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-182	AOS #1	926445.82	1115921.98	HB-5125-07	08/28/2008	SOIL	S-SB	REG	PAR	13.2	16.5	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-182	AOS #1	926445.82	1115921.98	HB-5125-08	08/28/2008	SOIL	S-SB	REG	PAR	16.5	19.8	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-183	AOS #1	926261.09	1116028.14	HB-5113-01	08/20/2008	SOIL	S-SB	REG	PAR	0	3.3	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-183	AOS #1	926261.09	1116028.14	HB-5113-02	08/20/2008	SOIL	S-SB	REG	PAR	3.3	6.6	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-183	AOS #1	926261.09	1116028.14	HB-5113-03	08/20/2008	SOIL	S-SB	REG	PAR	6.6	9.9	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-183	AOS #1	926261.09	1116028.14	HB-5113-04	08/20/2008	SOIL	S-SB	REG	PAR	9.9	13.2	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-183	AOS #1	926261.09	1116028.14	HB-5113-05	08/20/2008	SOIL	S-SB	REG	PAR	13.2	16.5	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-183	AOS #1	926261.09	1116028.14	HB-5113-06	08/20/2008	SOIL	S-SB	REG	PAR	16.5	19.8	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-184	AOS #1	926180.23	1115930.29	HB-5125-01	08/28/2008	SOIL	S-SB	REG	PAR	0	4.0	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-184	AOS #1	926180.23	1115930.29	HB-5125-02	08/28/2008	SOIL	S-SB	REG	PAR	4.0	6.6	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-184	AOS #1	926180.23	1115930.29	HB-5125-03	08/28/2008	SOIL	S-SB	REG	PAR	6.6	9.9	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-184	AOS #1	926180.23	1115930.29	HB-5125-04	08/28/2008	SOIL	S-SB	REG	PAR	9.9	13.2	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-184	AOS #1	926180.23	1115930.29	HB-5125-05	08/28/2008	SOIL	S-SB	REG	PAR	13.2	16.5	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-184	AOS #1	926180.23	1115930.29	HB-5125-06	08/28/2008	SOIL	S-SB	REG	PAR	16.5	19.8	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-214	AOS #1	924241.887	1117632.774	HB-5132-01	09/30/2008	SOIL	S-SB	REG	PAR	0	3.3	ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-214	AOS #1	924241.887	1117632.774	HB-5132-02	09/30/2008	SOIL	S-SB	REG	PAR	3.3	6.6	ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-214	AOS #1	924241.887	1117632.774	HB-5132-03	09/30/2008	SOIL	S-SB	REG	PAR	6.6	9.9	ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-214	AOS #1	924241.887	1117632.774	HB-5132-04	09/30/2008	SOIL	S-SB	REG	PAR	9.9	13.2	ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-214	AOS #1	924241.887	1117632.774	HB-5132-05	09/30/2008	SOIL	S-SB	REG	PAR	13.2	16.5	ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-214	AOS #1	924241.887	1117632.774	HB-5132-06	09/30/2008	SOIL	S-SB	REG	PAR	16.5	19.8	ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
S384	AOS #1	926644.862849	1116181.291475	WS0019	08/11/2000	SOIL	SED	REG	EXP	0	0.49	Ft	Outboard Area	X	Surface Soil	Removed from dataset (Outboard Area)
S384	AOS #1	926644.862849	1116181.291475	WS0020	08/11/2000	SOIL	SED	REG	EXP	0.49	0.98	Ft	Outboard Area	X	Surface Soil	Removed from dataset (Outboard Area)

Location ID	Subsite Name	East	North	Field Sample ID	Date Sampled	Sample Matrix	Sample Type	Sample Purpose	Sampling Company	Start Depth	End Depth	Depth Units	Notes	Include in Initial Dataset	Surface/Subsurface (Initial Dataset)	Change in Use for FS
HB-HBSED-18	AOS #2	925686.361745	1115339.97343	HB9743	06/03/2003	SOIL	SED	REG	OBG	0	0.5	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-HBSED-18	AOS #2	925686.361745	1115339.97343	HB9744	06/03/2003	SOIL	SED	REG	OBG	0.5	1	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-HBSED-18	AOS #2	925686.361745	1115339.97343	HB9760	06/04/2003	SOIL	SED	REG	OBG	0	0.5	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-HBSED-18	AOS #2	925686.361745	1115339.97343	HB9763	06/04/2003	SOIL	SED	REG	OBG	0.5	1	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-RISB-10	AOS #2	925655.5	1115229.2	HB9673	02/25/2003	SOIL	S-SB	REG	OBG	34	36	Ft	Uncovered; pending final Site remedy	X	Subsurface Soil	None
HB-RISB-10	AOS #2	925655.5	1115229.2	HB9680	03/10/2003	SOIL	S-SB	REG	OBG	0.5	1	Ft	Uncovered; pending final Site remedy	X	Surface Soil	None
HB-RISB-10	AOS #2	925655.5	1115229.2	HB9681	03/10/2003	SOIL	S-SB	REG	OBG	0	0.5	Ft	Uncovered; pending final Site remedy	X	Surface Soil	None
HB-SB-69	AOS #2	925648.837	1115253.821	HB-0004-01	10/18/2006	SOIL	S-SB	REG	OBG	22	24	FT	Uncovered; pending final Site remedy	X	Subsurface Soil	None
HB-SB-69	AOS #2	925648.837	1115253.821	HB-0004-02	10/18/2006	SOIL	S-SB	REG	OBG	22	24	FT	Uncovered; pending final Site remedy	X	Subsurface Soil	None
HB-SB-70	AOS #2	925618.4205	1115228.855	HB-0002-03	10/17/2006	SOIL	S-SB	REG	OBG	24	26	FT	Uncovered; pending final Site remedy	X	Subsurface Soil	None
HB-SB-70	AOS #2	925618.4205	1115228.855	HB-0002-04	10/17/2006	SOIL	S-SB	REG	OBG	24	26	FT	Uncovered; pending final Site remedy	X	Subsurface Soil	None
UHB-DS-08	AOS #2	925971.2167	1115174.071	UHB-1009-01	01/09/2013	SOIL	S-CONF	REG	OBG	0	0.5	Ft	Covered by UHB IRM (sample from immediately below cover material)	X	Subsurface Soil	None
UHB-DS-08	AOS #2	925971.2167	1115174.071	UHB-1009-02	01/09/2013	SOIL	S-CONF	REG	OBG	0	0.5	Ft	Covered by UHB IRM (sample from immediately below cover material)	X	Subsurface Soil	None
UHB-DS-09	AOS #2	926287.2608	1114963.617	UHB-1010-01	02/07/2013	SOIL	S-CONF	REG	OBG	0	0.5	Ft	Covered by UHB IRM (sample from immediately below cover material)	X	Subsurface Soil	None
UHB-DS-09	AOS #2	926287.2608	1114963.617	UHB-1010-02	02/07/2013	SOIL	S-CONF	REG	OBG	0	0.5	Ft	Covered by UHB IRM (sample from immediately below cover material)	X	Subsurface Soil	None
UHB-DS-10	AOS #2	926619.3131	1114776.972	UHB-1011-01	02/15/2013	SOIL	S-CONF	REG	OBG	0	0.5	Ft	Covered by UHB IRM (sample from immediately below cover material)	X	Subsurface Soil	None
UHB-DS-10	AOS #2	926619.3131	1114776.972	UHB-1011-02	02/15/2013	SOIL	S-CONF	REG	OBG	0	0.5	Ft	Covered by UHB IRM (sample from immediately below cover material)	X	Subsurface Soil	None
UHB-DS-11	AOS #2	926968.0731	1114632.775	UHB-1008-01	12/06/2012	SOIL	S-CONF	REG	OBG	0	0.5	Ft	Covered by UHB IRM (sample from immediately below cover material)	X	Subsurface Soil	None
UHB-DS-11	AOS #2	926968.0731	1114632.775	UHB-1008-02	12/06/2012	SOIL	S-CONF	REG	OBG	0	0.5	Ft	Covered by UHB IRM (sample from immediately below cover material)	X	Subsurface Soil	None
UHB-DS-12	AOS #2	927271.7585	1114410.002	UHB-1006-01	11/28/2012	SOIL	S-CONF	REG	OBG	0	0.5	Ft	Covered by UHB IRM (sample from immediately below cover material)	X	Subsurface Soil	None
UHB-DS-12	AOS #2	927271.7585	1114410.002	UHB-1006-02	11/28/2012	SOIL	S-CONF	REG	OBG	0	0.5	Ft	Covered by UHB IRM (sample from immediately below cover material)	X	Subsurface Soil	None
HB-EF1	EAST FLUME	924269.988672	1117516.40762	HB9071	10/02/1997	SOIL	SED	REG	OBG	0	1.5	Ft	Covered by West Wall IRM/East Flume IRM	X	Surface Sediment	Subsurface Soil
HB-EF1	EAST FLUME	924269.988672	1117516.40762	OBG98EF1	10/02/1997	SOIL	SED	REG	OBG	0	1.5	FT	Covered by West Wall IRM/East Flume IRM	X	Surface Sediment	Subsurface Soil
HB-EF2	EAST FLUME	924211.048773	1117611.36635	HB9064	10/02/1997	SOIL	SED	REG	NYSDEC	0	2.2	Ft	Outboard Area	X	Surface Sediment	Removed from dataset (Outboard Area)
HB-EF3	EAST FLUME	924142.285557	1117575.34752	HB9070	10/02/1997	SOIL	SED	REG	OBG	0	3	Ft	Covered by West Wall IRM/East Flume IRM	X	Surface Sediment	Subsurface Soil
HB-EF4	EAST FLUME	924024.405765	1117653.93405	HB9072	10/02/1997	SOIL	SED	REG	OBG	0	1.5	Ft	Covered by West Wall IRM/East Flume IRM	X	Surface Sediment	Subsurface Soil
HB-EF5	EAST FLUME	923777.185645	1117688.31565	HB9067	10/02/1997	SOIL	SED	REG	OBG	3	4	Ft	Covered by West Wall IRM/East Flume IRM	X	Subsurface Sediment	Subsurface Soil
HB-EF5	EAST FLUME	923777.185645	1117688.31565	HB9068	10/02/1997	SOIL	SED	REG	NYSDEC	2	4	Ft	Covered by West Wall IRM/East Flume IRM	X	Subsurface Sediment	Subsurface Soil
HB-EF5	EAST FLUME	923777.185645	1117688.31565	HB9069	10/02/1997	SOIL	SED	REG	OBG	0	2	Ft	Covered by West Wall IRM/East Flume IRM	X	Surface Sediment	Subsurface Soil
HB-EF6	EAST FLUME	923511.956108	1117747.25555	HB9066	10/02/1997	SOIL	SED	REG	NYSDEC	0	3.25	Ft	Covered by West Wall IRM/East Flume IRM	X	Surface Sediment	Subsurface Soil
HB-EF7	EAST FLUME	923238.540477	1117788.18603	HB9065	10/02/1997	SOIL	SED	REG	OBG	0	2.25	Ft	Covered by West Wall IRM/East Flume IRM	X	Surface Sediment	Subsurface Soil
HB-EF8	EAST FLUME	924397.46627	1117557.56325	FCB6_EF8	11/19/1997	SOIL	SED	REG	OBG	0	1	Ft	Covered by West Wall IRM/East Flume IRM	X	Surface Sediment	Subsurface Soil
HB-EF8	EAST FLUME	924397.46627	1117557.56325	HB9099	11/19/1997	SOIL	SED	REG	OBG	0	1	Ft	Covered by West Wall IRM/East Flume IRM	X	Surface Sediment	Subsurface Soil
HB-EF8	EAST FLUME	924397.46627	1117557.56325	HB9100	11/19/1997	SOIL	SED	REG	OBG	0	1	Ft	Covered by West Wall IRM/East Flume IRM	X	Surface Sediment	Subsurface Soil
HB-EF8	EAST FLUME	924397.46627	1117557.56325	HB9136	09/29/1998	SOIL	SED	REG	NYSDEC	0.5	1.2	Ft	Covered by West Wall IRM/East Flume IRM	X	Surface Sediment	Subsurface Soil
HB-FCB6	EAST FLUME	924397.4663	1117557.5632	OBG98EF8	11/19/1997	SOIL	SED	REG	OBG	0	1	FT	Covered by West Wall IRM/East Flume IRM	X	Surface Sediment	Subsurface Soil
HB-LEF1	EAST FLUME	924530.30654	1117537.69147	HB9128	09/29/1998	SOIL	SED	REG	OBG	0	0.5	Ft	Outboard Area	X	Surface Sediment	Removed from dataset (Outboard Area)
HB-LEF1	EAST FLUME	924530.30654	1117537.69147	HB9139	09/29/1998	SOIL	SED	REG	OBG	0.5	2.3	Ft	Outboard Area	X	Surface Sediment	Removed from dataset (Outboard Area)
HB-LEF1	EAST FLUME	924530.30654	1117537.69147	HB9140	09/29/1998	SOIL	SED	REG	NYSDEC	1.5	2.3	Ft	Outboard Area	X	Subsurface Sediment	Removed from dataset (Outboard Area)
HB-LEF1	EAST FLUME	924530.30654	1117537.69147	HB9144	09/29/1998	SOIL	SED	REG	NYSDEC	0.5	1.5	Ft	Outboard Area	X	Surface Sediment	Removed from dataset (Outboard Area)
HB-LEF2	EAST FLUME	924698.940137	1117516.40762	HB9118	09/29/1998	SOIL	SED	REG	OBG	0	0.5	Ft	Outboard Area	X	Surface Sediment	Removed from dataset (Outboard Area)
HB-LEF2	EAST FLUME	924698.940137	1117516.40762	HB9121	09/29/1998	SOIL	SED	REG	NYSDEC	1.5	2.3	Ft	Outboard Area	X	Subsurface Sediment	Removed from dataset (Outboard Area)
HB-LEF2	EAST FLUME	924698.940137	1117516.40762	HB9133	09/29/1998	SOIL	SED	REG	OBG	0.5	2.3	Ft	Outboard Area	X	Surface Sediment	Removed from dataset (Outboard Area)
HB-LEF2	EAST FLUME	924698.940137	1117516.40762	HB9141	09/29/1998	SOIL	SED	REG	NYSDEC	0.5	1.5	Ft	Outboard Area	X	Surface Sediment	Removed from dataset (Outboard Area)
HB-LEF3	EAST FLUME	924672.744631	1117411.62558	HB9113	09/29/1998	SOIL	SED	REG	NYSDEC	0	0.5	Ft	Outboard Area	X	Surface Sediment	Removed from dataset (Outboard Area)
HB-LEF3	EAST FLUME	924672.744631	1117411.62558	HB9120	09/29/1998	SOIL	SED	REG	OBG	0.5	1	Ft	Outboard Area	X	Surface Sediment	Removed from dataset (Outboard Area)
HB-LEF4	EAST FLUME	924680.930725	1117220.07092	HB9117	09/29/1998	SOIL	SED	REG	OBG	0	0.5	Ft	Outboard Area	X	Surface Sediment	Removed from dataset (Outboard Area)
HB-LEF4	EAST FLUME	924680.930725	1117220.07092	HB9119	09/29/1998	SOIL	SED	REG	OBG	0.5	1.3	Ft	Outboard Area	X	Surface Sediment	Removed from dataset (Outboard Area)
HB-LEF5	EAST FLUME	924847.927094	1117213.52204	HB9114	09/29/1998	SOIL	SED	REG	OBG	0	0.5	Ft	Outboard Area	X	Surface Sediment	Removed from dataset (Outboard Area)
HB-LEF5	EAST FLUME	924847.927094	1117213.52204	HB9115	09/29/1998	SOIL	SED	REG	OBG	0.5	1	Ft	Outboard Area	X	Surface Sediment	Removed from dataset (Outboard Area)
HB-LEF5	EAST FLUME	924847.927094	1117213.52204	HB9116	09/29/1998	SOIL	SED	REG	OBG	0.5	0.96	Ft	Outboard Area	X	Surface Sediment	Removed from dataset (Outboard Area)
HB-SB-230	EAST FLUME	924200.4545	1117590.6877	HB-5149-01	11/15/2010	Soil	SED	REG	PAR	2.0	4.0	FT	Outboard Area	X	Subsurface Sediment	Removed from dataset (Outboard Area)
HB-SB-230	EAST FLUME	924200.4545	1117590.6877	HB-5149-02	11/15/2010	Soil	SED	REG	PAR	4.0	6.0	FT	Outboard Area	X	Subsurface Sediment	Removed from dataset (Outboard Area)
HB-SB-230	EAST FLUME	924200.4545	1117590.6877	HB-5150-09	11/16/2010	Soil	SED	REG	PAR	0.0	2.0	FT	Outboard Area	X	Surface Sediment	Removed from dataset (Outboard Area)
HB-SB-230	EAST FLUME	924200.4545	1117590.6877	HB-5150-10	11/16/2010	Soil	SED	REG	PAR	6.0	8.0	FT	Outboard Area	X	Subsurface Sediment	Removed from dataset (Outboard Area)
HB-SB-230	EAST FLUME	924200.4545	1117590.6877	HB-5150-11	11/16/2010	Soil	SED	REG	PAR	8.0	10.0	FT	Outboard Area	X	Subsurface Sediment	Removed from dataset (Outboard Area)
HB-SB-230	EAST FLUME	924200.4545	1117590.6877	HB-5150-12	11/16/2010	Soil	SED	REG	PAR	12.0	14.0	FT	Outboard Area	X	Subsurface Sediment	Removed from dataset (Outboard Area)
HB-SB-230	EAST FLUME	924200.4545	1117590.6877	HB-5150-13	11/16/2010	Soil	SED	REG	PAR	14.0	16.0	FT	Outboard Area	X	Subsurface Sediment	Removed from dataset (Outboard Area)
HB-SB-230	EAST FLUME	924200.4545	1117590.6877	HB-5150-14	11/16/2010	Soil	SED	REG	PAR	16.0	18.0	FT	Outboard Area	X	Subsurface Sediment	Removed from dataset (Outboard Area)
HB-SB-230	EAST FLUME	924200.4545	1117590.6877	HB-5150-15	11/16/2010	Soil	SED	REG	PAR	18.0	20.0	FT	Outboard Area	X	Subsurface Sediment	Removed from dataset (Outboard Area)

Location ID	Subsite Name	East	North	Field Sample ID	Date Sampled	Sample Matrix	Sample Type	Sample Purpose	Sampling Company	Start Depth	End Depth	Depth Units	Notes	Include in Initial Dataset	Surface/Subsurface (Initial Dataset)	Change in Use for FS
HB-SB-232	EAST FLUME	924318.2151	1117556.5679	HB-5149-03	11/15/2010	Soil	SED	REG	PAR	4.0	6.0	FT	Outboard Area	X	Subsurface Sediment	Removed from dataset (Outboard Area)
HB-SB-232	EAST FLUME	924318.2151	1117556.5679	HB-5150-01	11/16/2010	Soil	SED	REG	PAR	0.0	2.0	FT	Outboard Area	X	Surface Sediment	Removed from dataset (Outboard Area)
HB-SB-232	EAST FLUME	924318.2151	1117556.5679	HB-5150-02	11/16/2010	Soil	SED	REG	PAR	2.0	4.0	FT	Outboard Area	X	Subsurface Sediment	Removed from dataset (Outboard Area)
HB-SB-232	EAST FLUME	924318.2151	1117556.5679	HB-5150-03	11/16/2010	Soil	SED	REG	PAR	8.0	10.0	FT	Outboard Area	X	Subsurface Sediment	Removed from dataset (Outboard Area)
HB-SB-232	EAST FLUME	924318.2151	1117556.5679	HB-5150-04	11/16/2010	Soil	SED	REG	PAR	10.0	12.0	FT	Outboard Area	X	Subsurface Sediment	Removed from dataset (Outboard Area)
HB-SB-232	EAST FLUME	924318.2151	1117556.5679	HB-5150-05	11/16/2010	Soil	SED	REG	PAR	12.0	14.0	FT	Outboard Area	X	Subsurface Sediment	Removed from dataset (Outboard Area)
HB-SB-232	EAST FLUME	924318.2151	1117556.5679	HB-5150-06	11/16/2010	Soil	SED	REG	PAR	16.0	18.0	FT	Outboard Area	X	Subsurface Sediment	Removed from dataset (Outboard Area)
HB-SB-232	EAST FLUME	924318.2151	1117556.5679	HB-5150-07	11/16/2010	Soil	SED	REG	PAR	18.0	20.0	FT	Outboard Area	X	Subsurface Sediment	Removed from dataset (Outboard Area)
HB-UEF1	EAST FLUME	924287.998079	1117498.39821	HB9145	09/29/1998	SOIL	SED	REG	OBG	0	0.5	Ft	Covered by West Wall IRM/East Flume IRM	X	Surface Sediment	Subsurface Soil
HB-UEF1	EAST FLUME	924287.998079	1117498.39821	HB9154	09/30/1998	SOIL	SED	REG	OBG	0	0.5	Ft	Covered by West Wall IRM/East Flume IRM	X	Surface Sediment	Subsurface Soil
HB-UEF2	EAST FLUME	924230.695408	1117591.71971	HB9146	09/29/1998	SOIL	SED	REG	OBG	0	0.5	Ft	Covered by West Wall IRM/East Flume IRM	X	Surface Sediment	Subsurface Soil
HB-UEF2	EAST FLUME	924230.695408	1117591.71971	HB9157	09/30/1998	SOIL	SED	REG	OBG	0	0.5	Ft	Covered by West Wall IRM/East Flume IRM	X	Surface Sediment	Subsurface Soil
HB-UEF3	EAST FLUME	924158.657751	1117558.97532	HB9143	09/29/1998	SOIL	SED	REG	OBG	0	0.5	Ft	Covered by West Wall IRM/East Flume IRM	X	Surface Sediment	Subsurface Soil
HB-UEF3	EAST FLUME	924158.657751	1117558.97532	HB9159	09/30/1998	SOIL	SED	REG	OBG	0	0.5	Ft	Covered by West Wall IRM/East Flume IRM	X	Surface Sediment	Subsurface Soil
HB-UEF4	EAST FLUME	924042.415182	1117635.92463	HB9147	09/29/1998	SOIL	SED	REG	OBG	0	0.5	Ft	Covered by West Wall IRM/East Flume IRM	X	Surface Sediment	Subsurface Soil
HB-UEF4	EAST FLUME	924042.415182	1117635.92463	HB9161	09/30/1998	SOIL	SED	REG	OBG	0	0.5	Ft	Covered by West Wall IRM/East Flume IRM	X	Surface Sediment	Subsurface Soil
HB-UEF5	EAST FLUME	923796.832279	1117668.66902	HB9148	09/29/1998	SOIL	SED	REG	OBG	0	0.5	Ft	Covered by West Wall IRM/East Flume IRM	X	Surface Sediment	Subsurface Soil
HB-UEF5	EAST FLUME	923796.832279	1117668.66902	HB9162	09/30/1998	SOIL	SED	REG	OBG	0	0.5	Ft	Covered by West Wall IRM/East Flume IRM	X	Surface Sediment	Subsurface Soil
HB-UEF6	EAST FLUME	923529.965525	1117729.24614	HB9149	09/29/1998	SOIL	SED	REG	NYSDEC	0.5	1.5	Ft	Covered by West Wall IRM/East Flume IRM	X	Surface Sediment	Subsurface Soil
HB-UEF6	EAST FLUME	923529.965525	1117729.24614	HB9150	09/29/1998	SOIL	SED	REG	OBG	0	0.5	Ft	Covered by West Wall IRM/East Flume IRM	X	Surface Sediment	Subsurface Soil
HB-UEF6	EAST FLUME	923529.965525	1117729.24614	HB9151	09/29/1998	SOIL	SED	REG	NYSDEC	1.5	2.5	Ft	Covered by West Wall IRM/East Flume IRM	X	Subsurface Sediment	Subsurface Soil
HB-UEF6	EAST FLUME	923529.965525	1117729.24614	HB9152	09/29/1998	SOIL	SED	REG	OBG	0.5	2.6	Ft	Covered by West Wall IRM/East Flume IRM	X	Surface Sediment	Subsurface Soil
HB-UEF6	EAST FLUME	923529.965525	1117729.24614	HB9160	09/30/1998	SOIL	SED	REG	OBG	0	0.5	Ft	Covered by West Wall IRM/East Flume IRM	X	Surface Sediment	Subsurface Soil
HB-UEF7	EAST FLUME	923251.638235	1117771.81384	HB9153	09/29/1998	SOIL	SED	REG	OBG	0	0.5	Ft	Covered by West Wall IRM/East Flume IRM	X	Surface Sediment	Subsurface Soil
HB-UEF7	EAST FLUME	923251.638235	1117771.81384	HB9158	09/30/1998	SOIL	SED	REG	OBG	0	0.5	Ft	Covered by West Wall IRM/East Flume IRM	X	Surface Sediment	Subsurface Soil
HB-UEF7	EAST FLUME	923251.638235	1117771.81384	UEF-7	09/29/1998	SOIL	SED	REG	OBG	0	0.5	FT	Covered by West Wall IRM/East Flume IRM	X	Surface Sediment	Subsurface Soil
HB-CSXSED-1	HARBOR BROOK	925769.173662	1115565.84455	HB9591	11/14/2002	SOIL	SED	REG	OBG	0	0.5	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-CSXSED-2	HARBOR BROOK	925794.712617	1115610.82362	HB9590	11/14/2002	SOIL	SED	REG	OBG	0	0.5	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-H1	HARBOR BROOK	NA	NA	HB9035	11/07/1996	SOIL	SED	REG	NYSDEC	NA	NA	Ft	Removed by UHB IRM; placed on Wastebed B	X	Subsurface Sediment	Removed; placed on Wastebed B
HB-H1	HARBOR BROOK	NA	NA	HB9036	11/07/1996	SOIL	SED	REG	OBG	0	1	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-H1	HARBOR BROOK	NA	NA	HB9037	11/07/1996	SOIL	SED	REG	OBG	1	2.2	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-H10	HARBOR BROOK	925596.913406	1115277.58859	HB9041	11/13/1996	SOIL	SED	REG	NYSDEC	0	1	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-H107	HARBOR BROOK	925549.00923	1115216.83107	HB9081	10/23/1997	SOIL	SED	REG	NYSDEC	NA	NA	Ft	Removed by UHB IRM; placed on Wastebed B	X	Subsurface Sediment	Removed; placed on Wastebed B
HB-H11	HARBOR BROOK	925461.445729	1115027.65041	HB9044	11/13/1996	SOIL	SED	REG	NYSDEC	0	0.83	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-H112	HARBOR BROOK	925885.787383	1115793.92308	HB9085	10/23/1997	SOIL	SED	REG	NYSDEC	NA	NA	Ft	Removed by UHB IRM; placed on Wastebed B	X	Subsurface Sediment	Removed; placed on Wastebed B
HB-H13	HARBOR BROOK	926698.892441	1113763.35695	HB9048	11/15/1996	SOIL	SED	REG	NYSDEC	0	0.58	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-H14	HARBOR BROOK	927390.913184	1113008.90301	HB9047	11/15/1996	SOIL	SED	REG	NYSDEC	0	1.1	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-H2	HARBOR BROOK	926428.127865	1116177.43044	HB9024	11/07/1996	SOIL	SED	REG	OBG	0	1.3	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-H2	HARBOR BROOK	926428.127865	1116177.43044	HB9029	11/07/1996	SOIL	SED	REG	NYSDEC	0	0.5	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-H3	HARBOR BROOK	926320.901351	1116180.08145	HB9020	11/07/1996	SOIL	SED	REG	OBG	1	1.8	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-H3	HARBOR BROOK	926320.901351	1116180.08145	HB9023	11/07/1996	SOIL	SED	REG	NYSDEC	0	0.5	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-H3	HARBOR BROOK	926320.901351	1116180.08145	HB9025	11/07/1996	SOIL	SED	REG	OBG	0	1	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-H4	HARBOR BROOK	926327.093249	1116157.53862	HB9019	11/07/1996	SOIL	SED	REG	OBG	0	1	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-H4	HARBOR BROOK	926327.093249	1116157.53862	HB9021	11/07/1996	SOIL	SED	REG	NYSDEC	0	0.5	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-H4	HARBOR BROOK	926327.093249	1116157.53862	HB9026	11/07/1996	SOIL	SED	REG	OBG	1	2.2	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-H5	HARBOR BROOK	926259.231911	1116139.81071	HB9027	11/07/1996	SOIL	SED	REG	NYSDEC	0	0.5	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-H5	HARBOR BROOK	926259.231911	1116139.81071	HB9028	11/07/1996	SOIL	SED	REG	OBG	1	1.6	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-H5	HARBOR BROOK	926259.231911	1116139.81071	HB9034	11/07/1996	SOIL	SED	REG	OBG	0	1	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-H6	HARBOR BROOK	926212.318298	1116125.72318	HB9022	11/07/1996	SOIL	SED	REG	NYSDEC	0	0.5	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-H6	HARBOR BROOK	926212.318298	1116125.72318	HB9032	11/07/1996	SOIL	SED	REG	OBG	0	0.8	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-H7	HARBOR BROOK	926132.266113	1116127.16252	HB9031	11/07/1996	SOIL	SED	REG	NYSDEC	0	0.5	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-H7	HARBOR BROOK	926132.266113	1116127.16252	HB9033	11/07/1996	SOIL	SED	REG	OBG	0	1	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-H8	HARBOR BROOK	925878.511073	1115778.61314	HB9038	11/13/1996	SOIL	SED	REG	NYSDEC	0	1.1	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-H9	HARBOR BROOK	925540.295728	1115199.52239	HB9042	11/13/1996	SOIL	SED	REG	NYSDEC	0	0.75	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-HBSED-14	HARBOR BROOK	925807.01288	1115634.6303	HB9588	11/14/2002	SOIL	SED	REG	OBG	0	0.33	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-HBSED-15	HARBOR BROOK	925791.086614	1115626.60818	HB9589	11/14/2002	SOIL	SED	REG	OBG	0	0.25	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-HBSED-16	HARBOR BROOK	925870.668552	1115760.38501	HB9728	06/02/2003	SOIL	SED	REG	OBG	0	0.5	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-HBSED-19	HARBOR BROOK	925626.982433	1115331.16275	HB9746	06/03/2003	SOIL	SED	REG	OBG	0.5	1	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-HBSED-19	HARBOR BROOK	925626.982433	1115331.16275	HB9747	06/03/2003	SOIL	SED	REG	OBG	0	0.5	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-HBSED-19	HARBOR BROOK	925626.982433	1115331.16275	HB9755	06/04/2003	SOIL	SED	REG	OBG	0.5	1	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-HBSED-19	HARBOR BROOK	925626.982433	1115331.16275	HB9756	06/04/2003	SOIL	SED	REG	OBG	0	0.5	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-HBSED-20	HARBOR BROOK	925530.179103	1115183.19744	HB9748	06/03/2003	SOIL	SED	REG	OBG	0	0.5	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-HBSED-20	HARBOR BROOK	925530.179103	1115183.19744	HB9761	06/04/2003	SOIL	SED	REG	OBG	0	0.5	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-OW-01	HARBOR BROOK	NA	NA	HB-1037-09	07/02/2008	SOIL	SED	REG	OBG	1	2	FT	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-OW-03	HARBOR BROOK	NA	NA	HB-1050-05	07/15/2008	SOIL	SED	REG	OBG	0.5	1.5	FT	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-S-1	HARBOR BROOK	925569.144787	1115241.76616	HB9354	01/31/2001	SOIL	SED	REG	BBL	0	0.5	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-S-1	HARBOR BROOK	925569.144787	1115241.76616	HB9436	02/16/2001	SOIL	SED	REG	BBL	0	0.5	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-S-2	HARBOR BROOK	925451.962435	1115038.48889	HB9353	01/31/2001	SOIL	SED	REG	BBL	0	0.5	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-S-2	HARBOR BROOK	925451.962435	1115038.48889	HB9427	02/16/2001	SOIL	SED	REG	BBL	0	0.5	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B

Location ID	Subsite Name	East	North	Field Sample ID	Date Sampled	Sample Matrix	Sample Type	Sample Purpose	Sampling Company	Start Depth	End Depth	Depth Units	Notes	Include in Initial Dataset	Surface/Subsurface (Initial Dataset)	Change in Use for FS
HB-SB-82	HARBOR BROOK	925637.1965	1115351.774	HB-0001-01	10/16/2006	SOIL	S-SB	REG	OBG	1	3	FT	Removed by UHB IRM; placed on Wastebed B	X	Subsurface Sediment	Removed; placed on Wastebed B
HB-SB-82	HARBOR BROOK	925637.1965	1115351.774	HB-0001-02	10/16/2006	SOIL	S-SB	REG	OBG	1	3	FT	Removed by UHB IRM; placed on Wastebed B	X	Subsurface Sediment	Removed; placed on Wastebed B
HB-SB-83	HARBOR BROOK	925530.5015	1115197.029	HB-0001-03	10/17/2006	SOIL	S-SB	REG	OBG	1	3	FT	Removed by UHB IRM; placed on Wastebed B	X	Subsurface Sediment	Removed; placed on Wastebed B
HB-SB-83	HARBOR BROOK	925530.5015	1115197.029	HB-0001-04	10/17/2006	SOIL	S-SB	REG	OBG	1	3	FT	Removed by UHB IRM; placed on Wastebed B	X	Subsurface Sediment	Removed; placed on Wastebed B
HB-SB-90	HARBOR BROOK	925530.5	1115197.1	HB-0011-01	10/27/2006	SOIL	S-SB	REG	OBG	9	11	FT	Covered by UHB IRM	X	Subsurface Soil	None
HB-SB-90	HARBOR BROOK	925530.5	1115197.1	HB-0011-02	10/27/2006	SOIL	S-SB	REG	OBG	9	11	FT	Covered by UHB IRM	X	Subsurface Soil	None
HB-SED-27	HARBOR BROOK	925634	1115343	HB-1038-01	07/09/2008	SOIL	SED	REG	OBG	1.5	2.5	FT	Removed by UHB IRM; placed on Wastebed B	X	Subsurface Sediment	Removed; placed on Wastebed B
HB-SED-27	HARBOR BROOK	925634	1115343	HB-1038-02	07/09/2008	SOIL	SED	REG	OBG	1.5	2.5	FT	Removed by UHB IRM; placed on Wastebed B	X	Subsurface Sediment	Removed; placed on Wastebed B
HB-SED-27	HARBOR BROOK	925634	1115343	HB-1038-03	07/09/2008	SOIL	SED	REG	OBG	2.5	3.5	Ft	Removed by UHB IRM; placed on Wastebed B	X	Subsurface Sediment	Removed; placed on Wastebed B
HB-SED-27	HARBOR BROOK	925634	1115343	HB-1038-04	07/09/2008	SOIL	SED	REG	OBG	2.5	3.5	FT	Removed by UHB IRM; placed on Wastebed B	X	Subsurface Sediment	Removed; placed on Wastebed B
HB-SED-28	HARBOR BROOK	925874	1115763	HB-1031-01	07/02/2008	SOIL	SED	REG	OBG	1	2	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-SED-28	HARBOR BROOK	925874	1115763	HB-1031-02	07/02/2008	SOIL	SED	REG	OBG	1	2	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-SED-28	HARBOR BROOK	925874	1115763	HB-1031-03	07/02/2008	SOIL	SED	REG	OBG	2	3	Ft	Removed by UHB IRM; placed on Wastebed B	X	Subsurface Sediment	Removed; placed on Wastebed B
HB-SED-28	HARBOR BROOK	925874	1115763	HB-1031-04	07/02/2008	SOIL	SED	REG	OBG	2	3	Ft	Removed by UHB IRM; placed on Wastebed B	X	Subsurface Sediment	Removed; placed on Wastebed B
HB-T-1-1	HARBOR BROOK	926403.171433	1116187.91144	HB9289	01/24/2001	SOIL	SED	REG	BBL	0	0.5	Ft	Outboard Area	X	Surface Sediment	Removed from dataset (Outboard Area)
HB-T-1-1	HARBOR BROOK	926403.171433	1116187.91144	HB9362	02/06/2001	SOIL	SED	REG	BBL	0	0.5	Ft	Outboard Area	X	Surface Sediment	Removed from dataset (Outboard Area)
HB-T-1-2	HARBOR BROOK	926399.543865	1116195.92096	HB9285	01/24/2001	SOIL	SED	REG	BBL	1.5	2.5	Ft	Outboard Area	X	Subsurface Sediment	Removed from dataset (Outboard Area)
HB-T-1-2	HARBOR BROOK	926399.543865	1116195.92096	HB9287	01/24/2001	SOIL	SED	REG	BBL	0.5	1.5	Ft	Outboard Area	X	Surface Sediment	Removed from dataset (Outboard Area)
HB-T-1-2	HARBOR BROOK	926399.543865	1116195.92096	HB9290	01/24/2001	SOIL	SED	REG	BBL	2.5	3.4	Ft	Outboard Area	X	Subsurface Sediment	Removed from dataset (Outboard Area)
HB-T-1-2	HARBOR BROOK	926399.543865	1116195.92096	HB9291	01/24/2001	SOIL	SED	REG	BBL	3.4	4.4	Ft	Outboard Area	X	Subsurface Sediment	Removed from dataset (Outboard Area)
HB-T-1-2	HARBOR BROOK	926399.543865	1116195.92096	HB9292	01/24/2001	SOIL	SED	REG	BBL	5.4	6.4	Ft	Outboard Area	X	Subsurface Sediment	Removed from dataset (Outboard Area)
HB-T-1-2	HARBOR BROOK	926399.543865	1116195.92096	HB9293	01/24/2001	SOIL	SED	REG	BBL	7.4	8.1	Ft	Outboard Area	X	Subsurface Sediment	Removed from dataset (Outboard Area)
HB-T-1-2	HARBOR BROOK	926399.543865	1116195.92096	HB9294	01/24/2001	SOIL	SED	REG	BBL	6.4	7.4	Ft	Outboard Area	X	Subsurface Sediment	Removed from dataset (Outboard Area)
HB-T-1-2	HARBOR BROOK	926399.543865	1116195.92096	HB9295	01/24/2001	SOIL	SED	REG	BBL	1.5	4.4	Ft	Outboard Area	X	Subsurface Sediment	Removed from dataset (Outboard Area)
HB-T-1-2	HARBOR BROOK	926399.543865	1116195.92096	HB9296	01/24/2001	SOIL	SED	REG	BBL	0	0.5	Ft	Outboard Area	X	Surface Sediment	Removed from dataset (Outboard Area)
HB-T-1-2	HARBOR BROOK	926399.543865	1116195.92096	HB9297	01/24/2001	SOIL	SED	REG	BBL	4.4	7.4	Ft	Outboard Area	X	Subsurface Sediment	Removed from dataset (Outboard Area)
HB-T-1-2	HARBOR BROOK	926399.543865	1116195.92096	HB9298	01/24/2001	SOIL	SED	REG	BBL	4.4	5.4	Ft	Outboard Area	X	Subsurface Sediment	Removed from dataset (Outboard Area)
HB-T-1-2	HARBOR BROOK	926399.543865	1116195.92096	HB9358	02/06/2001	SOIL	SED	REG	BBL	2.5	3.4	Ft	Outboard Area	X	Subsurface Sediment	Removed from dataset (Outboard Area)
HB-T-1-2	HARBOR BROOK	926399.543865	1116195.92096	HB9359	02/06/2001	SOIL	SED	REG	BBL	6.4	7.4	Ft	Outboard Area	X	Subsurface Sediment	Removed from dataset (Outboard Area)
HB-T-1-2	HARBOR BROOK	926399.543865	1116195.92096	HB9360	02/06/2001	SOIL	SED	REG	BBL	1.5	2.5	Ft	Outboard Area	X	Subsurface Sediment	Removed from dataset (Outboard Area)
HB-T-1-2	HARBOR BROOK	926399.543865	1116195.92096	HB9361	02/06/2001	SOIL	SED	REG	BBL	0	0.5	Ft	Outboard Area	X	Surface Sediment	Removed from dataset (Outboard Area)
HB-T-1-2	HARBOR BROOK	926399.543865	1116195.92096	HB9363	02/06/2001	SOIL	SED	REG	BBL	0.5	1.5	Ft	Outboard Area	X	Surface Sediment	Removed from dataset (Outboard Area)
HB-T-1-2	HARBOR BROOK	926399.543865	1116195.92096	HB9364	02/06/2001	SOIL	SED	REG	BBL	4.4	5.4	Ft	Outboard Area	X	Subsurface Sediment	Removed from dataset (Outboard Area)
HB-T-1-2	HARBOR BROOK	926399.543865	1116195.92096	HB9365	02/06/2001	SOIL	SED	REG	BBL	3.4	4.4	Ft	Outboard Area	X	Subsurface Sediment	Removed from dataset (Outboard Area)
HB-T-1-2	HARBOR BROOK	926399.543865	1116195.92096	HB9366	02/06/2001	SOIL	SED	REG	BBL	7.4	8.1	Ft	Outboard Area	X	Subsurface Sediment	Removed from dataset (Outboard Area)
HB-T-1-2	HARBOR BROOK	926399.543865	1116195.92096	HB9367	02/06/2001	SOIL	SED	REG	BBL	5.4	6.4	Ft	Outboard Area	X	Subsurface Sediment	Removed from dataset (Outboard Area)
HB-T-1-3	HARBOR BROOK	926392.893305	1116207.72504	HB9286	01/24/2001	SOIL	SED	REG	BBL	0	0.5	Ft	Outboard Area	X	Surface Sediment	Removed from dataset (Outboard Area)
HB-T-1-3	HARBOR BROOK	926392.893305	1116207.72504	HB9374	02/08/2001	SOIL	SED	REG	BBL	0	0.5	Ft	Outboard Area	X	Surface Sediment	Removed from dataset (Outboard Area)
HB-T-2-1	HARBOR BROOK	926160.778265	1116113.12867	HB9301	01/25/2001	SOIL	SED	REG	BBL	0	0.5	Ft	Outboard Area	X	Surface Sediment	Removed from dataset (Outboard Area)
HB-T-2-1	HARBOR BROOK	926160.778265	1116113.12867	HB9380	02/12/2001	SOIL	SED	REG	BBL	0	0.5	Ft	Outboard Area	X	Surface Sediment	Removed from dataset (Outboard Area)
HB-T-2-2	HARBOR BROOK	926160.348409	1116122.13427	HB9302	01/25/2001	SOIL	SED	REG	BBL	0	0.5	Ft	Outboard Area	X	Surface Sediment	Removed from dataset (Outboard Area)
HB-T-2-2	HARBOR BROOK	926160.348409	1116122.13427	HB9409	02/13/2001	SOIL	SED	REG	BBL	0	15	Ft	Outboard Area	X	Surface Sediment	Removed from dataset (Outboard Area)
HB-T-2-3	HARBOR BROOK	926158.508233	1116133.25891	HB9299	01/25/2001	SOIL	SED	REG	BBL	7.4	8.4	Ft	Outboard Area	X	Subsurface Sediment	Removed from dataset (Outboard Area)
HB-T-2-3	HARBOR BROOK	926158.508233	1116133.25891	HB9300	01/25/2001	SOIL	SED	REG	BBL	4.4	5.4	Ft	Outboard Area	X	Subsurface Sediment	Removed from dataset (Outboard Area)
HB-T-2-3	HARBOR BROOK	926158.508233	1116133.25891	HB9303	01/25/2001	SOIL	SED	REG	BBL	0.5	1.5	Ft	Outboard Area	X	Surface Sediment	Removed from dataset (Outboard Area)
HB-T-2-3	HARBOR BROOK	926158.508233	1116133.25891	HB9304	01/25/2001	SOIL	SED	REG	BBL	0	0.5	Ft	Outboard Area	X	Surface Sediment	Removed from dataset (Outboard Area)
HB-T-2-3	HARBOR BROOK	926158.508233	1116133.25891	HB9305	01/25/2001	SOIL	SED	REG	BBL	1.5	2.5	Ft	Outboard Area	X	Subsurface Sediment	Removed from dataset (Outboard Area)
HB-T-2-3	HARBOR BROOK	926158.508233	1116133.25891	HB9306	01/25/2001	SOIL	SED	REG	BBL	1.5	4.4	Ft	Outboard Area	X	Subsurface Sediment	Removed from dataset (Outboard Area)
HB-T-2-3	HARBOR BROOK	926158.508233	1116133.25891	HB9307	01/25/2001	SOIL	SED	REG	BBL	8.4	9.4	Ft	Outboard Area	X	Subsurface Sediment	Removed from dataset (Outboard Area)
HB-T-2-3	HARBOR BROOK	926158.508233	1116133.25891	HB9308	01/25/2001	SOIL	SED	REG	BBL	3.4	4.4	Ft	Outboard Area	X	Subsurface Sediment	Removed from dataset (Outboard Area)
HB-T-2-3	HARBOR BROOK	926158.508233	1116133.25891	HB9309	01/25/2001	SOIL	SED	REG	BBL	4.4	7.4	Ft	Outboard Area	X	Subsurface Sediment	Removed from dataset (Outboard Area)
HB-T-2-3	HARBOR BROOK	926158.508233	1116133.25891	HB9311	01/25/2001	SOIL	SED	REG	BBL	5.4	6.4	Ft	Outboard Area	X	Subsurface Sediment	Removed from dataset (Outboard Area)
HB-T-2-3	HARBOR BROOK	926158.508233	1116133.25891	HB9312	01/25/2001	SOIL	SED	REG	BBL	9.4	9.8	Ft	Outboard Area	X	Subsurface Sediment	Removed from dataset (Outboard Area)
HB-T-2-3	HARBOR BROOK	926158.508233	1116133.25891	HB9313	01/25/2001	SOIL	SED	REG	BBL	6.4	7.4	Ft	Outboard Area	X	Subsurface Sediment	Removed from dataset (Outboard Area)
HB-T-2-3	HARBOR BROOK	926158.508233	1116133.25891	HB9314	01/25/2001	SOIL	SED	REG	BBL	7.4	9.8	Ft	Outboard Area	X	Subsurface Sediment	Removed from dataset (Outboard Area)
HB-T-2-3	HARBOR BROOK	926158.508233	1116133.25891	HB9315	01/25/2001	SOIL	SED	REG	BBL	2.5	3.4	Ft	Outboard Area	X	Subsurface Sediment	Removed from dataset (Outboard Area)
HB-T-2-3	HARBOR BROOK	926158.508233	1116133.25891	HB9376	02/12/2001	SOIL	SED	REG	BBL	1.5	2.5	Ft	Outboard Area	X	Subsurface Sediment	Removed from dataset (Outboard Area)
HB-T-2-3	HARBOR BROOK	926158.508233	1116133.25891	HB9377	02/12/2001	SOIL	SED	REG	BBL	5.4	6.4	Ft	Outboard Area	X	Subsurface Sediment	Removed from dataset (Outboard Area)
HB-T-2-3	HARBOR BROOK	926158.508233	1116133.25891	HB9379	02/12/2001	SOIL	SED	REG	BBL	4.4	5.4	Ft	Outboard Area	X	Subsurface Sediment	Removed from dataset (Outboard Area)
HB-T-2-3	HARBOR BROOK	926158.508233	1116133.25891	HB9382	02/12/2001	SOIL	SED	REG	BBL	22	23.1	Ft	Outboard Area	X	Subsurface Sediment	Removed from dataset (Outboard Area)
HB-T-2-3	HARBOR BROOK	926158.508233	1116133.25891	HB9383	02/12/2001	SOIL	SED	REG	BBL	6.4	7.4	Ft	Outboard Area	X	Subsurface Sediment	Removed from dataset (Outboard Area)
HB-T-2-3	HARBOR BROOK	926158.508233	1116133.25891	HB9384	02/12/2001	SOIL	SED	REG	BBL	2.5	3.4	Ft	Outboard Area	X	Subsurface Sediment	Removed from dataset (Outboard Area)
HB-T-2-3	HARBOR BROOK	926158.508233	1116133.25891	HB9385	02/12/2001	SOIL	SED	REG	BBL	14	16.5	Ft	Outboard Area	X	Subsurface Sediment	Removed from dataset (Outboard Area)
HB-T-2-3	HARBOR BROOK	926158.508233	1116133.25891	HB9387	02/12/2001	SOIL	SED	REG	BBL	0.5	1.5	Ft	Outboard Area	X	Surface Sediment	Removed from dataset (Outboard Area)
HB-T-2-3	HARBOR BROOK	926158.508233	1116133.25891	HB9388	02/12/2001	SOIL	SED	REG	BBL	23.1	26.7	Ft	Outboard Area	X	Subsurface Sediment	Removed from dataset (Outboard Area)
HB-T-2-3	HARBOR BROOK	926158.508233	1116133.25891	HB9389	02/12/2001	SOIL	SED	REG	BBL	8.4	9.4	Ft	Outboard Area	X	Subsurface Sediment	Removed from dataset (Outboard Area)
HB-T-2-3	HARBOR BROOK	926158.508233	1116133.25891	HB9390	02/12/2001	SOIL	SED	REG	BBL	9.4	9.8	Ft	Outboard Area	X	Subsurface Sediment	Removed from dataset (Outboard Area)
HB-T-2-3	HARBOR BROOK	926158.508233	1116133.25891	HB9391	02/12/2001	SOIL	SED	REG	BBL	3.4	4.4	Ft	Outboard Area	X	Subsurface Sediment	Removed from dataset (Outboard Area)
HB-T-2-3	HARBOR BROOK	926158.508233	1116133.25891	HB9392	02/12/2001	SOIL	SED	REG	BBL	0	0.5	Ft	Outboard Area	X	Surface Sediment	Removed from dataset (Outboard Area)
HB-T-2-3	HARBOR BROOK	926158.508233	1116133.25891	HB9393	02/12/2001	SOIL	SED	REG	BBL	7.4	8.4	Ft	Outboard Area	X	Subsurface Sediment	Removed from dataset (Outboard Area)
HB-T-2-3	HARBOR BROOK	926158.508233	1116133.25891	HB9473	03/02/2001	SOIL	SED	REG	BBL	14	16.5	Ft	Outboard Area	X	Subsurface Sediment	Removed from dataset (Outboard Area)
HB-T-2-3	HARBOR BROOK	926158.508233	1116133.25891	HB9478	03/02/2001	SOIL	SED	REG	BBL	22	23.1	Ft	Outboard Area	X	Subsurface Sediment	Removed from dataset (Outboard Area)
HB-T-2-3	HARBOR BROOK	926158.508233	1116133.25891	HB9480	03/02/2001	SOIL	SED	REG	BBL	23.1	26.7	Ft	Outboard Area	X	Subsurface Sediment	Removed from dataset (Outboard Area)

Location ID	Subsite Name	East	North	Field Sample ID	Date Sampled	Sample Matrix	Sample Type	Sample Purpose	Sampling Company	Start Depth	End Depth	Depth Units	Notes	Include in Initial Dataset	Surface/Subsurface (Initial Dataset)	Change in Use for FS
HB-T-3-1	HARBOR BROOK	926023.573224	1116123.19441	HB9317	01/26/2001	SOIL	SED	REG	BBL	0	0.5	Ft	Covered by East Wall IRM	X	Surface Sediment	Subsurface Soil
HB-T-3-1	HARBOR BROOK	926023.573224	1116123.19441	HB9421	02/14/2001	SOIL	SED	REG	BBL	0	0.5	Ft	Covered by East Wall IRM	X	Surface Sediment	Subsurface Soil
HB-T-3-2	HARBOR BROOK	926010.351416	1116137.59717	HB9318	01/26/2001	SOIL	SED	REG	BBL	2.5	3.4	Ft	Covered by East Wall IRM	X	Subsurface Sediment	Subsurface Soil
HB-T-3-2	HARBOR BROOK	926010.351416	1116137.59717	HB9319	01/26/2001	SOIL	SED	REG	BBL	1.5	4.4	Ft	Covered by East Wall IRM	X	Subsurface Sediment	Subsurface Soil
HB-T-3-2	HARBOR BROOK	926010.351416	1116137.59717	HB9320	01/26/2001	SOIL	SED	REG	BBL	5.4	6.4	Ft	Covered by East Wall IRM	X	Subsurface Sediment	Subsurface Soil
HB-T-3-2	HARBOR BROOK	926010.351416	1116137.59717	HB9321	01/26/2001	SOIL	SED	REG	BBL	8.4	9.2	Ft	Covered by East Wall IRM	X	Subsurface Sediment	Subsurface Soil
HB-T-3-2	HARBOR BROOK	926010.351416	1116137.59717	HB9322	01/26/2001	SOIL	SED	REG	BBL	7.4	8.4	Ft	Covered by East Wall IRM	X	Subsurface Sediment	Subsurface Soil
HB-T-3-2	HARBOR BROOK	926010.351416	1116137.59717	HB9323	01/26/2001	SOIL	SED	REG	BBL	0	0.5	Ft	Covered by East Wall IRM	X	Surface Sediment	Subsurface Soil
HB-T-3-2	HARBOR BROOK	926010.351416	1116137.59717	HB9324	01/26/2001	SOIL	SED	REG	BBL	1.5	2.5	Ft	Covered by East Wall IRM	X	Subsurface Sediment	Subsurface Soil
HB-T-3-2	HARBOR BROOK	926010.351416	1116137.59717	HB9325	01/26/2001	SOIL	SED	REG	BBL	0.5	1.5	Ft	Covered by East Wall IRM	X	Surface Sediment	Subsurface Soil
HB-T-3-2	HARBOR BROOK	926010.351416	1116137.59717	HB9326	01/26/2001	SOIL	SED	REG	BBL	6.4	7.4	Ft	Covered by East Wall IRM	X	Subsurface Sediment	Subsurface Soil
HB-T-3-2	HARBOR BROOK	926010.351416	1116137.59717	HB9327	01/26/2001	SOIL	SED	REG	BBL	7.4	9.2	Ft	Covered by East Wall IRM	X	Subsurface Sediment	Subsurface Soil
HB-T-3-2	HARBOR BROOK	926010.351416	1116137.59717	HB9328	01/26/2001	SOIL	SED	REG	BBL	4.4	7.4	Ft	Covered by East Wall IRM	X	Subsurface Sediment	Subsurface Soil
HB-T-3-2	HARBOR BROOK	926010.351416	1116137.59717	HB9330	01/26/2001	SOIL	SED	REG	BBL	3.4	4.4	Ft	Covered by East Wall IRM	X	Subsurface Sediment	Subsurface Soil
HB-T-3-2	HARBOR BROOK	926010.351416	1116137.59717	HB9331	01/26/2001	SOIL	SED	REG	BBL	4.4	5.4	Ft	Covered by East Wall IRM	X	Subsurface Sediment	Subsurface Soil
HB-T-3-2	HARBOR BROOK	926010.351416	1116137.59717	HB9395	02/13/2001	SOIL	SED	REG	BBL	0.5	1.5	Ft	Covered by East Wall IRM	X	Surface Sediment	Subsurface Soil
HB-T-3-2	HARBOR BROOK	926010.351416	1116137.59717	HB9397	02/13/2001	SOIL	SED	REG	BBL	0	0.5	Ft	Covered by East Wall IRM	X	Surface Sediment	Subsurface Soil
HB-T-3-2	HARBOR BROOK	926010.351416	1116137.59717	HB9398	02/13/2001	SOIL	SED	REG	BBL	10	13.6	Ft	Covered by East Wall IRM	X	Subsurface Sediment	Subsurface Soil
HB-T-3-2	HARBOR BROOK	926010.351416	1116137.59717	HB9399	02/13/2001	SOIL	SED	REG	BBL	26	30	Ft	Covered by East Wall IRM	X	Subsurface Sediment	Subsurface Soil
HB-T-3-2	HARBOR BROOK	926010.351416	1116137.59717	HB9402	02/13/2001	SOIL	SED	REG	BBL	22	23.5	Ft	Covered by East Wall IRM	X	Subsurface Sediment	Subsurface Soil
HB-T-3-2	HARBOR BROOK	926010.351416	1116137.59717	HB9403	02/13/2001	SOIL	SED	REG	BBL	2.5	3.4	Ft	Covered by East Wall IRM	X	Subsurface Sediment	Subsurface Soil
HB-T-3-2	HARBOR BROOK	926010.351416	1116137.59717	HB9406	02/13/2001	SOIL	SED	REG	BBL	14	17.4	Ft	Covered by East Wall IRM	X	Subsurface Sediment	Subsurface Soil
HB-T-3-2	HARBOR BROOK	926010.351416	1116137.59717	HB9407	02/13/2001	SOIL	SED	REG	BBL	1.5	2.5	Ft	Covered by East Wall IRM	X	Subsurface Sediment	Subsurface Soil
HB-T-3-2	HARBOR BROOK	926010.351416	1116137.59717	HB9408	02/13/2001	SOIL	SED	REG	BBL	3.4	4.4	Ft	Covered by East Wall IRM	X	Subsurface Sediment	Subsurface Soil
HB-T-3-2	HARBOR BROOK	926010.351416	1116137.59717	HB9410	02/13/2001	SOIL	SED	REG	BBL	4.4	5.4	Ft	Covered by East Wall IRM	X	Subsurface Sediment	Subsurface Soil
HB-T-3-2	HARBOR BROOK	926010.351416	1116137.59717	HB9411	02/13/2001	SOIL	SED	REG	BBL	5.4	6.4	Ft	Covered by East Wall IRM	X	Subsurface Sediment	Subsurface Soil
HB-T-3-2	HARBOR BROOK	926010.351416	1116137.59717	HB9413	02/14/2001	SOIL	SED	REG	BBL	6.4	7.4	Ft	Covered by East Wall IRM	X	Subsurface Sediment	Subsurface Soil
HB-T-3-2	HARBOR BROOK	926010.351416	1116137.59717	HB9414	02/14/2001	SOIL	SED	REG	BBL	7.4	8.4	Ft	Covered by East Wall IRM	X	Subsurface Sediment	Subsurface Soil
HB-T-3-2	HARBOR BROOK	926010.351416	1116137.59717	HB9415	02/14/2001	SOIL	SED	REG	BBL	8.4	9.2	Ft	Covered by East Wall IRM	X	Subsurface Sediment	Subsurface Soil
HB-T-3-2	HARBOR BROOK	926010.351416	1116137.59717	HB9468	03/02/2001	SOIL	SED	REG	BBL	22	23.5	Ft	Covered by East Wall IRM	X	Subsurface Sediment	Subsurface Soil
HB-T-3-2	HARBOR BROOK	926010.351416	1116137.59717	HB9472	03/02/2001	SOIL	SED	REG	BBL	10	13.5	Ft	Covered by East Wall IRM	X	Subsurface Sediment	Subsurface Soil
HB-T-3-2	HARBOR BROOK	926010.351416	1116137.59717	HB9474	03/02/2001	SOIL	SED	REG	BBL	14	17.4	Ft	Covered by East Wall IRM	X	Subsurface Sediment	Subsurface Soil
HB-T-3-2	HARBOR BROOK	926010.351416	1116137.59717	HB9476	03/02/2001	SOIL	SED	REG	BBL	26	30	Ft	Covered by East Wall IRM	X	Subsurface Sediment	Subsurface Soil
HB-T-3-3	HARBOR BROOK	925997.60772	1116149.39195	HB9316	01/26/2001	SOIL	SED	REG	BBL	0	0.5	Ft	Covered by East Wall IRM	X	Surface Sediment	Subsurface Soil
HB-T-3-3	HARBOR BROOK	925997.60772	1116149.39195	HB9417	02/14/2001	SOIL	SED	REG	BBL	0	0.5	Ft	Covered by East Wall IRM	X	Surface Sediment	Subsurface Soil
HB-T-3-OIL	HARBOR BROOK	926019.313448	1116127.92702	HB9396	02/13/2001	SOIL	SED	REG	BBL	4.1	6.86	Ft	Covered by East Wall IRM	X	Subsurface Sediment	Subsurface Soil
HB-T-3-OIL	HARBOR BROOK	926019.313448	1116127.92702	HB9443	02/26/2001	SOIL	SED	REG	BBL	4.1	6.86	Ft	Covered by East Wall IRM	X	Subsurface Sediment	Subsurface Soil
HB-T-4-1	HARBOR BROOK	925988.302888	1116038.64683	HB9333	01/29/2001	SOIL	SED	REG	BBL	0	0.5	Ft	Covered by East Wall IRM	X	Surface Sediment	Subsurface Soil
HB-T-4-1	HARBOR BROOK	925988.302888	1116038.64683	HB9369	02/08/2001	SOIL	SED	REG	BBL	0	0.5	Ft	Covered by East Wall IRM	X	Surface Sediment	Subsurface Soil
HB-T-4-2	HARBOR BROOK	925975.929272	1116044.12054	HB9332	01/29/2001	SOIL	SED	REG	BBL	0	1.5	Ft	Covered by East Wall IRM	X	Surface Sediment	Subsurface Soil
HB-T-4-2	HARBOR BROOK	925975.929272	1116044.12054	HB9335	01/29/2001	SOIL	SED	REG	BBL	0	0.5	Ft	Covered by East Wall IRM	X	Surface Sediment	Subsurface Soil
HB-T-4-2	HARBOR BROOK	925975.929272	1116044.12054	HB9337	01/29/2001	SOIL	SED	REG	BBL	1.5	3	Ft	Covered by East Wall IRM	X	Subsurface Sediment	Subsurface Soil
HB-T-4-2	HARBOR BROOK	925975.929272	1116044.12054	HB9338	01/29/2001	SOIL	SED	REG	BBL	3	5.2	Ft	Covered by East Wall IRM	X	Subsurface Sediment	Subsurface Soil
HB-T-4-2	HARBOR BROOK	925975.929272	1116044.12054	HB9339	01/29/2001	SOIL	SED	REG	BBL	5.2	7.5	Ft	Covered by East Wall IRM	X	Subsurface Sediment	Subsurface Soil
HB-T-4-2	HARBOR BROOK	925975.929272	1116044.12054	HB9370	02/08/2001	SOIL	SED	REG	BBL	0	1.5	Ft	Covered by East Wall IRM	X	Surface Sediment	Subsurface Soil
HB-T-4-2	HARBOR BROOK	925975.929272	1116044.12054	HB9371	02/08/2001	SOIL	SED	REG	BBL	1.5	3	Ft	Covered by East Wall IRM	X	Subsurface Sediment	Subsurface Soil
HB-T-4-2	HARBOR BROOK	925975.929272	1116044.12054	HB9375	02/08/2001	SOIL	SED	REG	BBL	0	0.5	Ft	Covered by East Wall IRM	X	Surface Sediment	Subsurface Soil
HB-T-4-2	HARBOR BROOK	925975.929272	1116044.12054	HB9386	02/12/2001	SOIL	SED	REG	BBL	5.2	7.5	Ft	Covered by East Wall IRM	X	Subsurface Sediment	Subsurface Soil
HB-T-4-2	HARBOR BROOK	925975.929272	1116044.12054	HB9394	02/13/2001	SOIL	SED	REG	BBL	12	14	Ft	Covered by East Wall IRM	X	Subsurface Sediment	Subsurface Soil
HB-T-4-2	HARBOR BROOK	925975.929272	1116044.12054	HB9400	02/13/2001	SOIL	SED	REG	BBL	3	5.2	Ft	Covered by East Wall IRM	X	Subsurface Sediment	Subsurface Soil
HB-T-4-2	HARBOR BROOK	925975.929272	1116044.12054	HB9401	02/13/2001	SOIL	SED	REG	BBL	27.4	28	Ft	Covered by East Wall IRM	X	Subsurface Sediment	Subsurface Soil
HB-T-4-2	HARBOR BROOK	925975.929272	1116044.12054	HB9405	02/13/2001	SOIL	SED	REG	BBL	24	27.4	Ft	Covered by East Wall IRM	X	Subsurface Sediment	Subsurface Soil
HB-T-4-2	HARBOR BROOK	925975.929272	1116044.12054	HB9412	02/13/2001	SOIL	SED	REG	BBL	16	19	Ft	Covered by East Wall IRM	X	Subsurface Sediment	Subsurface Soil
HB-T-4-2	HARBOR BROOK	925975.929272	1116044.12054	HB9467	03/02/2001	SOIL	SED	REG	BBL	16	19	Ft	Covered by East Wall IRM	X	Subsurface Sediment	Subsurface Soil
HB-T-4-2	HARBOR BROOK	925975.929272	1116044.12054	HB9469	03/02/2001	SOIL	SED	REG	BBL	12	14	Ft	Covered by East Wall IRM	X	Subsurface Sediment	Subsurface Soil
HB-T-4-2	HARBOR BROOK	925975.929272	1116044.12054	HB9481	03/05/2001	SOIL	SED	REG	BBL	27.4	28	Ft	Covered by East Wall IRM	X	Subsurface Sediment	Subsurface Soil
HB-T-4-2	HARBOR BROOK	925975.929272	1116044.12054	HB9483	03/05/2001	SOIL	SED	REG	BBL	24	27.4	Ft	Covered by East Wall IRM	X	Subsurface Sediment	Subsurface Soil
HB-T-4-3	HARBOR BROOK	925966.230904	1116046.77861	HB9336	01/29/2001	SOIL	SED	REG	BBL	0	0.5	Ft	Covered by East Wall IRM	X	Surface Sediment	Subsurface Soil
HB-T-4-3	HARBOR BROOK	925966.230904	1116046.77861	HB9373	02/08/2001	SOIL	SED	REG	BBL	0	0.5	Ft	Covered by East Wall IRM	X	Surface Sediment	Subsurface Soil

Location ID	Subsite Name	East	North	Field Sample ID	Date Sampled	Sample Matrix	Sample Type	Sample Purpose	Sampling Company	Start Depth	End Depth	Depth Units	Notes	Include in Initial Dataset	Surface/Subsurface (Initial Dataset)	Change in Use for FS
HB-T-5-1	HARBOR BROOK	925964.21348	1115979.35552	HB9340	01/30/2001	SOIL	SED	REG	BBL	0.5	1.5	Ft	Covered by East Wall IRM	X	Surface Sediment	Subsurface Soil
HB-T-5-1	HARBOR BROOK	925964.21348	1115979.35552	HB9341	01/30/2001	SOIL	SED	REG	BBL	1.5	1.5	Ft	Covered by East Wall IRM	X	Surface Sediment	Subsurface Soil
HB-T-5-1	HARBOR BROOK	925964.21348	1115979.35552	HB9342	01/30/2001	SOIL	SED	REG	BBL	1.5	2.5	Ft	Covered by East Wall IRM	X	Subsurface Sediment	Subsurface Soil
HB-T-5-1	HARBOR BROOK	925964.21348	1115979.35552	HB9343	01/30/2001	SOIL	SED	REG	BBL	1.5	4.4	Ft	Covered by East Wall IRM	X	Subsurface Sediment	Subsurface Soil
HB-T-5-1	HARBOR BROOK	925964.21348	1115979.35552	HB9344	01/30/2001	SOIL	SED	REG	BBL	2.5	3.4	Ft	Covered by East Wall IRM	X	Subsurface Sediment	Subsurface Soil
HB-T-5-1	HARBOR BROOK	925964.21348	1115979.35552	HB9345	01/30/2001	SOIL	SED	REG	BBL	4.4	5.4	Ft	Covered by East Wall IRM	X	Subsurface Sediment	Subsurface Soil
HB-T-5-1	HARBOR BROOK	925964.21348	1115979.35552	HB9346	01/30/2001	SOIL	SED	REG	BBL	0	0.5	Ft	Covered by East Wall IRM	X	Surface Sediment	Subsurface Soil
HB-T-5-1	HARBOR BROOK	925964.21348	1115979.35552	HB9347	01/30/2001	SOIL	SED	REG	BBL	4.4	6.6	Ft	Covered by East Wall IRM	X	Subsurface Sediment	Subsurface Soil
HB-T-5-1	HARBOR BROOK	925964.21348	1115979.35552	HB9348	01/30/2001	SOIL	SED	REG	BBL	5.4	6.6	Ft	Covered by East Wall IRM	X	Subsurface Sediment	Subsurface Soil
HB-T-5-1	HARBOR BROOK	925964.21348	1115979.35552	HB9349	01/30/2001	SOIL	SED	REG	BBL	3.4	4.4	Ft	Covered by East Wall IRM	X	Subsurface Sediment	Subsurface Soil
HB-T-5-1	HARBOR BROOK	925964.21348	1115979.35552	HB9419	02/14/2001	SOIL	SED	REG	BBL	10	12.3	Ft	Covered by East Wall IRM	X	Subsurface Sediment	Subsurface Soil
HB-T-5-1	HARBOR BROOK	925964.21348	1115979.35552	HB9420	02/14/2001	SOIL	SED	REG	BBL	26	30	Ft	Covered by East Wall IRM	X	Subsurface Sediment	Subsurface Soil
HB-T-5-1	HARBOR BROOK	925964.21348	1115979.35552	HB9422	02/14/2001	SOIL	SED	REG	BBL	16	16	Ft	Covered by East Wall IRM	X	Subsurface Sediment	Subsurface Soil
HB-T-5-1	HARBOR BROOK	925964.21348	1115979.35552	HB9423	02/14/2001	SOIL	SED	REG	BBL	20	23.3	Ft	Covered by East Wall IRM	X	Subsurface Sediment	Subsurface Soil
HB-T-5-1	HARBOR BROOK	925964.21348	1115979.35552	HB9426	02/16/2001	SOIL	SED	REG	BBL	0	0.5	Ft	Covered by East Wall IRM	X	Surface Sediment	Subsurface Soil
HB-T-5-1	HARBOR BROOK	925964.21348	1115979.35552	HB9428	02/16/2001	SOIL	SED	REG	BBL	5.3	6.6	Ft	Covered by East Wall IRM	X	Subsurface Sediment	Subsurface Soil
HB-T-5-1	HARBOR BROOK	925964.21348	1115979.35552	HB9430	02/16/2001	SOIL	SED	REG	BBL	0.5	1.5	Ft	Covered by East Wall IRM	X	Surface Sediment	Subsurface Soil
HB-T-5-1	HARBOR BROOK	925964.21348	1115979.35552	HB9431	02/16/2001	SOIL	SED	REG	BBL	3.4	4.4	Ft	Covered by East Wall IRM	X	Subsurface Sediment	Subsurface Soil
HB-T-5-1	HARBOR BROOK	925964.21348	1115979.35552	HB9432	02/16/2001	SOIL	SED	REG	BBL	2.5	3.4	Ft	Covered by East Wall IRM	X	Subsurface Sediment	Subsurface Soil
HB-T-5-1	HARBOR BROOK	925964.21348	1115979.35552	HB9433	02/16/2001	SOIL	SED	REG	BBL	1.5	2.5	Ft	Covered by East Wall IRM	X	Subsurface Sediment	Subsurface Soil
HB-T-5-1	HARBOR BROOK	925964.21348	1115979.35552	HB9434	02/16/2001	SOIL	SED	REG	BBL	4.4	5.4	Ft	Covered by East Wall IRM	X	Subsurface Sediment	Subsurface Soil
HB-T-5-1	HARBOR BROOK	925964.21348	1115979.35552	HB9475	03/02/2001	SOIL	SED	REG	BBL	10	10.7	Ft	Covered by East Wall IRM	X	Subsurface Sediment	Subsurface Soil
HB-T-5-1	HARBOR BROOK	925964.21348	1115979.35552	HB9482	03/05/2001	SOIL	SED	REG	BBL	16	19.1	Ft	Covered by East Wall IRM	X	Subsurface Sediment	Subsurface Soil
HB-T-5-1	HARBOR BROOK	925964.21348	1115979.35552	HB9484	03/05/2001	SOIL	SED	REG	BBL	26	30	Ft	Covered by East Wall IRM	X	Subsurface Sediment	Subsurface Soil
HB-T-5-1	HARBOR BROOK	925964.21348	1115979.35552	HB9485	03/05/2001	SOIL	SED	REG	BBL	20	23.3	Ft	Covered by East Wall IRM	X	Subsurface Sediment	Subsurface Soil
HB-T-5-2	HARBOR BROOK	925954.09876	1115988.57117	HB9355	01/31/2001	SOIL	SED	REG	BBL	0	0.5	Ft	Covered by East Wall IRM	X	Surface Sediment	Subsurface Soil
HB-T-5-2	HARBOR BROOK	925954.09876	1115988.57117	HB9429	02/16/2001	SOIL	SED	REG	BBL	0	0.5	Ft	Covered by East Wall IRM	X	Surface Sediment	Subsurface Soil
HB-T-5-3	HARBOR BROOK	925939.681768	1115990.98643	HB9350	01/31/2001	SOIL	SED	REG	BBL	0	0.5	Ft	Covered by East Wall IRM	X	Surface Sediment	Subsurface Soil
HB-T-5-3	HARBOR BROOK	925939.681768	1115990.98643	HB9424	02/16/2001	SOIL	SED	REG	BBL	0	0.5	Ft	Covered by East Wall IRM	X	Surface Sediment	Subsurface Soil
HB-T-5-OIL	HARBOR BROOK	925952.729304	1115984.86771	HB9416	02/14/2001	SOIL	SED	REG	BBL	4.43	14.43	Ft	Covered by East Wall IRM	X	Subsurface Sediment	Subsurface Soil
HB-T-5-OIL	HARBOR BROOK	925952.729304	1115984.86771	HB9439	02/26/2001	SOIL	SED	REG	BBL	4.43	14.43	Ft	Covered by East Wall IRM	X	Subsurface Sediment	Subsurface Soil
UHB-DS-05	HARBOR BROOK	925884.1853	1115778.821	UHB-1017-01	07/26/2013	SOIL	S-CONF	REG	OBG	0	0.5	Ft	Covered by UHB IRM (sample from immediately below cover material)	X	Subsurface Sediment	Subsurface Soil
UHB-DS-05	HARBOR BROOK	925884.1853	1115778.821	UHB-1017-02	07/26/2013	SOIL	S-CONF	REG	OBG	0	0.5	Ft	Covered by UHB IRM (sample from immediately below cover material)	X	Subsurface Sediment	Subsurface Soil
UHB-DS-06	HARBOR BROOK	925829.6807	1115624.481	UHB-1015-01	07/11/2013	SOIL	S-CONF	REG	OBG	0	0.5	Ft	Covered by UHB IRM (sample from immediately below cover material)	X	Subsurface Sediment	Subsurface Soil
UHB-DS-06	HARBOR BROOK	925829.6807	1115624.481	UHB-1015-02	07/11/2013	SOIL	S-CONF	REG	OBG	0	0.5	Ft	Covered by UHB IRM (sample from immediately below cover material)	X	Subsurface Sediment	Subsurface Soil
UHB-DS-07	HARBOR BROOK	925647.7286	1115368.912	UHB-1014-01	05/10/2013	SOIL	S-CONF	REG	OBG	0	0.5	Ft	Covered by UHB IRM (sample from immediately below cover material)	X	Subsurface Sediment	Subsurface Soil
UHB-DS-07	HARBOR BROOK	925647.7286	1115368.912	UHB-1014-02	05/10/2013	SOIL	S-CONF	REG	OBG	0	0.5	Ft	Covered by UHB IRM (sample from immediately below cover material)	X	Subsurface Sediment	Subsurface Soil
UHB-DS-21	HARBOR BROOK	925542.3137	1115197.301	UHB-1013-01	03/27/2013	SOIL	S-CONF	REG	OBG	0	0.5	Ft	Covered by UHB IRM (sample from immediately below cover material)	X	Subsurface Sediment	Subsurface Soil
UHB-DS-21	HARBOR BROOK	925542.3137	1115197.301	UHB-1013-02	03/27/2013	SOIL	S-CONF	REG	OBG	0	0.5	Ft	Covered by UHB IRM (sample from immediately below cover material)	X	Subsurface Sediment	Subsurface Soil
HB-DSA#1NETP	LAKESHORE AREA	923597.562749	1117581.86162	HB9074	10/22/1997	SOIL	TESTPIT	REG	OBG	0	2	Ft	Covered by Lake Remedy Support Area	X	Surface Soil	Subsurface Soil
HB-DSA#1NETP	LAKESHORE AREA	923597.562749	1117581.86162	HB9074N	10/22/1997	SOIL	TESTPIT	REG	NYSDEC	0	2	FT	Covered by Lake Remedy Support Area	X	Surface Soil	Subsurface Soil
HB-DSA#1NETP	LAKESHORE AREA	923597.562749	1117581.86162	HB9075	10/22/1997	SOIL	TESTPIT	REG	OBG	6		Ft	Covered by Lake Remedy Support Area	X	Subsurface Soil	None
HB-DSA#1NETP	LAKESHORE AREA	923597.562749	1117581.86162	HB9075N	10/22/1997	SOIL	TESTPIT	REG	NYSDEC	6	6	FT	Covered by Lake Remedy Support Area	X	Subsurface Soil	None
HB-DSA#1NETP	LAKESHORE AREA	923597.562749	1117581.86162	HB9079	10/22/1997	SOIL	TESTPIT	REG	OBG	2	5	Ft	Covered by Lake Remedy Support Area	X	Subsurface Soil	None
HB-DSA#1NETP	LAKESHORE AREA	923597.562749	1117581.86162	HB9079N	10/22/1997	SOIL	TESTPIT	REG	NYSDEC	2	5	FT	Covered by Lake Remedy Support Area	X	Subsurface Soil	None
HB-DSA#1NWTP	LAKESHORE AREA	923424.753884	1117620.49735	HB9073N	10/22/1997	SOIL	TESTPIT	REG	NYSDEC	2	4	FT	Covered by Lake Remedy Support Area	X	Subsurface Soil	None
HB-DSA#1NWTP	LAKESHORE AREA	923424.753884	1117620.49735	HB9076	10/22/1997	SOIL	TESTPIT	REG	OBG	0	2	Ft	Covered by Lake Remedy Support Area	X	Surface Soil	Subsurface Soil
HB-DSA#1NWTP	LAKESHORE AREA	923424.753884	1117620.49735	HB9076N	10/22/1997	SOIL	TESTPIT	REG	NYSDEC	0	2	FT	Covered by Lake Remedy Support Area	X	Surface Soil	Subsurface Soil
HB-DSA#1NWTP	LAKESHORE AREA	923424.753884	1117620.49735	HB9078	10/22/1997	SOIL	TESTPIT	REG	OBG	5		Ft	Covered by Lake Remedy Support Area	X	Subsurface Soil	None
HB-DSA#1NWTP	LAKESHORE AREA	923424.753884	1117620.49735	HB9078N	10/22/1997	SOIL	TESTPIT	REG	NYSDEC	5	5	FT	Covered by Lake Remedy Support Area	X	Subsurface Soil	None
HB-DSA#1NWTP	LAKESHORE AREA	923424.753884	1117620.49735	HB9080	10/22/1997	SOIL	TESTPIT	REG	OBG	3	4	Ft	Covered by Lake Remedy Support Area	X	Subsurface Soil	None
HB-DSA#1SETP	LAKESHORE AREA	923542.214069	1117495.80896	HB9038N	10/22/1997	SOIL	TESTPIT	REG	NYSDEC	5	5	FT	Covered by Lake Remedy Support Area	X	Subsurface Soil	None
HB-DSA#1SETP	LAKESHORE AREA	923542.214069	1117495.80896	HB9077	10/22/1997	SOIL	TESTPIT	REG	OBG	0	2	Ft	Covered by Lake Remedy Support Area	X	Surface Soil	Subsurface Soil
HB-DSA#1SETP	LAKESHORE AREA	923542.214069	1117495.80896	HB9077N	10/22/1997	SOIL	TESTPIT	REG	NYSDEC	0	2	FT	Covered by Lake Remedy Support Area	X	Surface Soil	Subsurface Soil
HB-DSA#1SETP	LAKESHORE AREA	923542.214069	1117495.80896	HB9838N	10/22/1997	SOIL	TESTPIT	REG	NYSDEC	5	5	FT	Covered by Lake Remedy Support Area	X	Subsurface Soil	None
HB-DSA#2B2	LAKESHORE AREA	924646.809285	1117489.72939	HB9172	10/30/1998	SOIL	TAR	REG	OBG	4	6	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-DSA#2TP1	LAKESHORE AREA	924605.312472	1117491.66293	HB9062	09/19/1997	SOIL	TESTPIT	REG	OBG	5	5	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-DSA#2TP1	LAKESHORE AREA	924605.312472	1117491.66293	HB9062N	09/19/1997	SOIL	TESTPIT	REG	NYSDEC	5	5	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-DSA#2TP2	LAKESHORE AREA	924562.118829	1117382.48113	HB9063	09/19/1997	SOIL	TESTPIT	REG	OBG	5	5	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-DSA#2TP2	LAKESHORE AREA	924562.118829	1117382.48113	HB9063N	09/19/1997	SOIL	TESTPIT	REG	NYSDEC	5	5	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)

Location ID	Subsite Name	East	North	Field Sample ID	Date Sampled	Sample Matrix	Sample Type	Sample Purpose	Sampling Company	Start Depth	End Depth	Depth Units	Notes	Include in Initial Dataset	Surface/Subsurface (Initial Dataset)	Change in Use for FS
HB-GP-01	LAKESHORE AREA	923825.085556	1117546.34571	HB9225	07/14/2000	SOIL	S-GP	REG	OBG	20	22	Ft	Covered be Lake Remedy Support Area	X	Subsurface Soil	None
HB-GP-01	LAKESHORE AREA	923825.085556	1117546.34571	HB9226	07/14/2000	SOIL	S-GP	REG	OBG	0	0.17	Ft	Covered be Lake Remedy Support Area	X	Surface Soil	Subsurface Soil
HB-GP-02	LAKESHORE AREA	924089.459335	1117431.90913	HB9194	07/07/2000	SOIL	S-GP	REG	OBG	34	36	Ft	Uncovered; pending final Site remedy	X	Subsurface Soil	None
HB-GP-02	LAKESHORE AREA	924089.459335	1117431.90913	HB9195	07/07/2000	SOIL	S-GP	REG	OBG	0	0.17	Ft	Uncovered; pending final Site remedy	X	Surface Soil	None
HB-GP-03	LAKESHORE AREA	924275.09851	1117231.75467	HB9191	07/07/2000	SOIL	S-GP	REG	OBG	30	34	Ft	Covered be Lake Remedy Support Area	X	Subsurface Soil	None
HB-GP-03	LAKESHORE AREA	924275.09851	1117231.75467	HB9192	07/07/2000	SOIL	S-GP	REG	OBG	29.5	30	Ft	Covered be Lake Remedy Support Area	X	Subsurface Soil	None
HB-GP-03	LAKESHORE AREA	924275.09851	1117231.75467	HB9197	07/07/2000	SOIL	S-GP	REG	OBG	0	0.17	Ft	Covered be Lake Remedy Support Area	X	Surface Soil	Subsurface Soil
HB-GP-04	LAKESHORE AREA	924481.881549	1117155.2337	HB9207	07/10/2000	SOIL	S-GP	REG	OBG	0	0.17	Ft	Uncovered; pending final Site remedy	X	Surface Soil	None
HB-GP-04	LAKESHORE AREA	924481.881549	1117155.2337	HB9208	07/10/2000	SOIL	S-GP	REG	OBG	24	26	Ft	Uncovered; pending final Site remedy	X	Subsurface Soil	None
HB-GP-05	LAKESHORE AREA	925072.66275	1116678.63838	HB9203	07/10/2000	SOIL	S-GP	REG	OBG	28	30	Ft	Uncovered; pending final Site remedy	X	Subsurface Soil	None
HB-GP-05	LAKESHORE AREA	925072.66275	1116678.63838	HB9209	07/10/2000	SOIL	S-GP	REG	OBG	0	0.17	Ft	Uncovered; pending final Site remedy	X	Surface Soil	None
HB-GP-06	LAKESHORE AREA	925420.27704	1116539.92118	HB9201	07/10/2000	SOIL	S-GP	REG	OBG	0	0.17	Ft	Covered by WBB/HB MM,G,&D Plan	X	Surface Soil	Subsurface Soil
HB-GP-06	LAKESHORE AREA	925420.27704	1116539.92118	HB9202	07/10/2000	SOIL	S-GP	REG	OBG	32	34	Ft	Covered by WBB/HB MM,G,&D Plan	X	Subsurface Soil	None
HB-GP-07	LAKESHORE AREA	925566.234303	1116445.21353	HB9199	07/10/2000	SOIL	S-GP	REG	OBG	0	0.17	Ft	Covered by WBB/HB MM,G,&D Plan	X	Surface Soil	Subsurface Soil
HB-GP-07	LAKESHORE AREA	925566.234303	1116445.21353	HB9204	07/10/2000	SOIL	S-GP	REG	OBG	28	32	Ft	Covered by WBB/HB MM,G,&D Plan	X	Subsurface Soil	None
HB-GP-07	LAKESHORE AREA	925566.234303	1116445.21353	HB9206	07/10/2000	SOIL	S-GP	REG	OBG	31	32	Ft	Covered by WBB/HB MM,G,&D Plan	X	Subsurface Soil	None
HB-GP-08	LAKESHORE AREA	923660.171565	1117386.75509	HB9198	07/10/2000	SOIL	S-GP	REG	OBG	0	0.17	Ft	Covered be Lake Remedy Support Area	X	Surface Soil	Subsurface Soil
HB-GP-08	LAKESHORE AREA	923660.171565	1117386.75509	HB9200	07/10/2000	SOIL	S-GP	REG	OBG	34	38	Ft	Covered be Lake Remedy Support Area	X	Subsurface Soil	None
HB-GP-08	LAKESHORE AREA	923660.171565	1117386.75509	HB9205	07/10/2000	SOIL	S-GP	REG	OBG	36	38	Ft	Covered be Lake Remedy Support Area	X	Subsurface Soil	None
HB-GP-09	LAKESHORE AREA	923824.481496	1117238.47909	HB9212	07/12/2000	SOIL	S-GP	REG	OBG	30	32	Ft	Covered be Lake Remedy Support Area	X	Subsurface Soil	None
HB-GP-09	LAKESHORE AREA	923824.481496	1117238.47909	HB9213	07/12/2000	SOIL	S-GP	REG	OBG	0	0.17	Ft	Covered be Lake Remedy Support Area	X	Surface Soil	Subsurface Soil
HB-GP-10	LAKESHORE AREA	924039.87088	1117076.40535	HB9210	07/12/2000	SOIL	S-GP	REG	OBG	30	32	Ft	Covered be Lake Remedy Support Area	X	Subsurface Soil	None
HB-GP-10	LAKESHORE AREA	924039.87088	1117076.40535	HB9211	07/12/2000	SOIL	S-GP	REG	OBG	0	0.17	Ft	Covered be Lake Remedy Support Area	X	Surface Soil	Subsurface Soil
HB-GP-11	LAKESHORE AREA	924236.279806	1116908.08274	HB9216	07/13/2000	SOIL	S-GP	REG	OBG	28	30	Ft	Covered by WBB/HB MM,G,&D Plan	X	Subsurface Soil	None
HB-GP-11	LAKESHORE AREA	924236.279806	1116908.08274	HB9221	07/13/2000	SOIL	S-GP	REG	OBG	0	0.17	Ft	Covered by WBB/HB MM,G,&D Plan	X	Surface Soil	Subsurface Soil
HB-GP-11B	LAKESHORE AREA	924236.279768	1116908.08271	HB9215	07/13/2000	SOIL	S-GP	REG	OBG	0	0.17	Ft	Covered by WBB/HB MM,G,&D Plan	X	Surface Soil	Subsurface Soil
HB-GP-11B	LAKESHORE AREA	924236.279768	1116908.08271	HB9220	07/13/2000	SOIL	S-GP	REG	OBG	28	30	Ft	Covered by WBB/HB MM,G,&D Plan	X	Subsurface Soil	None
HB-GP-12	LAKESHORE AREA	924496.087366	1116763.5518	HB9218	07/13/2000	SOIL	S-GP	REG	OBG	24	26	Ft	Covered by WBB/HB MM,G,&D Plan	X	Subsurface Soil	None
HB-GP-12	LAKESHORE AREA	924496.087366	1116763.5518	HB9219	07/13/2000	SOIL	S-GP	REG	OBG	0	0.17	Ft	Covered by WBB/HB MM,G,&D Plan	X	Surface Soil	Subsurface Soil
HB-GP-13	LAKESHORE AREA	924662.437206	1116646.25366	HB9214	07/13/2000	SOIL	S-GP	REG	OBG	24	26	Ft	Covered by WBB/HB MM,G,&D Plan	X	Subsurface Soil	None
HB-GP-13	LAKESHORE AREA	924662.437206	1116646.25366	HB9217	07/13/2000	SOIL	S-GP	REG	OBG	0	0.17	Ft	Covered by WBB/HB MM,G,&D Plan	X	Surface Soil	Subsurface Soil
HB-GP-14	LAKESHORE AREA	924806.56952	1116497.39055	HB9222	07/14/2000	SOIL	S-GP	REG	OBG	26	28	Ft	Covered by WBB/HB MM,G,&D Plan	X	Subsurface Soil	None
HB-GP-14	LAKESHORE AREA	924806.56952	1116497.39055	HB9227	07/14/2000	SOIL	S-GP	REG	OBG	0	0.17	Ft	Covered by WBB/HB MM,G,&D Plan	X	Surface Soil	Subsurface Soil
HB-GP-15	LAKESHORE AREA	925005.942753	1116367.151	HB9223	07/14/2000	SOIL	S-GP	REG	OBG	0	0.17	Ft	Covered by WBB/HB MM,G,&D Plan	X	Surface Soil	Subsurface Soil
HB-GP-15	LAKESHORE AREA	925005.942753	1116367.151	HB9224	07/14/2000	SOIL	S-GP	REG	OBG	28	30	Ft	Covered by WBB/HB MM,G,&D Plan	X	Subsurface Soil	None
HB-GP-16	LAKESHORE AREA	925209.290542	1116229.98275	HB9234	07/18/2000	SOIL	S-GP	REG	OBG	0	0.17	Ft	Covered by WBB/HB MM,G,&D Plan	X	Surface Soil	Subsurface Soil
HB-GP-16	LAKESHORE AREA	925209.290542	1116229.98275	HB9238	07/18/2000	SOIL	S-GP	REG	OBG	26	28	Ft	Covered by WBB/HB MM,G,&D Plan	X	Subsurface Soil	None
HB-GP-17	LAKESHORE AREA	925435.295623	1116136.86031	HB9239	07/18/2000	SOIL	S-GP	REG	OBG	0	0.17	Ft	Covered by WBB/HB MM,G,&D Plan	X	Surface Soil	Subsurface Soil
HB-GP-17	LAKESHORE AREA	925435.295623	1116136.86031	HB9240	07/18/2000	SOIL	S-GP	REG	OBG	28	30	Ft	Covered by WBB/HB MM,G,&D Plan	X	Subsurface Soil	None
HB-GP-18	LAKESHORE AREA	925675.331799	1116047.42923	HB9228	07/17/2000	SOIL	S-GP	REG	OBG	0	0.17	Ft	Covered by WBB/HB MM,G,&D Plan	X	Surface Soil	Subsurface Soil
HB-GP-18	LAKESHORE AREA	925675.331799	1116047.42923	HB9229	07/17/2000	SOIL	S-GP	REG	OBG	30	32	Ft	Covered by WBB/HB MM,G,&D Plan	X	Subsurface Soil	None
HB-GP-19	LAKESHORE AREA	925841.469767	1115883.18377	HB9230	07/17/2000	SOIL	S-GP	REG	OBG	0	0.17	Ft	Covered by WBB/HB MM,G,&D Plan	X	Surface Soil	Subsurface Soil
HB-GP-19	LAKESHORE AREA	925841.469767	1115883.18377	HB9233	07/17/2000	SOIL	S-GP	REG	OBG	16	16.5	Ft	Covered by WBB/HB MM,G,&D Plan	X	Subsurface Soil	None
HB-GP-20	LAKESHORE AREA	925855.677791	1115832.1656	HB9231	07/17/2000	SOIL	S-GP	REG	OBG	20	22	Ft	Covered by WBB/HB MM,G,&D Plan	X	Subsurface Soil	None
HB-GP-20	LAKESHORE AREA	925855.677791	1115832.1656	HB9232	07/17/2000	SOIL	S-GP	REG	OBG	0	0.17	Ft	Covered by WBB/HB MM,G,&D Plan	X	Surface Soil	Subsurface Soil
HB-HB-01D	LAKESHORE AREA	924585.120559	1117454.99506	HB9250	07/21/2000	SOIL	S-SB	REG	OBG	0	0.17	Ft	Outboard Area	X	Surface Soil	Removed from dataset (Outboard Area)
HB-HB-01D	LAKESHORE AREA	924585.120559	1117454.99506	HB9251	07/24/2000	SOIL	S-SB	REG	OBG	90	91.5	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-HB-01S	LAKESHORE AREA	924589.21083	1117453.46318	HB9252	07/25/2000	SOIL	S-SB	REG	OBG	8	10	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-HB-01S	LAKESHORE AREA	924589.21083	1117453.46318	HB9253	07/25/2000	SOIL	S-SB	REG	OBG	0	0.17	Ft	Outboard Area	X	Surface Soil	Removed from dataset (Outboard Area)
HB-HB-02I	LAKESHORE AREA	925742.663311	1116367.29428	HB9248	07/19/2000	SOIL	S-SB	REG	OBG	32	34	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-HB-02I	LAKESHORE AREA	925742.663311	1116367.29428	HB9249	07/19/2000	SOIL	S-SB	REG	OBG	0	0.17	Ft	Outboard Area	X	Surface Soil	Removed from dataset (Outboard Area)
HB-HB-03S	LAKESHORE AREA	923856.361126	1117620.09382	HB9254	07/26/2000	SOIL	S-SB	REG	OBG	0	0.17	Ft	Covered by Lake Remedy Support Area	X	Surface Soil	None
HB-HB-03S	LAKESHORE AREA	923856.361126	1117620.09382	HB9255	07/26/2000	SOIL	S-SB	REG	OBG	16	18	Ft	Covered by Lake Remedy Support Area	X	Subsurface Soil	None
HB-HB-04D	LAKESHORE AREA	925878.999998	1115914.64	HB9666	01/30/2003	SOIL	S-SB	REG	OBG	94	97.7	Ft	Covered by WBB/HB MM,G,&D Plan	X	Subsurface Soil	None
HB-HB-04S	LAKESHORE AREA	925886.194977	1115920.23936	HB9256	07/27/2000	SOIL	S-SB	REG	OBG	0	0.17	Ft	Covered by WBB/HB MM,G,&D Plan	X	Surface Soil	None
HB-HB-04S	LAKESHORE AREA	925886.194977	1115920.23936	HB9258	07/27/2000	SOIL	S-SB	REG	OBG	16	18	Ft	Covered by WBB/HB MM,G,&D Plan	X	Subsurface Soil	None
HB-HB-05D	LAKESHORE AREA	925255.999998	1116715.24	HB9667	02/07/2003	SOIL	S-SB	REG	OBG	102	106	Ft	Uncovered; pending final Site remedy	X	Subsurface Soil	None
HB-HB-05I	LAKESHORE AREA	925256.051449	1116728.32958	HB9257	07/27/2000	SOIL	S-SB	REG	OBG	0	0.17	Ft	Uncovered; pending final Site remedy	X	Surface Soil	None
HB-HB-05I	LAKESHORE AREA	925256.051449	1116728.32958	HB9259	07/28/2000	SOIL	S-SB	REG	OBG	52	54	Ft	Uncovered; pending final Site remedy	X	Subsurface Soil	None
HB-HB-05S	LAKESHORE AREA	925255.3704	1116724.26512	HB9260	08/01/2000	SOIL	S-SB	REG	OBG	15	17	Ft	Uncovered; pending final Site remedy	X	Subsurface Soil	None
HB-HB-06S	LAKESHORE AREA	926184.619521	1116225.75234	HB-1048-03	07/16/2008	SOIL	S-SS	REG	OBG	0	0.5	FT	Outboard Area	X	Surface Soil	Removed from dataset (Outboard Area)
HB-HB-06S	LAKESHORE AREA	926184.619521	1116225.75234	HB-1048-04	07/16/2008	SOIL	S-SS	REG	OBG	0.5	1	FT	Outboard Area	X	Surface Soil	Removed from dataset (Outboard Area)
HB-HB-06S	LAKESHORE AREA	926184.619521	1116225.75234	HB9261	08/02/2000	SOIL	S-SB	REG	OBG	0	0.17	Ft	Outboard Area	X	Surface Soil	Removed from dataset (Outboard Area)
HB-HB-06S	LAKESHORE AREA	926184.619521	1116225.75234	HB9262	08/02/2000	SOIL	S-SB	REG	OBG	11	13	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-HB-06S	LAKESHORE AREA	926184.619521	1116225.75234	HB9263	08/02/2000	SOIL	S-SB	REG	OBG	26	28	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-HB-16D	LAKESHORE AREA	925489.601	1116123.396	HB9659	01/07/2003	SOIL	S-SB	REG	OBG	0.5	1	Ft	Covered by WBB/HB MM,G,&D Plan	X	Surface Soil	Subsurface Soil
HB-HB-16D	LAKESHORE AREA	925489.601	1116123.396	HB9660	01/07/2003	SOIL	S-SB	REG	OBG	0	0.5	Ft	Covered by WBB/HB MM,G,&D Plan	X	Surface Soil	Subsurface Soil
HB-HB-16D	LAKESHORE AREA	925489.601	1116123.396	HB9661	01/07/2003	SOIL	S-SB	REG	OBG	28	30	Ft	Covered by WBB/HB MM,G,&D Plan	X	Subsurface Soil	None

Location ID	Subsite Name	East	North	Field Sample ID	Date Sampled	Sample Matrix	Sample Type	Sample Purpose	Sampling Company	Start Depth	End Depth	Depth Units	Notes	Include in Initial Dataset	Surface/Subsurface (Initial Dataset)	Change in Use for FS
HB-HBSED-11	LAKESHORE AREA	924876.033	1116317.14862	HB9538	05/08/2001	SOIL	SED	REG	OBG	0	0.5	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-HBSED-11	LAKESHORE AREA	924876.033	1116317.14862	HB9548	05/11/2001	SOIL	SED	REG	OBG	0	0.5	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-HBSED-11	LAKESHORE AREA	924876.033	1116317.14862	HB9727	06/02/2003	SOIL	SED	REG	OBG	0.5	1	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-HBSED-11	LAKESHORE AREA	924876.033	1116317.14862	HB9734	06/02/2003	SOIL	SED	REG	OBG	0	0.5	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-HBSED-11	LAKESHORE AREA	924876.033	1116317.14862	HB9738	06/03/2003	SOIL	SED	REG	OBG	0.5	1	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-HBSED-11	LAKESHORE AREA	924876.033	1116317.14862	HB9739	06/03/2003	SOIL	SED	REG	OBG	0	0.5	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-HBSED-12	LAKESHORE AREA	925003.598751	1116230.33304	HB9537	05/08/2001	SOIL	SED	REG	OBG	0	0.5	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-HBSED-12	LAKESHORE AREA	925003.598751	1116230.33304	HB9542	05/11/2001	SOIL	SED	REG	OBG	0	0.5	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-HBSED-12	LAKESHORE AREA	925003.598751	1116230.33304	HB9724	06/02/2003	SOIL	SED	REG	OBG	0	0.5	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-HBSED-12	LAKESHORE AREA	925003.598751	1116230.33304	HB9725	06/02/2003	SOIL	SED	REG	OBG	0.5	1	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-HBSED-12	LAKESHORE AREA	925003.598751	1116230.33304	HB9740	06/03/2003	SOIL	SED	REG	OBG	0.5	1	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-HBSED-12	LAKESHORE AREA	925003.598751	1116230.33304	HB9741	06/03/2003	SOIL	SED	REG	OBG	0	0.5	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-HBSED-13	LAKESHORE AREA	925774.209505	1115809.467	HB9536	05/08/2001	SOIL	SED	REG	OBG	0	0.5	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-HBSED-13	LAKESHORE AREA	925774.209505	1115809.467	HB9547	05/11/2001	SOIL	SED	REG	OBG	0	0.5	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-HBSED-13	LAKESHORE AREA	925774.209505	1115809.467	HB9723	06/02/2003	SOIL	SED	REG	OBG	0	0.5	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-HBSED-13	LAKESHORE AREA	925774.209505	1115809.467	HB9726	06/02/2003	SOIL	SED	REG	OBG	0.5	1	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-HBSED-13	LAKESHORE AREA	925774.209505	1115809.467	HB9753	06/03/2003	SOIL	SED	REG	OBG	0.5	1	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-HBW-01	LAKESHORE AREA	925845.31667	1116387.32112	HB9265	08/04/2000	SOIL	S-SB	REG	OBG	24	26	Ft	Covered by West Wall IRM	X	Subsurface Soil	None
HB-HBW-01	LAKESHORE AREA	925845.31667	1116387.32112	HB9266	08/04/2000	SOIL	S-SB	REG	OBG	0	0.17	Ft	Covered by West Wall IRM	X	Surface Soil	Subsurface Soil
HB-HBW-02	LAKESHORE AREA	925817.257494	1116140.60744	HB9264	08/04/2000	SOIL	S-SB	REG	OBG	24	26	Ft	Covered by WBB/HB MM,G,&D Plan	X	Subsurface Soil	None
HB-HBW-02	LAKESHORE AREA	925817.257494	1116140.60744	HB9267	08/04/2000	SOIL	S-SB	REG	OBG	0	0.17	Ft	Covered by WBB/HB MM,G,&D Plan	X	Surface Soil	Subsurface Soil
HB-HBW-03	LAKESHORE AREA	926023.883039	1116186.9139	HB9269	08/07/2000	SOIL	S-SB	REG	OBG	0	0.17	Ft	Uncovered; pending further cover under WBB/HB MM,G,&D Plan	X	Surface Soil	None
HB-HBW-03	LAKESHORE AREA	926023.883039	1116186.9139	HB9270	08/07/2000	SOIL	S-SB	REG	OBG	26	28	Ft	Uncovered; pending further cover under WBB/HB MM,G,&D Plan	X	Subsurface Soil	None
HB-HBW-04	LAKESHORE AREA	925915.775895	1116238.96743	HB9268	08/07/2000	SOIL	S-SB	REG	OBG	0	0.17	Ft	Uncovered; pending further cover under WBB/HB MM,G,&D Plan	X	Surface Soil	None
HB-HBW-04	LAKESHORE AREA	925915.775895	1116238.96743	HB9271	08/07/2000	SOIL	S-SB	REG	OBG	22	24	Ft	Uncovered; pending further cover under WBB/HB MM,G,&D Plan	X	Subsurface Soil	None
HB-HBW-05	LAKESHORE AREA	923518.662925	1117578.52916	HB9272	08/08/2000	SOIL	S-SB	REG	OBG	22	24	Ft	Covered by Lake Remedy Support Area	X	Subsurface Soil	None
HB-HBW-05	LAKESHORE AREA	923518.662925	1117578.52916	HB9274	08/08/2000	SOIL	S-SB	REG	OBG	0	0.17	Ft	Outboard Area	X	Surface Soil	Removed from dataset (Outboard Area)
HB-HBW-06	LAKESHORE AREA	924727.717112	1117410.17893	HB9273	08/08/2000	SOIL	S-SB	REG	OBG	0	0.17	Ft	Outboard Area	X	Surface Soil	Removed from dataset (Outboard Area)
HB-HBW-06	LAKESHORE AREA	924727.717112	1117410.17893	HB9275	08/08/2000	SOIL	S-SB	REG	OBG	18	20	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-RISB-01	LAKESHORE AREA	925003.000002	1117098.6	HB-1048-11	07/16/2008	SOIL	S-SS	REG	OBG	0	0.5	FT	Outboard Area	X	Surface Soil	Removed from dataset (Outboard Area)
HB-RISB-01	LAKESHORE AREA	925003.000002	1117098.6	HB-1048-12	07/16/2008	SOIL	S-SS	REG	OBG	0.5	1	FT	Outboard Area	X	Surface Soil	Removed from dataset (Outboard Area)
HB-RISB-01	LAKESHORE AREA	925003.000002	1117098.6	HB9630	12/13/2002	SOIL	S-SB	REG	OBG	30	32	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-RISB-01	LAKESHORE AREA	925003.000002	1117098.6	HB9631	12/13/2002	SOIL	S-SB	REG	OBG	0	0.5	Ft	Outboard Area	X	Surface Soil	Removed from dataset (Outboard Area)
HB-RISB-01	LAKESHORE AREA	925003.000002	1117098.6	HB9632	12/13/2002	SOIL	S-SB	REG	OBG	0.5	1	Ft	Outboard Area	X	Surface Soil	Removed from dataset (Outboard Area)
HB-RISB-02	LAKESHORE AREA	925162.2188	1116928.913	HB-1049-01	07/16/2008	SOIL	S-SS	REG	OBG	0	0.5	FT	Outboard Area	X	Surface Soil	Removed from dataset (Outboard Area)
HB-RISB-02	LAKESHORE AREA	925162.2188	1116928.913	HB-1049-02	07/16/2008	SOIL	S-SS	REG	OBG	0.5	1	FT	Outboard Area	X	Surface Soil	Removed from dataset (Outboard Area)
HB-RISB-02	LAKESHORE AREA	925162.2188	1116928.913	HB9628	12/13/2002	SOIL	S-SB	REG	OBG	0	0.5	Ft	Outboard Area	X	Surface Soil	Removed from dataset (Outboard Area)
HB-RISB-02	LAKESHORE AREA	925162.2188	1116928.913	HB9629	12/13/2002	SOIL	S-SB	REG	OBG	0.5	1	Ft	Outboard Area	X	Surface Soil	Removed from dataset (Outboard Area)
HB-RISB-02	LAKESHORE AREA	925162.2188	1116928.913	HB9633	12/16/2002	SOIL	S-SB	REG	OBG	0.5	1	Ft	Outboard Area	X	Surface Soil	Removed from dataset (Outboard Area)
HB-RISB-02	LAKESHORE AREA	925162.2188	1116928.913	HB9634	12/16/2002	SOIL	S-SB	REG	OBG	18	20	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-157	LAKESHORE AREA	924605.03	1116509.628	HB-0045-01	07/03/2008	SOIL	S-SB	REG	OBG	10	12	FT	Covered by UHB IRM	X	Subsurface Soil	None
HB-SB-157	LAKESHORE AREA	924605.03	1116509.628	HB-0045-02	07/03/2008	SOIL	S-SB	REG	OBG	10	12	FT	Covered by UHB IRM	X	Subsurface Soil	None
HB-SB-157	LAKESHORE AREA	924605.03	1116509.628	HB-0047-04	07/03/2008	SOIL	S-SB	REG	OBG	6	8	FT	Covered by UHB IRM	X	Subsurface Soil	None
HB-SB-158	LAKESHORE AREA	924896.101	116301.588	HB-0047-01	07/02/2008	SOIL	S-SB	REG	OBG	4	6	FT	Covered by UHB IRM	X	Subsurface Soil	None
HB-SB-159	LAKESHORE AREA	925353.535	1115996.782	HB-0047-02	07/03/2008	SOIL	S-SB	REG	OBG	4	6	FT	Covered by UHB IRM	X	Subsurface Soil	None
HB-SB-160	LAKESHORE AREA	925786.352	1115791.668	HB-0044-01	07/01/2008	SOIL	S-SB	REG	OBG	6	8	Ft	Covered by UHB IRM	X	Subsurface Soil	None
HB-SB-160	LAKESHORE AREA	925786.352	1115791.668	HB-0044-02	07/01/2008	SOIL	S-SB	REG	OBG	6	8	Ft	Covered by UHB IRM	X	Subsurface Soil	None
HB-SB-160	LAKESHORE AREA	925786.352	1115791.668	HB-0044-03	07/01/2008	SOIL	S-SB	REG	OBG	6	8	Ft	Covered by UHB IRM	X	Subsurface Soil	None
HB-SB-160	LAKESHORE AREA	925786.352	1115791.668	HB-0047-03	07/01/2008	SOIL	S-SB	REG	OBG	6	8	FT	Covered by UHB IRM	X	Subsurface Soil	None
HB-SB-227	LAKESHORE AREA	923703.0928	1117749.8221	HB-5152-12	11/18/2010	Soil	SED	REG	PAR	0.0	2.0	FT	Outboard Area	X	Surface Soil	Removed from dataset (Outboard Area)
HB-SB-227	LAKESHORE AREA	923703.0928	1117749.8221	HB-5152-13	11/18/2010	SOIL	SED	REG	PAR	2.0	4.0	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-227	LAKESHORE AREA	923703.0928	1117749.8221	HB-5152-14	11/18/2010	Soil	SED	REG	PAR	4.0	6.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-227	LAKESHORE AREA	923703.0928	1117749.8221	HB-5152-15	11/18/2010	Soil	SED	REG	PAR	6.0	8.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-227	LAKESHORE AREA	923703.0928	1117749.8221	HB-5152-16	11/18/2010	Soil	SED	REG	PAR	8.0	10.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-227	LAKESHORE AREA	923703.0928	1117749.8221	HB-5152-17	11/18/2010	Soil	SED	REG	PAR	10.0	12.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-227	LAKESHORE AREA	923703.0928	1117749.8221	HB-5152-18	11/18/2010	Soil	SED	REG	PAR	12.0	14.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-227	LAKESHORE AREA	923703.0928	1117749.8221	HB-5152-19	11/18/2010	Soil	SED	REG	PAR	14.0	16.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-227	LAKESHORE AREA	923703.0928	1117749.8221	HB-5152-20	11/18/2010	Soil	SED	REG	PAR	16.0	18.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-227	LAKESHORE AREA	923703.0928	1117749.8221	HB-5152-21	11/18/2010	Soil	SED	REG	PAR	18.0	20.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-228	LAKESHORE AREA	923950.9445	1117697.6966	HB-5152-01	11/18/2010	Soil	SED	REG	PAR	0.0	2.0	FT	Outboard Area	X	Surface Soil	Removed from dataset (Outboard Area)
HB-SB-228	LAKESHORE AREA	923950.9445	1117697.6966	HB-5152-02	11/18/2010	Soil	SED	REG	PAR	2.0	4.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-228	LAKESHORE AREA	923950.9445	1117697.6966	HB-5152-03	11/18/2010	Soil	SED	REG	PAR	4.0	6.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-228	LAKESHORE AREA	923950.9445	1117697.6966	HB-5152-04	11/18/2010	Soil	SED	REG	PAR	6.0	8.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-228	LAKESHORE AREA	923950.9445	1117697.6966	HB-5152-05	11/18/2010	Soil	SED	REG	PAR	8.0	10.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-228	LAKESHORE AREA	923950.9445	1117697.6966	HB-5152-06	11/18/2010	Soil	SED	REG	PAR	10.0	12.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-228	LAKESHORE AREA	923950.9445	1117697.6966	HB-5152-07	11/18/2010	Soil	SED	REG	PAR	12.0	14.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-228	LAKESHORE AREA	923950.9445	1117697.6966	HB-5152-09	11/18/2010	Soil	SED	REG	PAR	14.0	16.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-228	LAKESHORE AREA	923950.9445	1117697.6966	HB-5152-10	11/18/2010	Soil	SED	REG	PAR	16.0	18.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-228	LAKESHORE AREA	923950.9445	1117697.6966	HB-5152-11	11/18/2010	Soil	SED	REG	PAR	18.0	20.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)

Location ID	Subsite Name	East	North	Field Sample ID	Date Sampled	Sample Matrix	Sample Type	Sample Purpose	Sampling Company	Start Depth	End Depth	Depth Units	Notes	Include in Initial Dataset	Surface/Subsurface (Initial Dataset)	Change in Use for FS
HB-SB-229	LAKESHORE AREA	924094.3362	1117659.3014	HB-5151-11	11/17/2010	Soil	SED	REG	PAR	0.0	2.0	FT	Outboard Area	X	Surface Soil	Removed from dataset (Outboard Area)
HB-SB-229	LAKESHORE AREA	924094.3362	1117659.3014	HB-5151-12	11/17/2010	Soil	SED	REG	PAR	2.0	4.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-229	LAKESHORE AREA	924094.3362	1117659.3014	HB-5151-13	11/17/2010	Soil	SED	REG	PAR	4.0	6.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-229	LAKESHORE AREA	924094.3362	1117659.3014	HB-5151-14	11/17/2010	Soil	SED	REG	PAR	6.0	8.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-229	LAKESHORE AREA	924094.3362	1117659.3014	HB-5151-15	11/17/2010	Soil	SED	REG	PAR	8.0	10.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-229	LAKESHORE AREA	924094.3362	1117659.3014	HB-5151-17	11/17/2010	Soil	SED	REG	PAR	12.0	14.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-229	LAKESHORE AREA	924094.3362	1117659.3014	HB-5151-18	11/17/2010	Soil	SED	REG	PAR	14.0	16.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-229	LAKESHORE AREA	924094.3362	1117659.3014	HB-5151-20	11/17/2010	Soil	SED	REG	PAR	18.0	20.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-231	LAKESHORE AREA	924342.3037	1117622.2727	HB-5151-01	11/17/2010	Soil	SED	REG	PAR	0.0	2.0	FT	Outboard Area	X	Surface Soil	Removed from dataset (Outboard Area)
HB-SB-231	LAKESHORE AREA	924342.3037	1117622.2727	HB-5151-02	11/17/2010	Soil	SED	REG	PAR	2.0	4.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-231	LAKESHORE AREA	924342.3037	1117622.2727	HB-5151-03	11/17/2010	Soil	SED	REG	PAR	4.0	6.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-231	LAKESHORE AREA	924342.3037	1117622.2727	HB-5151-04	11/17/2010	Soil	SED	REG	PAR	8.0	10.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-231	LAKESHORE AREA	924342.3037	1117622.2727	HB-5151-05	11/17/2010	Soil	SED	REG	PAR	10.0	12.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-231	LAKESHORE AREA	924342.3037	1117622.2727	HB-5151-06	11/17/2010	Soil	SED	REG	PAR	12.0	14.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-231	LAKESHORE AREA	924342.3037	1117622.2727	HB-5151-07	11/17/2010	Soil	SED	REG	PAR	14.0	16.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-231	LAKESHORE AREA	924342.3037	1117622.2727	HB-5151-08	11/17/2010	Soil	SED	REG	PAR	16.0	18.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-231	LAKESHORE AREA	924342.3037	1117622.2727	HB-5151-09	11/17/2010	Soil	SED	REG	PAR	18.0	20.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-233	LAKESHORE AREA	924506.4495	1117424.674	HB-5157-01	11/23/2010	Soil	SED	REG	PAR	0.0	2.0	FT	Outboard Area	X	Surface Soil	Removed from dataset (Outboard Area)
HB-SB-233	LAKESHORE AREA	924506.4495	1117424.674	HB-5157-02	11/23/2010	Soil	SED	REG	PAR	2.0	4.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-233	LAKESHORE AREA	924506.4495	1117424.674	HB-5157-03	11/23/2010	Soil	SED	REG	PAR	4.0	6.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-233	LAKESHORE AREA	924506.4495	1117424.674	HB-5157-04	11/23/2010	Soil	SED	REG	PAR	6.0	8.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-233	LAKESHORE AREA	924506.4495	1117424.674	HB-5157-05	11/23/2010	Soil	SED	REG	PAR	8.0	10.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-233	LAKESHORE AREA	924506.4495	1117424.674	HB-5157-06	11/23/2010	Soil	SED	REG	PAR	10.0	12.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-233	LAKESHORE AREA	924506.4495	1117424.674	HB-5157-07	11/23/2010	Soil	SED	REG	PAR	12.0	14.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-233	LAKESHORE AREA	924506.4495	1117424.674	HB-5157-08	11/23/2010	Soil	SED	REG	PAR	14.0	16.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-233	LAKESHORE AREA	924506.4495	1117424.674	HB-5157-09	11/23/2010	Soil	SED	REG	PAR	16.0	18.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-233	LAKESHORE AREA	924506.4495	1117424.674	HB-5157-10	11/23/2010	Soil	SED	REG	PAR	18.0	20.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-234	LAKESHORE AREA	924610.861	1117399.4489	HB-5155-11	11/22/2010	Soil	SED	REG	PAR	0.0	2.0	FT	Outboard Area	X	Surface Soil	Removed from dataset (Outboard Area)
HB-SB-234	LAKESHORE AREA	924610.861	1117399.4489	HB-5155-12	11/22/2010	Soil	SED	REG	PAR	2.0	4.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-234	LAKESHORE AREA	924610.861	1117399.4489	HB-5155-13	11/22/2010	Soil	SED	REG	PAR	4.0	6.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-234	LAKESHORE AREA	924610.861	1117399.4489	HB-5155-14	11/22/2010	Soil	SED	REG	PAR	6.0	8.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-234	LAKESHORE AREA	924610.861	1117399.4489	HB-5155-15	11/22/2010	Soil	SED	REG	PAR	8.0	10.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-234	LAKESHORE AREA	924610.861	1117399.4489	HB-5155-16	11/22/2010	Soil	SED	REG	PAR	10.0	12.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-234	LAKESHORE AREA	924610.861	1117399.4489	HB-5155-17	11/22/2010	Soil	SED	REG	PAR	12.0	14.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-234	LAKESHORE AREA	924610.861	1117399.4489	HB-5155-18	11/22/2010	Soil	SED	REG	PAR	14.0	16.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-234	LAKESHORE AREA	924610.861	1117399.4489	HB-5155-19	11/22/2010	Soil	SED	REG	PAR	16.0	18.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-234	LAKESHORE AREA	924610.861	1117399.4489	HB-5155-20	11/22/2010	Soil	SED	REG	PAR	18.0	20.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-235	LAKESHORE AREA	924652.3183	1117482.6545	HB-5153-01	11/18/2010	Soil	SED	REG	PAR	0.0	2.0	FT	Outboard Area	X	Surface Soil	Removed from dataset (Outboard Area)
HB-SB-235	LAKESHORE AREA	924652.3183	1117482.6545	HB-5153-02	11/18/2010	Soil	SED	REG	PAR	2.0	4.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-235	LAKESHORE AREA	924652.3183	1117482.6545	HB-5153-04	11/18/2010	Soil	SED	REG	PAR	4.0	6.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-235	LAKESHORE AREA	924652.3183	1117482.6545	HB-5153-05	11/18/2010	Soil	SED	REG	PAR	8.0	10.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-235	LAKESHORE AREA	924652.3183	1117482.6545	HB-5153-06	11/18/2010	Soil	SED	REG	PAR	10.0	12.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-235	LAKESHORE AREA	924652.3183	1117482.6545	HB-5153-07	11/18/2010	Soil	SED	REG	PAR	12.0	14.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-235	LAKESHORE AREA	924652.3183	1117482.6545	HB-5153-08	11/18/2010	Soil	SED	REG	PAR	14.0	16.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-235	LAKESHORE AREA	924652.3183	1117482.6545	HB-5153-09	11/18/2010	Soil	SED	REG	PAR	16.0	18.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-235	LAKESHORE AREA	924652.3183	1117482.6545	HB-5153-10	11/18/2010	Soil	SED	REG	PAR	18.0	20.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-236	LAKESHORE AREA	924722.2563	1117427.2853	HB-5154-01	11/19/2010	Soil	SED	REG	PAR	0.0	2.0	FT	Outboard Area	X	Surface Soil	Removed from dataset (Outboard Area)
HB-SB-236	LAKESHORE AREA	924722.2563	1117427.2853	HB-5154-02	11/19/2010	Soil	SED	REG	PAR	2.0	4.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-236	LAKESHORE AREA	924722.2563	1117427.2853	HB-5154-03	11/19/2010	Soil	SED	REG	PAR	4.0	6.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-236	LAKESHORE AREA	924722.2563	1117427.2853	HB-5154-04	11/19/2010	Soil	SED	REG	PAR	6.0	8.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-236	LAKESHORE AREA	924722.2563	1117427.2853	HB-5154-05	11/19/2010	Soil	SED	REG	PAR	8.0	10.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-236	LAKESHORE AREA	924722.2563	1117427.2853	HB-5154-06	11/19/2010	Soil	SED	REG	PAR	10.0	12.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-236	LAKESHORE AREA	924722.2563	1117427.2853	HB-5154-07	11/19/2010	Soil	SED	REG	PAR	16.0	18.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-236	LAKESHORE AREA	924722.2563	1117427.2853	HB-5154-08	11/19/2010	Soil	SED	REG	PAR	18.0	20.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-237	LAKESHORE AREA	924551.2474	1117351.5847	HB-5156-02	11/22/2010	Soil	SED	REG	PAR	0.0	2.0	FT	Outboard Area	X	Surface Soil	Removed from dataset (Outboard Area)
HB-SB-237	LAKESHORE AREA	924551.2474	1117351.5847	HB-5156-03	11/22/2010	Soil	SED	REG	PAR	2.0	4.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-237	LAKESHORE AREA	924551.2474	1117351.5847	HB-5156-04	11/22/2010	Soil	SED	REG	PAR	4.0	6.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-237	LAKESHORE AREA	924551.2474	1117351.5847	HB-5156-05	11/22/2010	Soil	SED	REG	PAR	6.0	8.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-237	LAKESHORE AREA	924551.2474	1117351.5847	HB-5156-06	11/22/2010	Soil	SED	REG	PAR	8.0	10.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-237	LAKESHORE AREA	924551.2474	1117351.5847	HB-5156-07	11/22/2010	Soil	SED	REG	PAR	10.0	12.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-237	LAKESHORE AREA	924551.2474	1117351.5847	HB-5156-08	11/22/2010	Soil	SED	REG	PAR	12.0	14.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-237	LAKESHORE AREA	924551.2474	1117351.5847	HB-5156-09	11/22/2010	Soil	SED	REG	PAR	14.0	16.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-237	LAKESHORE AREA	924551.2474	1117351.5847	HB-5156-10	11/22/2010	Soil	SED	REG	PAR	16.0	18.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-237	LAKESHORE AREA	924551.2474	1117351.5847	HB-5156-11	11/22/2010	Soil	SED	REG	PAR	18.0	20.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-238	LAKESHORE AREA	924932.2303	1117142.7239	HB-5160-01	11/29/2010	Soil	SED	REG	PAR	0.0	2.0	FT	Outboard Area	X	Surface Soil	Removed from dataset (Outboard Area)
HB-SB-238	LAKESHORE AREA	924932.2303	1117142.7239	HB-5160-02	11/29/2010	Soil	SED	REG	PAR	2.0	4.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-238	LAKESHORE AREA	924932.2303	1117142.7239	HB-5160-03	11/29/2010	Soil	SED	REG	PAR	4.0	6.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-238	LAKESHORE AREA	924932.2303	1117142.7239	HB-5160-04	11/29/2010	Soil	SED	REG	PAR	6.0	8.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-238	LAKESHORE AREA	924932.2303	1117142.7239	HB-5160-05	11/29/2010	Soil	SED	REG	PAR	8.0	10.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-238	LAKESHORE AREA	924932.2303	1117142.7239	HB-5160-06	11/29/2010	Soil	SED	REG	PAR	12.0	14.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-238	LAKESHORE AREA	924932.2303	1117142.7239	HB-5160-07	11/29/2010	Soil	SED	REG	PAR	14.0	16.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-238	LAKESHORE AREA	924932.2303	1117142.7239	HB-5160-08	11/29/2010	Soil	SED	REG	PAR	16.0	18.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-238	LAKESHORE AREA	924932.2303	1117142.7239	HB-5160-09	11/29/2010	Soil	SED	REG	PAR	18.0	20.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)

Location ID	Subsite Name	East	North	Field Sample ID	Date Sampled	Sample Matrix	Sample Type	Sample Purpose	Sampling Company	Start Depth	End Depth	Depth Units	Notes	Include in Initial Dataset	Surface/Subsurface (Initial Dataset)	Change in Use for FS
HB-SB-239	LAKESHORE AREA	925060.2985	1117087.1598	HB-5161-01	11/30/2010	Soil	SED	REG	PAR	0.0	2.0	FT	Outboard Area	X	Surface Soil	Removed from dataset (Outboard Area)
HB-SB-239	LAKESHORE AREA	925060.2985	1117087.1598	HB-5161-02	11/30/2010	Soil	SED	REG	PAR	2.0	4.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-239	LAKESHORE AREA	925060.2985	1117087.1598	HB-5161-03	11/30/2010	Soil	SED	REG	PAR	4.0	6.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-239	LAKESHORE AREA	925060.2985	1117087.1598	HB-5161-04	11/30/2010	Soil	SED	REG	PAR	6.0	8.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-239	LAKESHORE AREA	925060.2985	1117087.1598	HB-5161-05	11/30/2010	Soil	SED	REG	PAR	8.0	10.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-239	LAKESHORE AREA	925060.2985	1117087.1598	HB-5161-06	11/30/2010	Soil	SED	REG	PAR	10.0	12.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-239	LAKESHORE AREA	925060.2985	1117087.1598	HB-5161-07	11/30/2010	Soil	SED	REG	PAR	12.0	14.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-239	LAKESHORE AREA	925060.2985	1117087.1598	HB-5161-08	11/30/2010	Soil	SED	REG	PAR	14.0	16.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-239	LAKESHORE AREA	925060.2985	1117087.1598	HB-5161-09	11/30/2010	Soil	SED	REG	PAR	16.0	18.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-239	LAKESHORE AREA	925060.2985	1117087.1598	HB-5161-10	11/30/2010	Soil	SED	REG	PAR	18.0	20.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-240	LAKESHORE AREA	924977.7121	1117028.2501	HB-5159-12	11/29/2010	Soil	SED	REG	PAR	0.0	2.0	FT	Outboard Area	X	Surface Soil	Removed from dataset (Outboard Area)
HB-SB-240	LAKESHORE AREA	924977.7121	1117028.2501	HB-5159-13	11/29/2010	Soil	SED	REG	PAR	2.0	4.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-240	LAKESHORE AREA	924977.7121	1117028.2501	HB-5159-14	11/29/2010	Soil	SED	REG	PAR	4.0	6.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-240	LAKESHORE AREA	924977.7121	1117028.2501	HB-5159-15	11/29/2010	Soil	SED	REG	PAR	6.0	8.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-240	LAKESHORE AREA	924977.7121	1117028.2501	HB-5159-16	11/29/2010	Soil	SED	REG	PAR	8.0	10.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-240	LAKESHORE AREA	924977.7121	1117028.2501	HB-5159-17	11/29/2010	Soil	SED	REG	PAR	10.0	12.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-240	LAKESHORE AREA	924977.7121	1117028.2501	HB-5159-18	11/29/2010	Soil	SED	REG	PAR	12.0	14.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-240	LAKESHORE AREA	924977.7121	1117028.2501	HB-5159-19	11/29/2010	Soil	SED	REG	PAR	14.0	16.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-240	LAKESHORE AREA	924977.7121	1117028.2501	HB-5159-20	11/29/2010	Soil	SED	REG	PAR	16.0	18.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-240	LAKESHORE AREA	924977.7121	1117028.2501	HB-5159-21	11/29/2010	Soil	SED	REG	PAR	18.0	20.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-241	LAKESHORE AREA	925124.3758	1116998.0142	HB-5161-12	11/30/2010	Soil	SED	REG	PAR	0.0	2.0	FT	Outboard Area	X	Surface Soil	Removed from dataset (Outboard Area)
HB-SB-241	LAKESHORE AREA	925124.3758	1116998.0142	HB-5161-13	11/30/2010	Soil	SED	REG	PAR	2.0	4.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-241	LAKESHORE AREA	925124.3758	1116998.0142	HB-5161-14	11/30/2010	Soil	SED	REG	PAR	4.0	6.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-241	LAKESHORE AREA	925124.3758	1116998.0142	HB-5161-15	11/30/2010	Soil	SED	REG	PAR	6.0	8.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-241	LAKESHORE AREA	925124.3758	1116998.0142	HB-5161-16	11/30/2010	Soil	SED	REG	PAR	8.0	10.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-241	LAKESHORE AREA	925124.3758	1116998.0142	HB-5161-17	11/30/2010	Soil	SED	REG	PAR	10.0	12.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-241	LAKESHORE AREA	925124.3758	1116998.0142	HB-5161-18	11/30/2010	Soil	SED	REG	PAR	12.0	14.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-241	LAKESHORE AREA	925124.3758	1116998.0142	HB-5161-19	11/30/2010	Soil	SED	REG	PAR	14.0	16.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-241	LAKESHORE AREA	925124.3758	1116998.0142	HB-5161-20	11/30/2010	Soil	SED	REG	PAR	16.0	18.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-241	LAKESHORE AREA	925124.3758	1116998.0142	HB-5161-21	11/30/2010	Soil	SED	REG	PAR	18.0	20.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-242	LAKESHORE AREA	925236.1959	1116953.4414	HB-5162-11	11/30/2010	Soil	SED	REG	PAR	0.0	2.0	FT	Outboard Area	X	Surface Soil	Removed from dataset (Outboard Area)
HB-SB-242	LAKESHORE AREA	925236.1959	1116953.4414	HB-5162-12	11/30/2010	Soil	SED	REG	PAR	2.0	4.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-242	LAKESHORE AREA	925236.1959	1116953.4414	HB-5162-13	11/30/2010	Soil	SED	REG	PAR	4.0	6.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-242	LAKESHORE AREA	925236.1959	1116953.4414	HB-5162-14	11/30/2010	Soil	SED	REG	PAR	6.0	8.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-242	LAKESHORE AREA	925236.1959	1116953.4414	HB-5162-15	11/30/2010	Soil	SED	REG	PAR	8.0	10.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-242	LAKESHORE AREA	925236.1959	1116953.4414	HB-5162-16	11/30/2010	Soil	SED	REG	PAR	10.0	12.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-242	LAKESHORE AREA	925236.1959	1116953.4414	HB-5162-17	11/30/2010	Soil	SED	REG	PAR	12.0	14.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-242	LAKESHORE AREA	925236.1959	1116953.4414	HB-5162-18	11/30/2010	Soil	SED	REG	PAR	14.0	16.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-242	LAKESHORE AREA	925236.1959	1116953.4414	HB-5162-19	11/30/2010	Soil	SED	REG	PAR	16.0	18.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-242	LAKESHORE AREA	925236.1959	1116953.4414	HB-5162-20	11/30/2010	Soil	SED	REG	PAR	18.0	20.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-243	LAKESHORE AREA	925152.8277	1116916.1916	HB-5162-01	11/30/2010	Soil	SED	REG	PAR	0.0	2.0	FT	Outboard Area	X	Surface Soil	Removed from dataset (Outboard Area)
HB-SB-243	LAKESHORE AREA	925152.8277	1116916.1916	HB-5162-02	11/30/2010	Soil	SED	REG	PAR	2.0	4.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-243	LAKESHORE AREA	925152.8277	1116916.1916	HB-5162-03	11/30/2010	Soil	SED	REG	PAR	4.0	6.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-243	LAKESHORE AREA	925152.8277	1116916.1916	HB-5162-04	11/30/2010	Soil	SED	REG	PAR	6.0	8.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-243	LAKESHORE AREA	925152.8277	1116916.1916	HB-5162-05	11/30/2010	Soil	SED	REG	PAR	8.0	10.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-243	LAKESHORE AREA	925152.8277	1116916.1916	HB-5162-06	11/30/2010	Soil	SED	REG	PAR	10.0	12.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-243	LAKESHORE AREA	925152.8277	1116916.1916	HB-5162-07	11/30/2010	Soil	SED	REG	PAR	12.0	14.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-243	LAKESHORE AREA	925152.8277	1116916.1916	HB-5162-08	11/30/2010	Soil	SED	REG	PAR	14.0	16.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-243	LAKESHORE AREA	925152.8277	1116916.1916	HB-5162-09	11/30/2010	Soil	SED	REG	PAR	16.0	18.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-243	LAKESHORE AREA	925152.8277	1116916.1916	HB-5162-10	11/30/2010	Soil	SED	REG	PAR	18.0	20.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-248	LAKESHORE AREA	924704.5866	1117334.7754	HB-5154-09	11/19/2010	Soil	SED	REG	PAR	0.0	2.0	FT	Outboard Area	X	Surface Soil	Removed from dataset (Outboard Area)
HB-SB-248	LAKESHORE AREA	924704.5866	1117334.7754	HB-5154-10	11/19/2010	Soil	SED	REG	PAR	2.0	4.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-248	LAKESHORE AREA	924704.5866	1117334.7754	HB-5154-11	11/19/2010	Soil	SED	REG	PAR	4.0	6.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-248	LAKESHORE AREA	924704.5866	1117334.7754	HB-5154-12	11/19/2010	Soil	SED	REG	PAR	6.0	8.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-248	LAKESHORE AREA	924704.5866	1117334.7754	HB-5154-13	11/19/2010	Soil	SED	REG	PAR	8.0	10.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-248	LAKESHORE AREA	924704.5866	1117334.7754	HB-5154-15	11/19/2010	Soil	SED	REG	PAR	10.0	12.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-248	LAKESHORE AREA	924704.5866	1117334.7754	HB-5154-16	11/19/2010	Soil	SED	REG	PAR	12.0	14.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-248	LAKESHORE AREA	924704.5866	1117334.7754	HB-5154-17	11/19/2010	Soil	SED	REG	PAR	14.0	16.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-248	LAKESHORE AREA	924704.5866	1117334.7754	HB-5154-18	11/19/2010	Soil	SED	REG	PAR	16.0	18.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-248	LAKESHORE AREA	924704.5866	1117334.7754	HB-5154-19	11/19/2010	Soil	SED	REG	PAR	18.0	20.0	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-61	LAKESHORE AREA	925113.8345	1116304.874	HB-0021-03	11/03/2006	SOIL	S-SB	REG	OBG	26	28	Ft	Covered by WBB/HB MM,G,&D Plan	X	Subsurface Soil	None
HB-SB-61	LAKESHORE AREA	925113.8345	1116304.874	HB-0021-04	11/03/2006	SOIL	S-SB	REG	OBG	26	28	Ft	Covered by WBB/HB MM,G,&D Plan	X	Subsurface Soil	None
HB-SB-62	LAKESHORE AREA	925517.1075	1116501.674	HB-0019-01	11/01/2006	SOIL	S-SB	REG	OBG	32	34	Ft	Covered by WBB/HB MM,G,&D Plan	X	Subsurface Soil	None
HB-SB-62	LAKESHORE AREA	925517.1075	1116501.674	HB-0019-02	11/01/2006	SOIL	S-SB	REG	OBG	32	34	Ft	Covered by WBB/HB MM,G,&D Plan	X	Subsurface Soil	None
HB-SB-63	LAKESHORE AREA	925693.9815	1116540.816	HB-0019-03	11/01/2006	SOIL	S-SB	REG	OBG	4	6	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-63	LAKESHORE AREA	925693.9815	1116540.816	HB-0019-04	11/01/2006	SOIL	S-SB	REG	OBG	4	6	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-64	LAKESHORE AREA	925771.9495	1116471.454	HB-0019-05	11/02/2006	SOIL	S-SB	REG	OBG	2	4	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-64	LAKESHORE AREA	925771.9495	1116471.454	HB-0019-06	11/02/2006	SOIL	S-SB	REG	OBG	2	4	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-64	LAKESHORE AREA	925771.9495	1116471.454	HB-1048-05	07/16/2008	SOIL	S-SS	REG	OBG	0	0.5	FT	Removed by West Wall IRM; placed on Wastebed B	X	Surface Soil	Removed; placed on Wastebed B
HB-SB-64	LAKESHORE AREA	925771.9495	1116471.454	HB-1048-06	07/16/2008	SOIL	S-SS	REG	OBG	0.5	1	FT	Removed by West Wall IRM; placed on Wastebed B	X	Surface Soil	Removed; placed on Wastebed B
HB-SB-65	LAKESHORE AREA	925855.6525	1116351.484	HB-0021-01	11/03/2006	SOIL	S-SB	REG	OBG	0	2	Ft	Covered by West Wall IRM	X	Surface Soil	Subsurface Soil
HB-SB-65	LAKESHORE AREA	925855.6525	1116351.484	HB-0021-02	11/03/2006	SOIL	S-SB	REG	OBG	0	2	Ft	Covered by West Wall IRM	X	Surface Soil	Subsurface Soil

Location ID	Subsite Name	East	North	Field Sample ID	Date Sampled	Sample Matrix	Sample Type	Sample Purpose	Sampling Company	Start Depth	End Depth	Depth Units	Notes	Include in Initial Dataset	Surface/Subsurface (Initial Dataset)	Change in Use for FS
HB-SB-84	LAKESHORE AREA	923482.1005	1117787.261	HB-0010-01	10/27/2006	SOIL	S-SB	REG	OBG	6	8	FT	Covered by Lake Remedy Support Area	X	Subsurface Soil	None
HB-SB-84	LAKESHORE AREA	923482.1005	1117787.261	HB-0010-02	10/27/2006	SOIL	S-SB	REG	OBG	6	8	FT	Covered by Lake Remedy Support Area	X	Subsurface Soil	None
HB-SB-85	LAKESHORE AREA	923661.0975	1117741.781	HB-0008-03	10/26/2006	SOIL	S-SB	REG	OBG	4	6	FT	Removed by West Wall IRM; placed on Wastebed B	X	Subsurface Soil	Removed; placed of Wastebed B
HB-SB-85	LAKESHORE AREA	923661.0975	1117741.781	HB-0008-04	10/26/2006	SOIL	S-SB	REG	OBG	4	6	FT	Removed by West Wall IRM; placed on Wastebed B	X	Subsurface Soil	Removed; placed of Wastebed B
HB-SB-86	LAKESHORE AREA	924748.5485	1117385.761	HB-0003-03	10/19/2006	SOIL	S-SB	REG	OBG	16	18	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-86	LAKESHORE AREA	924748.5485	1117385.761	HB-0003-04	10/19/2006	SOIL	S-SB	REG	OBG	16	18	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-87	LAKESHORE AREA	924734.5915	1117311.432	HB-0005-01	10/20/2006	SOIL	S-SB	REG	OBG	10	12	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-87	LAKESHORE AREA	924734.5915	1117311.432	HB-0005-02	10/20/2006	SOIL	S-SB	REG	OBG	10	12	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-88	LAKESHORE AREA	924837.6125	1117357.888	HB-0003-01	10/18/2006	SOIL	S-SB	REG	OBG	12	14	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SB-88	LAKESHORE AREA	924837.6125	1117357.888	HB-0003-02	10/18/2006	SOIL	S-SB	REG	OBG	12	14	FT	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-SED-21	LAKESHORE AREA	924605.03	1116509.628	HB-1031-05	07/02/2008	SOIL	SED	REG	OBG	0	1	FT	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-SED-21	LAKESHORE AREA	924605.03	1116509.628	HB-1031-06	07/02/2008	SOIL	SED	REG	OBG	0	1	FT	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-SED-21	LAKESHORE AREA	924605.03	1116509.628	HB-1031-07	07/02/2008	SOIL	SED	REG	OBG	1	4	FT	Down to 3.25 ft removed by UHB IRM and place on Wastebed B; covered with liner	X	Subsurface Sediment	Removed and placed on Wastebed B; covered and now Subsurface Soil
HB-SED-21	LAKESHORE AREA	924605.03	1116509.628	HB-1031-08	07/02/2008	SOIL	SED	REG	OBG	1	4	FT	Down to 3.25 ft removed by UHB IRM and place on Wastebed B; covered with liner	X	Subsurface Sediment	Removed and placed on Wastebed B; covered and now Subsurface Soil
HB-SED-21	LAKESHORE AREA	924605.03	1116509.628	HB-1051-07	07/02/2008	SOIL	SED	REG	OBG	0	2	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-SED-21	LAKESHORE AREA	924605.03	1116509.628	HB-1051-08	07/02/2008	SOIL	SED	REG	OBG	2	4	Ft	Down to 3.25 ft removed by UHB IRM and place on Wastebed B; covered with liner	X	Subsurface Sediment	Removed and placed on Wastebed B; covered and now Subsurface Soil
HB-SED-22	LAKESHORE AREA	925353.535	1115996.782	HB-1032-01	07/03/2008	SOIL	SED	REG	OBG	0	1	FT	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-SED-22	LAKESHORE AREA	925353.535	1115996.782	HB-1032-02	07/03/2008	SOIL	SED	REG	OBG	1	4	FT	Down to 3.25 ft removed by UHB IRM and place on Wastebed B; covered with liner	X	Subsurface Sediment	Removed and placed on Wastebed B; covered and now Subsurface Soil
HB-SED-22	LAKESHORE AREA	925353.535	1115996.782	HB-1032-03	07/03/2008	SOIL	SED	REG	OBG	0	1	FT	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-SED-22	LAKESHORE AREA	925353.535	1115996.782	HB-1032-04	07/03/2008	SOIL	SED	REG	OBG	1	4	FT	Down to 3.25 ft removed by UHB IRM and place on Wastebed B; covered with liner	X	Subsurface Sediment	Removed and placed on Wastebed B; covered and now Subsurface Soil
HB-SED-22	LAKESHORE AREA	925353.535	1115996.782	HB-1051-09	07/03/2008	SOIL	SED	REG	OBG	0	4	Ft	Down to 3.25 ft removed by UHB IRM and place on Wastebed B; covered with liner	X	Subsurface Sediment	Removed and placed on Wastebed B; covered and now Subsurface Soil
HB-SEEP-2	LAKESHORE AREA	920511.844881	1118757.50166	HB9816	09/09/2003	SOIL	SP	REG	OBG	0	0.5	Ft	Outboard Area	X	Surface Soil	Removed from dataset (Outboard Area)
HB-SEEP-2	LAKESHORE AREA	920511.844881	1118757.50166	HB9817	09/09/2003	SOIL	SP	REG	OBG	0.5	1	Ft	Outboard Area	X	Surface Soil	Removed from dataset (Outboard Area)
HB-SS-01	LAKESHORE AREA	923438.000002	1117556	HB-1049-07	07/16/2008	SOIL	S-SS	REG	OBG	0	0.5	FT	Covered by Lake Remedy Support Area	X	Surface Soil	Subsurface Soil
HB-SS-01	LAKESHORE AREA	923438.000002	1117556	HB-1049-08	07/16/2008	SOIL	S-SS	REG	OBG	0.5	1	FT	Covered by Lake Remedy Support Area	X	Surface Soil	Subsurface Soil
HB-SS-01	LAKESHORE AREA	923438.000002	1117556	HB9594	12/03/2002	SOIL	S-SS	REG	OBG	0.5	1	Ft	Covered by Lake Remedy Support Area	X	Surface Soil	Subsurface Soil
HB-SS-01	LAKESHORE AREA	923438.000002	1117556	HB9595	12/03/2002	SOIL	S-SS	REG	OBG	0	0.5	Ft	Covered by Lake Remedy Support Area	X	Surface Soil	Subsurface Soil
HB-SS-02	LAKESHORE AREA	923848.000001	1117429	HB9596	12/03/2002	SOIL	S-SS	REG	OBG	0.5	1	Ft	Covered by Lake Remedy Support Area	X	Surface Soil	Subsurface Soil
HB-SS-02	LAKESHORE AREA	923848.000001	1117429	HB9597	12/03/2002	SOIL	S-SS	REG	OBG	0	0.5	Ft	Covered by Lake Remedy Support Area	X	Surface Soil	Subsurface Soil
HB-SS-03	LAKESHORE AREA	924512.999998	1117439	HB-1049-05	07/16/2008	SOIL	S-SS	REG	OBG	0	0.5	FT	Outboard Area	X	Surface Soil	Removed from dataset (Outboard Area)
HB-SS-03	LAKESHORE AREA	924512.999998	1117439	HB9598	12/03/2002	SOIL	S-SS	REG	OBG	0.5	1	Ft	Outboard Area	X	Surface Soil	Removed from dataset (Outboard Area)
HB-SS-03	LAKESHORE AREA	924512.999998	1117439	HB9599	12/03/2002	SOIL	S-SS	REG	OBG	0	0.5	Ft	Outboard Area	X	Surface Soil	Removed from dataset (Outboard Area)
HB-SS-04	LAKESHORE AREA	924706.999999	1117306	HB-1049-03	07/16/2008	SOIL	S-SS	REG	OBG	0	0.5	FT	Outboard Area	X	Surface Soil	Removed from dataset (Outboard Area)
HB-SS-04	LAKESHORE AREA	924706.999999	1117306	HB-1049-04	07/16/2008	SOIL	S-SS	REG	OBG	0.5	1	FT	Outboard Area	X	Surface Soil	Removed from dataset (Outboard Area)
HB-SS-04	LAKESHORE AREA	924706.999999	1117306	HB9600	12/03/2002	SOIL	S-SS	REG	OBG	0.5	1	Ft	Outboard Area	X	Surface Soil	Removed from dataset (Outboard Area)
HB-SS-04	LAKESHORE AREA	924706.999999	1117306	HB9604	12/03/2002	SOIL	S-SS	REG	OBG	0	0.5	Ft	Outboard Area	X	Surface Soil	Removed from dataset (Outboard Area)
HB-SS-05	LAKESHORE AREA	924697.000001	1116838	HB9593	12/03/2002	SOIL	S-SS	REG	OBG	0	0.5	Ft	Covered by WBB/HB MM,G,&D Plan	X	Surface Soil	Subsurface Soil
HB-SS-05	LAKESHORE AREA	924697.000001	1116838	HB9601	12/03/2002	SOIL	S-SS	REG	OBG	0.5	1	Ft	Covered by WBB/HB MM,G,&D Plan	X	Surface Soil	Subsurface Soil
HB-SS-06	LAKESHORE AREA	925243.999999	1116661	HB9602	12/03/2002	SOIL	S-SS	REG	OBG	0.5	1	Ft	Uncovered; pending final Site remedy	X	Surface Soil	None
HB-SS-06	LAKESHORE AREA	925243.999999	1116661	HB9603	12/03/2002	SOIL	S-SS	REG	OBG	0	0.5	Ft	Uncovered; pending final Site remedy	X	Surface Soil	None
HB-SS-07	LAKESHORE AREA	925434.999998	1116112	HB9624	12/05/2002	SOIL	S-SS	REG	OBG	0	0.5	Ft	Covered by WBB/HB MM,G,&D Plan	X	Surface Soil	Subsurface Soil
HB-SS-08	LAKESHORE AREA	925785.999998	1116277	HB-1048-07	07/16/2008	SOIL	S-SS	REG	OBG	0	0.5	FT	Covered by WBB/HB MM,G,&D Plan	X	Surface Soil	Subsurface Soil
HB-SS-08	LAKESHORE AREA	925785.999998	1116277	HB-1048-08	07/16/2008	SOIL	S-SS	REG	OBG	0.5	1	FT	Covered by WBB/HB MM,G,&D Plan	X	Surface Soil	Subsurface Soil
HB-SS-08	LAKESHORE AREA	925785.999998	1116277	HB9606	12/04/2002	SOIL	S-SS	REG	OBG	0.5	1	Ft	Covered by WBB/HB MM,G,&D Plan	X	Surface Soil	Subsurface Soil
HB-SS-08	LAKESHORE AREA	925785.999998	1116277	HB9608	12/04/2002	SOIL	S-SS	REG	OBG	0	0.5	Ft	Covered by WBB/HB MM,G,&D Plan	X	Surface Soil	Subsurface Soil
HB-SS-09	LAKESHORE AREA	925872.999998	1116094	HB-1047-11	07/16/2008	SOIL	S-SS	REG	OBG	0	0.5	FT	Covered by WBB/HB MM,G,&D Plan	X	Surface Soil	Subsurface Soil
HB-SS-09	LAKESHORE AREA	925872.999998	1116094	HB-1047-12	07/16/2008	SOIL	S-SS	REG	OBG	0.5	1	FT	Covered by WBB/HB MM,G,&D Plan	X	Surface Soil	Subsurface Soil
HB-SS-09	LAKESHORE AREA	925872.999998	1116094	HB9609	12/04/2002	SOIL	S-SS	REG	OBG	0.5	1	Ft	Covered by WBB/HB MM,G,&D Plan	X	Surface Soil	Subsurface Soil
HB-SS-09	LAKESHORE AREA	925872.999998	1116094	HB9610	12/04/2002	SOIL	S-SS	REG	OBG	0	0.5	Ft	Covered by WBB/HB MM,G,&D Plan	X	Surface Soil	Subsurface Soil
HB-SS-10	LAKESHORE AREA	925985.999999	1116202	HB-1048-01	07/16/2008	SOIL	S-SS	REG	OBG	0	0.5	FT	Uncovered; pending further cover under WBB/HB MM,G,&D Plan	X	Surface Soil	None
HB-SS-10	LAKESHORE AREA	925985.999999	1116202	HB-1048-02	07/16/2008	SOIL	S-SS	REG	OBG	0.5	1	FT	Uncovered; pending further cover under WBB/HB MM,G,&D Plan	X	Surface Soil	None
HB-SS-10	LAKESHORE AREA	925985.999999	1116202	HB9611	12/04/2002	SOIL	S-SS	REG	OBG	0.5	1	Ft	Uncovered; pending further cover under WBB/HB MM,G,&D Plan	X	Surface Soil	None
HB-SS-10	LAKESHORE AREA	925985.999999	1116202	HB9612	12/04/2002	SOIL	S-SS	REG	OBG	0	0.5	Ft	Uncovered; pending further cover under WBB/HB MM,G,&D Plan	X	Surface Soil	None
HB-SS-11	LAKESHORE AREA	926117.000002	1116312	HB-1048-09	07/16/2008	SOIL	S-SS	REG	OBG	0	0.5	FT	Outboard Area	X	Surface Soil	Removed from dataset (Outboard Area)
HB-SS-11	LAKESHORE AREA	926117.000002	1116312	HB-1048-10	07/16/2008	SOIL	S-SS	REG	OBG	0.5	1	FT	Outboard Area	X	Surface Soil	Removed from dataset (Outboard Area)
HB-SS-11	LAKESHORE AREA	926117.000002	1116312	HB9613	12/04/2002	SOIL	S-SS	REG	OBG	0.5	1	Ft	Outboard Area	X	Surface Soil	Removed from dataset (Outboard Area)
HB-SS-11	LAKESHORE AREA	926117.000002	1116312	HB9614	12/04/2002	SOIL	S-SS	REG	OBG	0	0.5	Ft	Outboard Area	X	Surface Soil	Removed from dataset (Outboard Area)
HB-STA-185	LAKESHORE AREA	926321.16	1116170.62	HB-5127-06	09/04/2008	SOIL	S-SB	REG	PAR	0.0	3.3	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-185	LAKESHORE AREA	926321.16	1116170.62	HB-5127-07	09/04/2008	SOIL	S-SB	REG	PAR	3.3	6.6	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-185	LAKESHORE AREA	926321.16	1116170.62	HB-5127-08	09/04/2008	SOIL	S-SB	REG	PAR	6.6	8.7	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-186	LAKESHORE AREA	926220.71	1116137.91	HB-5127-09	09/04/2008	SOIL	S-SB	REG	PAR	0.0	3.3	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-186	LAKESHORE AREA	926220.71	1116137.91	HB-5127-10	09/04/2008	SOIL	S-SB	REG	PAR	3.3	6.6	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-186	LAKESHORE AREA	926220.71	1116137.91	HB-5127-11	09/04/2008	SOIL	S-SB	REG	PAR	6.6	7.7	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)

Location ID	Subsite Name	East	North	Field Sample ID	Date Sampled	Sample Matrix	Sample Type	Sample Purpose	Sampling Company	Start Depth	End Depth	Depth Units	Notes	Include in Initial Dataset	Surface/Subsurface (Initial Dataset)	Change in Use for FS
HB-STA-187	LAKESHORE AREA	926089.54	1116319.27	HB-5102-01	08/06/2008	SOIL	S-SB	REG	PAR	0	3.3	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-187	LAKESHORE AREA	926089.54	1116319.27	HB-5102-02	08/06/2008	SOIL	S-SB	REG	PAR	3.3	6.6	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-187	LAKESHORE AREA	926089.54	1116319.27	HB-5102-03	08/06/2008	SOIL	S-SB	REG	PAR	6.6	9.9	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-187	LAKESHORE AREA	926089.54	1116319.27	HB-5102-04	08/06/2008	SOIL	S-SB	REG	PAR	9.9	13.2	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-187	LAKESHORE AREA	926089.54	1116319.27	HB-5102-05	08/06/2008	SOIL	S-SB	REG	PAR	13.2	16	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-188	LAKESHORE AREA	925877.3	1116465.89	HB-5100-01	08/05/2008	SOIL	S-SB	REG	PAR	0	3.3	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-188	LAKESHORE AREA	925877.3	1116465.89	HB-5100-02	08/05/2008	SOIL	S-SB	REG	PAR	3.3	6.6	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-188	LAKESHORE AREA	925877.3	1116465.89	HB-5100-03	08/05/2008	SOIL	S-SB	REG	PAR	6.6	9.9	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-188	LAKESHORE AREA	925877.3	1116465.89	HB-5100-04	08/05/2008	SOIL	S-SB	REG	PAR	9.9	13.2	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-188	LAKESHORE AREA	925877.3	1116465.89	HB-5100-05	08/05/2008	SOIL	S-SB	REG	PAR	13.2	16	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-189 ALT	LAKESHORE AREA	925635.54	1116585.69	HB-5098-01	08/04/2008	SOIL	S-SB	REG	PAR	0	3.3	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-189 ALT	LAKESHORE AREA	925635.54	1116585.69	HB-5098-02	08/04/2008	SOIL	S-SB	REG	PAR	3.3	6.6	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-189 ALT	LAKESHORE AREA	925635.54	1116585.69	HB-5098-03	08/04/2008	SOIL	S-SB	REG	PAR	6.6	9.9	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-189 ALT	LAKESHORE AREA	925635.54	1116585.69	HB-5098-04	08/04/2008	SOIL	S-SB	REG	PAR	9.9	13.2	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-189 ALT	LAKESHORE AREA	925635.54	1116585.69	HB-5098-05	08/04/2008	SOIL	S-SB	REG	PAR	13.2	16.5	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-189 ALT	LAKESHORE AREA	925635.54	1116585.69	HB-5098-06	08/04/2008	SOIL	S-SB	REG	PAR	16.5	19.8	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-190	LAKESHORE AREA	925298.19	1116808.08	HB-5102-06	08/06/2008	SOIL	S-SB	REG	PAR	0	3.3	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-190	LAKESHORE AREA	925298.19	1116808.08	HB-5102-07	08/06/2008	SOIL	S-SB	REG	PAR	3.3	6.6	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-190	LAKESHORE AREA	925298.19	1116808.08	HB-5102-08	08/06/2008	SOIL	S-SB	REG	PAR	6.6	7.5	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-190	LAKESHORE AREA	925298.19	1116808.08	HB-5102-09	08/06/2008	SOIL	S-SB	REG	PAR	7.5	9.5	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-190	LAKESHORE AREA	925298.19	1116808.08	HB-5102-10	08/06/2008	SOIL	S-SB	REG	PAR	9.9	13.2	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-190	LAKESHORE AREA	925298.19	1116808.08	HB-5102-11	08/06/2008	SOIL	S-SB	REG	PAR	13.2	16.5	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-190	LAKESHORE AREA	925298.19	1116808.08	HB-5102-12	08/06/2008	SOIL	S-SB	REG	PAR	16.5	17.4	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-192	LAKESHORE AREA	925183.68	1117057	HB-5104-01	08/07/2008	SOIL	S-SB	REG	PAR	0	3.3	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-192	LAKESHORE AREA	925183.68	1117057	HB-5104-02	08/07/2008	SOIL	S-SB	REG	PAR	3.3	6.6	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-192	LAKESHORE AREA	925183.68	1117057	HB-5104-03	08/07/2008	SOIL	S-SB	REG	PAR	6.6	9.9	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-192	LAKESHORE AREA	925183.68	1117057	HB-5104-05	08/07/2008	SOIL	S-SB	REG	PAR	9.9	13.2	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-192	LAKESHORE AREA	925183.68	1117057	HB-5104-06	08/07/2008	SOIL	S-SB	REG	PAR	13.2	15.5	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-192 ALT	LAKESHORE AREA	925183.68	1117057.97	HB-5104-07	08/07/2008	SOIL	S-SB	REG	PAR	0	3.3	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-192 ALT	LAKESHORE AREA	925183.68	1117057.97	HB-5104-08	08/07/2008	SOIL	S-SB	REG	PAR	3.3	6.6	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-193	LAKESHORE AREA	924799.88	1117141.21	HB-5112-01	08/18/2008	SOIL	S-SB	REG	PAR	0	3.3	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-193	LAKESHORE AREA	924799.88	1117141.21	HB-5112-02	08/18/2008	SOIL	S-SB	REG	PAR	3.3	6.6	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-193	LAKESHORE AREA	924799.88	1117141.21	HB-5112-03	08/18/2008	SOIL	S-SB	REG	PAR	9.9	13.2	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-193	LAKESHORE AREA	924799.88	1117141.21	HB-5112-04	08/18/2008	SOIL	S-SB	REG	PAR	6.6	9.9	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-193	LAKESHORE AREA	924799.88	1117141.21	HB-5112-05	08/18/2008	SOIL	S-SB	REG	PAR	13.2	16.5	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-193	LAKESHORE AREA	924799.88	1117141.21	HB-5112-06	08/18/2008	SOIL	S-SB	REG	PAR	16.5	18	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-195	LAKESHORE AREA	924784.81	1117357.44	HB-5127-01	09/04/2008	SOIL	S-SB	REG	PAR	0.0	3.3	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-195	LAKESHORE AREA	924784.81	1117357.44	HB-5127-02	09/04/2008	SOIL	S-SB	REG	PAR	3.3	6.6	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-195	LAKESHORE AREA	924784.81	1117357.44	HB-5127-03	09/04/2008	SOIL	S-SB	REG	PAR	6.6	9.9	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-195	LAKESHORE AREA	924784.81	1117357.44	HB-5127-04	09/04/2008	SOIL	S-SB	REG	PAR	9.9	13.2	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-195	LAKESHORE AREA	924784.81	1117357.44	HB-5127-05	09/04/2008	SOIL	S-SB	REG	PAR	13.2	13.8	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-196	LAKESHORE AREA	924745.46	1117267.45	HB-5127-12	09/04/2008	SOIL	S-SB	REG	PAR	0.0	3.3	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-196	LAKESHORE AREA	924745.46	1117267.45	HB-5127-13	09/04/2008	SOIL	S-SB	REG	PAR	3.3	6.6	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-196	LAKESHORE AREA	924745.46	1117267.45	HB-5127-15	09/04/2008	SOIL	S-SB	REG	PAR	6.6	9.9	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-196	LAKESHORE AREA	924745.46	1117267.45	HB-5127-16	09/04/2008	SOIL	S-SB	REG	PAR	9.9	13.2	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-196	LAKESHORE AREA	924745.46	1117267.45	HB-5127-17	09/04/2008	SOIL	S-SB	REG	PAR	13.2	15.0	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-197	LAKESHORE AREA	924511.09	1117360.05	HB-5107-01	08/14/2008	SOIL	S-SB	REG	PAR	0	3.3	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-197	LAKESHORE AREA	924511.09	1117360.05	HB-5107-02	08/14/2008	SOIL	S-SB	REG	PAR	3.3	6.6	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-197	LAKESHORE AREA	924511.09	1117360.05	HB-5107-04	08/14/2008	SOIL	S-SB	REG	PAR	6.6	9	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-197	LAKESHORE AREA	924511.09	1117360.05	HB-5107-05	08/14/2008	SOIL	S-SB	REG	PAR	9	11	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-197	LAKESHORE AREA	924511.09	1117360.05	HB-5107-06	08/14/2008	SOIL	S-SB	REG	PAR	11	13	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-197	LAKESHORE AREA	924511.09	1117360.05	HB-5107-07	08/14/2008	SOIL	S-SB	REG	PAR	13	15	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-197	LAKESHORE AREA	924511.09	1117360.05	HB-5107-08	08/14/2008	SOIL	S-SB	REG	PAR	15	17	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-197	LAKESHORE AREA	924511.09	1117360.05	HB-5107-09	08/14/2008	SOIL	S-SB	REG	PAR	17	19	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-197	LAKESHORE AREA	924511.09	1117360.05	HB-5107-10	08/14/2008	SOIL	S-SB	REG	PAR	19	19.8	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-198	LAKESHORE AREA	924542.67	1117489.95	HB-5107-11	08/14/2008	SOIL	S-SB	REG	PAR	0	3.3	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-198	LAKESHORE AREA	924542.67	1117489.95	HB-5107-12	08/14/2008	SOIL	S-SB	REG	PAR	3.3	6.6	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-198	LAKESHORE AREA	924542.67	1117489.95	HB-5107-13	08/14/2008	SOIL	S-SB	REG	PAR	6.6	9.9	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-198	LAKESHORE AREA	924542.67	1117489.95	HB-5107-14	08/14/2008	SOIL	S-SB	REG	PAR	9.9	13.2	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-198	LAKESHORE AREA	924542.67	1117489.95	HB-5107-15	08/14/2008	SOIL	S-SB	REG	PAR	13.2	16.5	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-198	LAKESHORE AREA	924542.67	1117489.95	HB-5107-16	08/14/2008	SOIL	S-SB	REG	PAR	16.5	18.8	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-199	LAKESHORE AREA	924450.38	1117498.29	HB-5106-01	08/12/2008	SOIL	S-SB	REG	PAR	0	3.3	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-199	LAKESHORE AREA	924450.38	1117498.29	HB-5106-02	08/12/2008	SOIL	S-SB	REG	PAR	3.3	6.6	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-199	LAKESHORE AREA	924450.38	1117498.29	HB-5106-03	08/12/2008	SOIL	S-SB	REG	PAR	6.6	9.9	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-199	LAKESHORE AREA	924450.38	1117498.29	HB-5106-04	08/12/2008	SOIL	S-SB	REG	PAR	9.9	13.2	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-200	LAKESHORE AREA	923782.28	1117724.27	HB-5110-01	08/15/2008	SOIL	S-SB	REG	PAR	0	2	Ft	Outboard Area	X	Surface Soil	Removed from dataset (Outboard Area)
HB-STA-200	LAKESHORE AREA	923782.28	1117724.27	HB-5110-02	08/15/2008	SOIL	S-SB	REG	PAR	2	4	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-200	LAKESHORE AREA	923782.28	1117724.27	HB-5110-03	08/15/2008	SOIL	S-SB	REG	PAR	4	6	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-200	LAKESHORE AREA	923782.28	1117724.27	HB-5110-04	08/15/2008	SOIL	S-SB	REG	PAR	6	8	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-200	LAKESHORE AREA	923782.28	1117724.27	HB-5110-05	08/15/2008	SOIL	S-SB	REG	PAR	8	11.3	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-200	LAKESHORE AREA	923782.28	1117724.27	HB-5110-06	08/15/2008	SOIL	S-SB	REG	PAR	11.3	14.6	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-200	LAKESHORE AREA	923782.28	1117724.27	HB-5110-07	08/15/2008	SOIL	S-SB	REG	PAR	14.6	17.9	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-STA-200	LAKESHORE AREA	923782.28	1117724.27	HB-5110-08	08/15/2008	SOIL	S-SB	REG	PAR	17.9	21.2	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)

Location ID	Subsite Name	East	North	Field Sample ID	Date Sampled	Sample Matrix	Sample Type	Sample Purpose	Sampling Company	Start Depth	End Depth	Depth Units	Notes	Include in Initial Dataset	Surface/Subsurface (Initial Dataset)	Change in Use for FS
HB-TP-01	LAKESHORE AREA	923835.566822	1117551.82105	HB9181	07/05/2000	SOIL	TESTPIT	REG	OBG	6		Ft	Covered by Lake Remedy Support Area	X	Subsurface Soil	None
HB-TP-01B	LAKESHORE AREA	923819.3932	1117521.36732	HB9247	07/19/2000	SOIL	TESTPIT	REG	OBG	8		Ft	Covered by Lake Remedy Support Area	X	Subsurface Soil	None
HB-TP-01D	LAKESHORE AREA	923885.246596	1117550.20823	HB9246	07/19/2000	SOIL	TESTPIT	REG	OBG	3		Ft	Covered by Lake Remedy Support Area	X	Subsurface Soil	None
HB-TP-03A	LAKESHORE AREA	924442.09258	1117423.37534	HB9245	07/19/2000	SOIL	TESTPIT	REG	OBG	6.5	6.5	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-TP-03B	LAKESHORE AREA	924496.568725	1117314.42306	HB9244	07/19/2000	SOIL	TESTPIT	REG	OBG	9.5	9.5	Ft	Removed by West Wall IRM; placed on Wastebed B	X	Subsurface Soil	Removed; placed on Wastebed B
HB-TP-03C	LAKESHORE AREA	924539.773944	1117269.33935	HB9243	07/19/2000	SOIL	TESTPIT	REG	OBG	9	9	Ft	Removed by West Wall IRM; placed on Wastebed B	X	Subsurface Soil	Removed; placed on Wastebed B
HB-TP-05	LAKESHORE AREA	925052.601085	1116675.73725	HB9180	07/05/2000	SOIL	TESTPIT	REG	OBG	3		Ft	Uncovered; pending final Site remedy	X	Subsurface Soil	None
HB-TP-07	LAKESHORE AREA	925572.942175	1116459.71116	HB9179	07/05/2000	SOIL	TESTPIT	REG	OBG	2.5		Ft	Covered by WBB/HB MM,G,&D Plan	X	Subsurface Soil	None
HB-TP-09	LAKESHORE AREA	923824.070136	1117229.89111	HB9177	07/05/2000	SOIL	TESTPIT	REG	OBG	2		Ft	Covered by Lake Remedy Support Area	X	Subsurface Soil	None
HB-TP-12	LAKESHORE AREA	924496.568725	1116782.81104	HB9184	07/06/2000	SOIL	TESTPIT	REG	OBG	3		Ft	Covered by WBB/HB MM,G,&D Plan	X	Subsurface Soil	None
HB-TP-15	LAKESHORE AREA	924996.246455	1116382.69317	HB9182	07/06/2000	SOIL	TESTPIT	REG	OBG	3		Ft	Covered by WBB/HB MM,G,&D Plan	X	Subsurface Soil	None
HB-TP-18	LAKESHORE AREA	925666.866559	1116042.6869	HB9189	07/06/2000	SOIL	TESTPIT	REG	OBG	4		Ft	Covered by WBB/HB MM,G,&D Plan	X	Subsurface Soil	None
HB-TP-19	LAKESHORE AREA	925862.229278	1115883.01544	HB9193	07/07/2000	SOIL	TESTPIT	REG	OBG	6		Ft	Covered by WBB/HB MM,G,&D Plan	X	Subsurface Soil	None
HB-TP-20	LAKESHORE AREA	925847.201378	1115821.02534	HB9196	07/07/2000	SOIL	TESTPIT	REG	OBG	6.5		Ft	Covered by WBB/HB access road	X	Subsurface Soil	None
HB-TP-20A	LAKESHORE AREA	925825.140071	1115770.96146	HB9241	07/18/2000	SOIL	TESTPIT	REG	OBG	5		Ft	Covered by UHB IRM	X	Subsurface Soil	None
HB-TP-21	LAKESHORE AREA	925927.976352	1116042.6869	HB9237	07/18/2000	SOIL	TESTPIT	REG	OBG	3.5		Ft	Uncovered; pending further cover under WBB/HB MM,G,&D Plan	X	Subsurface Soil	None
HB-TP-22	LAKESHORE AREA	925822.781038	1116174.18103	HB9236	07/18/2000	SOIL	TESTPIT	REG	OBG	4		Ft	Covered by WBB/HB MM,G,&D Plan	X	Subsurface Soil	None
HB-TP-23	LAKESHORE AREA	925757.033969	1116315.06761	HB9235	07/18/2000	SOIL	TESTPIT	REG	OBG	4.5		Ft	Covered by WBB/HB MM,G,&D Plan	X	Subsurface Soil	None
HB-TP-44	LAKESHORE AREA	923576.9245	1117605.503	HB-0031-06	11/16/2006	SOIL	TESTPIT	REG	OBG	5	6	Ft	Covered by Lake Remedy Support Area	X	Subsurface Soil	None
HB-TP-44	LAKESHORE AREA	923576.9245	1117605.503	HB-0031-07	11/16/2006	SOIL	TESTPIT	REG	OBG	5	6	Ft	Covered by Lake Remedy Support Area	X	Subsurface Soil	None
HB-TP-46A	LAKESHORE AREA	923917.4	1117604.1	HB-0031-04	11/16/2006	SOIL	TESTPIT	REG	OBG	3	4	Ft	Uncovered; pending final Site remedy	X	Subsurface Soil	None
HB-TP-46A	LAKESHORE AREA	923917.4	1117604.1	HB-0031-05	11/16/2006	SOIL	TESTPIT	REG	OBG	3	4	Ft	Uncovered; pending final Site remedy	X	Subsurface Soil	None
HB-TP-53	LAKESHORE AREA	924595.2455	1117355.742	HB-0022-01	11/14/2006	SOIL	TESTPIT	REG	OBG	3	4	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-TP-53	LAKESHORE AREA	924595.2455	1117355.742	HB-0022-02	11/14/2006	SOIL	TESTPIT	REG	OBG	3	4	Ft	Outboard Area	X	Subsurface Soil	Removed from dataset (Outboard Area)
HB-WSD-42	LAKESHORE AREA	925607.158	1115877.239	HB-1045-01	07/16/2008	SOIL	WSD	REG	OBG	0	1	FT	Removed by UHB IRM	X	Surface Sediment	Removed; placed on Wastebed B
HB-WSD-42	LAKESHORE AREA	925607.158	1115877.239	HB-1045-02	07/16/2008	SOIL	WSD	REG	OBG	0	1	FT	Removed by UHB IRM	X	Surface Sediment	Removed; placed on Wastebed B
HB-WSD-42	LAKESHORE AREA	925607.158	1115877.239	HB-1045-03	07/16/2008	SOIL	WSD	REG	OBG	1	2	FT	Removed by UHB IRM	X	Surface Sediment	Removed; placed on Wastebed B
HB-WSD-42	LAKESHORE AREA	925607.158	1115877.239	HB-1045-04	07/16/2008	SOIL	WSD	REG	OBG	1	2	FT	Removed by UHB IRM	X	Surface Sediment	Removed; placed on Wastebed B
HB-WSD-42	LAKESHORE AREA	925607.158	1115877.239	HB-1051-05	07/16/2008	SOIL	WSD	REG	OBG	0	1	FT	Removed by UHB IRM	X	Surface Sediment	Removed; placed on Wastebed B
HB-WSD-42	LAKESHORE AREA	925607.158	1115877.239	HB-1051-06	07/16/2008	SOIL	WSD	REG	OBG	1	2	FT	Removed by UHB IRM	X	Surface Sediment	Removed; placed on Wastebed B
S383	LAKESHORE AREA	926320.325702	1116215.043175	WS0017	08/11/2000	SOIL	SED	REG	EXP	0	0.49	Ft	Outboard Area	X	Surface Soil	Removed from dataset (Outboard Area)
S383	LAKESHORE AREA	926320.325702	1116215.043175	WS0018	08/11/2000	SOIL	SED	REG	EXP	0.49	0.98	Ft	Outboard Area	X	Surface Soil	Removed from dataset (Outboard Area)
S385	LAKESHORE AREA	925941.266111	1116459.095349	WS0021	08/11/2008	SOIL	SED	REG	EXP	0	0.49	Ft	Outboard Area	X	Surface Soil	Removed from dataset (Outboard Area)
S385	LAKESHORE AREA	925941.266111	1116459.095349	WS0022	08/11/2000	SOIL	SED	REG	EXP	0.49	0.98	Ft	Outboard Area	X	Surface Soil	Removed from dataset (Outboard Area)
S386	LAKESHORE AREA	924874.187467	1117248.369943	WS0023	08/11/2000	SOIL	SED	REG	EXP	0	0.49	Ft	Outboard Area	X	Surface Soil	Removed from dataset (Outboard Area)
S386	LAKESHORE AREA	924874.187467	1117248.369943	WS0024	08/11/2000	SOIL	SED	REG	EXP	0.49	0.98	Ft	Outboard Area	X	Surface Soil	Removed from dataset (Outboard Area)
UHB-DS-01	LAKESHORE AREA	924675.7856	1116466.675	UHB-1007-01	12/03/2012	SOIL	S-CONF	REG	OBG	0	0.5	Ft	Covered by UHB IRM (sample from immediately below cover material)	X	Subsurface Soil	None
UHB-DS-01	LAKESHORE AREA	924675.7856	1116466.675	UHB-1007-02	12/03/2012	SOIL	S-CONF	REG	OBG	0	0.5	Ft	Covered by UHB IRM (sample from immediately below cover material)	X	Subsurface Soil	None
UHB-DS-02	LAKESHORE AREA	924995.7227	1116245.735	UHB-1007-03	12/03/2012	SOIL	S-CONF	REG	OBG	0	0.5	Ft	Covered by UHB IRM (sample from immediately below cover material)	X	Subsurface Soil	None
UHB-DS-02	LAKESHORE AREA	924995.7227	1116245.735	UHB-1007-04	12/03/2012	SOIL	S-CONF	REG	OBG	0	0.5	Ft	Covered by UHB IRM (sample from immediately below cover material)	X	Subsurface Soil	None
UHB-DS-03	LAKESHORE AREA	924995.7227	1116019.25	UHB-1007-05	12/03/2012	SOIL	S-CONF	REG	OBG	0	0.5	Ft	Covered by UHB IRM (sample from immediately below cover material)	X	Subsurface Soil	None
UHB-DS-03	LAKESHORE AREA	924995.7227	1116019.25	UHB-1007-06	12/03/2012	SOIL	S-CONF	REG	OBG	0	0.5	Ft	Covered by UHB IRM (sample from immediately below cover material)	X	Subsurface Soil	None
UHB-DS-04	LAKESHORE AREA	925671.5249	1115859.552	UHB-1007-07	12/03/2012	SOIL	S-CONF	REG	OBG	0	0.5	Ft	Covered by UHB IRM (sample from immediately below cover material)	X	Subsurface Soil	None
UHB-DS-04	LAKESHORE AREA	925671.5249	1115859.552	UHB-1007-08	12/03/2012	SOIL	S-CONF	REG	OBG	0	0.5	Ft	Covered by UHB IRM (sample from immediately below cover material)	X	Subsurface Soil	None
HB-GP-32	PENN-CAN PROPERTY	925235.321041	1115738.20328	HB9512	03/13/2001	SOIL	S-GP	REG	OBG	0	0.17	Ft	Covered by WBB/HB access road	X	Surface Soil	None
HB-GP-32	PENN-CAN PROPERTY	925235.321041	1115738.20328	HB9513	03/13/2001	SOIL	S-GP	REG	OBG	48	50	Ft	Covered by WBB/HB access road	X	Subsurface Soil	None
HB-GP-32A	PENN-CAN PROPERTY	925209.524	1115751.049	HB-0004-03	10/19/2006	SOIL	S-SB	REG	OBG	16	18	Ft	Covered by WBB/HB access road	X	Subsurface Soil	None
HB-GP-32A	PENN-CAN PROPERTY	925209.524	1115751.049	HB-0004-04	10/19/2006	SOIL	S-SB	REG	OBG	16	18	Ft	Covered by WBB/HB access road	X	Subsurface Soil	None
HB-GP-32A	PENN-CAN PROPERTY	925209.524	1115751.049	HB-0009-01	10/25/2006	SOIL	S-SB	REG	OBG	78	80	Ft	Covered by WBB/HB access road	X	Subsurface Soil	None
HB-GP-32A	PENN-CAN PROPERTY	925209.524	1115751.049	HB-0009-02	10/25/2006	SOIL	S-SB	REG	OBG	78	80	Ft	Covered by WBB/HB access road	X	Subsurface Soil	None
HB-GP-33	PENN-CAN PROPERTY	925156.341806	1115721.85713	HB9506	03/12/2001	SOIL	S-GP	REG	OBG	0	0.17	Ft	Uncovered; pending final Site remedy	X	Surface Soil	None
HB-GP-33	PENN-CAN PROPERTY	925156.341806	1115721.85713	HB9507	03/12/2001	SOIL	S-GP	REG	OBG	36	38	Ft	Uncovered; pending final Site remedy	X	Subsurface Soil	None
HB-GP-34	PENN-CAN PROPERTY	925002.816192	1115734.52185	HB9508	03/12/2001	SOIL	S-GP	REG	OBG	0	0.17	Ft	Uncovered; pending final Site remedy	X	Surface Soil	None
HB-GP-34	PENN-CAN PROPERTY	925002.816192	1115734.52185	HB9509	03/12/2001	SOIL	S-GP	REG	OBG	40	42	Ft	Uncovered; pending final Site remedy	X	Subsurface Soil	None
HB-GP-35	PENN-CAN PROPERTY	924712.278486	1115838.32336	HB9510	03/12/2001	SOIL	S-GP	REG	OBG	0	0.17	Ft	Covered by Tonodo Property fill (not clean fill)	X	Subsurface Soil	None
HB-GP-35	PENN-CAN PROPERTY	924712.278486	1115838.32336	HB9511	03/12/2001	SOIL	S-GP	REG	OBG	38	40	Ft	Covered by Tonodo Property fill (not clean fill)	X	Subsurface Soil	None
HB-GP-36	PENN-CAN PROPERTY	924505.57398	1115880.34397	HB9502	03/09/2001	SOIL	S-GP	REG	OBG	0	0.17	Ft	Covered by Tonodo Property fill (not clean fill)	X	Subsurface Soil	None
HB-GP-36	PENN-CAN PROPERTY	924505.57398	1115880.34397	HB9503	03/09/2001	SOIL	S-GP	REG	OBG	36	38	Ft	Covered by Tonodo Property fill (not clean fill)	X	Subsurface Soil	None
HB-GP-37	PENN-CAN PROPERTY	924237.793598	1116034.77056	HB9504	03/09/2001	SOIL	S-GP	REG	OBG	0	0.17	Ft	Covered by Tonodo Property fill (not clean fill)	X	Subsurface Soil	None
HB-GP-37	PENN-CAN PROPERTY	924237.793598	1116034.77056	HB9505	03/09/2001	SOIL	S-GP	REG	OBG	22	24	Ft	Covered by Tonodo Property fill (not clean fill)	X	Subsurface Soil	None
HB-GP-38	PENN-CAN PROPERTY	924082.695972	1116047.17902	HB9516	03/14/2001	SOIL	S-GP	REG	OBG	10	12	Ft	Uncovered; pending final Site remedy	X	Subsurface Soil	None
HB-GP-38	PENN-CAN PROPERTY	924082.695972	1116047.17902	HB9517	03/14/2001	SOIL	S-GP	REG	OBG	0	0.17	Ft	Uncovered; pending final Site remedy	X	Surface Soil	None
HB-GP-39	PENN-CAN PROPERTY	924005.148316	1116256.93125	HB9519	04/06/2001	SOIL	S-GP	REG	OBG	0	0.17	Ft	Uncovered; pending final Site remedy	X	Surface Soil	None
HB-GP-39	PENN-CAN PROPERTY	924005.148316	1116256.93125	HB9520	04/06/2001	SOIL	S-GP	REG	OBG	22	24	Ft	Uncovered; pending final Site remedy	X	Subsurface Soil	None

Location ID	Subsite Name	East	North	Field Sample ID	Date Sampled	Sample Matrix	Sample Type	Sample Purpose	Sampling Company	Start Depth	End Depth	Depth Units	Notes	Include in Initial Dataset	Surface/Subsurface (Initial Dataset)	Change in Use for FS
HB-H12	PENN-CAN PROPERTY	925432.232776	1115586.25678	HB9040	11/13/1996	SOIL	SED	REG	NYSDEC	NA	NA	Ft	Covered by WBB/HB access road	X	Surface Sediment	Surface Soil
HB-HB-10	PENN-CAN PROPERTY	924195.252453	1116421.33759	HB9486	03/06/2001	SOIL	S-SB	REG	OBG	40	42	Ft	Uncovered; pending final Site remedy	X	Subsurface Soil	None
HB-HB-10	PENN-CAN PROPERTY	924195.252453	1116421.33759	HB9490	03/06/2001	SOIL	S-SB	REG	OBG	0	0.17	Ft	Uncovered; pending final Site remedy	X	Surface Soil	None
HB-HB-11I	PENN-CAN PROPERTY	924507.680567	1116271.97225	HB9499	03/08/2001	SOIL	S-SB	REG	OBG	4	6	Ft	Uncovered; pending final Site remedy	X	Subsurface Soil	None
HB-HB-11I	PENN-CAN PROPERTY	924507.680567	1116271.97225	HB9500	03/08/2001	SOIL	S-SB	REG	OBG	42	44	Ft	Uncovered; pending final Site remedy	X	Subsurface Soil	None
HB-HB-12D	PENN-CAN PROPERTY	925070.997005	1115893.79982	HB9493	03/07/2001	SOIL	S-SB	REG	OBG	0	0.17	Ft	Uncovered; pending final Site remedy	X	Surface Soil	None
HB-HB-12D	PENN-CAN PROPERTY	925070.997005	1115893.79982	HB9495	03/07/2001	SOIL	S-SB	REG	OBG	40	42	Ft	Uncovered; pending final Site remedy	X	Subsurface Soil	None
HB-HB-13D	PENN-CAN PROPERTY	925155.873415	1115722.54667	HB9518	03/27/2001	SOIL	S-SB	REG	OBG	80	84	Ft	Uncovered; pending final Site remedy	X	Subsurface Soil	None
HB-HB-15	PENN-CAN PROPERTY	924024.329414	1116076.59576	HB9514	03/14/2001	SOIL	S-SB	REG	OBG	0	0.17	Ft	Uncovered; pending final Site remedy	X	Surface Soil	None
HB-HB-15	PENN-CAN PROPERTY	924024.329414	1116076.59576	HB9515	03/14/2001	SOIL	S-SB	REG	OBG	12	14	Ft	Uncovered; pending final Site remedy	X	Subsurface Soil	None
HB-HB-17D	PENN-CAN PROPERTY	924852.099949	1116031.39997	HB9662	01/13/2003	SOIL	S-SB	REG	OBG	38	40	Ft	Uncovered; pending final Site remedy	X	Subsurface Soil	None
HB-HB-17D	PENN-CAN PROPERTY	924852.099949	1116031.39997	HB9663	01/14/2003	SOIL	S-SB	REG	OBG	0	0.5	Ft	Uncovered; pending final Site remedy	X	Surface Soil	None
HB-HB-17D	PENN-CAN PROPERTY	924852.099949	1116031.39997	HB9664	01/14/2003	SOIL	S-SB	REG	OBG	0.5	1	Ft	Uncovered; pending final Site remedy	X	Surface Soil	None
HB-HBSED-01	PENN-CAN PROPERTY	924366.521537	1115909.45442	HB9535	05/08/2001	SOIL	SED	REG	OBG	0	0.5	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-HBSED-01	PENN-CAN PROPERTY	924366.521537	1115909.45442	HB9546	05/11/2001	SOIL	SED	REG	OBG	0	0.5	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-HBSED-01	PENN-CAN PROPERTY	924366.521537	1115909.45442	HB9742	06/03/2003	SOIL	SED	REG	OBG	0	0.5	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-HBSED-02	PENN-CAN PROPERTY	924841.923117	1115684.99495	HB9527	05/08/2001	SOIL	SED	REG	OBG	0	0.5	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-HBSED-02	PENN-CAN PROPERTY	924841.923117	1115684.99495	HB9545	05/11/2001	SOIL	SED	REG	OBG	0	0.5	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-HBSED-02	PENN-CAN PROPERTY	924841.923117	1115684.99495	HB9737	06/03/2003	SOIL	SED	REG	OBG	0	0.5	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-HBSED-03	PENN-CAN PROPERTY	925428.36223	1115579.77531	HB9521	05/07/2001	SOIL	SED	REG	OBG	0	0.5	Ft	Covered by WBB/HB access road	X	Surface Sediment	Surface Soil
HB-HBSED-03	PENN-CAN PROPERTY	925428.36223	1115579.77531	HB9549	05/11/2001	SOIL	SED	REG	OBG	0	0.5	Ft	Covered by WBB/HB access road	X	Surface Sediment	Surface Soil
HB-HBSED-03	PENN-CAN PROPERTY	925428.36223	1115579.77531	HB9735	06/03/2003	SOIL	SED	REG	OBG	0	0.5	Ft	Covered by WBB/HB access road	X	Surface Sediment	Surface Soil
HB-HBSED-03	PENN-CAN PROPERTY	925428.36223	1115579.77531	HB9736	06/03/2003	SOIL	SED	REG	OBG	0.5	1	Ft	Covered by WBB/HB access road	X	Surface Sediment	Surface Soil
HB-PCSS-1	PENN-CAN PROPERTY	924192.000001	1116199	HB9619	12/05/2002	SOIL	S-SS	REG	OBG	0	0.5	Ft	Covered by Tonodo Property fill (not clean fill)	X	Subsurface Soil	None
HB-PCSS-1	PENN-CAN PROPERTY	924192.000001	1116199	HB9623	12/05/2002	SOIL	S-SS	REG	OBG	0.5	1	Ft	Covered by Tonodo Property fill (not clean fill)	X	Subsurface Soil	None
HB-PCSS-2	PENN-CAN PROPERTY	924899.999999	1115740	HB9622	12/05/2002	SOIL	S-SS	REG	OBG	0.5	1	Ft	Covered by Tonodo Property fill (not clean fill)	X	Subsurface Soil	None
HB-PCSS-2	PENN-CAN PROPERTY	924899.999999	1115740	HB9625	12/05/2002	SOIL	S-SS	REG	OBG	0	0.5	Ft	Covered by Tonodo Property fill (not clean fill)	X	Subsurface Soil	None
HB-PCSS-3	PENN-CAN PROPERTY	925181.000001	1115824	HB9620	12/05/2002	SOIL	S-SS	REG	OBG	0	0.5	Ft	Covered by WBB/HB access road	X	Surface Soil	None
HB-PCSS-3	PENN-CAN PROPERTY	925181.000001	1115824	HB9621	12/05/2002	SOIL	S-SS	REG	OBG	0.5	1	Ft	Covered by WBB/HB access road	X	Surface Soil	None
HB-PSD-01	PENN-CAN PROPERTY	925459.454214	1115659.30152	HB9827	10/09/2003	SOIL	S-SS	REG	OBG	0.5	1	Ft	Covered by Tonodo Property fill (not clean fill)	X	Subsurface Soil	None
HB-PSD-01	PENN-CAN PROPERTY	925459.454214	1115659.30152	HB9829	10/09/2003	SOIL	S-SS	REG	OBG	0	0.5	Ft	Covered by Tonodo Property fill (not clean fill)	X	Subsurface Soil	None
HB-PSD-02	PENN-CAN PROPERTY	925404.807607	1115643.68821	HB9828	10/09/2003	SOIL	S-SS	REG	OBG	0	0.5	Ft	Uncovered; pending final Site remedy	X	Surface Soil	None
HB-PSD-02	PENN-CAN PROPERTY	925404.807607	1115643.68821	HB9830	10/09/2003	SOIL	S-SS	REG	OBG	0.5	1	Ft	Uncovered; pending final Site remedy	X	Surface Soil	None
HB-SB-161A	PENN-CAN PROPERTY	924097.877	1116121.228	HB-0048-02	07/10/2008	SOIL	S-SB	REG	OBG	0	1.3	FT	Removed by UHB IRM; placed on Wastebed B	X	Surface Soil	Removed; placed on Wastebed B
HB-SB-162	PENN-CAN PROPERTY	924142.545	1116070.257	HB-0048-03	07/10/2008	SOIL	S-SB	REG	OBG	0	0.9	FT	Removed by UHB IRM; placed on Wastebed B	X	Surface Soil	Removed; placed on Wastebed B
HB-SB-163	PENN-CAN PROPERTY	924548.483	1115807.035	HB-0048-04	07/10/2008	SOIL	S-SB	REG	OBG	4	6	FT	Uncovered; pending final Site remedy	X	Subsurface Soil	None
HB-SB-164	PENN-CAN PROPERTY	924873.704	1115675.434	HB-0048-01	07/11/2008	SOIL	S-SB	REG	OBG	6	8	FT	Uncovered; pending final Site remedy	X	Subsurface Soil	None
HB-SB-165B	PENN-CAN PROPERTY	924997.376	1115633.126	HB-0048-05	07/11/2008	SOIL	S-SB	REG	OBG	0	1.5	FT	Removed by UHB IRM; placed on Wastebed B	X	Surface Soil	Removed; placed on Wastebed B
HB-SB-72	PENN-CAN PROPERTY	925310.2715	1115653.882	HB-0007-01	10/23/2006	SOIL	S-SB	REG	OBG	18	20	FT	Uncovered; pending final Site remedy	X	Subsurface Soil	None
HB-SB-72	PENN-CAN PROPERTY	925310.2715	1115653.882	HB-0007-02	10/23/2006	SOIL	S-SB	REG	OBG	18	20	FT	Uncovered; pending final Site remedy	X	Subsurface Soil	None
HB-SB-73	PENN-CAN PROPERTY	925067.398	1115759.435	HB-0017-01	10/31/2006	SOIL	S-SB	REG	OBG	32	34	Ft	Uncovered; pending final Site remedy	X	Subsurface Soil	None
HB-SB-73	PENN-CAN PROPERTY	925067.398	1115759.435	HB-0017-02	10/31/2006	SOIL	S-SB	REG	OBG	32	34	Ft	Uncovered; pending final Site remedy	X	Subsurface Soil	None
HB-SB-74	PENN-CAN PROPERTY	924952.4165	1115769.218	HB-0027-01	11/06/2006	SOIL	S-SB	REG	OBG	36	38	Ft	Covered by Tonodo Property fill (not clean fill)	X	Subsurface Soil	None
HB-SB-74	PENN-CAN PROPERTY	924952.4165	1115769.218	HB-0027-02	11/06/2006	SOIL	S-SB	REG	OBG	36	38	Ft	Covered by Tonodo Property fill (not clean fill)	X	Subsurface Soil	None
HB-SB-75	PENN-CAN PROPERTY	924814.3995	1115768.21	HB-0025-05	11/09/2006	SOIL	S-SB	REG	OBG	34	38	Ft	Covered by Tonodo Property fill (not clean fill)	X	Subsurface Soil	None
HB-SB-75	PENN-CAN PROPERTY	924814.3995	1115768.21	HB-0025-06	11/09/2006	SOIL	S-SB	REG	OBG	34	38	Ft	Covered by Tonodo Property fill (not clean fill)	X	Subsurface Soil	None
HB-SB-75	PENN-CAN PROPERTY	924814.3995	1115768.21	HB-0025-07	11/09/2006	SOIL	S-SB	REG	OBG	34	38	Ft	Covered by Tonodo Property fill (not clean fill)	X	Subsurface Soil	None
HB-SB-75	PENN-CAN PROPERTY	924814.3995	1115768.21	HB-0025-08	11/09/2006	SOIL	S-SB	REG	OBG	34	38	Ft	Covered by Tonodo Property fill (not clean fill)	X	Subsurface Soil	None
HB-SB-75	PENN-CAN PROPERTY	924814.3995	1115768.21	HB-0025-09	11/09/2006	SOIL	S-SB	REG	OBG	34	38	Ft	Covered by Tonodo Property fill (not clean fill)	X	Subsurface Soil	None
HB-SB-75	PENN-CAN PROPERTY	924814.3995	1115768.21	HB-0025-10	11/09/2006	SOIL	S-SB	REG	OBG	34	38	Ft	Covered by Tonodo Property fill (not clean fill)	X	Subsurface Soil	None
HB-SB-76	PENN-CAN PROPERTY	924845.1735	1115854.33	HB-0025-01	11/08/2006	SOIL	S-SB	REG	OBG	30	32	Ft	Covered by Tonodo Property fill (not clean fill)	X	Subsurface Soil	None
HB-SB-76	PENN-CAN PROPERTY	924845.1735	1115854.33	HB-0025-02	11/08/2006	SOIL	S-SB	REG	OBG	30	32	Ft	Covered by Tonodo Property fill (not clean fill)	X	Subsurface Soil	None
HB-SB-77	PENN-CAN PROPERTY	924934.5115	1115970.968	HB-0012-01	11/02/2006	SOIL	S-SB	REG	OBG	36	38	Ft	Uncovered; pending final Site remedy	X	Subsurface Soil	None
HB-SB-77	PENN-CAN PROPERTY	924934.5115	1115970.968	HB-0012-02	11/02/2006	SOIL	S-SB	REG	OBG	36	38	Ft	Uncovered; pending final Site remedy	X	Subsurface Soil	None
HB-SB-78	PENN-CAN PROPERTY	924769.0235	1116058.978	HB-0008-01	10/25/2006	SOIL	S-SB	REG	OBG	20	22	FT	Uncovered; pending final Site remedy	X	Subsurface Soil	None
HB-SB-78	PENN-CAN PROPERTY	924769.0235	1116058.978	HB-0008-02	10/25/2006	SOIL	S-SB	REG	OBG	20	22	FT	Uncovered; pending final Site remedy	X	Subsurface Soil	None
HB-SB-79	PENN-CAN PROPERTY	924724.581	1115924.8	HB-0006-03	10/24/2006	SOIL	S-SB	REG	OBG	34	36	FT	Uncovered; pending final Site remedy	X	Subsurface Soil	None
HB-SB-79	PENN-CAN PROPERTY	924724.581	1115924.8	HB-0006-04	10/24/2006	SOIL	S-SB	REG	OBG	34	36	FT	Uncovered; pending final Site remedy	X	Subsurface Soil	None
HB-SB-80	PENN-CAN PROPERTY	924613.652	1115883.001	HB-0006-01	10/23/2006	SOIL	S-SB	REG	OBG	34	36	FT	Covered by Tonodo Property fill (not clean fill)	X	Subsurface Soil	None
HB-SB-80	PENN-CAN PROPERTY	924613.652	1115883.001	HB-0006-02	10/23/2006	SOIL	S-SB	REG	OBG	34	36	FT	Covered by Tonodo Property fill (not clean fill)	X	Subsurface Soil	None
HB-SB-81	PENN-CAN PROPERTY	924651.7085	1116132.669	HB-0023-03	11/06/2006	SOIL	S-SB	REG	OBG	16	18	Ft	Uncovered; pending final Site remedy	X	Subsurface Soil	None
HB-SB-81	PENN-CAN PROPERTY	924651.7085	1116132.669	HB-0023-04	11/07/2006	SOIL	S-SB	REG	OBG	16	18	Ft	Uncovered; pending final Site remedy	X	Subsurface Soil	None
HB-SB-89	PENN-CAN PROPERTY	925082.346	1115820.44	HB-0014-01	11/03/2006	SOIL	S-SB	REG	OBG	44	46	Ft	Uncovered; pending final Site remedy	X	Subsurface Soil	None
HB-SB-89	PENN-CAN PROPERTY	925082.346	1115820.44	HB-0014-02	11/03/2006	SOIL	S-SB	REG	OBG	44	46	Ft	Uncovered; pending final Site remedy	X	Subsurface Soil	None
HB-SB-89	PENN-CAN PROPERTY	925082.346	1115820.44	HB-0023-01	11/06/2006	SOIL	S-SB	REG	OBG	84	86	Ft	Uncovered; pending final Site remedy	X	Subsurface Soil	None
HB-SB-89	PENN-CAN PROPERTY	925082.346	1115820.44	HB-0023-02	11/06/2006	SOIL	S-SB	REG	OBG	84	86	Ft	Uncovered; pending final Site remedy	X	Subsurface Soil	None
HB-TP-32	PENN-CAN PROPERTY	925278.019608	1115717.70853	HB9488	03/06/2001	SOIL	TESTPIT	REG	OBG	10	12	Ft	Covered by WBB/HB access road	X	Subsurface Soil	None
HB-TP-33	PENN-CAN PROPERTY	925148.403959	1115708.31609	HB9487	03/06/2001	SOIL	TESTPIT	REG	OBG	11		Ft	Uncovered; pending final Site remedy	X	Subsurface Soil	None
HB-TP-34	PENN-CAN PROPERTY	925001.88192	1115715.83004	HB9496	03/07/2001	SOIL	TESTPIT	REG	OBG	11.5		Ft	Uncovered; pending final Site remedy	X	Subsurface Soil	None
HB-TP-35	PENN-CAN PROPERTY	924738.893638	1115824.78232	HB9494	03/07/2001	SOIL	TESTPIT	REG	OBG	9	10	Ft	Covered by Tonodo Property fill (not clean fill)	X	Subsurface Soil	None
HB-TP-36	PENN-CAN PROPERTY	924519.110584	1115873.623	HB9491	03/07/2001	SOIL	TESTPIT	REG	OBG	6		Ft	Covered by Tonodo Property fill (not clean fill)	X	Subsurface Soil	None
HB-TP-37	PENN-CAN PROPERTY	924235.458942	1116046.44387	HB9492	03/07/2001	SOIL	TESTPIT	REG	OBG	7		Ft	Covered by Tonodo Property fill (not clean fill)	X	Subsurface Soil	None
HB-TP-38	PENN-CAN PROPERTY	924102.086309	1116061.47177	HB9497	03/08/2001	SOIL	TESTPIT	REG	OBG	7		Ft	Covered by UHB IRM	X	Subsurface Soil	None

Location ID	Subsite Name	East	North	Field Sample ID	Date Sampled	Sample Matrix	Sample Type	Sample Purpose	Sampling Company	Start Depth	End Depth	Depth Units	Notes	Include in Initial Dataset	Surface/Subsurface (Initial Dataset)	Change in Use for FS
HB-TP-39	PENN-CAN PROPERTY	924036.339244	1116238.04962	HB9498	03/08/2001	SOIL	TESTPIT	REG	OBG	8		Ft	Uncovered; pending final Site remedy	X	Subsurface Soil	None
HB-WSD-31	PENN-CAN PROPERTY	924089.695	1116162.588	HB-1033-11	07/08/2008	SOIL	WSD	REG	OBG	0	1	FT	Removed by UHB IRM	X	Surface Soiil	Removed; placed on Wastebed B
HB-WSD-31	PENN-CAN PROPERTY	924089.695	1116162.588	HB-1033-12	07/08/2008	SOIL	WSD	REG	OBG	0	1	FT	Removed by UHB IRM	X	Surface Soiil	Removed; placed on Wastebed B
HB-WSD-31	PENN-CAN PROPERTY	924089.695	1116162.588	HB-1034-01	07/08/2008	SOIL	WSD	REG	OBG	1	2	FT	Removed by UHB IRM	X	Surface Soiil	Removed; placed on Wastebed B
HB-WSD-31	PENN-CAN PROPERTY	924089.695	1116162.588	HB-1034-02	07/08/2008	SOIL	WSD	REG	OBG	1	2	FT	Removed by UHB IRM	X	Surface Soiil	Removed; placed on Wastebed B
HB-WSD-31	PENN-CAN PROPERTY	924089.695	1116162.588	HB-1037-03	07/08/2008	SOIL	WSD	REG	OBG	0	1	FT	Removed by UHB IRM	X	Surface Soiil	Removed; placed on Wastebed B
HB-WSD-31	PENN-CAN PROPERTY	924089.695	1116162.588	HB-1037-04	07/08/2008	SOIL	WSD	REG	OBG	1	2	FT	Removed by UHB IRM	X	Surface Soiil	Removed; placed on Wastebed B
HB-WSD-32	PENN-CAN PROPERTY	924107.083	1116113.957	HB-1033-07	07/08/2008	SOIL	WSD	REG	OBG	0	1	FT	Removed by UHB IRM	X	Surface Soiil	Removed; placed on Wastebed B
HB-WSD-32	PENN-CAN PROPERTY	924107.083	1116113.957	HB-1033-08	07/08/2008	SOIL	WSD	REG	OBG	0	1	FT	Removed by UHB IRM	X	Surface Soiil	Removed; placed on Wastebed B
HB-WSD-32	PENN-CAN PROPERTY	924107.083	1116113.957	HB-1033-09	07/08/2008	SOIL	WSD	REG	OBG	1	2	FT	Removed by UHB IRM	X	Surface Soiil	Removed; placed on Wastebed B
HB-WSD-32	PENN-CAN PROPERTY	924107.083	1116113.957	HB-1033-10	07/08/2008	SOIL	WSD	REG	OBG	1	2	FT	Removed by UHB IRM	X	Surface Soiil	Removed; placed on Wastebed B
HB-WSD-32	PENN-CAN PROPERTY	924107.083	1116113.957	HB-1037-05	07/08/2008	SOIL	WSD	REG	OBG	0	1	FT	Removed by UHB IRM	X	Surface Soiil	Removed; placed on Wastebed B
HB-WSD-32	PENN-CAN PROPERTY	924107.083	1116113.957	HB-1037-06	07/08/2008	SOIL	WSD	REG	OBG	1	2	FT	Removed by UHB IRM	X	Surface Soiil	Removed; placed on Wastebed B
HB-WSD-33	PENN-CAN PROPERTY	924818.257	1115715.011	HB-1033-01	07/08/2008	SOIL	WSD	REG	OBG	0	1	FT	Removed by UHB IRM	X	Surface Soiil	Removed; placed on Wastebed B
HB-WSD-33	PENN-CAN PROPERTY	924818.257	1115715.011	HB-1033-02	07/08/2008	SOIL	WSD	REG	OBG	0	1	FT	Removed by UHB IRM	X	Surface Soiil	Removed; placed on Wastebed B
HB-WSD-33	PENN-CAN PROPERTY	924818.257	1115715.011	HB-1033-03	07/08/2008	SOIL	WSD	REG	OBG	1	2	FT	Removed by UHB IRM	X	Surface Soiil	Removed; placed on Wastebed B
HB-WSD-33	PENN-CAN PROPERTY	924818.257	1115715.011	HB-1033-04	07/08/2008	SOIL	WSD	REG	OBG	1	2	FT	Removed by UHB IRM	X	Surface Soiil	Removed; placed on Wastebed B
HB-WSD-33	PENN-CAN PROPERTY	924818.257	1115715.011	HB-1037-07	07/08/2008	SOIL	WSD	REG	OBG	0	1	FT	Removed by UHB IRM	X	Surface Soiil	Removed; placed on Wastebed B
HB-WSD-33	PENN-CAN PROPERTY	924818.257	1115715.011	HB-1037-08	07/08/2008	SOIL	WSD	REG	OBG	1	2	FT	Removed by UHB IRM	X	Surface Soiil	Removed; placed on Wastebed B
TON-SB-01	PENN-CAN PROPERTY	925004.1201	1115743.79	TON-0012-01	03/05/2013	SOIL	S-SB	REG	OBG	12	14	Ft	Tonodo Property Inv. Soil Sample	X	Subsurface Soil	None
TON-SB-01	PENN-CAN PROPERTY	925004.1201	1115743.79	TON-0012-02	03/05/2013	SOIL	S-SB	REG	OBG	12	16	Ft	Tonodo Property Inv. Soil Sample	X	Subsurface Soil	None
TON-SB-02	PENN-CAN PROPERTY	924754.1599	1115881.2	TON-0012-03	03/05/2013	SOIL	S-SB	REG	OBG	14	16	Ft	Tonodo Property Inv. Soil Sample	X	Subsurface Soil	None
TON-SB-02	PENN-CAN PROPERTY	924754.1599	1115881.2	TON-0012-04	03/05/2013	SOIL	S-SB	REG	OBG	14	16	Ft	Tonodo Property Inv. Soil Sample	X	Subsurface Soil	None
TON-SB-03	PENN-CAN PROPERTY	924225.09	1116106.93	TON-0012-05	03/05/2013	SOIL	S-SB	REG	OBG	8	10	Ft	Tonodo Property Inv. Soil Sample	X	Subsurface Soil	None
TON-SB-03	PENN-CAN PROPERTY	924225.09	1116106.93	TON-0012-06	03/05/2013	SOIL	S-SB	REG	OBG	8	10	Ft	Tonodo Property Inv. Soil Sample	X	Subsurface Soil	None
TON-SB-04	PENN-CAN PROPERTY	924560.99	1115837.66	TON-0012-07	03/06/2013	SOIL	S-SB	REG	OBG	6	8	Ft	Tonodo Property Inv. Soil Sample	X	Subsurface Soil	None
TON-SB-04	PENN-CAN PROPERTY	924560.99	1115837.66	TON-0012-08	03/06/2013	SOIL	S-SB	REG	OBG	6	8	Ft	Tonodo Property Inv. Soil Sample	X	Subsurface Soil	None
TON-SB-05	PENN-CAN PROPERTY	924713.3701	1115779.56	TON-0012-09	03/06/2013	SOIL	S-SB	REG	OBG	8	10	Ft	Tonodo Property Inv. Soil Sample	X	Subsurface Soil	None
TON-SB-05	PENN-CAN PROPERTY	924713.3701	1115779.56	TON-0012-10	03/06/2013	SOIL	S-SB	REG	OBG	8	10	Ft	Tonodo Property Inv. Soil Sample	X	Subsurface Soil	None
TON-SB-06	PENN-CAN PROPERTY	925000.97	1115682.29	TON-0012-11	03/06/2013	SOIL	S-SB	REG	OBG	6	8	Ft	Tonodo Property Inv. Soil Sample	X	Subsurface Soil	None
TON-SB-06	PENN-CAN PROPERTY	925000.97	1115682.29	TON-0012-12	03/06/2013	SOIL	S-SB	REG	OBG	6	8	Ft	Tonodo Property Inv. Soil Sample	X	Subsurface Soil	None
TON-SB-07	PENN-CAN PROPERTY	924743.8	1115847.24	TON-0013-01	03/06/2013	SOIL	S-SB	REG	OBG	8	10	Ft	Tonodo Property Inv. Soil Sample	X	Subsurface Soil	None
TON-SB-07	PENN-CAN PROPERTY	924743.8	1115847.24	TON-0013-02	03/06/2013	SOIL	S-SB	REG	OBG	8	10	Ft	Tonodo Property Inv. Soil Sample	X	Subsurface Soil	None
TON-SS-01	PENN-CAN PROPERTY	925004.1201	1115743.79	TON-0014-01	03/08/2013	SOIL	S-SS	REG	OBG	0	0.5	Ft	Tonodo Property Soil Sample.	X	Surface Soiil	None
TON-SS-01	PENN-CAN PROPERTY	925004.1201	1115743.79	TON-0014-02	03/08/2013	SOIL	S-SS	REG	OBG	0	0.5	Ft	Tonodo Property Soil Sample.	X	Surface Soiil	None
TON-SS-02	PENN-CAN PROPERTY	924754.1599	1115881.2	TON-0014-07	03/08/2013	SOIL	S-SS	REG	OBG	0	0.5	Ft	Tonodo Property Soil Sample.	X	Surface Soiil	None
TON-SS-02	PENN-CAN PROPERTY	924754.1599	1115881.2	TON-0014-08	03/08/2013	SOIL	S-SS	REG	OBG	0	0.5	Ft	Tonodo Property Soil Sample.	X	Surface Soiil	None
TON-SS-03	PENN-CAN PROPERTY	924225.09	1116106.93	TON-0014-09	03/08/2013	SOIL	S-SS	REG	OBG	0	0.5	Ft	Tonodo Property Soil Sample.	X	Surface Soiil	None
TON-SS-03	PENN-CAN PROPERTY	924225.09	1116106.93	TON-0014-10	03/08/2013	SOIL	S-SS	REG	OBG	0	0.5	Ft	Tonodo Property Soil Sample.	X	Surface Soiil	None
UHB-DS-13	PENN-CAN PROPERTY	924072.0657	1116154.2	UHB-1024-01	12/24/2013	SOIL	S-CONF	REG	OBG	0	0.5	Ft	Covered by UHB IRM (sample from immediately below cover material)	X	Subsurface Soil	None
UHB-DS-13	PENN-CAN PROPERTY	924072.0657	1116154.2	UHB-1024-02	12/24/2013	SOIL	S-CONF	REG	OBG	0	0.5	Ft	Covered by UHB IRM (sample from immediately below cover material)	X	Subsurface Soil	None
UHB-DS-14	PENN-CAN PROPERTY	924344.9444	1115907.875	UHB-1024-03	12/24/2013	SOIL	S-CONF	REG	OBG	0	0.5	Ft	Covered by UHB IRM (sample from immediately below cover material)	X	Subsurface Soil	None
UHB-DS-14	PENN-CAN PROPERTY	924344.9444	1115907.875	UHB-1024-04	12/24/2013	SOIL	S-CONF	REG	OBG	0	0.5	Ft	Covered by UHB IRM (sample from immediately below cover material)	X	Subsurface Soil	None
UHB-DS-15	PENN-CAN PROPERTY	924635.045	1115762.466	UHB-1024-05	12/24/2013	SOIL	S-CONF	REG	OBG	0	0.5	Ft	Covered by UHB IRM (sample from immediately below cover material)	X	Subsurface Soil	None
UHB-DS-15	PENN-CAN PROPERTY	924635.045	1115762.466	UHB-1024-06	12/24/2013	SOIL	S-CONF	REG	OBG	0	0.5	Ft	Covered by UHB IRM (sample from immediately below cover material)	X	Subsurface Soil	None
UHB-DS-16	PENN-CAN PROPERTY	924829.7294	1115709.854	UHB-1024-07	12/24/2013	SOIL	S-CONF	REG	OBG	0	0.5	Ft	Covered by UHB IRM (sample from immediately below cover material)	X	Subsurface Soil	None
UHB-DS-16	PENN-CAN PROPERTY	924829.7294	1115709.854	UHB-1024-08	12/24/2013	SOIL	S-CONF	REG	OBG	0	0.5	Ft	Covered by UHB IRM (sample from immediately below cover material)	X	Subsurface Soil	None
UHB-DS-17	PENN-CAN PROPERTY	925117.6466	1115608.591	UHB-1024-09	12/24/2013	SOIL	S-CONF	REG	OBG	0	0.5	Ft	Covered by UHB IRM (sample from immediately below cover material)	X	Subsurface Soil	None
UHB-DS-17	PENN-CAN PROPERTY	925117.6466	1115608.591	UHB-1024-10	12/24/2013	SOIL	S-CONF	REG	OBG	0	0.5	Ft	Covered by UHB IRM (sample from immediately below cover material)	X	Subsurface Soil	None
HB-GP-25	RAILROAD AREA	925346.14647	1115320.83185	HB9455	02/28/2001	SOIL	S-GP	REG	OBG	18	20	Ft	Covered by UHB IRM	X	Subsurface Soil	None
HB-GP-25	RAILROAD AREA	925346.14647	1115320.83185	HB9462	02/28/2001	SOIL	S-GP	REG	OBG	0	0.17	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Soil	Removed; placed on Wastebed B
HB-GP-26	RAILROAD AREA	925430.318989	1115371.71549	HB9452	02/27/2001	SOIL	S-GP	REG	OBG	32	34	Ft	Uncovered; pending final Site remedy	X	Subsurface Soil	None
HB-GP-26	RAILROAD AREA	925430.318989	1115371.71549	HB9453	02/27/2001	SOIL	S-GP	REG	OBG	0	0.17	Ft	Uncovered; pending final Site remedy	X	Surface Soil	None
HB-GP-27	RAILROAD AREA	925052.927545	1115429.36579	HB9465	03/01/2001	SOIL	S-GP	REG	OBG	0	0.17	Ft	Uncovered; pending final Site remedy	X	Surface Soil	None
HB-GP-27	RAILROAD AREA	925052.927545	1115429.36579	HB9466	03/01/2001	SOIL	S-GP	REG	OBG	12	14	Ft	Uncovered; pending final Site remedy	X	Subsurface Soil	None
HB-GP-28	RAILROAD AREA	924801.302702	1115531.8823	HB9454	02/28/2001	SOIL	S-GP	REG	OBG	16	18	Ft	Uncovered; pending final Site remedy	X	Subsurface Soil	None
HB-GP-28	RAILROAD AREA	924801.302702	1115531.8823	HB9463	02/28/2001	SOIL	S-GP	REG	OBG	0	0.17	Ft	Uncovered; pending final Site remedy	X	Surface Soil	None
HB-GP-29	RAILROAD AREA	924558.96603	1115615.2343	HB9456	02/28/2001	SOIL	S-GP	REG	OBG	16	18	Ft	Uncovered; pending final Site remedy	X	Subsurface Soil	None
HB-GP-29	RAILROAD AREA	924558.96603	1115615.2343	HB9458	02/28/2001	SOIL	S-GP	REG	OBG	0	0.17	Ft	Uncovered; pending final Site remedy	X	Surface Soil	None
HB-GP-30	RAILROAD AREA	924777.609359	1115365.9293	HB9470	03/02/2001	SOIL	S-GP	REG	OBG	0	0.17	Ft	Uncovered; pending final Site remedy	X	Surface Soil	None
HB-GP-30	RAILROAD AREA	924777.609359	1115365.9293	HB9471	03/02/2001	SOIL	S-GP	REG	OBG	12	14	Ft	Uncovered; pending final Site remedy	X	Subsurface Soil	None

Location ID	Subsite Name	East	North	Field Sample ID	Date Sampled	Sample Matrix	Sample Type	Sample Purpose	Sampling Company	Start Depth	End Depth	Depth Units	Notes	Include in Initial Dataset	Surface/Subsurface (Initial Dataset)	Change in Use for FS
HB-H108	RAILROAD AREA	925301.80748	1115136.32666	HB9089	10/23/1997	SOIL	SED	REG	NYSDEC	NA	NA	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-H109	RAILROAD AREA	925247.159247	1115164.4677	HB9090	10/23/1997	SOIL	SED	REG	NYSDEC	NA	NA	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-H110	RAILROAD AREA	925118.337119	1115460.87979	HB9087	10/23/1997	SOIL	SED	REG	NYSDEC	NA	NA	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-HB-07S	RAILROAD AREA	925295.124589	1114938.45601	HB9477	03/02/2001	SOIL	S-SB	REG	OBG	0	0.17	Ft	Uncovered; pending final Site remedy	X	Surface Soil	None
HB-HB-07S	RAILROAD AREA	925295.124589	1114938.45601	HB9479	03/02/2001	SOIL	S-SB	REG	OBG	4	6	Ft	Uncovered; pending final Site remedy	X	Subsurface Soil	None
HB-HB-08D	RAILROAD AREA	925459.000001	1115475.55	HB9437	02/27/2001	SOIL	S-SB	REG	OBG	0	0.17	Ft	Uncovered; pending final Site remedy	X	Surface Soil	None
HB-HB-08D	RAILROAD AREA	925459.000001	1115475.55	HB9449	02/27/2001	SOIL	S-SB	REG	OBG	16	18	Ft	Uncovered; pending final Site remedy	X	Subsurface Soil	None
HB-HB-08D	RAILROAD AREA	925459.000001	1115475.55	HB9451	02/27/2001	SOIL	S-SB	REG	OBG	0	0.17	Ft	Uncovered; pending final Site remedy	X	Surface Soil	None
HB-HB-08D	RAILROAD AREA	925459.000001	1115475.55	HB9675	02/28/2003	SOIL	S-SB	REG	OBG	64	68	Ft	Uncovered; pending final Site remedy	X	Subsurface Soil	None
HB-HB-09	RAILROAD AREA	924389.365311	1115732.00134	HB9445	02/26/2001	SOIL	S-SB	REG	OBG	0	0.17	Ft	Uncovered; pending final Site remedy	X	Surface Soil	None
HB-HB-09S	RAILROAD AREA	924389.522	1115732.483	HB9440	02/26/2001	SOIL	S-SB	REG	OBG	20	22	Ft	Uncovered; pending final Site remedy	X	Subsurface Soil	None
HB-HBSED-04	RAILROAD AREA	924988.443976	1115496.03178	HB9528	05/08/2001	SOIL	SED	REG	OBG	0	0.5	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-HBSED-04	RAILROAD AREA	924988.443976	1115496.03178	HB9544	05/11/2001	SOIL	SED	REG	OBG	0	0.5	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-HBSED-04	RAILROAD AREA	924988.443976	1115496.03178	HB9759	06/04/2003	SOIL	SED	REG	OBG	0	0.5	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-HBSED-04	RAILROAD AREA	924988.443976	1115496.03178	HB9764	06/04/2003	SOIL	SED	REG	OBG	0.5	1	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-HBSED-05	RAILROAD AREA	925042.051745	1115282.6887	HB9530	05/08/2001	SOIL	SED	REG	OBG	0	0.5	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-HBSED-05	RAILROAD AREA	925042.051745	1115282.6887	HB9554	05/11/2001	SOIL	SED	REG	OBG	0	0.5	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-HBSED-05	RAILROAD AREA	925042.051745	1115282.6887	HB9757	06/04/2003	SOIL	SED	REG	OBG	0	0.5	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-HBSED-05	RAILROAD AREA	925042.051745	1115282.6887	HB9758	06/04/2003	SOIL	SED	REG	OBG	0.5	1	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-RISB-08	RAILROAD AREA	925657.1488	1115421.1375	HB9671	02/24/2003	SOIL	S-SB	REG	OBG	20	24	Ft	Uncovered; pending final Site remedy	X	Subsurface Soil	None
HB-RISB-08	RAILROAD AREA	925657.1488	1115421.1375	HB9676	03/04/2003	SOIL	S-SB	REG	OBG	0	0.5	Ft	Uncovered; pending final Site remedy	X	Surface Soil	None
HB-RISB-08	RAILROAD AREA	925657.1488	1115421.1375	HB9677	03/04/2003	SOIL	S-SB	REG	OBG	0.5	1	Ft	Uncovered; pending final Site remedy	X	Surface Soil	None
HB-RISB-09	RAILROAD AREA	925522.0	1115305.7	HB9672	02/25/2003	SOIL	S-SB	REG	OBG	14	17	Ft	Covered by UHB IRM	X	Subsurface Soil	None
HB-RISB-09	RAILROAD AREA	925522.0	1115305.7	HB9678	03/10/2003	SOIL	S-SB	REG	OBG	0.5	1	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Soil	Removed; placed on Wastebed B
HB-RISB-09	RAILROAD AREA	925522.0	1115305.7	HB9679	03/10/2003	SOIL	S-SB	REG	OBG	0	0.5	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Soil	Removed; placed on Wastebed B
HB-SB-166	RAILROAD AREA	924742.121	1115417.306	HB-0051-07	09/10/2008	SOIL	S-SB	REG	OBG	6	8	Ft	Covered by UHB IRM	X	Subsurface Soil	None
HB-SB-167	RAILROAD AREA	924886.405	1115269.835	HB-0051-08	09/11/2008	SOIL	S-SB	REG	OBG	8	10	Ft	Covered by UHB IRM	X	Subsurface Soil	None
HB-SB-168	RAILROAD AREA	925114.698	1115242.043	HB-0050-01	09/12/2008	SOIL	S-SB	REG	OBG	2	4	FT	Covered by UHB IRM	X	Subsurface Soil	None
HB-SB-168	RAILROAD AREA	925114.698	1115242.043	HB-0050-02	09/12/2008	SOIL	S-SB	REG	OBG	2	4	FT	Covered by UHB IRM	X	Subsurface Soil	None
HB-SB-168	RAILROAD AREA	925114.698	1115242.043	HB-0051-01	09/12/2008	SOIL	S-SB	REG	OBG	8	10	Ft	Covered by UHB IRM	X	Subsurface Soil	None
HB-SB-169	RAILROAD AREA	925270.474	1115154.772	HB-0051-02	09/11/2008	SOIL	S-SB	REG	OBG	6	8	Ft	Covered by UHB IRM	X	Subsurface Soil	None
HB-SB-170	RAILROAD AREA	925198.949	1115034.262	HB-0051-09	09/11/2008	SOIL	S-SB	REG	OBG	4	6	Ft	Covered by UHB IRM	X	Subsurface Soil	None
HB-SB-171	RAILROAD AREA	925278.253	1114969.692	HB-0051-03	09/11/2008	SOIL	S-SB	REG	OBG	4	5.3	Ft	Uncovered; pending final Site remedy	X	Subsurface Soil	None
HB-SB-172	RAILROAD AREA	925210.924	1115411.537	HB-0049-01	09/10/2008	SOIL	S-SB	REG	OBG	2	4	FT	Covered by UHB IRM	X	Subsurface Soil	None
HB-SB-172	RAILROAD AREA	925210.924	1115411.537	HB-0049-02	09/10/2008	SOIL	S-SB	REG	OBG	2	4	FT	Covered by UHB IRM	X	Subsurface Soil	None
HB-SB-172	RAILROAD AREA	925210.924	1115411.537	HB-0051-10	09/10/2008	SOIL	S-SB	REG	OBG	10	12	Ft	Covered by UHB IRM	X	Subsurface Soil	None
HB-SB-173	RAILROAD AREA	925384.539	1115362.469	HB-0051-11	09/10/2008	SOIL	S-SB	REG	OBG	0	2	Ft	Uncovered; pending final Site remedy	X	Surface Soil	None
HB-SB-71	RAILROAD AREA	925532.5705	1115291.269	HB-0002-01	10/16/2006	SOIL	S-SB	REG	OBG	12	14	FT	Uncovered; pending final Site remedy	X	Subsurface Soil	None
HB-SB-71	RAILROAD AREA	925532.5705	1115291.269	HB-0002-02	10/16/2006	SOIL	S-SB	REG	OBG	14	16	FT	Uncovered; pending final Site remedy	X	Subsurface Soil	None
HB-SED-23	RAILROAD AREA	925314.978	1115375.668	HB-1035-05	07/09/2008	SOIL	SED	REG	OBG	0	1	FT	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-SED-23	RAILROAD AREA	925314.978	1115375.668	HB-1035-06	07/09/2008	SOIL	SED	REG	OBG	0	1	FT	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-SED-23	RAILROAD AREA	925314.978	1115375.668	HB-1035-11	07/09/2008	SOIL	SED	REG	OBG	1	3	FT	Down to 2 ft removed by UHB IRM and place on Wastebed B; covered with clean fill	X	Subsurface Sediment	Removed and placed on Wastebed B; covered and now Subsurface Soil
HB-SED-23	RAILROAD AREA	925314.978	1115375.668	HB-1035-12	07/09/2008	SOIL	SED	REG	OBG	1	3	FT	Down to 2 ft removed by UHB IRM and place on Wastebed B; covered with clean fill	X	Subsurface Sediment	Removed and placed on Wastebed B; covered and now Subsurface Soil
HB-SED-23	RAILROAD AREA	925314.978	1115375.668	HB-1041-06	07/09/2008	SOIL	SED	REG	OBG	0	1	FT	Removed by UHB IRM; placed on Wastebed B	X	Surface Sediment	Removed; placed on Wastebed B
HB-SED-23	RAILROAD AREA	925314.978	1115375.668	HB-1041-07	07/09/2008	SOIL	SED	REG	OBG	1	4	FT	Down to 2 ft removed by UHB IRM and place on Wastebed B; covered with clean fill	X	Subsurface Sediment	Removed and placed on Wastebed B; covered and now Subsurface Soil
HB-TP-24	RAILROAD AREA	925278.019608	1114986.97682	HB9460	02/28/2001	SOIL	TESTPIT	REG	OBG	2.5	3	Ft	Uncovered; pending final Site remedy	X	Subsurface Soil	None
HB-TP-25	RAILROAD AREA	925360.673062	1115319.46913	HB9438	02/26/2001	SOIL	TESTPIT	REG	OBG	8		Ft	Covered by UHB IRM	X	Subsurface Soil	None
HB-TP-26	RAILROAD AREA	925437.691061	1115484.77605	HB9442	02/26/2001	SOIL	TESTPIT	REG	OBG	3		Ft	Uncovered; pending final Site remedy	X	Subsurface Soil	None
HB-TP-27	RAILROAD AREA	925065.750495	1115432.17839	HB9448	02/27/2001	SOIL	TESTPIT	REG	OBG	10.5		Ft	Uncovered; pending final Site remedy	X	Subsurface Soil	None
HB-TP-28	RAILROAD AREA	924821.547102	1115548.64463	HB9447	02/27/2001	SOIL	TESTPIT	REG	OBG	8		Ft	Uncovered; pending final Site remedy	X	Subsurface Soil	None
HB-TP-29	RAILROAD AREA	924547.287894	1115614.39171	HB9450	02/27/2001	SOIL	TESTPIT	REG	OBG	2		Ft	Uncovered; pending final Site remedy	X	Subsurface Soil	None
HB-TP-30	RAILROAD AREA	924808.397687	1115345.76796	HB9464	02/28/2001	SOIL	TESTPIT	REG	OBG	5		Ft	Uncovered; pending final Site remedy	X	Subsurface Soil	None
HB-TP-31	RAILROAD AREA	925099.563279	1115227.42324	HB9461	02/28/2001	SOIL	TESTPIT	REG	OBG	3		Ft	Covered by UHB IRM	X	Subsurface Soil	None
HB-WSD-34	RAILROAD AREA	924720.613	1115437.691	HB-1043-05	07/15/2008	SOIL	WSD	REG	OBG	0	1	FT	Removed by UHB IRM	X	Surface Soiil	Removed; placed on Wastebed B
HB-WSD-34	RAILROAD AREA	924720.613	1115437.691	HB-1043-06	07/15/2008	SOIL	WSD	REG	OBG	0	1	FT	Removed by UHB IRM	X	Surface Soiil	Removed; placed on Wastebed B
HB-WSD-34	RAILROAD AREA	924720.613	1115437.691	HB-1043-07	07/15/2008	SOIL	WSD	REG	OBG	1	2	FT	Removed by UHB IRM	X	Surface Soiil	Removed; placed on Wastebed B
HB-WSD-34	RAILROAD AREA	924720.613	1115437.691	HB-1043-08	07/15/2008	SOIL	WSD	REG	OBG	1	2	FT	Removed by UHB IRM	X	Surface Soiil	Removed; placed on Wastebed B
HB-WSD-34	RAILROAD AREA	924720.613	1115437.691	HB-1050-01	07/15/2008	SOIL	WSD	REG	OBG	0	1	FT	Removed by UHB IRM	X	Surface Soiil	Removed; placed on Wastebed B
HB-WSD-34	RAILROAD AREA	924720.613	1115437.691	HB-1050-02	07/15/2008	SOIL	WSD	REG	OBG	1	2	FT	Removed by UHB IRM	X	Surface Soiil	Removed; placed on Wastebed B
HB-WSD-35	RAILROAD AREA	924890.793	1115259.048	HB-1044-07	07/16/2008	SOIL	WSD	REG	OBG	0	1	FT	Removed by UHB IRM	X	Surface Sediment	Removed; placed on Wastebed B
HB-WSD-35	RAILROAD AREA	924890.793	1115259.048	HB-1044-08	07/16/2008	SOIL	WSD	REG	OBG	0	1	FT	Removed by UHB IRM	X	Surface Sediment	Removed; placed on Wastebed B
HB-WSD-35	RAILROAD AREA	924890.793	1115259.048	HB-1044-09	07/16/2008	SOIL	WSD	REG	OBG	1	2	FT	Removed by UHB IRM	X	Surface Sediment	Removed; placed on Wastebed B
HB-WSD-35	RAILROAD AREA	924890.793	1115259.048	HB-1044-10	07/16/2008	SOIL	WSD	REG	OBG	1	2	FT	Removed by UHB IRM	X	Surface Sediment	Removed; placed on Wastebed B
HB-WSD-35	RAILROAD AREA	924890.793	1115259.048	HB-1051-01	07/16/2008	SOIL	WSD	REG	OBG	0	1	FT	Removed by UHB IRM	X	Surface Sediment	Removed; placed on Wastebed B
HB-WSD-35	RAILROAD AREA	924890.793	1115259.048	HB-1051-02	07/16/2008	SOIL	WSD	REG	OBG	1	2	FT	Removed by UHB IRM	X	Surface Sediment	Removed; placed on Wastebed B
HB-WSD-36	RAILROAD AREA	925219.095	1115186.247	HB-1044-01	07/16/2008	SOIL	WSD	REG	OBG	0	1	FT	Removed by UHB IRM	X	Surface Sediment	Removed; placed on Wastebed B
HB-WSD-36	RAILROAD AREA	925219.095	1115186.247	HB-1044-02	07/16/2008	SOIL	WSD	REG	OBG	0	1	FT	Removed by UHB IRM	X	Surface Sediment	Removed; placed on Wastebed B
HB-WSD-36	RAILROAD AREA	925219.095	1115186.247	HB-1044-05	07/16/2008	SOIL	WSD	REG	OBG	1	2	FT	Removed by UHB IRM	X	Surface Sediment	Removed; placed on Wastebed B
HB-WSD-36	RAILROAD AREA	925219.095	1115186.247	HB-1044-06	07/16/2008	SOIL	WSD	REG	OBG	1	2	FT	Removed by UHB IRM	X	Surface Sediment	Removed; placed on Wastebed B
HB-WSD-36	RAILROAD AREA	925219.095	1115186.247	HB-1051-03	07/16/2008	SOIL	WSD	REG	OBG	0	1	FT	Removed by UHB IRM	X	Surface Sediment	Removed; placed on Wastebed B
HB-WSD-36	RAILROAD AREA	925219.095	1115186.247	HB-1051-04	07/16/2008	SOIL	WSD	REG	OBG	1	2	FT	Removed by UHB IRM	X	Surface Sediment	Removed; placed on Wastebed B

Location ID	Subsite Name	East	North	Field Sample ID	Date Sampled	Sample Matrix	Sample Type	Sample Purpose	Sampling Company	Start Depth	End Depth	Depth Units	Notes	Include in Initial Dataset	Surface/Subsurface (Initial Dataset)	Change in Use for FS
HB-WSD-37	RAILROAD AREA	925307.118	1114911.937	HB-1040-01	07/11/2008	SOIL	WSD	REG	OBG	0	1	FT	Removed by UHB IRM	X	Surface Soiil	Removed; placed on Wastebed B
HB-WSD-37	RAILROAD AREA	925307.118	1114911.937	HB-1040-02	07/11/2008	SOIL	WSD	REG	OBG	0	1	FT	Removed by UHB IRM	X	Surface Soiil	Removed; placed on Wastebed B
HB-WSD-37	RAILROAD AREA	925307.118	1114911.937	HB-1040-03	07/11/2008	SOIL	WSD	REG	OBG	1	2	FT	Removed by UHB IRM	X	Surface Soiil	Removed; placed on Wastebed B
HB-WSD-37	RAILROAD AREA	925307.118	1114911.937	HB-1040-04	07/11/2008	SOIL	WSD	REG	OBG	1	2	FT	Removed by UHB IRM	X	Surface Soiil	Removed; placed on Wastebed B
HB-WSD-37	RAILROAD AREA	925307.118	1114911.937	HB-1042-01	07/11/2008	SOIL	WSD	REG	OBG	0	1	FT	Removed by UHB IRM	X	Surface Soiil	Removed; placed on Wastebed B
HB-WSD-37	RAILROAD AREA	925307.118	1114911.937	HB-1042-02	07/11/2008	SOIL	WSD	REG	OBG	1	2	FT	Removed by UHB IRM	X	Surface Soiil	Removed; placed on Wastebed B
HB-WSD-38	RAILROAD AREA	925261.066	1115106.504	HB-1039-05	07/11/2008	SOIL	WSD	REG	OBG	0	1	FT	Removed by UHB IRM	X	Surface Soiil	Removed; placed on Wastebed B
HB-WSD-38	RAILROAD AREA	925261.066	1115106.504	HB-1039-06	07/11/2008	SOIL	WSD	REG	OBG	0	1	FT	Removed by UHB IRM	X	Surface Soiil	Removed; placed on Wastebed B
HB-WSD-38	RAILROAD AREA	925261.066	1115106.504	HB-1039-11	07/11/2008	SOIL	WSD	REG	OBG	1	2	FT	Removed by UHB IRM	X	Surface Soiil	Removed; placed on Wastebed B
HB-WSD-38	RAILROAD AREA	925261.066	1115106.504	HB-1039-12	07/11/2008	SOIL	WSD	REG	OBG	1	2	FT	Removed by UHB IRM	X	Surface Soiil	Removed; placed on Wastebed B
HB-WSD-38	RAILROAD AREA	925261.066	1115106.504	HB-1042-03	07/11/2008	SOIL	WSD	REG	OBG	0	1	FT	Removed by UHB IRM	X	Surface Soiil	Removed; placed on Wastebed B
HB-WSD-38	RAILROAD AREA	925261.066	1115106.504	HB-1042-04	07/11/2008	SOIL	WSD	REG	OBG	1	2	FT	Removed by UHB IRM	X	Surface Soiil	Removed; placed on Wastebed B
HB-WSD-39	RAILROAD AREA	925376.315964583	1115101.89518715	HB-1039-01	07/11/2008	SOIL	WSD	REG	OBG	0	1	FT	Removed by UHB IRM	X	Surface Sediment	Removed; placed on Wastebed B
HB-WSD-39	RAILROAD AREA	925376.315964583	1115101.89518715	HB-1039-02	07/11/2008	SOIL	WSD	REG	OBG	0	1	FT	Removed by UHB IRM	X	Surface Sediment	Removed; placed on Wastebed B
HB-WSD-39	RAILROAD AREA	925376.315964583	1115101.89518715	HB-1039-03	07/11/2008	SOIL	WSD	REG	OBG	1	2	FT	Removed by UHB IRM	X	Surface Sediment	Removed; placed on Wastebed B
HB-WSD-39	RAILROAD AREA	925376.315964583	1115101.89518715	HB-1039-04	07/11/2008	SOIL	WSD	REG	OBG	1	2	FT	Removed by UHB IRM	X	Surface Sediment	Removed; placed on Wastebed B
HB-WSD-39	RAILROAD AREA	925376.315964583	1115101.89518715	HB-1042-05	07/11/2008	SOIL	WSD	REG	OBG	0	1	FT	Removed by UHB IRM	X	Surface Sediment	Removed; placed on Wastebed B
HB-WSD-39	RAILROAD AREA	925376.315964583	1115101.89518715	HB-1042-06	07/11/2008	SOIL	WSD	REG	OBG	1	2	FT	Removed by UHB IRM	X	Surface Sediment	Removed; placed on Wastebed B
HB-WSD-40	RAILROAD AREA	925444.016	1115302.911	HB-1035-01	07/09/2008	SOIL	WSD	REG	OBG	0	1	FT	Removed by UHB IRM	X	Surface Sediment	Removed; placed on Wastebed B
HB-WSD-40	RAILROAD AREA	925444.016	1115302.911	HB-1035-02	07/09/2008	SOIL	WSD	REG	OBG	0	1	FT	Removed by UHB IRM	X	Surface Sediment	Removed; placed on Wastebed B
HB-WSD-40	RAILROAD AREA	925444.016	1115302.911	HB-1035-03	07/09/2008	SOIL	WSD	REG	OBG	1	2	FT	Removed by UHB IRM	X	Surface Sediment	Removed; placed on Wastebed B
HB-WSD-40	RAILROAD AREA	925444.016	1115302.911	HB-1035-04	07/09/2008	SOIL	WSD	REG	OBG	1	2	FT	Removed by UHB IRM	X	Surface Sediment	Removed; placed on Wastebed B
HB-WSD-40	RAILROAD AREA	925444.016	1115302.911	HB-1041-01	07/09/2008	SOIL	WSD	REG	OBG	0	1	FT	Removed by UHB IRM	X	Surface Sediment	Removed; placed on Wastebed B
HB-WSD-40	RAILROAD AREA	925444.016	1115302.911	HB-1041-02	07/09/2008	SOIL	WSD	REG	OBG	1	2	FT	Removed by UHB IRM	X	Surface Sediment	Removed; placed on Wastebed B
HB-WSD-41	RAILROAD AREA	925243.017	1115403.316	HB-1036-01	07/09/2008	SOIL	WSD	REG	OBG	0	1	FT	Removed by UHB IRM	X	Surface Soiil	Removed; placed on Wastebed B
HB-WSD-41	RAILROAD AREA	925243.017	1115403.316	HB-1036-02	07/09/2008	SOIL	WSD	REG	OBG	0	1	FT	Removed by UHB IRM	X	Surface Soiil	Removed; placed on Wastebed B
HB-WSD-41	RAILROAD AREA	925243.017	1115403.316	HB-1036-03	07/09/2008	SOIL	WSD	REG	OBG	1	2	FT	Removed by UHB IRM	X	Surface Soiil	Removed; placed on Wastebed B
HB-WSD-41	RAILROAD AREA	925243.017	1115403.316	HB-1036-04	07/09/2008	SOIL	WSD	REG	OBG	1	2	FT	Removed by UHB IRM	X	Surface Soiil	Removed; placed on Wastebed B
HB-WSD-41	RAILROAD AREA	925243.017	1115403.316	HB-1041-03	07/09/2008	SOIL	WSD	REG	OBG	0	1	FT	Removed by UHB IRM	X	Surface Soiil	Removed; placed on Wastebed B
HB-WSD-41	RAILROAD AREA	925243.017	1115403.316	HB-1041-04	07/09/2008	SOIL	WSD	REG	OBG	1	2	FT	Removed by UHB IRM	X	Surface Soiil	Removed; placed on Wastebed B
HB-XSS-1	RAILROAD AREA	924573.999999	1115533	HB9605	12/04/2002	SOIL	S-SS	REG	OBG	0.5	1	Ft	Uncovered; pending final Site remedy	X	Surface Soil	None
HB-XSS-1	RAILROAD AREA	924573.999999	1115533	HB9607	12/04/2002	SOIL	S-SS	REG	OBG	0	0.5	Ft	Uncovered; pending final Site remedy	X	Surface Soil	None
HB-XSS-2	RAILROAD AREA	925289.999999	1115408	HB9616	12/04/2002	SOIL	S-SS	REG	OBG	0	0.5	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Soil	Removed; placed on Wastebed B
HB-XSS-3	RAILROAD AREA	925076.000002	1115084	HB9615	12/04/2002	SOIL	S-SS	REG	OBG	0.5	1	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Soil	Removed; placed on Wastebed B
HB-XSS-3	RAILROAD AREA	925076.000002	1115084	HB9618	12/04/2002	SOIL	S-SS	REG	OBG	0	0.5	Ft	Removed by UHB IRM; placed on Wastebed B	X	Surface Soil	Removed; placed on Wastebed B
UHB-DS-18	RAILROAD AREA	924875.1854	1115556.625	UHB-1000-01	09/21/2012	SOIL	S-CONF	REG	OBG	0	0.5	Ft	Covered by UHB IRM (sample from immediately below cover material)	X	Subsurface Soil	None
UHB-DS-19	RAILROAD AREA	925274.1196	1115400.012	UHB-1002-01	10/10/2012	SOIL	S-CONF	REG	OBG	0	0.5	Ft	Covered by UHB IRM (sample from immediately below cover material)	X	Subsurface Soil	None
UHB-DS-20	RAILROAD AREA	925479.7027	1115283.616	UHB-1005-01	10/25/2012	SOIL	S-CONF	REG	OBG	0	0.5	Ft	Covered by UHB IRM (sample from immediately below cover material)	X	Subsurface Soil	None
UHB-DS-20	RAILROAD AREA	925479.7027	1115283.616	UHB-1005-02	10/25/2012	SOIL	S-CONF	REG	OBG	0	0.5	Ft	Covered by UHB IRM (sample from immediately below cover material)	X	Subsurface Soil	None
UHB-DS-22	RAILROAD AREA	924671.222	1115478.064	UHB-1000-03	09/21/2012	SOIL	S-CONF	REG	OBG	0	0.5	Ft	Covered by UHB IRM (sample from immediately below cover material)	X	Subsurface Soil	None
UHB-DS-23	RAILROAD AREA	924901.8229	1115278.505	UHB-1000-02	09/21/2012	SOIL	S-CONF	REG	OBG	0	0.5	Ft	Covered by UHB IRM (sample from immediately below cover material)	X	Subsurface Soil	None
UHB-DS-24	RAILROAD AREA	925239.5452	1115088.577	UHB-1001-01	09/26/2012	SOIL	S-CONF	REG	OBG	0	0.5	Ft	Covered by UHB IRM (sample from immediately below cover material)	X	Subsurface Soil	None
UHB-DS-25	RAILROAD AREA	925412.3671	1115078.757	UHB-1003-01	10/11/2012	SOIL	S-CONF	REG	OBG	0	0.5	Ft	Covered by UHB IRM (sample from immediately below cover material)	X	Subsurface Soil	None
UHB-DS-26	RAILROAD AREA	925279.6985	1114916.002	UHB-1001-02	09/26/2012	SOIL	S-CONF	REG	OBG	0	0.5	Ft	Covered by UHB IRM (sample from immediately below cover material)	X	Subsurface Soil	None