



**Final
Close Out Report for the Meadow Marsh
Operable Unit I Area of Concern 8**

February 6, 2004



REGISTERED TO ISO 14001

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1.0 INTRODUCTION

This Close Out Report documents that Brookhaven National Laboratory (BNL) has completed all response actions for the Meadow Marsh, Operable Unit I, Area of Concern 8, in accordance with *Close Out Procedures for National Priorities List Sites* (OSWER Directive 9320.2-09A-P).

2.0 SUMMARY OF SITE CONDITIONS

2.1 Background

The Meadow Marsh, designated as Area of Concern (AOC) 8, also known as the Upland Recharge/Meadow Marsh Area, was the site of experiments to evaluate the capacity of small natural and man-made terrestrial and aquatic ecosystems for treating sewage and recharging ground and surface waters. These experiments were conducted from 1973 to 1975. Liquid effluent from residential cesspools and treated and untreated effluent from the BNL Sewage Treatment Plant (STP) were applied to various study areas within this AOC. Prior to remediation, the area was a series of overgrown fields and man-made basins. This area was included in the Sitewide Biological Inventory (LMS, 1995). Under 6 NYCRR Part 664.5, the existing Meadow Marsh Ponds are classified as Class I Wetlands based on the presence of the Tiger Salamander, which is a New York State endangered species.

The Meadow Marsh contained six small man-made ponds underlain with a PVC containment system to prevent recharge to groundwater. The PVC liners in the three western ponds and the northeastern pond had deteriorated and no longer retained water. The sediment depth ranged from two inches to two feet in the various ponds. The two eastern ponds were the only concern in the Meadow Marsh Area due to serving as breeding ground for the Tiger Salamander.

2.2 Remedial Investigation/Feasibility Study

The Operable Unit I/VI Remedial Investigation (RI) (CDM, 1996) was conducted to evaluate the nature and extent of contamination, and potential risks associated with AOC 8. A Feasibility Study (FS) (CDM, 1999) was prepared to evaluate the alternatives for remediation. The preliminary Ecological Risk Screening completed as part of the RI identified a potential risk to biota in the Meadow Marsh Area based on levels of inorganics and PCBs in surface water, soil and sediment. AOC 8 was determined not to present a risk to human health under any future use scenarios. Further ecological assessment was performed to quantify the ecological risks.

The Focused Ecological Risk Assessment (CDM, 1999) identified the potential for ecological risk in AOC 8 via exposure to inorganics in surface water, sediment and soil. A high potential risk was identified for the larval Tiger Salamander from exposure to surface water. A low potential risk from exposure to sediment was identified for the adult Tiger Salamander. The ecological risk assessment identified aluminum, cadmium, copper, iron, lead, silver and zinc as the primary metals of concern in surface water of the two eastern ponds. These metals pose a hazard to the larval Tiger Salamander. Iron and zinc were identified as present in the sediments and posing a hazard to the adult Tiger Salamander, in the two eastern ponds.

As part of the RI, three sediment samples were collected in the two eastern ponds and analyzed for metals and radionuclides. Supplemental sediment samples were collected after the RI was finalized to support the Focused Ecological Risk Assessment (CDM, 1999). Two sediment samples were collected in 1996 and two sediment samples were collected in 1997 within the two eastern ponds and analyzed for metals. Elevated metals were detected in sediments of the two eastern ponds, including chromium (up to 2,108 mg/kg), lead (up to 370 mg/kg), and mercury (up to 12.2 mg/kg). The radionuclides Cs-137, Sr-90 and tritium were detected, at or near background levels. There were no ecological risk associated with the volatile organic compounds, semi-volatile organic compounds, nor radionuclides.

2.3 Record of Decision

The following objectives for the remedial action were established in the OU I Record of Decision (ROD) (BNL, 1999):

- Minimize threats to the environment from site contaminants.
- Prevent/minimize the leaching of chemical contaminants from sediment or leaking of contaminated water into the underlying sole-source aquifer (Upper Glacial Aquifer).
- Prevent/minimize the uptake of chemical contaminants present in the sediment and water by sensitive species – which is the primary objective of this remedial action.
- Reconstruct a pond with shoreline wetland vegetation which will support a breeding population of the Tiger Salamander. The Tiger Salamander is a New York State endangered species.

The selected remedy included remediation of the two eastern ponds, designated the East Pond and West Pond from here forth, and is detailed as following:

- Excavating, stockpiling and sampling of sludge and sediments and waste PVC liner and pipe debris. Transportation and off-site disposal of the waste. The excavation was planned for late summer/early autumn when monthly precipitation amounts were minimum and the Tiger Salamander no longer occupied the ponds.
- Sampling and removal of soil meeting cleanup goals from the berm between the two ponds and from the side slopes of the area adjacent to the ponds to create one pond. Soil above sediment goals but meeting cleanup goals will be used for backfill of the other existing dry ponds located in AOC 8.
- Replacement of the PVC liner, backfilling the ponds to elevations that will provide sufficient water volume to support the desired ecological habitat, installation of indigenous wetland vegetation, and placing approximately 440,000 gallons of clean water in the proposed pond from an adjacent irrigation well or natural precipitation.

2.4 Remedial Activities

The Remedial Action Work Plan (RAWP) and New York State Wetland Equivalency Permit was submitted to the USEPA and NYSDEC in the Fall of 2002 and were finalized/approved in Summer of 2003, following incorporation of regulator comments into the plan. In accordance with the wetland permit, remedial activities were allowed to be conducted from August 1, 2003 to November 30, 2003.

A supplemental investigation was conducted to collect additional analytical data to help guide the remediation and characterize the waste. The supplemental investigation was conducted during the spring of 2003 and the results are documented in the Supplemental Investigation Report for the Meadow Marsh, Ash Pits, Waste Concentration Facility - Building 811 (BNL, 2003). The results of the supplemental investigation concluded that the soil in the berm between the two ponds was acceptable for reuse in the proposed pond and met sediment goals. The sediment was determined to be a non-hazardous waste, determined by the Toxicity Characteristic Leaching Procedure (TCLP) Test Method EPA 1311. However, the radionuclides slightly exceeded background levels for cobalt-60 (Co-60) and Americium-241 (Am-241) and required disposal at a Low Level Waste Disposal Facility.

In addition to the NYSDEC Wetland Equivalency Permit, BNL revised the BNL endangered species permit to include relocation of Tiger Salamanders from the Meadow Marsh Area to the Weaver Drive Wetland prior to remediation. Five Tiger Salamanders were relocated on July 28, 2003.

Remediation of the Meadow Marsh was separated into two phases. Phase 1 consisted of sediment, liner and contaminated soil removal, processing, on-site transportation to the rail siding, stockpiling, off-site transportation, and disposal at Envirocare of Utah. Phase 2 consisted of clearing/grubbing, excavation of the proposed pond, backfilling of ponds not requiring remediation, installation of a new liner, backfilling of the lined pond with soil meeting sediment goals, and replanting of native indigenous wetland plants.

Remediation began on August 1, 2003. The Phase 1 remedial action contractor was Miller Environmental Group, Incorporated of Calverton, New York. Clearing and grubbing began on August 1, 2003. Dewatering of the ponds began on August 5, 2003 and was completed on August 19, 2003. Pumping continued as necessary, due to precipitation events. Approximately 30,000 gallons of water were removed from the Meadow Marsh East and West Ponds. The water was sampled three times prior to remediation and analyzed for metals and pH. One water sample was unfiltered, one sample was filtered with a 10-micron filter and one sample was filtered with a 5-micron filter. The water, unfiltered and filtered with 10- and 5-micron filters, exceeded the BNL STP NYSDEC State Pollution Discharge Elimination System Permit limit for iron. The results are documented in the Supplemental Investigation Report for the Meadow Marsh, Ash Pits, Waste Concentration Facility - Building 811 (BNL, 2003). The water was acceptable for discharge at a Suffolk County wastewater treatment plant. The analytical data was provided to the county representative and a site tour of the remediation was provided on August 5, 2003. The water was discharged at the Bergen Point Waste Water Treatment Plant in Babylon, New York.

Processing of the sediment began on August 6, 2003 and was completed on August 21, 2003. There were precipitation events on several days which resulted in additional removal of water and re-processing of sediment to remove free liquids. The remediation contractor processed the sediment in-situ using manual labor and mixing of sediment with an absorbent. The sediment that was processed with the absorbent was then vacuumed from the pond by a Guzzler Vacuum Truck. The vacuumed sediment was staged in a 20 cubic yard enclosed roll-off container. The first load that was transported to the on-site rail siding was determined to be too wet for disposal. It was determined that the vibration of the vacuum truck was liquefying the sediment. The Guzzler Vacuum Truck removal was discontinued.

Processing of the sediment was continued with a combination of manual labor and heavy equipment in-situ. A bobcat, a small piece of heavy equipment, was utilized to reduce damage to the existing liner system. The absorbent was added to the sediment and it was mixed and removed from the ponds and placed in an open top lined 20 cubic yard roll-off containers with the bobcat. The contractor was requested to leave the sediment more wet than was specified in

the specification, due to dust suppression problems at the on-site rail siding where the sediment was mixed with other dry soils for transportation and disposal at Envirocare of Utah. Approximately 342 cubic yards of sediment were removed and disposed of from the East and West Ponds.

Removal of the liner and piping debris began on August 8, 2003 and was completed on August 21, 2003. The liner was cut into 12 foot by 12 foot sections and transported to the on-site rail siding in roll-off containers. Approximately 42 cubic yards of liner and pipe debris was removed and disposed of from the East and West Ponds at Envirocare of Utah.

Following the removal of the sediment and liner, the bottom soil of each pond was scraped with a payloader prior to sampling. The bottom soil volume that was scraped was included in the 342 cubic yards of sediment discussed above. Sample and analysis was conducted in accordance with the RAWP. Sampling of the ponds was conducted on the following days: August 22, 2003, August 29, 2003, September 12, 2003 and September 17, 2003. The results are shown in Tables 1 through 5.

As a result of the sample and analysis results, it was determined that approximately 143 cubic yards of soil needed to be removed to meet remediation goals. The 143 cubic yards represented removal of an additional 4 inches of soil from the bottom of each pond. The removal of the additional 4 inches of soil from the bottom of each pond began on September 8, 2003 and was completed on September 12, 2003. In addition to the soil removal, the contractor removed the liner that was anchored beneath the ground that was not previously shown on the drawings nor included in the specifications. At the time of contract award, there were no as-built drawings for the two ponds showing the anchor details, as a result, the contractor was awarded a change order to remove the extra liner.

Phase 2 began on August 26, 2003 with clearing and grubbing of the adjacent ponds for backfilling. The contractor for Phase 2 was awarded to Ralph Lettieri, Inc. Work stopped on August 27, 2003 and then continued on September 12, 2003, while waiting for sample and

analysis results and additional soil removal from the ponds. Clearing and grubbing was completed on September 12, 2003.

Excavation of the berm between the ponds began on September 15, 2003 and was completed on September 18, 2003. Excavation and re-grading of the proposed new pond began on September 15, 2003 and was completed on September 22, 2003. On September 17, 2003, work was stopped for 4 hours because bones were found in the excavation. The BNL Safe Guards and Security Group and Emergency Services were called. BNL called the Suffolk County Police and the crime Scene Investigators came to BNL to help identify the bones. The bones turned out to be horse bones and work was allowed to continue. And subsequently, more bones were found that were easily identifiable as horse bones. During excavation and re-grading, it was determined that there wasn't a sufficient amount of soil at the Meadow Marsh for use as backfill on the liner. BNL purchased 500 cubic yards of soil (sand screened to ½ inch) from Ranco Sand and Gravel for use on the liner.

The PVC liner was delivered on September 24, 2003. Arrival of the liner was delayed due to Hurricane Isabel that landed in North Carolina, where the liner was manufactured. The liner was installed on September 25, 2003 by Ralph Lettieri and Atlantic Liner Systems.

The liner was backfilled from September 26, 2003 to September 28, 2003. One foot of sand was placed on the liner base and sidewalls. Sand for use on the liner was delivered to the job site from September 23, 2003 to September 25, 2003. Topsoil was delivered to the site for use on the sand to support the wetland vegetation. Topsoil (6 inches in depth) was placed on the liner from September 27, 2003 and was completed September 30, 2003. Wetland plants were planted on September 30, 2003. Tussock Sedge and Water Smartweed were planted 18 inches on center in the planting zones specified in the design drawings.

Pond water was not replaced with the irrigation well from the adjacent agricultural fields because the water did not meet the water goals specified for the remediation. In accordance with the RAWP, the ponds will be allowed to fill naturally during precipitation events.

Remediation progress photographs are shown in Figures 1 to 8.

3.0 MONITORING RESULTS

Soil sampling beneath the liner that was removed and of the soil and top-soil to be used in the new pond was completed to ensure compliance with NYSDEC Technical and Administrative Guidance Memorandum (TAGM) #4046 – Heavy Metals Soil Cleanup Criteria and site background values. The average results showed that the soil met the TAGMs, was close to background values and less than eastern background values.

3.1 Pond Verification Soil Sampling

Pond verification sampling was performed in five rounds to ensure that the soil met the soil cleanup criteria.

Verification soil samples were collected from the bottom surface of the East and West Ponds after Phase 1 (sediment and liner removal). Sixteen composite samples, eight from each pond, were collected on August 22, 2003 in accordance with the RAWP. The samples were submitted to Severn Trent Laboratory (STL) for TAL metals. Results of the composite samples show that seven samples exceeded the TAGM/background criteria for Thallium (0.35 mg/kg) and four exceeded for zinc (22.4 mg/kg). Results from round 1 are included as Table 1.

A second round of verification samples were collected on August 29, 2003 at four inches below grade in each of the ponds. A total of thirty-two grab samples, sixteen from each pond, were collected and submitted to STL for thallium, zinc and copper analyses. Two samples exceeded the TAGM/background values for thallium, two samples exceeded for copper (25 mg/kg) and six samples exceeded for zinc. However, the average thallium, copper and zinc results passed TAGM/background values in the East Pond. The average thallium and copper results passed in the West Pond and the average zinc result was slightly elevated. Results from round 2 are included as Table 2.

A third round of verification samples were collected on August 29, 2003 at eight inches below grade in each of the ponds. A total of thirty-two grab samples, sixteen from each pond, were collected and submitted to STL for thallium, zinc and copper analyses. Eighteen samples exceeded the TAGM/background values for thallium, one sample exceeded for copper and five samples exceeded for zinc. However, the average copper and zinc results passed TAGM/background values in the East Pond and the average thallium result was slightly elevated. The average thallium and copper results passed in the West Pond and the average zinc result was slightly elevated. Results from round 3 are included as Table 3.

Based on the results of the first three rounds of verification sampling events, an additional 142 cubic yards of soil was removed from each of the two ponds. A fourth round of verification samples were collected on September 12, 2003 at grade in each of the ponds. A total of sixteen grab samples, eight from each pond, were collected and submitted to STL for TAL metals analyses. One sample slightly exceeded the TAGM/background values for beryllium (0.43 mg/kg), and two samples slightly exceeded for zinc. However, the average thallium, copper and zinc results passed TAGM/background values in the East and West Pond. Results from round 4 are included as Table 4.

A fifth round of verification samples were collected on September 17, 2003 at grade in each of the three areas of the East Pond that exceeded for either zinc or beryllium. Three grab samples were collected and submitted to STL for TAL metals analyses. All samples passed the TAGM/background values. Results from round 5 are included as Table 5.

3.2 Irrigation Well Sampling

One sample was collected from the irrigation well in the adjacent Biology Fields on June 27, 2003. The irrigation well pumps approximately 200 gallons of water a minute, and was purged for twenty minutes prior to collecting the sample. The sample was submitted to STL for TAL metals, gamma spectroscopy, total organic carbon and total organic halogens analyses. Sample results are included as Table 6. The irrigation well water contains metals that are greater than background and therefore this water could not be used in the new pond. The pond will be allowed to fill naturally.

3.3 New Pond Fill Soil Sampling

Four composite samples were collected from the soil berm between the two ponds as part of the supplemental investigation in the spring of 2003. These samples were collected in accordance with the RAWP and were submitted for TAL metals analysis. Results indicate that the berm soil meets the sediment criteria established in the RAWP and can be used as fill/cover material in the proposed pond.

In addition, three samples were collected on September 22, 2003, from the soil pile along the East Princeton Avenue Fire Break to ensure that the soil was acceptable for use in the new pond as fill/cover material. The samples were submitted to STL for TAL metals and PCB analyses. Sample results indicated that the fire break soil met the soil criteria (TAGM/background) and was used as fill/cover material in the pond. Results of the soil sampling effort are included as Table 7.

One top-soil sample was collected and analyzed for TAL metals and PCB analyses by LI Analytical. Sample results indicated that the top-soil met the soil criteria (TAGM/background) and was used in the pond. Results of the top-soil sampling effort are included as Table 8.

4.0 LONG TERM RESPONSE ACTION

Brookhaven National Laboratory will perform long-term surveillance and monitoring for the Meadow Marsh. Surveillance and monitoring will include ecological monitoring and institutional controls.

Ecological monitoring will also be implemented following completion of the remedial action. This monitoring will include annual visual observations and surface water monitoring.

Visual observations will be conducted annually to evaluate the health and vigor of the flora and fauna, i.e., wetlands vegetation and Tiger Salamander. These observations will include a survey of Tiger Salamander numbers. The surveys will be performed during the developmental stages and according to the associated schedules as follows: counts of egg masses as well as of adults

during late winter/early spring; and larval counts during late spring/early summer. In addition, the presence of invasive wetland species of vegetation, i.e., phragmites, will be monitored and controlled as necessary to maintain other indigenous wetlands vegetation.

Surface water monitoring will also be conducted annually during the period of the Tiger Salamander surveys. This monitoring will include collecting the following information: temperature; turbidity; conductivity; pH; pond water levels; and patterns of runoff to the pond from the surrounding area.

It is not expected that sediment sampling from the proposed pond bottom will be necessary because the fill material was sampled to ensure compliance with sediment goals prior to placement on the liner. Groundwater monitoring will not be performed for this project because rain water will be the source for maintaining pond levels and no impacts are expected to local groundwater from this area.

The results of Tiger Salamander surveys will be reported to the NYSDEC through the annual reporting required under Endangered/Threatened Species License. Each of the ecological monitoring activities identified above will be conducted for a period of five years, and the annual records documented and reported. At the end of five years, the documented information will be reviewed, summarized and reported to the NYSDEC and USEPA. A reduction in the monitoring frequency will be requested if the ecological health of the proposed pond area is determined to be satisfactory at that time.

Institutional controls to restrict the future use of the Meadow Marsh have been put in place as prescribed in the Brookhaven National Laboratory Land Use Controls Management Plan (BNL, 2003).

Institutional controls will be implemented following completion of the remedial action, as documented in the ROD, to minimize ecological impacts. This area is a New York State Class 1 Wetland and controls will include ensuring that land uses remain protective of sensitive species, and limiting access to and personnel activities at the site. These latter measures will preclude

development of AOC 8. In addition, any sale or transfer of BNL properties will also meet the requirements of New York State regulations for Class 1 Wetlands.

5.0 REFERENCES

EPA, 2000. Close Out Procedures for National Priorities List Sites (OSWER Directive 9320.2-09A-P) January 2000.

BNL, 1996. Final Remedial Investigation/Remedial Action Report for OU I/VI - June 14, 1996

P.W.Grosser, 2003. Remedial Action Work Plan, Area of Concern 8, Operable Unit I Meadow Marsh Remediation – June 2003

BNL, 2003. Supplemental Investigation Plan for the Meadow Marsh, Ash Pits, Waste Concentration Facility - Building 811 Supplemental Investigation

New York State Department of Environmental Conservation, Technical and Administrative Guidance Memorandum (TAGM) 4046

BNL 1999. Operable Unit I, Record of Decision (ROD), June 1999

BNL 2003. Draft Brookhaven National Laboratory Land Use Controls Management Plan - January 2003

LMS 1995. Phase II Sitewide Biological Inventory Report, Operable Unit IV, Brookhaven National Laboratory, Upton, New York September 1995

Figure 1: Pumping of Surface Water



Figure 2: Removal of Sediment with Vacuum Truck



Figure 3: Removal of Sediment with Bobcat



Figure 4: Bobcat Placing Sediment in Roll-off Container



Figure 5: East Pond Following Sediment and Liner Removal



Figure 6: West Pond Following Sediment and Liner Removal



Figure 7: Verification Sampling of Soil Under Ponds



Figure 8: Land Surveying for Proposed Pond



Figure 9: Graded Pond Prior to Liner Installation



Figure 10 Placement of Top Soil in Pond



Figure 11 Planting Wetland Plants in Pond



Table 1
Results for the Meadow Marsh Verification Samples
Round 1 - Composite Samples at Bottom Surface

COC 16980 - Composite Samples

| Parameter | Sample Result (mg/kg) 16980-001 | EPA Qualifier | Sample Result (mg/kg) 16980-002 | EPA Qualifier | Sample Result (mg/kg) 16980-003 | EPA Qualifier | Sample Result (mg/kg) 16980-004 | EPA Qualifier | Sample Result (mg/kg) 16980-005 | EPA Qualifier | Sample Result (mg/kg) 16980-006 | EPA Qualifier | Sample Result (mg/kg) 16980-007 | EPA Qualifier | Sample Result (mg/kg) 16980-008 | EPA Qualifier | High | Low | Average | TAGM Values** (mg/kg) | Number of Samples Above TAGM Values** |
|-----------|---------------------------------|---------------|---------------------------------|---------------|---------------------------------|---------------|---------------------------------|---------------|---------------------------------|---------------|---------------------------------|---------------|---------------------------------|---------------|---------------------------------|---------------|-------|-------|---------|-----------------------|---------------------------------------|
| Mercury | 0.048 | | 0.059 | | 0.086 | | 0.054 | | 0.17 | | 0.13 | | 0.025 | B | 0.15 | | 0.15 | 0.048 | 0.0794 | 1.84 | 0 |
| Aluminum | 4,030 | N | 2,270 | N | 3,880 | N | 2,370 | N | 4,080 | N | 3,830 | N | 3,340 | N | 4,180 | N | 4,180 | 2,270 | 3346 | 16,491 ^b | 0 |
| Arsenic | 2.1 | | 0.71 | B | 1.2 | | 0.72 | B | 1.2 | | 1.0 | B | 1.1 | | 0.96 | B | 2.1 | 0.71 | 1.138 | 7.5 ^a | 0 |
| Lead | 5.6 | | 4.5 | | 7.6 | | 3.4 | | 6.3 | | 9.9 | | 2.1 | | 11.1 | | 11.1 | 3.4 | 6.44 | 15.8 ^b | 0 |
| Antimony | ND | N* | ND | N* | ND | N* | ND | N* | ND | N* | ND | N* | ND | N* | ND | N* | 0 | 0 | #DIV/0! | 13.1 ^b | 0 |
| Barium | 11.3 | B | 8.2 | B | 12.8 | B | 7.3 | B | 17.4 | B | 17.1 | B | 11.3 | B | 18.2 | B | 18.2 | 7.3 | 11.56 | 300 ^a | 0 |
| Selenium | ND | | ND | | ND | | ND | | ND | | ND | | ND | | ND | | 0 | 0 | #DIV/0! | 2.0 ^a | 0 |
| Beryllium | 0.097 | B | ND | | ND | B | ND | | 0.081 | B | 0.086 | B | 0.04 | B | 0.052 | B | 0.097 | 0 | 0.0445 | 0.43 ^b | 0 |
| Thallium | 0.59 | B | ND | | 0.68 | B | 0.59 | B | 0.66 | B | 1.1 | | 0.5 | B | 0.41 | B | 0.68 | 0 | 0.56625 | 0.35 ^b | 7 |
| Cadmium | 0.27 | U | ND | | ND | | ND | | ND | | ND | | ND | | ND | | 0.27 | 0 | 0.03375 | 1.5 ^b | 0 |
| Calcium | 136 | B | 93.2 | B | 146 | B | 160 | B | 259 | B | 300 | B | 235 | B | 232 | B | 232 | 93.2 | 153.44 | 434 ^b | 0 |
| Chromium | 5.6 | | 3.2 | | 4.9 | | 2.8 | | 5.7 | | 5.5 | | 7.1 | | 5.7 | | 5.7 | 2.8 | 4.44 | 14.2 ^b | 0 |
| Cobalt | 2 | B | 1.1 | B | 1.7 | B | 1.0 | B | 2.9 | B | 2.2 | B | 2.5 | B | 2.4 | B | 2.4 | 1 | 1.64 | 30 ^b | 0 |
| Copper | 8.9 | | 8.6 | | 13 | | 5.7 | | 14.9 | B | 20.2 | | 5 | | 20.5 | | 21 | 5.7 | 11.4 | 25 ^b | 0 |
| Iron | 4,790 | N | 2,890 | N | 4,740 | N | 2,880 | N | 5,450 | N | 5,420 | N | 5,030 | N | 5,360 | N | 5,360 | 2,880 | 4132 | 14,429 ^b | 0 |
| Magnesium | 649 | | 362 | B | 597 | | 350 | B | 1,030 | | 941 | | 905 | | 1,010 | | 1,010 | 350 | 593.6 | 2,122 ^b | 0 |
| Manganese | 74.1 | | 42.6 | | 62 | | 55.2 | | 94.0 | | 76.1 | | 80.8 | | 80.2 | | 80.2 | 42.6 | 62.82 | 148 ^b | 0 |
| Nickel | 2.8 | B | 1.5 | B | 2.6 | B | 1.6 | B | 3.8 | B | 3.5 | B | 3.4 | B | 3.7 | B | 3.7 | 1.5 | 2.44 | 13 ^a | 0 |
| Potassium | 369 | B | 331 | B | 202 | B | 350 | B | 578 | | 289 | B | 481 | B | 534 | | 534 | 202 | 357.2 | 628 ^b | 0 |
| Silver | 0.43 | B | 0.44 | B | 0.72 | B | 0.20 | B | 0.63 | B | 0.93 | B | 0.051 | B | 1.1 | | 1.1 | 0.2 | 0.578 | 2 ^b | 0 |
| Sodium | 69.1 | B | 95.2 | B | 111 | B | 77.0 | B | 79.9 | B | 99.0 | B | 54.3 | B | 90.0 | B | 111 | 69.1 | 88.46 | 196 ^b | 0 |
| Vanadium | 9.1 | | 5.5 | | 9.5 | | 5.1 | B | 9.1 | | 8.4 | | 8.0 | | 8.6 | | 9.5 | 5.1 | 7.56 | 150 ^a | 0 |
| Zinc | 20.9 | | 18.9 | | 31.8 | | 11.9 | | 28.1 | | 37.6 | | 15.4 | | 27.7 | | 32 | 11.9 | 22.24 | 22.4 ^b | 4 |

Notes:

N - Spiked analyte recovery is outside stated control limits

* - Relative percent difference between MS/MSD is outside stated control limits

B - Estimated results. Result is less than Reporting Limit.

ND - Analyte not detected

** Background values as determined in the Final OU I/VI RI/RA, CDM, 1996.

^b Site Background: 97.72 percentile of available results for background soil samples. Final RI/RA OU I/VI (CDM, 1996)

^a NYSDEC TAGM # 4046 value

NA - Sample not analyzed for this parameter

Sample 17288-001 = 17287-009, 17288-002 = 17287-010 and 17288-003 = 17287-012

Table 2
Results for the Meadow Marsh Verification Samples
Round 2 - Grab Samples from 4 Inches Below Grade

COC 17000 - West Pond Grab Samples - 4 inches below grade

| Parameter | Sample Result (mg/kg) 17000-001 | EPA Qualifier | Sample Result (mg/kg) 17000-002 | EPA Qualifier | Sample Result (mg/kg) 17000-003 | EPA Qualifier | Sample Result (mg/kg) 17000-004 | EPA Qualifier | Sample Result (mg/kg) 17000-005 | EPA Qualifier | Sample Result (mg/kg) 17000-006 | EPA Qualifier | Sample Result (mg/kg) 17000-007 | EPA Qualifier | Sample Result (mg/kg) 17000-008 | EPA Qualifier | Sample Result (mg/kg) 17000-009 | EPA Qualifier | Sample Result (mg/kg) 17000-010 | EPA Qualifier | Sample Result (mg/kg) 17000-011 | EPA Qualifier | Sample Result (mg/kg) 17000-012 | EPA Qualifier | Sample Result (mg/kg) 17000-013 | EPA Qualifier | Sample Result (mg/kg) 17000-014 | EPA Qualifier | Sample Result (mg/kg) 17000-015 | EPA Qualifier | Sample Result (mg/kg) 17000-016 | EPA Qualifier | High | Low | Average | TAGM Values** (mg/kg) | Number of Samples Above TAGM Values** |
|-----------|---------------------------------|---------------|---------------------------------|---------------|---------------------------------|---------------|---------------------------------|---------------|---------------------------------|---------------|---------------------------------|---------------|---------------------------------|---------------|---------------------------------|---------------|---------------------------------|---------------|---------------------------------|---------------|---------------------------------|---------------|---------------------------------|---------------|---------------------------------|---------------|---------------------------------|---------------|---------------------------------|---------------|---------------------------------|---------------|------|-----|---------|-----------------------|---------------------------------------|
| Thallium | ND | N | ND | N | ND | N | ND | N | ND | N | ND | N | ND | N | ND | N | ND | N | ND | N | ND | N | ND | N | ND | N | ND | N | ND | N | ND | N | 0 | 0 | #DIV/0! | 0.35 ⁵ | 0 |
| Copper | 7.3 | E | 7.4 | E | 6.8 | E | 22.3 | E | 1.2 | BE | 11.3 | E | 6.8 | E | 27.3 | E | 2.5 | BE | 2.5 | BE | 2.2 | BE | 3.3 | E | 3.0 | E | 6.8 | E | 32.3 | E | 5.8 | E | 32.3 | 1.2 | 9.3 | 25 ⁵ | 2 |
| Zinc | 19.6 | | 9.7 | | 17.6 | | 52.4 | | 2.0 | B | 26.1 | | 14.9 | | 67.7 | | 6.4 | | 6.0 | | 5.8 | | 7.4 | | 6.5 | | 18.6 | | 69.6 | | 32.4 | | 69.6 | 2.0 | 22.7 | 22.4 ⁵ | 5 |

COC 17001 - East Pond Grab Samples - 4 inches below grade

| Parameter | Sample Result (mg/kg) 17001-001 | EPA Qualifier | Sample Result (mg/kg) 17001-002 | EPA Qualifier | Sample Result (mg/kg) 17001-003 | EPA Qualifier | Sample Result (mg/kg) 17001-004 | EPA Qualifier | Sample Result (mg/kg) 17001-005 | EPA Qualifier | Sample Result (mg/kg) 17001-006 | EPA Qualifier | Sample Result (mg/kg) 17001-007 | EPA Qualifier | Sample Result (mg/kg) 17001-008 | EPA Qualifier | Sample Result (mg/kg) 17001-009 | EPA Qualifier | Sample Result (mg/kg) 17001-010 | EPA Qualifier | Sample Result (mg/kg) 17001-011 | EPA Qualifier | Sample Result (mg/kg) 17001-012 | EPA Qualifier | Sample Result (mg/kg) 17001-013 | EPA Qualifier | Sample Result (mg/kg) 17001-014 | EPA Qualifier | Sample Result (mg/kg) 17001-015 | EPA Qualifier | Sample Result (mg/kg) 17001-016 | EPA Qualifier | High | Low | Average | TAGM Values** (mg/kg) | Number of Samples Above TAGM Values** |
|-----------|---------------------------------|---------------|---------------------------------|---------------|---------------------------------|---------------|---------------------------------|---------------|---------------------------------|---------------|---------------------------------|---------------|---------------------------------|---------------|---------------------------------|---------------|---------------------------------|---------------|---------------------------------|---------------|---------------------------------|---------------|---------------------------------|---------------|---------------------------------|---------------|---------------------------------|---------------|---------------------------------|---------------|---------------------------------|---------------|------|-------------------|---------|-----------------------|---------------------------------------|
| Thallium | ND | | 0.51 | B | ND | | ND | | ND | | ND | | ND | | ND | | ND | | ND | | ND | | ND | | ND | | ND | | 0.42 | B | ND | | 0.51 | 0 | 0.05813 | 0.35 ⁵ | 2 |
| Copper | 9.7 | E | 3.7 | E | 3.8 | E | 3.8 | E | 3.2 | E | 5.5 | E | 3.7 | E | 3.5 | E | 5.5 | E | 4.0 | E | 5.0 | E | 3.3 | E | 4.2 | E | 4.1 | E | 10.9 | E | 5.4 | E | 10.9 | 3.2 | 5.0 | 25 ⁵ | 0 |
| Zinc | 47.5 | | 9.1 | | 10.3 | | 9.8 | | 7.9 | | 16.9 | | 10.1 | | 14.8 | | 9.9 | | 10.6 | | 8.6 | | 11.1 | | 10.7 | | 20.6 | | 14.7 | | 47.5 | 7.9 | 13.9 | 22.4 ⁵ | 1 | | |

Notes:
 N - Spiked analyte recovery is outside stated control limits
 * - Relative percent difference between MS/MSD is outside stated control limits
 B - Estimated results. Result is less than Reporting Limit.
 ND - Analyte not detected
 ** Background values as determined in the Final OU I/VI RfRA, CDM, 1996.
 # Site Background: 97.72 percentile of available results for background soil samples. Final RfRA OU I/VI (CDM, 1996)
 # NYSDEC TAGM # 4046 value
 NA - Sample not analyzed for this parameter
 # Sample 17288-001 = 17287-009, 17288-002 = 17287-010 and 17288-003 = 17287-012

Table 3
Results for the Meadow Marsh Verification Samples
Round 3 - Grab Samples from 8 Inches Below Grade

COC 17275 - West Pond Grab Samples - 8 inches below grade

| Parameter | Sample Result (mg/kg) 17275-001 | EPA Qualifier | Sample Result (mg/kg) 17275-002 | EPA Qualifier | Sample Result (mg/kg) 17275-003 | EPA Qualifier | Sample Result (mg/kg) 17275-004 | EPA Qualifier | Sample Result (mg/kg) 17275-005 | EPA Qualifier | Sample Result (mg/kg) 17275-006 | EPA Qualifier | Sample Result (mg/kg) 17275-007 | EPA Qualifier | Sample Result (mg/kg) 17275-008 | EPA Qualifier | Sample Result (mg/kg) 17275-009 | EPA Qualifier | Sample Result (mg/kg) 17275-010 | EPA Qualifier | Sample Result (mg/kg) 17275-011 | EPA Qualifier | Sample Result (mg/kg) 17275-012 | EPA Qualifier | Sample Result (mg/kg) 17275-013 | EPA Qualifier | Sample Result (mg/kg) 17275-014 | EPA Qualifier | Sample Result (mg/kg) 17275-015 | EPA Qualifier | Sample Result (mg/kg) 17275-016 | EPA Qualifier | High | Low | Average | TAGM Values** (mg/kg) | Number of Samples Above TAGM Values** |
|-----------|---------------------------------|---------------|---------------------------------|---------------|---------------------------------|---------------|---------------------------------|---------------|---------------------------------|---------------|---------------------------------|---------------|---------------------------------|---------------|---------------------------------|---------------|---------------------------------|---------------|---------------------------------|---------------|---------------------------------|---------------|---------------------------------|---------------|---------------------------------|---------------|---------------------------------|---------------|---------------------------------|---------------|---------------------------------|---------------|------|-----|---------|-----------------------|---------------------------------------|
| Thallium | 0.5 | B | ND | | ND | | ND | | ND | | ND | | ND | | ND | | ND | | ND | | 0.44 | B | ND | | ND | | 0.75 | B | ND | | ND | | 0.75 | 0 | 0.10563 | 0.35 ^b | 3 |
| Copper | 6.2 | | 2.1 | B | 4.3 | | 14.3 | | 1.3 | B | 2.1 | B | 3.4 | | 7.6 | | 6.2 | | 3.7 | | 7.3 | | 3.4 | | 6.3 | | 78.2 | | 10.5 | | 6.8 | | 78 | 1.3 | 10.2 | 25 ^b | 1 |
| Zinc | 18.8 | | 5.2 | | 9.4 | | 32 | | 2.8 | | 3.4 | | 6.7 | | 16.1 | | 14.3 | | 7.6 | | 17.6 | | 7.9 | | 13.0 | | 183.0 | | 4.0 | | 24.8 | | 183 | 2.8 | 22.9 | 22.4 ^b | 3 |

COC 17276 - East Pond Grab Samples - 8 inches below grade

| Parameter | Sample Result (mg/kg) 17276-001 | EPA Qualifier | Sample Result (mg/kg) 17276-002 | EPA Qualifier | Sample Result (mg/kg) 17276-003 | EPA Qualifier | Sample Result (mg/kg) 17276-004 | EPA Qualifier | Sample Result (mg/kg) 17276-005 | EPA Qualifier | Sample Result (mg/kg) 17276-006 | EPA Qualifier | Sample Result (mg/kg) 17276-007 | EPA Qualifier | Sample Result (mg/kg) 17276-008 | EPA Qualifier | Sample Result (mg/kg) 17276-009 | EPA Qualifier | Sample Result (mg/kg) 17276-010 | EPA Qualifier | Sample Result (mg/kg) 17276-011 | EPA Qualifier | Sample Result (mg/kg) 17276-012 | EPA Qualifier | Sample Result (mg/kg) 17276-013 | EPA Qualifier | Sample Result (mg/kg) 17276-014 | EPA Qualifier | Sample Result (mg/kg) 17276-015 | EPA Qualifier | Sample Result (mg/kg) 17276-016 | EPA Qualifier | High | Low | Average | TAGM Values** (mg/kg) | Number of Samples Above TAGM Values** |
|-----------|---------------------------------|---------------|---------------------------------|---------------|---------------------------------|---------------|---------------------------------|---------------|---------------------------------|---------------|---------------------------------|---------------|---------------------------------|---------------|---------------------------------|---------------|---------------------------------|---------------|---------------------------------|---------------|---------------------------------|---------------|---------------------------------|---------------|---------------------------------|---------------|---------------------------------|---------------|---------------------------------|---------------|---------------------------------|---------------|------|-----|---------|-----------------------|---------------------------------------|
| Thallium | 1 | B | 0.7 | B | 0.76 | | 0.71 | B | 0.49 | B | 0.54 | B | 0.6 | B | 0.46 | B | 0.72 | B | 0.73 | B | 0.56 | B | 0.43 | B | 0.6 | B | 0.5 | B | 0.83 | B | ND | | 1 | 0 | 0.60 | 0.35 ^b | 15 |
| Copper | 15.1 | | 4.9 | | 5.6 | | 5.4 | | 4.5 | | 6.9 | | 4.4 | | 3.7 | | 6.6 | | 6.4 | | 10.7 | | 4.2 | | 4.6 | | 4.7 | | 13.1 | | 5.6 | | 15 | 3.7 | 6.7 | 25 ^b | 0 |
| Zinc | 47.6 | E | 11.3 | E | 14.5 | E | 13.5 | E | 12.4 | E | 21.3 | E | 11.4 | E | 9.5 | E | 17.9 | E | 12.0 | E | 16.8 | E | 9.8 | E | 11.6 | E | 10.5 | E | 23.0 | E | 13.5 | E | 48 | 9.5 | 16.0 | 22.4 ^b | 2 |

Notes:

N - Spiked analyte recovery is outside stated control limits

* - Relative percent difference between MS/MSD is outside stated control limits

B - Estimated results. Result is less than Reporting Limit.

ND - Analyte not detected

** Background values as determined in the Final OU 1/VI R/RA, CDM, 1996.

^b Site Background: 97.72 percentile of available results for background soil samples. Final R/RA OU 1/VI (CDM, 1996)

^c NYSDEC TAGM # 4046 value

NA - Sample not analyzed for this parameter

Sample 17288-001 = 17287-009, 17288-002 = 17287-010 and 17288-003 = 17287-012

Table 4
Results for the Meadow Marsh Verification Samples
Round 4 - Grab Samples from Bottom Surface

COC 17287 - West Pond Grab Samples - Post Soil Removal Confirmation Samples

| Parameter | Sample Result (mg/kg) 17287-001 | EPA Qualifier | Sample Result (mg/kg) 17287-002 | EPA Qualifier | Sample Result (mg/kg) 17287-003 | EPA Qualifier | Sample Result (mg/kg) 17287-004 | EPA Qualifier | Sample Result (mg/kg) 17287-005 | EPA Qualifier | Sample Result (mg/kg) 17287-006 | EPA Qualifier | Sample Result (mg/kg) 17287-007 | EPA Qualifier | Sample Result (mg/kg) 17287-008 | EPA Qualifier | High | Low | Average | TAGM Values** (mg/kg) | Number of Samples Above TAGM Values** |
|-----------|---------------------------------|---------------|---------------------------------|---------------|---------------------------------|---------------|---------------------------------|---------------|---------------------------------|---------------|---------------------------------|---------------|---------------------------------|---------------|---------------------------------|---------------|------|-------|---------|-----------------------|---------------------------------------|
| Mercury | ND | | ND | | ND | | ND | | ND | | 0.04 | | ND | | ND | | 0.04 | 0 | 0.01 | 1.84 | 0 |
| Aluminum | 1120 | N | 1310 | N | 820 | N | 422 | N | 635 | N | 2340 | N | 3430 | N | 641 | N | 3430 | 422 | 1339.75 | 16,491 ^b | 0 |
| Arsenic | 0.6 | B | 0.49 | B | 0.68 | B | ND | | 0.41 | B | 1.7 | | 1.8 | | 0.44 | B | 1.8 | 0 | 0.77 | 7.5 ^a | 0 |
| Lead | 1.4 | | 1.5 | | 1.5 | | 0.59 | | 0.84 | | 4.5 | | 8 | | 0.93 | | 8 | 0.59 | 2.41 | 15.8 ^b | 0 |
| Antimony | 0.49 | B | ND | | 0.18 | B | ND | | ND | | ND | | ND | | ND | | 0.49 | 0 | 0.08 | 13.1 ^b | 0 |
| Barium | 3.2 | BE | 4.4 | BE | 2.3 | BE | 3.1 | BE | 2.7 | BE | 6.7 | BE | 10.7 | BE | 2.7 | BE | 10.7 | 2.3 | 4.48 | 300 ^a | 0 |
| Selenium | ND | | ND | | ND | | ND | | ND | | 0.24 | B | 0.27 | B | ND | | 0.27 | 0 | 0.06 | 2.0 ^a | 0 |
| Beryllium | 0.11 | B | 0.12 | B | 0.096 | B | 0.078 | B | 0.11 | B | 0.14 | B | 0.16 | B | 0.071 | B | 0.16 | 0.071 | 0.11 | 0.43 ^b | 0 |
| Thallium | ND | | ND | | ND | | ND | | ND | | ND | | ND | | ND | | 0 | 0 | ND | 0.35 ^b | 0 |
| Cadmium | ND | | ND | | ND | | ND | | ND | | ND | | ND | | ND | | 0 | 0 | ND | 1.5 ^b | 0 |
| Calcium | 61.5 | B | 74.8 | B | 40.9 | B | 31.2 | B | 49.4 | B | 107 | B | 96 | B | 28.5 | B | 107 | 28.5 | 61.16 | 434 ^b | 0 |
| Chromium | 2.2 | | 2.3 | | 2.3 | | 1.1 | | 1.1 | | 1.1 | | 3.5 | | 1.3 | | 4.9 | 1.1 | 2.34 | 14.2 ^b | 0 |
| Cobalt | 1.2 | B | 1.3 | B | 0.57 | B | 0.32 | B | 0.45 | B | 1.3 | B | 1.5 | B | 0.52 | B | 1.5 | 0.32 | 0.90 | 30 ^b | 0 |
| Copper | 1.8 | B | 1.8 | B | 1.7 | B | 1.2 | B | 1 | B | 7.9 | | 9.6 | | 1.5 | B | 9.6 | 1 | 3.31 | 25 ^b | 0 |
| Iron | 2230 | N | 2090 | N | 1510 | N | 825 | N | 1320 | N | 3870 | N | 4310 | N | 1120 | N | 4310 | 825 | 2159.38 | 14,429 ^b | 0 |
| Magnesium | 257 | B | 341 | B | 152 | B | 125 | B | 156 | B | 352 | B | 430 | B | 124 | B | 430 | 124 | 242.13 | 2,122 ^b | 0 |
| Manganese | 55 | | 47.5 | | 23 | | 62.4 | | 38.5 | | 55 | | 44.9 | | 42.9 | | 62.4 | 23 | 46.15 | 148 ^b | 0 |
| Nickel | 1.4 | B | 1.6 | B | 0.75 | B | 0.96 | B | 0.84 | B | 1.8 | B | 2.3 | B | 0.69 | B | 2.3 | 0.69 | 1.29 | 13 ^a | 0 |
| Potassium | 127 | B | ND | | ND | | ND | | ND | | 156 | | 156 | | ND | B | 156 | 0 | 35.38 | 628 ^b | 0 |
| Silver | ND | | ND | | ND | | ND | | ND | | 0.32 | B | 0.52 | B | ND | | 0.52 | 0 | 0.11 | 2 ^b | 0 |
| Sodium | 11.8 | B | 19.6 | B | 21.3 | B | 19 | B | 12.9 | B | 29.6 | B | 34.9 | B | 13.4 | B | 34.9 | 11.8 | 20.31 | 196 ^b | 0 |
| Vanadium | 4 | B | 3.3 | B | 2.4 | B | 1.3 | B | 2 | B | 5.6 | | 7.6 | | 1.8 | B | 7.6 | 1.3 | 3.50 | 150 ^a | 0 |
| Zinc | 5 | | 4.9 | | 4.8 | | 2.3 | | 3.3 | | 11.4 | | 19.7 | | 2.4 | | 19.7 | 2.3 | 6.73 | 22.4 ^b | 0 |

Notes:

N - Spiked analyte recovery is outside stated control limits

* - Relative percent difference between MS/MSD is outside stated control limits

B - Estimated results. Result is less than Reporting Limit.

ND - Analyte not detected

** Background values as determined in the Final OU I/VI RI/RA, CDM, 1996.

^b Site Background: 97.72 percentile of available results for background soil samples. Final RI/RA OU I/VI (CDM, 1996)

^a NYSDEC TAGM # 4046 value

NA - Sample not analyzed for this parameter

Sample 17288-001 = 17287-009, 17288-002 = 17287-010 and 17288-003 = 17287-012

Table 4
Results for the Meadow Marsh Verification Samples
Round 4 - Grab Samples from Bottom Surface

COC 17287 - East Pond Grab Samples - Post Soil Removal Confirmation Samples

| Parameter | Sample Result (mg/kg) 17287-009 | EPA Qualifier | Sample Result (mg/kg) 17287-010 | EPA Qualifier | Sample Result (mg/kg) 17287-011 | EPA Qualifier | Sample Result (mg/kg) 17287-012 | EPA Qualifier | Sample Result (mg/kg) 17287-013 | EPA Qualifier | Sample Result (mg/kg) 17287-014 | EPA Qualifier | Sample Result (mg/kg) 17287-015 | EPA Qualifier | Sample Result (mg/kg) 17287-016 | EPA Qualifier | High | Low | Average | TAGM Values** (mg/kg) | Number of Samples Above TAGM Values** |
|-----------|------------------------------------|---------------|------------------------------------|---------------|------------------------------------|---------------|------------------------------------|---------------|------------------------------------|---------------|------------------------------------|---------------|------------------------------------|---------------|------------------------------------|---------------|-------|------|---------|--------------------------|---------------------------------------|
| Mercury | ND | | ND | | ND | | ND | | 0.053 | | 0.029 | B | ND | | ND | | 0.053 | 0 | 0.01 | 1.84 | 0 |
| Aluminum | 3310 | N | 3790 | N | 2280 | N | 3000 | N | 3300 | N | 2750 | B | 2810 | N | 2940 | N | 3790 | 2280 | 3022.50 | 16,491 ^b | 0 |
| Arsenic | 1.1 | | 0.88 | B | 0.65 | B | 1.2 | | 1.2 | | 0.76 | B | 2.1 | | 0.68 | B | 2.1 | 0.65 | 1.07 | 7.5 ^a | 0 |
| Lead | 2.5 | | 2 | | 1.5 | | 1.9 | | 4.5 | | 2.9 | | 2.1 | | 2.1 | | 4.5 | 1.5 | 2.49 | 15.8 ^b | 0 |
| Antimony | ND | | ND | | ND | | ND | | ND | | ND | | ND | | ND | | 0 | 0 | #DIV/0! | 13.1 ^b | 0 |
| Barium | 10.7 | BE | 14.2 | BE | 6.8 | BE | 10.1 | BE | 13.6 | BE | 11.6 | BE | 9.3 | BE | 12.4 | BE | 14.2 | 6.8 | 11.09 | 300 ^a | 0 |
| Selenium | ND | | ND | | ND | | ND | | ND | | ND | | ND | | ND | | 0 | 0 | #DIV/0! | 2.0 ^a | 0 |
| Beryllium | 0.23 | B | 0.26 | B | 0.15 | B | 0.48 | B | 0.28 | B | 0.22 | B | 0.22 | B | 0.23 | B | 0.48 | 0.15 | 0.26 | 0.43 ^b | 1 |
| Thallium | ND | | ND | | ND | | ND | | ND | | ND | | ND | | ND | | 0 | 0 | #DIV/0! | 0.35 ^b | 0 |
| Cadmium | ND | | ND | | ND | | 0.043 | B | ND | | ND | | ND | | ND | | 0.043 | 0 | 0.01 | 1.5 ^b | 0 |
| Calcium | 369 | B | 277 | B | 350 | B | 351 | B | 274 | B | 254 | B | 342 | B | 328 | B | 369 | 254 | 318.13 | 434 ^b | 0 |
| Chromium | 4.7 | | 5.1 | | 3.3 | | 4.4 | | 4.8 | | 4.1 | | 4.3 | | 3.8 | | 5.1 | 3.3 | 4.31 | 14.2 ^b | 0 |
| Cobalt | 2.4 | B | 3.8 | B | 1.8 | B | 2.8 | B | 2.1 | B | 2.5 | B | 1.9 | B | 2.6 | B | 3.8 | 1.8 | 2.49 | 30 ^b | 0 |
| Copper | 5.9 | | 6.9 | | 2.6 | B | 3.7 | | 10 | | 6.4 | | 6.1 | | 4.5 | | 10 | 2.6 | 5.76 | 25 ^b | 0 |
| Iron | 5040 | N | 5540 | N | 3570 | N | 4740 | N | 4950 | N | 4040 | N | 4500 | N | 4580 | N | 5540 | 3570 | 4620.00 | 14,429 ^b | 0 |
| Magnesium | 953 | | 1180 | | 704 | | 917 | | 888 | | 792 | | 823 | | 855 | | 1180 | 704 | 889.00 | 2,122 ^b | 0 |
| Manganese | 73.4 | | 133 | | 52 | | 75.8 | | 81.7 | | 101 | | 66.3 | | 97.8 | | 133 | 52 | 85.13 | 148 ^b | 0 |
| Nickel | 3.8 | B | 5.3 | B | 2.8 | B | 3.9 | B | 3.6 | B | 3.5 | B | 3.2 | B | 3.7 | B | 5.3 | 2.8 | 3.73 | 13 ^a | 0 |
| Potassium | 346 | B | 498 | B | 172 | B | 516 | B | 345 | B | 210 | B | 594 | B | 441 | B | 594 | 172 | 390.25 | 628 ^b | 0 |
| Silver | ND | | ND | | ND | | ND | | 0.32 | B | 0.2 | B | ND | | ND | | 0.32 | 0 | 0.07 | 2 ^b | 0 |
| Sodium | 45.1 | B | 26.5 | B | 24.6 | B | 34.2 | B | 33.4 | B | 45.7 | B | 39.4 | B | 30.2 | B | 45.7 | 24.6 | 34.89 | 196 ^b | 0 |
| Vanadium | 9.5 | | 9 | | 5.6 | | 7.2 | | 7.6 | | 6.5 | | 7.1 | | 7 | | 9.5 | 5.6 | 7.44 | 150 ^a | 0 |
| Zinc | 24.2 | | 23.4 | | 7.4 | | 11.4 | | 17.4 | | 16.1 | | 13.5 | | 14.7 | | 24.2 | 7.4 | 16.01 | 22.4 ^b | 2 |

Notes:

N - Spiked analyte recovery is outside stated control limits

* - Relative percent difference between MS/MSD is outside stated control limits

B - Estimated results. Result is less than Reporting Limit.

ND - Analyte not detected

** Background values as determined in the Final OU I/VI RI/RA, CDM, 1996.

^b Site Background: 97.72 percentile of available results for background soil samples. Final RI/RA OU I/VI (CDM, 1996)

^a NYSDEC TAGM # 4046 value

NA - Sample not analyzed for this parameter

Sample 17288-001 = 17287-009, 17288-002 = 17287-010 and 17288-003 = 17287-012

Table 5
Results for the Meadow Marsh Confirmation Samples
Round 5 - Grab Samples from Bottom Surface

COC 17288 - East Pond Grab Samples - Post Soil Removal Confirmation Samples

| Parameter | Sample Result (mg/kg) 17288-001# | EPA Qualifier | Sample Result (mg/kg) 17288-002# | EPA Qualifier | Sample Result (mg/kg) 17288-003# | EPA Qualifier | High | Low | Average | TAGM Values** (mg/kg) | Number of Samples Above TAGM Values** |
|-----------|-------------------------------------|---------------|-------------------------------------|---------------|-------------------------------------|---------------|-------|-------|---------|-----------------------|---------------------------------------|
| Mercury | ND | | 0.046 | | ND | | 0.046 | 0 | 0.02 | 1.84 | 0 |
| Aluminum | 3830 | | 5330 | | 3870 | | 5330 | 3830 | 4343.33 | 16,491 ^b | 0 |
| Arsenic | 0.98 | B | 1.6 | | 0.89 | B | 1.6 | 0.89 | 1.16 | 7.5 ^a | 0 |
| Lead | 2.4 | | 4.9 | | 2.2 | | 4.9 | 2.2 | 3.17 | 15.8 ^b | 0 |
| Antimony | ND | | ND | | ND | | 0 | 0 | ND | 13.1 ^b | 0 |
| Barium | 11.9 | | 10.8 | B | 16.3 | B | 16.3 | 10.8 | 13.00 | 300 ^a | 0 |
| Selenium | ND | | ND | | ND | | 0 | 0 | ND | 2.0 ^a | 0 |
| Beryllium | 0.24 | B | 0.25 | B | 0.025 | B | 0.25 | 0.025 | 0.17 | 0.43 ^b | 0 |
| Thallium | ND | | ND | | ND | | 0 | 0 | ND | 0.35 ^b | 0 |
| Cadmium | ND | | ND | | ND | | 0 | 0 | ND | 1.5 ^b | 0 |
| Calcium | 368 | B | 171 | B | 209 | B | 368 | 171 | 249.33 | 434 ^b | 0 |
| Chromium | 5.1 | | 6.3 | | 5.1 | | 6.3 | 5.1 | 5.50 | 14.2 ^b | 0 |
| Cobalt | 2.6 | B | 2.7 | B | 2.5 | B | 2.7 | 2.5 | 2.60 | 30 ^b | 0 |
| Copper | 4.5 | | 6.3 | | 7 | | 7 | 4.5 | 5.93 | 25 ^b | 0 |
| Iron | 5580 | | 6680 | | 5500 | | 6680 | 5500 | 5920.00 | 14,429 ^b | 0 |
| Magnesium | 990 | | 931 | | 997 | | 997 | 931 | 972.67 | 2,122 ^b | 0 |
| Manganese | 86.4 | | 73.2 | | 97.6 | | 97.6 | 73.2 | 85.73 | 148 ^b | 0 |
| Nickel | 4.1 | B | 4.4 | | 3.8 | B | 4.4 | 3.8 | 4.10 | 13 ^a | 0 |
| Potassium | 551 | | ND | | 552 | | 552 | 0 | 367.67 | 628 ^b | 0 |
| Silver | ND | | ND | | ND | | 0 | 0 | ND | 2 ^b | 0 |
| Sodium | 32.7 | B | 25.1 | | 25.3 | B | 32.7 | 25.1 | 27.70 | 196 ^b | 0 |
| Vanadium | 8.8 | | 10.8 | | 9.3 | | 10.8 | 8.8 | 9.63 | 150 ^a | 0 |
| Zinc | 18.4 | | 14.4 | | 14.3 | | 18.4 | 14.3 | 15.70 | 22.4 ^b | 0 |

Notes:

N - Spiked analyte recovery is outside stated control limits

* - Relative percent difference between MS/MSD is outside stated control limits

B - Estimated results. Result is less than Reporting Limit.

ND - Analyte not detected

** Background values as determined in the Final OU I/VI RI/RA, CDM, 1996.

^b Site Background: 97.72 percentile of available results for background soil samples. Final RI/RA OU I/VI (CDM, 1996)

^a NYSDEC TAGM # 4046 value

NA - Sample not analyzed for this parameter

Sample 17288-001 = 17287-009, 17288-002 = 17287-010 and 17288-003 = 17287-012

Table 6
Irrigation Well Sample Results

COC 16655 - Irrigation Well Sample

| Parameter | Sample Result (mg/kg) 16655-001 | EPA Qualifier | Background (mg/kg) | Above Background? |
|------------------|--|----------------------|---------------------------|--------------------------|
| Mercury | ND | | ND | No |
| Aluminum | 643 | | 309 | Yes |
| Arsenic | ND | | ND | No |
| Lead | 1.7 | B | ND | Yes |
| Antimony | ND | | ND | No |
| Barium | 27.6 | B | 3.5 | Yes |
| Selenium | ND | | ND | No |
| Beryllium | 0.33 | B | ND | Yes |
| Thallium | ND | | ND | No |
| Cadmium | 0.8 | B | ND | Yes |
| Calcium | 3140 | B | 659 | Yes |
| Chromium | 7.0 | B | ND | Yes |
| Cobalt | ND | | ND | No |
| Copper | 16.9 | B | 2.8 | Yes |
| Iron | 90.3 | B | 421 | No |
| Magnesium | 1750 | B | 424 | Yes |
| Manganese | 1640 | | 64 | Yes |
| Nickel | ND | | ND | No |
| Potassium | 3080 | B | ND | Yes |
| Silver | ND | | ND | No |
| Sodium | 4070 | | 1700 | Yes |
| Vanadium | ND | | ND | No |
| Zinc | 235 | | 18.9 | Yes |

Notes:

N - Spiked analyte recovery is outside stated control limits

* - Relative percent difference between MS/MSD is outside stated control limits

B - Estimated results. Result is less than Reporting Limit.

ND = Not Detected

Table 7
Pond Soil Sample Results

COC 17376 - Pond Soil Samples

| Parameter | Sample Result (mg/kg) 17376-001 | EPA Qualifier | Sample Result (mg/kg) 17376-002 | EPA Qualifier | Sample Result (mg/kg) 17376-003 | EPA Qualifier | High | Low | Average | TAGM Values** (mg/kg) | Number of Samples Above TAGM Values** |
|---------------------|---------------------------------|---------------|---------------------------------|---------------|---------------------------------|---------------|------|------|---------|-----------------------|---------------------------------------|
| Aroclor 1016 | ND | | ND | | ND | | 0 | 0 | ND | 1.0 | 0 |
| Aroclor 1221 | ND | | ND | | ND | | 0 | 0 | ND | 1.0 | 0 |
| Aroclor 1232 | ND | | ND | | ND | | 0 | 0 | ND | 1.0 | 0 |
| Aroclor 1242 | ND | | ND | | ND | | 0 | 0 | ND | 1.0 | 0 |
| Aroclor 1248 | ND | | ND | | ND | | 0 | 0 | ND | 1.0 | 0 |
| Aroclor 1254 | ND | | ND | | ND | | 0 | 0 | ND | 1.0 | 0 |
| Aroclor 1260 | ND | | ND | | ND | | 0 | 0 | ND | 1.0 | 0 |
| Heptachlor | ND | | ND | | ND | | 0 | 0 | ND | 0.1 | 0 |
| Heptachlor epoxide | ND | | ND | | ND | | 0 | 0 | ND | 0.02 | 0 |
| Toxaphene | ND | | ND | | ND | | 0 | 0 | ND | NA | 0 |
| Aldrin | ND | | ND | | ND | | 0 | 0 | ND | 0.041 | 0 |
| alpha-BHC | ND | | ND | | ND | | 0 | 0 | ND | 0.11 | 0 |
| beta-BHC | ND | | ND | | ND | | 0 | 0 | ND | 0.2 | 0 |
| delta-BHC | ND | | ND | | ND | | 0 | 0 | ND | 0.3 | 0 |
| gamma-BHC (Lindane) | ND | | ND | | ND | | 0 | 0 | ND | 0.06 | 0 |
| 4,4'-DDD | ND | | ND | | ND | | 0 | 0 | ND | 2.9 | 0 |
| 4,4'-DDE | ND | | ND | | ND | | 0 | 0 | ND | 2.1 | 0 |
| 4,4'-DDT | ND | | ND | | ND | | 0 | 0 | ND | 2.1 | 0 |
| Dieldrin | ND | | ND | | ND | | 0 | 0 | ND | 0.044 | 0 |
| Endosulfan I | ND | | ND | | ND | | 0 | 0 | ND | 0.9 | 0 |
| Endosulfan II | ND | | ND | | ND | | 0 | 0 | ND | 0.9 | 0 |
| Endosulfan sulfate | ND | | ND | | ND | | 0 | 0 | ND | 1.0 | 0 |
| Endrin | ND | | ND | | ND | | 0 | 0 | ND | 0.1 | 0 |
| Mercury | ND | | ND | | ND | | 0 | 0 | ND | 1.84 | 0 |
| Aluminum | 1760 | N | 1770 | N | 1160 | N | 1770 | 1160 | 1563.33 | 16,491 ^b | 0 |
| Arsenic | 0.94 | B | 0.42 | B | 0.49 | B | 0.94 | 0.42 | 0.62 | 7.5 ^a | 0 |
| Lead | 1.6 | | 1.5 | | 1.2 | | 1.6 | 1.2 | 1.43 | 15.8 ^b | 0 |
| Antimony | 0.62 | BN | 0.23 | BN | ND | N | 0.62 | 0 | 0.28 | 13.1 ^b | 0 |
| Barium | 5 | B | 5.4 | B | 3.2 | B | 5.4 | 3.2 | 4.53 | 300 ^a | 0 |
| Selenium | 0.22 | B | ND | | ND | | 0.22 | 0 | 0.07 | 2.0 ^a | 0 |
| Beryllium | 0.14 | B | 0.16 | B | 0.12 | B | 0.16 | 0.12 | 0.14 | 0.43 ^b | 0 |
| Thallium | 0.45 | B | ND | | ND | | 0.45 | 0 | 0.15 | 0.35 ^b | 1 |
| Cadmium | ND | | ND | | ND | | 0 | 0 | ND | 1.5 ^b | 0 |
| Calcium | 115 | B | 91.2 | B | 43.1 | B | 115 | 43.1 | 83.10 | 434 ^b | 0 |
| Chromium | 4.0 | | 2.5 | | 3.0 | | 4 | 2.5 | 3.17 | 14.2 ^b | 0 |
| Cobalt | 1.8 | B | 1.4 | B | 1.0 | B | 1.8 | 1 | 1.40 | 30 ^b | 0 |
| Copper | 8.4 | N | 2.9 | N | 2.3 | BN | 8.4 | 2.3 | 4.53 | 25 ^b | 0 |
| Iron | 2820 | N | 2590 | N | 2000 | N | 2820 | 2000 | 2470.00 | 14,429 ^b | 0 |
| Magnesium | 371 | BE | 413 | BE | 241 | BE | 413 | 241 | 341.67 | 2,122 ^b | 0 |
| Manganese | 46.8 | | 48.7 | | 31.5 | | 48.7 | 31.5 | 42.33 | 148 ^b | 0 |
| Nickel | ND | | ND | | ND | | 0 | 0 | #DIV/0! | 13 ^a | 0 |
| Potassium | 210 | B | 232 | B | 234 | B | 234 | 0 | 367.67 | 628 ^b | 0 |
| Silver | ND | | ND | | ND | | 0 | 0 | ND | 2 ^b | 0 |
| Sodium | 18.7 | B | 22.8 | B | 15.0 | B | 22.8 | 15 | 18.83 | 196 ^b | 0 |
| Vanadium | 4.8 | B | 4.4 | B | 3.4 | B | 4.8 | 3.4 | 4.20 | 150 ^a | 0 |
| Zinc | 5.2 | | 5.2 | | 4.4 | | 5.2 | 4.4 | 4.93 | 22.4 ^b | 0 |

Notes:

N - Spiked analyte recovery is outside stated control limits

* - Relative percent difference between MS/MSD is outside stated control limits

B - Estimated results. Result is less than Reporting Limit.

ND - Analyte not detected

** Background values as determined in the Final OU I/VI RI/RA, CDM, 1996.

^b Site Background: 97.72 percentile of available results for background soil samples. Final RI/RA OU I/VI (CDM, 1996)

^a NYSDEC TAGM # 4046 value

NA - Sample not analyzed for this parameter

Table 8
Top Soil Sample Results

| Parameter | Sample Result (mg/kg) | EPA Qualifier | TAGM Values** (mg/kg) |
|--------------|-----------------------|---------------|-----------------------|
| Aroclor 1016 | <MDL | <MDL | 1.0 |
| Aroclor 1221 | <MDL | <MDL | 1.0 |
| Aroclor 1232 | <MDL | <MDL | 1.0 |
| Aroclor 1242 | <MDL | <MDL | 1.0 |
| Aroclor 1248 | <MDL | <MDL | 1.0 |
| Aroclor 1254 | <MDL | <MDL | 1.0 |
| Aroclor 1260 | <MDL | <MDL | 1.0 |
| Mercury | < 0.02 | <MDL | 1.84 |
| Aluminum | 7,580 | | 16,491 ^b |
| Arsenic | 2.17 | | 7.5 ^a |
| Lead | 10.2 | | 15.8 ^b |
| Antimony | <1.65 | <MDL | 13.1 ^b |
| Barium | 8.9 | | 300 ^a |
| Selenium | <1.65 | <MDL | 2.0 ^a |
| Beryllium | <1.65 | <MDL | 0.43 ^b |
| Thallium | <1.65 | <MDL | 0.35 ^b |
| Cadmium | <1.00 | <MDL | 1.5 ^b |
| Calcium | <1.65 | <MDL | 434 ^b |
| Chromium | 5.82 | | 14.2 ^b |
| Cobalt | 1.84 | | 30 ^b |
| Copper | 9.73 | | 25 ^b |
| Iron | 7,387 | | 14,429 ^b |
| Magnesium | 293 | | 2,122 ^b |
| Manganese | 24.9 | | 148 ^b |
| Nickel | 2.67 | | 13 ^a |
| Potassium | 261 | | 628 ^b |
| Silver | < 1.65 | <MDL | 2 ^b |
| Sodium | 61 | | 196 ^b |
| Vanadium | 12.5 | | 150 ^a |
| Zinc | 9.4 | | 22.4 ^b |

Notes:

<MDL = Less than Method Detection Limit

** Background values as determined in the Final OU I/VI RI/RA, CDM, 1996.

^b Site Background: 97.72 percentile of available results for background soil samples. Final RI/RA OU I/VI (CDM, 1996)

^a NYSDEC TAGM # 4046 value