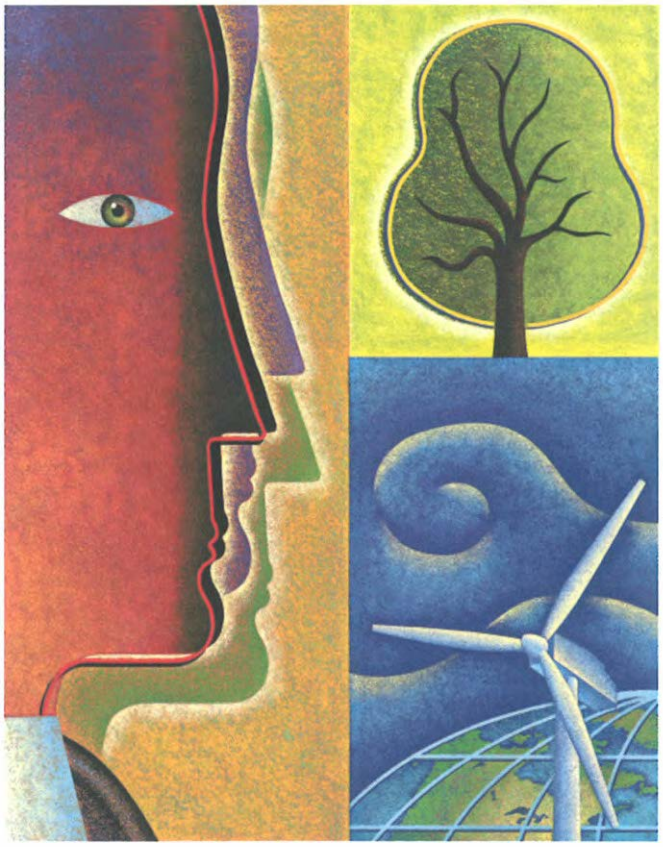
RMT

• ENVIRONMENT • ENERGY • ENGINEERING

Hot Spot Investigation Documentation and Remedial Options Analysis Report

Kewaunee Marsh

May 2010



RMT

• ENVIRONMENT • ENERGY • ENGINEERING

Hot Spot Investigation Documentation and Remedial Options Analysis Report

Kewaunee Marsh

May 2010

Prepared For
Wisconsin Department of Natural Resources
Green Bay, Wisconsin

Alyssa Sellwood, P.E.
Project Engineer

Paul D. Turpin, P.E.
Senior Engineer

Robert R. Stanforth, Ph.D.
Senior Applied Chemist

Richard P. Fish
Senior Project Manager

744 Heartland Trail • Madison, WI 53717 • 608.831.4444 • 608.831.3334 FAX • www.rmtinc.com

Table of Contents

1. Introduction 1
   - 1.1 Background 1
   - 1.2 Purpose and Scope 1

2. Previous Understanding of the Site 3
   - 2.1 Cap Description 3
   - 2.2 Historical Soil Sampling – Capped Area 1994/2004/2006 3
   - 2.3 Leach Testing 2006 4
   - 2.4 2007 RMT Hot Spot Groundwater Sampling 4
   - 2.5 Original Concepts for Remediation of the Hot Spot 5

3. Hot Spot Investigation 6
   - 3.1 Geoprobe Investigation 6
     - 3.1.1 December 2009 Soil Sampling 6
     - 3.1.2 March 2010 Soil Sampling 6
     - 3.1.3 Soil Stratigraphy 7
     - 3.1.4 Sampling Results 7
   - 3.2 Geophysical Survey 7

4. Hot Spot Definition 9
   - 4.1 Hot Spot Definition 9
     - 4.1.1 Laboratory Analysis - Leach Testing 9
     - 4.1.2 Arsenic Distribution 10
   - 4.2 Concentration Trends Over Time 11
   - 4.3 Remedial Objectives 12

5. Remedial Options – Laboratory Evaluations 13
   - 5.1 Groundwater Extraction Evaluation 13
     - 5.1.1 Leach Testing 13
     - 5.1.2 Results 13
   - 5.2 *In Situ* Treatment Evaluation 13
     - 5.2.1 Effectiveness 13
     - 5.2.2 Long-term Stability 14
     - 5.2.3 Refinement of Chemical Dosages 14

6. Remedial Options Analysis 16
6.1 *In Situ* Treatment – 11,000 cy 16
6.1.1 Remedy Description – Basis of Cost 16
6.1.2 Performance Monitoring – Basis of Cost 17
6.1.3 Effectiveness 17
6.1.4 Implementability 18
6.1.5 Time Frame for Restoration 18
6.1.6 Cost 18
6.2 *In Situ* Treatment – 3,000 cy 18
6.2.1 Remedy Description – Basis of Cost 18
6.2.2 Performance Monitoring – Basis of Cost 19
6.2.3 Effectiveness 19
6.2.4 Implementability 19
6.2.5 Time Frame for Restoration 19
6.2.6 Cost 19
6.3 *In Situ* Treatment with On-Site Containment 19
6.3.1 Remedy Description – Basis of Cost 19
6.3.2 Performance Monitoring – Basis of Cost 20
6.3.3 Effectiveness 21
6.3.4 Implementability 21
6.3.5 Time Frame for Restoration 21
6.3.6 Cost 21
6.4 *In Situ* Treatment with Off-Site Disposal 22
6.4.1 Remedy Description – Basis of Cost 22
6.4.2 Performance Monitoring – Basis of Cost 22
6.4.3 Effectiveness 22
6.4.4 Implementability 23
6.4.5 Time Frame for Restoration 23
6.4.6 Cost 23

7. Conclusions and Recommendations 24
7.1 Conclusions 24
7.2 Recommendations 25

8. References 26

List of Tables

Table 1	December 2009/March 2010 Hot Spot Geoprobe Investigation
Table 2	Remedial Options Analysis
Table 3	Comparative Summary of Remedial Options Estimated Costs[1]

List of Figures

Figure 1	Site Location Map
Figure 2	2009/2010 Hot Spot Investigation
Figure 3	Cross-Section Locator Map
Figure 4	Cross-Section A-A′
Figure 5	Cross-Section B-B′
Figure 6	Cross-Section C-C′
Figure 7	Cross-Section D-D′
Figure 8	Cross-Section E-E′

List of Appendices

Appendix A	Geophysical Conductivity Survey
Appendix B	Remediation Laboratory Summary Memos
Appendix C	Concentration Trend Over Time Analysis
Appendix D	Detailed Cost and Quantity Estimating Sheets

List of Attachments

Attachment A	Soil Boring Logs
Attachment B	Laboratory Reports

Section 1
Introduction

1.1 Background

Approximately 15 acres of the Kewaunee Marsh Besadny Wildlife Area, in Kewaunee, Wisconsin, are contaminated with arsenic. The source of the arsenic is likely a spill of calcium/magnesium arsenate from the adjacent railroad that occurred in the late 1930s or early 1940s. An interim action was completed in 1996 to limit the threat of direct contact with the arsenic. Specifically, 4 acres of the marsh were capped, and all 15 acres were enclosed within a fence (Figure 1).

Between 2002 and 2005, STS Consultants (STS) completed site investigation activities to define the distribution of arsenic in the soil and groundwater at the site (STS, 2004 and STS, 2006). Based on the results of the STS investigation, WDNR established site specific cleanup standards of 19 mg/kg for soil and 148 µg/L for groundwater/surface water.

Between 2005 and 2007, following the site investigation, RMT, Inc. (RMT), completed a treatability study and a remedial options analysis for the marsh to evaluate alternatives for achieving the site-specific cleanup standards (RMT, 2007). During the study, RMT noted that an area of elevated arsenic concentrations (2,200,000 µg/L) was present in groundwater near the former railroad ballast at monitoring well MW04-10. RMT completed an additional groundwater investigation near MW04-10 to test the hypothesis that a hot spot of dissolved-phase arsenic was present within the railroad ballast near the location of a railroad spill. The results of the additional investigation confirmed that a hot spot of dissolved-phase arsenic is present below the railroad ballast and to the east of the ballast in the marsh, near MW 04-10, although the results did not define the depth and lateral extent of the high-level contamination into the marsh.

1.2 Purpose and Scope

Because the hot spot of dissolved-phase arsenic identified in 2007 can act as a source of arsenic to the groundwater in the marsh, remediation of the hot spot is the critical first step to achieving the remediation objectives that have been established for the site. In order to design a remedy for the hot spot material, the WDNR and RMT determined that the extent of the hot spot must be further defined, and a focused remedial alternatives analysis for the hot spot area should be completed.

RMT has completed additional site investigation activities and testing to define the extent of the hot spot material. RMT has also completed laboratory bench scale testing to evaluate potential treatment and disposal approaches for the material. Based on the results of the site investigation activities and bench scale studies, three remedial options were evaluated for the hot spot material: (1) *in situ* treatment; (2) *in situ* treatment with on-site containment; and (3) *in situ* treatment with off-site disposal.

The purpose of this report is to document the results of the additional investigations and laboratory testing, and to present the remedial options analysis for the hot spot material. The scope of this report includes the following:

- Summary of the previous data related to the hot spot area
- Summary of the focused 2009-2010 hot spot investigation
- Delineation of the hot spot
- Determination of hot spot remedial action objectives
- Summary of the bench scale evaluations of the prospective remedial options
- Remedial options analysis

Section 2
Previous Understanding of the Site

The following describes the site conditions that were documented by RMT and STS prior to the most recent hot spot investigation. It is critical to review the previous understanding of the site in order to put the current data and evaluations into context.

2.1 Cap Description

In 1996, STS completed an Interim Action at the site (STS, 1996). Specifically, STS constructed a permeable cap over areas with distressed vegetation in the marsh (Figure 2). The cap covered approximately 4 acres, was approximately 1.5-2.5 feet thick, and was constructed from the ground up as follows:

- Granular Lime: 30 cubic yards of granular lime were applied across the surface in an effort to remove soluble arsenic as an insoluble precipitate.
- Polystyrene sheets: 5-inch–thick polystyrene sheets were placed over areas devoid of vegetation to provide a supportive base for the cap
- Geotextile Fabric: 155,000 sf of woven geotextile was placed over visibly impacted areas to provide a high-strength permeable support for the wood chips
- Wood Chips: 2 to 2.5 feet of a yard mulch and wood chip mix was applied across the cap area
- Vegetation: Capped area was seeded to establish a vegetative mat.

2.2 Historical Soil Sampling – Capped Area 1994/2004/2006

In 1994, STS collected soil samples from the area to be capped prior to construction of the cap. The arsenic concentrations down the center of the capped area ranged between 2,660 and 10,700 mg/kg. The concentrations were generally highest near the railroad ballast and decreased moving east from the ballast, and generally decreased moving north and south from the areas previously devoid of vegetation.

In 2002, during the site investigation, STS collected soil samples from approximately 20 borings throughout the marsh; however, no samples were collected from the capped area. The results from the soil samples collected outside the capped area indicated that arsenic impacts that exceeded the cleanup criteria of 19 mg/kg were limited to the upper 2 feet of soil in the marsh, and samples outside the capped area were generally below 1,000 mg/kg, with a few exceptions. One exception was SB02-18, which was constructed within the ballast material near the

presumed location of the historical railroad spill. The concentrations of arsenic in SB 02-18 were between 1,800 and 6,520 mg/kg, at depths between 9 and 15 feet below ground surface (STS, 2004).

In 2005, during collection of samples for the treatability work, RMT collected a soil sample from beneath the cap near the railroad ballast near the location of the historical spill. The concentration of arsenic in this sample was 2,500 mg/kg, which was significantly lower than the 10,700 mg/kg that was detected in this area in 1994. Therefore, in June 2006, in order to confirm whether this decreasing trend was observable throughout the capped area, RMT collected soil samples from approximately the same locations under the cap that had previously been sampled in 1994 by STS. The results of the sampling found that the arsenic concentrations had decreased by a factor of 2 or 4 between 1994 and 2006; specifically, the concentrations in 2006 ranged from 340 to 6,100 mg/kg, as compared to the range of 2,660 and 10,700 mg/kg documented in 1994. It should be noted, that there is a high degree in variability in the concentrations of arsenic within relatively small areas across the marsh, and this variability may also be contributing to the decreasing concentration trend.

2.3 Leach Testing 2006

The soil samples collected by RMT in 2005 were subjected to screening Toxicity Characteristic Leaching Procedure (TCLP) and screening Synthetic Precipitation Leaching Procedure (SPLP). The screening tests follow the standard USEPA protocols (TCLP-SW 846 Method 1311 and SPLP-SW 846 Method 1312), with the exceptions that the leaching solution is analyzed directly after acidification, and smaller quantities of solid and leaching solution are used, while still maintaining the 1:20 solid to solution ratio. Previous tests have shown that the screening tests correlate well with standard leaching test results.

Each of the samples used in this testing, with the exception of one, were collected from locations outside the capped area and contained concentrations of arsenic below 1,000 mg/kg. For samples with compositional arsenic less than 1,000 mg/kg, none of the material was determined to be hazardous (TCLP >5 mg/L), and no correlation between leachable and compositional arsenic concentration was observed (RMT, 2007).

2.4 2007 RMT Hot Spot Groundwater Sampling

Groundwater collected from monitoring well MW 04-10 throughout 2004 and 2005 had arsenic concentrations between 1,000,000 µg/L and 2,200,000 µg/L, suggesting that the well is located within the area of the historical railroad spill. The elevated concentrations of arsenic detected in this well, along with the elevated concentrations of arsenic detected in ballast in SB 02-18 in

2002, indicated that a hot spot, or source area, of dissolved phase arsenic has persisted in this area since the original spill.

In order to evaluate the presence and delineate the extent of the presumed dissolved phase source area (the "hot spot"), RMT collected groundwater samples from 22 Geoprobe borings constructed in the ballast and the marsh near MW 04-10 in April 2007. The results of the sampling found that groundwater with concentrations of arsenic greater than 100,000 µg/L is present along approximately 70 feet of the ballast area. The results suggested that the hot spot impacts extended eastward into the marsh. However, the results of the investigation did not specifically delineate the extent of the impacts into the marsh or the depth of the impacts (RMT, 2007).

2.5 Original Concepts for Remediation of the Hot Spot

As of 2007, it appeared that the cap continued to provide a direct contact barrier in the marsh, that the concentrations of arsenic were decreasing within the capped area, and that a hot spot source area persisted in the groundwater in the granular ballast material, and extended slightly eastward into the marsh. Based on this understanding, several remedial options were evaluated for the hot spot (RMT, 2007). These remedies included the following:

- Groundwater extraction and on-site treatment
- Groundwater extraction and off-site disposal
- *In situ* treatment of the hot spot

In February 2010, following the initial screening of alternatives, the options for remediation of the hot spot were refined by RMT and the WDNR. The WDNR selected the following options, which will be described in further detail within this report:

- Groundwater extraction and off-site disposal (using an extraction trench)
- *In situ* treatment
- *In situ* treatment and on site containment in the unsaturated zone
- *In situ* treatment and off-site disposal at a solid waste landfill.

Section 3
Hot Spot Investigation

In order to confirm the extent and depth of the hot spot impacts along the ballast and eastward into the marsh, a subsurface Geoprobe® investigation and geophysical conductivity survey were completed at the site.

3.1 Geoprobe Investigation

3.1.1 December 2009 Soil Sampling

On December 9, 2009, RMT, and its Geoprobe® subcontractor On-Site Environmental Services (OES), mobilized to the site to initiate the hot spot soil investigation. Fourteen, or approximately half of the proposed Geoprobe® borings, were completed between December 9 and 10, 2009. However, the fieldwork was forced to stop on December 10, 2009 because of severe winter weather.

A total of 10 borings were completed in the ballast area (B1D-B1E, B2A-B2E, and B3D-B3E), and 4 boring were completed in the marsh (M2D-M5D). The locations of the borings are shown on Figure 2. The borings were logged in the field and the soil boring logs are included in Attachment A. The borings extended between 20 and 30 feet below ground surface (bgs) in the ballast area, and 10 ft bgs in the marsh.

3.1.2 March 2010 Soil Sampling

Because a second mobilization was required to complete the investigation, RMT delayed completion of the investigation until the results of the December 2009 sampling event could be evaluated and the locations selected for the remaining Geoprobe® borings could be optimized. The results from the December 2009 sampling indicated the extent and depth of the impacts had been delineated in the ballast, but that the extent of the hot spot impacts required further delineation in the marsh. Therefore, no additional samples were completed in the ballast and the remainder of the sampling was focused on the marsh area.

RMT and OES mobilized to the site on March 17, 2010 to further investigate the extent of the hot spot in the marsh area. Sixteen borings were completed in the marsh area. Two transects (M2A-M2F) and (M5A-M5F) were completed parallel to the ballast. Transect M2 was approximately 10 feet from the ballast and transect M5 was approximately 60 feet from the ballast. A transect was also completed approximately 600 feet eastward

into the marsh (M6E-M12F) within the area that previously contained distressed vegetation prior to placement of the cap. The locations of the borings are shown on Figure 2. Each of the borings extended 8 to 12 feet bgs. The borings were logged in the field and the soil boring logs are included in Attachment A.

3.1.3 Soil Stratigraphy

Five cross-sections were developed from the hot spot investigation results. The locations of each cross-section are shown on Figure 3 and the cross-sections are included as Figures 4 through 8.

The marsh contains approximately 8 feet of peat, which overlays a 7 to 12 foot layer of organic silt. A coarse-grained gravel layer was observed beneath the organic silt in the deeper borings. Evidence of the cap (Styrofoam) was observed at 2 to 3 feet bgs in 5 of the marsh borings.

The ballast contains 6 to 14 feet of granular fill sand that overlays a compressed layer of peat and the organic silt. The coarse-gravel layer is present approximately 20 feet bgs in the ballast area. The upper 4 to 5 feet of the ballast are unsaturated.

3.1.4 Sampling Results

Soil samples were collected from 2-foot to 4-foot intervals, or from distinct soil types within each interval. The soil samples were submitted to Pace Analytical (Pace) for arsenic analysis. The laboratory reports are included in Attachment B, and the results are summarized in Table 1.

3.2 Geophysical Survey

A geophysical electrical conductivity survey was completed concurrent with the March 2010 Geoprobe® sampling event. The intent of the geophysical survey was to capture the electrical conductivity of a broad area surrounding the hot spot and then to correlate the conductivity to the arsenic concentrations detected at the discrete borings. The goal was to define the limits of the hot spot within the marsh based on this correlation

The Wisconsin Geological and Natural History Survey (WGNHS) completed the electrical conductivity survey on March 9, 2010. The WGNHS summarized the methods and results of the survey, which are included in Appendix A.

RMT analyzed the geophysical data and results of the compositional arsenic analyses with the goal of developing a correlation between conductivity and arsenic concentration in the marsh

(Figures A.1 and A.2). No correlation was observed between the two datasets, as shown on Figure A.3. It is likely that other factors, such as limestone used in the construction of the cap, may have interfered with the electrical conductivity response.

Based on the additional analysis of the geophysical survey, we have concluded that the limits of the hot spot cannot be defined from the electrical conductivity data. Although a specific correlation was not observed, the geophysical survey does provide a good relative picture of the arsenic distribution. The geophysical survey showed that the higher concentrations of arsenic are limited to the area under the cap, and to the east of the ballast area. This information supports that the established monitoring network is sufficient and appropriately distributed throughout the marsh.

Section 4
Hot Spot Definition

4.1 Hot Spot Definition

The results of the March 17, 2010 Geoprobe® investigation confirmed that elevated arsenic concentrations extend into the marsh; however, specific criteria were needed in order to define the limits of hot spot. RMT and the WDNR determined that the leaching characteristic, or potential impact the material has to groundwater, would be used to define the hot spot material.

4.1.1 Laboratory Analysis - Leach Testing

One criterion that could be used for delineating the hot spot material is the potential to leach arsenic above 5 mg/L in a TCLP test, which would mean the excavated material would be classified as a hazardous waste under the RCRA regulations. However, the sediment analysis to date has primarily been for compositional arsenic, and to use leachable arsenic as a criterion, the correlation between compositional and leachable arsenic needs to be determined.

RMT evaluated leaching characteristics of material collected during the December 2009/March 2010 sampling events. A memo describing the laboratory methods and results is included in Appendix B. The results of the study found a strong correlation between compositional arsenic concentration and leaching arsenic concentrations for samples with arsenic concentrations above 600 mg/kg. Specifically, the study found that material with compositional arsenic concentrations greater than 1,000 mg/kg would result in a TCLP concentration greater than 5 mg/L, and thus would be considered hazardous. Based on these results, the 1,000 mg/kg criterion was selected as the threshold to define the limits of the hot spot.

It is important to note that the previous leaching studies, discussed in Section 2.3, found no correlation between compositional arsenic concentration and TCLP. However, the previous work was focused on the moderately contaminated material that is present in the broad area of the marsh and not the high concentrations present near the former location of the railroad spill. The current and previous leaching studies both found that below approximately 600 mg/kg the arsenic is not very leachable, and there is no correlation between compositional concentrations and leaching concentrations.

4.1.2 Arsenic Distribution

The arsenic results are summarized in Table 1 and are also shown on each of the cross-sections (Figures 4 through 8). The approximate extent of the current hot spot (i.e., concentrations greater than 1,000 mg/kg) is shown on Figure 2.

The depth and extent of the hot spot arsenic impacts have been defined within the ballast. Arsenic concentrations greater than 1,000 mg/kg are present along a 70 foot length of the ballast, which is consistent with the results of the results from 2007, and coincide with the location of elevated impacts detected by STS in the ballast in 2004. The elevated arsenic impacts begin approximately 5 feet bgs (at the approximate) location of the groundwater table), and extend to a depth of approximately 15 feet bgs. The organic silt layer appears to be impeding the downward migration of the arsenic impacts.

The lateral extent of the hot spot impacts within the marsh has been generally defined, but additional investigation may be required to define the specific limits for the eastern edge (Figure 2). The material with arsenic concentrations greater than 1,000 mg/kg extends approximately 200 feet eastward from the ballast into the marsh. The width of hot spot impacts are present over approximately 80 feet near the ballast, but expand to at least 160 feet in width as you move eastward. The width of the impacts on the eastern edge is still approximate and further delineation is recommended. It was anticipated that the geophysical survey could have been useful to define the lateral extent of the hot spot impacts within the marsh. However, because a direct correlation between conductivity and arsenic concentration was not seen at the site (see Section 3.2), additional soil sampling is recommended.

The depth of the arsenic impacts has been defined within the marsh. Arsenic concentrations greater than 1,000 mg/kg are present within the upper 2 feet of the marsh material, and extend 8 to 10 feet bgs. Similar to the ballast area, the organic silt layer appears to be impeding further downward migration of the arsenic impacts. The elevated arsenic concentrations detected in the upper 2 feet suggest that the once "clean" cap material has now been impacted with arsenic. The specific mechanism that has caused these impacts is unknown; however, potential causes for arsenic impacts to the cap include evapotranspiration causing contaminated groundwater to rise into the vadose zone, groundwater fluctuations, settlement of the cap, or migration due to conversion of arsenic to arsine gas.

Based on the area and depth of impacts described above, the hot spot area with arsenic concentrations greater than 1000 mg/kg currently includes approximately 11,000 cy of material (Appendix D).

4.2 Concentration Trends Over Time

As discussed in Section 2.2, decreasing trends were observed in the arsenic concentrations under the cap between 1994 and 2006. In order to determine if the decreasing trend has continued, RMT compared the most recent sampling results (December 2009/March 2010) to the samples collected by RMT in 2006, and to the samples collected by STS in 1994. Again, it should be noted that while there is a high degree in variability in the concentrations of arsenic within relatively small areas across the marsh, there does appear to be a significant decrease in concentration for the 12 years which were used to predict future decreases. The details of this analysis are included in Appendix C.

The arsenic concentrations from similar locations were compared and a trendline was fit to the data from each distinct area. A decreasing trend with a strong correlation was observed in each of the areas under the cap. The mechanism causing the arsenic concentrations to naturally attenuate is uncertain, but is most likely either surface water transport or conversion of the arsenic to arsine gas. Further evaluation is recommended to identify this mechanism(s) to ensure that the mechanism is not causing unanticipated problems elsewhere, and to ensure that the conditions facilitating natural attenuation can be maintained.

Although the mechanism for the decreasing trend is unknown, we can assume that further reductions in concentration will likely occur over time in the capped area. Therefore, the area currently delineated as the hot spot within the capped area of the marsh (arsenic > 1,000 mg/kg), will likely reduce in size over time. This is important because reducing the quantity of material containing hazardous levels of arsenic significantly reduces the remediation cost, with minimal risk to human health and the environment.

To evaluate the impact that natural attenuation of arsenic will have on the extent of the hot spot area, RMT assumed the average rate of decrease observed over the last 16 years to estimate what the extent of the hot spot might be 4 to 5 years from now, when performance monitoring for a hot spot remedy will likely begin. This calculation is summarized in Appendix C. The results of the calculation suggest that areas that currently have arsenic concentrations greater than 2,000 mg/kg, would likely still be considered hot spot material 4 to 5 years from now, and all areas that currently have arsenic concentrations less than 2,000 mg/kg would likely be less than 1,000 mg/kg in 4 to 5 years, and thus will no longer be considered hot spot. The approximate extent of the area that will be considered hot spot in 4 to 5 years is shown on Figure 2. This area extends approximately 7 to 8 feet bgs in the marsh, and includes approximately 3,000 cy of material (Appendix D).

However, this evaluation and observation of decreasing concentrations applies to the marsh material, and not to the ballast area. Because detailed historical data is not available from the

ballast, and the material in the ballast is different than the marsh (granular vs. organic), we assume that natural attenuation of arsenic is not occurring in the ballast, and that the material currently above 1,000 mg/kg within the ballast will remain at those levels in the future.

4.3 Remedial Objectives

The hot spot material that will be targeted by the selected remedy is that material which would be considered hazardous if excavated from the site (TCLP > 5mg/L). The remedial action objectives for this hot spot material depend upon the remedial option selected.

- For any option that leaves the material on-site, the treatment must reduce the compositional arsenic concentrations to leach less than the site specific clean up criteria of 148 μg/L.
- For any option that removes the material from the site, the material must be treated to the level that renders it non-hazardous for arsenic (TCLP < 5 mg/L) so it can be disposed of at a WDNR-licensed solid waste (Subtitle D) landfill.

Section 5
Remedial Options – Laboratory Evaluations

Bench-scale laboratory tests were completed to evaluate the feasibility and develop design criteria for groundwater extraction and *in situ* treatment.

5.1 Groundwater Extraction Evaluation

5.1.1 Leach Testing

In order to evaluate the feasibility of the groundwater extraction trench, it is critical to determine the length of time, or number of pore volumes of water requiring removal, to achieve the remedial objectives for the hot spot. Bench-scale leach testing was completed on four materials composited from samples collected in December 2009/March 2010. The materials included Ballast Sand, Peat from the Ballast, Peat from the Marsh, and Organic Silt from the Marsh. A memo describing the laboratory methods and results for this leach testing is included in Appendix B.

5.1.2 Results

The results of the leach testing found that at least 1,000 pore volumes (500 to 600 million gallons) must be flushed through the hot spot material to achieve the remedial objectives for the on-site remedy (leachable concentration < 148 µg/L). The large number of pore volumes required for the groundwater extraction makes this option unfeasible from the standpoint of time frame, groundwater management, and cost. Therefore, this option was eliminated from further evaluation in the detailed remedial options analysis presented in Section 6.

5.2 *In Situ* Treatment Evaluation

5.2.1 Effectiveness

During the 2007 treatability work, a groundwater treatment chemical process was developed that would achieve the groundwater cleanup criterion. The treatment consisted of the following:

- 25 mL/kg hydrogen peroxide (3%)
- 8.4% ferric sulfate
- 6% calcium carbonate

Additional bench scale testing was needed in order to evaluate the effectiveness of using this chemistry for *in situ* mixing of the saturated hot spot material (solids and liquid). A memo describing the laboratory methods and results for this testing are included in Appendix D.

The results from the 2010 bench scale work show that the treatment chemistry developed during the 2007 treatability study for the groundwater can also be used to effectively treat the saturated ballast and marsh material *in situ*. It should be noted that treatment of soil or sediment to render it nonhazardous for arsenic using this chemistry is covered under U.S. Patent 6,254,312 B1 (treatment of groundwater itself is not covered by the patent). Licensing to use this technology can be made available to the WDNR for the hot spot remediation either through RMT or purchasing the chemicals through Premier Chemicals, LLC.

5.2.2 Long-term Stability

The bench scale study described above was also set up to make a preliminary assessment of the long-term stability of the *in situ* treatment. The concern being that because the treated material will be left below the groundwater table, the treatment process may reverse if the treated material becomes anoxic over time through biodegradation, and some arsenic may leach from the treated material in the future.

The bench scale study evaluated the stability of the treated material over a 3 month time period. Within this time, no arsenic leached from the treated material, even when left in saturated conditions. However, these results cannot be extrapolated to conclude that the treated material will be stable over the long-term, but the results do support pursuing *in situ* treatment as an effective remedial option.

5.2.3 Refinement of Chemical Dosages

The bench scale-studies described above confirmed the effectiveness of the *in situ* treatment approach; however, since the chemistry had been developed for purposes of groundwater treatment of the most highly contaminated groundwater on the site, it was presumed that the chemical doses could be reduced for the *in situ* process and still be effective.

In order to refine the chemical dose for *in situ* treatment, additional bench-scale tests were completed. A memo describing the laboratory methods and results for this testing are included in Appendix B.

The results of the testing show that the doses for the *in situ* mixing could be reduced by 75 percent and still achieve the remedial objectives (leachable arsenic less than 148 µg/L). The recommended dose for *in situ* mixing are:

- 6.25 mL/kg 3% hydrogen peroxide
- 2.1% ferric sulfate
- 1.5% calcium carbonate

In the case where the treated material would be excavated and disposed of at a WDNR-licensed solid waste (Subtitle D) landfill, the remedial objectives are less stringent (leachable arsenic < 5 mg/L). In this case, the doses of ferric sulfate and calcium carbonate can be reduced by 90 percent and the hydrogen peroxide application can be eliminated. The recommended doses for treatment and off-site disposal are:

- 1% ferric sulfate
- 0.75% calcium carbonate

Section 6
Remedial Options Analysis

Based on the initial screening of alternatives, and the results of the laboratory evaluations , three options were included in the remedial options analysis for the hot spot material.

1. *In situ* treatment
    a. 11,000 cy (based on the current extent of the hot spot)
    b. 3,000 cy (based on the extent of the hot spot estimated to remain in 4 to 5 years if natural attenuation continues)
2. *In situ* treatment, with on-site containment in the unsaturated zone (11,000 cy)
3. *In situ* treatment, with off-site disposal at a WDNR-licensed solid waste (Subtitle D) landfill (11,000 cy)

Groundwater extraction was eliminated from the detailed remedial options analysis because WDNR and RMT determined it to be unfeasible from the standpoint of cost and time frame for restoration (see Section 5.1).

The remedial options are summarized in Table 2 and Table 3, and the detailed quantity and cost estimating sheets for each option are included in Appendix D. Each remedial option is discussed below.

6.1 *In Situ* Treatment – 11,000 cy

6.1.1 Remedy Description – Basis of Cost

The 11,000 cy of hot spot material will be treated *in situ* to achieve the site specific clean up criteria (leachable arsenic concentration < 148 µg/L). Approximately 300 tons ferric sulfate, 200 tons limestone, and 1,000 gallons hydrogen peroxide (50%), will be incorporated into the hot spot material using excavators, end loaders, and similar equipment. Within the marsh, swamp mats would likely be used to provide a stable surface for the heavy equipment. The treatment zone will be gridded off into accessible areas, and the *in situ* mixing will occur sequentially in each subdivided area in 3 to 5 foot lifts. Following the application of the treatment chemicals, approximately 600 tons of bentonite powder will be blended into the treated area in order to reduce the permeability of the material, and improve the long-term performance of the treatment (restrict the flow of groundwater in the area). The addition of the treatment chemicals

and bentonite will cause some bulking and will raise the elevation of the treatment area approximately 1.5 to 2.5 feet.

Following the mixing process, a 6-inch layer of top soil or similar organic material will be placed over the treated marsh material and seeded to restore vegetation so as to reduce erosion and provide a vegetative barrier. The fence and ballast/bike path will be reconstructed in the treatment area, and the bike path will be restored where damaged by truck traffic during construction.

6.1.2 Performance Monitoring – Basis of Cost

Performance monitoring will be required to evaluate the effectiveness and long-term chemical stability of the *in situ* treatment. For the purposes of the remedial options analysis, it was assumed that 3 wells will be constructed in the treatment area, and one well will be constructed downgradient from the treated material. The wells will be monitored twice in the first year following treatment, and annually thereafter for 20 years. The wells will be monitored during each event for arsenic, iron, sulfate, calcium, and pH.

6.1.3 Effectiveness

The laboratory evaluations have indicated that the *in situ* treatment will achieve the remedial action objectives in the short term for the hot spot. However, because the material will be left in place below the groundwater table, there is the potential for anoxic conditions to appear following treatment (years to decades later) as a result of biodegradation. The anoxic conditions could allow some of the arsenic to leach into the groundwater, and thus the long-term effectiveness is less predictable.

The impact on the marsh of any future leached arsenic can be reduced by lowering the permeability of the treated material. A simple way to do this would be to add bentonite. Laboratory experiments have been conducted to evaluate the effectiveness of bentonite addition. These results are presented in Appendix B.

The application of bentonite into the hot spot is intended to reduce the permeability of the material, such that even if leaching occurs, less groundwater will flow through the treatment area and come in contact with the leachable arsenic. In addition, even if the material does leach in the long-term, it is likely that it will leach at lower concentrations than are currently seen in the untreated hot spot. Thus, although the long-term effectiveness cannot be guaranteed, the amount of arsenic leaching into the groundwater and moving into the marsh will be significantly reduced through *in situ* treatment.

6.1.4 Implementability

The *in situ* mixing process and site restoration can be accomplished using standard construction equipment. However, the marsh setting and target depth of 10 feet of saturated marsh material will require special consideration to the construction methods and phasing. Swamp mats or similar equipment would likely be required, and additional steps, such as a field trial are recommended in order to refine the specific means and methods that will be used by the contractor to complete the work. In addition, effort will likely be required to improve the bike path prior to construction and restore the bike path following construction, since it will be used as a haul road for the treatment chemicals and equipment during active remediation.

6.1.5 Time Frame for Restoration

The *in situ* treatment including site preparation and site restoration will take 6 to 8 weeks to complete. The bike path will need to be closed during this time to allow a safe work zone in the treatment area, and access for the construction equipment.

6.1.6 Cost

The estimated present worth cost for the *in situ* remedy for 11,000 cy of material is $1,430,000. At this feasibility level of costing, a range -30% to +50% is typical, which equates to a potential cost range of $1,000,000 to $2,150,000.

6.2 *In Situ* Treatment – 3,000 cy

6.2.1 Remedy Description – Basis of Cost

The 3,000 cy of hot spot material would be treated *in situ* to achieve the site specific clean up criteria (leachable arsenic concentration < 148 μg/L). The mixing and restoration process will be consistent with that presented in Section 6.1 where only the size of the treatment area will be reduced. This reduced area assumes that the natural attenuation that has been observed in the arsenic in the capped area will continue at the site, and that within 4 to 5 years only 3,000 cy of material will constitute the hot spot and require treatment. Based on this reduced area, approximately 70 tons ferric sulfate, 50 tons limestone, and 300 gallons hydrogen peroxide (50%), will be incorporated into the hot spot material.

As discussed in Section 4.2, although natural attenuation has been observed under the cap, RMT assumes that natural attenuation is not occurring readily within the ballast.

Therefore, active remediation to address the most highly impacted material near and in the ballast is warranted.

6.2.2 Performance Monitoring – Basis of Cost

Performance monitoring will be required to evaluate the effectiveness and long-term stability of the *in situ* treatment. For the purposes of the remedial options analysis, it was assumed that 2 wells will be constructed in the treatment area, and one well will be constructed downgradient from the treated material. The wells will be monitored twice in the first year following treatment, and annually thereafter for 20 years. The wells will be monitored during each event for arsenic, iron, sulfate, calcium, and pH.

6.2.3 Effectiveness

Same as 6.1.3.

6.2.4 Implementability

Same as 6.1.4.

6.2.5 Time Frame for Restoration

The *in situ* treatment including site preparation and site restoration will take 4 to 5 weeks to complete. The bike path will need to be closed during this time to allow a safe work zone in the treatment area, and access for the construction equipment.

6.2.6 Cost

The estimated present worth cost for the *in situ* remedy of 3,000 cy of material is $780,000. At this feasibility level of costing, a range -30% to +50% is typical, which equates to a potential cost range of $550,000 to $1,170,000.

6.3 *In Situ* Treatment with On-Site Containment

6.3.1 Remedy Description – Basis of Cost

The 11,000 cy of hot spot material will be treated *in situ* to achieve the site specific clean up criteria (leachable arsenic concentration < 148 µg/L). Approximately 300 tons ferric sulfate, 200 tons limestone, and 1,000 gallons hydrogen peroxide (50%), will be incorporated into the hot spot material using excavators, end loaders, and similar equipment. Swamp mats would likely be used to provide a stable surface for the heavy

equipment. The treatment zone will be gridded off into accessible areas, and the *in situ* mixing will occur sequentially in each subdivided area in 3 to 5 foot lifts.

Following the application of the treatment chemicals, the treated material will be excavated and placed on the surface of the marsh. For the purposes of this cost estimate, we assumed the material will be placed over a 500 by 180 foot section of the untreated capped area, and will be graded into a uniform mound 3 to 4 feet in height. No additional barriers or liners will be used, and the material will be allowed to dewater in place. Swamp mats would likely be used to provide stable access to the eastern portions of the marsh where the material will be placed.

Clean organic backfill will be transported to the site, and placed in the open excavation. A 6-inch layer of organic soil will be placed over the mound of treated marsh material. The newly placed organic soil will be seeded to restore vegetation so as to reduce erosion and provide a vegetative barrier. The fence and ballast/bike path will be reconstructed in the treatment area, and the bike path will be restored where damaged by truck traffic during construction. A larger effort will be required for restoration of the bike path, as compared to *in situ* treatment, due to the increased amount of truck traffic (approximately 800 trucks) that will occur due to importing of backfill.

6.3.2 Performance Monitoring – Basis of Cost

Performance monitoring will be required to evaluate the effectiveness of the hot spot treatment, and long-term monitoring will be required to evaluate the chemical and structural stability of the mound of treated material that will be left on site.

To document the effectiveness of the remediation, it was assumed that 3 wells will be constructed in the excavated and backfilled area. The wells will be monitored twice in the first year following treatment, and annually thereafter for 5 years. The wells will be monitored during each event for arsenic and pH.

To document the long-term chemical and structural stability of the mound of treated material, it was assumed that 2 wells will be constructed near or through this material. These wells will be monitored twice in the first year, and annually thereafter for 20 years. The wells will be monitored during each event for arsenic, iron, sulfate, calcium, and pH. In addition, an evaluation of the structural integrity of the mound of treated material will be made during each annual monitoring event. For the purposes of this cost estimate it was assumed that the mound will need to be regraded and restored once in the 20 years of monitoring.

6.3.3 Effectiveness

The laboratory evaluations have shown that the *in situ* treatment will achieve the remedial action objectives in the short term for the hot spot. The placement of the treated material above the groundwater table increases the confidence in the long-term effectiveness of the treatment. However, long-term monitoring is still recommended for this option, because settlement of the material or fluctuations in the water table may occur, whereby the treated material becomes submerged below the groundwater table and the long-term stability is no longer predictable.

It is also important to note that it is possible that movement of the treated material to an area outside the hot spot could have unintended consequences and a negative impact on the effectiveness of the natural attenuation of arsenic that appears to be occurring within the marsh.

6.3.4 Implementability

The *in situ* mixing and on-site containment of the treated material can be accomplished using standard construction equipment. However, the marsh setting and target depth of 10 feet of saturated marsh material will require special consideration to the construction methods. Swamp mats or similar equipment would likely be required, and additional steps such as a field trial are recommended in order to refine the specific means and methods that will be used by the contractor to complete the work. In addition, additional effort would be required to improve the bike path as a haul road or restore damage to the bike path following construction, because of the significant amount of truck traffic (likely over 800 trucks) that will occur importing of backfill.

6.3.5 Time Frame for Restoration

The *in situ* treatment with on site containment, including site preparation and site restoration will take 18 to 20 weeks to complete. The bike path will need to be closed during this time to allow a safe work zone in the treatment area, and access for the construction equipment.

6.3.6 Cost

The estimated present worth cost for the *in situ* remedy of 11,000 cy of material is $2,650,000. At this feasibility level of costing, a range -30% to +50% is typical, which equates to a potential cost range of $1,860,000 to $3,980,000.

6.4 *In Situ* Treatment with Off-Site Disposal

6.4.1 Remedy Description – Basis of Cost

The 11,000 cy of hot spot material will be treated *in situ* to meet the less stringent objective of being non-hazardous (leachable arsenic < 5 mg/L) upon excavation. Approximately 200 tons ferric sulfate and 100 tons limestone will be incorporated into the hot spot material using a backhoe, loader, and similar equipment. Swamp mats will be used to provide a stable surface for the heavy equipment. The treatment zone will be gridded off into accessible areas, and the *in situ* mixing will occur sequentially in each subdivided area in 3 to 5 foot lifts.

Following the application of the treatment chemicals, the treated material will be excavated and dewatered. For purposes of this estimate, it was assumed 1,200 tons of magnesium sulfate ($MgSO_4$) will be incorporated into the excavated material to remove any free liquids. The treated and dewatered material will then be transported off-site to a Subtitle D landfill. For purposes of this estimate it was assumed that the material will be disposed at Hickory Meadows landfill, under the State's contract with Veolia.

Clean organic backfill will be transported to the marsh site, and placed in the open excavation. The backfilled area will be seeded to restore vegetation so as to reduce erosion and provide a vegetative barrier. The fence and ballast/bike path will be reconstructed in the treatment area, and the bike path will be restored where damaged by truck traffic during the construction. A larger effort will be required for restoration of the bike path, as compared to *in situ* treatment and *in situ* treatment with on-site containment, due to the larger amount of truck traffic that will occur while transporting the treated material off-site and the importing backfill.

6.4.2 Performance Monitoring – Basis of Cost

Performance monitoring will be required to evaluate the effectiveness of the hot spot treatment. For purposes of this cost estimate, it was assumed that 3 wells will be constructed in the excavated and backfilled area. The wells will be monitored twice in the first year following treatment and excavation, and annually thereafter for 5 years. The wells will be monitored during each event for arsenic and pH.

6.4.3 Effectiveness

This option provides the strongest assurance of effectiveness in both the short-term and long-term. The laboratory evaluations have shown that the *in situ* treatment will achieve the remedial action objectives for the hot spot material in the short term (make it non-

hazardous). The removal of the treated material from the site provides the highest level of confidence as to long-term effectiveness, i.e. the material will no longer serve as a source of arsenic impacts to the Kewaunee Marsh in the future.

6.4.4 Implementability

The *in situ* mixing, excavation, and off-site disposal of the treated material can be accomplished using standard construction equipment. However, the marsh setting and target depth of 10 feet of saturated marsh material will require special consideration to the construction methods. Swamp mats or similar equipment may be required, and additional steps such as a field trial are recommended in order to refine the specific means and methods that will be used by the contractor to complete the work. In addition, additional effort would be required to improve the bike path as a haul road or restore damage to the bike path following construction, because of the significant amount of truck traffic (likely over 1,000 trucks) that will occur transporting treated material off-site and importing clean backfill.

6.4.5 Time Frame for Restoration

The *in situ* treatment with on site containment, including site preparation and site restoration will take 13-15 weeks to complete. The bike path will need to be closed during this time to allow a safe work zone in the treatment area, and access for the construction equipment.

6.4.6 Cost

The estimated present worth cost for the *in situ* remedy of 11,000 cy of material is $2,900,000. At this feasibility level of costing, a range -30% to +50% is typical, which equates to a potential cost range of $2,030,000 to $4,350,000.

Section 7
Conclusions and Recommendations

7.1 Conclusions

The results of the hot spot investigation and laboratory evaluations of the hot spot material show the following:

- Material with compositional arsenic concentrations greater than 1,000 mg/kg would be considered hazardous if removed from the site (i.e., leach arsenic over 5 mg/L). Any material with arsenic concentrations greater than 1,000 mg/kg has thus been categorized as "hot spot" material.
    - The hot spot material is present under a 70 foot length of the ballast and extends approximately 200 feet into the marsh. The extent of the eastern edge of the impacts in the marsh are still approximate.
    - The hot spot material is present 5 to 15 feet below grade in the ballast and 0 to 10 feet below grade in the marsh. An organic silt/clay layer is impeding further downward migration of the arsenic.
    - The hot spot currently contains an estimated 11,000 cy of material.
- Natural attenuation appears to be occurring within the capped area of the marsh, but the process controlling the decreasing arsenic concentrations are not understood at this time.
    - If the rate of decrease in the arsenic concentrations (observed since 1994) continues, a smaller area would be considered hot spot material within the next 4 to 5 years ("future hot spot"). Specifically, marsh material that currently has arsenic concentrations of 2,000 mg/kg or less, would have arsenic concentrations less than 1,000 mg/kg in the next 4 to 5 years.
    - The future hot spot will still be present in the ballast (no natural attenuation presumed to be occurring here), and would only extend 80 feet into the marsh.
    - The future hot spot will contain an estimated 3,000 cy of material.

The results of the laboratory evaluations and detailed remedial options analysis have indicated the following:

- Groundwater extraction is not a feasible option for the site because it would require approximately 500 to 600 million gallons of groundwater to be flushed through the hot spot to achieve the remedial objectives. Given the low permeability of the marsh material, removing this large volume of water would time prohibitive, and give the remote location of the site, management of this large volume of water would be cost prohibitive.

- The chemistry developed for treatment of groundwater at the site in the treatability study (RMT, 2007) will achieve the remedial objectives when applied to the hot spot material through *in situ* mixing.
    - The treated material can either be: (1) left in place, (2) excavated and contained in a dry area of the marsh, or (3) excavated and disposed off-site at a landfill.
    - Leaving the material in place is the lowest cost alternative, but there is less predictability with the long-term effectiveness of leaving the treated material below the groundwater table.
    - The on-site containment and off-site disposal options are similar in cost; however, off-site disposal provides the most reliability regarding long-term effectiveness.
- Natural attenuation could be relied upon to remediate a portion of the hot spot, and a smaller volume of material (3,000 cy) could be targeted for active remediation.

7.2 Recommendations

Based on the results of the investigations and remediation options analysis, we recommend the following:

- Select an active remedy from the list of options defined in Section 6 for the hot spot material.
- Collect additional samples in the eastern edge of the impacts of the marsh prior to the implementation of the hot spot remediation to confirm the extent of the hot spot.
- Complete additional studies to define the processes controlling natural attenuation of arsenic in the marsh, and evaluate if natural attenuation will continue.

Section 8
References

RMT, Inc. 2007. WDNR Kewaunee marsh treatability study. Prepared for Wisconsin Department of Natural Resources, Kewaunee, Wisconsin. August 2007.

STS. 1996. Construction documentation report for interim action at the Kewaunee marsh arsenic site. Prepared for Wisconsin Department of Natural Resources, Kewaunee, Wisconsin. June 11, 1996

STS. 2004. Site assessment and remedial action alternatives report. Prepared for Wisconsin Department of Natural Resources, Kewaunee, Wisconsin. March 2004.

STS. 2006. Site assessment and remedial action alternatives report addendum. Prepared for Wisconsin Department of Natural Resources, Kewaunee, Wisconsin. September 2006.

Table 1
December 2009/March 2010 Hotspot Geoprobe Investigation
Compositional Arsenic Results - Soil Sampling
Kewaunee Marsh, Kewaunee, Wisconsin

	Transect B1				Transect B2				Transect B3				Transect M2				Transect M3				Transect M4				Transect M5			
	ID	Date	Depth (ft bgs)	Moisture (%)	As (mg/kg)	ID	Date	Depth (ft bgs)	Moisture (%)	As (mg/kg)	ID	Date	Depth (ft bgs)	Moisture (%)	As (mg/kg)	ID	Date	Depth (ft bgs)	Moisture (%)	As (mg/kg)	ID	Date	Depth (ft bgs)	Moisture (%)	As (mg/kg)	ID	Date	Depth (ft bgs)	Moisture (%)	As (mg/kg)
Transect A						B2-A	10-Dec-09	0-2	4.3	3.8						M-2A	17-Mar-10	0-2.5'	43.9	13.6							M-5A	17-Mar-10	0-2.0'	48.8	20.8
								2-4	3	2.2								2.5-5.0'	63.1	107								2-4.0'	69.7	**1090**
								4-6	6.3	30.9								5.0-7.5'	79.5	67								4-6.0'	82.5	**3000**
								6-8	12.9	27.5								7.5-10.0'	66.5	63.9								6-8.0'	76.4	590
								8-10	12.6	1.6J																		8-10.0'	61.9	3.9 J
								10-12	17.6	2.4																				
								12-14	24.2	7.1J																				
								14-15	56.2	2.9J																				
Transect B						B2-B	10-Dec-09	0-2	3.3	9.5						M-2B	17-Mar-10	0-2.5'	41.4	**4500**							M-5B	17-Mar-10	0-2.0'	82	**1460**
								2-4	5.8	527								2.5-5.0'	79.4	**13200**								2.0-4.0'	50.5	400
								4-6	7.4	**3830**								5.0-7.5'	51.4	834								4.0-6.0'	82	**4350**
								6-8	15.1	309								7.5-10.0'	22.8	**2100**								6.0-8.0'	84.1	**4300**
								8-10	14	343																		8.0-10.0'	67.5	91.6
								10-12	15.5	240																				
								12-14	54.9	140																				
								15-19	50.6	8.7																				
								19-20	18	2.8																				
Transect C						B2-C	10-Dec-09	0-2	3.9	332						M-2C	17-Mar-10	0-2.5'	47	**1510**							M-5C	17-Mar-10	0-2.5'	75.2	**3070**
								2-4	4.9	804								2.5-5.0'	38.4	**4510**								2.5-5.0'	85.2	**5060**
								4-6	5.6	**2880**								5.0-7.5'	74.4	**11400**								5.0-7.5'	82.3	**4080**
								6-8	15	996								7.5-10.0'	82.3	**9950**								7.5-10.0'	79.3	**1780**
								8-10	8.7	**1470**																				
								10-12	13.3	**1270**																				
								12-14	72.6	**9050**																				
								14-20	50.8	708																				
Transect D	B-1D	10-Dec-09	0-2	14.7	7.1	B2-D	10-Dec-09	0-2	6.7	4.3	B-3D	10-Dec-09	0-2	46.5	408	M-2D	10-Dec-09	0-2	19.5	454	M-3D	10-Dec-09	0-2	56.5	**2310**	M-4D	10-Dec-09	0-5	53.5	**1850**	M-5D	10-Dec-09	0-5	77.7	**4960**
			2-4	12.8	105			2-4	2.3	3.3			2-4	8.5	11.8			2-4	71.1	**5120**			2-4	82.3	**3800**			5-7	84.5	**4770**			5-7	87.9	**7300**
			4-6	20.2	719			4-6	5.7	4.1			4-6	13.5	14.9			4-6	78.6	**1930**			4-6	78.8	**2450**			6-10	67.9	628			6-10	68.8	500
			6-8	25.5	**1850**			6-8	13.4	**1030**			6-8	11.8	538			6-8	81.1	**2180**			6-8	75.7	**1610**									
			8-10	75.9	**2160**			8-10	12.8	**1420**			8-10	17.5	**2130**			8-10	67.4	633			8-10	67.1	654									
			10-12	80.8	**1070**			10-12	17.4	798			10-12	18.4	**1210**																		
			12-14	53.4	151			12-14	13.9	533			12-14	77.3	**2030**																		
			15-19	54.3	86.4			14-15	72.8	**2820**			14-16	59.4	759																		
			19-20	16.2	4.6			15-17.5	44.9	**1330**																						
								17.5-20	24.7	81.5																						
								20-25	9.7	15.5																						
Transect E	B-1E	10-Dec-09	0-2	8.6	2.8	B2-E	10-Dec-09	0-2	2.6	2.6	B-3E	10-Dec-09	0-2	8.9	2.9	M-2E	17-Mar-10	0-2.5'	48.3	734							M-5E	17-Mar-10	0-2.0'	70.3	269
			2-4	17.8	35.4			2-4	4.2	1.5J			2-4	9.9	23.2			2.5-5.0'	59.6	**1720**								2.0-4.0'	82.6	215
			4-6	18	49.9			4-6	6.2	112			4-6	17.3	330			5.0-7.5'	55	906								4.0-6.0'	87.9	46.6
			6-8	23.2	232			6-8	14.6	100			6-8	17.4	249			7.5-10.0'	77.4	**1400**								6.0-8.0'	83.8	9.8 J
			8-10	77.5	932			8-10	13.1	107			8-10	14	151														8.0-10.0'	60.7	2.7 J
			10-12	63.3	294			10-13.8	10.1	87.1			10-12	66.8	927														10.0-12.0'	60.1	40.3
			12-14	77.1	341			13.8-15	75.2	324			12-14	79	582														12-14'	64.1	8.1
			14-16	58	6.2			20-23	62.8	86.5			14-16	61.7	63.1														14-15'	20.1	3.1
			16-19	53.6	3.4J			23-25	12.4	2.6			16-20	53	11.7																
			19-20	21.5	2.7								20-25	15.4	2.9																
Transect F						B-2F	10-Dec-09	0-2	2.7	4.1						M-2F	17-Mar-10	0-2.5'	53.6	109 M0							M-5F	17-Mar-10	0-2.5'	51.7	98.2
								2-4	4.8	1.8J								2.5-5.0'	78.7	664								2.5-5.0'	77.7	**1300**
								4-6	5.4	21.8								5.0-7.5'	77.2	407								5.0-7.5'	86	**1260**
								6-8	10.5	68.1								7.5-10.0'	78.1	54.7								7.5-10.0'	76.7	111
								8-10	12.2	10.4																				
								10-12	15.6	11.8																				
								12-13.8	16.7	16																				
								13.8-15	76	4.8J																				
								15-16	67	37.5																				
								16-20	37.6	2.6J																				
								23-25	7.8	1.9J																				
								25-30	10.9	3.2																				

Table 1 (continued)
December 2009/March 2010 Hotspot Geoprobe Investigation
Compositional Arsenic Results- Soil Sampling
Kewaunee Marsh, Kewaunee, Wisconsin

	Transect M6					Transect M7					Transect M8					Transect M9					Transect M10					Transect M11					Transect M12				
	ID	Date	Depth (ft bgs)	Moisture (%)	As (mg/kg)	ID	Date	Depth (ftbgs)	Moisture (%)	As (mg/kg)	ID	Date	Depth (ft bgs)	Moisture (%)	As (mg/kg)	ID	Date	Depth (ft bgs)	Moisture (%)	As (mg/kg)	ID	Date	Depth (ft bgs)	Moisture (%)	As (mg/kg)	ID	Date	Depth (ft bgs)	Moisture (%)	As (mg/kg)	ID	Date	Depth (ft bgs)	Moisture (%)	As (mg/kg)
Transect A																																		
Transect B																																		
Transect C																																		
Transect D																																		
Transect E	M-6E	17-Mar-10	0-4.0'	77.2	895	M-7E	17-Mar-10	0-2.0'	42	15.1	M-8E	17-Mar-10	0-4.0'	61.8	311																				
			4-6.0'	78.2	**1910**			2-4.0'	48.4	277			4-6.0'	60.5	24.4																				
			6-8.0'	88.2	**2020**			4-6.0'	83.2	**1260**			6-8.0'	87.8	12.9 J																				
								6-8.0'	86.8	478																										
Transect F																M-9F	17-Mar-10	0-4.0'	70	348	M-10F	17-Mar-10	0-4.0'	59.3	357	M-11F	17-Mar-10	0-2.0'	60.7	106	M-12F	17-Mar-10	0-4.0'	58.3	204
																		4.0-6.0'	67.8	452			4-6'	69.3	589			2.0-4.0'	73.3	549			4.0-6.0'	84.7	313
																		6.0-8.0'	86.3	82.1			6-8.0'	86.3	52.7			4.0-6.0'	86	160			6.0-8.0'	74.9	7.6
																													6.0-8.0'	87.7	27.5					
																													8.0-10.0'	84.5	62.9					
																													10.0-12.0'	75.3	3.3 JB					

Notes
1. Sample data presented in the grid orientation shown on Figure 2.
J = Estimated concentrations above the detection limit and below the reporting limit
B = Analyte was detected in the associated method blank
M0 = Matrix spike recover and/or matrix spike duplicate recovery was outside laboratory control limits
BOLD =Arsenic concentration greater than 1,000 mg/kg, which corresponds to the material that has been classified as "hot spot" based on its potential to be hazardous (TCLP > 5 mg/L).

Prepared By: A. Goergen 12/29/09, A. Sellwood 4/5/10
Checked By: A. Sellwood 12/30/09, T. O'Connell 5/12/10

Table 2
Remedial Options Analysis
WDNR – Kewaunee Marsh Hot Spot Remediation – Kewaunee, Wisconsin

REMEDIAL OPTION	ESTIMATED COST	TIME FRAME	ADVANTAGES	DISADVANTAGES	DESCRIPTION AND ASSUMPTIONS
1a. *In Situ* Treatment (11,000 cy)	$1,430,000	6 to 8 weeks	▪ Low cost and short remediation time ▪ Least amount of disturbance to surface of bike path (i.e. least amount of truck traffic) ▪ Perception of not "relocating" the problem	▪ Treated material left below water table ▪ Uncertainty with long-term stability in saturated reducing environment ▪ Long-term performance monitoring required to evaluate and confirm stability over time ▪ Public perception of leaving material on site	**Remedy Description**: The "hot spot" material will be treated *in situ* to render the material non-hazardous for arsenic and achieve the site specific clean up criteria. The treatment chemicals will be mechanically mixed into the saturated hot spot material with a backhoe and loader. The treated material will be left in place, and covered with either vegetation or ballast material. Following remediation, the bike path and fence will be restored to existing conditions. ▪ The treatment cost is based on applying 300 tons (21 g/kg_{soil}) ferric sulfate, 200 tons (15g/ kg_{soil}) limestone, and 1,800 gallons (6.25 mL/kg_{soil}) hydrogen peroxide (30%) to the hot spot material. The chemical doses for treating the material are on the basis that the material must be treated to achieve the site specific cleanup criteria. (Additional testing could be used to refine these doses.) ▪ Following treatment 600 tons (50g/kg_{soil}) of bentonite (5%) will be mixed into the treated material, to reduce the permeability. ▪ The *in situ* work will be targeted for the late fall and winter months to provide a more stable work surface on the marsh, and swamp mats will be used to provide a stable work surface. ▪ The mixing will be accomplished with an excavator, dozer, and loader. The treatment area will be divided into smaller accessible areas, and mixing would occur sequentially in each subdivided area in 3 to 5 ft lifts. Treated material will be removed and temporarily stockpiled to allow access to the deeper material. All treated material will be replaced into the area from which is was removed. ▪ A 6-inch layer of top soil or similar organic soil will be placed over the treated marsh material and seeded to restore vegetation so as to reduce erosion and provide a vegetative barrier. ▪ The unsaturated ballast material (upper 4 to 5 feet) will be segregated from the treated material and stockpiled on-site. Following treatment of the saturated material, the untreated, unsaturated ballast soils will be used as backfill to restore the ballast to grade. ▪ The bike path will be restored and the fence replaced to existing conditions. **Performance Monitoring – 20 years** A total of 20 years of monitoring are assumed in order to confirm the long term chemical stability of the treated material. ▪ Construct 3 wells within the treated area and 1 well downgradient from the treated material. Each well will be set to a depth of 7 feet below grade. ▪ Monitor water level and collect groundwater samples for arsenic, pH, sulfate, calcium, and iron ▪ Complete semi-annual monitoring for the first year, and annual monitoring thereafter up to 20 years.
1b. *In Situ* Treatment (3,000 cy)	$780,000	4 to 5 weeks	▪ Lowest cost and least time ▪ Takes advantage of the natural attenuation of arsenic ▪ Others same as above	▪ Same as above ▪ Assumes that natural attenuation will continue	**Remedy Description**: ***Same as above, only with smaller quantities:*** ▪ 70 tons (21 g/kg_{soil}) ferric sulfate, 60 tons (15g/ kg_{soil}) limestone, and 480 gallons (6.25 mL/kg_{soil}) hydrogen peroxide (30%), and 160 tons bentonite. **Performance Monitoring – 20 years** ▪ Same as above only with 2 wells in smaller treatment area and 1 well downgradient from the treated material.

Notes:
1. The "hot spot" area is defined at material with compositional arsenic concentrations greater than 1,000 mg/kg. This concentration correlates to levels that have the potential to be hazardous for arsenic. The hot spot area is shown on Figure 2, and includes approximately 11,000 cy or 11,900 tons of material. In the case of treatment option 1b, the "hot spot" is defined at material with compositional arsenic concentrations greater than 2,000mg/kg. This concentration correlates to levels that will still have the potential to be hazardous for arsenic in 4 to 5 years, assuming natural attenuation reduces the concentration to be below 1,000 mg/kg in that time. The future hot spot area is shown on Figure 2, and includes approximately 3,000 cy or 3,200 tons of material
2. All monitoring costs are strictly for evaluating the performance of the hot spot remediation, and do not include monitoring and evaluations for the entire marsh area, or bringing the site to closure.
3. All costs based on preliminary concepts. They are intended for remedial option comparison and not for budgetary purposes. The detailed cost estimating spreadsheets that provide a basis for the opinion of probable cost are included in Appendix F of this report.
4. A field trial is recommended to determine the specific means and methods for construction/implementation in this unique setting.
5. The best judgment value is presented in the table. However, at this level of cost estimating, the range in cost may vary from –30 percent to +50 percent of the best judgment value. This approach is consistent with USEPA guidance on feasibility study level estimating of remediation costs.
6. Costs are rounded to two significant digits. Total costs include direct and indirect capital costs, and present worth costs of the monitoring.

Table 2 (continued)
Remedial Options Analysis
WDNR – Kewaunee Marsh Hot Spot Remediation – Kewaunee, Wisconsin

REMEDIAL OPTION	ESTIMATED COST	TIME FRAME	ADVANTAGES	DISADVANTAGES	DESCRIPTION AND ASSUMPTIONS
2. *In Situ* Treatment with On-site Containment in Unsaturated Zone	$2,650,000	18 to 20 weeks	▪ Treated material set above the groundwater table ▪ Higher confidence in chemical stability of treated material when kept unsaturated ▪ Perception of not "relocating" the problem ▪ Less costly than transporting and disposing off site at a solid waste landfill	▪ Cannot guarantee the material will remain unsaturated over the long-term (material may settle below water table or water table may rise) ▪ Requires long-term maintenance and inspection of contained material ▪ Long-term monitoring still required ▪ May alter the natural attenuation process that is on-going in the capped area ▪ Alters the existing topography, and may be more noticeable to the public ▪ Public perception of leaving material on site ▪ Significant closure time to bike path ▪ Significant amount of truck traffic and disturbance to the bike path	**Remedy Description**: The "hot spot" material will be treated using the same approach described for *in situ* treatment. However, for this option, the treated material will be excavated and placed on the unsaturated capped area of the marsh The marsh excavation will be backfilled with organic soil from an off-site source, and the ballast excavation will backfilled with granular material. Following remediation, the bike path and fence will be restored to existing conditions. ▪ Same chemistry, treatment/construction process, and basis for the chemical doses as described for *in situ* treatment ▪ The treated material will be excavated and placed on top of the "capped" area that is outside the hot spot area, and above the current water table. The treated soil would be graded across an area approximately 180' x 500 'and would extend approximately 3 to 4 feet above the existing grade. ▪ The material will dewater in place on the unsaturated capped area. The water that drains off the material will not require additional treatment. ▪ The treated material would be covered with a 6-inch layer of top soil and seeded to restore vegetation so as to reduce erosion and provide a vegetative barrier. ▪ The marsh excavation would be backfilled with approximately 10,500 cy of organic material, and seeded to restore vegetative cover. ▪ The ballast area would be backfilled with approximately 800 cy of granular material. Approximately 450 cy of backfill will come from an off-site source. The other 350 cy will come from unsaturated ballast material (upper 4 to 5 feet) that is segregate and stockpiled on site as was described for the *in situ* treatment process. ▪ The bike path will be restored and the fence replaced to existing conditions. ▪ This cost assumes that the stabilization, on-site containment, and site restoration can be completed in18 to 20 weeks. **Performance Monitoring – 5 and 20 years** A total of 5 years of performance monitoring are assumed for the hot spot area, and a total of 20 years of monitoring are assumed to confirm the long term chemical and structural stability of the treated material that is left on site. ***Hot Spot Area (5 yrs)*** ▪ Construct 3 wells within the limits of the excavated area. ▪ Monitor water level and collect groundwater samples for arsenic and pH. ▪ Complete semi-annual monitoring for the first year, and annual monitoring thereafter up to 5years. ***Treated Material (20 yrs)*** ▪ Construct 2 wells within the mound of treated material. ▪ Monitor water level and collect groundwater samples for arsenic, pH, sulfate, calcium, and iron ▪ Complete semi-annual monitoring for the first year, and annual monitoring thereafter up to 20 years ▪ Inspect the treated material for settling and erosion during each monitoring event. Cost assume that the treated material will require regrading/repair one time over the 20 year evaluation period

Notes:
1. The "hot spot" area is defined at material with compositional arsenic concentrations greater than 1,000 mg/kg. This concentration correlates to levels that have the potential to be hazardous for arsenic.
   The hot spot area is shown on Figure 2, and includes approximately 11,000 cy or 11,900 tons of material. In the case of treatment option 1b, the "hot spot" is defined at material with compositional arsenic concentrations greater than 2,000mg/kg.
   This concentration correlates to levels that will still have the potential to be hazardous for arsenic in 4 to 5 years, assuming natural attenuation reduces the concentration to be below 1,000 mg/kg in that time.
   The future hot spot area is shown on Figure 2, and includes approximately 3,000 cy or 3,200 tons of material
2. All monitoring costs are strictly for evaluating the performance of the hot spot remediation, and do not include monitoring and evaluations for the entire marsh area, or bringing the site to closure.
3. All costs based on preliminary concepts. They are intended for remedial option comparison and not for budgetary purposes. The detailed cost estimating spreadsheets that provide a basis for the opinion of probable cost are included in Appendix F of this report.
4. A field trial is recommended to determine the specific means and methods for construction/implementation in this unique setting.
5. The best judgment value is presented in the table. However, at this level of cost estimating, the range in cost may vary from –30 percent to +50 percent of the best judgment value. This approach is consistent with USEPA guidance on feasibility study level estimating of remediation costs.
6. Costs are rounded to two significant digits. Total costs include direct and indirect capital costs, and present worth costs of the monitoring.

Table 2 (continued)
Remedial Options Analysis
WDNR – Kewaunee Marsh Hot Spot Remediation – Kewaunee, Wisconsin

REMEDIAL OPTION	ESTIMATED COST	TIME FRAME	ADVANTAGES	DISADVANTAGES	DESCRIPTION AND ASSUMPTIONS
3. *In Situ* Treatment, with Off-Site Disposal	$2,900,000	13 to 15 weeks	▪ Treated material will be kept in a controlled and monitored location (solid waste landfill) ▪ Removes bulk of source material ▪ Highest confidence in long-term effectiveness. (i.e. eliminates long-term stability concern for saturated reducing conditions at the marsh) ▪ Public perception may be improved for removing the hot spot material from the site ▪ Least amount of performance monitoring	▪ Highest cost ▪ Some uncertainty with dewatering ▪ Perception of "relocating" the problem ▪ Significant closure time to bike path ▪ Significant amount of truck traffic and disturbance to the bike path	**Remedy Description**: The "hot spot" material will be treated using the same approach described for *in situ* treatment. However, for this option, the treated material will be excavated, dewatered, and transported off site for disposal at a solid waste landfill. The marsh excavation will be backfilled with organic soil from an off-site source, and the ballast excavation will backfilled with imported granular material. Following remediation, the bike path and fence will be restored to existing conditions. ▪ The treatment cost is based on applying 200 tons (10.5 g/kg_{soil}) ferric sulfate, 100 tons (7.5g/ kg_{soil}) limestone, and no hydrogen peroxide to the hot spot material. The chemical doses selected for treating the material are on the basis that the material must be treated to render it non-hazardous for disposal purposes. ▪ The treatment process will be the same as described for *in situ* treatment. ▪ The treated material will be excavated and stockpiled on-site. The material will be dewatered by adding magnesium sulfate to the material to absorb any residual free liquids. The material must be dewatered to contain no free liquids for landfill acceptance. ▪ Cost assume that the excavated material will be transported to Hickory Meadow landfill in Hilbert, Wisconsin (55 miles from the site), and will be disposed under the State's waste disposal contract with Veolia. ▪ The marsh excavation would be backfilled with approximately 10,500 cy of organic material, and seeded to restore vegetative cover. ▪ The ballast area would be backfilled with approximately 800 cy of granular material. Approximately 450 cy of backfill will come from an off-site source. The other 350 cy will come from unsaturated ballast material (upper 4 to 5 feet) that is segregate and stockpiled on site as was described for the *in situ* treatment process. ▪ The bike path will be restored and the fence replaced to existing conditions. **Performance Monitoring – 5 years** A total of 5 years of performance monitoring are assumed for the hot spot area ▪ Construct 3 wells within the limits of the excavated area. ▪ Monitor water level and collect groundwater samples for arsenic and pH. ▪ Complete semi-annual monitoring for the first year, and annual monitoring thereafter up to 5years

Notes:
1. The "hot spot" area is defined at material with compositional arsenic concentrations greater than 1,000 mg/kg. This concentration correlates to levels that have the potential to be hazardous for arsenic. The hot spot area is shown on Figure 2, and includes approximately 11,000 cy or 11,900 tons of material. In the case of treatment option 1b, the "hot spot" is defined at material with compositional arsenic concentrations greater than 2,000mg/kg. This concentration correlates to levels that will still have the potential to be hazardous for arsenic in 4 to 5 years, assuming natural attenuation reduces the concentration to be below 1,000 mg/kg in that time. The future hot spot area is shown on Figure 2, and includes approximately 3,000 cy or 3,200 tons of material
2. All monitoring costs are strictly for evaluating the performance of the hot spot remediation, and do not include monitoring and evaluations for the entire marsh area, or bringing the site to closure.
3. All costs based on preliminary concepts. They are intended for remedial option comparison and not for budgetary purposes. The detailed cost estimating spreadsheets that provide a basis for the opinion of probable cost are included in Appendix F of this report.
4. A field trial is recommended to determine the specific means and methods for construction/implementation in this unique setting.
5. The best judgment value is presented in the table. However, at this level of cost estimating, the range in cost may vary from –30 percent to +50 percent of the best judgment value. This approach is consistent with USEPA guidance on feasibility study level estimating of remediation costs.
6. Costs are rounded to two significant digits. Total costs include direct and indirect capital costs, and present worth costs of the monitoring.

Table 3
Comparative Summary of Remedial Options Estimated Costs[1]
WDNR – Kewaunee Marsh Hot Spot Remediation

SCENARIO	REMEDIAL OPTION	BEST JUDGMENT REMEDIATION CONCEPTUAL COST ESTIMATES				
		TOTAL COST PRESENT WORTH[2]	YEAR 1 COSTS[3]	PRESENT WORTH OF ANNUAL COSTS[4]		
				O&M	MONITORING	DURATION
1a	*In Situ* Treatment (11,000 cy)	**$1,430,000**	$1,250,000	$0	$180,000	20 years
1b	*In Situ* Treatment (3,000 cy)	**$780,000**	$600,000	$0	$180,000	20 years
2	*In Situ* Treatment with On-site Containment	**$2,650,000**	$2,400,000	$40,000 (once – yr 10)	$210,000	20 years
3	*In Situ* Treatment with Off-site Disposal	**$2,900,000**	$2,850,000	$0	$50,000	5 years

Footnotes:

(1) This table is a summary of information presented in Table 2, and is not intended to be used as a stand alone document. This summary is compiled for comparative purposes only. Important descriptions, assumptions and uncertainties are discussed in Table 2.

(2) The best judgment value is presented in the table. However, at this level of cost estimating, the range in cost may vary from –30 percent to +50 percent of the best judgment value. This approach is consistent with USEPA guidance on feasibility study level estimating of remediation costs.

(3) Year 1 costs include direct and indirect capital costs, as well as the first year O&M and monitoring costs.

(4) Costs do not include total site monitoring and evaluation to bring the site to closure.

IMAGERY FROM USDA - NATIONALAGRICULTURE IMAGERY PROGRAM, 2008.

RMT
744 Heartland Trail
Madison, WI53717-1934
P.O. Box 8923 53708-8923
Phone: 608-831-4444
Fax: 608-831-3334

WISCONSIN DEPARTMENT OF NATURAL RESOURCES
KEWAUNEE MARSH

SITE AREA MAP

DRAWN BY:	PAPEZJ
APPROVED BY:	FISHD
PROJECT NO:	00-007201.19
FILE NO.	72011903.mxd
DATE:	MAY 2010

D:\PRE_TESS_PROJECTS\07201\19\MXD\72011903.mxd 5/27/2010 11:06:40

FIGURE 1

SCALE OF DETAIL

0 50 100 FEET

1 " = 60 '
1:720

N

M5A
M5B
M5C
M5D
M5E
M5F
M2A
M2B
M2C
M2D
M2E
M2F
B2A
B2B
B2C
B1D
B2D
B3D
B3E
B2E
B1E
B2F
MW04-10
M4D
M3D
SB02-18
M6E
M7E
M8E
M9F
M10F
M11F
M12F
MW02-3
MW04-9
6-7
2-3
TEST PLOTS

LEGEND

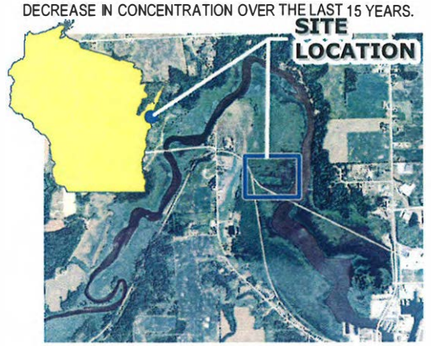
- ARSENIC > 1,000 mg/kg } M-SERIES = MARSH (8-12 FT)
- ARSENIC < 1,000 mg/kg } B-SERIES = BALLAST (15-30 FT)
- MONITORING WELL LOCATION

RMT TEMPORARY WELL LOCATION (APRIL 2007)
(ARSENIC CONCENTRATION COLOR CODE)

- < 100,000 µg/L
- > 100,000 µg/L
- SOIL BORING (STS HISTORICAL SAMPLE LOCATION)
- —×—×—×—×— FENCE
- CAPPED AREA
- APPROXIMATE AREA OF PREVIOUSLY DISTRESSED VEGETATION
- APPROXIMATE EXTENT OF CURRENT HOT SPOT AREA (>1,000 mg/kg) (DASHED WHERE INFERRED)
- APPROXIMATE EXTENT OF FUTURE HOT SPOT (>2,000 mg/kg)

NOTES:

1. ALL GEOPROBE BORINGS WERE LOCATED USING A TRIMBLE GEOXH GPS UNIT.
2. CURRENT HOT SPOT IS DEFINED AS CONTAINING COMPOSITIONAL ARSENIC CONCENTRATIONS GREATER THAN 1,000 mg/kg. THIS COMPOSITIONAL CONCENTRATION CORRELATES TO POTENTIALLY HAZARDOUS MATERIAL (TCLP > 5 mg/kg).
3. THE CURRENT HOTSPOT IMPACTS EXTEND APPROXIMATELY 10 FT BELOW GRADE IN THE MARSH AND ARE PRESENT 5-12 FT BELOW GRADE IN BALLAST.
4. THE FUTURE HOT SPOT REPRESENTS THE AREA THAT WILL HAVE ARSENIC > 1,000 mg/kg IN 4 YEARS BASED ON THE OBSERVED RATE OF DECREASE IN CONCENTRATION OVER THE LAST 15 YEARS.



PROJECT:	WISCONSIN DEPARTMENT OF NATURAL RESOURCES KEWAUNEE MARSH
SHEET TITLE:	2009/2010 HOT SPOT GEOPROBE INVESTIGATION

DRAWN BY:	MCKEEFRY J	SCALE:		PROJ. NO.	00-07201.15
CHECKED BY:	SELLWOOD A		AS NOTED	FILE NO.	72011901.mxd
APPROVED BY:	FISH D	DATE PRINTED:		FIGURE 2	
DATE:	MAY 2010		5/27/2010		

RMT

744 Heartland Trail
Madison, WI 53717-1934

P.O. Box 8923 53708-8923
Phone: 608-831-4444
Fax: 608-831-3334

D:\PRE_TESS_PROJECTS\07201\19\MXD\72011901.mxd 5/27/2010 13:34:32

SCALE OF DETAIL

0 50 100 FEET

1 " = 60 '
1:720

N

LEGEND

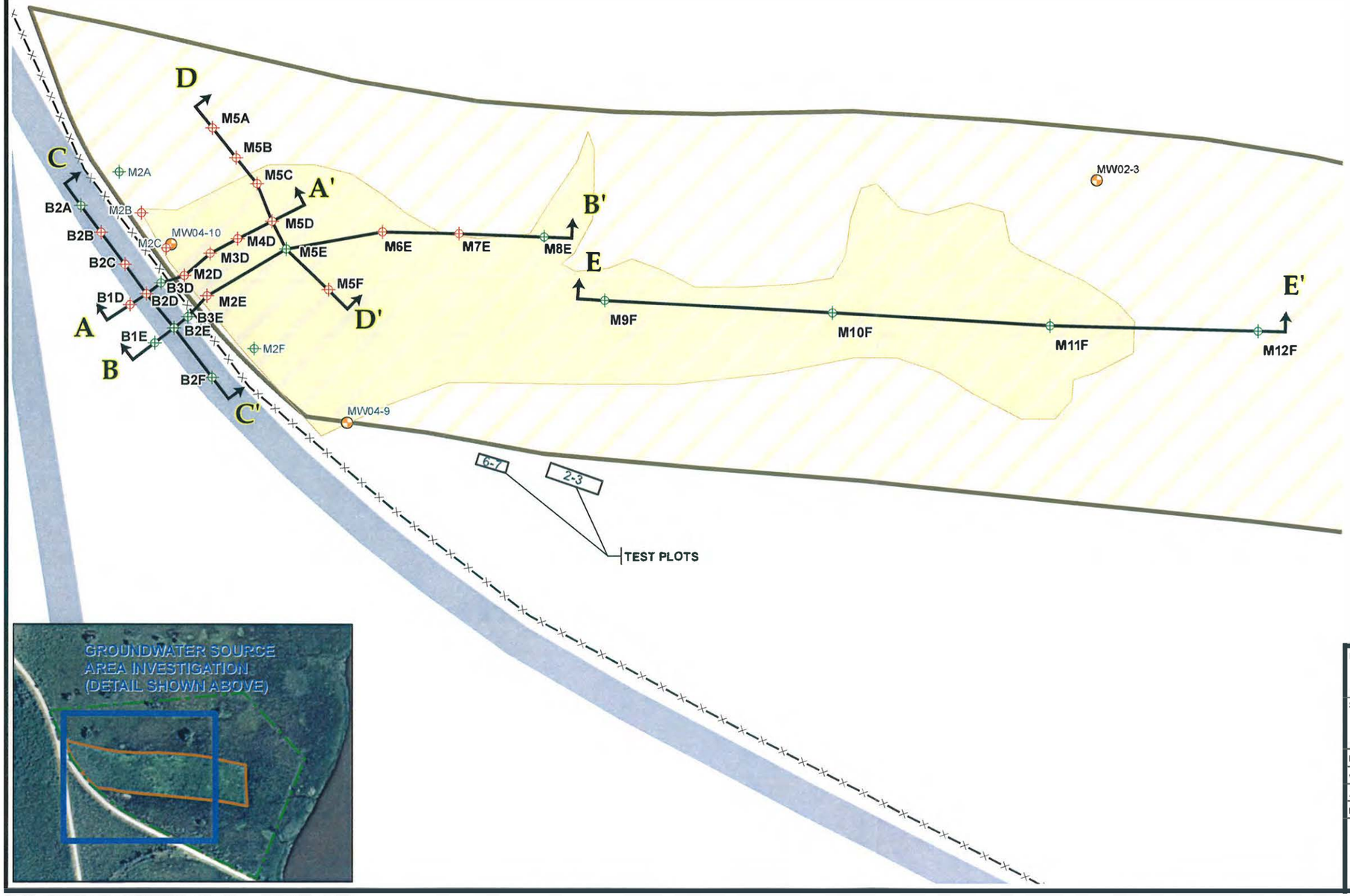
- ARSENIC > 1,000 mg/kg
- ARSENIC < 1,000 mg/kg

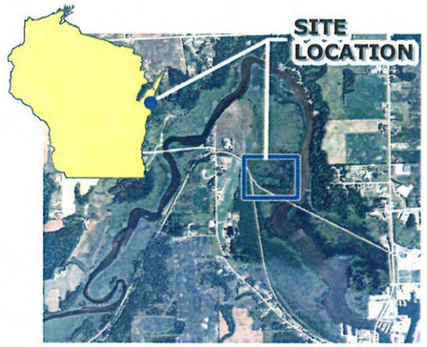
} M-SERIES = MARSH (8-12 FT)
B-SERIES = BALLAST (15-30 FT)

- MONITORING WELL LOCATION
- FENCE
- CAPPED AREA
- APPROXIMATE AREA OF PREVIOUSLY DISTRESSED VEGETATION
- CROSS-SECTION TRANSECT

NOTES:

1. ALL GEOPROBE BORINGS WERE LOCATED USING A TRIMBLE GEOXH GPS UNIT.





PROJECT: WISCONSIN DEPARTMENT OF NATURAL RESOURCES
KEWAUNEE MARSH

SHEET TITLE: 2009/2010 HOT SPOT GEOPROBE INVESTIGATION
CROSS-SECTION TRANSECTS

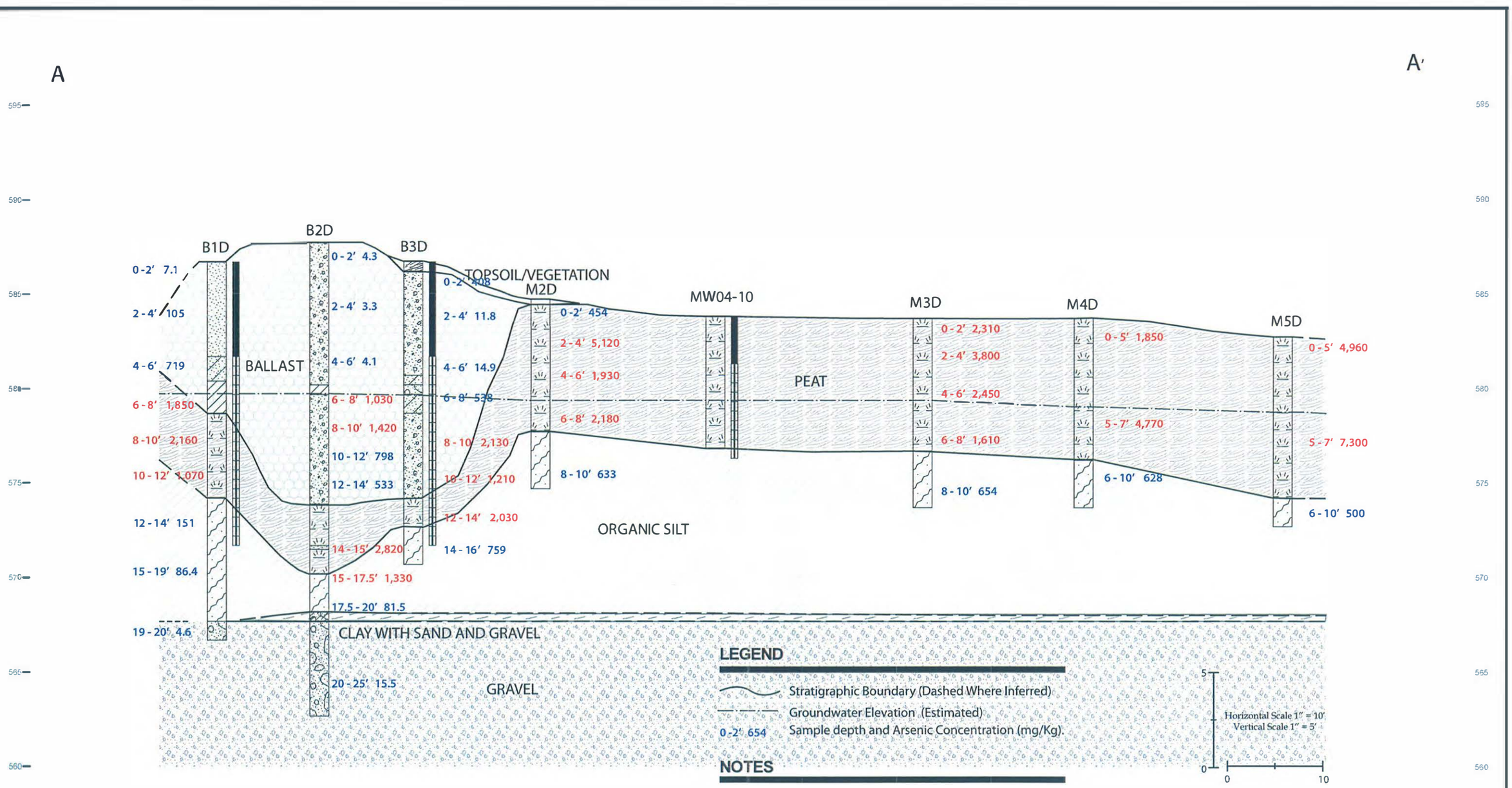
DRAWN BY:	PAPEZ J	SCALE:		PROJ. NO.	00-07201.22
CHECKED BY:	SELLWOOD A		AS NOTED	FILE NO.	72011904.mxd
APPROVED BY:	FISH D	DATE PRINTED:		FIGURE 3	
DATE:	MAY 2010	5/27/2010			

RMT

744 Heartland Trail
Madison, WI 53717-1934

P.O. Box 8923 53708-8923
Phone: 608-831-4444
Fax: 608-831-3334

D:\PRE_TESS_PROJECTS\07201\19\MXD\72011904.mxd 5/27/2010 11:55:22



NOTES

1. Boring elevations are approximate.
2. Groundwater elevation data is from July 2005, seasonal elevations fluctuate.
3. Red Values indicate arsenic concentrations greater than 1,000 mg/Kg. This concentration correlates to potentially hazardous material (TCLP As > 5.0 mg/L), and has been classified as the "hot spot" material.

RMT
744 Heartland Trail
Madison, WI 53717-1934
P.O. Box 8923 53708-8923
Phone: 608-831-4444
Fax: 608-831-3334

D:\07201\15\GIS\docusecs\Kewaunee a transectLai

KEWAUNEE MARSH — KEWAUNEE, WISCONSIN

GEOLOGIC CROSS SECTION A - A'
Arsenic Concentrations

SCALE	PROJ. NO.	DWG. NAME	FIGURE 4
	7201.15		

B

B′

595
590
585
580
575
570
565
560
555

B1E
B2E
B3E
M2E
M5E
M6E
M7E
M8E

0-2′ 2.8
2-4′ 35.4
BALLAST
4-6′ 49.9
6-8′ 232
8-10′ 932
10-12′ 294
12-14′ 341
14-16′ 6.2
16-19′ 3.4J
19-20′ 2.7
20-23′ 86.5
23-25′ 2.6

0-2′ 2.6
2-4′ 1.5J
4-6′ 112
6-8′ 100
8-10′ 107
10-13.8 87.1
13.8-15′ 324

0-2′ 2.9
2-4′ 23.2
4-6′ 330
6-8′ 249
8-10′ 151
10-12′ 927
12-14′ 582
14-16′ 63.1
16-20′ 11.7
20-25′ 2.9
GRAVEL

0-2.5′ 734
2.5-5′ 1,720
5-7.5′ 906
7.5-10′ 1,400

PEAT

0-2′ 269
2-4′ 215
4-6′ 46.6
6-8′ 9.8J

ORGANIC SILT

8-10 2.7J
10-12 40.3
12-14′ 8.1
14-15′ 3.1

CLAY WITH SAND AND GRAVEL

0-4′ 895
4-6′ 1,910
6-8′ 2.020

0-2′ 15.1
2-4′ 277
4-6′ 1,260
6-8′ 478

0-4′ 311
4-6′ 24.4
6-8′ 12.9J

LEGEND

Stratigraphic Boundary (Dashed Where Inferred)

0-2′ 654 Sample depth and Arsenic Concentration (mg/Kg).

NOTES

1. Boring elevations are approximate.
3. Red values indicate arsenic concentrations greater than 1,000 mg/Kg. This concentration correlates to potentially hazardous material (TCLP As > 5.0 mg/L), and has been classified as the "hot spot" material.

5
Horizontal Scale 1" = 10'
Vertical Scale 1" = 5'
0
0
10

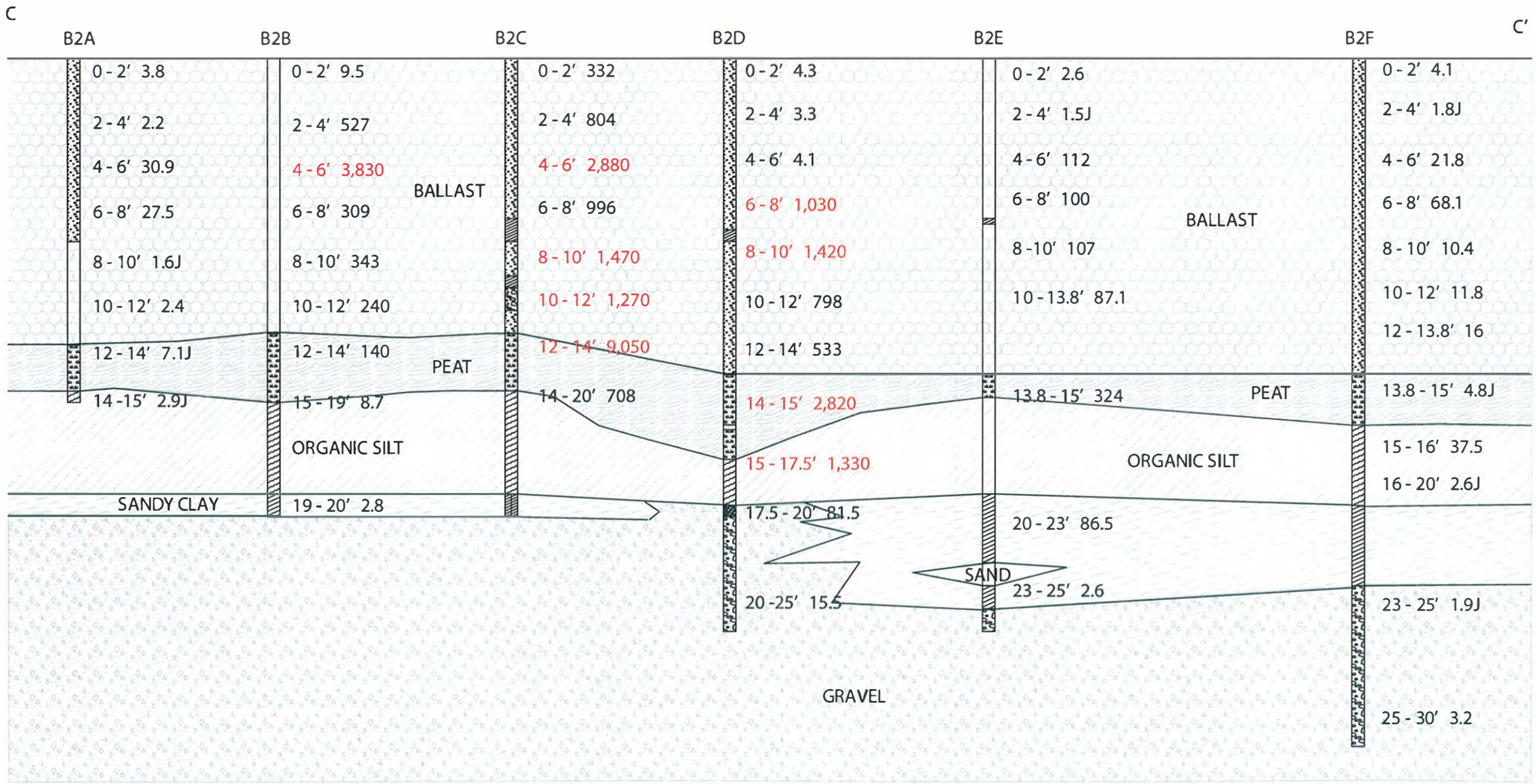
RMT
744 Heartland Trail
Madison, WI 53717-1934
PO Box 8923 53708-8923
Phone 608-831-4444
Fax 608-831-3334

D:\07201\15\GIS\doc\xsecs\kewaunee b transect.ai

KEWAUNEE MARSH — KEWAUNEE, WISCONSIN

GEOLOGIC CROSS SECTION B - B'

SCALE	PROJ. NO.	DWG. NAME	FIGURE 5
	7201.15		



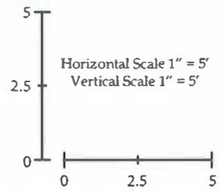
LEGEND

Stratigraphic Boundary (Dashed Where Inferred)

0 -2' 654 Sample depth and Arsenic Concentration (mg/Kg).

NOTES

1. Boring elevations are approximate.
3. Red values indicate arsenic concentrations greater than 1,000 mg/Kg. This concentration correlates to potentially hazardous material (TCLP As > 5.0 mg/L), and has been classified as the "hot spot" material.



Cartographer: OCONNELL T Checked By: Approved By: Date Printed: JANUARY 2010

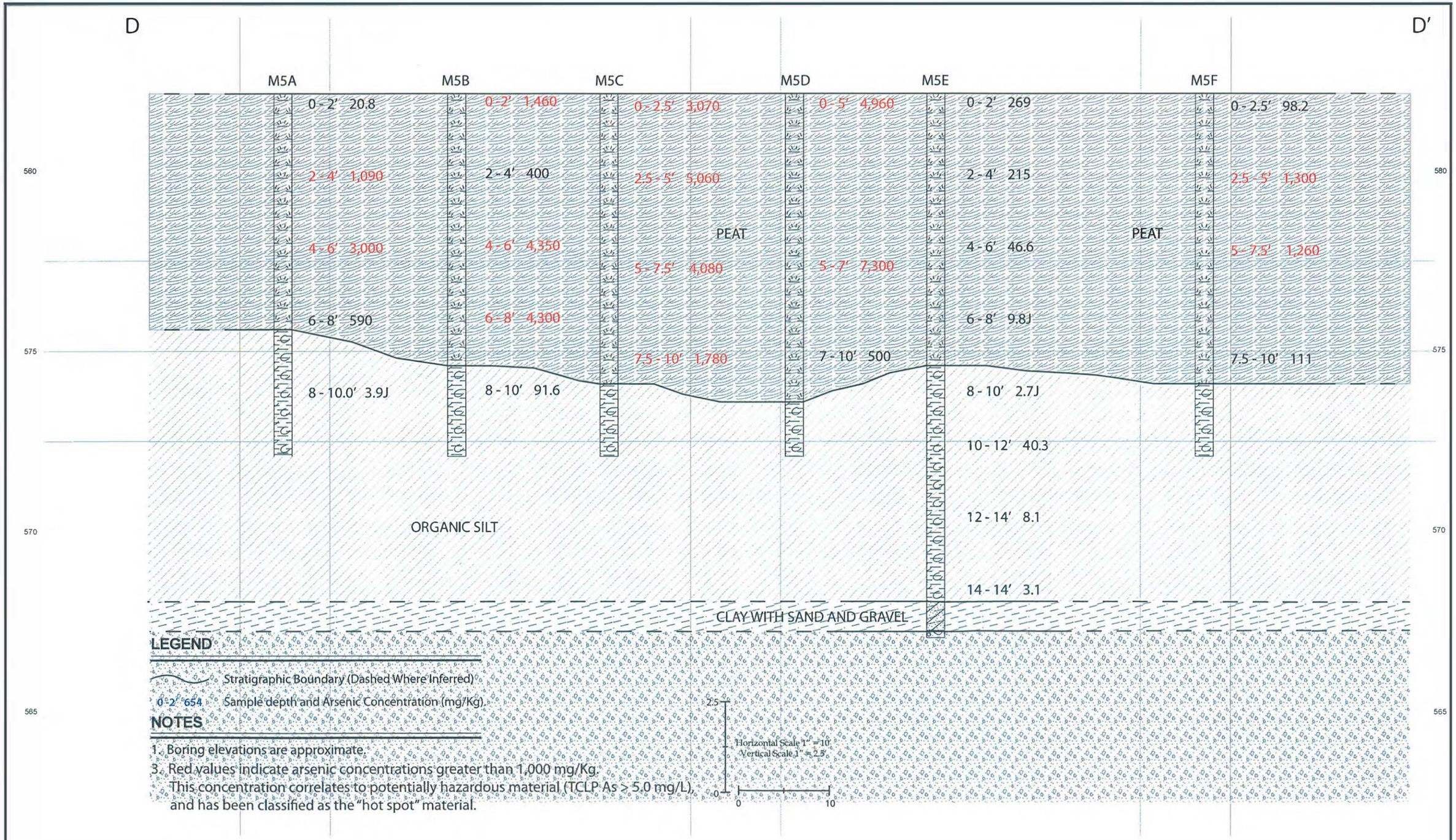
RMT
744 Heartland Trail
Madison, WI 53717-1934
PO Box 8923 53708-8923
Phone 608-831-4444
Fax 608-831-3334

D:\07201\15\GIS\doc\xsecs\kewaunee c transect.ai

KEWAUNEE MARSH — KEWAUNEE, WISCONSIN

GEOLOGIC CROSS SECTION C - C'
Arsenic Concentrations

SCALE	PROJ NO.	DWG NAME	
AS NOTED	07201.15		FIGURE 6



RMT
744 Heartland Trail
Madison WI 53717-1934
PO Box: 8521 53708-8903
Phone 608-831-4444
Fax 608-831-3334

D:\07201\15\GIS\doc\xsecs\kewaunee d transe:1.ai

KEWAUNEE MARSH — KEWAUNEE, WISCONSIN

GEOLOGIC CROSS SECTION D - D'
Arsenic Concentrations

SCALE	PROJ NO	DWG NAME	
	7201.15		FIGURE 7

E

E′

M9F

M10F

M11F

M12F

580

575

570

565

0 - 4′ 348

0 - 4′ 357

0 - 2′ 106

0 - 4′ 204

2 - 4′ 549

PEAT

4 - 6′ 452

4 - 6′ 589

4 - 6′ 160

PEAT

4 - 6′ 313

6 - 8′ 82.1

6 - 8′ 52.7

6 - 8′ 27.5

6 - 8′ 7.6

8 - 10′ 62.9

10 - 12′ 3.3JB

ORGANIC SILT

ORGANIC SILT

LEGEND

Stratigraphic Boundary (Dashed Where Inferred)

0 -2′ 654 Sample depth and Arsenic Concentration (mg/Kg).

NOTES

1. Boring elevations are approximate.
3. Red values indicate arsenic concentrations greater than 1,000 mg/Kg. This concentration correlates to potentially hazardous material (TCLP As > 5.0 mg/L), and has been classified as the "hot spot" material.

2.5

Horizontal Scale 1" = 10′
Vertical Scale 1" = 5′

0

0 10

RMT
744 Heartland Trail
Madison, WI 53717-1934
PO Box 8923 53708-8923
Phone: 608-831-4444
Fax: 608-831-3334

D:\07201\115\GIS\doc\xsecs\kewaunee e transect_01.ai

KEWAUNEE MARSH — KEWAUNEE, WISCONSIN

GEOLOGIC CROSS SECTION E - E′
Arsenic Concentrations

SCALE | PROJ. NO. 7201.15 | DWG. NAME | FIGURE 8

Appendix A
Geophysical Conductivity Survey

April 7, 2010

Annette Weissbach, Hydrogeologist
Wisconsin Department of Natural Resources
2984 Shawano Ave.
Green Bay, WI 54313-6727

Re: Geophysical Survey of an Arsenic Contaminated Site in the Kewaunee Marsh

Dear Ms. Weissbach,

This memorandum describes efforts by scientists from the Wisconsin Geological and Natural History Survey to characterize an arsenic plume in the Kewaunee Marsh Besadny Wildlife Area near Kewaunee, WI using electrical conductivity measurements. The site of the arsenic contamination is a wetlands located near the Kewaunee River. The site is underlain by approximately 7 feet of peat over around 10 feet of organic silt over clays, sands and gravels. The source of the arsenic is thought to be a spill from a nearby railroad, currently a recreational bike trail. The spill is thought to have occurred in the 1940s (Stanforth and others, 2007).

We chose to use electrical conductivity measurements to map the arsenic plume because the concentrations of arsenic are very high in the soils (>1000 mg/Kg) and also in ground water samples (>1,000,000 μg/L), creating a measurable contrast to uncontaminated areas. The high concentrations of arsenic ions, arsenate or arsenite, in the groundwater cause large increases in the conductivity of the subsurface. These high conductivities allowed us to quickly map the extent of the arsenic plume.

Methods

The electrical conductivity of the subsurface varies with the conductivity of the pore fluid and the sediment. Pore fluids with higher ionic strengths are more conductive and result in higher conductivities measured with the instrument. In this survey, we expect that the higher concentrations of arsenic ions caused measurably higher conductivities. Also, different lithologies have different electrical conductivities. Most common minerals such as quartz or feldspar have very low conductivities so that pore fluids dominate the overall conductivities in these sediments. However, clays are highly conductive with the result that a sediment with a high clay content and with pore fluid of low conductivity will give overall conductivities similar to a clean sand sediment with a high conductivity pore fluid. For this reason, if bulk measurements of conductivity are used to map the extent of a plume of conductive pore fluid, the clay content and porosity of the subsurface must be assumed to not vary significantly. We made that assumption in this survey.

We used an EM-31 ground conductivity meter to measure the bulk electrical conductivity of the subsurface. This instrument is easy to use and can collect large

amounts of data quickly. It measures electrical conductivity by inducing current in the subsurface with a coil located at the end of one of its arms. Another coil at the end of the other arm records the induced earth current. That current is proportional to the conductivity of the subsurface (McNeill, 1980).

The orientation of the instrument coils affects the depths at which the instrument is most sensitive (McNeill, 1980). If the coils are aligned vertically, the instrument will sense greater depths. When the coils are aligned horizontally, more shallow depths have greater weight. For example, Figure 1 shows the instrument response with depth for when the coils are vertical, Rv(z) and horizontal, Rh(z). When the coils are vertical, the about half of the instrument response is due to the subsurface above 12.1 feet. The figure also shows that about 25% of the instrument response when the coils are vertical is from below 24.3 feet. In contrast, when the coils are aligned horizontally, half of the instrument response is due to the subsurface above only 5 feet. This difference allowed us to measure the difference between the shallow (around 5 feet depth) and deep (around 12 feet depth) conductivities at the site.

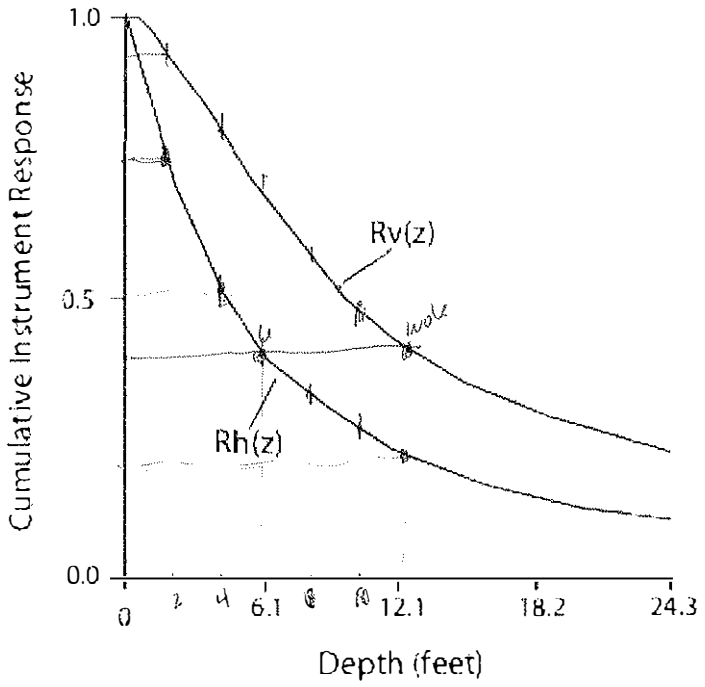


Figure 1. EM-31 instrument response (after McNeill, 1980)

We collected data at approximately even intervals across the site. At each location, we collected vertical and horizontal coil conductivity readings. Each location was recorded with a Garmin Oregon GPS unit. The data was collected in approximately 2 hours.

Results

In general, the conductivity results confirm earlier interpretations of the extent of the impacted area. Figure 2 shows the site, the shallow and deep conductivity measurements, and conductivity contours based on the deep measurements. Red corresponds to higher conductivity and blue to low. The deep measurements are shown as the larger circles beneath the smaller circles of the shallow measurements. The regions of highest conductivity correspond to the two zones of dead vegetation where the arsenic spill and runoff was thought to have accumulated. There do not appear to be any high values of deep conductivities outside the capped area either to the west or north. Some moderately high conductivities are present to the southwest, between the tracks, shown in orange but their origin may be due to sediment changes or moderate concentrations of arsenic. The conductivities suggest that the arsenic plume is slowly migrating to the east and diminishes in strength towards the river, around 100 feet past the capped zone.

Other factors, in addition to variation in pore fluid and lithologic variation, may affect the conductivities. A cap, indicated in the 2005 air photo in Figure 2 by the more green vegetation beneath the central plumes, had been placed over the highly contaminated areas. While that cap may have altered the conductivity of the upper 3-4 feet at the site and might affect the shallow conductivity values, it would have much less effect on the deep conductivity values. This is justified by observing that the orange value deep conductivities shown on the east end of the capped area are not significantly different than the deep conductivities just outside of the capped area. Another factor, one that also affected the shallow readings, was there was around 6 inches of water over ice in the area outside the capped zone. Within the capped zone, there was little standing water and no ice. There was standing water to the west of the tracks but no ice. In general, where the vegetation seen in the air photo is green, the ice had melted. Where the vegetation was brown, the ice was still present. The presence of ice would tend to lower the resistivity of the shallow measurements since nearly 30% of the weighted measurement would be from the upper two feet. In contrast, the deep measurements would be relatively unaffected since only 5% of the deep measurement depends on the upper two feet (Figure 1). For these reasons the deep measurements are relatively unaffected by the ice, standing water, or the cap.

Conclusions

A survey of the electrical conductivity of the subsurface was conducted using an EM-31 ground conductivity meter in an area contaminated with arsenic. The measured conductivities are highest where the arsenic was known to have been spilled and to have killed vegetation. The conductivities are lower in areas not thought to be contaminated. Although the conductivities between the railroad tracks may suggest an area of additional moderate contamination, the survey confirmed that the current interpretation of the arsenic migration towards the river is likely correct.

Please contact me (608-262-2307; djhart@wisc.edu) if you have any questions regarding this report.

Sincerely,

David Hart
Hydrogeologist/Geophysicist

Cc: Alyssa Sellwood, RMT

References

McNeil, J.D., 1980, Electromagnetic Terrain Conductivity Measurement at Low Induction Numbers. Technical Note TN-6. Geonics Limited, Ontario, Canada.

Stanforth, R., R. Fish, A. Sellwood, and P. Turpin., 2007, WDNR-Kewaunee Marsh Treatability Project-Final Report to WDNR, RMT, Madison, WI.

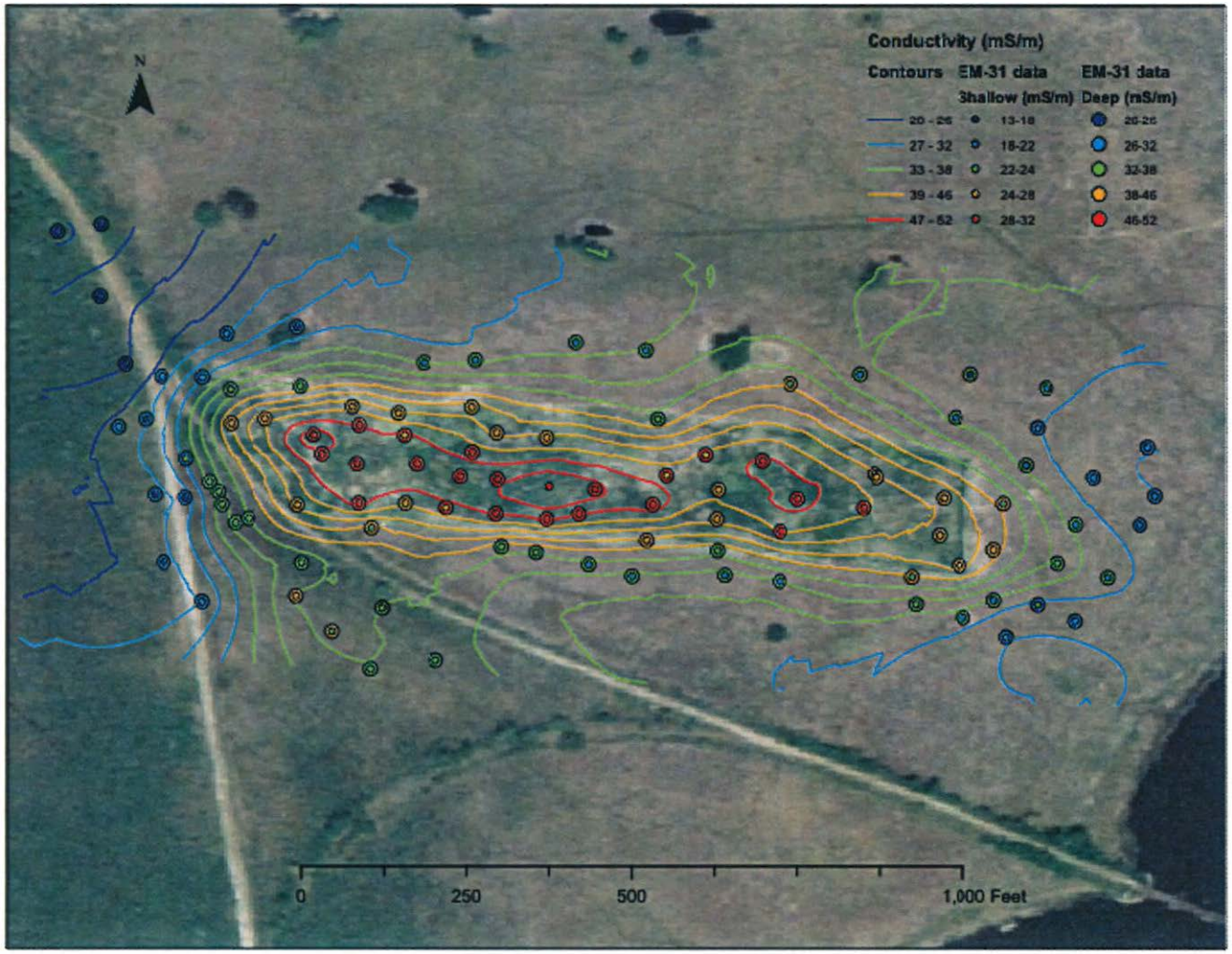
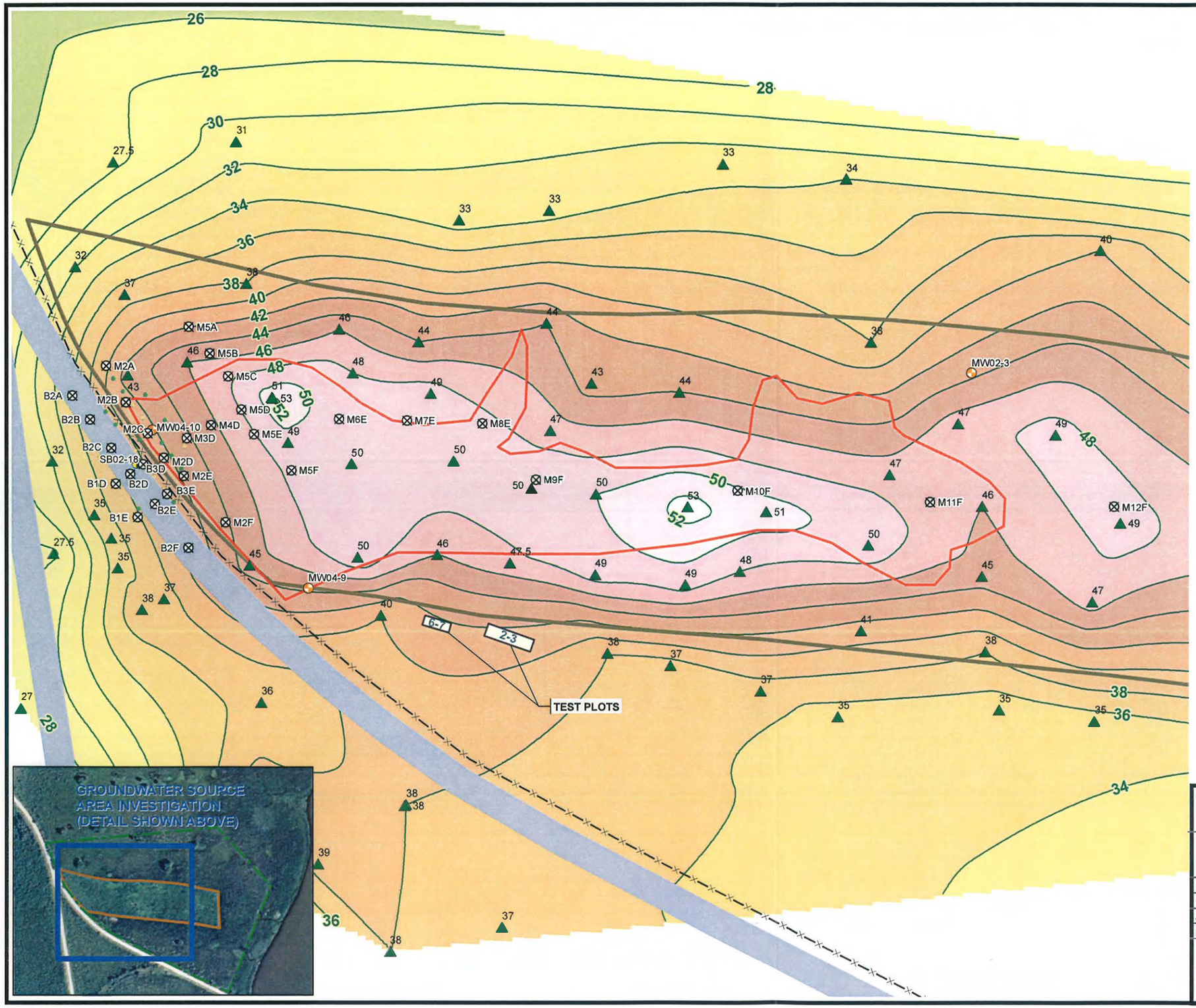


Figure 2. Air photo showing conductivity measurements. The highest conductivities are shown in red; the lowest are shown in blue. The small circles are for the shallow horizontal coil measurements; the large circles are for the deep vertical coil measurements.

9



LEGEND

- RMT GEOPROBE LOCATION (DEC 2009/MARCH 2010)
- MONITORING WELL LOCATION

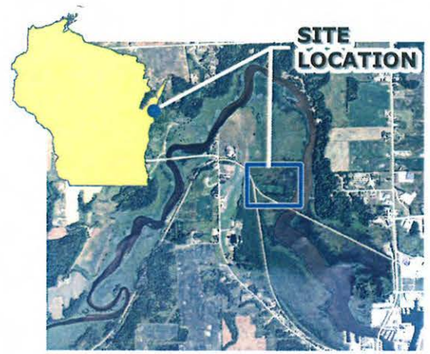
RMT TEMPORARY WELL LOCATION (APRIL 2007)
(ARSENIC CONCENTRATION COLOR CODE)

- < 100,000 µg/L
- > 100,000 µg/L
- SOIL BORING (STS HISTORICAL SAMPLE LOCATION)
- BIKE PATH (FORMER RAILROAD TRACKS)
- FENCE
- CAPPED AREA
- APPROXIMATE AREA OF PREVIOUSLY DISTRESSED VEGETATION
- WGNHS CONDUCTIVITY SAMPLE POINT (MARCH 9, 2010)
- ISO-CONDUCTIVITY CONTOUR

CONDUCIVITY

19 - 20 | 20.1 - 22 | 22.1 - 24 | 24.1 - 26 | 26.1 - 28 | 28.1 - 30 | 30.1 - 32 | 32.1 - 34 | 34.1 - 36 | 36.1 - 38 | 38.1 - 40 | 40.1 - 42 | 42.1 - 44 | 44.1 - 46 | 46.1 - 48 | 48.1 - 50 | 50.1 - 52 | 52.1 - 54

NOTES:



PROJECT:	WISCONSIN DEPARTMENT OF NATURAL RESOURCES KEWAUNEE MARSH		
SHEET TITLE:	HOT SPOT GEOPROBE INVESTIGATION VERTICAL CONDUCTIVITY		
DRAWN BY: PAPEZ J	SCALE:	PROJ. NO.	00-07201.15
CHECKED BY: SELLWOOD A	AS NOTED	FILE NO.	72011507.mxd
APPROVED BY:	DATE PRINTED:	FIGURE A.1	
DATE: MAY 2010	5/27/2010		

RMT
744 Heartland Trail
Madison, WI 53717-1934
P.O. Box 8923 53708-8923
Phone: 608-831-4444
Fax: 608-831-3334

D:\PRE_TESS_PROJECTS\07201\15\MXD\72011507.mxd 5/27/2010 12:04:34

LEGEND

- RMT GEOPROBE LOCATION (DEC 2009/MARCH 2010)
- MONITORING WELL LOCATION

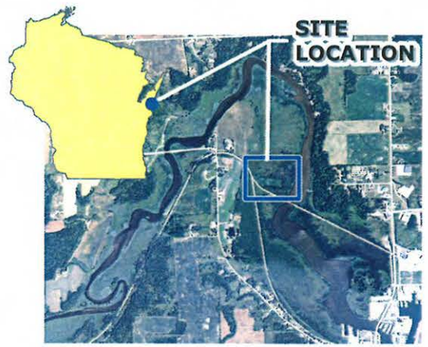
RMT TEMPORARY WELL LOCATION (APRIL 2007)
(ARSENIC CONCENTRATION COLOR CODE)

- < 100,000 µg/L
- > 100,000 µg/L
- SOIL BORING (STS HISTORICAL SAMPLE LOCATION)
- BIKE PATH (FORMER RAILROAD TRACKS)
- FENCE
- CAPPED AREA
- APPROXIMATE AREA OF PREVIOUSLY DISTRESSED VEGETATION
- WGNHS CONDUCTIVITY SAMPLE POINT (MARCH 9, 2010
- ISO-CONDUCTIVITY CONTOUR

CONDUCTIVITY

13 - 14 | 14.1 - 16 | 16.1 - 18 | 18.1 - 20 | 20.1 - 22 | 22.1 - 24 | 24.1 - 26 | 26.1 - 28 | 28.1 - 30 | 30.1 - 32

NOTES:



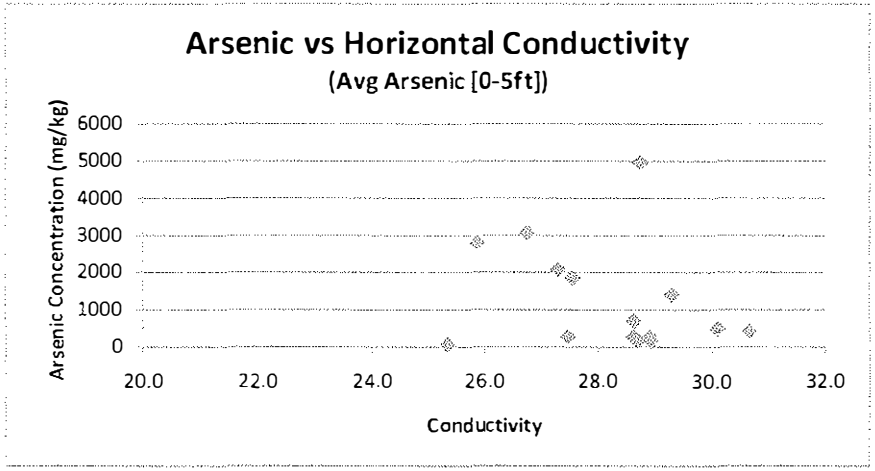
PROJECT: WISCONSIN DEPARTMENT OF NATURAL RESOURCES KEWAUNEE MARSH

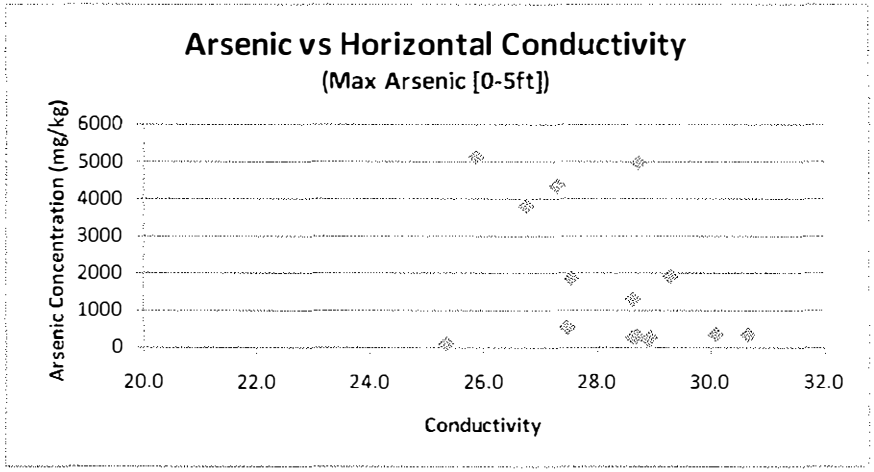
SHEET TITLE: HOT SPOT GEOPROBE INVESTIGATION HORIZONTAL CONDUCTIVITY

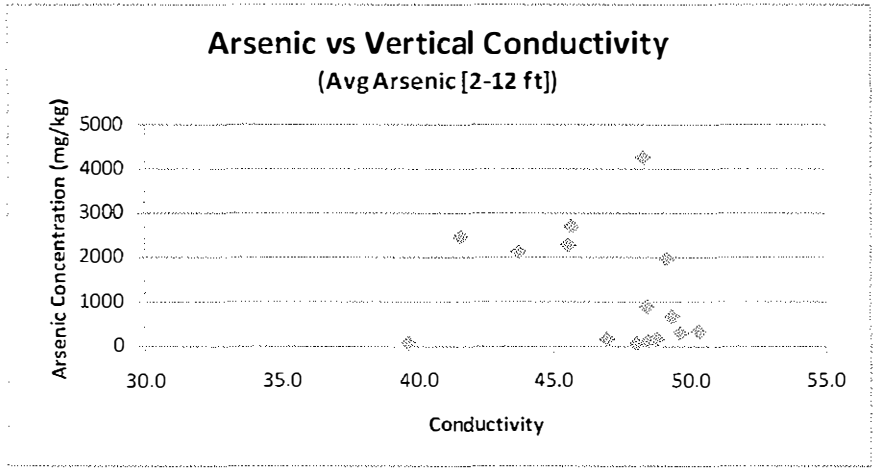
DRAWN BY:	PAPEZ J	SCALE:	PROJ.NO. 00-07201.15
CHECKED BY:	SELLWOOD A	AS NOTED	FILE NO. 72011506.mxd
APPROVED BY:	FISH D	DATE PRINTED:	FIGURE A.2
DATE:	MAY 2010	5/27/2010	

RMT
744 Heartland Trail
Madison, WI 53717-1934
P.O. Box 8923 53708-8923
Phone: 608-831-4444
Fax: 608-831-3334

D:\PRE_TESS_PROJECTS\07201\15\MXD\72011506.mxd 5/27/2010 13:49:43


Arsenic vs Horizontal Conductivity
(Avg Arsenic [0-5ft])
Arsenic Concentration (mg/kg)
6000
5000
4000
3000
2000
1000
0
20.0
22.0
24.0
26.0
28.0
30.0
32.0
Conductivity


Arsenic vs Horizontal Conductivity
(Max Arsenic [0-5ft])
Arsenic Concentration (mg/kg)
6000
5000
4000
3000
2000
1000
0
20.0
22.0
24.0
26.0
28.0
30.0
32.0
Conductivity


Arsenic vs Vertical Conductivity
(Avg Arsenic [2-12 ft])
Arsenic Concentration (mg/kg)
5000
4000
3000
2000
1000
0
30.0
35.0
40.0
45.0
50.0
55.0
Conductivity

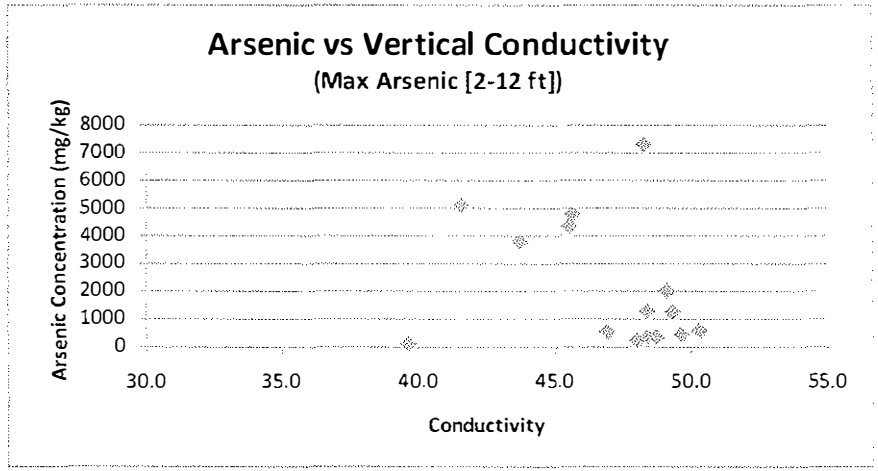

Arsenic vs Vertical Conductivity
(Max Arsenic [2-12 ft])
Arsenic Concentration (mg/kg)
8000
7000
6000
5000
4000
3000
2000
1000
0
30.0
35.0
40.0
45.0
50.0
55.0
Conductivity

FIGURE A.3

6

Appendix B
Remediation Laboratory Summary Memos

Table of Contents

- Comparison of DI Water and TCLP Leach Test Results
- Leach Testing of Composite Samples
- Confirmation of Treatment Effectiveness for Sediments
- Dose Response Testing
- Addition of Bentonite

Comparison of DI Water and TCLP Leach Test Results

RMT

Technical Memorandum

Date: May 5, 2010

To: Technical File

From: Bob Stanforth

Project No.: 02085.23.009

Subject: Comparison of DI Water and Screening TCLP Leaching Test Results for Kewaunee Sediments

Introduction

The focus of leaching studies for the Kewaunee soils has been predominantly using distilled water leaching tests (using the SPLP procedure but with DI water), or modifications thereof with different solids concentrations. Less work has been done using screening TCLP tests[1], since the focus has not been on whether the sediments are hazardous, but rather on the potential for contributing dissolved arsenic to the marsh. However, one approach to delineating the "hot-spot" area requiring treatment would be to determine the areas of the marsh that leach arsenic at over 5 mg/L in a TCLP test, and would be considered hazardous were they to be removed.

Compositional analysis and screening TCLP and DI Water tests have been run on a number of composite sediments from the two recent Geoprobe investigations on the site (in December 2009, and Marsh 2010). These results can be used for two purposes: first to compare DI Water and TCLP results and see if the DI Water test (at 2 g/40 mL) can be used as a surrogate for the TCLP test, and second, to compare leaching test concentrations (TCLP or DI Water) with the compositional values.

Results

Compositional and leaching test results for the different composites are given in Table 1.

Table 1

SAMPLE	ARSENIC CONCENTRATION		
	COMPOSITIONAL, mg/kg	SCREENING TCLP, mg/L	DI WATER, mg/L[(1)]
December 2009 Composites			
Ballast	1,400	8.4	13
Peat Under ballast	1,500	11	11
Peat in Marsh	2,600	24	18
Organic Silt in marsh	550	3.1	2.5

[1] The screening tests follow the standard USEPA protocols (TCLP-SW 846 Method 1311 and SPLP-SW 846 Method 1312), with the exceptions that the leaching solution is analyzed directly after acidification, and smaller quantities of solid and leaching solution are used, while still maintaining the 1:20 solid to solution ratio. Previous tests have shown that the screening tests correlate well with standard leaching test results.

Table 1

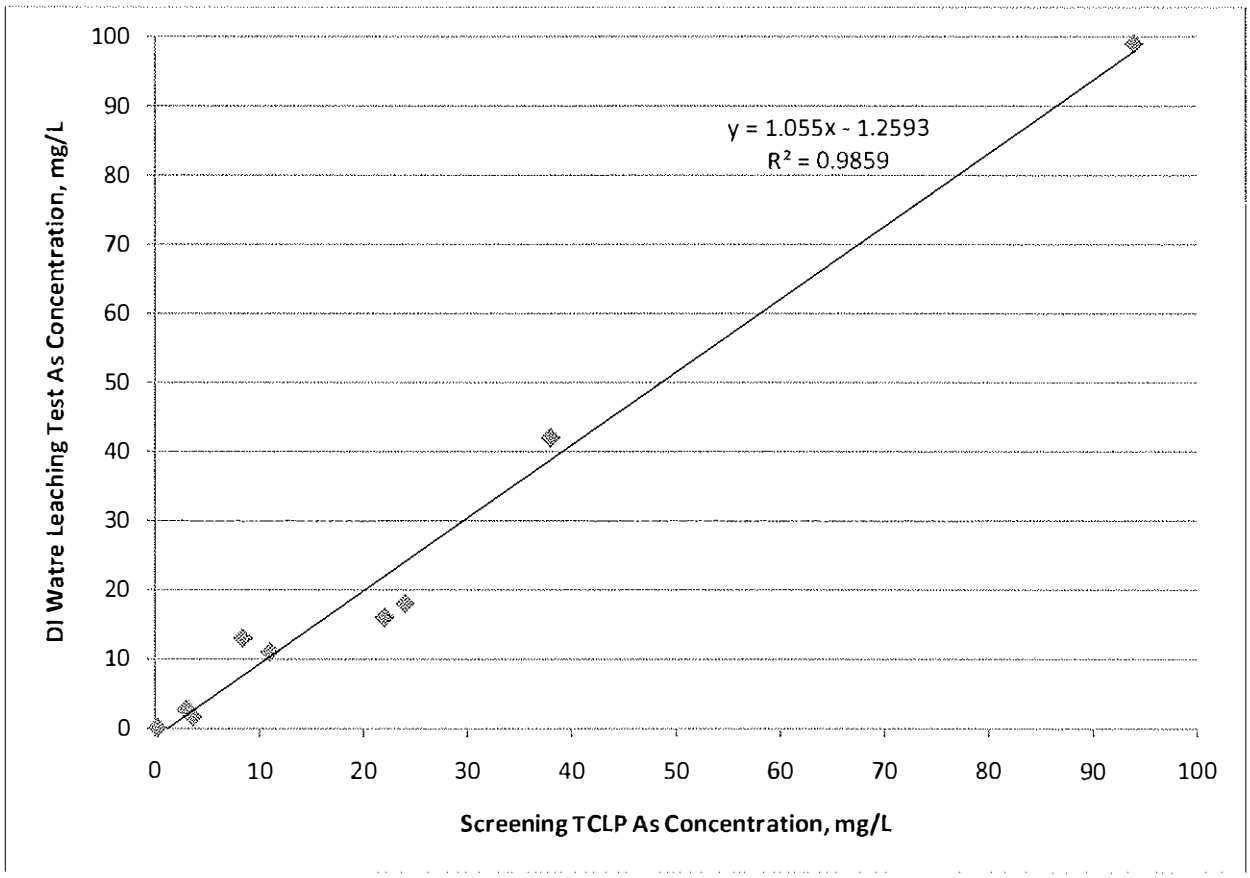
SAMPLE	ARSENIC CONCENTRATION		
	COMPOSITIONAL, mg/kg	SCREENING TCLP, mg/L	DI WATER, mg/L[1]
March 2010 Composites			
>10,000 mg/kg	8900	94	99
~5,000 mg/kg	4550	38	42
2,000 – 4,000 mg/kg	2950	22	16
1,000 – 2,000 mg/kg	1200	3.0	2.8
500 – 1,000 mg/kg	920	3.6	1.7
250 – 500 mg/kg	440	0.26	0.18

Note:
[1] 2 g/40 mL sample.

Comparison of TCLP and DI Water Leaching Test Results

A comparison of the two leaching test results, using the same solid/solution ratio (2 g/40 mL) is given in Figure 1.

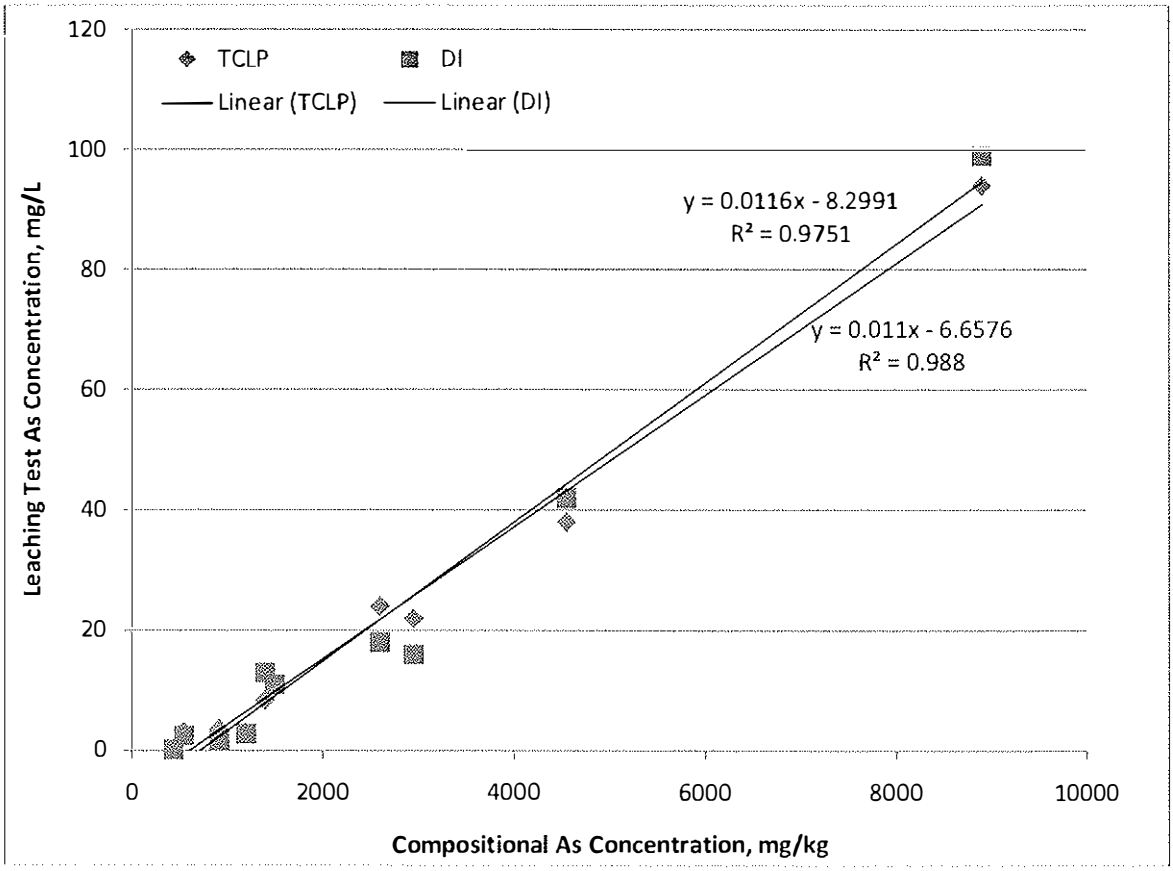
Figure 1
Comparison of DI Water Leaching Test Arsenic Concentrations
With TCLP Arsenic Concentrations for Composite Kewaunee Samples



The two leaching tests give very similar arsenic concentrations, indicating that the DI water leaching test (at the correct solids concentration) gives a good indication of the expected TCLP test arsenic concentration.

A second comparison can be made between the compositional arsenic concentration and the leaching test concentration, as shown in Figure 2.

Figure 2
Comparison Between Compositional and TCLP and DI Water Test Leachable Arsenic Concentrations



There is a good correlation between the compositional levels of arsenic in the samples and the leachable concentrations, in either the TCLP or DI water tests. Increasing compositional levels of arsenic increase the amount leached in the TCLP or DI Water tests. However, for both tests, the lines do not go through the origin, but rather there is a compositional threshold below which arsenic is not very leachable, and above which leaching concentrations increases linearly with compositional arsenic. The threshold value for the TCLP test is 605 mg/kg, while for the DI Water test it is 715 mg/L. More importantly, a compositional value of around 1060 mg/kg is needed to give a TCLP test concentration of greater than 5 mg/L. In other words, sediments with compositional levels below 1060 are not likely to be hazardous due to arsenic leaching in the TCLP test.

Conclusion

Based on the compositional analysis and screening leaching test analysis of the Geoprobe samples from the Kewaunee Marsh, **sediments with a compositional value of below 1000 mg/kg are not likely to be hazardous due to arsenic leaching in a TCLP test.**

Leach Testing of Composite Samples

RMT

Technical Memorandum

Date: May 5, 2010

To: Technical File

From: Bob Stanforth

Project No.: 02085.23.009

Subject: Leach Testing of Composite Kewaunee Hot Spot Samples

Introduction

Compositional analysis of the Geoprobe samples showed several things:

1. The boundaries of the highly contaminated soil under the railroad (RR) bed have been delineated.
2. The contamination extends past the ballast under the RR bed and into the underlying peat material. Contamination does not extend into the underlying silt or into the gravel layer beneath the RR bed.
3. The highly contaminated zone extends further into the marsh than was anticipated. The eastern edge has not been delineated.
4. The highly contaminated zone extends deeper into the marsh than was anticipated, going into the organic silt at 7-10 feet as well as through the peat layer going down to 7 feet.

One potential approach to remediating the highly contaminated groundwater in the ballast under the RR bed is to install a groundwater extraction trench parallel to the bike path and pump the groundwater. A question that needs to be addressed in evaluating this approach is how long it will take to remove the contamination from the area using a groundwater pumping system. Is the arsenic sufficiently soluble that the contamination can be removed by pumping a few pore volumes, or will multiple pore volumes need to be removed in order to reduce arsenic concentrations to acceptably low levels? This question can be addressed by running leaching tests on the contaminated material collected during the December 2009 Geoprobe sampling.

The original work called for doing leaching tests on the ballast to evaluate the leaching pattern of arsenic from the contaminated area. However, given the much more extensive nature of the contamination and the need to know whether the arsenic is dissolved or particulate for treatment purposes, leaching tests were run on composites of the different types of contaminated soils found, namely ballast, peat under the ballast, peat in the marsh, and organic silt in the marsh.

Procedure

Composite Preparation

Composites were made of the different types of material to be tested. The different soil samples divided into the four groups (Ballast, Peat under Ballast, Peat in Marsh, Organic Silt in Marsh) and composites made by mixing equal weights of each Ballast sample, each Peat-under-Ballast sample, each Peat-in-Marsh sample and each Organic-Silt-in-Marsh sample. Table 1 gives the

9

individual samples used for each composite, along with the arsenic concentrations and moisture content for each sample. The moisture content and arsenic concentration for each composite are also given in Table 1.

Leaching Tests

A series of leaching tests were run on each composite. Amounts of solid ranging from 0.5 g to 20 g were placed in 50 mL centrifuge tubes, and sufficient deionized (DI) water added to bring the volume to 40 mL. The samples were shaken overnight, then centrifuged to separate the solids and leachate. The leachate was removed and an aliquot filtered for arsenic and calcium analysis. The pH was measured on the remaining leachate. Meanwhile, fresh DI water was added to each sample, and the process repeated. The 0.5 g through 4 g samples were leached for a total of ten elutions, while the 10 and 20 g samples were leached for five elutions. The pore volume was estimated from the moisture content of the samples (since they were saturated when collected).

To illustrate what the leaching pattern looks like when there is no retention on the solids, sand spiked with an arsenate standard to give an arsenic concentration of 1000 mg/kg As was leached using solids concentrations of 0.5 g, 1.0 g, 2.0 g and 4.0 g per 40 mL.

Results

The results of the leaching tests are given in Tables 2 and 3 for arsenic concentration and mass of arsenic released, respectively.

Arsenic concentrations in the 4 g/40 mL samples vs. pore volume are shown in Figure 1. The leaching pattern for all the solids samples follows a similar curve, with a rapid decrease at low pore volumes and an extended tailing off to much higher pore volumes. Arsenic concentrations from the spiked sand samples drop much more quickly than the marsh samples, indicating that the tailing is due to something more than retained pore water. Note that concentrations do not drop to low levels even after several elutions (representing hundreds of pore volumes).

The focus of the pump-and-treat concept was for the ballast material. Arsenic concentrations versus pore volume for the different solids concentrations of Ballast samples are shown in Figure 2. All the solid concentrations fall on the same line. Arsenic concentrations are not reduced to low values until after many pore volumes. Figure 3 shows arsenic concentration vs. pore volume for the low arsenic concentration section of the graph. Arsenic concentrations are not reduced to below 0.17 mg/L (the target value) until after over 1000 pore volumes (approximately 500 to 600 million gallons) have been removed. Given the low permeability of the marsh material, removing this large volume of water would be time prohibitive, and given the remote location of the site, management of this large volume of water would be cost prohibitive.

Further, the mass balance on arsenic for the ballast material indicates that only about 500 mg/kg arsenic was removed from the ballast by the leaching, or about one third of the total arsenic present (Table 3). Not only would groundwater extraction involve removing large volumes of water, it would also not remove much of the arsenic present in the ballast. In contrast, almost all the arsenic was removed from the other three composites in the multiple elution leaching tests (Table 3).

Conclusions

It would require removal of more than 1000 pore volumes of water from the ballast area to reduce the leached concentration to below 0.17 mg/L. Removing and treating such a large volume is impractical, and the pump-and-treat approach is unlikely to be a cost-effective way to remediate the soil under the bike path.

11

Table 1
Kewaunee Geoprobe Investigation of Hot Spot Area, December 2009
Summary of Contaminated Samples in BD/MD Transect

SAMPLE		MOISTURE, %	ARSENIC
BORING	DEPTH		MEASURED, mg/kg
Ballast			
B1D	6-8	25.5	1,850
B2D	6-8	13.4	1,030
	8-10	12.8	1,420
	10-12	17.4	798
	12-14	13.9	533
B3D	6-8	11.8	538
	8-10	17.5	2,130
	10-12	18.4	1,210
Composite		**17.7**	**1,400**
Peat Under Ballast			
B1D	8-10	75.9	2,150
	10-12	80.8	1,070
B2D	14-15	72.8	2,820
	15-17.5	44.9	1,330
B3D	12-14	77.3	2,030
	14-16	59.4	759
Composite		**68.0**	**1,500**
Peat in Marsh			
M2D	2-4	71.1	5,120
	4-6	78.6	1,930
	6-8	81.1	2,180
M3D	0-2	56.5	2,310
	2-4	82.3	3,800
	4-6	78.8	2,450
	6-8	75.7	1,610
M4D	0-5	53.5	1,850
	5-7	84.5	4,770
M5D	0-5	77.7	4,960
	5-7	87.9	7,300
Composite		**74.9**	**2,600**
Organic Silt in Marsh			
M2D	8-10	67.4	633
M3D	8-10	67.1	654
M4D	7-10	67.9	628
M5D	7-10	68.8	500
Composite		**67.7**	**550**

Table 2
Arsenic Concentrations – Kewaunee Geoprobe Composite Samples Multiple Extraction Test
Using DI Water Extractant

SAMPLE		EXTRACTION									
ID	DRY WT	1	2	3	4	5	6	7	8	9	10
As Concentration, mg/L (Concentrations below target of 0.148 mg/L in bold)											
Ballast	0.5	2.7	0.71	0.37	0.29	0.21	**0.12**	**0.10**	**0.091**	**0.081**	**0.045**
	1.0	5.9	1.7	0.91	0.65	0.46	0.24	0.24	0.20	0.15	**0.091**
	2.0	9.8	3.2	1.8	1.4	1.1	0.57	0.47	0.40	0.35	0.24
	4.0	16	6.1	3.8	3.4	2.1	1.2	0.85	0.77	0.64	0.44
	10.0	34	15	11	7.9						
	20.0	54	28	22	17						
Peat under Ballast	0.5	3.7	0.90	0.39	0.25	0.16	**0.081**	**0.063**	**0.057**	**0.034**	**0.03**
	1.0	6.4	2.1	1.0	0.70	0.47	0.25	0.20	0.18	**0.12**	**0.09**
	2.0	12	3.7	1.9	1.4	1.0	0.63	0.49	0.41	0.31	0.24
	4.0	19	7.0	3.6	2.3	2.6	1.5	1.1	0.92	0.71	0.63
	10.0	40	19	14	11						
	20.0	71	31	27	23						
Peat in Marsh	0.5	6.4	1.0	0.32	0.19	**0.12**	**0.062**	**0.049**	**0.038**	**0.026**	**0.02**
	1.0	9.9	2.3	0.93	0.59	0.40	0.19	0.17	0.16	**0.14**	**0.10**
	2.0	16	4.3	2.1	1.5	1.2	0.72	0.59	0.52	0.44	0.39
	4.0	33	12	5.0	3.2	2.8	1.8	1.3	1.0	0.94	0.86
	10.0	85	30	23	14						
	20.0	160	49	19	40						
Organic Silt in Marsh	0.5	1.0	0.40	0.22	0.16	**0.10**	**0.066**	**0.061**	**0.058**	**0.030**	**0.02**
	1.0	1.6	0.64	0.37	0.29	0.20	**0.13**	**0.10**	**0.11**	**0.078**	**0.04**
	2.0	2.6	1.2	0.80	0.64	0.55	0.35	0.30	0.24	0.20	0.14
	4.0	4.1	2.1	1.3	1.2	1.1	0.68	0.63	0.55	0.43	0.38
	10.0	8.2	2.7	1.8	0.89						
	20.0	12	4.1	2.6	1.2						
As Spiked Sand	0.5	11	0.078	<0.013	<0.013						
	1.0	23	0.28	0.024	<0.013						
	2.0	45	1.1	0.045	<0.013						
	4.0	85	3.2	0.12	<0.013						

Table 3
Cumulative Arsenic Extracted – Kewaunee Geoprobe Composite Samples Multiple Extraction Test
Using DI Water Extractant

SAMPLE		EXTRACTION									
ID	DRYWT	1	2	3	4	5	6	7	8	9	10
Cumulative Arsenic Mass extracted, mg/kg											
Ballast (1,400)	0.5	262	331	367	395	415	427	436	445	453	457
	1.0	287	370	414	446	468	480	491	501	508	513
	2.0	237	314	358	392	419	433	444	454	462	468
	4.0	195	269	315	356	382	397	407	417	425	430
	10	165	238	291	329						
	20	131	199	252	293						
Peat under Ballast (1,500)	0.5	925	1150	1250	1310	1350	1370	1386	1400	1410	1420
	1.0	750	1010	1135	1220	1279	1310	1335	1358	1373	1384
	2.0	750	981	1100	1190	1253	1292	1323	1349	1368	1383
	4.0	595	814	927	999	1080	1127	1161	1190	1212	1232
	10	500	738	913	1050						
	20	444	638	807	951						
Peat in Marsh (2,600)	0.5	2030	2350	2450	2510	2548	2568	2584	2596	2604	2610
	1.0	1570	1940	2090	2180	2244	2274	2301	2327	2344	2365
	2.0	1280	1620	1790	1910	2006	2063	2110	2152	2187	2218
	4.0	1270	1730	1920	2040	2148	2217	2267	2306	2342	2375
	10	1351	1828	2286	2510						
	20	1275	1666	1817	2136						
Organic Silt in Marsh (550)	0.5	247	346	400	440	465	481	496	511	518	523
	1.0	198	277	323	359	384	400	413	426	436	441
	2.0	161	235	285	325	359	381	399	414	426	435
	4.0	127	192	232	269	303	324	344	361	374	386
	10	102	135	157	168						
	20	74.3	99.7	116	123						
As Spiked Sand	0.5	880	890	890	890						
	1.0	920	931	932	932						
	2.0	900	922	923	923						

Figure 1
Arsenic Concentrations versus Elution Number for the 4g/40 mL Samples of Each Composite

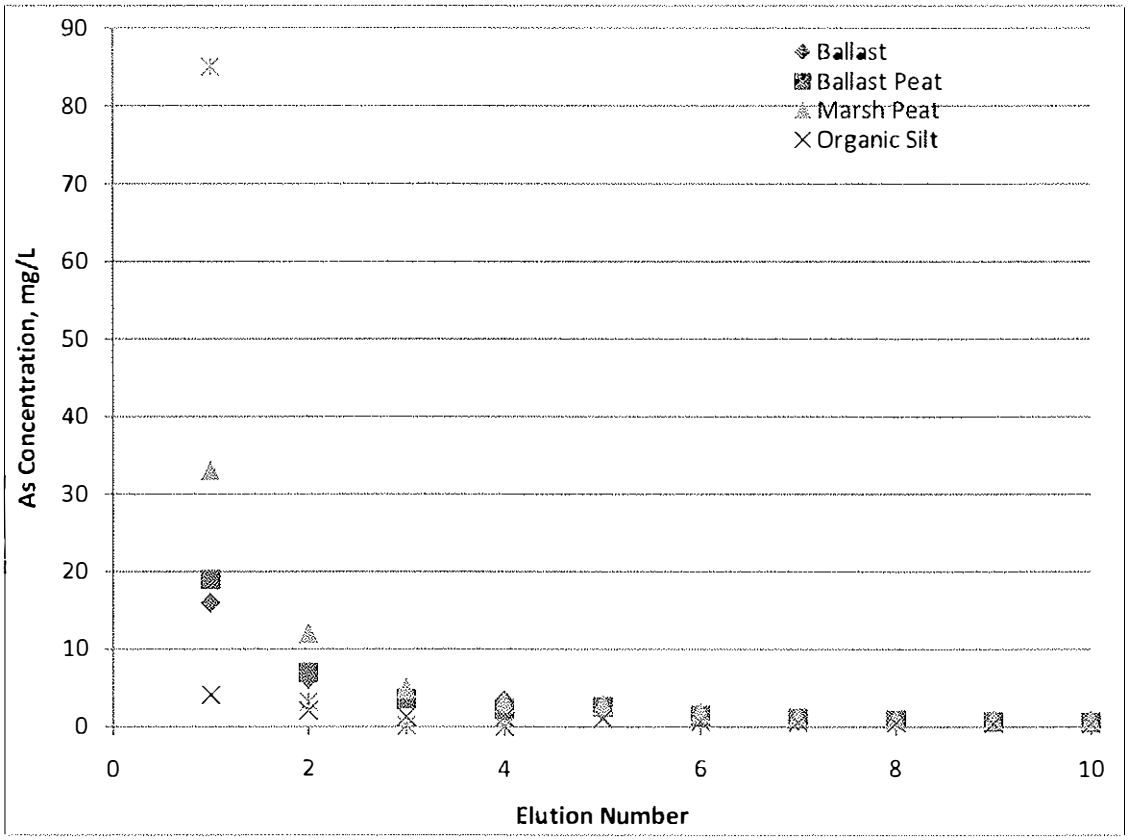


Figure 2
Arsenic Concentration versus Pore Volume for the Ballast Samples

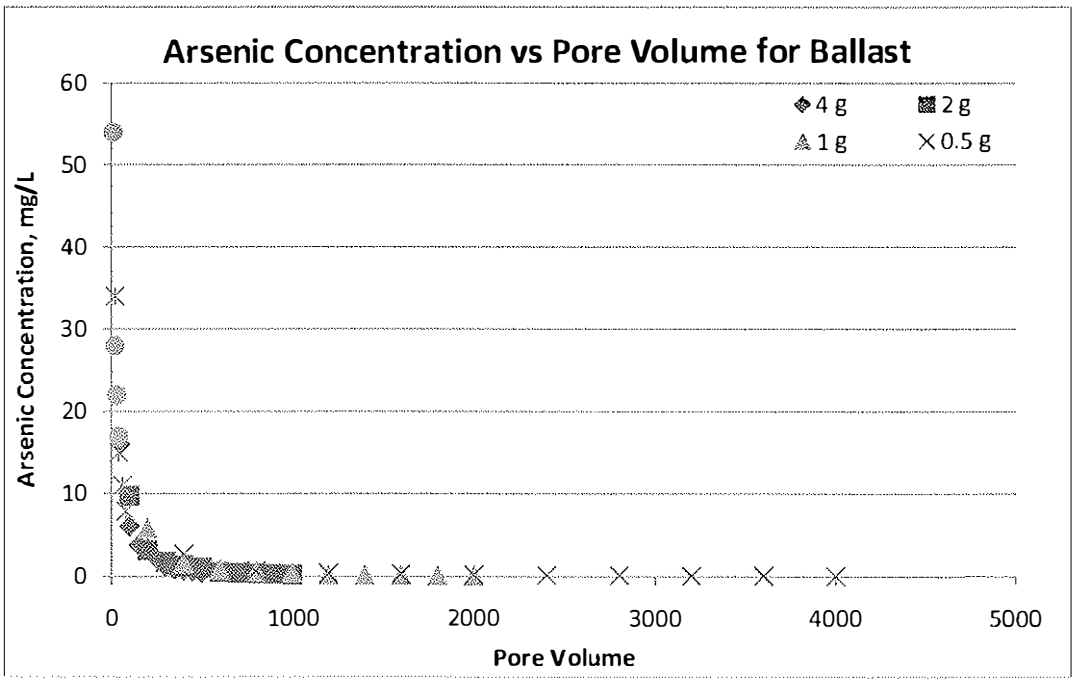
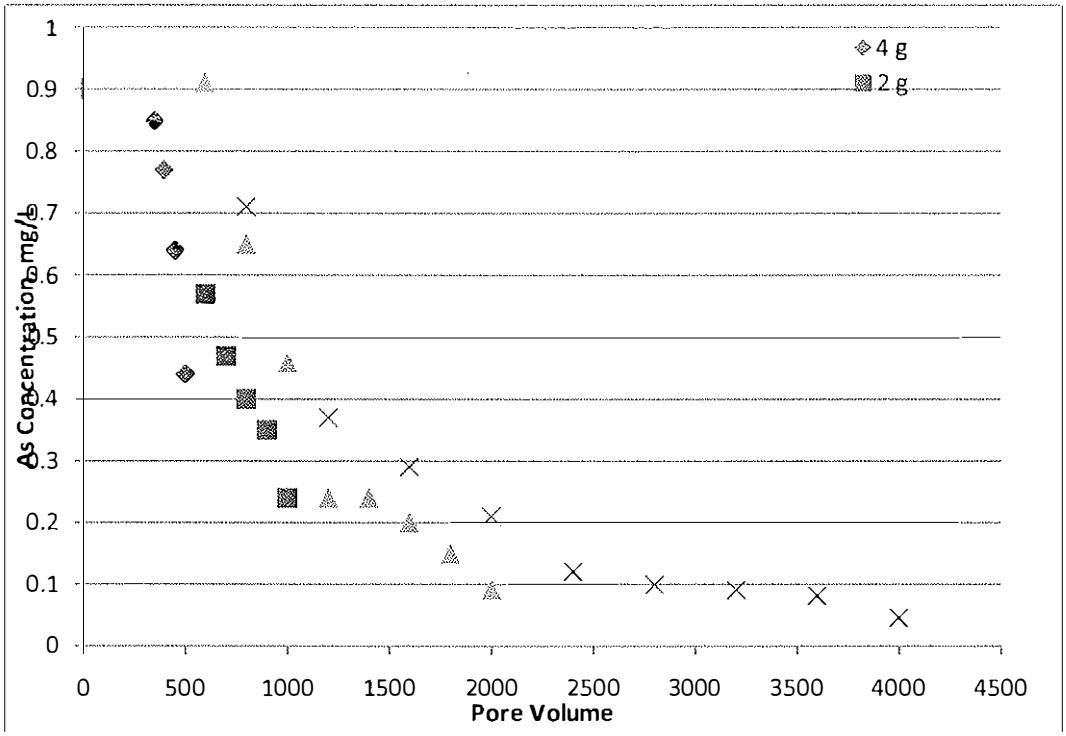


Figure 3
Arsenic Concentration (below 1 mg/L) versus Pore Volume for the Ballast Samples



Confirmation of Treatment Effectiveness for Sediments

RMT

Technical Memorandum

Date: May 5, 2010

To: Technical File

From: Bob Stanforth

Project No.: 02085.23.009

Subject: Kewaunee Confirmation of Treatment Effectiveness for Sediments

Introduction

A treatment process was developed for treating contaminated groundwater at the Kewaunee site, using the groundwater from MW04-10 and from in the ballast under the bike path, as discussed in the 2007 Treatability Report. The objectives of the treatment were as follows:

- Reduce dissolved arsenic to <170 μg/L
- Generate solids that do not leach arsenic at greater than 5 mg/L in a TCLP test

It was assumed that the bulk of the arsenic in the ballast was dissolved, and that the ballast solids would be inert in the treatment testing. Since the ballast solids appear to be predominantly sand, this assumption is not unreasonable. However, the sediment in the marsh contains significant amounts of organic matter, lower concentrations of arsenic, and presumably more arsenic tied up in the solid phase. It is important, therefore, to test the treatment chemistry developed for the ballast groundwater on the sediment samples, both from under the tracks and in the marsh to ensure that the treatment process is still effective.

During the Geoprobe sampling in December, 2009 high arsenic levels were found in several different types of media in addition to the ballast groundwater. High levels of arsenic were found in the peat under the ballast, in the peat in marsh adjacent to the tracks, and at somewhat lower levels in the organic silt under the peat in the marsh. All the media need to be tested to confirm treatment effectiveness.

Composite samples of the four types of soil found during the December, 2009 Geoprobe investigation were mixed with the treatment reagents developed for the groundwater in the ballast area to evaluate whether the reagents effectively immobilized arsenic in the soils. The treatment consists of the following (per kilogram of soil):

- 25 mL 3% H_2O_2
- 84 g $Fe_2(SO_4)_3$-xH_2O
- 60 g $CaCO_3$

The soils were treated and then subjected to both screening TCLP and SPLP tests, and the leachates analyzed for arsenic.

19

The treatment process was developed for the contaminated groundwater in the ballast and hot spot area in the marsh (near MW04-10). Since the ballast contains very little organic matter, and the treatment process will render the solids oxic, there is little driving force to generate anaerobic conditions in the ballast. Anaerobic conditions could reverse a small portion of the treatment chemistry and release some arsenic. Hence, there is some concern that the treatment process could be reversed if the samples become anoxic following treatment due to the continued biodegradation of the organic material in the solids. To address this concern the samples were saturated with DI water after aliquots were removed for the leaching tests and allowed to sit in capped beakers. Samples were taken after 10 days, 1 month, and after 3 months to determine whether arsenic is released from the treated material over time.

Results

The untreated ballast and two peat samples leached arsenic over the hazardous waste criterion of 5 mg/L in the screening TCLP (Table 1). The organic peat sample was marginally nonhazardous (at 3.1 mg/L As). All four samples leached significant amounts of arsenic (>1 mg/L) in an SPLP test.

Treatment with the proposed reagents reduced arsenic leaching in both the TCLP and SPLP tests to below detection (<0.013 mg/L). Arsenic concentrations remained below detection for all samples tested under saturated conditions.

The results indicate that the treatment process developed for the groundwater in the ballast is also effective for both the ballast solids and marsh solids, and maintains a low arsenic leaching potential from the solids for all the times tested (up to three months) after treatment.

Table 1
Results of Screening TCLP and SPLP Leaching Tests on the
Composite Geoprobe Samples With and Without Treatment

SAMPLE		SCREENING TCLP		SCREENING SPLP	
		pH	As, mg/L	pH	As, mg/L
Ballast					
Untreated		5.94	8.4	8.91	13
Treated	Immediate	5.98	<0.013	6.56	<0.013
	10 Day			7.46	<0.013
	1 month			7.63	<0.013
	3 month			7.74	<0.013
Peat Under Ballast					
Untreated		6.27	11	8.36	11
Treated	Immediate	6.14	<0.013	6.71	<0.013
	10 Day			7.31	<0.013
	1 month			7.44	<0.013
	3 month			7.54	<0.013
Peat in Marsh					
Untreated		5.44	24	8.33	18
Treated	Immediate	5.94	<0.013	5.70	<0.013
	10 Day			6.93	<0.013
	1 month			6.97	<0.013
	3 month			7.44	<0.013
Organic Silt in Marsh					
Untreated		6.29	3.1	8.76	2.5
Treated	Immediate	6.28	<0.013	7.21	<0.013
	10 Day			7.46	<0.013
	1 month			7.56	<0.013
	3 month			7.77	<0.013

Dose Response Testing

RMT

Technical Memorandum

Date: May 5, 2010

To: Technical File

From: Bob Stanforth

Project No.: 02085.23.009

Subject: Kewaunee Dose Response Testing For Hot-Spot Sediments

Introduction

With an increased area of "hot-spot" sediment that may require treatment, and with much lower soluble arsenic concentrations than found in the ballast groundwater, lower doses of treatment additives were tested to see if the dose could be reduced and still have effective treatment. The initial "dose" was that determined for the ballast groundwater. However, since the objective was to lower the leachable arsenic to below the hazardous waste criterion of 5 mg/L rather than to meet a groundwater criterion, the arsenite oxidation using peroxide was not included. The selected chemistry consisted of the following:

- 8.4% Ferric Sulfate ($Fe_2(SO_4)_3 \bullet xH_2O$)
- 6.0% high calcium limestone

Varying proportions (0.1, 0.25, and 0.5 times) of this dose were introduced to the composite sediments of differing arsenic concentrations made up form the March 2010 Geoprobe investigation samples. The treated samples were subjected to both screening TCLP and screening SPLP tests.

Results

The results are given below.

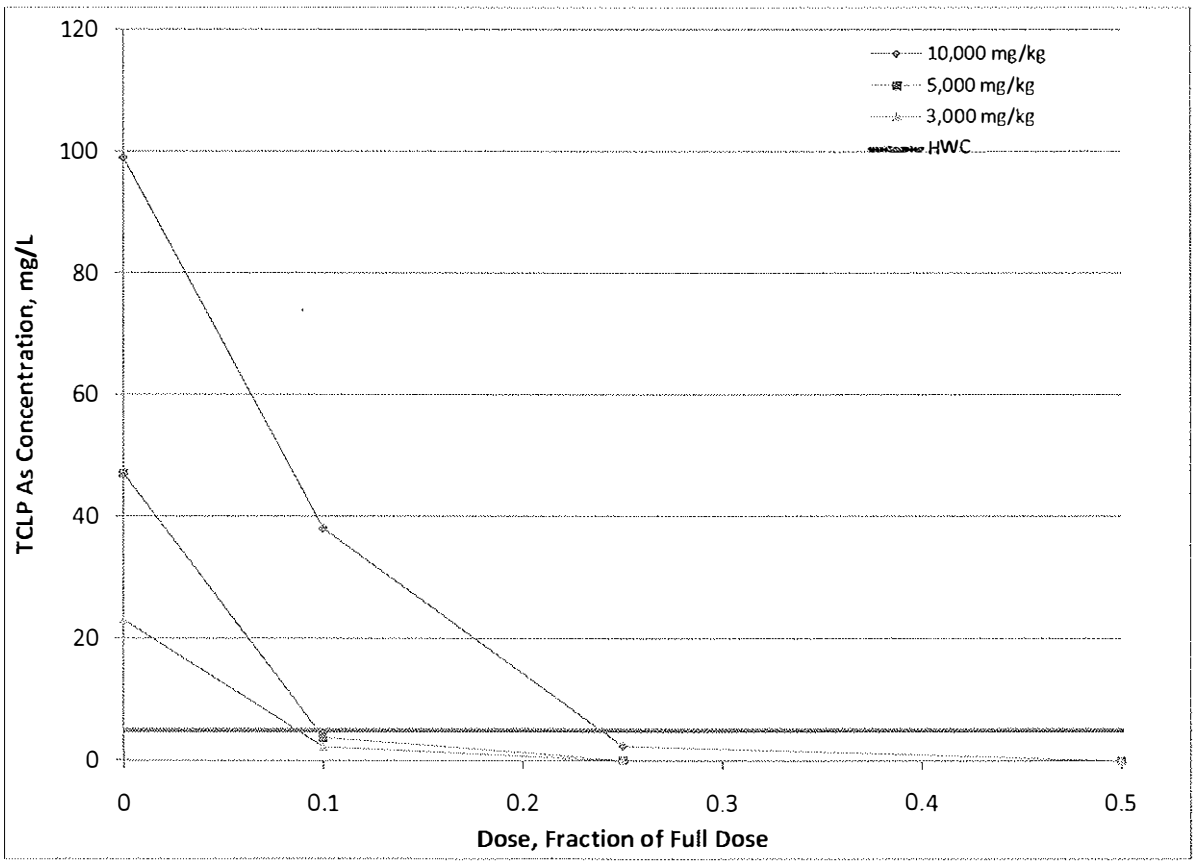
DOSE	SCREENING TCLP		SCREENING SPLP	
	pH	As, mg/L	pH	As, mg/L
~10,000 mg/kg As Sediment				
Untreated	5.28	94	7.88	99
	5.39	99	8.10	88
0.10 Dose	5.45	38	7.60	27
0.25 Dose	5.49	2.4	7.05	0.96
0.50 Dose	5.73	<0.013	5.61	0.025
~5000 mg/kg As Sediment				
Untreated	5.50	38	8.08	42
	5.40	47	8.14	35
0.10 Dose	5.60	3.8	7.44	2.6
0.25 Dose	5.52	0.099	6.52	0.062
0.50 Dose	5.61	<0.013	6 02	<0 013

25

DOSE	SCREENING TCLP		SCREENING SPLP	
	pH	As, mg/L	pH	As, mg/L
2000-4000 mg/kg As Sediment				
Untreated	5.57	22	8.42	16
	5.54	23	8.45	16
0.10 Dose	5.65	2.3	7.35	0.20
0.25 Dose	5.59	<0.013	6.68	0.023
0.50 Dose	5.67	<0.013	5.91	<0.013

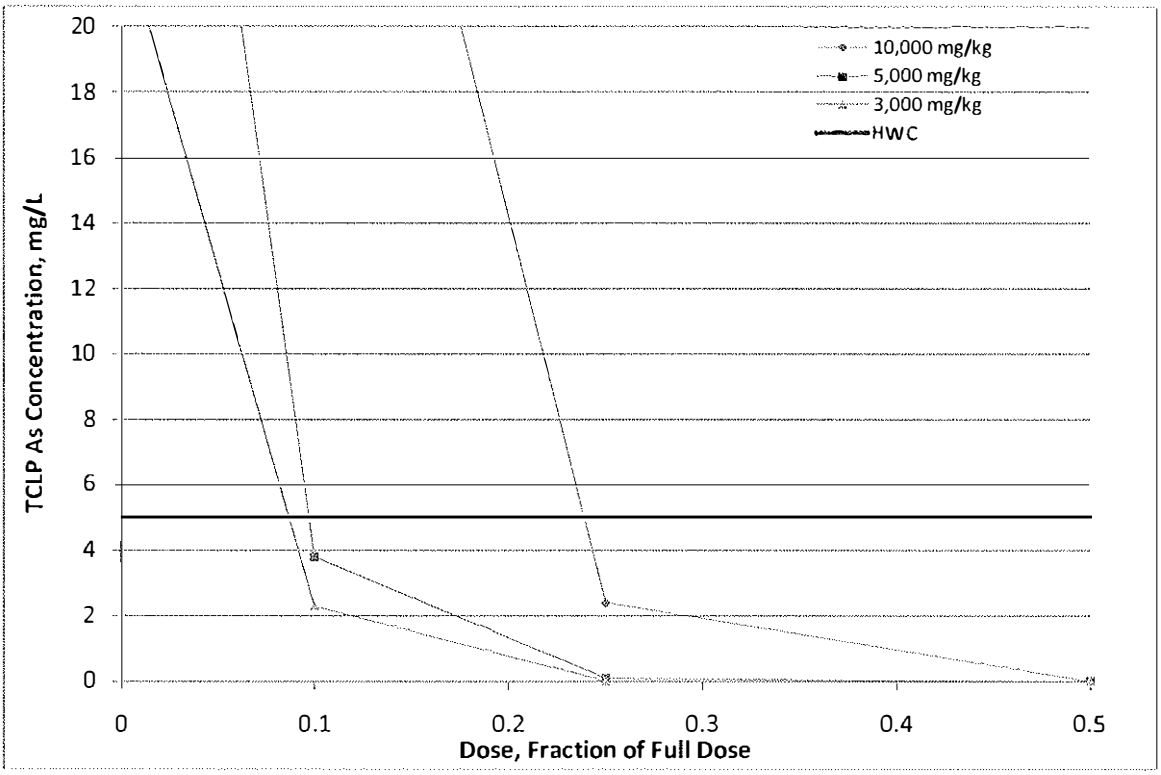
The results indicate that a much lower dose of the treatment additive is required for reducing leaching from the sediments to below 5 mg/L, with a 0.25 X dose effective for the most contaminated sediments, and a 0.10 X dose effective for the sediments with lower arsenic levels (5000 mg/kg and below). A plot of the TCLP arsenic concentration versus dose (as the fraction of the groundwater treatment dose) is shown in Figure 1. Figure 2 shows the same results with the Y-axis expanded so that results under the hazardous waste criterion (HWC) for arsenic (5 mg/L)are more clearly seen. Since there is very little sediment with the very high arsenic levels (~10,000 mg/kg), an overall dose for the contaminated sediment of 1% ferric sulfate and 0.75% limestone (or 0.125 X dose) should be effective for the bulk of the material. For the higher arsenic concentrations (5000 mg/kg and above) a 0.25 X dose is effective.

Figure 1
TCLP As versus Dose for Kewaunee Sediments of Differing Arsenic Concentrations
(HWC – Hazardous Waste Criterion)



26

Figure 2
TCLP As versus Dose for Kewaunee Sediments of Differing Arsenic Concentrations, with the Y-axis Expanded so that Concentrations Around the Hazardous Waste Criterion (HWC) are More Clearly Seen



27

Addition of Bentonite

RMT

Technical Memorandum

Date: May 11, 2010

To: Technical File

From: Bob Stanforth

Project No.: 02085.23.009

Subject: Addition of Bentonite to Treated Kewaunee Peat Samples

Introduction

The treatment process for the Kewaunee sediment samples is designed to immobilize arsenic so that it is insoluble and immobile in the treated material. This process could be improved by reducing the permeability of the treated material, so that the potential for arsenic mobility back into the marsh is reduced still further. To test this concept, samples of treated peat material were further treated with different amounts of bentonite and the permeability of the samples measured.

Procedure

Samples of contaminated peat were mixed with the target treatment reagent (6.6 mL 3% peroxide, 21 g ferric sulfate and 15 g high calcium limestone per kilogram of sediment). The samples were allowed to react for several hours (to ensure all gas has been generated from the acid-limestone reaction), then different amounts of sodium bentonite powder were added, as shown in the Table 1 below. The bentonite was allowed to hydrate, then the samples were placed into permeameter cells, gently compacted by hand and the permeability measured in a flexible wall permeameter using a falling head permeameter test (ASTM D5084).

Results

The permeability results are presented in Table 1 below. Laboratory data sheets are attached.

SAMPLE	BENTONITE	PERMEABILITY, cm/sec
Untreated	0	4.6×10^{-7}
Treated	0	2.9×10^{-7}
	2%	3.1×10^{-7}
	4%	1.8×10^{-7}
	6%	1.3×10^{-7}
	8%	1.1×10^{-7}

Conclusions

Somewhat surprisingly, the untreated sediment has a relatively low permeability even without treatment or bentonite addition. Permeabilities in the peat layers in field range from 1.5×10^{-4} to 6.7×10^{-3} cm/sec, (STS, 2004). The laboratory measurements for the untreated material has a permeability three orders of magnitude lower than what is found in the field. The lower permeability in the lab sample may be due to the disruption of the sediment layering that enhances horizontal permeability in the field. Disruption of this layering, which occurs due to the annual deposition of the plant material, can lower the permeability significantly. Treatment of the sediment would disrupt the layering, and would be anticipated to lower the permeability even without addition of either treatment reagents or bentonite. Addition of the treatment reagents lowered the permeability slightly, since the reagents form very fine solids which plug the pores in the sediment, while addition of bentonite lowered the permeability still further. However, the difference in permeability between the sample with no bentonite (2.9×10^{-7} cm/sec) and the highest (8%) bentonite dose (1.1×10^{-7} cm/sec) is fairly small. The addition of bentonite provides some assurance that the permeability has been reduced. However, the disruption of the sediment structure during treatment is the major factor reducing permeability.

The laboratory test does not perfectly model what will happen in the field, but is indicative of a significant reduction in permeability just due to working the marsh material. The actual decrease in permeability due to the treatment will need to be determined in the field.

A previous estimate of groundwater flow rates at the site gave a groundwater velocity of 0.37 ft/yr using a permeability of 1.7×10^{-4} cm/sec (STS, 2004). A reduction in permeability of several orders of magnitude would lower the groundwater flow velocity to insignificant rates, such that the groundwater would be essentially static in the treated area.

RMT, Inc.

Falling Head Permeability Test (ASTM D5084)

QC: JH

QA: JM

Project Name:	WDNR - Kewaunee	Cell #:	8
Project #:	02085.01.001	USCS Description:	N/A
Sample Name:	AC100-4042	USCS Classification:	N/A
Visual Descript:	Marsh Sediment	Average Kv =	4.6E-07 cm/sec

		Initial Values	Final Values			
Sample Type:	Remoided					
Sample Dia. (in)		2.85	2.70	Permeant:	Water	
Sample Ht. (in)		2.20	1.97	Permeant Specific Gravity:	1.00	
Tare & Wet (g)		299.22	518.80	Sample Specific Gravity:	1.95	Est.
Tare & Dry (g)		144.00	408.10	Confining Pressure (psi):	100.0	
Tare (g)		0.00	264.10	Burette Diameter (in):	0.250	
Sample Wt. (g)		299.22	254.70	Burette Zero (cm):	100.0	
				Final Sample Condition:	Consolidated	
Moisture (%)		107.8	76.9	Maximum Gradient:	13.7	
Wet Density (pcf)		81.2	86.0	Average Gradient:	10.9	
Dry Density (pcf)		39.1	48.6	Max. Effect. Stress (psi):	3.2	
Saturation (%)		99.6	100.0	Min. Effect. Stress (psi):	1.3	
				Ave. Effect. Stress (psi):	2.1	

	Date			Time		Run	Temp	Pressure (psi)			Cham.		Bot.		Top	Flow	Kv ***	Ave.*
	Yr.	Mo.	Day	Hr.	Min.	Time	C***	Bot	Top	Cham	Dif.	Bot	Dif.	Top	Dif.	Dif.%	cm/sec	0,1
1	2010	5	3	13	3.00		0.0	98	98	20.55		3.95		100.65				
2	2010	5	3	13	37.00	2040	20.0	98	98	25.35	4.80	6.40	2.45	94.60	6.05	-42.4	9.7E-07	
3	2010	5	3	14	10.00	1980	20.0	98	98	27.50	2.15	8.95	2.55	91.25	3.35	-13.6	7.5E-07	
4	2010	5	3	14	46.00	2160	20.0	98	98	29.10	1.60	11.75	2.80	88.20	3.05	-4.3	7.3E-07	
5	2010	5	3	14	57.00	660	20.0	98	98	30.15	1.05	12.40	0.65	87.20	1.00	-21.2	7.1E-07	
6	2010	5	4	5	53.00		0.0	98	98	54.00		2.55		98.95				
7	2010	5	4	7	4.00	4260	20.0	98	98	55.35	1.35	7.65	5.10	93.40	5.55	-4.2	5.9E-07	
8	2010	5	4	8	4.00	3600	20.0	98	98	56.80	1.45	11.40	3.75	89.70	3.70	0.7	5.4E-07	
9	2010	5	4	8	57.00	3180	20.0	98	98	57.90	1.10	14.40	3.00	86.50	3.20	-3.2	5.6E-07	
10	2010	5	4	9	58.00	3660	20.0	98	98	58.20	0.30	17.70	3.30	83.35	3.15	2.3	5.5E-07	
11	2010	5	4	10	59.00	3660	20.0	98	98	59.40	1.20	20.55	2.85	80.40	2.95	-1.7	5.4E-07	
12	2010	5	4	12	4.00	3900	20.0	98	98	60.20	0.80	23.40	2.85	77.65	2.75	1.8	5.4E-07	
13	2010	5	4	13	5.00	3660	20.0	98	98	61.70	1.50	25.75	2.35	75.20	2.45	-2.1	5.4E-07	
14	2010	5	4	14	7.00	3720	20.0	98	98	62.40	0.70	28.00	2.25	73.15	2.05	4.7	5.2E-07	
15	2010	5	4	16	16.00	7740	20.0	98	98	64.60	2.20	31.85	3.85	69.30	3.85	0.0	5.2E-07	
16	2010	5	5	5	40.00		0.0	98	98	15.15		4.20		99.30				
17	2010	5	5	6	40.00	3600	20.0	98	98	18.00	2.85	7.30	3.10	94.25	5.05	-23.9	5.3E-07	
18	2010	5	5	7	42.00	3720	20.0	98	98	18.90	0.90	10.55	3.25	90.75	3.50	-3.7	4.7E-07	
19	2010	5	5	8	42.00	3600	20.0	98	98	19.20	0.30	13.60	3.05	87.70	3.05	0.0	4.7E-07	
20	2010	5	5	9	42.00	3600	20.0	98	98	20.60	1.40	16.25	2.65	84.60	3.10	-7.8	4.8E-07	
21	2010	5	5	10	42.00	3600	19.0	98	98	20.90	0.30	18.80	2.55	82.05	2.55	0.0	4.7E-07	1
22	2010	5	5	11	42.00	3600	20.0	98	98	22.10	1.20	21.15	2.35	79.50	2.55	-4.1	4.8E-07	1
23	2010	5	5	12	42.00	3600	20.0	98	98	22.40	0.30	23.35	2.20	77.40	2.10	2.3	4.6E-07	1
24	2010	5	5	13	42.00	3600	20.0	98	98	23.50	1.10	25.20	1.85	75.25	2.15	-7.5	4.6E-07	1
25	2010	5	5	14	43.00	3660	20.0	98	98	24.00	0.50	27.15	1.95	73.40	1.85	2.6	4.6E-07	1
26	2010	5	5	15	50.00	4020	20.0	98	98	24.40	0.40	28.90	1.75	71.40	2.00	-6.7	4.5E-07	1

**A zero in this column starts a series of measurements. (Termination determined by stable Kv and low flow differential.)

*Average Kv for those rows with a 1 in the Ave. column. 4.6E-07 cm/sec

***Kv adjusted for temperature.

33

RMT, Inc.

Falling Head Permeability Test (ASTM D5084)

QC: MP

QA: MM

Project Name:	WDNR - Kewaunee	Cell #:	3
Project #:	02085.01.001	USCS Description:	N/A
Sample Name:	AC10040-13	USCS Classification:	N/A
Visual Descript:	Treated Sediment	Average Kv =	2.9E-07 cm/sec

Sample Type:	Remolded	Initial Values	Final Values		
Sample Dia. (in)		2.85	2.75	Permeant:	Water
Sample Ht. (in)		2.13	1.80	Permeant Specific Gravity:	1.00
Tare & Wet (g)		297.80	501.00	Sample Specific Gravity:	2.08 Est.
Tare & Dry (g)		146.49	396.42	Confining Pressure (psi):	100.0
Tare (g)		0.00	249.93	Burette Diameter (in):	0.250
Sample Wt. (g)		297.80	251.07	Burette Zero (cm):	100.0
				Final Sample Condition:	Consolidated
Moisture (%)		103.3	71.4	Maximum Gradient:	20.5
Wet Density (pcf)		83.7	89.5	Average Gradient:	11.0
Dry Density (pcf)		41.2	52.2	Max. Effect. Stress (psi):	3.1
Saturation (%)		99.8	100.0	Min. Effect. Stress (psi):	1.4
				Ave. Effect. Stress (psi):	2.2

	Date			Time		Run	Temp	Pressure (psi)			Cham.		Bot.		Top	Flow	Kv ***	Ave.*
	Yr.	Mo.	Day	Hr.	Min.	Time	C***	Bot	Top	Cham	Dif.	Bot	Dif.	Top	Dif.	Dif.%	cm/sec	0,1
1	2010	4	30	10	29.00		0.0	98	98	62.20		17.90		98.25				
2	2010	4	30	12	39.00	7800	20.0	98	98	64.10	1.90	23.55	5.65	91.45	6.80	-9.2	4.1E-07	
3	2010	4	30	13	40.00	3660	20.0	98	98	64.45	0.35	25.90	2.35	89.85	1.60	19.0	3.1E-07	
4	2010	4	30	14	11.00	1860	20.0	98	98	64.80	0.35	27.00	1.10	87.70	2.15	-32.3	5.3E-07	
5	2010	5	3	6	11.00		0.0	98	98	22.80		1.70		100.70				
6	2010	5	3	7	11.00	3600	20.0	98	98	23.85	1.05	4.35	2.65	97.05	3.65	-15.9	3.5E-07	
7	2010	5	3	8	12.00	3660	20.0	98	98	24.10	0.25	7.10	2.75	93.90	3.15	-6.8	3.4E-07	
8	2010	5	3	9	12.00	3600	20.0	98	98	24.60	0.50	9.65	2.55	91.15	2.75	-3.8	3.3E-07	
9	2010	5	3	11	13.00	7260	21.0	98	98	25.80	1.20	14.30	4.65	86.20	4.95	-3.1	3.2E-07	
10	2010	5	3	12	44.00	5460	20.0	98	98	25.00	-0.80	17.35	3.05	82.75	3.45	-6.2	3.3E-07	
11	2010	5	3	14	8.00	5040	20.0	98	98	25.55	0.55	19.95	2.60	79.90	2.85	-4.6	3.3E-07	
12	2010	5	4	5	49.00	56460	20.0	98	98	29.80	4.25	37.15	17.20	60.95	18.95	-4.8	3.1E-07	
13	2010	5	4	5	58.00		0.0	98	98	30.30		37.25		100.50				
14	2010	5	4	7	59.00	7260	20.0	98	98	31.20	0.90	40.50	3.25	96.30	4.20	-12.8	3.3E-07	
15	2010	5	4	10	1.00	7356	20.0	98	98	31.60	0.40	43.50	3.00	93.10	3.20	-3.2	3.0E-07	
16	2010	5	4	11	59.00	7044	20.0	98	98	32.20	0.60	45.95	2.45	90.25	2.85	-7.5	3.0E-07	
17	2010	5	4	14	0.00	7260	20.0	98	98	32.70	0.50	48.25	2.30	87.70	2.55	-5.2	3.0E-07	
18	2010	5	4	16	8.00	7680	20.0	98	98	33.50	0.80	50.40	2.15	85.35	2.35	-4.4	3.0E-07	
19	2010	5	5	5	31.00	48180	20.0	98	98	37.15	3.65	58.75	8.35	75.70	9.65	-7.2	2.8E-07	
20	2010	5	5	5	40.00		0.0	98	98	37.05		41.95		98.75				
21	2010	5	5	7	44.00	7440	20.0	98	98	37.60	0.55	10.05	5.10	93.65	5.10	0.0	2.9E-07	1
22	2010	5	5	9	44.00	7200	20.0	98	98	37.60	0.00	14.30	4.25	89.15	4.50	-2.9	2.9E-07	1
23	2010	5	5	11	45.00	7260	20.0	98	98	37.75	0.15	18.15	3.85	85.20	3.95	-1.3	2.9E-07	1
24	2010	5	5	13	44.00	7140	20.0	98	98	38.00	0.25	21.50	3.35	81.60	3.60	-3.6	2.9E-07	1
25	2010	5	5	16	23.00	9540	20.0	98	98	38.50	0.50	25.40	3.90	77.55	4.05	-1.9	2.8E-07	1
26	2010	5	6	7	37.00	54840	19.0	98	98	41.30	2.80	39.30	13.90	62.80	14.75	-3.0	2.8E-07	1

**A zero in this column starts a series of measurements.

*Average Kv for those rows with a 1 in the Ave. column. 2.9E-07 cm/sec

(Termination determined by stable Kv and low flow differential.)

***Kv adjusted for temperature.

RMT, Inc.

Falling Head Permeability Test (ASTM D5084)

QC: JD

QA: MJ

Project Name:	WDNR - Kewaunee	Cell #:	4
Project #:	02085.01.001	USCS Description:	N/A
Sample Name:	AC100404-H	USCS Classification:	N/A
Visual Descript:	Treated Sediment	Average Kv =	3.1E-07 cm/sec

		Initial Values	Final Values			
Sample Type:	Remolded					
Sample Dia. (in)		2.85	2.70	Permeant:	Water	
Sample Ht. (in)		2.17	2.00	Permeant Specific Gravity:	1.00	
Tare & Wet (g)		303.03	525.80	Sample Specific Gravity:	2.04	Est.
Tare & Dry (g)		151.20	412.30	Confining Pressure (psi):	100.0	
Tare (g)		0.00	261.10	Burette Diameter (in):	0.250	
Sample Wt. (g)		303.03	264.70	Burette Zero (cm):	100.0	
				Final Sample Condition:	Consolidated	
Moisture (%)		100.4	75.1	Maximum Gradient:	18.9	
Wet Density (pcf)		83.4	88.1	Average Gradient:	10.5	
Dry Density (pcf)		41.6	50.3	Max. Effect. Stress (psi):	3.2	
Saturation(%)		99.5	100.0	Min. Effect. Stress (psi):	1.2	
				Ave. Effect. Stress (psi):	2.3	

	Date			Time		Run	Temp	Pressure (psi)			Cham.		Bot.		Top	Flow		Kv ***	Ave.*
	Yr.	Mo.	Day	Hr.	Min.	Time	C***	Bot	Top	Cham	Dif.	Bot	Dif.	Top	Dif.	Dif.%	cm/sec	0,1
1	2010	4	30	10	29.00		0.0	98	98	70.70		17.65		98.40				
2	2010	4	30	12	40.00	7860	20.0	98	98	72.85	2.15	23.15	5.50	89.25	9.15	-24.9	5.5E-07	
3	2010	4	30	13	41.00	3660	20.0	98	98	73.20	0.35	25.55	2.40	86.60	2.65	-5.0	4.7E-07	
4	2010	4	30	14	12.00	1860	20.0	98	98	73.40	0.20	26.60	1.05	85.40	1.20	-6.7	4.4E-07	
5	2010	5	3	6	12.00		0.0	98	98	17.05		1.00		99.30				
6	2010	5	3	7	12.00	3600	20.0	98	98	18.70	1.65	3.35	2.35	95.30	4.00	-26.0	4.0E-07	
7	2010	5	3	8	12.00	3600	20.0	98	98	19.10	0.40	5.85	2.50	92.05	3.25	-13.0	3.9E-07	
8	2010	5	3	9	12.00	3600	20.0	98	98	19.95	0.85	8.20	2.35	89.20	2.85	-9.6	3.8E-07	
9	2010	5	3	11	13.00	7260	21.0	98	98	21.40	1.45	12.55	4.35	84.10	5.10	-7.9	3.6E-07	
10	2010	5	3	12	44.00	5460	20.0	98	98	20.35	-1.05	15.35	2.80	80.50	3.60	-12.5	3.7E-07	
11	2010	5	3	14	8.00	5040	20.0	98	98	20.90	0.55	17.75	2.40	77.65	2.85	-8.6	3.6E-07	
12	2010	5	4	5	49.00	56460	20.0	98	98	24.90	4.00	34.20	16.45	58.25	19.40	-8.2	3.5E-07	
13	2010	5	4	5	58.00		0.0	98	98	25.15		34.20		100.75				
14	2010	5	4	8	0.00	7320	20.0	98	98	28.80	3.65	37.40	3.20	96.50	4.25	-14.1	3.5E-07	
15	2010	5	4	10	3.00	7380	20.0	98	98	26.20	-2.60	40.30	2.90	93.00	3.50	-9.4	3.4E-07	
16	2010	5	4	12	0.00	7020	20.0	98	98	26.70	0.50	42.75	2.45	90.05	2.95	-9.3	3.4E-07	
17	2010	5	4	14	1.00	7260	20.0	98	98	27.30	0.60	45.00	2.25	87.35	2.70	-9.1	3.3E-07	
18	2010	5	4	16	10.00	7740	20.0	98	98	27.80	0.50	47.10	2.10	84.80	2.55	-9.7	3.3E-07	
19	2010	5	5	5	32.00	48120	20.0	98	98	30.75	2.95	55.65	8.55	74.35	10.45	-10.0	3.2E-07	
20	2010	5	5	5	41.00		0.0	98	98	30.55		2.85		99.05				
21	2010	5	5	7	45.00	7440	20.0	98	98	30.90	0.35	7.55	4.70	94.05	5.00	-3.1	3.1E-07	1
22	2010	5	5	9	45.00	7200	20.0	98	98	30.80	-0.10	11.55	4.00	89.60	4.45	-5.3	3.1E-07	1
23	2010	5	5	11	46.00	7260	20.0	98	98	30.90	0.10	15.20	3.65	85.65	3.95	-3.9	3.1E-07	1
24	2010	5	5	13	46.00	7200	20.0	98	98	31.10	0.20	18.40	3.20	82.10	3.55	-5.2	3.0E-07	1
25	2010	5	5	16	24.00	9480	20.0	98	98	31.40	0.30	22.15	3.75	78.00	4.10	-4.5	3.0E-07	1
26	2010	5	6	7	41.00	55020	19.0	98	98	33.20	1.80	36.10	13.95	62.50	15.50	-5.3	3.0E-07	1

**A zero in this column starts a series of measurements.

*Average Kv for those rows with a 1 in the Ave. column.

3.1E-07 cm/sec

(Termination determined by stable Kv and low flow differential.)

***Kv adjusted for temperature.

35

RMT, Inc.

QC: JA

Falling Head Permeability Test (ASTM D5084)

QA: JS

Project Name:	WDNR - Kewaunee	Cell #:	5
Project #:	02085.01.001	USCS Description:	N/A
Sample Name:	AC10040445	USCS Classification:	N/A
Visual Descript:	Treated Sediment	Average Kv =	1.8E-07 cm/sec

		Initial Values	Final Values			
Sample Type:	Remolded					
Sample Dia. (in)		2.85	2.72	Permeant:	Water	
Sample Ht. (in)		2.23	2.10	Permeant Specific Gravity:	1.00	
Tare & Wet (g)		316.03	537.40	Sample Specific Gravity:	2.04	Est.
Tare & Dry (g)		163.81	417.90	Confining Pressure (psi):	100.0	
Tare (g)		0.00	254.09	Burette Diameter (in):	0.250	
Sample Wt. (g)		316.03	283.31	Burette Zero (cm):	100.0	
				Final Sample Condition:	Consolidated	
Moisture (%)		92.9	73.0	Maximum Gradient:	17.6	
Wet Density (pcf)		84.6	88.4	Average Gradient:	12.0	
Dry Density (pcf)		43.9	51.1	Max. Effect. Stress (psi):	2.9	
Saturation (%)		99.7	100.0	Min. Effect. Stress (psi):	1.3	
				Ave. Effect. Stress (psi):	2.0	

	Date			Time		Run	Temp	Pressure (psi)			Cham.		Bot.		Top	Flow	Kv ***	Ave.*
	Yr.	Mo.	Day	Hr.	Min.	Time	C***	Bot	Top	Cham	Dif.	Bot	Dif.	Top	Dif.	Dif.%	cm/sec	0,1
1	2010	4	30	10	30.00		0.0	98	98	34.50		21.45		98.00				
2	2010	4	30	12	41.00	7860	20.0	98	98	35.85	1.35	23.90	2.45	92.60	5.40	-37.6	3.1E-07	
3	2010	4	30	13	42.00	3660	20.0	98	98	36.15	0.30	25.05	1.15	91.30	1.30	-6.1	2.2E-07	
4	2010	4	30	14	13.00	1860	20.0	98	98	36.30	0.15	25.60	0.55	90.80	0.50	4.8	1.9E-07	
5	2010	5	3	6	13.00		0.0	98	98	47.10		2.30		100.80				
6	2010	5	3	7	13.00	3600	20.0	98	98	47.15	0.05	3.80	1.50	99.15	1.65	-4.8	2.0E-07	
7	2010	5	3	8	13.00	3600	20.0	98	98	46.95	-0.20	5.30	1.50	97.60	1.55	-1.6	2.0E-07	
8	2010	5	3	9	13.00	3600	20.0	98	98	47.30	0.35	6.75	1.45	96.10	1.50	-1.7	2.0E-07	
9	2010	5	3	11	14.00	7260	21.0	98	98	48.20	0.90	9.45	2.70	93.30	2.80	-1.8	1.9E-07	
10	2010	5	3	12	45.00	5460	20.0	98	98	46.85	-1.35	11.45	2.00	91.25	2.05	-1.2	2.0E-07	
11	2010	5	3	14	9.00	5040	20.0	98	98	47.10	0.25	13.15	1.70	89.55	1.70	0.0	1.9E-07	
12	2010	5	4	5	50.00	56460	20.0	98	98	48.60	1.50	27.75	14.60	74.70	14.85	-0.8	1.9E-07	
13	2010	5	4	8	1.00	7860	20.0	98	98	49.10	0.50	29.20	1.45	73.20	1.50	-1.7	1.9E-07	
14	2010	5	4	10	7.00	7560	20.0	98	98	49.00	-0.10	30.55	1.35	71.80	1.40	-1.8	1.9E-07	
15	2010	5	4	12	1.00	6840	20.0	98	98	49.30	0.30	31.70	1.15	70.60	1.20	-2.1	1.9E-07	
16	2010	5	4	14	3.00	7320	20.0	98	98	49.70	0.40	32.85	1.15	69.45	1.15	0.0	1.9E-07	
17	2010	5	4	16	11.00	7680	20.0	98	98	50.90	1.20	33.90	1.05	68.30	1.15	-4.5	1.8E-07	
18	2010	5	5	5	33.00	48120	20.0	98	98	51.55	0.65	39.45	5.55	62.55	5.75	-1.8	1.9E-07	
19	2010	5	5	5	42.00		0.0	98	98	51.70		4.65		98.40				
20	2010	5	5	7	46.00	7440	20.0	98	98	52.00	0.30	7.40	2.75	95.40	3.00	-4.3	1.9E-07	1
21	2010	5	5	9	46.00	7200	20.0	98	98	51.80	-0.20	9.90	2.50	92.80	2.60	-2.0	1.9E-07	1
22	2010	5	5	11	47.00	7260	20.0	98	98	51.90	0.10	12.30	2.40	90.40	2.40	0.0	1.9E-07	1
23	2010	5	5	13	47.00	7200	20.0	98	98	52.00	0.10	14.50	2.20	88.20	2.20	0.0	1.8E-07	1
24	2010	5	5	16	25.00	9480	20.0	98	98	52.10	0.10	17.20	2.70	85.40	2.80	-1.8	1.8E-07	1
25	2010	5	6	7	45.00	55200	20.0	98	98	53.30	1.20	29.25	12.05	73.20	12.20	-0.6	1.8E-07	1
26	2010	5	6	9	42.00	7020	20.0	98	98	53.70	0.40	30.40	1.15	72.00	1.20	-2.1	1.8E-07	1

**A zero in this column starts a series of measurements.
(Termination determined by stable Kv and low flow differential.)

*Average Kv for those rows with a 1 in the Ave. column. 1.8E-07 cm/sec

***Kv adjusted for temperature.

36

RMT, Inc.

QC:

Falling Head Permeability Test (ASTM D5084)

QA:

Project Name:	WDNR - Kewaunee	Cell #:	6
Project #:	02085.01.001	USCS Description:	N/A
Sample Name:	AC1004046	USCS Classification:	N/A
Visual Descript:	Treated Sediment	Average Kv =	1.3E-07 cm/sec

Sample Type: Remolded	Initial Values	Final Values			
Sample Dia. (in)	2.85	2.75	Permeant:	Water	
Sample Ht. (in)	2.31	2.10	Permeant Specific Gravity:	1.00	
Tare & Wet (g)	325.21	540.00	Sample Specific Gravity:	1.98	Est.
Tare & Dry (g)	169.89	421.40	Confining Pressure (psi):	100.0	
Tare (g)	0.00	251.51	Burette Diameter (in):	0.250	
Sample Wt. (g)	325.21	288.49	Burette Zero (cm):	100.0	
			Final Sample Condition:	Consolidated	
Moisture (%)	91.4	69.8	Maximum Gradient:	17.8	
Wet Density (pcf)	84.1	88.1	Average Gradient:	13.4	
Dry Density (pcf)	43.9	51.9	Max. Effect. Stress (psi):	3.1	
Saturation (%)	99.8	100.0	Min. Effect. Stress (psi):	1.2	
			Ave. Effect. Stress (psi):	2.1	

	Date			Time		Run	Temp	Pressure (psi)			Cham.		Bot.		Top	Flow	Kv***	Ave.*
	Yr.	Mo.	Day	Hr.	Min.	Time	C***	Bot	Top	Cham	Dif.	Bot	Dif.	Top	Dif.	Dif.%	cm/sec	0.1
1	2010	4	30	10	30.00		0.0	98	98	42.00		198.5		98.10				
2	2010	4	30	12	42.00	7920	20.0	98	98	43.15	1.15	22.05	2.20	95.40	2.70	-10.2	1.8E-07	
3	2010	4	30	13	43.00	3660	20.0	98	98	43.70	0.55	22.85	0.80	94.30	1.10	-15.8	1.6E-07	
4	2010	4	30	14	13.00	1800	20.0	98	98	43.90	0.20	23.30	0.45	93.80	0.50	-5.3	1.6E-07	
5	2010	5	3	6	14.00		0.0	98	98	55.60		2.55		100.55				
6	2010	5	3	7	14.00	3600	20.0	98	98	55.60	0.00	3.85	1.30	99.35	1.20	4.0	1.6E-07	
7	2010	5	3	8	14.00	3600	20.0	98	98	55.60	0.00	5.00	1.15	98.15	1.20	-2.1	1.5E-07	
8	2010	5	3	9	14.00	3600	20.0	98	98	55.80	0.20	6.10	1.10	97.10	1.05	2.3	1.4E-07	
9	2010	5	3	11	14.00	7200	21.0	98	98	56.60	0.80	8.30	2.20	95.05	2.05	3.5	1.4E-07	
10	2010	5	3	12	45.00	5460	20.0	98	98	55.45	-1.15	9.75	1.45	93.35	1.70	-7.9	1.5E-07	
11	2010	5	3	14	9.00	5040	20.0	98	98	55.65	0.20	11.20	1.45	92.05	1.30	5.5	1.5E-07	
12	2010	5	4	5	50.00	56460	20.0	98	98	57.40	1.75	23.70	12.50	79.65	12.40	0.4	1.4E-07	
13	2010	5	4	8	2.00	7920	20.0	98	98	58.00	0.60	25.05	1.35	78.30	1.35	0.0	1.4E-07	
14	2010	5	4	10	8.00	7560	20.0	98	98	58.10	0.10	26.35	1.30	77.05	1.25	2.0	1.4E-07	
15	2010	5	4	12	2.00	6840	20.0	98	98	58.20	0.10	27.40	1.05	75.90	1.15	-4.5	1.4E-07	
16	2010	5	4	14	5.00	7380	20.0	98	98	58.50	0.30	28.55	1.15	74.85	1.05	4.5	1.4E-07	
17	2010	5	4	16	13.00	7680	20.0	98	98	59.00	0.50	29.65	1.10	73.75	1.10	0.0	1.4E-07	
18	2010	5	5	5	34.00	48060	20.0	98	98	60.55	1.55	35.25	5.60	67.95	5.80	-1.8	1.4E-07	
19	2010	5	5	5	42.00		0.0	98	98	18.65		2.75		97.95				
20	2010	5	5	7	48.00	7560	20.0	98	98	19.80	1.15	4.55	1.80	95.25	2.70	-20.0	1.4E-07	1
21	2010	5	5	9	48.00	7200	20.0	98	98	19.90	0.10	6.40	1.85	93.20	2.05	-5.1	1.3E-07	1
22	2010	5	5	11	48.00	7200	20.0	98	98	20.10	0.20	8.10	1.70	91.20	2.00	-8.1	1.3E-07	1
23	2010	5	5	13	48.00	7200	20.0	98	98	20.50	0.40	9.80	1.70	89.40	1.80	-2.9	1.3E-07	1
24	2010	5	5	16	26.00	9480	20.0	98	98	20.70	0.20	11.90	2.10	87.10	2.30	-4.5	1.3E-07	1
25	2010	5	6	7	46.00	55200	20.0	98	98	22.80	2.10	21.80	9.90	76.40	10.70	-3.9	1.3E-07	1
26	2010	5	6	9	43.00	7020	20.0	98	98	23.40	0.60	22.80	1.00	75.35	1.05	-2.4	1.2E-07	1

**.A zero in this column starts a series of measurements. (Termination determined by stable Kv and low flow differential.)

*Average Kv for those rows with a 1 in the Ave. column. 1.3E-07 cm/sec

***Kv adjusted for temperature.

37

RMT, Inc.

QC: [illegible]

Falling Head Permeability Test (ASTM D5084)

QA: [illegible]

Project Name:	WDNR - Kowaunee	Cell #:	7
Project #:	02085.01.001	USCS Description:	N/A
Sample Name:	AC1004047	USCS Classification:	N/A
Visual Descript:	Treated Sediment	Average Kv =	1.1E-07 cm/sec

Sample Type:	Remolded	Initial Values	Final Values			
Sample Dia. (in)		2.85	2.72	Permeant:	Water	
Sample Ht. (in)		2.36	2.22	Permeant Specific Gravity:	1.00	
Tare & Wet (g)		337.68	565.00	Sample Specific Gravity:	2.15	Est.
Tare & Dry (g)		171.84	433.70	Confining Pressure (psi):	100.0	
Tare (g)		0.00	261.86	Burette Diameter (in):	0.250	
Sample Wt. (g)		337.68	303.14	Burette Zero (cm):	100.0	
				Final Sample Condition:	Consolidated	
Moisture (%)		96.5	76.4	Maximum Gradient:	7.4	
Wet Density (pcf)		85.4	89.5	Average Gradient:	6.0	
Dry Density (pcf)		43.5	50.7	Max. Effect. Stress (psi):	3.1	
Saturation (%)		99.5	100.0	Min. Effect. Stress (psi):	1.4	
				Ave. Effect. Stress (psi):	2.2	

	Date			Time		Run	Temp	Pressure (psi)			Cham.		Bot.		Top	Flow		Kv***	Ave.*
	Yr.	Mo.	Day	Hr.	Min.	Time	C***	Bot	Top	Cham	Dif.	Bot	Dif.	Top	Dif.	Dif.%	cm/sec	0,1
1	2010	4	30	10	31.00		0.0	98	98	60.75		19.35		97.45				
2	2010	4	30	12	42.00	7860	20.0	98	98	62.70	1.95	20.70	1.35	95.00	2.45	-28.9	1.5E-07	
3	2010	4	30	13	43.00	3660	20.0	98	98	63.15	0.45	21.40	0.70	94.20	0.80	-6.7	1.3E-07	
4	2010	4	30	14	44.00	1860	20.0	98	98	63.25	0.10	21.75	0.35	93.85	0.35	0.0	1.2E-07	
5	2010	5	3	6	16.00		0.0	98	98	22.85		2.40		100.95				
6	2010	5	3	7	15.00	3540	20.0	98	98	24.40	1.55	2.85	0.45	99.05	1.90	-61.7	1.6E-07	
7	2010	5	3	8	15.00	3600	20.0	98	98	24.65	0.25	3.55	0.70	98.05	1.00	-17.6	1.2E-07	
8	2010	5	3	9	15.00	3600	20.0	98	98	25.20	0.55	4.30	0.75	97.10	0.95	-11.8	1.2E-07	
9	2010	5	3	11	15.00	7200	21.0	98	98	26.65	1.45	5.85	1.55	95.40	1.70	-4.6	1.2E-07	
10	2010	5	3	12	46.00	5460	20.0	98	98	25.75	-0.90	6.95	1.10	94.05	1.35	-10.2	1.2E-07	
11	2010	5	3	14	10.00	5040	20.0	98	98	26.30	0.55	7.95	1.00	92.90	1.15	-7.0	1.2E-07	
12	2010	5	4	5	51.00	56460	20.0	98	98	29.85	3.55	17.90	9.95	82.50	10.40	-2.2	1.2E-07	
13	2010	5	4	8	3.00	7920	20.0	98	98	30.60	0.75	19.10	1.20	81.40	1.10	4.3	1.1E-07	
14	2010	5	4	10	9.00	7560	20.0	98	98	30.60	0.00	20.15	1.05	80.20	1.20	-6.7	1.2E-07	
15	2010	5	4	12	3.00	6840	20.0	98	98	30.90	0.30	21.10	0.95	79.25	0.95	0.0	1.1E-07	
16	2010	5	4	14	6.00	7380	20.0	98	98	31.40	0.50	22.10	1.00	78.20	1.05	-2.4	1.2E-07	
17	2010	5	4	16	14.00	7680	20.0	98	98	31.90	0.50	23.10	1.00	77.20	1.00	0.0	1.1E-07	
18	2010	5	5	5	35.00	48060	20.0	98	98	34.05	2.15	28.40	5.30	71.55	5.65	-3.2	1.1E-07	
19	2010	5	5	7	49.00	8040	20.0	98	98	34.70	0.65	29.15	0.75	70.80	0.75	0.0	1.0E-07	
20	2010	5	5	9	49.00	7200	20.0	98	98	34.60	-0.10	29.80	0.65	70.05	0.75	-7.1	1.1E-07	1
21	2010	5	5	11	49.00	7200	20.0	98	98	34.60	0.00	30.40	0.60	69.35	0.70	-7.7	1.1E-07	1
22	2010	5	5	13	49.00	7200	20.0	98	98	34.80	0.20	31.05	0.65	68.75	0.60	4.0	1.1E-07	1
23	2010	5	5	16	27.00	9480	20.0	98	98	36.00	1.20	31.80	0.75	67.90	0.85	-6.2	1.1E-07	1
24	2010	5	6	7	47.00	55200	20.0	98	98	36.70	0.70	35.60	3.80	63.70	4.20	-5.0	1.1E-07	1
25	2010	5	6	9	44.00	7020	20.0	98	98	37.30	0.60	36.05	0.45	63.25	0.45	0.0	1.1E-07	1
26																		

**A zero in this column starts a series of measurements.
(Termination determined by stable Kv and low flow differential.)

*Average Kv for those rows with a 1 in the Ave. column. 1.1E-07 cm/sec

***Kv adjusted for temperature.

38/38

Appendix C
Concentration Trend Over Time Analysis

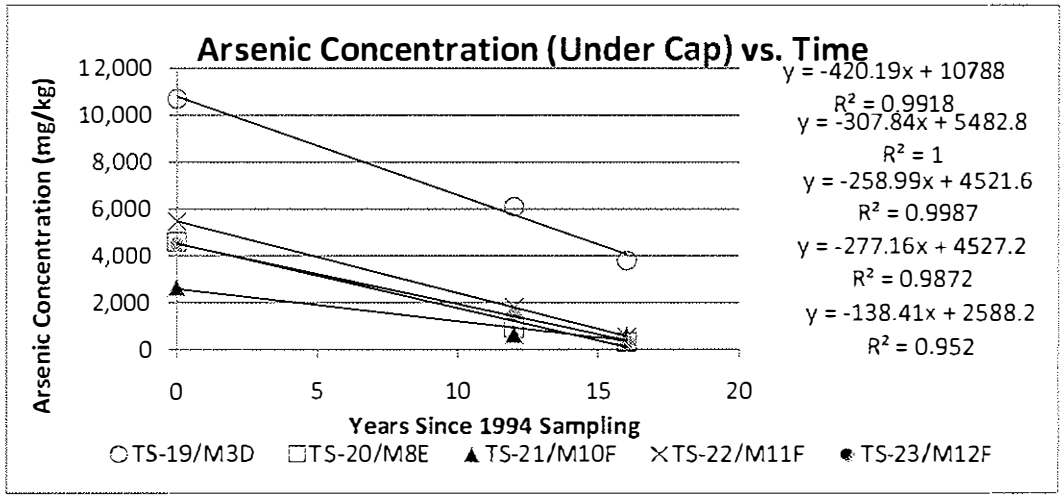
Appendix C

Evaluation of Arsenic Concentration Trends Under the Cap

Kewaunee Marsh - Kewaunee, WI

April 2010

	ARSENIC CONCENTRATION (mg/kg)		
LOCATION	STS 1994	RMT JUNE 2006	RMT MARCH 2010
YEARS	0	12	16
TS-18	2,030	340	--
TS-19/M3D	10,700	6,100	3,800
TS-20/M8E	4,600	910	311
TS-21/M10F	2,660	640	589
TS-22/M11F	5,480	1,800	549
TS-23/M12F	4,500	1,500	313
TS-24	1,880	1,100	--



What is the concentration today that will be approximately 1,000 mg/kg in 4 years?
1. Choose average slope = -245.6
2. Set x (years) to be 4 years
3. Set y (target concentration) to be 1000 mg/kg
4. Solve for starting concentration today (the y-intercept) [1000 = - 245.6 * 4 + concentration]
5. Solution 2000 mg/kg

Slopes for Low Concentration	
	307.84
	258.99
	277.16
	138.41
Average Slope	245.6

3/1

SCALE OF DETAIL

0 50 100 FEET

1 " = 60 '
1:720

N

M5A M5B M5C M5D M6E M7E M8E M2A M2B M2C M3D M4D M5E M2D M2E M5F M9F M10F M11F M12F B2A B2B B2C B1D B2D B3D B3E B2E B1E M2F B2F MW04-10 SB02-18 T-19 T-1 T-20 T-21 T-3 T-22 T-23 MW02-3 MW04-9 T-18 T-16 6-7 2-3 TEST PLOTS T-5 T-11 T-6 T-12

GROUNDWATER SOURCE AREA INVESTIGATION (DETAIL SHOWN ABOVE)

SITE LOCATION

LEGEND

HISTORIC SOIL ARSENIC CONCENTRATIONS IN SAMPLES COLLECTED BY STS (1994-2004)

- ARSENIC < 1,000 mg/kg
- ARSENIC > 1,000 mg/kg

RMT GEOPROBE 2005/2006

- ARSENIC < 1,000 mg/kg
- ARSENIC > 1,000 mg/kg

RMT GEOPROBE 2009/2010

- ARSENIC > 1,000 mg/kg
- ARSENIC < 1,000 mg/kg

} M-SERIES = MARSH (8-12 FT)
B-SERIES = BALLAST (15-30 FT)

- MONITORING WELL LOCATION
- FENCE
- CAPPED AREA
- APPROXIMATE AREA OF PREVIOUSLY DISTRESSED VEGETATION
- APPROXIMATE EXTENT OF CURRENT HOT SPOT AREA (>1,000 mg/kg) (DASHED WHERE INFERRED)
- APPROXIMATE EXTENT OF FUTURE HOT SPOT (>2,000 mg/kg)

NOTES:

1. ALL GEOPROBE BORINGS WERE LOCATED USING A TRIMBLE GEOXH GPS UNIT.
2. HOT SPOT IS DEFINED AS CONTAINING COMPOSITIONAL ARSENIC CONCENTRATIONS GREATER THAN 1,000 mg/kg. THIS COMPOSITIONAL CONCENTRATION CORRELATES TO POTENTIALLY HAZARDOUS MATERIAL (TCLP > 5 mg/kg).
3. THE HOTSPOT IMPACTS EXTEND APPROXIMATELY 10 FT BELOW GRADE IN THE MARSH AND ARE PRESENT 5-12 FT BELOW GRADE IN BALLAST.
4. THE FUTURE HOT SPOT REPRESENTS THE AREA THAT WILL HAVE ARSENIC > 1,000 mg/kg IN 4 YEARS BASED ON THE OBSERVED RATE OF DECREASE IN CONCENTRATION OVER THE LAST 15 YEARS.

PROJECT: WISCONSIN DEPARTMENT OF NATURAL RESOURCES
KEWAUNEE MARSH

SHEET TITLE: COMPARISON OF HISTORICAL AND CURRENT ARSENIC CONCENTRATIONS IN SOIL

DRAWN BY:	PAPEZ J	SCALE:		PROJ. NO.	00-07201.15
CHECKED BY:	SELLWOOD A		AS NOTED	FILE NO.	72011902.mxd
APPROVED BY:	FISH D	DATE PRINTED:			C.1
DATE:	MAY 2010		5/27/2010		

RMT
744 Heartland Trail
Madison, WI 53717-1934
P.O. Box 8923 53708-8923
Phone: 608-831-4444
Fax: 608-831-3334

D:\PRE_TESS_PROJECTS\07201\19\MXD\72011902.mxd 5/27/2010 13:41:03

Appendix D
Detailed Cost and Quantity Estimating Sheets

Table of Contents

- Cost Estimates
- Quantity Estimates

Cost Estimates

OPINION OF PROBABLE COST
WDNR - KEWAUNEE MARSH HOT SPOT REMEDIATION
KEWAUNEE, WI
PROJECT NO. 02085.21.001

OPTION 1a: *IN SITU* TREATMENT (11,000 cy)

ITEM	UNIT	UNIT COST	QTY	TOTAL
DIRECT CAPITAL COSTS				
Mobilization	ls	$30,000	1	$30,000
Site Preparation	ls	$67,500	1	$67,500
Mixing of treatment chemicals	week	$46,750	5	$233,750
Treatment Chemicals				
- Ferric sulfate	tons	$600	300	$180,000
- Limestone	tons	$50	200	$10,000
- Peroxide (50%)	gallon	$5	1,000	$4,600
- Bentonite	tons	$275	600	$165,000
Top Soil and Seed (Marsh Area)	sf	$1.65	30,000	$49,500
Fence Restoration	ls	$10,000	1	$10,000
Bike Path Restoration	ls	$50,000	1	$50,000
Demobilization	ls	$15,000	1	$15,000
Monitoring Well Construction	well	$2,500	4	$10,000
SUBTOTAL OF DIRECT CAPITAL COST				$825,350
30 % CONTINGENCY	%	30%		$247,605
INDIRECT CAPITAL COSTS				
Project management/administration	ls	$20,000	1	$20,000
Plans and Specifications	ls	$30,000	1	$30,000
Subcontracting	ls	$25,000	1	$25,000
Permitting	ls	$10,000	1	$10,000
Construction oversight	wk	$7,500	6	$45,000
Documentation reporting	ls	$15,000	1	$15,000
SUBTOTAL OF INDIRECT CAPITAL COSTS				$145,000
SUBTOTAL OF DIRECT AND INDIRECT CAPITAL COSTS				$1,217,955
FIRST YEAR OF GROUNDWATER MONITORING - SEMI-ANNUAL				
Project management/administration	hr	$195	20	$3,900
Groundwater sampling (4 wells, 2 times/yr)	hr	$100	50	$5,000
Field equipment/expenses	ls	$1,000	1	$1,000
Lab - As, Fe, SO4, pH , Calcium	each	$100	8	$800
Data evaluation	hr	$130	20	$2,600
Reporting	hr	$130	30	$3,900
SUBTOTAL OF FIRST YEAR OF MONITORING				$17,200
30 % CONTINGENCY	%	30%		$5,160
SUBTOTAL OF CAPITAL AND FIRST YEAR COSTS				**$1,240,315**

3

OPINION OF PROBABLE COST
WDNR - KEWAUNEE MARSH HOT SPOT REMEDIATION
KEWAUNEE, WI
PROJECT NO. 02085.21.001

OPTION 1a: *IN SITU* TREATMENT (11,000 cy)

ITEM	UNIT	UNIT COST	QTY	TOTAL
FUTURE ANNUAL COSTS				
MONITORING COSTS (ANNUAL - YEARS 2-20)				
Project management/administration	hr	$195	15	$2,925
Groundwater sampling (4 wells, once/yr)	hr	$100	25	$2,500
Field equipment and expenses	ls	$500	1	$500
Lab - As, Fe, SO4, pH , Calcium	each	$100	4	$400
Data evaluation	hr	$100	10	$1,000
Reporting	hr	$130	20	$2,600
SUBTOTAL FOR ANNUAL GROUNDWATER MONITORING				$9,925
30 % CONTINGENCY	%	30%		$2,978
PRESENT WORTH OF ANNUAL MONITORING	19	years @	3%	**$184,813**
TOTAL COST (TOTAL CAPITAL + PRESENT WORTH)			**Total**	**$1,430,000**
			+ 50%	**$2,150,000**
			- 30%	**$1,000,000**

Prepared By. A. Sellwood

ASSUMPTIONS:

1. Costs rounded up to the nearest ten thousand dollars.
2. Costs determined from experience and estimates from other similar projects.
3. Contingency is assumed to be 30% of direct capital costs, monitoring costs, and annual O&M.
4. Indirect costs do not include legal fees or public relations assistance.
5. Interest rate 3%; the balance of an 8% interest rate less a 5% inflation rate, based on EPA approach for remedial cost estimating.
6. All costs are based on preliminary concepts. They are intended for remedial option comparison and not for final budgeting.

REMEDIATION NOTES:

1. Mobilization includes the mobilization of equipment, swamp mats, chemicals and job trailer to the site.
2. Site preparation includes removal of 100 LF of existing chain link fence, installation of approximately 4500 LF of silt fence, and set up of a site trailer and construction of a site laydown area for storage of equipment and materials at the intersection of the road and bike path. Assumes existing bike path can be used as access road.
3. *In situ* treatment includes construction of a temporary access ramp to the marsh and assumes treatment of approximately 500 CY/day with the specified chemicals
4. Bike path restoration includes backfilling the excavated area and grading up to 2,000 cy of gravel over the section of path used by trucks to access the site.
5. Site restoration includes repair of the 100 LF of chainlink fence and application of 6-inches of top soil and seed to the marsh. It does not include wetlands restoration.

4

OPINION OF PROBABLE COST
WDNR - KEWAUNEE MARSH HOT SPOT REMEDIATION
KEWAUNEE, WI
PROJECT NO. 02085.21.001

OPTION 1B: *IN SITU* TREATMENT (3,000 cy)

ITEM	UNIT	UNIT COST	QTY	TOTAL
DIRECT CAPITAL COSTS				
Mobilization	ls	$30,000	1	$30,000
Site Preparation	ls	$50,000	1	$50,000
Mixing of treatment chemicals	week	$46,750	2	$93,500
Treatment Chemicals				
- Ferric sulfate	tons	$600	70	$42,000
- Limestone	tons	$50	50	$2,500
- Peroxide (50%)	gallon	$5	300	$1,380
- Bentonite	tons	$275	160	$44,000
Top Soil and Seed (Marsh Area)	sf	$1.65	12,000	$19,800
Fence Restoration	ls	$10,000	1	$10,000
Bike Path Restoration	ls	$50,000	1	$50,000
Demobilization	ls	$15,000	1	$15,000
Monitoring Well Construction	well	$2,500	3	$7,500
SUBTOTAL OF DIRECT CAPITAL COST				$365,680
30 % CONTINGENCY	%	30%		$109,704
INDIRECT CAPITAL COSTS				
Project management/administration	ls	$15,000	1	$15,000
Plans and Specifications	ls	$20,000	1	$20,000
Subcontracting	ls	$20,000	1	$20,000
Permitting	ls	$10,000	1	$10,000
Construction oversight	wk	$7,500	3	$22,500
Documentation reporting	ls	$10,000	1	$10,000
SUBTOTAL OF INDIRECT CAPITAL COSTS				$97,500
SUBTOTAL OF DIRECT AND INDIRECT CAPITAL COSTS				$572,884
FIRST YEAR OF GROUNDWATER MONITORING - SEMI-ANNUAL				
Project management/administration	hr	$195	20	$3,900
Groundwater sampling (3 wells, 2 times/yr)	hr	$100	40	$4,000
Field equipment/expenses	ls	$1,000	1	$1,000
Lab - As, Fe, SO4, pH , Calcium	each	$100	6	$600
Data evaluation	hr	$130	20	$2,600
Reporting	hr	$130	30	$3,900
SUBTOTAL OF FIRST YEAR OF MONITORING				$16,000
30 % CONTINGENCY	%	30%		$4,800
SUBTOTAL OF CAPITAL AND FIRST YEAR COSTS				**$593,684**

5

OPINION OF PROBABLE COST
WDNR - KEWAUNEE MARSH HOT SPOT REMEDIATION
KEWAUNEE, WI
PROJECT NO. 02085.21.001

OPTION 1B: *IN SITU* TREATMENT (3,000 cy)

ITEM	UNIT	UNIT COST	QTY	TOTAL
FUTURE ANNUAL COSTS				
MONITORING COSTS (ANNUAL - YEARS 2- 20)				
Project management/administration	hr	$195	15	$2,925
Groundwater sampling (3 wells, once/yr)	hr	$100	25	$2,500
Field equipment and expenses	ls	$500	1	$500
Lab - As, Fe, SO4, pH , Calcium	each	$100	3	$300
Data evaluation	hr	$100	10	$1,000
Reporting	hr	$130	20	$2,600
SUBTOTAL FOR ANNUAL GROUNDWATER MONITORING				$9,825
30 % CONTINGENCY	%	30%		$2,948
PRESENT WORTH OF ANNUAL MONITORING	19	years @	3%	**$182,951**
TOTAL COST (TOTAL CAPITAL + PRESENT WORTH)			**Total**	**$780,000**
			+ 50%	**$1,170,000**
			- 30%	**$550,000**

Prepared By. A. Sellwood

ASSUMPTIONS:

1. Costs rounded up to the nearest ten thousand dollars.
2. Costs determined from experience and estimates from other similar projects.
3. Contingency is assumed to be 30% of direct capital costs, monitoring costs, and annual O&M
4. Indirect costs do not include legal fees or public relations assistance.
5. Interest rate 3%; the balance of an 8% interest rate less a 5% inflation rate, based on EPA approach for remedial cost estimating.
6. All costs are based on preliminary concepts. They are intended for remedial option comparison and not for final budgeting.

REMEDIATION NOTES:

1. Mobilization includes the mobilization of equipment, swamp mats, chemicals and job trailer to the site.
2. Site preparation includes removal of 100 LF of existing chain link fence, installation of approximately 4500 LF of silt fence, and set up of a site trailer and construction of a site laydown area for storage of equipment and materials at the intersection of the road and bike path. Assumes existing bike path can be used as access road.
3. *In situ* treatment includes construction of a temporary access ramp to the marsh and assumes treatment of approximately 500 CY/day with the specified chemicals.
4. Bike path restoration includes backfilling the excavated area and grading up to 2,000 cy of gravel over the section of path used by trucks to access the site.
5. Site restoration includes repair of the 100 LF of chainlink fence and application of 6-inches of top soil and seed to the marsh. It does not include wetlands restoration.

OPINION OF PROBABLE COST
WDNR - KEWAUNEE MARSH HOT SPOT REMEDIATION
KEWAUNEE, WI
PROJECT NO. 02085.21.001

OPTION 2: *IN SITU* TREATMENT, WITH ON-SITE CONTAINMENT

ITEM	UNIT	UNIT COST	QTY	TOTAL
DIRECT CAPITAL COSTS				
Mobilization	ls	$30,000	1	$30,000
Site Preparation	ls	$67,500	1	$67,500
Mixing of treatment chemicals	week	$46,750	4	$187,000
Treatment Chemicals				
- Ferric sulfate	tons	$600	300	$180,000
- Limestone	tons	$50	200	$10,000
- Peroxide (50%)	gallon	$5	1,000	$4,600
Excavation and placement on cap	cy	$35	11,000	$385,000
Backfill and Seed (Marsh excavation)	cy	$45	11,000	$495,000
Top Soil and Seed (Capped Area)	sf	$1.65	87,000	$143,550
Fence Restoration	ls	$10,000	1	$10,000
Bike Path Restoration	ls	$80,000	1	$80,000
Demobilization	ls	$15,000	1	$15,000
Monitoring Well Construction	well	$2,500	5	$12,500
SUBTOTAL OF DIRECT CAPITAL COST				$1,620,150
30 % CONTINGENCY	%	30%		$486,045
INDIRECT CAPITAL COSTS				
Project management/administration	ls	$25,000	1	$25,000
Plans and Specifications	ls	$45,000	1	$45,000
Subcontracting	ls	$25,000	1	$25,000
Permitting	ls	$20,000	1	$20,000
Construction oversight	wk	$7,500	18	$135,000
Documentation reporting	ls	$25,000	1	$25,000
SUBTOTAL OF INDIRECT CAPITAL COSTS				$275,000
SUBTOTAL OF DIRECT AND INDIRECT CAPITAL COSTS				$2,381,195
FIRST YEAR OF GROUNDWATER MONITORING - SEMI-ANNUAL				
Project management/administration	hr	$195	20	$3,900
Groundwater sampling (5 wells, 2 times/yr)	hr	$100	55	$5,500
Field equipment/expenses	ls	$1,000	1	$1,000
Lab - As, Fe, SO4, pH , Calcium	each	$100	10	$1,000
Data evaluation	hr	$130	20	$2,600
Reporting	hr	$130	30	$3,900
SUBTOTAL OF FIRST YEAR OF MONITORING				$17,900
30 % CONTINGENCY	%	30%		$5,370
SUBTOTAL OF CAPITAL AND FIRST YEAR COSTS				**$2,404,465**

7

OPINION OF PROBABLE COST
WDNR - KEWAUNEE MARSH HOT SPOT REMEDIATION
KEWAUNEE, WI
PROJECT NO. 02085.21.001

OPTION 2: *IN SITU* TREATMENT, WITH ON-SITE CONTAINMENT

ITEM	UNIT	UNIT COST	QTY	TOTAL
ANNUAL COSTS				
HOT SPOT MONITORING COSTS (ANNUAL - YEARS 2-5)				
Project management/administration	hr	$195	10	$1,950
Groundwater sampling (3 wells, once/yr)	hr	$100	10	$1,000
Field equipment and expenses	ls	$500	1	$500
Lab - As and pH ,	each	$25	3	$75
Data evaluation	hr	$100	5	$500
Reporting	hr	$130	10	$1,300
SUBTOTAL FOR ANNUAL GROUNDWATER MONITORING				$5,325
30 % CONTINGENCY	%	30%		$1,598
PRESENT WORTH OF HOT SPOT MONITORING	4	years @	3%	**$25,732**
TREATED MATERIAL O&M (ONE TIME REPAIR EVENT = YEAR 10)				
Construction Cost	ls	$45,000	1	$45,000
PRESENT WORTH OF O&M				**$33,484**
TREATED MATERIAL MONITORING COSTS (ANNUAL - YEARS 2-20)				
Project management/administration	hr	$195	15	$2,925
Groundwater sampling (2 wells, once/yr)	hr	$100	25	$2,500
Field equipment and expenses	ls	$500	1	$500
Lab - As, Fe, SO4, pH , Calcium	each	$100	2	$200
Data evaluation	hr	$100	10	$1,000
Reporting	hr	$130	20	$2,600
SUBTOTAL FOR ANNUAL GROUNDWATER MONITORING				$9,725
30 % CONTINGENCY	%	30%		$2,918
PRESENT WORTH OF ANNUAL MONITORING	19	years @	3%	**$181,089**
PRESENT WORTH OF HOT SPOT MONITORING				**$25,732**
PRESENT WORTH OF TREATED MATERIAL O&M AND MONITORING				**$214,572.86**
TOTAL COST (TOTAL CAPITAL + PRESENT WORTH)			Total	$2,650,000
			+ 50%	$3,980,000
			- 30%	$1,860,000

Prepared By. A. Sellwood

ASSUMPTIONS:

1. Costs rounded up to the nearest ten thousand dollars.
2. Costs determined from experience and estimates from other similar projects.
3. Contingency is assumed to be 30% of direct capital costs, monitoring costs, and annual O&M.
4. Indirect costs do not include legal fees or public relations assistance.
5. Interest rate 3%; the balance of an 8% interest rate less a 5% inflation rate, based on EPA approach for remedial cost estimating.
6. All costs are based on preliminary concepts. They are intended for remedial option comparison and not for final budgeting.

REMEDIATION NOTES:

1. Mobilization includes the mobilization of equipment, swamp mats, chemicals and job trailer to the site.
2. Site preparation includes removal of 100 LF of existing chain link fence, installation of approximately 4500 LF of silt fence, and set up of a site trailer and construction of a site laydown area for storage of equipment and materials at the intersection of the road and bike path. Assumes existing bike path can be used as access road.
3. *In situ* treatment includes construction of a temporary access ramp to the marsh and assumes treatment of approximately 500 CY/day with the specified chemicals.
4. Onsite containment assumes purchase/rental of 500 LF of additional swamp mats to reach outer aroa of cap, production rate of 300 CY per day to transport and place treated material over approximately 2 acres of the exiting in tact cap to a height of up to 4 feet.
5. Bike path restoration includes backfilling the excavated area and grading up to 2,000 cy of gravel over the section of path used by trucks to access the site.
6. Site restoration includes repair of the 100 LF of chainlink fence and application of 6-inches of top soil and seed to the marsh. It does not include wetlands restoration.

OPINION OF PROBABLE COST
WDNR - KEWAUNEE MARSH HOT SPOT REMEDIATION
KEWAUNEE, WI
PROJECT NO. 02085.21.001

OPTION 3: *IN SITU* TREATMENT WITH OFF-SITE DISPOSAL

ITEM	UNIT	UNIT COST	QTY	TOTAL
DIRECT CAPITAL COSTS				
Mobilization	ls	$30,000	1	$30,000
Site Preparation	ls	$67,500	1	$67,500
Mixing of treatment chemicals	week	$46,750	4	$187,000
Treatment Chemicals				
- Ferric sulfate	tons	$600	200	$120,000
- Limestone	tons	$50	100	$5,000
- Peroxide	gal	$25	0	$0
Dewater - Magnesium Sulfate	tons	$175	1,200	$210,000
Excavate and Transport to Hickory Meadows	tons	$40	11,900	$476,000
Disposal (Hickory Meadows - Veolia Contract)	tons	$25	11,900	$297,500
Backfill and Seed (Marsh excavation)	cy	$45	11,000	$495,000
Fence Restoration	ls	$10,000	1	$10,000
Bike Path Restoration	ls	$80,000	1	$80,000
Demobilization	ls	$15,000	1	$15,000
Monitoring Well Construction	well	$2,500	3	$7,500
SUBTOTAL OF DIRECT CAPITAL COST				$2,000,500
30 % CONTINGENCY	%	30%		$600,150
INDIRECT CAPITAL COSTS				
Project management/administration	ls	$25,000	1	$25,000
Plans and Specifications	ls	$35,000	1	$35,000
Subcontracting	ls	$25,000	1	$25,000
Permitting	ls	$20,000	1	$20,000
Construction oversight	wk	$7,500	13	$97,500
Documentation reporting	ls	$25,000	1	$25,000
SUBTOTAL OF INDIRECT CAPITAL COSTS				$227,500
SUBTOTAL OF DIRECT AND INDIRECT CAPITAL COSTS				$2,828,150
FIRST YEAR OF GROUNDWATER MONITORING - SEMI-ANNUAL				
Project management/administration	hr	$195	20	$3,900
Groundwater sampling (3 wells, 2 times/yr)	hr	$100	50	$5,000
Field equipment/expenses	ls	$1,000	1	$1,000
Lab - As, pH	each	$25	6	$150
Data evaluation	hr	$130	20	$2,600
Reporting	hr	$130	30	$3,900
SUBTOTAL OF FIRST YEAR OF MONITORING				$16,550
30 % CONTINGENCY	%	30%		$4,965
SUBTOTAL OF CAPITAL AND FIRST YEAR COSTS				**$2,849,665**

OPINION OF PROBABLE COST
WDNR - KEWAUNEE MARSH HOT SPOT REMEDIATION
KEWAUNEE, WI
PROJECT NO. 02085.21.001

OPTION 3: *IN SITU* TREATMENT WITH OFF-SITE DISPOSAL

ITEM	UNIT	UNIT COST	QTY	TOTAL
FUTURE ANNUAL COSTS				
MONITORING COSTS (ANNUAL - YEARS 2-5)				
Project management/administration	hr	$195	15	$2,925
Groundwater sampling (3 wells, once/yr)	hr	$100	25	$2,500
Field equipment and expenses	ls	$500	1	$500
Lab - As, pH	each	$25	3	$75
Data evaluation	hr	$100	10	$1,000
Reporting	hr	$130	20	$2,600
SUBTOTAL FOR ANNUAL GROUNDWATER MONITORING				$9,600
30 % CONTINGENCY	%	30%		$2,880
PRESENT WORTH OF ANNUAL MONITORING	4	years @	3%	**$46,389**
PRESENT WORTH OF MONITORING				**$46,389.39**
TOTAL COST (TOTAL CAPITAL + PRESENT WORTH)			**Total**	**$2,900,000**
			+ 50%	**$4,350,000**
			- 30%	**$2,030,000**

Prepared By. A. Sellwood

ASSUMPTIONS:

1. Costs rounded up to the nearest hundred thousand dollars.
2. Costs determined from experience and estimates from other similar projects.
3. Contingency is assumed to be 30% of direct capital costs, monitoring costs, and annual O&M.
4. Indirect costs do not include legal fees or public relations assistance.
5. Interest rate 3%; the balance of an 8% interest rate less a 5% inflation rate, based on EPA approach for remedial cost estimating.
6. All costs are based on preliminary concepts. They are intended for remedial option comparison and not for final budgeting.

REMEDIATION NOTES:

1. Mobilization includes the mobilization of equipment, swamp mats, chemicals and job trailer to the site.
2. Site preparation includes removal of 100 LF of existing chain link fence, installation of approximately 4500 LF of silt fence, and set up of a site trailer and construction of a site laydown area for storage of equipment and materials at the intersection of the road and bike path. Assumes existing bike path can be used as access road.
3. *In situ* treatment includes construction of a temporary access ramp to the marsh and assumes treatment of approximately 500 CY/day with the specified chemicals.
4. Assumes excavation rate of 500 tons per day and disposal at the Veolia Hickory Meadows (53 miles from site).
5. Bike path restoration includes backfilling the excavated area and grading up to 2,000 cy of gravel over the section of path used by trucks to access the site.
6. Site restoration includes repair of the 100 LF of chainlink fence and application of 6-inches of top soil and seed to the marsh. It does not include wetlands restoration.

Quantity Estimates

Kewaunee Hot Spot Remediation
***In Situ* Treatment (Small Volume)**

Volumes

Location	Area (sf)	Depth (ft)	Volume (cy)
Ballast ("Clean")	1,750	5	400
Ballast (Hot Spot)	1,750	7	500
Marsh	5,600	8	1,700
		Total Hot Spot	**2,200**
		Benching/Slope (Add 25%)	**3,000**

Mass

Soil Type	Volume (cy)	γ_{sat} (lb/cf)	Mass (ton)	Mass (kg)
Sand/Silt	600	130	1,060	9.62E+05
Peat	2,400	65	2,110	1.92E+06
		Total	**3,170**	**2.88E+06**

Chemical Quantities

Material	Dose (%)	Tons
Ferric Sulfate	2.1	70
Limestone	1.5	50
Bentonite	5	160
	Dose (L/kg)	**Gallons**
Hydrogen Peroxide (30%)	0.000625	480
Hydrogen Peroxide (50%)		290

Prepared By: A. Sellwood 4/15/10

Kewaunee Hot Spot Remediation
In Situ or On- Site Containment

Volumes

Location	Area (sf)	Depth (ft)	Volume (cy)
Ballast ("Clean")	1,750	5	400
Ballast (Hot Spot)	1,750	7	500
Marsh	20,700	10	7,700
		Total Hot Spot	**8,200**
		Benching/Slope (Add 25%)	**11,000**

Mass

Soil Type	Volume (cy)	γ_{sat} (lb/cf)	Mass (ton)	Mass (kg)
Sand/Silt	2,200	130	3,870	3.51E+06
Peat	8,800	65	7,730	7.02E+06
		Total	**11,600**	**1.05E+07**

Chemical Quantities

Material	Dose (%)	Tons
Ferric Sulfate	2.1	300
Limestone	1.5	200
Bentonite	5	600
	Dose (L/kg)	**Gallons**
Hydrogen Peroxide (30%)	0.000625	1,800
Hydrogen Peroxide (50%)		1,080

Prepared By: A. Sellwood 4/15/10

Kewaunee Hot Spot Remediation
Off Site Disposal

Volumes

Location	Area (sf)	Depth (ft)	Volume (cy)
Ballast ("Clean")	1,750	5	400
Ballast (Hot Spot)	1,750	7	500
Marsh	20,700	10	7,700
		Total Hot Spot	**8,200**
		Benching/Slope (Add 25%)	**11,000**

Mass

Soil Type	Volume (cy)	γ_{sat} (lb/cf)	Mass (ton)	Mass (kg)
Sand/Silt	2,200	130	3,870	3.51E+06
Peat	8,800	65	7,730	7.02E+06
		Total	**11,600**	**1.05E+07**

Chemical Quantities

Material	Dose (%)	Tons
Ferric Sulfate	1.05	200
Limestone	0.75	100
	Dose (L/kg)	**Gallons**
Hydrogen Peroxide	0	0

Prepared By: A. Sellwood 4/15/10

Attachment A
Soil Boring Logs

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Kewaunee Marsh		B1D

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Dusty Harvey On-Site Environmental Services	12/7/2009	12/7/2009	Geoprobe

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	586.0 Feet MSL	2.1 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 243,967 N, 2,616,443 E S/C/N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N Feet ☐ S ☐ E Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Kewaunee	31	Kewaunee

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	60 36		1–5	SAND (SP), with gravel, medium grained, medium to light brown 10YR 6/4, moist.	SP									
2 CS	60 48		5–8	SANDY CLAY (CL), with trace gravel, brown 10YR 5/3, moist, soft. Large rock from 6.0 - 6.3 feet bgs. CLAY (CL), with sand, reddish gray brown 5YR 5/2, moist, soft.	CL CL									
3 CS	60 51		8–12	PEAT, with organics (wood and root mass), dark brown 10YR 3/2, moist, soft.										

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	
	RMT, Inc. 744 Heartland Trail Madison, WI 53717	Tel: 608-831-4444 Fax: 608-831-3334

This form is authorized by Chapters 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

1/44

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT

Form 4400-122A

Boring Number B1D — Use only as an attachment to Form 4400-122. —

Sample: Number and Type	Sample: Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
4 CS	60 42		13	ORGANIC SILT (OL), with shells and trace organics, dark greenish gray GLEY1 4/1, moist, soft.	OL									
			14											
			15											
			16											
			17											
			18											
			19	GRAVEL WITH SAND (GW), and trace fines, small to large, subangular, coarse to medium grained sand, light red brown 2.5YR 7/3, wet.	GW									
			20	E.O.B at 20 feet bgs.										

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Kewaunee Marsh		B1E

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Dusty Harvey On-Site Environmental Services	12/7/2009	12/7/2009	Geoprobe

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	586.0 Feet MSL	2.1 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 243,946 N, 2,616,456 E S/C/N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N Feet ☐ S ☐ E Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Kewaunee	31	Kewaunee

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	60 21		1	SAND (SP), with gravel, medium to fine grained, brown 10YR 5/3, moist.	SP									
2 CS	60 24		6	SANDY CLAY (CL), light red brown 2.5YR 6/3, moist, soft.	CL									
			7	PEAT, with organics (root mass, wood), dark brown black 10YR 3/2, moist, soft.										
3 CS	60 60		10											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	
	RMT, Inc. 744 Heartland Trail Madison, WI 53717	Tel: 608-831-4444 Fax: 608-831-3334

This form is authorized by Chapters 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number B1E — Use only as an attachment to Form 4400-122. —

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			13											
			14	ORGANIC SILT (OL), with shells and trace organics, dark greenish gray GLEY1 4/1, moist, soft.										
4 CS	60 48		15											
			16		OL									
			17											
			18											
			19	SANDY CLAY (CL), with gravel, fine to medium grained, reddish brown 5YR 5/3, very wet, soft.	CL									
			20	GRAVEL WITH SAND (GW), and trace fines, small to large, subangular, coarse to medium grained sand, light red brown 2.5YR 7/3, wet. E.O.B at 20 feet bgs.	GW									

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Kewaunee Marsh		B2A

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Dusty Harvey On-Site Environmental Services	12/8/2009	12/8/2009	Geoprobe

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	587.0 Feet MSL	2.1 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 244,022 N, 2,616,416 E S/C/N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N Feet ☐ S ☐ E Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Kewaunee	31	Kewaunee

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	60 39		1–12	SAND (SP), with gravel, medium grained, yellow brown 10YR 4/4, moist. Black stained material at 6.5 - 6.7 feet bgs. Ballast.	SP									
2 CS	60 45			Black stained material from 6.5 - 6.8 feet bgs. As above, with clay, moist to wet, red brown 5YR 5/3.										
3 CS	60 60			SAND (SP), with trace gravel, medium to fine grained, grayish brown 10YR 5/2, very wet.	SP									

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	
	RMT, Inc. 744 Heartland Trail Madison, WI 53717	Tel: 608-831-4444 Fax: 608-831-3334

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number B2A — Use only as an attachment to Form 4400-122. —

Sample: Number and Type	Sample: Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			13	PEAT, with organics (wood and root mass), dark brown 10YR 3/2, moist, soft.	SP									
			14											
			15	ORGANIC SILT (OL), with shells and trace organics, dark greenish gray GLEY1 4/1, moist, soft. E.O.B. at 15 feet bgs.	OL									

WDNR SBL 1998 07201DNR.GPJ WI DNR 2003.GDT 4/22/10

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Kewaunee Marsh		B2B

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Dusty Harvey On-Site Environmental Services	12/8/2009	12/8/2009	Geoprobe

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	587.0 Feet MSL	2.1 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 244,007 N, 2,616,427 E S/C/N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Kewaunee	31	Kewaunee

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	60 30		1	SAND (SP), with gravel, medium grained, small to large, subangular gravel, yellowish brown 10YR 5/4, moist.	SP									
2 CS	60 30		5											
			9	As above, with clay, moist to wet.										
3 CS	60 15		10											
			12											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	
	RMT, Inc. 744 Heartland Trail Madison, WI 53717	Tel: 608-831-4444 Fax: 608-831-3334

This form is authorized by Chapters 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number B2B — Use only as an attachment to Form 4400-122. —

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			13	PEAT, with organics (wood and root mass), dark brown 10YR 3/2, moist, soft.										
			14											
4 CS	60 60		15	ORGANIC SILT (OL), with shells and trace organics, dark greenish gray GLEY1 4/1, moist, soft.										
			16											
			17		OL									
			18											
			19	SANDY CLAY (CL),with gravel, medium grained, red brown gray 5YR 5/2, moist.	CL									
			20	E.O.B. at 20 feet bgs.										

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Kewaunee Marsh		B2C

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Dusty Harvey On-Site Environmental Services	12/8/2009	12/8/2009	Geoprobe

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	587.0 Feet MSL	2.1 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 243,989 N, 2,616,440 E S/C/N
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N Feet ☐ S ☐ E Feet ☐ W
1/4 of 1/4 of Section , T N, R

Facility ID	County	County Code	Civil Town/City/ or Village
	Kewaunee	31	Kewaunee

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	60 30		1	SAND (SP), with gravel, medium grained, small to large, subangular gravel, yellowish brown 10YR 5/4, moist.	SP									
2 CS	60 48		5											
			7	CLAY (CL), red brown 5YR 5/3, moist, stiff.	CL									
			8	SAND (SP), with gravel, medium grained, small to medium, subangular gravel, yellowish brown 10YR 5/4, moist.	SP									
			9	CLAY (CL), red brown 5YR 5/3, moist, stiff.	CL									
3 CS	60 60		10	GRAVEL (GP), with sand, medium to large, medium grained, light brown 10YR 6/3, wet.	GP									
			11	SAND (SP), with gravel, medium to fine	SP									
			12											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	
	RMT, Inc. 744 Heartland Trail Madison, WI 53717	Tel: 608-831-4444 Fax: 608-831-3334

This form is authorized by Chapters 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number B2C — Use only as an attachment to Form 4400-122. —

Sample: Number and Type	Sample: Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			13	grained, small to medium subangular to round gravel, brown 10YR 5/3, very wet.										
			13	PEAT, with organics (wood and root mass), dark brown 10YR 3/2, moist, soft.										
			14											
4 CS	60 30		15	ORGANIC SILT (OL), with shells and trace organics, dark greenish gray GLEY1 4/1, moist, soft.										
			16											
			17		OL									
			18											
			19	SILTY CLAY (CL-ML), with sand, red brown 5YR 5/3, moist, stiff.	CL-ML									
			20	E.O.B. at 20 feet bgs.										

WDNR SBL 1998 07201DNR.GPJ WI DNR 2003.GDT 4/22/10

10

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Kewaunee Marsh		B2D

Boring Drilled By: Name of crew chief (First, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Dusty Harvey On-Site Environmental Services	12/7/2009	12/7/2009	Geoprobe

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	587.0 Feet MSL	2.1 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 243,973 N, 2,616,452 E S/C/N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N Feet ☐ S ☐ E Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Kewaunee	31	Kewaunee

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	60 36		1	SAND (SP), with gravel, medium grained, yellow brown 10YR 4/4, moist. Black stained material at 6.5 - 6.7 feet bgs. Ballast.	SP									
2 CS	60 42		5											
			7	CLAY (CL), brownish red 5YR 4/4, moist, soft.	CL									
			8	SAND (SP), with gravel, medium grained, brown 10YR 5/3, moist.										
3 CS	60 48		10		SP									
			12											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	Tel: 608-831-4444
	RMT, Inc. 744 Heartland Trail Madison, WI 53717	Fax: 608-831-3334

This form is authorized by Chapters 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT

Form 4400-122A

Boring Number B2D — Use only as an attachment to Form 4400-122. —

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			13		SP									
			14	PEAT, with organics (wood and root mass), dark brown 10YR 3/2, moist, soft.										
4 CS	60 54		15											
			16	SAND (SW), medium grained, light yellow brown 10YR 6/4, moist.	SW									
			17	PEAT, with organics (wood and root mass), dark brown 10YR 3/2, moist, soft.										
			18	ORGANIC SILT (OL), with shells and trace organics, dark greenish gray GLEY1 4/1, moist, soft.	OL									
			19											
			20	GRAVEL WITH CLAY AND SAND (GW-GC), small to large gravel, medium to coarse grained, red-brown gray 5YR 5/3, wet.	GW-GC									
5 CS	60 60		21											
			22	GRAVEL WITH SAND (GW), and clay, small to large gravel, sub-angular, medium to coarse grained, light red brown 2.5YR 7/3, wet.	GW									
			23											
			24											
			25	E.O.B. at 25 feet bgs.										

WDNR SBL 1996 07201DNR.GPJ WI DNR 2003.GDT 4/22/10

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Kewaunee Marsh		B2E

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Dusty Harvey On-Site Environmental Services	12/7/2009	12/7/2009	Geoprobe

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	587.0 Feet MSL	2.1 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 243,954 N, 2,616,467 E S/C/N
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N ☐ E
Feet ☐ S Feet ☐ W
1/4 of 1/4 of Section , T N, R

Facility ID	County	County Code	Civil Town/City/ or Village
	Kewaunee	31	Kewaunee

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	60 42		1	SAND (SP), with gravel, medium grained, small to large gravel, yellow brown 10YR 6/6, moist. Ballast.	SP									
2 CS	60 36		5											
			7	CLAY (CL), brown red 5YR 5/3, moist, moderately stiff. Ballast	CL									
			8	SAND (SP), with gravel, medium to fine grained, small to large gravel, yellow brown 10YR 6/6, moist, Ballast.	SP									
3 CS	60 60		10	As above, medium grained, brownish gray 10YR 5/2, very wet.										

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	
	RMT, Inc. 744 Heartland Trail Madison, WI 53717	Tel: 608-831-4444 Fax: 608-831-3334

This form is authorized by Chapters 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number B2E — Use only as an attachment to Form 4400-122. —

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			13		SP									
			14	PEAT, with organics (wood and root mass), dark brown 10YR 3/2, moist, soft.										
4 CS	60 0		15	ORGANIC SILT (OL), with shells and trace organics, dark greenish gray GLEY1 4/1, moist, soft.										
			16											
			17		OL									
			18											
			19	SANDY CLAY (CL), dark red gray 2.5YR 4/2, moist, soft.										
5 CS	60 18		20											
			21		CL									
			22	SAND (SP), with trace small gravel and fines, very fine grained, red brown 5YR 5/3, very wet.	SP									
			23	SANDY CLAY (CL), fine to medium grained, reddish brown 5YR 5/3, very wet, soft.	CL									
			24	GRAVEL WITH SAND (GW), and trace fines, small to large, subangular, coarse to medium grained sand, light red brown 2.5YR 7/3, wet.	GW									
			25	E.O.B at 25 feet bgs.										

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Kewaunee Marsh		B2F

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Dusty Harvey On-Site Environmental Services	12/7/2009	12/7/2009	Geoprobe

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	587.0 Feet MSL	2.1 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 243,927 N, 2,616,488 E S/C/N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N Feet ☐ S ☐ E Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Kewaunee	31	Kewaunee

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	60 36		1	SAND (SP), with gravel, medium grained, brown-yellow 10YR 6/6, moist. Ballast.										
			2											
			3											
			4											
			5											
2 CS	60 27		6		SP									
			7	As above, fine to medium grained, small to medium gravel, with trace fines, dark gray 10 YR 4/1, wet. Ballast.										
			8											
			9											
			10											
3 CS	60 60			As above, very wet.										
			11											
			12											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	
	RMT, Inc. 744 Heartland Trail Madison, WI 53717	Tel: 608-831-4444 Fax: 608-831-3334

This form is authorized by Chapters 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number B2F — Use only as an attachment to Form 4400-122. —

Sample: Number and Type	Sample: Length Att. & Recovered (in)	Sample: Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
			13		SP									
			14	PEAT, with visible organics, very dark brown 10YR 2/2, moist, soft.										
4 CS	60 60		15											
			16	ORGANIC SILT (OL), with shells and trace organics, dark greenish gray GLEY1 4/1, moist, soft.										
			17											
			18		OL									
			19											
			20	CLAY (CL), with sand, very fine grained, dark grayish red 2.5YR 4/2, moist, moderately stiff.										
5 CS	60 60		21											
			22		CL									
			23	GRAVEL WITH SAND (GW), and trace fines, small to large, subangular, coarse to medium grained sand, light red brown 2.5YR 7/3, wet.										
			24											
6 CS	60 60		25											
			26											
			27		GW									
			28											
			29											
			30	E.O.B. at 30 feet bgs.										

WDNR SBL 1998 07201DNR.GPJ WI DNR 2003.GDT 4/22/10

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Kewaunee Marsh		B3D

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Dusty Harvey On-Site Environmental Services	12/7/2009	12/7/2009	Geoprobe

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	586.0 Feet MSL	2.1 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 243,979 N, 2,616,460 E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N Feet ☐ S ☐ E Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Kewaunee	31	Kewaunee

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	60 48		1	TOPSOIL.										
			1	SAND (SP), with gravel, medium grained, brown-yellow 10YR 6/6, moist. Ballast.										
			2											
			3		SP									
			4											
2 CS	60 57		5											
			6	SANDY CLAY (CL), medium grained, reddish brown 5YR 5/3, moist.	CL									
			7	GRAVEL (GP), with sand, small to medium, coarse grained, brown-yellow 10YR 6/6, moist.	GP									
			8	SANDY CLAY (CL), brown 10YR 5/3, moist, soft.	CL									
			9	SAND (SP), with gravel, medium grained, large angular gravel, brown 10YR 5/3, moist.										
3 CS	60 57		10		SP									
			11											
			12											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	Tel: 608-831-4444
	RMT, Inc. 744 Heartland Trail Madison, WI 53717	Fax: 608-831-3334

This form is authorized by Chapters 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent. 17

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number B3D — Use only as an attachment to Form 4400-122. —

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			13	PEAT, with visible organics, very dark brown 10YR 2/2, moist, soft.	SP									
4 CS	12 12		14 15	ORGANIC SILT (OL), with shells and trace organics, dark greenish gray GLEY1 4/1, moist, soft.	OL									
			16	E.O.B. at 16 feet bgs.										

WDNR SBL 1998 0720 DNR.GPJ WI DNR 2003.GDT 4/22/10

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Kewaunee Marsh		B3E

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Dusty Harvey On-Site Environmental Services	12/7/2009	12/7/2009	Geoprobe

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	586.0 Feet MSL	2.1 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 243,960 N, 2,616,475 E S/C/N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N Feet ☐ S ☐ E Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Kewaunee	31	Kewaunee

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	60 48		1–5	SAND (SP), with small gravel, fine grained, yellow brown 10YR 6/6, moist.	SP									
2 CS	60 48		5–6	CLAY (CL), brown 7.5YR 4/6, moist, soft.	CL									
			6–8	SAND (SP), with small gravel, fine grained, yellow brown 10YR 6/6, moist.	SP									
			8–9	CLAY (CL), brown 7.5YR 4/6, moist, soft.	CL									
			9–10	SAND (SP), with trace gravel, fine to medium grained, yellow brown 10YR 6/2, very wet.	SP									
3 CS	60 39		10–12	PEAT, with visible organics, very dark brown 10YR 2/2, moist, soft.										

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	Tel: 608-831-4444
	RMT, Inc. 744 Heartland Trail Madison, WI 53717	Fax: 608-831-3334

This form is authorized by Chapters 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number B3E — Use only as an attachment to Form 4400-122. — Page 2 of 2

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			13											
			14											
4 CS	60 42		15	ORGANIC SILT (OL), with shells and trace organics, dark greenish gray GLEY1 4/1, moist, soft.										
			16											
			17		OL									
			18											
			19											
			20	SILTY CLAY (CL-ML), dark grayish red 2.5YR 4/2, moist, soft.	CL-ML									
5 CS	60 48		21	GRAVEL WITH SAND (GW), and clay, small to large, subangular, coarse to medium grained sand, light red brown 2.5YR 7/3, wet.										
			22	As above, trace fines.	GW									
			23											
			24											
			25	E.O.B at 25 feet bgs.										

WDNR SBL 1995 07201DNR.GPJ WI DNR 2003.GDT 4/22/10

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Kewaunee Marsh		M10F

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Toni Kapugi On-Site Environmental Services	3/17/2010	3/17/2010	Geoprobe

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	582.0 Feet MSL	2.1 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 243,962 N, 2,616,829 E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Kewaunee	31	Kewaunee

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	48 / 24		1–8	**PEAT,** dark brown to black (10YR 3/2), moist, soft.										
2 CS	48 / 24													
				E.O.B. at 8 feet bgs.										

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	Tel: 608-831-4444
	RMT, Inc. 744 Heartland Trail Madison, WI 53717	Fax: 608-831-3334

This form is authorized by Chapters 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

21

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Kewaunee Marsh		M11F

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Toni Kapugi On-Site Environmental Services	3/17/2010	3/17/2010	Geoprobe

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	583.0 Feet MSL	2.1 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 243,956 N, 2,616,948 E S/C/N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N Feet ☐ S ☐ E Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Kewaunee	31	Kewaunee

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	48 30		1	**PEAT,** dark brown to black (10YR 3/2), frozen, soft.										
			2	As above, no longer frozen - wet.										
			3	Styrofoam cap material present										
2 CS	48 30		4											
			5											
			6											
			7											
3 CS	48 48		8	**ORGANIC SILT (OL),** with shells, dark greenish gray (gley1 4/1), moist, soft.										
			9											
			10		OL									
			11											
			12											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	Tel: 608-831-4444
	RMT, Inc. 744 Heartland Trail Madison, WI 53717	Fax: 608-831-3334

This form is authorized by Chapters 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number M11F — Use only as an attachment to Form 4400-122. — Page 2 of 2

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
4 CS	48 0		13	No recovery from 12 - 16 feet bgs. Drillers reported very soft material.	OL									
			14											
			15											
			16	E.O.B. at 16 feet bgs										

WDNR SBL 1998 07201DNR.GPJ WI DNR 2003.GDT 4/22/10

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Kewaunee Marsh		M12F

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Toni Kapugi On-Site Environmental Services	3/17/2010	3/17/2010	Geoprobe

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	582.0 Feet MSL	2.1 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 243,953 N, 2,617,062 E S/C/N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Kewaunee	31	Kewaunee

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	48 9.6		1	**PEAT,** dark brown to black (10YR 3/2), moist, soft.										
			2											
			3											
2 CS	48 30		4	As above, wet.										
			5											
			6											
			7	**ORGANIC SILT(OL),** with shells, dark greenish gray (gley1 4/1), moist, soft.	OL									
			8	E.O.B. at 8 feet bgs.										

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	
	RMT, Inc. 744 Heartland Trail Madison, WI 53717	Tel: 608-831-4444 Fax: 608-831-3334

This form is authorized by Chapters 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Kewaunee Marsh		M2A

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Toni Kapugi On-Site Environmental Services	3/17/2010	3/17/2010	Geoprobe

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	584.0 Feet MSL	2.1 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 244,040 N, 2,616,437 E S/C/N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N Feet ☐ S ☐ E Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Kewaunee	31	Kewaunee

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	60 25		1	**TOPSOIL/CAP MATERIAL.**										
			2											
			3	**POORLY GRADED SAND (SP),** medium grained, light brown, wet.	SP									
			4	**PEAT,** dark brown to black (10YR 3/2), wet, soft.										
2 CS	60 30		5											
			6											
			7											
			8											
			9	**ORGANIC SILT (OL),** with shells, dark greenish gray (gley1 4/1), wet, soft.	OL									
			10	E.O.B. at 10 feet bgs.										

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	
	RMT, Inc. 744 Heartland Trail Madison, WI 53717	Tel: 608-831-4444 Fax: 608-831-3334

This form is authorized by Chapters 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Kewaunee Marsh		M2B

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Toni Kapugi On-Site Environmental Services	3/17/2010	3/17/2010	Geoprobe

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	584.0 Feet MSL	2.1 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 244,017 N, 2,616,449 E S/C/N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N Feet ☐ S ☐ E Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Kewaunee	31	Kewaunee

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	60 30		1	**TOPSOIL.** **POORLY GRADED SAND (SP),** medium grained, light brown, wet.	SP									
			2	**PEAT,** dark brown to black (10YR 3/2), wet, soft.										
			3											
			4											
2 CS	60 40		5	**ORGANIC SILT (OL),** with shells, greenish gray (gley1 4/1), wet, soft.										
			6											
			7		OL									
			8											
			9	**POORLY GRADED SAND WITH GRAVEL (SP),** medium grained, small gravel, wet, soft.	SP									
			10	**PEAT,** dark brown to black (10YR 3/2), wet, soft. E.O.B. at 10 feet bgs.										

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	
	RMT, Inc. 744 Heartland Trail Madison, WI 53717	Tel: 608-831-4444 Fax: 608-831-3334

This form is authorized by Chapters 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Kewaunee Marsh		M2C

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Toni Kapugi On-Site Environmental Services	3/17/2010	3/17/2010	Geoprobe

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	584.0 Feet MSL	2.1 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 243,998 N, 2,616,463 E S/C/N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Kewaunee	31	Kewaunee

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	60 30		1 2 3 4	**PEAT,** dark brown to black (10YR 3/2), wet, soft.										
2 CS	60 35		5 6 7 8	**POORLY GRADED SAND (SP),** medium grained, light yellow brown, wet. **PEAT,** dark brown to black (10YR 3/2), wet, soft.	SP									
			9 10	**ORGANIC SILT (OL),** with shells, dark geenish gray (gley1 4/1), wet, soft. E.O.B. at 10 feet bgs.	OL									

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	Tel: 608-831-4444
	RMT, Inc. 744 Heartland Trail Madison, WI 53717	Fax: 608-831-3334

This form is authorized by Chapters 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Kewaunee Marsh		M2D

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Dusty Harvey On-Site Environmental Services	12/8/2009	12/8/2009	Geoprobe

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	584.0 Feet MSL	2.1 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 243,983 N, 2,616,473 E S/C/N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Kewaunee	31	Kewaunee

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	60 9		1	ORGANICS. PEAT, with organics (wood and root mass), dark brown 10YR 3/2, moist, soft.										
2 CS	60 51		7	ORGANIC SILT (OL), with shells and trace organics, dark greenish gray GLEY1 4/1, moist, soft.	OL									
			10	E.O.B. at 10 feet bgs.										

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	
	RMT, Inc. 744 Heartland Trail Madison, WI 53717	Tel: 608-831-4444 Fax: 608-831-3334

This form is authorized by Chapters 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Kewaunee Marsh		M2E

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Toni Kapugi On-Site Environmental Services	3/17/2010	3/17/2010	Geoprobe

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	584.0 Feet MSL	2.1 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 243,972 N, 2,616,485 E S/C/N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Kewaunee	31	Kewaunee

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	60 24		1	**PEAT,** dark brown to black (10YR 3/2), wet, soft.										
			2											
			3											
			4											
2 CS	60 36		5											
			6											
			7											
			8	**POORLY GRADED SAND (SP),** medium grained, light brown, wet.	SP									
			9	**PEAT,** dark brown to black (10YR 3/2), wet, soft.										
			10	**ORGANIC SILT (OL),** with shells, dark greenish gray (gley1 4/1), wet, soft. E.O.B. at 10 feet bgs.	OL									

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	Tel: 608-831-4444
	RMT, Inc. 744 Heartland Trail Madison, WI 53717	Fax: 608-831-3334

This form is authorized by Chapters 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Kewaunee Marsh		M2F

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Toni Kapugi On-Site Environmental Services	3/17/2010	3/17/2010	Geoprobe

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	584.0 Feet MSL	2.1 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 243,943 N, 2,616,511 E S/C/N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N Feet ☐ S ☐ E Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Kewaunee	31	Kewaunee

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	60 35		1	**PEAT,** dark brown to black (10YR 3/2), wet, soft.										
			2	**POORLY GRADED SAND (SP),** medium grained, light brown, wet.	SP									
			3	**PEAT,** dark brown to black (10YR 3/2), wet, soft.										
			4											
			5											
2 CS	60 38.4		6											
			7											
			8											
			9	**ORGANIC SILT (OL),** with shells, dark greenish gray (gley1 4/1), soft, wet.	OL									
			10	E.O.B. at 10 feet bgs.										

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	
	RMT, Inc. 744 Heartland Trail Madison, WI 53717	Tel: 608-831-4444 Fax: 608-831-3334

This form is authorized by Chapters 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Kewaunee Marsh		M3D

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Dusty Harvey On-Site Environmental Services	12/8/2009	12/8/2009	Geoprobe

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	583.0 Feet MSL	2.1 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 243,995 N, 2,616,487 E S / C / N
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W
1/4 of 1/4 of Section , T N, R

Facility ID	County	County Code	Civil Town/City/ or Village
	Kewaunee	31	Kewaunee

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	60 24		1	PEAT, with organics (wood and root mass), dark brown 10YR 3/2, moist, soft.										
			2											
			3											
			4											
2 CS	60 36		5											
			6											
			7	ORGANIC SILT (OL), with shells and trace organics, dark greenish gray GLEY1 4/1, moist, soft.	OL									
			8											
			9											
			10	E.O.B. at 10 feet bgs.										

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	Tel: 608-831-4444
	RMT, Inc. 744 Heartland Trail Madison, WI 53717	Fax: 608-831-3334

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Kewaunee Marsh		M4D

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Dusty Harvey On-Site Environmental Services	12/8/2009	12/8/2009	Geoprobe

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	583.0 Feet MSL	2.1 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 244,003 N, 2,616,502 E S/C/N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Kewaunee	31	Kewaunee

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	60 6		1	PEAT, with organics (wood and root mass), dark brown 10YR 3/2, moist, soft.										
			2											
			3											
			4											
2 CS	60 54		5											
			6											
			7											
			8	ORGANIC SILT (OL), with shells and trace organics, dark greenish gray GLEY1 4/1, moist, soft.	OL									
			9											
			10	E.O.B. at 10 feet bgs.										

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	
	RMT, Inc. 744 Heartland Trail Madison, WI 53717	Tel: 608-831-4444 Fax: 608-831-3334

This form is authorized by Chapters 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Kewaunee Marsh		M5A

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Toni Kapugi On-Site Environmental Services	3/17/2010	3/17/2010	Geoprobe

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	582.0 Feet MSL	2.1 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 244,064 N, 2,616,488 E S/C/N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N Feet ☐ S ☐ E Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Kewaunee	31	Kewaunee

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	60 30		1	**PEAT,** dark brown to black (10YR 3/2), wet, soft.										
			2											
			3											
			4											
			5											
2 CS	60 55		6											
			7	**ORGANIC SILT (OL),** with shells, dark greenish gray (gley1 4/1), wet, soft.	OL									
			8											
			9											
			10	E.O.B. at 10 feet bgs.										

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	
	RMT, Inc. 744 Heartland Trail Madison, WI 53717	Tel: 608-831-4444 Fax: 608-831-3334

This form is authorized by Chapters 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Kewaunee Marsh		M5B

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Toni Kapugi On-Site Environmental Services	3/17/2010	3/17/2010	Geoprobe

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	582.0 Feet MSL	2.1 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 244,048 N, 2,616,501 E S/C/N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N Feet ☐ S ☐ E Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Kewaunee	31	Kewaunee

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	60 26.4		1	**PEAT,** dark brown to black (10YR 3/2), wet, soft.										
			2											
			3	Styrofoam cap material observed at 3 feet bgs.										
			4											
2 CS	60 55		5											
			6											
			7											
			8	**ORGANIC SILT (OL),** with shells, greenish gray (gleyl 4/1), wet, soft.	OL									
			9											
			10	E.O.B. at 10 feet bgs.										

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	
	RMT, Inc. 744 Heartland Trail Madison, WI 53717	Tel: 608-831-4444 Fax: 608-831-3334

This form is authorized by Chapters 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Kewaunee Marsh		M5C

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Toni Kapugi On-Site Environmental Services	3/17/2010	3/17/2010	Geoprobe

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	582.0 Feet MSL	2.1 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 244,033 N, 2,616,512 E S/C/N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Kewaunee	31	Kewaunee

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	60 26		1	**PEAT,** dark brown to black (10YR 3/2), wet, soft.										
			2											
			3											
			4	Styrofoam cap material present at 3.5 feet bgs.										
2 CS	60 28		5											
			6											
			7											
			8	**ORGANIC SILT (OL),** with shells, greenish gray (gley1 4/1), wet, soft.	OL									
			9											
			10	E.O.B. at 10 feet bgs.										

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	
	RMT, Inc. 744 Heartland Trail Madison, WI 53717	Tel: 608-831-4444 Fax: 608-831-3334

This form is authorized by Chapters 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Kewaunee Marsh		M5D

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Dusty Harvey On-Site Environmental Services	12/8/2009	12/8/2009	Geoprobe

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	582.0 Feet MSL	2.1 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 244,013 N, 2,616,521 E S/C/N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Kewaunee	31	Kewaunee

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	60 12		1	PEAT, with organics (wood and root mass), dark brown 10YR 3/2, moist, soft.										
			2											
			3											
			4											
2 CS	60 48		5											
			6											
			7											
			8											
			9	ORGANIC SILT (OL), with shells and trace organics, dark greenish gray GLEY1 4/1, moist, soft.	OL									
			10											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	
	RMT, Inc. 744 Heartland Trail Madison, WI 53717	Tel: 608-831-4444 Fax: 608-831-3334

This form is authorized by Chapters 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Kewaunee Marsh		M5E

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Toni Kapugi On-Site Environmental Services	3/17/2010	3/17/2010	Geoprobe

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	582.0 Feet MSL	2.1 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 243,998 N, 2,616,528 E S/C/N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N Feet ☐ S ☐ E Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Kewaunee	31	Kewaunee

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	60 30		1	**PEAT,** dark brown to black (10YR 3/2), wet, soft.										
			2											
			3											
			4											
			5											
2 CS	60 60		6											
			7											
			8	**ORGANIC SILT (OL),** with shells, dark greenish gray (gley1 4/1), wet, soft.										
			9											
			10		OL									
3 CS	60 60		11											
			12											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	
	RMT, Inc. 744 Heartland Trail Madison, WI 53717	Tel: 608-831-4444 Fax: 608-831-3334

This form is authorized by Chapters 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number M5E — Use only as an attachment to Form 4400-122 —

Sample: Number and Type	Sample: Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
			13		OL									
			14	**SANDY LEAN CLAY WITH GRAVEL (CL),** medium grained sand, small to medium gravel, redish brown gray (2.5YR 4/2), wet, moderately stiff.	CL									
			15		GP									
			16	**POORLY GRADED GRAVEL (GP),** with clay, small to medium gravel, redish brown gray (2.5YR 4/2), wet.										
				E.O.B. at 15 feet bgs.										

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Kewaunee Marsh		M5F

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Toni Kapugi On-Site Environmental Services	3/17/2010	3/17/2010	Geoprobe

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	582.0 Feet MSL	2.1 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 243,975 N, 2,616,552 E S/C/N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N Feet ☐ S ☐ E Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Kewaunee	31	Kewaunee

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	60 30		1	**PEAT,** dark brown to black (10YR 3/2), wet, soft										
			2											
			3	Styrofoam cap material present at 2.5 feet bgs.										
			4											
2 CS	60 60		5											
			6											
			7											
			8	**ORGANIC SILT (OL),** dark greenish gray (gley1 4/1), wet, soft.	OL									
			9											
			10	E.O.B. at 10 feet bgs.										

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	Tel: 608-831-4444
	RMT, Inc. 744 Heartland Trail Madison, WI 53717	Fax: 608-831-3334

This form is authorized by Chapters 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Kewaunee Marsh		MOE

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Toni Kapugi On-Site Environmental Services	3/17/2010	3/17/2010	Geoprobe

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	582.0 Feet MSL	2.1 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 244,007 N, 2,616,581 E S/C/N
Lat ___ ° ___ ' ___ "
Long ___ ° ___ ' ___ "
Local Grid Location ☐ N ☐ E
1/4 of 1/4 of Section , T N, R
Feet ☐ S Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Kewaunee	31	Kewaunee

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	48 14.4		1	**PEAT,** dark brown to black (10YR 3/2), wet, soft.										
			2											
			3											
2 CS	48 24		4											
			5											
			6											
			7											
			8	**ORGANIC SILT (OL),** with shells, dark greenish gray (gley1 4/1), moist, soft. E.O.B. at 8 feet bgs.	OL									

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	
	RMT, Inc. 744 Heartland Trail Madison, WI 53717	Tel: 608-831-4444 Fax: 608-831-3334

This form is authorized by Chapters 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Kewaunee Marsh		M7E

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Toni Kapugi On-Site Environmental Services	3/17/2010	3/17/2010	Geoprobe

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	582.0 Feet MSL	2.1 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 244,006 N, 2,616,623 E S / C / N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N Feet ☐ S ☐ E Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Kewaunee	31	Kewaunee

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	48 24		1	**PEAT,** dark brown to black (10YR 3/2), wet, soft.										
			2											
			3											
2 CS	48 24		4											
			5											
			6											
			7											
			8	E.O.B. at 8 feet bgs.										

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	
	RMT, Inc. 744 Heartland Trail Madison, WI 53717	Tel: 608-831-4444 Fax: 608-831-3334

This form is authorized by Chapters 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Kewaunee Marsh		M8E

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Toni Kapugi On-Site Environmental Services	3/17/2010	3/17/2010	Geoprobe

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	582.0 Feet MSL	2.1 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 244,004 N, 2,616,670 E S/C/N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N Feet ☐ S ☐ E Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Kewaunee	31	Kewaunee

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	48 22.5		1	**PEAT,** dark brown to black (10YR 3/2), moist, soft.										
			2											
			3											
2 CS	48 43.2		4	As above, wet.										
			5											
			6											
			7											
			8	E.O.B. at 8 feet bgs.										

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	Tel: 608-831-4444
	RMT, Inc. 744 Heartland Trail Madison, WI 53717	Fax: 608-831-3334

This form is authorized by Chapters 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

WDNR SBL 1998 07201DNR.GPJ WI DNR 2003.GDT 4/22/10

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Kewaunee Marsh		M9F

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Toni Kapugi On-Site Environmental Services	3/17/2010	3/17/2010	Geoprobe

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet MSL	582.0 Feet MSL	2.1 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 243,969 N, 2,616,703 E S/C/N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Kewaunee	31	Kewaunee

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
1 CS	48 14.4		1	**PEAT,** dark brown to black (10YR 3/2), wet, soft.										
				Cap material present from 1-1.3 feet bgs.										
			2											
			3											
2 CS	48 43.2		4	As above very wet from 4-6.5 feet bgs.										
			5											
			6											
			7											
			8	E.O.B. at 8 feet bgs.										

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	
	RMT, Inc. 744 Heartland Trail Madison, WI 53717	Tel: 608-831-4444 Fax: 608-831-3334

This form is authorized by Chapters 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

43

WDNR SBL 1996 07201DNR.GPJ WI DNR 2003.GDT 4/22/10

Attachment B
Laboratory Reports

Pace Analytical®
www.pacelabs.com

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

December 29, 2009

BOB STANFORTH
RMT MADISON
744 Heartland Trail
Madison, WI 537171934

RE: Project: 7201.10 KEWAUNEE MARSH
Pace Project No.: 4026525

Dear BOB STANFORTH:
Enclosed are the analytical results for sample(s) received by the laboratory on December 15, 2009. The results relate only to the samples included in this report. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Tod Noltemeyer

Tod Noltemeyer

tod.noltemeyer@pacelabs.com
Project Manager

Enclosures

cc: ALEX GOERGEN, RMT - MADISON

nelac

1/112

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

CERTIFICATIONS

Project: 7201.10 KEWAUNEE MARSH
Pace Project No.: 4026525

Green Bay Certification IDs
California Certification #: 09268CA
Florida/NELAP Certification #: E87948
Illinois Certification #: 200050
Kentucky Certification #: 82
Louisiana Certification #: 04168
Minnesota Certification #: 055-999-334
New York Certification #: 11887
New York Certification #: 11888
North Carolina Certification #: 503
North Dakota Certification #: R-150
South Carolina Certification #: 83006001
Wisconsin Certification #: 405132750
Wisconsin DATCP Certification #: 105-444
1241 Bellevue Street Green Bay, WI 54302

Pace Analytical
www.pacelabs.com

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

SAMPLE SUMMARY

Project: 7201.10 KEWAUNEE MARSH
Pace Project No.: 4026525

Lab ID	Sample ID	Matrix	Date Collected	Date Received
4026525001	B1D-0-2'	Solid	12/10/09 13:00	12/15/09 08:55
4026525002	B1D-2-4'	Solid	12/10/09 13:00	12/15/09 08:55
4026525003	B1D-4-6'	Solid	12/10/09 13:00	12/15/09 08:55
4026525004	B1D-6-8'	Solid	12/10/09 13:00	12/15/09 08:55
4026525005	B1D-8-10'	Solid	12/10/09 13:00	12/15/09 08:55
4026525006	B1D-10-12'	Solid	12/10/09 13:00	12/15/09 08:55
4026525007	B1D-12-14'	Solid	12/10/09 13:00	12/15/09 08:55
4026525008	B1D-15-19'	Solid	12/10/09 13:00	12/15/09 08:55
4026525009	B1D-19-20'	Solid	12/10/09 13:00	12/15/09 08:55
4026525010	B1E-0-2'	Solid	12/10/09 13:00	12/15/09 08:55
4026525011	B1E-2-4'	Solid	12/10/09 13:00	12/15/09 08:55
4026525012	B1E-4-6'	Solid	12/10/09 13:00	12/15/09 08:55
4026525013	B1E-6-8'	Solid	12/10/09 13:00	12/15/09 08:55
4026525014	B1E-8-10'	Solid	12/10/09 13:00	12/15/09 08:55
4026525015	B1E-10-12'	Solid	12/10/09 13:00	12/15/09 08:55
4026525016	B1E-12-14'	Solid	12/10/09 13:00	12/15/09 08:55
4026525017	B1E-14-16'	Solid	12/10/09 13:00	12/15/09 08:55
4026525018	B1E-16-19'	Solid	12/10/09 13:00	12/15/09 08:55
4026525019	B1E-19-20'	Solid	12/10/09 13:00	12/15/09 08:55
4026525020	B2A-0-2'	Solid	12/10/09 13:00	12/15/09 08:55
4026525021	B2A-2-4'	Solid	12/10/09 13:00	12/15/09 08:55
4026525022	B2A-4-6'	Solid	12/10/09 13:00	12/15/09 08:55
4026525023	B2A-6-8'	Solid	12/10/09 13:00	12/15/09 08:55
4026525024	B2A-8-10'	Solid	12/10/09 13:00	12/15/09 08:55
4026525025	B2A-10-12'	Solid	12/10/09 13:00	12/15/09 08:55
4026525026	B2A-12-14'	Solid	12/10/09 13:00	12/15/09 08:55
4026525027	B2A-14-15'	Solid	12/10/09 13:00	12/15/09 08:55
4026525028	B2B-0-2'	Solid	12/10/09 13:00	12/15/09 08:55
4026525029	B2B-2-4'	Solid	12/10/09 13:00	12/15/09 08:55
4026525030	B2B-4-6'	Solid	12/10/09 13:00	12/15/09 08:55
4026525031	B2B-6-8'	Solid	12/10/09 13:00	12/15/09 08:55
4026525032	B2B-8-10'	Solid	12/10/09 13:00	12/15/09 08:55
4026525033	B2B-10-12'	Solid	12/10/09 13:00	12/15/09 08:55
4026525034	B2B-12-15'	Solid	12/10/09 13:00	12/15/09 08:55
4026525035	B2B-15-19'	Solid	12/10/09 13:00	12/15/09 08:55
4026525036	B2B-19-20'	Solid	12/10/09 13:00	12/15/09 08:55
4026525037	B2C-0-2'	Solid	12/10/09 13:00	12/15/09 08:55

Pace Analytical
www.pacelabs.com

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

SAMPLE SUMMARY

Project: 7201.10 KEWAUNEE MARSH
Pace Project No.: 4026525

Lab ID	Sample ID	Matrix	Date Collected	Date Received
4026525038	B2C-2-4'	Solid	12/10/09 13:00	12/15/09 08:55
4026525039	B2C-4-6'	Solid	12/10/09 13:00	12/15/09 08:55
4026525040	B2C-6-8'	Solid	12/10/09 13:00	12/15/09 08:55
4026525041	B2C-8-10'	Solid	12/10/09 13:00	12/15/09 08:55
4026525042	B2C-10-12'	Solid	12/10/09 13:00	12/15/09 08:55
4026525043	B2C-12-14'	Solid	12/10/09 13:00	12/15/09 08:55
4026525044	B2C-14-20'	Solid	12/10/09 13:00	12/15/09 08:55
4026525045	B2D-0-2'	Solid	12/10/09 13:00	12/15/09 08:55
4026525046	B2D-2-4'	Solid	12/10/09 13:00	12/15/09 08:55
4026525047	B2D-4-6'	Solid	12/10/09 13:00	12/15/09 08:55
4026525048	B2D-6-8'	Solid	12/10/09 13:00	12/15/09 08:55
4026525049	B2D-8-10'	Solid	12/10/09 13:00	12/15/09 08:55
4026525050	B2D-10-12'	Solid	12/10/09 13:00	12/15/09 08:55
4026525051	B2D-12-14'	Solid	12/10/09 13:00	12/15/09 08:55
4026525052	B2D-14-15'	Solid	12/10/09 13:00	12/15/09 08:55
4026525053	B2D-15-17.5'	Solid	12/10/09 13:00	12/15/09 08:55
4026525054	B2D-17.5-20'	Solid	12/10/09 13:00	12/15/09 08:55
4026525055	B2D-20-25'	Solid	12/10/09 13:00	12/15/09 08:55
4026525056	B2E-0-2'	Solid	12/10/09 13:00	12/15/09 08:55
4026525057	B2E-2-4'	Solid	12/10/09 13:00	12/15/09 08:55
4026525058	B2E-4-6'	Solid	12/10/09 13:00	12/15/09 08:55
4026525059	B2E-6-8'	Solid	12/10/09 13:00	12/15/09 08:55
4026525060	B2E-8-10'	Solid	12/10/09 13:00	12/15/09 08:55
4026525061	B2E-10-13.8'	Solid	12/10/09 13:00	12/15/09 08:55
4026525062	B2E-13.8-15'	Solid	12/10/09 13:00	12/15/09 08:55
4026525063	B2E-20-23'	Solid	12/10/09 13:00	12/15/09 08:55
4026525064	B2E-23-25'	Solid	12/10/09 13:00	12/15/09 08:55
4026525065	B2F-0-2'	Solid	12/10/09 13:00	12/15/09 08:55
4026525066	B2F-2-4'	Solid	12/10/09 13:00	12/15/09 08:55
4026525067	B2F-4-6'	Solid	12/10/09 13:00	12/15/09 08:55
4026525068	B2F-6-8'	Solid	12/10/09 13:00	12/15/09 08:55
4026525069	B2F-8-10'	Solid	12/10/09 13:00	12/15/09 08:55
4026525070	B2F-10-12'	Solid	12/10/09 13:00	12/15/09 08:55
4026525071	B2F-12-13.8'	Solid	12/10/09 13:00	12/15/09 08:55
4026525072	B2F-13.8-15'	Solid	12/10/09 13:00	12/15/09 08:55
4026525073	B2F-15-16'	Solid	12/10/09 13:00	12/15/09 08:55
4026525074	B2F-16-20'	Solid	12/10/09 13:00	12/15/09 08:55

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

SAMPLE SUMMARY

Project: 7201.10 KEWAUNEE MARSH
Pace Project No.: 4026525

Lab ID	Sample ID	Matrix	Date Collected	Date Received
4026525075	B2F-23-25'	Solid	12/10/09 13:00	12/15/09 08:55
4026525076	B2F-25-30'	Solid	12/10/09 13:00	12/15/09 08:55
4026525077	B3D-0-2'	Solid	12/10/09 13:00	12/15/09 08:55
4026525078	B3D-2-4'	Solid	12/10/09 13:00	12/15/09 08:55
4026525079	B3D-4-6'	Solid	12/10/09 13:00	12/15/09 08:55
4026525080	B3D-6-8'	Solid	12/10/09 13:00	12/15/09 08:55
4026525081	B3D-8-10'	Solid	12/10/09 13:00	12/15/09 08:55
4026525082	B3D-10-12'	Solid	12/10/09 13:00	12/15/09 08:55
4026525083	B3D-12-14'	Solid	12/10/09 13:00	12/15/09 08:55
4026525084	B3D-14-16'	Solid	12/10/09 13:00	12/15/09 08:55
4026525085	B3E-0-2'	Solid	12/10/09 13:00	12/15/09 08:55
4026525086	B3E-2-4'	Solid	12/10/09 13:00	12/15/09 08:55
4026525087	B3E-4-6'	Solid	12/10/09 13:00	12/15/09 08:55
4026525088	B3E-6-8'	Solid	12/10/09 13:00	12/15/09 08:55
4026525089	B3E-8-10'	Solid	12/10/09 13:00	12/15/09 08:55
4026525090	B3E-10-12'	Solid	12/10/09 13:00	12/15/09 08:55
4026525091	B3E-12-14'	Solid	12/10/09 13:00	12/15/09 08:55
4026525092	B3E-14-16'	Solid	12/10/09 13:00	12/15/09 08:55
4026525093	B3E-16-20'	Solid	12/10/09 13:00	12/15/09 08:55
4026525094	B3E-20-25'	Solid	12/10/09 13:00	12/15/09 08:55
4026525095	M2D-0-2'	Solid	12/10/09 13:00	12/15/09 08:55
4026525096	M2D-2-4'	Solid	12/10/09 13:00	12/15/09 08:55
4026525097	M2D-4-6'	Solid	12/10/09 13:00	12/15/09 08:55
4026525098	M2D-6-8'	Solid	12/10/09 13:00	12/15/09 08:55
4026525099	M2D-8-10'	Solid	12/10/09 13:00	12/15/09 08:55
4026525100	M3D-0-2'	Solid	12/10/09 13:00	12/15/09 08:55
4026525101	M3D-2-4'	Solid	12/10/09 13:00	12/15/09 08:55
4026525102	M3D-4-6'	Solid	12/10/09 13:00	12/15/09 08:55
4026525103	M3D-6-8'	Solid	12/10/09 13:00	12/15/09 08:55
4026525104	M3D-8-10'	Solid	12/10/09 13:00	12/15/09 08:55
4026525105	M4D-0-5'	Solid	12/10/09 13:00	12/15/09 08:55
4026525106	M4D-5-7'	Solid	12/10/09 13:00	12/15/09 08:55
4026525107	M4D-7-10'	Solid	12/10/09 13:00	12/15/09 08:55
4026525108	M5D-0-5'	Solid	12/10/09 13:00	12/15/09 08:55
4026525109	M5D-5-7'	Solid	12/10/09 13:00	12/15/09 08:55
4026525110	M5D-7-10'	Solid	12/10/09 13:00	12/15/09 08:55

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

SAMPLE ANALYTE COUNT

Project: 7201.10 KEWAUNEE MARSH
Pace Project No.: 4026525

Lab ID	Sample ID	Method	Analysts	Analytes Reported
4026525001	B1D-0-2'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525002	B1D-2-4'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525003	B1D-4-6'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525004	B1D-6-8'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525005	B1D-8-10'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525006	B1D-10-12'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525007	B1D-12-14'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525008	B1D-15-19'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525009	B1D-19-20'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525010	B1E-0-2'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525011	B1E-2-4'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525012	B1E-4-6'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525013	B1E-6-8'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525014	B1E-8-10'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525015	B1E-10-12'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525016	B1E-12-14'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525017	B1E-14-16'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525018	B1E-16-19'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525019	B1E-19-20'	EPA 6010	DLB	1

Pace Analytical
www.pacelabs.com

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

SAMPLE ANALYTE COUNT

Project: 7201.10 KEWAUNEE MARSH
Pace Project No.: 4026525

Lab ID	Sample ID	Method	Analysts	Analytes Reported
		ASTM D2974-87	MRN	1
4026525020	B2A-0-2'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525021	B2A-2-4'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525022	B2A-4-6'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525023	B2A-6-8'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525024	B2A-8-10'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525025	B2A-10-12'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525026	B2A-12-14'	EPA6010	DLB	1
		ASTM D2974-87	MRN	1
4026525027	B2A-14-15'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525028	B2B-0-2'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525029	B2B-2-4'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525030	B2B-4-6'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525031	B2B-6-8'	EPA6010	DLB	1
		ASTM D2974-87	MRN	1
4026525032	B2B-8-10'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525033	B2B-10-12'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525034	B2B-12-15'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525035	B2B-15-19'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525036	B2B-19-20'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525037	B2C-0-2'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

SAMPLE ANALYTE COUNT

Project: 7201.10 KEWAUNEE MARSH
Pace Project No.: 4026525

Lab ID	Sample ID	Method	Analysts	Analytes Reported
4026525038	B2C-2-4'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525039	B2C-4-6'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525040	B2C-6-8'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525041	B2C-8-10'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525042	B2C-10-12'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525043	B2C-12-14'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525044	B2C-14-20'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525045	B2D-0-2'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525046	B2D-2-4'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525047	B2D-4-6'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525048	B2D-6-8'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525049	B2D-8-10'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525050	B2D-10-12'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525051	B2D-12-14'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525052	B2D-14-15'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525053	B2D-15-17.5'	EPA 6010	DLB	1
		ASTM D2974-67	MRN	1
4026525054	B2D-17.5-20'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525055	B2D-20-25'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525056	B2E-0-2'	EPA 6010	DLB	1

8

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

SAMPLE ANALYTE COUNT

Project: 7201.10 KEWAUNEE MARSH
Pace Project No.: 4026525

Lab ID	Sample ID	Method	Analysts	Analytes Reported
		ASTM D2974-87	MRN	1
4026525057	B2E-2-4'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525058	B2E-4-6'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525059	B2E-6-8'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525060	B2E-8-10'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525061	B2E-10-13.8'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525062	B2E-13.8-15'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525063	B2E-20-23'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525064	B2E-23-25'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525065	B2F-0-2'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525066	B2F-2-4'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525067	B2F-4-6'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525068	B2F-6-8'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525069	B2F-8-10'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525070	B2F-10-12'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525071	B2F-12-13.8'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525072	B2F-13.8-15'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525073	B2F-15-16'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525074	B2F-16-20'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1

Pace Analytical
www.pacelabs.com

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

SAMPLE ANALYTE COUNT

Project: 7201.10 KEWAUNEE MARSH
Pace Project No.: 4026525

Lab ID	Sample ID	Method	Analysts	Analytes Reported
4026525075	B2F-23-25'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525076	B2F-25-30'	EPA6010	DLB	1
		ASTM D2974-87	MRN	1
4026525077	B3D-0-2'	EPA6010	DLB	1
		ASTM D2974-87	MRN	1
4026525078	B3D-2-4'	EPA6010	DLB	1
		ASTM D2974-87	MRN	1
4026525079	B3D-4-6'	EPA6010	DLB	1
		ASTM D2974-87	MRN	1
4026525080	B3D-6-8'	EPA6010	DLB	1
		ASTM D2974-87	MRN	1
4026525081	B3D-8-10'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525082	B3D-10-12'	EPA6010	DLB	1
		ASTM D2974-87	MRN	1
4026525083	B3D-12-14'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525084	B3D-14-16'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525085	B3E-0-2'	EPA6010	DLB	1
		ASTM D2974-87	MRN	1
4026525086	B3E-2-4'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525087	B3E-4-6'	EPA6010	DLB	1
		ASTM D2974-87	MRN	1
4026525088	B3E-6-8'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525089	B3E-8-10'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525090	B3E-10-12'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525091	B3E-12-14'	EPA6010	DLB	1
		ASTM D2974-87	MRN	1
4026525092	B3E-14-16'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525093	B3E-16-20'	EPA 6010	DLB	1

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

SAMPLE ANALYTE COUNT

Project: 7201.10 KEWAUNEE MARSH
Pace Project No.: 4026525

Lab ID	Sample ID	Method	Analysts	Analytes Reported
		ASTM D2974-87	MRN	1
4026525094	B3E-20-25'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525095	M2D-0-2'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525096	M2D-2-4'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525097	M2D-4-6'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525098	M2D-6-8'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525099	M2D-8-10'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525100	M3D-0-2'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525101	M3D-2-4'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525102	M3D-4-6'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525103	M3D-6-8'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525104	M3D-8-10'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525105	M4D-0-5'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525106	M4D-5-7'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525107	M4D-7-10'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525108	M5D-0-5'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525109	M5D-5-7'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1
4026525110	M5D-7-10'	EPA 6010	DLB	1
		ASTM D2974-87	MRN	1

Pace Analytical
www.pacelabs.com

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 7201.10 KEWAUNEE MARSH
Pace Project No.: 4026525

Sample: B1D-0-2' **Lab ID: 4026525001** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**7.1**	mg/kg	2.2	0.13	1	12/16/09 13:45	12/17/09 13:52	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	14.7	%	0.10	0.10	1		12/18/09 08:01		

Sample: B1D-2-4' **Lab ID: 4026525002** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**105**	mg/kg	2.1	0.12	1	12/16/09 13:45	12/17/09 13:56	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**12.8**	%	0.10	0.10	1		12/18/09 08:01		

Sample: B1D-4-6' **Lab ID: 4026525003** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**719**	mg/kg	2.4	0.14	1	12/16/09 13:45	12/17/09 14:00	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**20.2**	%	0.10	0.10	1		12/18/09 08:01		

Sample: B1D-6-8' **Lab ID: 4026525004** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA3050								
Arsenic	**1850**	mg/kg	2.7	0.15	1	12/16/09 13:45	12/17/09 14:04	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**25.5**	%	0.10	0.10	1		12/18/09 08:01		

Pace Analytical
www.pacelabs.com

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 7201.10 KEWAUNEE MARSH
Pace Project No.: 4026525

Sample: B1D-8-10' **Lab ID: 4026525005** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA3050								
Arsenic	**2160**	mg/kg	8.3	0.48	1	12/16/09 13:45	12/17/09 14:08	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**75.9**	%	0.10	0.10	1		12/18/09 08:01		

Sample: B1D-10-12' **Lab ID: 4026525006** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA6010 Preparation Method: EPA3050								
Arsenic	**1070**	mg/kg	10.2	0.59	1	12/16/09 13:45	12/17/09 14:19	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**80.8**	%	0.10	0.10	1		12/18/09 08:02		

Sample: B1D-12-14' **Lab ID: 4026525007** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**151**	mg/kg	4.3	0.25	1	12/16/09 13:45	12/17/09 14:23	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**53.4**	%	0.10	0.10	1		12/18/09 08:02		

Sample: B1D-15-19' **Lab ID: 4026525008** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**86.4**	mg/kg	4.4	0.25	1	12/16/09 13:45	12/17/09 14:27	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**54.3**	%	0.10	0.10	1		12/18/09 08:02		

Pace Analytical
www.pacelabs.com

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 7201.10 KEWAUNEE MARSH
Pace Project No.: 4026525

Sample: B1D-19-20' **Lab ID: 4026525009** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**4.6**	mg/kg	2.4	0.14	1	12/16/09 13:45	12/17/09 14:32	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**16.2**	%	0.10	0.10	1		12/18/09 08:02		

Sample: B1E-0-2' **Lab ID: 4026525010** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**2.8**	mg/kg	2.2	0.13	1	12/16/09 13:45	12/17/09 13:36	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**8.6**	%	0.10	0.10	1		12/18/09 08:02		

Sample: B1E-2-4' **Lab ID: 4026525011** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**35.4**	mg/kg	2.4	0.14	1	12/16/09 13:45	12/17/09 14:36	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**17.8**	%	0.10	0.10	1		12/18/09 08:02		

Sample: B1E-4-6' **Lab ID: 4026525012** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**49.9**	mg/kg	2.4	0.14	1	12/16/09 13:45	12/17/09 14:40	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**18.0**	%	0.10	0.10	1		12/18/09 08:03		

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, Wi 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 7201.10 KEWAUNEE MARSH
Pace Project No.: 4026525

Sample: B1E-6-8' **Lab ID: 4026525013** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA3050								
Arsenic	**232**	mg/kg	2.6	0.15	1	12/16/09 13:45	12/17/09 14:44	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**23.2**	%	0.10	0.10	1		12/18/09 08:04		

Sample: B1E-8-10' **Lab ID: 4026525014** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA3050								
Arsenic	**932**	mg/kg	8.6	0.50	1	12/16/09 13:45	12/17/09 14:48	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**77.5**	%	0.10	0.10	1		12/18/09 08:04		

Sample: B1E-10-12' **Lab ID: 4026525015** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**294**	mg/kg	5.3	0.31	1	12/16/09 13:45	12/17/09 14:52	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**63.3**	%	0.10	0.10	1		12/18/09 08:04		

Sample: B1E-12-14' **Lab ID: 4026525016** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**341**	mg/kg	8.7	0.50	1	12/16/09 13:45	12/17/09 14:56	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**77.1**	%	0.10	0.10	1		12/18/09 08:04		

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 7201.10 KEWAUNEE MARSH
Pace Project No.: 4026525

Sample: B1E-14-16' Lab ID: 4026525017 Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**6.2**	mg/kg	4.7	0.27	1	12/16/09 13:45	12/17/09 15:07	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**58.0**	%	0.10	0.10	1		12/18/09 08:04		

Sample: B1E-16-19' Lab ID: 4026525018 Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**3.4J**	mg/kg	4.3	0.25	1	12/16/09 13:45	12/17/09 15:11	7440-38-2	B
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**53.6**	%	0.10	0.10	1		12/18/09 08:04		

Sample: B1E-19-20' Lab ID: 4026525019 Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA3050								
Arsenic	**2.7**	mg/kg	2.5	0.14	1	12/16/09 13:45	12/17/09 15:16	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**21.5**	%	0.10	0.10	1		12/18/09 08:04		

Sample: B2A-0-2' Lab ID: 4026525020 Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA3050								
Arsenic	**3.8**	mg/kg	2.1	0.12	1	12/16/09 14:00	12/17/09 15:35	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**4.3**	%	0.10	0.10	1		12/18/09 08:04		

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 7201.10 KEWAUNEE MARSH
Pace Project No.: 4026525

Sample: B2A-2-4' **Lab ID: 4026525021** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**2.2**	mg/kg	1.9	0.11	1	12/16/09 14:00	12/17/09 15:55	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**3.0**	%	0.10	0.10	1		12/18/09 08:04		

Sample: B2A-4-6' **Lab ID: 4026525022** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**30.9**	mg/kg	2.1	0.12	1	12/16/09 14:00	12/17/09 15:59	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**6.3**	%	0.10	0.10	1		12/18/09 08:05		

Sample: B2A-6-8' **Lab ID: 4026525023** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**27.5**	mg/kg	2.2	0.13	1	12/16/09 14:00	12/17/09 16:03	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**12.9**	%	0.10	0.10	1		12/18/09 08:05		

Sample: B2A-8-10' **Lab ID: 4026525024** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**1.6J**	mg/kg	2.3	0.13	1	12/16/09 14:00	12/17/09 16:07	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**12.6**	%	0.10	0.10	1		12/18/09 08:05		

Pace Analytical®
www.pacelabs.com

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 7201.10 KEWAUNEE MARSH
Pace Project No.: 4026525

Sample: B2A-10-12' **Lab ID: 4026525025** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**2.4**	mg/kg	2.4	0.14	1	12/16/09 14:00	12/17/09 16:11	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**17.6**	%	0.10	0.10	1		12/18/09 08:05		

Sample: B2A-12-14' **Lab ID: 4026525026** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**7.1J**	mg/kg	7.3	0.42	1	12/16/09 14:00	12/17/09 16:15	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**74.2**	%	0.10	0.10	1		12/18/09 08:05		

Sample: B2A-14-15' **Lab ID: 4026525027** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**2.9J**	mg/kg	4.1	0.24	1	12/16/09 14:00	12/17/09 16:19	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**56.2**	%	0.10	0.10	1		12/18/09 08:05		

Sample: B2B-0-2' **Lab ID: 4026525028** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**9.5**	mg/kg	2.0	0.12	1	12/16/09 14:00	12/17/09 16:23	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**3.3**	%	0.10	0.10	1		12/18/09 08:05		

Pace Analytical
www.pacelabs.com

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 7201.10 KEWAUNEE MARSH
Pace Project No.: 4026525

Sample: B2B-2-4' **Lab ID: 4026525029** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA3050								
Arsenic	**527**	mg/kg	2.1	0.12	1	12/16/09 14:00	12/17/09 16:27	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**5.8**	%	0.10	0.10	1		12/18/09 08:05		

Sample: B2B-4-6' **Lab ID: 4026525030** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**3830**	mg/kg	2.1	0.12	1	12/16/09 14:00	12/17/09 16:31	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**7.4**	%	0.10	0.10	1		12/18/09 08:06		

Sample: B2B-6-8' **Lab ID: 4026525031** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**309**	mg/kg	2.1	0.12	1	12/16/09 14:00	12/17/09 16:43	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**15.1**	%	0.10	0.10	1		12/18/09 08:06		

Sample: B2B-8-10' **Lab ID: 4026525032** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**343**	mg/kg	2.3	0.13	1	12/16/09 14:00	12/17/09 16:47	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**14.0**	%	0.10	0.10	1		12/18/09 08:09		

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 7201.10 KEWAUNEE MARSH
Pace Project No.: 4026525

Sample: B2B-10-12' **Lab ID: 4026525033** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**240**	mg/kg	2.3	0.13	1	12/16/09 14:00	12/17/09 16:50	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**15.5**	%	0.10	0.10	1		12/18/09 08:09		

Sample: B2B-12-15' **Lab ID: 4026525034** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**140**	mg/kg	4.3	0.25	1	12/16/09 14:00	12/17/09 16:55	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**54.9**	%	0.10	0.10	1		12/18/09 08:10		

Sample: B2B-15-19' **Lab ID: 4026525035** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**8.7**	mg/kg	4.0	0.23	1	12/16/09 14:00	12/17/09 16:59	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**50.6**	%	0.10	0.10	1		12/18/09 08:10		

Sample: B2B-19-20' **Lab ID: 4026525036** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**2.8**	mg/kg	2.3	0.13	1	12/16/09 14:00	12/17/09 17:03	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**18.0**	%	0.10	0.10	1		12/18/09 08:10		

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 7201.10 KEWAUNEE MARSH
Pace Project No.: 4026525

Sample: B2C-0-2' **Lab ID: 4026525037** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA3050								
Arsenic	**332**	mg/kg	1.9	0.11	1	12/16/09 14:00	12/17/09 17:06	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**3.9**	%	0.10	0.10	1		12/18/09 08:10		

Sample: B2C-2-4' **Lab ID: 4026525038** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**804**	mg/kg	1.9	0.11	1	12/16/09 14:00	12/17/09 17:11	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**4.9**	%	0.10	0.10	1		12/18/09 08:10		

Sample: B2C-4-6' **Lab ID: 4026525039** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA3050								
Arsenic	**2880**	mg/kg	2.0	0.11	1	12/16/09 14:00	12/17/09 17:15	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**5.6**	%	0.10	0.10	1		12/18/09 08:10		

Sample: B2C-6-8' **Lab ID: 4026525040** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**996**	mg/kg	2.3	0.14	1	12/16/09 14:25	12/17/09 17:38	7440-38-2	P6
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**15.0**	%	0.10	0.10	1		12/18/09 08:10		

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 7201.10 KEWAUNEE MARSH
Pace Project No.: 4026525

Sample: B2C-8-10' **Lab ID: 4026525041** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**1470**	mg/kg	2.1	0.12	1	12/16/09 14:25	12/17/09 17:50	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**8.7**	%	0.10	0.10	1		12/18/09 08:10		

Sample: B2C-10-12' **Lab ID: 4026525042** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**1270**	mg/kg	2.2	0.13	1	12/16/09 14:25	12/17/09 17:54	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**13.3**	%	0.10	0.10	1		12/18/09 08:11		

Sample: B2C-12-14' **Lab ID: 4026525043** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**9050**	mg/kg	7.3	0.42	1	12/16/09 14:25	12/17/09 17:58	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**72.6**	%	0.10	0.10	1		12/18/09 08:11		

Sample: B2C-14-20' **Lab ID: 4026525044** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**708**	mg/kg	3.9	0.23	1	12/16/09 14:25	12/17/09 18:02	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**50.8**	%	0.10	0.10	1		12/18/09 08:11		

Pace Analytical
www.pacelabs.com

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 7201.10 KEWAUNEE MARSH
Pace Project No.: 4026525

Sample: B2D-0-2' **Lab ID: 4026525045** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**4.3**	mg/kg	2.0	0.12	1	12/16/09 14:25	12/17/09 18:06	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**6.7**	%	0.10	0.10	1		12/18/09 08:11		

Sample: B2D-2-4' **Lab ID: 4026525046** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**3.3**	mg/kg	1.9	0.11	1	12/16/09 14:25	12/17/09 18:18	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**2.3**	%	0.10	0.10	1		12/18/09 08:11		

Sample: B2D-4-6' **Lab ID: 4026525047** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**4.1**	mg/kg	2.0	0.12	1	12/16/09 14:25	12/17/09 18:22	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**5.7**	%	0.10	0.10	1		12/18/09 08:11		

Sample: B2D-6-8' **Lab ID: 4026525048** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**1030**	mg/kg	2.2	0.13	1	12/16/09 14:25	12/17/09 18:26	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**13.4**	%	0.10	0.10	1		12/18/09 08:11		

Pace Analytical
www.pacelabs.com

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 7201.10 KEWAUNEE MARSH
Pace Project No.: 4026525

Sample: B2D-8-10' **Lab ID: 4026525049** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**1420**	mg/kg	2.1	0.12	1	12/16/09 14:25	12/17/09 18:30	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**12.8**	%	0.10	0.10	1		12/18/09 08:11		

Sample: B2D-10-12' **Lab ID: 4026525050** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA6010 Preparation Method: EPA3050								
Arsenic	**798**	mg/kg	2.2	0.13	1	12/16/09 14:25	12/17/09 18:34	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**17.4**	%	0.10	0.10	1		12/18/09 08:11		

Sample: B2D-12-14' **Lab ID: 4026525051** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**533**	mg/kg	2.1	0.12	1	12/16/09 14:25	12/17/09 18:38	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**13.9**	%	0.10	0.10	1		12/18/09 08:11		

Sample: B2D-14-15' **Lab ID: 4026525052** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**2820**	mg/kg	6.9	0.40	1	12/16/09 14:25	12/17/09 18:42	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**72.8**	%	0.10	0.10	1		12/18/09 08:12		

Pace Analytical
www.pacelabs.com

Paco Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 7201.10 KEWAUNEE MARSH
Pace Project No.: 4026525

Sample: B2D-15-17.5' **Lab ID: 4026525053** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**1330**	mg/kg	3.6	0.21	1	12/16/09 14:25	12/17/09 18:46	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**44.9**	%	0.10	0.10	1		12/18/09 08:13		

Sample: B2D-17.5-20' **Lab ID: 4026525054** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	81.5	mg/kg	2.4	0.14	1	12/16/09 14:25	12/17/09 18:50	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**24.7**	%	0.10	0.10	1		12/18/09 08:13		

Sample: B2D-20-25' **Lab ID: 4026525055** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**15.5**	mg/kg	2.1	0.12	1	12/16/09 14:25	12/17/09 18:54	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**9.7**	%	0.10	0.10	1		12/18/09 08:13		

Sample: B2E-0-2' **Lab ID: 4026525056** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**2.6**	mg/kg	1.9	0.11	1	12/16/09 14:25	12/17/09 19:06	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**2.6**	%	0.10	0.10	1		12/18/09 08:13		

Pace Analytical
www.pacelabs.com

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 7201.10 KEWAUNEE MARSH
Pace Project No.: 4026525

Sample: B2E-2-4' **Lab ID: 4026525057** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**1.5J**	mg/kg	2.0	0.11	1	12/16/09 14:25	12/17/09 19:10	7440-38-2	B
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**4.2**	%	0.10	0.10	1		12/18/09 08:13		

Sample: B2E-4-6' **Lab ID: 4026525058** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA3050								
Arsenic	**112**	mg/kg	2.1	0.12	1	12/16/09 14:25	12/17/09 19:14	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**6.2**	%	0.10	0.10	1		12/18/09 08:13		

Sample: B2E-6-8' **Lab ID: 4026525059** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**100**	mg/kg	2.3	0.13	1	12/16/09 14:25	12/17/09 19:18	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**14.6**	%	0.10	0.10	1		12/18/09 08:13		

Sample: B2E-8-10' **Lab ID: 4026525060** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA3050								
Arsenic	**107**	mg/kg	2.3	0.13	1	12/16/09 14:45	12/17/09 19:34	7440-38-2	M0
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**13.1**	%	0.10	0.10	1		12/18/09 08:13		

Pace Analytical
www.pacelabs.com

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 7201.10 KEWAUNEE MARSH
Pace Project No.: 4026525

Sample: B2E-10-13.8' **Lab ID: 4026525061** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**87.1**	mg/kg	2.2	0.13	1	12/16/09 14:45	12/17/09 19:53	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**10.1**	%	0.10	0.10	1		12/18/09 08:14		

Sample: B2E-13.8-15' **Lab ID: 4026525062** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**324**	mg/kg	7.7	0.44	1	12/16/09 14:45	12/17/09 19:58	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**75.2**	%	0.10	0.10	1		12/18/09 08:14		

Sample: B2E-20-23' **Lab ID: 4026525063** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**86.5**	mg/kg	5.0	0.29	1	12/16/09 14:45	12/17/09 20:02	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**62.8**	%	0.10	0.10	1		12/18/09 08:14		

Sample: B2E-23-25' **Lab ID: 4026525064** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**2.6**	mg/kg	2.1	0.12	1	12/16/09 14:45	12/17/09 20:05	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**12.4**	%	0.10	0.10	1		12/18/09 08:14		

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 7201.10 KEWAUNEE MARSH
Pace Project No.: 4026525

Sample: B2F-0-2' **Lab ID: 4026525065** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**4.1**	mg/kg	1.9	0.11	1	12/16/09 14:45	12/17/09 20:10	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**2.7**	%	0.10	0.10	1		12/18/09 08:14		

Sample: B2F-2-4' **Lab ID: 4026525066** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**1.8J**	mg/kg	2.0	0.11	1	12/16/09 14:45	12/17/09 20:14	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**4.8**	%	0.10	0.10	1		12/18/09 08:14		

Sample: B2F-4-6' **Lab ID: 4026525067** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**21.8**	mg/kg	2.0	0.11	1	12/16/09 14:45	12/17/09 20:18	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**5.4**	%	0.10	0.10	1		12/18/09 08:14		

Sample: B2F-6-8' **Lab ID: 4026525068** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**68.1**	mg/kg	2.1	0.12	1	12/16/09 14:45	12/17/09 20:22	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**10.5**	%	0.10	0.10	1		12/18/09 08:14		

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 7201.10 KEWAUNEE MARSH
Pace Project No.: 4026525

Sample: B2F-8-10' **Lab ID: 4026525069** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**10.4**	mg/kg	2.2	0.13	1	12/16/09 14:45	12/17/09 20:26	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**12.2**	%	0.10	0.10	1		12/18/09 08:14		

Sample: B2F-10-12' **Lab ID: 4026525070** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA3050								
Arsenic	**11.8**	mg/kg	2.2	0.13	1	12/16/09 14:45	12/17/09 20:30	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**15.6**	%	0.10	0.10	1		12/18/09 08:14		

Sample: B2F-12-13.8' **Lab ID: 4026525071** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**16.0**	mg/kg	2.3	0.13	1	12/16/09 14:45	12/17/09 20:42	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**16.7**	%	0.10	0.10	1		12/18/09 08:14		

Sample: B2F-13.8-15' **Lab ID: 4026525072** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**4.8J**	mg/kg	7.5	0.43	1	12/16/09 14:45	12/17/09 20:46	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**76.0**	%	0.10	0.10	1		12/18/09 08:15		

REPORT OF LABORATORY ANALYSIS

Pace Analytical
www.pacelabs.com

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 7201.10 KEWAUNEE MARSH
Pace Project No.: 4026525

Sample: B2F-15-16' **Lab ID: 4026525073** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**37.5**	mg/kg	6.1	0.35	1	12/16/09 14:45	12/17/09 20:50	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**67.0**	%	0.10	0.10	1		12/18/09 08:16		

Sample: B2F-16-20' **Lab ID: 4026525074** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**2.6J**	mg/kg	3.0	0.17	1	12/16/09 14:45	12/17/09 20:54	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**37.6**	%	0.10	0.10	1		12/18/09 08:16		

Sample: B2F-23-25' **Lab ID: 4026525075** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**1.9J**	mg/kg	2.0	0.12	1	12/16/09 14:45	12/17/09 20:58	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**7.8**	%	0.10	0.10	1		12/18/09 08:16		

Sample: B2F-25-30' **Lab ID: 4026525076** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**3.2**	mg/kg	2.1	0.12	1	12/16/09 14:45	12/17/09 21:02	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**10.9**	%	0.10	0.10	1		12/18/09 08:16		

Pace Analytical
www.pacelabs.com

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 7201.10 KEWAUNEE MARSH
Pace Project No.: 4026525

Sample: B3D-0-2' **Lab ID: 4026525077** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**408**	mg/kg	3.5	0.20	1	12/16/09 14:45	12/17/09 21:06	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**46.5**	%	0.10	0.10	1		12/18/09 08:16		

Sample: B3D-2-4' **Lab ID: 4026525078** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**11.8**	mg/kg	2.2	0.13	1	12/16/09 14:45	12/17/09 21:10	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**8.5**	%	0.10	0.10	1		12/18/09 08:16		

Sample: B3D-4-6' **Lab ID: 4026525079** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA3050								
Arsenic	**14.9**	mg/kg	2.1	0.12	1	12/16/09 14:45	12/17/09 21:14	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**13.5**	%	0.10	0.10	1		12/18/09 08:16		

Sample: B3D-6-8' **Lab ID: 4026525080** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**538**	mg/kg	2.3	0.13	1	12/16/09 17:00	12/17/09 21:38	7440-38-2	P6
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**11.8**	%	0.10	0.10	1		12/18/09 08:16		

Pace Analytical
www.pacelabs.com

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 7201.10 KEWAUNEE MARSH
Pace Project No.: 4026525

Sample: B3D-8-10' **Lab ID: 4026525081** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA3050								
Arsenic	**2130**	mg/kg	2.3	0.13	1	12/16/09 17:00	12/17/09 21:50	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**17.5**	%	0.10	0.10	1		12/18/09 08:16		

Sample: B3D-10-12' **Lab ID: 4026525082** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**1210**	mg/kg	2.3	0.13	1	12/16/09 17:00	12/17/09 21:54	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**18.4**	%	0.10	0.10	1		12/18/09 08:17		

Sample: B3D-12-14' **Lab ID: 4026525083** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA3050								
Arsenic	**2030**	mg/kg	7.9	0.46	1	12/16/09 17:00	12/17/09 21:58	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**77.3**	%	0.10	0.10	1		12/18/09 08:17		

Sample: B3D-14-16' **Lab ID: 4026525084** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA6010 Preparation Method: EPA3050								
Arsenic	**759**	mg/kg	4.7	0.27	1	12/16/09 17:00	12/17/09 22:02	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**59.4**	%	0.10	0.10	1		12/18/09 08:17		

Pace Analytical
www.pacelabs.com

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 7201.10 KEWAUNEE MARSH
Pace Project No.: 4026525

Sample: B3E-0-2' **Lab ID: 4026525085** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**2.9**	mg/kg	2.1	0.12	1	12/16/09 17:00	12/17/09 22:06	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**8.9**	%	0.10	0.10	1		12/18/09 08:17		

Sample: B3E-2-4' **Lab ID: 4026525086** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**23.2**	mg/kg	2.0	0.12	1	12/16/09 17:00	12/17/09 22:18	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**9.9**	%	0.10	0.10	1		12/18/09 08:17		

Sample: B3E-4-6' **Lab ID: 4026525087** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA3050								
Arsenic	**330**	mg/kg	2.3	0.13	1	12/16/09 17:00	12/17/09 22:22	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**17.3**	%	0.10	0.10	1		12/18/09 08:17		

Sample: B3E-6-8' **Lab ID: 4026525088** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**249**	mg/kg	2.2	0.13	1	12/16/09 17:00	12/17/09 22:26	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**17.4**	%	0.10	0.10	1		12/18/09 08:17		

Pace Analytical
www.pacelabs.com

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 7201.10 KEWAUNEE MARSH
Pace Project No.: 4026525

Sample: B3E-8-10' **Lab ID: 4026525089** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**151**	mg/kg	2.3	0.13	1	12/16/09 17:00	12/17/09 22:30	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**14.0**	%	0.10	0.10	1		12/18/09 08:17		

Sample: B3E-10-12' **Lab ID: 4026525090** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**927**	mg/kg	5.5	0.32	1	12/16/09 17:00	12/17/09 22:34	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**66.8**	%	0.10	0.10	1		12/18/09 08:17		

Sample: B3E-12-14' **Lab ID: 4026525091** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**582**	mg/kg	9.5	0.55	1	12/16/09 17:00	12/17/09 22:38	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**79.0**	%	0.10	0.10	1		12/18/09 08:17		

Sample: B3E-14-16' **Lab ID: 4026525092** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA3050								
Arsenic	**63.1**	mg/kg	5.1	0.30	1	12/16/09 17:00	12/17/09 22:42	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**61.7**	%	0.10	0.10	1		12/18/09 08:18		

Pace Analytical
www.pacelabs.com

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 7201.10 KEWAUNEE MARSH
Pace Project No.: 4026525

Sample: B3E-16-20' **Lab ID: 4026525093** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**11.7**	mg/kg	4.2	0.24	1	12/16/09 17:00	12/17/09 22:46	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**53.0**	%	0.10	0.10	1		12/18/09 08:18		

Sample: B3E-20-25' **Lab ID: 4026525094** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**2.9**	mg/kg	2.3	0.13	1	12/16/09 17:00	12/17/09 22:50	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**15.4**	%	0.10	0.10	1		12/18/09 08:19		

Sample: M2D-0-2' **Lab ID: 4026525095** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**454**	mg/kg	2.4	0.14	1	12/16/09 17:00	12/17/09 22:54	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**19.5**	%	0.10	0.10	1		12/18/09 08:19		

Sample: M2D-2-4' **Lab ID: 4026525096** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**5120**	mg/kg	6.6	0.38	1	12/16/09 17:00	12/17/09 23:06	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**71.1**	%	0.10	0.10	1		12/18/09 08:19		

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 7201.10 KEWAUNEE MARSH
Pace Project No.: 4026525

Sample: M2D-4-6' **Lab ID: 4026525097** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**1930**	mg/kg	9.3	0.54	1	12/16/09 17:00	12/17/09 23:10	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**78.6**	%	0.10	0.10	1		12/18/09 08:19		

Sample: M2D-6-8' **Lab ID: 4026525098** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**2180**	mg/kg	10.5	0.60	1	12/16/09 17:00	12/17/09 23:14	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**81.1**	%	0.10	0.10	1		12/18/09 08:19		

Sample: M2D-8-10' **Lab ID: 4026525099** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**633**	mg/kg	6.1	0.35	1	12/16/09 17:00	12/17/09 23:18	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**67.4**	%	0.10	0.10	1		12/18/09 08:19		

Sample: M3D-0-2' **Lab ID: 4026525100** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**2310**	mg/kg	4.6	0.26	1	12/16/09 17:00	12/17/09 11:57	7440-38-2	P6,R1
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**56.5**	%	0.10	0.10	1		12/18/09 08:19		

Pace Analytical
www.pacelabs.com

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 7201.10 KEWAUNEE MARSH
Pace Project No.: 4026525

Sample: M3D-2-4' **Lab ID: 4026525101** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA6010 Preparation Method: EPA3050								
Arsenic	**3800**	mg/kg	10.6	0.61	1	12/16/09 17:00	12/17/09 12:08	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**82.3**	%	0.10	0.10	1		12/18/09 08:19		

Sample: M3D-4-6' **Lab ID: 4026525102** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**2450**	mg/kg	9.4	0.55	1	12/16/09 17:00	12/17/09 12:12	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**78.8**	%	0.10	0.10	1		12/18/09 08:20		

Sample: M3D-6-8' **Lab ID: 4026525103** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA3050								
Arsenic	**1610**	mg/kg	7.9	0.46	1	12/16/09 17:00	12/17/09 12:16	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**75.7**	%	0.10	0.10	1		12/18/09 08:20		

Sample: M3D-8-10' **Lab ID: 4026525104** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**654**	mg/kg	6.0	0.35	1	12/16/09 17:00	12/17/09 12:20	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**67.1**	%	0.10	0.10	1		12/18/09 08:20		

Pace Analytical
www.pacelabs.com

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 7201.10 KEWAUNEE MARSH
Pace Project No.: 4026525

Sample: M4D-0-5' **Lab ID: 4026525105** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**1850**	mg/kg	3.9	0.23	1	12/16/09 17:00	12/17/09 12:24	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**53.5**	%	0.10	0.10	1		12/18/09 08:20		

Sample: M4D-5-7' **Lab ID: 4026525106** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 **MET ICP**	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**4770**	mg/kg	11.6	0.67	1	12/16/09 17:00	12/17/09 12:28	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**84.5**	%	0.10	0.10	1		12/18/09 08:20		

Sample: M4D-7-10' **Lab ID: 4026525107** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**628**	mg/kg	5.7	0.33	1	12/16/09 17:00	12/17/09 12:32	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**67.9**	%	0.10	0.10	1		12/18/09 08:20		

Sample: M5D-0-5' **Lab ID: 4026525108** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**4960**	mg/kg	8.7	0.51	1	12/16/09 17:00	12/17/09 13:00	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**77.7**	%	0.10	0.10	1		12/18/09 08:20		

Pace Analytical
www.pacelabs.com

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 7201.10 KEWAUNEE MARSH
Pace Project No.: 4026525

Sample: M5D-5-7' Lab ID: **4026525109** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA6010 Preparation Method: EPA3050								
Arsenic	**7300**	mg/kg	15 9	0.92	1	12/16/09 17:00	12/17/09 13:04	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**87.9**	%	0.10	0.10	1		12/18/09 08:20		

Sample: M5D-7-10' Lab ID: **4026525110** Collected: 12/10/09 13:00 Received: 12/15/09 08:55 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA6010 Preparation Method: EPA3050								
Arsenic	**500**	mg/kg	6.1	0.35	1	12/16/09 17:00	12/17/09 13:08	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**68.8**	%	0.10	0.10	1		12/18/09 08:20		

Pace Analytical Services, Inc.
12.41 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA

Project: 7201.10 KEWAUNEE MARSH
Pace Project No.: 4026525

QC Batch: MPRP/3476 Analysis Method: EPA 6010
QC Batch Method: EPA 3050 Analysis Description: 6010 MET
Associated Lab Samples: 4026525001, 4026525002, 4026525003, 4026525004, 4026525005, 4026525006, 4026525007, 4026525008, 4026525009, 4026525010, 4026525011, 4026525012, 4026525013, 4026525014, 4026525015, 4026525016, 4026525017, 4026525018, 4026525019

METHOD BLANK: 246938 Matrix: Solid
Associated Lab Samples: 4026525001, 4026525002, 4026525003, 4026525004, 4026525005, 4026525006, 4026525007, 4026525008, 4026525009, 4026525010, 4026525011, 4026525012, 4026525013, 4026525014, 4026525015, 4026525016, 4026525017, 4026525018, 4026525019

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Arsenic	mg/kg	0.19J	2.0	12/17/09 13:20	

LABORATORY CONTROL SAMPLE: 246939

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	mg/kg	50	49.8	100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 246940 246941

Parameter	Units	4026525010 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	mg/kg	2.8	54.7	54.7	55.7	56.7	97	98	75-125	2	20	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA

Project: 7201.10 KEWAUNEE MARSH
Pace Project No.: 4026525

QC Batch: MPRP/3477 Analysis Method: EPA 6010
QC Batch Method: EPA 3050 Analysis Description: 6010 MET
Associated Lab Samples: 4026525020, 4026525021, 4026525022, 4026525023, 4026525024, 4026525025, 4026525026, 4026525027, 4026525028, 4026525029, 4026525030, 4026525031, 4026525032, 4026525033, 4026525034, 4026525035, 4026525036, 4026525037, 4026525038, 4026525039

METHOD BLANK: 246942 Matrix: Solid
Associated Lab Samples: 4026525020, 4026525021, 4026525022, 4026525023, 4026525024, 4026525025, 4026525026, 4026525027, 4026525028, 4026525029, 4026525030, 4026525031, 4026525032, 4026525033, 4026525034, 4026525035, 4026525036, 4026525037, 4026525038, 4026525039

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Arsenic	mg/kg	<0.12	2.0	12/17/09 15:27	

LABORATORY CONTROL SAMPLE: 246943

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	mg/kg	50	49.2	98	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 246944 246945

Parameter	Units	4026525020 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	mg/kg	3.8	52.2	52.2	55.4	56.2	99	100	75-125	1	20	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA

Project: 7201.10 KEWAUNEE MARSH
Pace Project No.: 4026525

QC Batch: MPRP/3478 Analysis Method: EPA 6010
QC Batch Method: EPA 3050 Analysis Description: 6010 MET
Associated Lab Samples: 4026525040, 4026525041, 4026525042, 4026525043, 4026525044, 4026525045, 4026525046, 4026525047, 4026525048, 4026525049, 4026525050, 4026525051, 4026525052, 4026525053, 4026525054, 4026525055, 4026525056, 4026525057, 4026525058, 4026525059

METHOD BLANK: 247057 Matrix: Solid
Associated Lab Samples: 4026525040, 4026525041, 4026525042, 4026525043, 4026525044, 4026525045, 4026525046, 4026525047, 4026525048, 4026525049, 4026525050, 4026525051, 4026525052, 4026525053, 4026525054, 4026525055, 4026525056, 4026525057, 4026525058, 4026525059

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Arsenic	mg/kg	0.16J	2.0	12/17/09 17:30	

LABORATORY CONTROL SAMPLE: 247058

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	mg/kg	50	50.2	100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 247059 247060

Parameter	Units	4026525040 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	mg/kg	996	58.8	58.7	1040	967	82	-49	75-125	8	20	P6

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA

Project: 7201.10 KEWAUNEE MARSH
Pace Project No.: 4026525

QC Batch: MPRP/3479 Analysis Method: EPA6010
QC Batch Method: EPA 3050 Analysis Description: 6010 MET
Associated Lab Samples: 4026525060, 4026525061, 4026525062, 4026525063, 4026525064, 4026525065, 4026525066, 4026525067, 4026525068, 4026525069, 4026525070, 4026525071, 4026525072, 4026525073, 4026525074, 4026525075, 4026525076, 4026525077, 4026525078, 4026525079

METHOD BLANK: 247061 Matrix: Solid
Associated Lab Samples: 4026525060, 4026525061, 4026525062, 4026525063, 4026525064, 4026525065, 4026525066, 4026525067, 4026525068, 4026525069, 4026525070, 4026525071, 4026525072, 4026525073, 4026525074, 4026525075, 4026525076, 4026525077, 4026525078, 4026525079

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Arsenic	mg/kg	0.12J	2.0	12/17/09 19:26	

LABORATORY CONTROL SAMPLE: 247062

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	mg/kg	50	49.7	99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 247063 247064

Parameter	Units	4026525060 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	mg/kg	107	57.4	57.4	185	219	135	196	75-125	17	20	M0

Pace Analytical
www.pacelabs.com

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA

Project: 7201.10 KEWAUNEE MARSH
Pace Project No.: 4026525

QC Batch: MPRP/3480 Analysis Method: EPA 6010
QC Batch Method: EPA 3050 Analysis Description: 6010 MET
Associated Lab Samples: 4026525080, 4026525081, 4026525082, 4026525083, 4026525084, 4026525085, 4026525086, 4026525087, 4026525088, 4026525089, 4026525090, 4026525091, 4026525092, 4026525093, 4026525094, 4026525095, 4026525096, 4026525097, 4026525098, 4026525099

METHOD BLANK: 247065 Matrix: Solid
Associated Lab Samples: 4026525080, 4026525081, 4026525082, 4026525083, 4026525084, 4026525085, 4026525086, 4026525087, 4026525088, 4026525089, 4026525090, 4026525091, 4026525092, 4026525093, 4026525094, 4026525095, 4026525096, 4026525097, 4026525098, 4026525099

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Arsenic	mg/kg	<0.12	2.0	12/17/09 21:30	

LABORATORY CONTROL SAMPLE: 247066

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	mg/kg	50	51.1	102	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 247067 247068

Parameter	Units	4026525080 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	mg/kg	538	56.6	56.6	505	537	-58	-.3	75-125	6	20	P6

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA

Project: 7201.10 KEWAUNEE MARSH
Pace Project No.: 4026525

QC Batch: MPRP/3481 Analysis Method: EPA 6010
QC Batch Method: EPA 3050 Analysis Description: 6010 MET
Associated Lab Samples: 4026525100, 4026525101, 4026525102, 4026525103, 4026525104, 4026525105, 4026525106, 4026525107, 4026525108, 4026525109, 4026525110

METHOD BLANK: 247093 Matrix: Solid
Associated Lab Samples: 4026525100, 4026525101, 4026525102, 4026525103, 4026525104, 4026525105, 4026525106, 4026525107, 4026525108, 4026525109, 4026525110

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Arsenic	mg/kg	<0.12	2.0	12/17/09 11:27	

LABORATORY CONTROL SAMPLE: 247094

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	mg/kg	50	49.3	99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 247095 247096

Parameter	Units	4026525100 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	mg/kg	2310	114	115	1980	1580	-289	-633	75-125	22	20	P6,R1

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA

Project: 7201.10 KEWAUNEE MARSH
Pace Project No.: 4026525

QC Batch: PMST/3428 Analysis Method: ASTM D2974-87
QC Batch Method: ASTM D2974-87 Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 4026525001, 4026525002, 4026525003, 4026525004, 4026525005, 4026525006, 4026525007, 4026525008, 4026525009, 4026525010, 4026525011

SAMPLE DUPLICATE: 247630

Parameter	Units	4026507001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	84.9	85.7	.9	10	

Pace Analytical
www.pacelabs.com

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA

Project: 7201.10 KEWAUNEE MARSH
Pace Project No.: 4026525

QC Batch: PMST/3429 Analysis Method: ASTM D2974-87
QC Batch Method: ASTM D2974-87 Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 4026525012, 4026525013, 4026525014, 4026525015, 4026525016, 4026525017, 4026525018, 4026525019, 4026525020, 4026525021, 4026525022, 4026525023, 4026525024, 4026525025, 4026525026, 4026525027, 4026525028, 4026525029, 4026525030, 4026525031

SAMPLE DUPLICATE: 247636

Parameter	Units	4026525012 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	18.0	18.7	3	10	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA

Project: 7201.10 KEWAUNEE MARSH
Pace Project No.: 4026525

QC Batch: PMST/3430 Analysis Method: ASTM D2974-87
QC Batch Method: ASTM D2974-87 Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 4026525032, 4026525033, 4026525034, 4026525035, 4026525036, 4026525037, 4026525038, 4026525039, 4026525040, 4026525041, 4026525042, 4026525043, 4026525044, 4026525045, 4026525046, 4026525047, 4026525048, 4026525049, 4026525050, 4026525051

SAMPLE DUPLICATE: 247664

Parameter	Units	4026525032 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	14.0	16.2	14	10	

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA

Project: 7201.10 KEWAUNEE MARSH
Pace Project No.: 4026525

QC Batch: PMST/3431 Analysis Method: ASTM D2974-87
QC Batch Method: ASTM D2974-87 Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 4026525052, 4026525053, 4026525054, 4026525055, 4026525056, 4026525057, 4026525058, 4026525059, 4026525060, 4026525061, 4026525062, 4026525063, 4026525064, 4026525065, 4026525066, 4026525067, 4026525068, 4026525069, 4026525070, 4026525071

SAMPLE DUPLICATE: 247665

Parameter	Units	4026525052 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	72.8	72.1	.9	10	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA

Project: 7201.10 KEWAUNEE MARSH
Pace Project No.: 4026525

QC Batch: PMST/3432 Analysis Method: ASTM D2974-87
QC Batch Method: ASTM D2974-87 Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 4026525072, 4026525073, 4026525074, 4026525075, 4026525076, 4026525077, 4026525078, 4026525079, 4026525080, 4026525081, 4026525082, 4026525083, 4026525084, 4026525085, 4026525086, 4026525087, 4026525088, 4026525089, 4026525090, 4026525091

SAMPLE DUPLICATE: 247666

Parameter	Units	4026525072 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	76.0	74.3	2	10	

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA

Project: 7201.10 KEWAUNEE MARSH
Pace Project No.: 4026525

QC Batch: PMST/3433 Analysis Method: ASTM D2974-87
QC Batch Method: ASTM D2974-87 Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 4026525092, 4026525093, 4026525094, 4026525095, 4026525096, 4026525097, 4026525098, 4026525099, 4026525100, 4026525101, 4026525102, 4026525103, 4026525104, 4026525105, 4026525106, 4026525107, 4026525108, 4026525109, 4026525110

SAMPLE DUPLICATE: 247667

Parameter	Units	4026525092 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	61.7	59.8	3	10	

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALIFIERS

Project: 7201.10 KEWAUNEE MARSH
Pace Project No.: 4026525

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

Pace Analytical is NELAP accredited. Contact your Pace PM for the current list of accredited analytes.

U - Indicates the compound was analyzed for, but not detected.

ANALYTE QUALIFIERS

B	Analyte was detected in the associated method blank.
M0	Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
P6	Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.
R1	RPD value was outside control limits.

CHAIN OF CUSTODY RECORD

63847

4026525

RMT Inc., 744 Heartland Trail, Madison, WI 53717-1934
Phone 608/831-4444 • Fax 608/831-3334 • www.rmtinc.com

Project No. 7201.10

Project/Client: Kewaunee Marsh

Project Manager/Contact Person: Dick Fish / Bob Stanforth

Lab No.	Yr. 09 Date	Time	Sample Station ID	Total Number of Containers	MATRIX	Filtered (Yes/No) N; Preserved (Code) A; Analyses Requested: Arsenic	Comments:
001	12-10	13:00	BID-0-2'	1	Soil	X	4oz poly
002			BID-2-4'	1		X	
003			BID-4-6'	1		X	
004			BID-6-8'	1		X	
005			BID-8-10'	1		X	
006			BID-10-12'	1		X	
007			BID-12-14'	1		X	
008			BID-15-19	1		X	
009	12-10	13:00	BID-19-20	1	Soil	X	

PRESERVED CODES
A — NONE
B — HNO_3
C — H_2SO_4
D — NaOH
E — HCl
F — METHANOL
G — _____

SPECIAL INSTRUCTIONS

SAMPLER Relinquished by (Signature) Date/Time: Alex Lagen 12-14-09	Received by (Signature) Date/Time: D. Fish 12/14/9 1345	HAZARDS ASSOCIATED WITH SAMPLES: ☐ Flammable ☐ Corrosive ☐ Highly Toxic ☐ Other (list) _____
Relinquished by (Signature) Date/Time: D. Fish 12/14/9 1700	Received by (Signature) Date/Time:	
Relinquished by (Signature) Date/Time: Walter 12/15/09 855	Received by (Signature) Date/Time: 12/15/09 855	
Custody Seal: Present/(Absent) Intact/Not Intact Seal #s		

Turn Around (circle one) (Normal) Rush
Report Due _____

(For Lab Use Only)
Receipt Temp:
Temp Blank (Y) N
RO 7
Receipt pH (Wet/Metals)
N/A

F-268 (10/05)

WHITE—LABORATORY COPY YELLOW—REPORT APPENDIX PINK—SAMPLER/SUBMITTER

1026525

CHAIN OF CUSTODY RECORD

№ 063507

744 Heartland Trail, P.O. Box 8923 • Madison, WI 53708-8923 • Phone (608) 831-4444 • FAX (608) 831-3334

Project No. 7201.16

Project/Client: Kewaunee Marsh

Project Manager/Contact Person: Dick Fish / Bob Stanforth

Filtered (Yes/No): N

Preserved (Code): A

Analyses Requested: Arsenic

PRESERVED CODES
A - NONE
B - HNO_3
C - H_2SO_4
D - NaOH
E - HCl
F - METHANOL
G - _____

Lab No.	Yr 09 Date	Time	Sample Station ID	Total Number Of Containers	MATRIX	Arsenic	Comments:
010	12-10	13:00	BIE - 0-2'	1	Soil	X	4oz poly
011	"	"	BIE - 2-4'	1	"	X	"
012	"	"	BIE - 4-6'	1	"	X	"
013	"	"	BIE - 6-8'	1	"	X	"
014	"	"	BIE - 8-10'	1	"	X	"
015	"	"	BIE - 10-12'	1	"	X	"
016	"	"	BIE - 12-14'	1	"	X	"
017	"	"	BIE - 14-16'	1	"	X	"
018	"	"	BIE - 16-19'	1	"	X	"
019	12-10	13:00	BIE - 19-20'	1	Soil	X	"

SPECIAL INSTRUCTIONS

SAMPLER Relinquished by (Sig.) (Alex Georgia) — Date/Time 12-14-09	Received by (Sig.) D. Fanning — Date/Time 12/14/9 1345	HAZARDS ASSOCIATED WITH SAMPLES: ☐ Flammable ☐ Corrosive ☐ Highly Toxic ☐ Other (list) _____
Relinquished by (Sig.) D. Fanning 12/14/9 — Date/Time 1700	Received by (Sig.) — Date/Time	
Relinquished by (Sig.) Walter — Date/Time 12/15/09 855	Received by (Sig.) — Date/Time 12/15/09 855	
Custody Seal: Present/Absent — Intact/Not Intact — Seal #'s		

Turn Around (circle one): (Normal) Rush

Report Due _____

(For Lab Use Only)

Receipt Temp: Temp Blank (Y) N — R01

Receipt pH (Wet/Metals): N/A

hg

F-268 (R6/95)

WHITE - LABORATORY COPY YELLOW - REPORT APPENDIX PINK - SAMPLER/SUBMITTER

402625

CHAIN OF CUSTODY RECORD

№ 063508

744 Heartland Trail, P.O. Box 8923 • Madison, WI 53708-8923 • Phone (608) 831-4444 • FAX (608) 831-3334

Project No. 7201.16 | Project/Client: Kewaunee Marsh

Project Manager/Contact Person: Dick Fisk / Bob Stanfield

Filtered (Yes/No): N

Preserved (Code): A

Analyses Requested: Arsenic

PRESERVED CODES: A - NONE; B - HNO_3; C - H_2SO_4; D - NaOH; E - HCl; F - METHANOL; G - _____

Lab No.	Yr. 09 Date	Time	Sample Station ID	Total Number Of Containers	MATRIX	Comments:
020	12-10	13:00	B2A-0-2'	1	Soil	4oz poly
021	"	"	B2A-2-4'	1	"	"
022	"	"	B2A-4-6'	1	"	"
023	"	"	B2A-6-8'	1	"	"
024	"	"	B2A-8-10'	1	"	"
025	"	"	B2A-10-12'	1	"	"
026	"	"	B2A-12-14'	1	"	"
027	"	"	B2A-14-15'	1	"	"
028	↓	↓	B2B-0-2'	1	↓	"
029	12-10	13:00	B2B-2-4'	1	Soil	4oz poly

SPECIAL INSTRUCTIONS

SAMPLER Relinquished by (Sig.) Alex Georgson	Date/Time 12-14-09	Received by (Sig.) D. Fanin	Date/Time 12/14/9 1345
Relinquished by (Sig.) D. Fanin	Date/Time 12/14/9 1700	Received by (Sig.)	Date/Time
Relinquished by (Sig.) Waltco	Date/Time 12/15/09 855	Received by (Sig.)	Date/Time 12/15/09 855
Custody Seal: Present/Absent	Intact/Not Intact	Seal #'s	

HAZARDS ASSOCIATED WITH SAMPLES
- ☐ Flammable
- ☐ Corrosive
- ☐ Highly Toxic
- ☐ Other (list) _____

Turn Around (circle one) (Normal) Rush

Report Due _____

(For Lab Use Only)

Receipt Temp: Temp Blank (Y) N RO 1

Receipt pH (Wet/Metals) N/A

55

F-268 (R6/95)

WHITE - LABORATORY COPY YELLOW - REPORT APPENDIX PINK - SAMPLER/SUBMITTER

4026525
63848

CHAIN OF CUSTODY RECORD

RMT Inc., 744 Heartland Trail, Madison, WI 53717-1934
Phone 608/831-4444 • Fax 608/831-3334 • www.rmtinc.com

Project No. 20116 | Project/Client: Kewaunee Marsh

Project Manager/Contact Persan: Dick Fisk / Bob Stanforth

Lab No.	Yr. 09 Date	Time	Sample Station ID	Total Number of Containers	MATRIX	Analyses Requested: Arsenic	Filtered (Yes/No) N	Preserved (Code) A	Comments:
030	12-10	13:00	B2B - 4-6'	1	Soil	X			4oz poly
031	"	"	B2B - 6-8'	1	"	X			"
032	"	"	B2B - 8-10'	1	"	X			"
033	"	"	B2B - 10-12'	1	"	X			"
034	"	"	B2B - 12-15'	1	"	X			"
035	"	"	B2B - 15-19'	1	"	X			"
036	"	"	B2B - 19-20'	1	"	X			"
037	"	"	B2C - 0-2'	1	"	X			"
038	↓	↓	B2C - 2-4'	1	↓	X			"
039	12-10	13:00	B2C - 4-6'	1	Soil	X			"

PRESERVED CODES
A — NONE
B — HNO_3
C — H_2SO_4
D — NaOH
E — HCl
F — METHANOL
G — _____

SPECIAL INSTRUCTIONS

SAMPLER Relinquished by (Signature) Alan Goeckner — Date/Time 12-14-09	Received by (Signature) D. Fenrich — Date/Time 12/14/09 1345	HAZARDS ASSOCIATED WITH SAMPLES: ☐ Flammable ☐ Corrosive ☐ Highly Toxic ☐ Other (list) _____
Relinquished by (Signature) D. Fenrich 12/14/09 1700	Received by (Signature) — Date/Time	Turn Around (circle one) (Normal) Rush; Report Due _____
Relinquished by (Signature) Walter — Date/Time 12/15/09 855	Received by (Signature) — Date/Time 12/15/09 855	(For Lab Use Only) Receipt Temp: Temp Blank (Y) N RO 7; Receipt pH (Wet/Metals) N/A
Custody Seal: Present/(Absent) Intact/Not Intact Seal #s		

F-268 (10/05)

WHITE—LABORATORY COPY YELLOW—REPORT APPENDIX PINK—SAMPLER/SUBMITTER

L026525
63849

CHAIN OF CUSTODY RECORD

RMT Inc., 744 Heartland Trail, Madison, WI 53717-1934
Phone 608/831-4444 • Fax 608/831-3334 • www.rmtinc.com

Project No. 720110 | Project/Client: Clearwater Marsh

Project Manager/Contact Person: Dick Fish / Bob Stanforth

Filtered (Yes/No): N | Preserved (Code): A

Lab No.	Yr. 09 Date	Time	Sample Station ID	Total Number of Containers	MATRIX	Analyses Requested: Arsenic	Comments:
040	12-10	13:00	B2C-6-8'	1	Soil	X	4oz poly
041	"	"	B2C-8-10'	1	"	X	"
042	"	"	B2C-10-12'	1	"	X	"
043	"	"	B2C-12-14'	1	"	X	"
044	"	"	B2C-14-20'	1	"	X	"
045	"	"	B2D-0-2'	1	"	X	"
046	"	"	B2D-2-4'	1	"	X	"
047	"	"	B2D-4-6'	1	"	X	"
048	↓	↓	B2D-6-8'	1	↓	X	"
049	12-10	13:00	B2D-8-10	1	Soil	X	"

PRESERVED CODES
A — NONE
B — HNO_3
C — H_2SO_4
D — NaOH
E — HCl
F — METHANOL
G — _____

SPECIAL INSTRUCTIONS

SAMPLER Relinquished by (Signature)	Date/Time	Received by (Signature)	Date/Time
(Alex Gucsa)	12-14-09	D. Fish	12/14/9 1345
Relinquished by (Signature)	Date/Time	Received by (Signature)	Date/Time
D. Fish	12/14/9 1700		
Relinquished by (Signature)	Date/Time	Received by (Signature)	Date/Time
Walton	12/15/09 855	MK Morrison Lab	12/15/09 855

HAZARDS ASSOCIATED WITH SAMPLES
☐ Flammable
☐ Corrosive
☐ Highly Toxic
☐ Other (list) _____

Turn Around (circle one): (Normal) Rush
Report Due _____

(For Lab Use Only)
Receipt Temp: Temp Blank (Y) N — RO 1
Receipt pH (Wet/Metals): N/A

Custody Seal: Present/(Absent) Intact/Not Intact Seal #s

57

F-268 (10/05)

WHITE—LABORATORY COPY YELLOW—REPORT APPENDIX PINK—SAMPLER/SUBMITTER

63850

4026525

CHAIN OF CUSTODY RECORD

RMT Inc., 744 Heartland Trail, Madison, WI 53717-1934
Phone 608/831-4444 • Fax 608/831-3334 • www.rmtinc.com

Project No. 72016 | Project/Client: Kewaunee Marsh

Project Manager/Contact Person: Dick Fisk / Bob Stanfill

Filtered (Yes/No) N | Preserved (Code) A

Lab No's 050	Yr. 09 Date	Time	Sample Station ID	Total Number of Containers	MATRIX	Analyses Requested: Arsenic	Comments:
050	12-10	13:00	B2D - 10-12'	1	Soil	X	4oz poly
051			B2D - 12-14'	1		X	
052			B2D - 14-15'	1		X	
053			B2D - 15-17.5'	1		X	
054			B2D - 17.5-20'	1		X	
055			B2D - 20-25'	1		X	
056			B2E - 0-2'	1		X	
057			B2E - 2-4'	1		X	
058			B2E - 4-6'	1		X	
059	↓	↓	B2E - 6-8'	1	↓	X	↓
060	12:00	13:00					

PRESERVED CODES
A — NONE
B — HNO_3
C — H_2SO_4
D — NaOH
E — HCl
F — METHANOL
G — _____

SPECIAL INSTRUCTIONS

SAMPLER Relinquished by (Signature)	Date/Time	Received by (Signature)	Date/Time
(Alex Boesch)	12-10-09	D. Fisk	12/14/09 1345
Relinquished by (Signature)	Date/Time	Received by (Signature)	Date/Time
D. Fisk	12/14/09 1700		
Relinquished by (Signature)	Date/Time	Received by (Signature)	Date/Time
Walter	12/15/09 855		12/15/09 855

Custody Seal: Present/Absent Intact/Not Intact Seal #s

HAZARDS ASSOCIATED WITH SAMPLES
☐ Flammable
☐ Corrosive
☐ Highly Toxic
☐ Other (list) _____

Turn Around (circle one) (Normal) Rush
Report Due _____

(For Lab Use Only)
Receipt Temp: Temp Blank (Y) N 20.1
Receipt pH (Wet/Metals) N/A

F-268 (10/05) WHITE—LABORATORY COPY YELLOW—REPORT APPENDIX PINK—SAMPLER/SUBMITTER

CHAIN OF CUSTODY RECORD

63851

4026525

RMT Inc., 744 Heartland Trail, Madison, WI 53717-1934
Phone 608/831-4444 • Fax 608/831-3334 • www.rmtinc.com

Project No. 7201.10

Project/Client: Kewaunee Mgt

Project Manager/Contact Person: Dick Fisk / Bob Stanford

Filtered (Yes/No) N

Preserved (Code) A

PRESERVED CODES
A — NONE
B — HNO_3
C — H_2SO_4
D — NaOH
E — HCl
F — METHANOL
G — _____

Lab No.	Yr. 09 Date	Time	Sample Station ID	Total Number of Containers	MATRIX	Analyses Requested: Arsenic	Comments:
060	12-10	13:00	B2E - 8-10'	1	Soil	X	
061	12-10		B2E - 10-13.8'	1		X	
062	12-10	13:00	B2E - 13.8-15'	1		X	
063			B2E - 20 - 23'	1		X	
064			B2E - 23-25'	1		X	
065			B2F - 0-2'	1		X	
066			B2F - 2-4'	1		X	
067			B2F - 4-6'	1		X	
068			B2F - 6-8'	1		X	
069			B2F -8-10'	1	Soil	X	

SPECIAL INSTRUCTIONS

SAMPLER Relinquished by (Signature) (Alex Course)	Date/Time 12-14-09	Received by (Signature) D. Fisk	Date/Time 12/14/09 1545
Relinquished by (Signature) D. Fisk 12/14/09	Date/Time 1700	Received by (Signature)	Date/Time
Relinquished by (Signature) Walco	Date/Time 12/15/09 855	Received by (Signature)	Date/Time 12/15/09 855

Custody Seal: Present/(Absent) Intact/Not Intact Seal #s

HAZARDS ASSOCIATED WITH SAMPLES
- ☐ Flammable
- ☐ Corrosive
- ☐ Highly Toxic
- ☐ Other (list) _____

Turn Around (circle one) (Normal) Rush

Report Due _____

(For Lab Use Only)

Receipt Temp: 1.0 / Temp Blank (Y) N

Receipt pH (Wet/Metals) N/A

59

F-268 (10/05)

WHITE—LABORATORY COPY YELLOW—REPORT APPENDIX PINK—SAMPLER/SUBMITTER

63852

4026525

CHAIN OF CUSTODY RECORD

RMT Inc., 744 Heartland Trail, Madison, WI 53717-1934
Phone 608/831-4444 • Fax 608/831-3334 • www.rmtinc.com

Project No. 7201.10

Project/Client: Kewaunee Marsh

Project Manager/Contact Person: Dick Fish / Bob Stanford

Lab No. (Yr. 09)	Date	Time	Sample Station ID	Total Number of Containers	MATRIX	Analyses Requested: Arsenic	Comments:
070 07 (MW-12)	12-10	13:00	B2F - 10-12'	1	Soil	X	4oz poly
071 072	12-10	13:00	B2F - 12-13.8'	1	Soil	X	
072 073	12-10	13:00	B2F - 13.8-15'	1	Soil	X	

Filtered (Yes/No): N
Preserved (Code): A

PRESERVED CODES
A — NONE
B — HNO_3
C — H_2SO_4
D — NaOH
E — HCl
F — METHANOL
G — _____

SPECIAL INSTRUCTIONS

SAMPLER Relinquished by (Signature) (Alex Goerges)	Date/Time 12-14-09	Received by (Signature) D. Fish	Date/Time 12/14/09 1345
Relinquished by (Signature) D. Fish	Date/Time 12/14/09 1700	Received by (Signature)	Date/Time
Relinquished by (Signature) Wolfe	Date/Time 12/15/09 855	Received by (Signature)	Date/Time 12/15/09 855

Custody Seal: Present/Absent Intact/Not Intact Seal #s

HAZARDS ASSOCIATED WITH SAMPLES
- ☐ Flammable
- ☐ Corrosive
- ☐ Highly Toxic
- ☐ Other (list) _____

Turn Around (circle one): (Normal) Rush
Report Due _____

(For Lab Use Only)
Receipt Temp: Temp Blank (Y) N
RO1
Receipt pH (Wet/Metals)
N/A

F-268 (10/05)

WHITE—LABORATORY COPY YELLOW—REPORT APPENDIX PINK—SAMPLER/SUBMITTER

CHAIN OF CUSTODY RECORD

63853

4026525

RMT Inc., 744 Heartland Trail, Madison, WI 53717-1934
Phone 608/831-4444 • Fax 608/831-3334 • www.rmtinc.com

Project No. 7201.10

Project/Client: Kewaunee Marsh

Project Manager/Contact Person: Dick Fish / Bob Stanforth

Filtered (Yes/No): N

Preserved (Code): A

PRESERVED CODES: A — NONE; B — HNO_3; C — H_2SO_4; D — NaOH; E — HCl; F — METHANOL; G — _____

Lab No. (Yr. 09)	Date	Time	Sample Station ID	Total Number of Containers	MATRIX	Analyses Requested: Arsenic	Comments:
074 (minus 15)	12-10	13:00	B2F-15-16'	1	Soil	X	4oz poly
075 (minus 15)			B2F-16-20'	1		X	
076			B2F-23-25'	1		X	
077			B2F-25-30'	1		X	
078			B3D-0-2'	1		X	
079			B3D-2-4'	1		X	
080			B3D-4-6'	1		X	
081			B3D-6-8'	1		X	
082			B3D-8-10'	1		X	
083	12-10	13:00	B3D-10-12'	1	Soil	X	

SPECIAL INSTRUCTIONS

SAMPLER Relinquished by (Signature) (Alex Goerse)	Date/Time 12-14-09	Received by (Signature) D. Fanning	Date/Time 12/14/09 1345
Relinquished by (Signature) D. Fanning	Date/Time 12/14/09 1700	Received by (Signature)	Date/Time
Relinquished by (Signature) Walton	Date/Time 12/15/09 855	Received by (Signature) Woodlake	Date/Time 12/15/09 855

Custody Seal: Present/~~Absent~~ Intact/Not Intact Seal #s

HAZARDS ASSOCIATED WITH SAMPLES
- ☐ Flammable
- ☐ Corrosive
- ☐ Highly Toxic
- ☐ Other (list) _____

Turn Around (circle one): (Normal) Rush

Report Due _____

(For Lab Use Only)

Receipt Temp: Temp Blonk (Y) N RO 1

Receipt pH (Wet/Metals): N/A

F-268 (10/05)

WHITE—LABORATORY COPY YELLOW—REPORT APPENDIX PINK—SAMPLER/SUBMITTER

63802

4026525

CHAIN OF CUSTODY RECORD

RMT Inc., 744 Heartland Trail, Madison, WI 53717-1934
Phone 608/831-4444 • Fax 608/831-3334 • www.rmtinc.com

Project No. 7201.10

Project/Client: Kewaunee MASL

Project Manager/Contact Person: Dick Fish / Bob Stanforth

Lab No.	Yr. 09 Date	Time	Sample Station ID	Total Number of Containers	MATRIX	Analyses Requested: Arsenic	Filtered (Yes/No): N	Preserved (Code): A	Comments:
084	12-10	13:00	B3D-12-14'	1	Soil	X			4oz poly
085			B3D-14-16'	1		X			
086			B3E-0-2'	1		X			
087			B3E-2-4'	1		X			
088			B3E-4-6'	1		X			
089			B3E-6-8'	1		X			
090			B3E-8-10'	1		X			
091			B3E-10-12'	1		X			
092			B3E-12-14'	1		X			
093	12-10	13:00	B3E-14-16'	1	Soil	X			

PRESERVED CODES
A — NONE
B — HNO_3
C — H_2SO_4
D — NaOH
E — HCl
F — METHANOL
G — _____

SPECIAL INSTRUCTIONS

SAMPLER Relinquished by (Signature) (Alex Gage) Date/Time 12-14-09	Received by (Signature) D. Fish Date/Time 12/14/9 1345	HAZARDS ASSOCIATED WITH SAMPLES: ☐ Flammable ☐ Corrosive ☐ Highly Toxic ☐ Other (list) _____
Relinquished by (Signature) D. Fish Date/Time 12/14/9 1700	Received by (Signature) Date/Time	
Relinquished by (Signature) Walter Date/Time 12/15/09 855	Received by (Signature) A.J. Grzeselak Date/Time 12/15/09 855	
Custody Seal: Present/(Absent) Intact/Not Intact Seal #s		

Turn Around (circle one) (Normal) Rush
Report Due _____

(For Lab Use Only)
Receipt Temp: Temp Blank (Y) N ROI
Receipt pH (Wet/Metals) N/A

F-268 (10/05)

WHITE—LABORATORY COPY YELLOW—REPORT APPENDIX PINK—SAMPLER/SUBMITTER

63803

402525

CHAIN OF CUSTODY RECORD

RMT Inc., 744 Heartland Trail, Madison, WI 53717-1934
Phone 608/831-4444 • Fax 608/831-3334 • www.rmtinc.com

Project No. 7201.10

Project/Client: New Canaan Mark

Project Manager/Contact Person: Dick Fisk / Bob Stanfield

Lab No.	Yr. 09 Date	Time	Sample Station ID	Total Number of Containers	MATRIX	Analyses Requested: Arsenic	Comments:
093	094 12-10	13:00	B3E-16-20'	1	Soil	X	4oz poly
094	095 "	"	B3E-20-25'	1	"	X	"
095	096 "	"	M2D-0-2'	1	"	X	"
096	097 "	"	M2D-2-4'	1	"	X	"
097	098 "	"	M2D-4-6'	1	"	X	"
098	099 "	"	M2D-6-8'	1	"	X	"
099	100 "	"	M2D-8-10'	1	"	X	"
100	101 "	"	M3D-0-2'	1	"	X	"
101	102 "	"	M3D-2-4'	1	"	X	"
102	103 12-10	13:00	M3D-4-6'	1	Soil	X	▽

Filtered (Yes/No): N
Preserved (Code): A

PRESERVED CODES
A — NONE
B — HNO_3
C — H_2SO_4
D — NaOH
E — HCl
F — METHANOL
G — _____

SPECIAL INSTRUCTIONS

SAMPLER Relinquished by (Signature) (Alex Gorsen)	Date/Time 12-14-09	Received by (Signature) D. Fisk
Relinquished by (Signature) D. Fisk	Date/Time 12/14/9 1700	Received by (Signature)
Relinquished by (Signature) Walter	Date/Time 12/15/09 855	Received by (Signature)
Custody Seal: Present/Absent	Intact/Not Intact	Seal #s

Date/Time: 12/14/9 1345

Received by (Signature) — Date/Time: 12/15/09 855

HAZARDS ASSOCIATED WITH SAMPLES
- ☐ Flammable
- ☐ Corrosive
- ☐ Highly Toxic
- ☐ Other (list) _____

Turn Around (circle one): (Normal) Rush

Report Due _____

(For Lab Use Only)

Receipt Temp: Temp Blank (Y) N — KOI

Receipt pH (Wet/Metals): N/A

F-268 (10/05)

WHITE—LABORATORY COPY YELLOW—REPORT APPENDIX PINK—SAMPLER/SUBMITTER

63804

402525

CHAIN OF CUSTODY RECORD

RMT Inc., 744 Heartland Trail, Madison, WI 53717-1934
Phone 608/831-4444 • Fax 608/831-3334 • www.rmtinc.com

Project No. 7201.10 | Project/Client: Kewaunee Marsh

Project Manager/Contac Person: Dick Fisk / Bob Stanforth

Lab No.	Yr. 09 Date	Time	Sample Station ID	Total Number of Containers	MATRIX	Analyses Requested: Arsenic	Comments:
104	12-10	13:00	M3D-6-8'	1	Soil	X	4oz poly
105			M3D-8-10'	1		X	
106			M4D-0-5'	1		X	
107			M4D-5-7'	1		X	
108			M4D-7-10'	1		X	
109			M5D-0-5'	1		X	
110			M5D-5-7'	1		X	
111	12-10	13:00	M5D-7-10'	1	Soil	X	

Filtered (Yes/No): N
Preserved (Code): A

PRESERVED CODES
A — NONE
B — HNO_3
C — H_2SO_4
D — NaOH
E — HCl
F — METHANOL
G — _____

SPECIAL INSTRUCTIONS

SAMPLER Relinquished by (Signature) (Chris Gaugert) 12-14-09	Date/Time	Received by (Signature) D. Fenner 12/14/9 1345	Date/Time
Relinquished by (Signature) D. Fenner 12/14/9 1700	Date/Time	Received by (Signature)	Date/Time
Relinquished by (Signature) Waltco	Date/Time 12/15/09 855	Received by (Signature)	Date/Time 12/15/09 855

Custody Seal: Present / (Absent) Intact/Not Intact Seal #'s

HAZARDS ASSOCIATED WITH SAMPLES
☐ Flammable
☐ Corrosive
☐ Highly Toxic
☐ Other (list) _____

Turn Around (circle one) (Normal) Rush
Report Due _____

(For Lab Use Only)
Receipt Temp: RO ?
Temp Blank (Y) N
MEP 12/15
Receipt pH (Wet Metals) (N/A)

F-268 (10/05)

WHITE—LABORATORY COPY YELLOW—REPORT APPENDIX PINK—SAMPLER/SUBMITTER

Pace Analytical Services, Inc.
1241 Bellevue Street, Suite 9
Green Bay, WI 54302

Pace Analytical

Sample Condition Upon Receipt

Client Name: RMT Project # 4026525

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other Walter

Tracking #:

Custody Seal on Cooler/Box Present: ☐ yes ☒ no Seals intact: ☐ yes ☐ no

Custody Seal on Samples Present: ☐ yes ☒ no Seals intact: ☐ yes ☐ no

Packing Material: ☐ Bubble Wrap ☒ Bubble Bags ☐ None Other

Thermometer Used N/A Type of Ice: (Wet) Blue Dry None ☐ Samples on ice, cooling process has begun

Cooler Temperature R01 Biological Tissue is Frozen: ☐ yes ☐ no

Temp Blank Present: ☒ yes ☐ no

Person examining contents:
Date: 12/15/09
Initials: MEN

Temp should be above freezing to 6°C for all sample except Biota.
Biota Samples should be received ≤ 0°C.

		Comments:
Chain of Custody Present:	☒Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☒Yes ☐No ☐N/A	2.
Chain of Custody Relinquished:	☒Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☒Yes ☐No ☐N/A	4.
Samples Arrived within Hold Time:	☒Yes ☐No ☐N/A	5.
Short Hold Time Analysis (<72hr):	☐Yes ☒No ☐N/A	6.
Rush Turn Around Time Requested:	☐Yes ☒No ☐N/A	7.
Sufficient Volume:	☒Yes ☐No ☐N/A	8.
Correct Containers Used:	☒Yes ☐No ☐N/A	9.
-Pace Containers Used:	☒Yes ☐No ☐N/A	
Containers Intact:	☒Yes ☐No ☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☒N/A	11.
Sample Labels match COC:	☒Yes ☐No ☐N/A	12.
-Includes date/time/ID/Analysis Matrix: S		
All containers needing preservation have been checked.	☐Yes ☐No ☒N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation.	☐Yes ☐No ☒N/A	
exceptions: VOA, coliform, TOC, O&G, WI-DRO (water)	☐Yes ☐No	Initial when completed / Lot # of added preservative
Samples checked for dechlorination:	☐Yes ☐No ☒N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes ☐No ☒N/A	15.
Trip Blank Present:	☐Yes ☐No ☒N/A	16.
Trip Blank Custody Seals Present	☐Yes ☐No ☒N/A	
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: Date/Time:

Comments/ Resolution:

Project Manager Review: for TN **Date:** 12/15/09

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

Pace Analytical
www.pacelabs.com

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

March 31, 2010

BOB STANFORTH
RMT MADISON
744 Heartland Trail
Madison, WI 537171934

RE: Project: 7201.15 KEWAUNEE MARSH
Pace Project No.: 4029654

Dear BOB STANFORTH:
Enclosed are the analytical results for sample(s) received by the laboratory on March 20, 2010. The results relate only to the samples included in this report. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Tod Noltemeyer

Tod Noltemeyer

tod.noltemeyer@pacelabs.com
Project Manager

Enclosures

cc: ALEX GOERGEN, RMT - MADISON

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

CERTIFICATIONS

Project: 7201.15 KEWAUNEE MARSH
Pace Project No.: 4029654

Green Bay Certification IDs
California Certification #: 09268CA
Florida/NELAP Certification #: E87948
Illinois Certification #: 200050
Kentucky Certification #: 82
Louisiana Certification #: 04168
Minnesota Certification#: 055-999-334
New York Certification #: 11887
New York Certification #: 11888
North Carolina Certification #: 503
North Dakota Certification#: R-150
South Carolina Certification #: 83006001
Wisconsin Certification #: 405132750
Wisconsin DATCP Certification #: 105-444
1241 Bellevue Street Green Bay, WI 54302

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

SAMPLE SUMMARY

Project: 7201.15 KEWAUNEE MARSH
Pace Project No.: 4029654

Lab ID	Sample ID	Matrix	Date Collected	Date Received
4029654001	M2A 0-2.5'	Solid	03/17/10 00:00	03/20/10 08:43
4029654002	M2A 2.5-5.0'	Solid	03/17/10 00:00	03/20/10 08:43
4029654003	M2A 5.0-7.5'	Solid	03/17/10 00:00	03/20/10 08:43
4029654004	M2A 7.5-10.0'	Solid	03/17/10 00:00	03/20/10 08:43
4029654005	M2B 0-2.5'	Solid	03/17/10 00:00	03/20/10 08:43
4029654006	M2B 2.5-5.0'	Solid	03/17/10 00:00	03/20/10 08:43
4029654007	M2B 5.0-7.5'	Solid	03/17/10 00:00	03/20/10 08:43
4029654008	M2B 7.5-10.0'	Solid	03/17/10 00:00	03/20/10 08:43
4029654009	M2C 0-2.5'	Solid	03/17/10 00:00	03/20/10 08:43
4029654010	M2C 2.5-5.0'	Solid	03/17/10 00:00	03/20/10 08:43
4029654011	M2C 5.0-7.5'	Solid	03/17/10 00:00	03/20/10 08:43
4029654012	M2C 7.5-10.0'	Solid	03/17/10 00:00	03/20/10 08:43
4029654013	M2E 0-2.5'	Solid	03/17/10 00:00	03/20/10 08:43
4029654014	M2E 2.5-5.0'	Solid	03/17/10 00:00	03/20/10 08:43
4029654015	M2E 5.0-7.5'	Solid	03/17/10 00:00	03/20/10 08:43
4029654016	M2E 7.5-10.0'	Solid	03/17/10 00:00	03/20/10 08:43
4029654017	M2F 0-2.5'	Solid	03/17/10 00:00	03/20/10 08:43
4029654018	M2F 2.5-5.0'	Solid	03/17/10 00:00	03/20/10 08:43
4029654019	M2F 5.0-7.5'	Solid	03/17/10 00:00	03/20/10 08:43
4029654020	M2F 7.5-10.0'	Solid	03/17/10 00:00	03/20/10 08:43
4029654021	M5A 0-2.0'	Solid	03/17/10 00:00	03/20/10 08:43
4029654022	M5A 2-4.0'	Solid	03/17/10 00:00	03/20/10 08:43
4029654023	M5A 4-6.0'	Solid	03/17/10 00:00	03/20/10 08:43
4029654024	M5A 6-8.0'	Solid	03/17/10 00:00	03/20/10 08:43
4029654025	M5A 8-10.0'	Solid	03/17/10 00:00	03/20/10 08:43
4029654026	M5B 0-2.0'	Solid	03/17/10 00:00	03/20/10 08:43
4029654027	M5B 2.0-4.0'	Solid	03/17/10 00:00	03/20/10 08:43
4029654028	M5B 4.0-6.0'	Solid	03/17/10 00:00	03/20/10 08:43
4029654029	M5B 6.0-8.0'	Solid	03/17/10 00:00	03/20/10 08:43
4029654030	M5B 8.0-10.0'	Solid	03/17/10 00:00	03/20/10 08:43
4029654031	M5C 0-2.5'	Solid	03/17/10 00:00	03/20/10 08:43
4029654032	M5C 2.5-5.0'	Solid	03/17/10 00:00	03/20/10 08:43
4029654033	M5C 5.0-7.5'	Solid	03/17/10 00:00	03/20/10 08:43
4029654034	M5C 7.5-10.0'	Solid	03/17/10 00:00	03/20/10 08:43
4029654035	M5E 0-2.0'	Solid	03/17/10 00:00	03/20/10 08:43
4029654036	M5E 2.0-4.0'	Solid	03/17/10 00:00	03/20/10 08:43
4029654037	M5E 4.0-6.0'	Solid	03/17/10 00:00	03/20/10 08:43

Pace Analytical
www.pacelabs.com

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

SAMPLE SUMMARY

Project: 7201.15 KEWAUNEE MARSH
Pace Project No.: 4029654

Lab ID	Sample ID	Matrix	Date Collected	Date Received
4029654038	M5E 6.0-8.0'	Solid	03/17/10 00:00	03/20/10 08:43
4029654039	M5E 8.0-10.0'	Solid	03/17/10 00:00	03/20/10 08:43
4029654040	M5E 10.0-12.0'	Solid	03/17/10 00:00	03/20/10 08:43
4029654041	M5E 12-14'	Solid	03/17/10 00:00	03/20/10 08:43
4029654042	M5E 14-15'	Solid	03/17/10 00:00	03/20/10 08:43
4029654043	M5F 0-2.5'	Solid	03/17/10 00:00	03/20/10 08:43
4029654044	M5F 2.5-5.0'	Solid	03/17/10 00:00	03/20/10 08:43
4029654045	M5F 5.0-7.5'	Solid	03/17/10 00:00	03/20/10 08:43
4029654046	M5F 7.5-10.0'	Solid	03/17/10 00:00	03/20/10 08:43
4029654047	M6E 0-4.0'	Solid	03/17/10 00:00	03/20/10 08:43
4029654048	M6E 4-6.0'	Solid	03/17/10 00:00	03/20/10 08:43
4029654049	M6E 6-8.0'	Solid	03/17/10 00:00	03/20/10 08:43
4029654050	M7E 0-2.0'	Solid	03/17/10 00:00	03/20/10 08:43
4029654051	M7E 2-4.0'	Solid	03/17/10 00:00	03/20/10 08:43
4029654052	M7E 4-6.0'	Solid	03/17/10 00:00	03/20/10 08:43
4029654053	M7E 6-8.0'	Solid	03/17/10 00:00	03/20/10 08:43
4029654054	M8E 0-4.0'	Solid	03/17/10 00:00	03/20/10 08:43
4029654055	M8E 4-6.0'	Solid	03/17/10 00:00	03/20/10 08:43
4029654056	M8E 6-8.0'	Solid	03/17/10 00:00	03/20/10 08:43
4029654057	M9F 0-4.0'	Solid	03/17/10 00:00	03/20/10 08:43
4029654058	M9F 4.0-6.0'	Solid	03/17/10 00:00	03/20/10 08:43
4029654059	M9F 6.0-8.0'	Solid	03/17/10 00:00	03/20/10 08:43
4029654060	M10F 0-4.0'	Solid	03/17/10 00:00	03/20/10 08:43
4029654061	M10F 4-6'	Solid	03/17/10 00:00	03/20/10 08:43
4029654062	M10F 6-8.0'	Solid	03/17/10 00:00	03/20/10 08:43
4029654063	M11F 0-2.0'	Solid	03/17/10 00:00	03/20/10 08:43
4029654064	M11F 2.0-4.0'	Solid	03/17/10 00:00	03/20/10 08:43
4029654065	M11F 4.0-6.0'	Solid	03/17/10 00:00	03/20/10 08:43
4029654066	M11F 6.0-8.0'	Solid	03/17/10 00:00	03/20/10 08:43
4029654067	M11F 8.0-10.0'	Solid	03/17/10 00:00	03/20/10 08:43
4029654068	M11F 10.0-12.0'	Solid	03/17/10 00:00	03/20/10 08:43
4029654069	M12F 0-4.0'	Solid	03/17/10 00:00	03/20/10 08:43
4029654070	M12F 4.0-6.0'	Solid	03/17/10 00:00	03/20/10 08:43
4029654071	M12F 6.0-8.0'	Solid	03/17/10 00:00	03/20/10 08:43

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

SAMPLE ANALYTE COUNT

Project: 7201.15 KEWAUNEE MARSH
Pace Project No.: 4029654

Lab ID	Sample ID	Method	Analysts	Analytes Reported
4029654001	M2A 0-2.5'	EPA 6010	DLB	1
		ASTM D2974-87	AME	1
4029654002	M2A 2.5-5.0'	EPA 6010	DLB	1
		ASTM D2974-87	AME	1
4029654003	M2A 5.0-7.5'	EPA 6010	DLB	1
		ASTM D2974-87	AME	1
4029654004	M2A 7.5-10.0'	EPA 6010	DLB	1
		ASTM D2974-87	AME	1
4029654005	M2B 0-2.5'	EPA 6010	DLB	1
		ASTM D2974-87	AME	1
4029654006	M2B 2.5-5.0'	EPA 6010	DLB	1
		ASTM D2974-87	AME	1
4029654007	M2B 5.0-7.5'	EPA 6010	DLB	1
		ASTM D2974-87	AME	1
4029654008	M2B 7.5-10.0'	EPA 6010	DLB	1
		ASTM D2974-87	AME	1
4029654009	M2C 0-2.5'	EPA 6010	DLB	1
		ASTM D2974-87	AME	1
4029654010	M2C 2.5-5.0'	EPA 6010	DLB	1
		ASTM D2974-87	AME	1
4029654011	M2C 5.0-7.5'	EPA 6010	DLB	1
		ASTM D2974-87	AME	1
4029654012	M2C 7.5-10.0'	EPA 6010	DLB	1
		ASTM D2974-87	AME	1
4029654013	M2E 0-2.5'	EPA 6010	DLB	1
		ASTM D2974-87	AME	1
4029654014	M2E 2.5-5.0'	EPA 6010	DLB	1
		ASTM D2974-87	AME	1
4029654015	M2E 5.0-7.5'	EPA 6010	DLB	1
		ASTM D2974-87	AME	1
4029654016	M2E 7.5-10.0'	EPA 6010	DLB	1
		ASTM D2974-87	AME	1
4029654017	M2F 0-2.5'	EPA 6010	DLB	1
		ASTM D2974-87	AME	1
4029654018	M2F 2.5-5.0'	EPA 6010	DLB	1
		ASTM D2974-87	AME	1
4029654019	M2F 5.0-7.5'	EPA 6010	DLB	1

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

SAMPLE ANALYTE COUNT

Project: 7201.15 KEWAUNEE MARSH
Pace Project No.: 4029654

Lab ID	Sample ID	Method	Analysts	Analytes Reported
		ASTM D2974-87	AME	1
4029654020	M2F 7.5-10.0'	EPA 6010	DLB	1
		ASTM D2974-87	AME	1
4029654021	M5A 0-2.0'	EPA 6010	DLB	1
		ASTM D2974-87	AME	1
4029654022	M5A 2-4.0'	EPA 6010	DLB	1
		ASTM D2974-87	AME	1
4029654023	M5A 4-6.0'	EPA 6010	DLB	1
		ASTM D2974-87	AME	1
4029654024	M5A 6-8.0'	EPA 6010	DLB	1
		ASTM D2974-87	AME	1
4029654025	M5A 8-10.0'	EPA 6010	DLB	1
		ASTM D2974-87	AME	1
4029654026	M5B 0-2.0'	EPA 6010	DLB	1
		ASTM D2974-87	AME	1
4029654027	M5B 2.0-4.0'	EPA 6010	DLB	1
		ASTM D2974-87	AME	1
4029654028	M5B 4.0-6.0'	EPA 6010	DLB	1
		ASTM D2974-87	AME	1
4029654029	M5B 6.0-8.0'	EPA 6010	DLB	1
		ASTM D2974-87	AME	1
4029654030	M5B 8.0-10.0'	EPA 6010	DLB	1
		ASTM D2974-87	AME	1
4029654031	M5C 0-2.5'	EPA 6010	DLB	1
		ASTM D2974-87	AME	1
4029654032	M5C 2.5-5.0'	EPA 6010	DLB	1
		ASTM D2974-87	AME	1
4029654033	M5C 5.0-7.5'	EPA 6010	DLB	1
		ASTM D2974-87	AME	1
4029654034	M5C 7.5-10.0'	EPA 6010	DLB	1
		ASTM D2974-87	AME	1
4029654035	M5E 0-2.0'	EPA 6010	DLB	1
		ASTM D2974-87	AME	1
4029654036	M5E 2.0-4.0'	EPA 6010	DLB	1
		ASTM D2974-87	AME	1
4029654037	M5E 4.0-6.0'	EPA 6010	DLB	1
		ASTM D2974-87	AME	1

Pace Analytical
www.pacelabs.com

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

SAMPLE ANALYTE COUNT

Project: 7201.15 KEWAUNEE MARSH
Pace Project No.: 4029654

Lab ID	Sample ID	Method	Analysts	Analytes Reported
4029654038	M5E 6.0-8.0'	EPA 6010	DLB	1
		ASTM D2974-87	AME	1
4029654039	M5E 8.0-10.0'	EPA 6010	DLB	1
		ASTM D2974-87	AME	1
4029654040	M5E 10.0-12.0'	EPA 6010	DLB	1
		ASTM D2974-87	AME	1
4029654041	M5E 12-14'	EPA 6010	DLB	1
		ASTM D2974-87	AME	1
4029654042	M5E 14-15'	EPA 6010	DLB	1
		ASTM D2974-87	AME	1
4029654043	M5F 0-2.5'	EPA 6010	DLB	1
		ASTM D2974-87	AME	1
4029654044	M5F 2.5-5.0'	EPA 6010	DLB	1
		ASTM D2974-87	AME	1
4029654045	M5F 5.0-7.5'	EPA 6010	DLB	1
		ASTM D2974-87	AME	1
4029654046	M5F 7.5-10.0'	EPA 6010	DLB	1
		ASTM D2974-87	AME	1
4029654047	M6E 0-4.0'	EPA 6010	DLB	1
		ASTM D2974-87	AME	1
4029654048	M6E 4-6.0'	EPA 6010	DLB	1
		ASTM D2974-87	AME	1
4029654049	M6E 6-8.0'	EPA 6010	DLB	1
		ASTM D2974-87	AME	1
4029654050	M7E 0-2.0'	EPA 6010	DLB	1
		ASTM D2974-87	AME	1
4029654051	M7E 2-4.0'	EPA 6010	DLB	1
		ASTM D2974-87	AME	1
4029654052	M7E 4-6.0'	EPA 6010	DLB	1
		ASTM D2974-87	AME	1
4029654053	M7E 6-8.0'	EPA 6010	DLB	1
		ASTM D2974-87	AME	1
4029654054	M8E 0-4.0'	EPA 6010	DLB	1
		ASTM D2974-87	AME	1
4029654055	M8E 4-6.0'	EPA 6010	DLB	1
		ASTM D2974-87	AME	1
4029654056	M8E 6-8.0'	EPA 6010	DLB	1

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

SAMPLE ANALYTE COUNT

Project: 7201.15 KEWAUNEE MARSH
Pace Project No.: 4029654

Lab ID	Sample ID	Method	Analysts	Analytes Reported
		ASTM D2974-87	AME	1
4029654057	M9F 0-4.0'	EPA 6010	DLB	1
		ASTM D2974-87	AME	1
4029654058	M9F 4.0-6.0'	EPA 6010	DLB	1
		ASTM D2974-87	AME	1
4029654059	M9F 6.0-8.0'	EPA 6010	DLB	1
		ASTM D2974-87	AME	1
4029654060	M10F 0-4.0'	EPA 6010	DLB	1
		ASTM D2974-87	AME	1
4029654061	M10F 4-6'	EPA 6010	DLB	1
		ASTM D2974-87	AME	1
4029654062	M10F 6-8.0'	EPA 6010	DLB	1
		ASTM D2974-87	AME	1
4029654063	M11F 0-2.0'	EPA 6010	DLB	1
		ASTM D2974-87	AME	1
4029654064	M11F 2.0-4.0'	EPA 6010	DLB	1
		ASTM D2974-87	AME	1
4029654065	M11F 4.0-6.0'	EPA 6010	DLB	1
		ASTM D2974-87	AME	1
4029654066	M11F 6.0-8.0'	EPA 6010	DLB	1
		ASTM D2974-87	AME	1
4029654067	M11F 8.0-10.0'	EPA 6010	DLB	1
		ASTM D2974-87	AME	1
4029654068	M11F 10.0-12.0'	EPA 6010	DLB	1
		ASTM D2974-87	AME	1
4029654069	M12F 0-4.0'	EPA 6010	DLB	1
		ASTM D2974-87	AME	1
4029654070	M12F 4.0-6.0'	EPA 6010	DLB	1
		ASTM D2974-87	AME	1
4029654071	M12F 6.0-8.0'	EPA 6010	DLB	1
		ASTM D2974-87	AME	1

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 7201.15 KEWAUNEE MARSH
Pace Project No.: 4029654

Sample: M2A 0-2.5' **Lab ID: 4029654001** Collected: 03/17/10 00:00 Received: 03/20/10 08:43 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**13.6**	mg/kg	3.5	0.20	1	03/23/10 11:40	03/23/10 17:50	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**43.9**	%	0.10	0.10	1		03/25/10 08:15		

Sample: M2A 2.5-5.0' **Lab ID: 4029654002** Collected: 03/17/10 00:00 Received: 03/20/10 08:43 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**107**	mg/kg	5.0	0.29	1	03/23/10 11:40	03/23/10 17:54	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**63.1**	%	0.10	0.10	1		03/25/10 08:15		

Sample: M2A 5.0-7.5' **Lab ID: 4029654003** Collected: 03/17/10 00:00 Received: 03/20/10 08:43 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**67.0**	mg/kg	9.1	0.52	1	03/23/10 11:40	03/23/10 17:58	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**79.5**	%	0.10	0.10	1		03/25/10 08:15		

Sample: M2A 7.5-10.0' **Lab ID: 4029654004** Collected: 03/17/10 00:00 Received: 03/20/10 08:43 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**63.9**	mg/kg	5.7	0.33	1	03/23/10 11:40	03/23/10 18:02	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**66.5**	%	0.10	0.10	1		03/25/10 08:15		

REPORT OF LABORATORY ANALYSIS

Pace Analytical
www.pacelabs.com

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 7201.15 KEWAUNEE MARSH
Pace Project No.: 4029654

Sample: M2B 0-2.5' **Lab ID: 4029654005** Collected: 03/17/10 00:00 Received: 03/20/10 08:43 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**4500**	mg/kg	3.2	0.19	1	03/23/10 11:40	03/23/10 18:06	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**41.4**	%	0.10	0.10	1		03/25/10 08:15		

Sample: M2B 2.5-5.0' **Lab ID: 4029654006** Collected: 03/17/10 00:00 Received: 03/20/10 08:43 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**13200**	mg/kg	8.7	0.50	1	03/23/10 11:40	03/23/10 18:10	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**79.4**	%	0.10	0.10	1		03/25/10 08:15		

Sample: M2B 5.0-7.5' **Lab ID: 4029654007** Collected: 03/17/10 00:00 Received: 03/20/10 08:43 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA3050								
Arsenic	**834**	mg/kg	3.5	0.20	1	03/23/10 11:40	03/23/10 18:14	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**51.4**	%	0.10	0.10	1		03/25/10 08:15		

Sample: M2B 7.5-10.0' **Lab ID: 4029654008** Collected: 03/17/10 00:00 Received: 03/20/10 08:43 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**2100**	mg/kg	2.3	0.13	1	03/23/10 11:40	03/23/10 18:18	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**22.8**	%	0.10	0.10	1		03/25/10 08:16		

Pace Analytical
www.pacelabs.com

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 7201.15 KEWAUNEE MARSH
Pace Project No.: 4029654

Sample: M2C 0-2.5' Lab ID: **4029654009** Collected: 03/17/10 00:00 Received: 03/20/10 08:43 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**1510**	mg/kg	3.2	0.19	1	03/23/10 11:40	03/23/10 18:22	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**47.0**	%	0.10	0.10	1		03/25/10 08:16		

Sample: M2C 2.5-5.0' Lab ID: **4029654010** Collected: 03/17/10 00:00 Received: 03/20/10 08:43 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**4510**	mg/kg	2.9	0.17	1	03/23/10 11:40	03/23/10 18:26	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**38.4**	%	0.10	0.10	1		03/25/10 08:16		

Sample: M2C 5.0-7.5' Lab ID: **4029654011** Collected: 03/17/10 00:00 Received: 03/20/10 08:43 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**11400**	mg/kg	7.2	0.42	1	03/23/10 11:40	03/23/10 18:38	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**74.4**	%	0.10	0.10	1		03/25/10 08:16		

Sample: M2C 7.5-10.0' Lab ID: **4029654012** Collected: 03/17/10 00:00 Received: 03/20/10 08:43 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**9950**	mg/kg	9.9	0.57	1	03/23/10 11:40	03/23/10 18:42	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**82.3**	%	0.10	0.10	1		03/25/10 08:16		

Pace Analytical
www.pacelabs.com

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 7201.15 KEWAUNEE MARSH
Pace Project No.: 4029654

Sample: M2E 0-2.5' **Lab ID: 4029654013** Collected: 03/17/10 00:00 Received: 03/20/10 08:43 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**734**	mg/kg	3.8	0.22	1	03/23/10 11:40	03/23/10 18:46	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**48.3**	%	0.10	0.10	1		03/25/10 08:16		

Sample: M2E 2.5-5.0' **Lab ID: 4029654014** Collected: 03/17/10 00:00 Received: 03/20/10 08:43 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**1720**	mg/kg	4.5	0.26	1	03/23/10 11:40	03/23/10 18:50	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**59.6**	%	0.10	0.10	1		03/25/10 08:16		

Sample: M2E 5.0-7.5' **Lab ID: 4029654015** Collected: 03/17/10 00:00 Received: 03/20/10 08:43 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**906**	mg/kg	3.9	0.22	1	03/23/10 11:40	03/23/10 18:54	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**55.0**	%	0.10	0.10	1		03/25/10 08:16		

Sample: M2E 7.5-10.0' **Lab ID: 4029654016** Collected: 03/17/10 00:00 Received: 03/20/10 08:43 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**1400**	mg/kg	8.2	0.48	1	03/23/10 11:40	03/23/10 18:58	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**77.4**	%	0.10	0.10	1		03/25/10 08:16		

Pace Analytical
www.pacelabs.com

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 7201.15 KEWAUNEE MARSH
Pace Project No.: 4029654

Sample: M2F 0-2.5' **Lab ID: 4029654017** Collected: 03/17/10 00:00 Received: 03/20/10 08:43 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**109**	mg/kg	4.3	0.25	1	03/23/10 15:15	03/25/10 00:48	7440-38-2	M0
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**53.6**	%	0.10	0.10	1		03/25/10 08:16		

Sample: M2F 2.5-5.0' **Lab ID: 4029654018** Collected: 03/17/10 00:00 Received: 03/20/10 08:43 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA3050								
Arsenic	**664**	mg/kg	8.9	0.51	1	03/23/10 15:15	03/25/10 01:07	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**78.7**	%	0.10	0.10	1		03/25/10 08:16		

Sample: M2F 5.0-7.5' **Lab ID: 4029654019** Collected: 03/17/10 00:00 Received: 03/20/10 08:43 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA3050								
Arsenic	**407**	mg/kg	7.5	0.43	1	03/23/10 15:15	03/25/10 01:11	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**77.2**	%	0.10	0.10	1		03/25/10 08:17		

Sample: M2F 7.5-10.0' **Lab ID: 4029654020** Collected: 03/17/10 00:00 Received: 03/20/10 08:43 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**54.7**	mg/kg	8.2	0.48	1	03/23/10 15:15	03/25/10 01:15	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**78.1**	%	0.10	0.10	1		03/25/10 08:17		

Pace Analytical
www.pacelabs.com

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 7201.15 KEWAUNEE MARSH
Pace Project No.: 4029654

Sample: M5A 0-2.0' **Lab ID: 4029654021** Collected: 03/17/10 00:00 Received: 03/20/10 08:43 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**20.8**	mg/kg	3.4	0.19	1	03/23/10 15:15	03/25/10 01:19	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**48.8**	%	0.10	0.10	1		03/25/10 08:17		

Sample: M5A 2-4.0' **Lab ID: 4029654022** Collected: 03/17/10 00:00 Received: 03/20/10 08:43 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**1090**	mg/kg	6.5	0.38	1	03/23/10 15:15	03/25/10 01:23	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**69.7**	%	0.10	0.10	1		03/25/10 08:18		

Sample: M5A 4-6.0' **Lab ID: 4029654023** Collected: 03/17/10 00:00 Received: 03/20/10 08:43 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**3000**	mg/kg	11.0	0.63	1	03/23/10 15:15	03/25/10 01:27	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**82.5**	%	0.10	0.10	1		03/25/10 08:18		

Sample: M5A 6-8.0' **Lab ID: 4029654024** Collected: 03/17/10 00:00 Received: 03/20/10 08:43 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**590**	mg/kg	8.4	0.48	1	03/23/10 15:15	03/25/10 01:31	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**76.4**	%	0.10	0.10	1		03/25/10 08:18		

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 7201.15 KEWAUNEE MARSH
Pace Project No.: 4029654

Sample: M5A 8-10.0' **Lab ID: 4029654025** Collected: 03/17/10 00:00 Received: 03/20/10 08:43 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA6010 Preparation Method: EPA 3050								
Arsenic	**3.9J**	mg/kg	5.0	0.29	1	03/23/10 15:15	03/25/10 01:35	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**61.9**	%	0.10	0.10	1		03/25/10 08:18		

Sample: M5B 0-2.0' **Lab ID: 4029654026** Collected: 03/17/10 00:00 Received: 03/20/10 08:43 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA6010 Preparation Method: EPA3050								
Arsenic	**1460**	mg/kg	10	0.58	1	03/23/10 15:15	03/25/10 01:39	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**82.0**	%	0.10	0.10	1		03/25/10 08:18		

Sample: M5B 2.0-4.0' **Lab ID: 4029654027** Collected: 03/17/10 00:00 Received: 03/20/10 08:43 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA6010 Preparation Method: EPA 3050								
Arsenic	**400**	mg/kg	3.6	0.21	1	03/23/10 15:15	03/25/10 01:44	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**50.5**	%	0.10	0.10	1		03/25/10 08:19		

Sample: M5B 4.0-6.0' **Lab ID: 4029654028** Collected: 03/17/10 00:00 Received: 03/20/10 08:43 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA3050								
Arsenic	**4350**	mg/kg	10.1	0.58	1	03/23/10 15:15	03/25/10 01:55	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**82.0**	%	0.10	0.10	1		03/25/10 08:19		

Pace Analytical
www.pacelabs.com

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 7201.15 KEWAUNEE MARSH
Pace Project No.: 4029654

Sample: M5B 6.0-8.0' **Lab ID: 4029654029** Collected: 03/17/10 00:00 Received: 03/20/10 08:43 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA3050								
Arsenic	**4300**	mg/kg	12.3	0.71	1	03/23/10 15:15	03/25/10 01:59	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**84.1**	%	0.10	0.10	1		03/25/10 08:19		

Sample: M5B 8.0-10.0' **Lab ID: 4029654030** Collected: 03/17/10 00:00 Received: 03/20/10 08:43 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**91.6**	mg/kg	5.5	0.32	1	03/23/10 15:15	03/25/10 02:03	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**67.5**	%	0.10	0.10	1		03/25/10 08:19		

Sample: M5C 0-2.5' **Lab ID: 4029654031** Collected: 03/17/10 00:00 Received: 03/20/10 08:43 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA3050								
Arsenic	**3070**	mg/kg	8.0	0.46	1	03/23/10 15:15	03/25/10 02:07	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**75.2**	%	0.10	0.10	1		03/25/10 08:19		

Sample: M5C 2.5-5.0' **Lab ID: 4029654032** Collected: 03/17/10 00:00 Received: 03/20/10 08:43 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**5060**	mg/kg	13.3	0.77	1	03/23/10 15:15	03/25/10 02:11	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**85.2**	%	0.10	0.10	1		03/25/10 08:19		

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 7201.15 KEWAUNEE MARSH
Pace Project No.: 4029654

Sample: M5C 5.0-7.5' **Lab ID: 4029654033** Collected: 03/17/10 00:00 Received: 03/20/10 08:43 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**4080**	mg/kg	10.3	0.60	1	03/23/10 15:15	03/25/10 02:15	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**82.3**	%	0.10	0.10	1		03/25/10 08:19		

Sample: M5C 7.5-10.0' **Lab ID: 4029654034** Collected: 03/17/10 00:00 Received: 03/20/10 08:43 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA3050								
Arsenic	**1780**	mg/kg	8.7	0.50	1	03/23/10 15:15	03/25/10 02:19	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**79.3**	%	0.10	0.10	1		03/25/10 08:19		

Sample: M5E 0-2.0' **Lab ID: 4029654035** Collected: 03/17/10 00:00 Received: 03/20/10 08:43 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**269**	mg/kg	6.3	0.36	1	03/23/10 15:15	03/25/10 02:23	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**70.3**	%	0.10	0.10	1		03/25/10 08:19		

Sample: M5E 2.0-4.0' **Lab ID: 4029654036** Collected: 03/17/10 00:00 Received: 03/20/10 08:43 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**215**	mg/kg	10.8	0.62	1	03/23/10 15:15	03/25/10 02:27	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**82.6**	%	0.10	0.10	1		03/25/10 08:19		

Pace Analytical
www.pacelabs.com

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 7201.15 KEWAUNEE MARSH
Pace Project No.: 4029654

Sample: M5E 4.0-6.0' **Lab ID: 4029654037** Collected: 03/17/10 00:00 Received: 03/20/10 08:43 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**46.6**	mg/kg	16.3	0.94	1	03/23/10 17:00	03/25/10 02:51	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**87.9**	%	0.10	0.10	1		03/25/10 08:19		

Sample: M5E 6.0-8.0' **Lab ID: 4029654038** Collected: 03/17/10 00:00 Received: 03/20/10 08:43 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**9.8J**	mg/kg	10.5	0.61	1	03/23/10 17:00	03/25/10 03:02	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**83.8**	%	0.10	0.10	1		03/25/10 08:19		

Sample: M5E 8.0-10.0' **Lab ID: 4029654039** Collected: 03/17/10 00:00 Received: 03/20/10 08:43 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**2.7J**	mg/kg	4.4	0.25	1	03/23/10 17:00	03/25/10 03:06	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**60.7**	%	0.10	0.10	1		03/25/10 08:19		

Sample: M5E 10.0-12.0' **Lab ID: 4029654040** Collected: 03/17/10 00:00 Received: 03/20/10 08:43 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**40.3**	mg/kg	4.3	0.25	1	03/23/10 17:00	03/25/10 03:10	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**60.1**	%	0.10	0.10	1		03/25/10 08:20		

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 7201.15 KEWAUNEE MARSH
Pace Project No.: 4029654

Sample: M5E 12-14' **Lab ID: 4029654041** Collected: 03/17/10 00:00 Received: 03/20/10 08:43 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**8.1**	mg/kg	4.9	0.29	1	03/23/10 17:00	03/25/10 03:15	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**64.1**	%	0.10	0.10	1		03/25/10 08:21		

Sample: M5E 14-15' **Lab ID: 4029654042** Collected: 03/17/10 00:00 Received: 03/20/10 08:43 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA6010 Preparation Method: EPA3050								
Arsenic	**3.1**	mg/kg	2.2	0.12	1	03/23/10 17:00	03/25/10 03:19	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**20.1**	%	0.10	0.10	1		03/25/10 08:21		

Sample: M5F 0-2.5' **Lab ID: 4029654043** Collected: 03/17/10 00:00 Received: 03/20/10 08:43 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**98.2**	mg/kg	3.6	0.21	1	03/23/10 17:00	03/25/10 03:30	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**51.7**	%	0.10	0.10	1		03/25/10 08:21		

Sample: M5F 2.5-5.0' **Lab ID: 4029654044** Collected: 03/17/10 00:00 Received: 03/20/10 08:43 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**1300**	mg/kg	8.6	0.50	1	03/23/10 17:00	03/25/10 03:34	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**77.7**	%	0.10	0.10	1		03/25/10 08:21		

Pace Analytical
www.pacelabs.com

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 7201.15 KEWAUNEE MARSH
Pace Project No.: 4029654

Sample: M5F 5.0-7.5' **Lab ID: 4029654045** Collected: 03/17/10 00:00 Received: 03/20/10 08:43 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**1260**	mg/kg	12.5	0.72	1	03/23/10 17:00	03/25/10 03:38	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**86.0**	%	0.10	0.10	1		03/25/10 08:21		

Sample: M5F 7.5-10.0' **Lab ID: 4029654046** Collected: 03/17/10 00:00 Received: 03/20/10 08:43 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**111**	mg/kg	7.7	0.45	1	03/23/10 17:00	03/25/10 03:42	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**76.7**	%	0.10	0.10	1		03/25/10 08:21		

Sample: M6E 0-4.0' **Lab ID: 4029654047** Collected: 03/17/10 00:00 Received: 03/20/10 08:43 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**895**	mg/kg	8.4	0.49	1	03/23/10 17:00	03/25/10 03:47	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**77.2**	%	0.10	0.10	1		03/25/10 08:22		

Sample: M6E 4-6.0' **Lab ID: 4029654048** Collected: 03/17/10 00:00 Received: 03/20/10 08:43 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA3050								
Arsenic	**1910**	mg/kg	8.7	0.50	1	03/23/10 17:00	03/25/10 03:51	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**78.2**	%	0.10	0.10	1		03/25/10 08:22		

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 7201.15 KEWAUNEE MARSH
Pace Project No.: 4029654

Sample: M6E 6-8.0' **Lab ID: 4029654049** Collected: 03/17/10 00:00 Received: 03/20/10 08:43 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**2020**	mg/kg	15.4	0.89	1	03/23/10 17:00	03/25/10 03:54	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**88.2**	%	0.10	0.10	1		03/25/10 08:22		

Sample: M7E 0-2.0' **Lab ID: 4029654050** Collected: 03/17/10 00:00 Received: 03/20/10 08:43 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**15.1**	mg/kg	3.0	0.18	1	03/23/10 17:00	03/25/10 03:58	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**42.0**	%	0.10	0.10	1		03/25/10 08:22		

Sample: M7E 2-4.0' **Lab ID: 4029654051** Collected: 03/17/10 00:00 Received: 03/20/10 08:43 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**277**	mg/kg	3.4	0.20	1	03/23/10 17:00	03/25/10 04:03	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**48.4**	%	0.10	0.10	1		03/25/10 08:22		

Sample: M7E 4-6.0' **Lab ID: 4029654052** Collected: 03/17/10 00:00 Received: 03/20/10 08:43 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**1260**	mg/kg	11.4	0.66	1	03/23/10 17:00	03/25/10 04:07	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**83.2**	%	0.10	0.10	1		03/25/10 08:22		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 7201.15 KEWAUNEE MARSH
Pace Project No.: 4029654

Sample: M7E 6-8.0' **Lab ID: 4029654053** Collected: 03/17/10 00:00 Received: 03/20/10 08:43 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA6010 Preparation Method: EPA3050								
Arsenic	**478**	mg/kg	14.0	0.81	1	03/23/10 17:00	03/25/10 04:18	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**86.8**	%	0.10	0.10	1		03/25/10 08:22		

Sample: M8E 0-4.0' **Lab ID: 4029654054** Collected: 03/17/10 00:00 Received: 03/20/10 08:43 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**311**	mg/kg	5.1	0.30	1	03/23/10 17:00	03/25/10 04:22	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**61.8**	%	0.10	0.10	1		03/25/10 08:22		

Sample: M8E 4-6.0' **Lab ID: 4029654055** Collected: 03/17/10 00:00 Received: 03/20/10 08:43 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**24.4**	mg/kg	4.5	0.26	1	03/23/10 17:00	03/25/10 04:27	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**60.5**	%	0.10	0.10	1		03/25/10 08:22		

Sample: M8E 6-8.0' **Lab ID: 4029654056** Collected: 03/17/10 00:00 Received: 03/20/10 08:43 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA3050								
Arsenic	**12.9J**	mg/kg	15.1	0.88	1	03/23/10 17:00	03/25/10 04:30	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**87.8**	%	0.10	0.10	1		03/25/10 08:22		

Pace Analytical
www.pacelabs.com

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 7201.15 KEWAUNEE MARSH
Pace Project No.: 4029654

Sample: M9F 0-4.0' **Lab ID: 4029654057** Collected: 03/17/10 00:00 Received: 03/20/10 08:43 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA3050								
Arsenic	**348**	mg/kg	5.9	0.34	1	03/24/10 11:35	03/25/10 17:55	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**70.0**	%	0.10	0.10	1		03/25/10 08:22		

Sample: M9F 4.0-6.0' **Lab ID: 4029654058** Collected: 03/17/10 00:00 Received: 03/20/10 08:43 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**452**	mg/kg	5.6	0.32	1	03/24/10 11:35	03/25/10 17:59	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**67.8**	%	0.10	0.10	1		03/25/10 08:23		

Sample: M9F 6.0-8.0' **Lab ID: 4029654059** Collected: 03/17/10 00:00 Received: 03/20/10 08:43 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**82.1**	mg/kg	13.7	0.79	1	03/24/10 11:35	03/25/10 18:03	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**86.3**	%	0.10	0.10	1		03/25/10 08:23		

Sample: M10F 0-4.0' **Lab ID: 4029654060** Collected: 03/17/10 00:00 Received: 03/20/10 08:43 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**357**	mg/kg	4.3	0.25	1	03/24/10 11:35	03/25/10 18:06	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**59.3**	%	0.10	0.10	1		03/25/10 08:23		

Pace Analytical
www.pacelabs.com

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 7201.15 KEWAUNEE MARSH
Pace Project No.: 4029654

Sample: M10F 4-6' **Lab ID: 4029654061** Collected: 03/17/10 00:00 Received: 03/20/10 08:43 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**589**	mg/kg	5.9	0.34	1	03/24/10 11:35	03/25/10 18:11	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**69.3**	%	0.10	0.10	1		03/25/10 08:23		

Sample: M10F 6-8.0' **Lab ID: 4029654062** Collected: 03/17/10 00:00 Received: 03/20/10 08:43 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**52.7**	mg/kg	14.1	0.81	1	03/24/10 11:35	03/25/10 18:22	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**86.3**	%	0.10	0.10	1		03/25/10 08:24		

Sample: M11F 0-2.0' **Lab ID: 4029654063** Collected: 03/17/10 00:00 Received: 03/20/10 08:43 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**106**	mg/kg	5.0	0.29	1	03/24/10 11:35	03/25/10 18:26	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**60.7**	%	0.10	0.10	1		03/25/10 08:24		

Sample: M11F 2.0-4.0' **Lab ID: 4029654064** Collected: 03/17/10 00:00 Received: 03/20/10 08:43 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**549**	mg/kg	6.6	0.38	1	03/24/10 11:35	03/25/10 18:30	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**73.3**	%	0.10	0.10	1		03/25/10 08:24		

Pace Analytical
www.pacelabs.com

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 7201.15 KEWAUNEE MARSH
Pace Project No.: 4029654

Sample: M11F 4.0-6.0' **Lab ID: 4029654065** Collected: 03/17/10 00:00 Received: 03/20/10 08:43 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**160**	mg/kg	14.0	0.81	1	03/24/10 11:35	03/25/10 18:34	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**86.0**	%	0.10	0.10	1		03/25/10 08:24		

Sample: M11F 6.0-8.0' **Lab ID: 4029654066** Collected: 03/17/10 00:00 Received: 03/20/10 08:43 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**27.5**	mg/kg	14.9	0.86	1	03/24/10 11:35	03/25/10 18:38	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**87.7**	%	0.10	0.10	1		03/25/10 08:24		

Sample: M11F 8.0-10.0' **Lab ID: 4029654067** Collected: 03/17/10 00:00 Received: 03/20/10 08:43 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**62.9**	mg/kg	11.6	0.67	1	03/24/10 11:35	03/25/10 18:42	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**84.5**	%	0.10	0.10	1		03/25/10 08:24		

Sample: M11F 10.0-12.0' **Lab ID: 4029654068** Collected: 03/17/10 00:00 Received: 03/20/10 08:43 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**3.3J**	mg/kg	7.6	0.44	1	03/24/10 11:35	03/25/10 18:46	7440-38-2	B
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**75.3**	%	0.10	0.10	1		03/25/10 08:24		

Pace Analytical
www.pacelabs.com

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 7201.15 KEWAUNEE MARSH
Pace Project No.: 4029654

Sample: M12F 0-4.0' **Lab ID: 4029654069** Collected: 03/17/10 00:00 Received: 03/20/10 08:43 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**204**	mg/kg	4.2	0.24	1	03/24/10 11:35	03/25/10 18:50	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**58.3**	%	0.10	0.10	1		03/25/10 08:24		

Sample: M12F 4.0-6.0' **Lab ID: 4029654070** Collected: 03/17/10 00:00 Received: 03/20/10 08:43 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA3050								
Arsenic	313	mg/kg	11.9	0.69	1	03/25/10 10:00	03/26/10 15:24	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**84.7**	%	0.10	0.10	1		03/25/10 08:25		

Sample: M12F 6.0-8.0' **Lab ID: 4029654071** Collected: 03/17/10 00:00 Received: 03/20/10 08:43 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**7.6**	mg/kg	7.4	0.43	1	03/25/10 10:00	03/26/10 15:28	7440-38-2	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**74.9**	%	0.10	0.10	1		03/25/10 08:25		

Pace Analytical
www.pacelabs.com

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA

Project: 7201.15 KEWAUNEE MARSH
Pace Project No.: 4029654

QC Batch: MPRP/3799 Analysis Method: EPA 6010
QC Batch Method: EPA3050 Analysis Description: 6010 MET
Associated Lab Samples: 4029654001, 4029654002, 4029654003, 4029654004, 4029654005, 4029654006, 4029654007, 4029654008, 4029654009, 4029654010, 4029654011, 4029654012, 4029654013, 4029654014, 4029654015, 4029654016

METHOD BLANK: 277796 Matrix: Solid
Associated Lab Samples: 4029654001, 4029654002, 4029654003, 4029654004, 4029654005, 4029654006, 4029654007, 4029654008, 4029654009, 4029654010, 4029654011, 4029654012, 4029654013, 4029654014, 4029654015, 4029654016

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Arsenic	mg/kg	<0.12	2.0	03/23/10 17:10	

LABORATORY CONTROL SAMPLE: 277797

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	mg/kg	50	47.0	94	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 277798 277799

Parameter	Units	4029572022 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	mg/kg	4.6	50.9	53	54.6	53.6	98	92	75-125	2	20	

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA

Project: 7201.15 KEWAUNEE MARSH
Pace Project No.: 4029654

QC Batch: MPRP/3800 Analysis Method: EPA 6010
QC Batch Method: EPA 3050 Analysis Description: 6010 MET
Associated Lab Samples: 4029654017, 4029654018, 4029654019, 4029654020, 4029654021, 4029654022, 4029654023, 4029654024, 4029654025, 4029654026, 4029654027, 4029654028, 4029654029, 4029654030, 4029654031, 4029654032, 4029654033, 4029654034, 4029654035, 4029654036

METHOD BLANK: 277880 Matrix: Solid
Associated Lab Samples: 4029654017, 4029654018, 4029654019, 4029654020, 4029654021, 4029654022, 4029654023, 4029654024, 4029654025, 4029654026, 4029654027, 4029654028, 4029654029, 4029654030, 4029654031, 4029654032, 4029654033, 4029654034, 4029654035, 4029654036

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Arsenic	mg/kg	<0.12	2.0	03/25/10 00:40	

LABORATORY CONTROL SAMPLE: 277881

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	mg/kg	50	49.7	99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 277882 277883

Parameter	Units	4029654017 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	mg/kg	109	104	106	244	250	129	132	75-125	2	20	M0

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA

Project: 7201.15 KEWAUNEE MARSH
Pace Project No.: 4029654

QC Batch: MPRP/3805 Analysis Method: EPA 6010
QC Batch Method: EPA3050 Analysis Description: 6010 MET
Associated Lab Samples: 4029654037, 4029654038, 4029654039, 4029654040, 4029654041, 4029654042, 4029654043, 4029654044, 4029654045, 4029654046, 4029654047, 4029654048, 4029654049, 4029654050, 4029654051, 4029654052, 4029654053, 4029654054, 4029654055, 4029654056

METHOD BLANK: 278047 Matrix: Solid
Associated Lab Samples: 4029654037, 4029654038, 4029654039, 4029654040, 4029654041, 4029654042, 4029654043, 4029654044, 4029654045, 4029654046, 4029654047, 4029654048, 4029654049, 4029654050, 4029654051, 4029654052, 4029654053, 4029654054, 4029654055, 4029654056

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Arsenic	mg/kg	<0.12	2.0	03/25/10 02:43	

LABORATORY CONTROL SAMPLE: 278048

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	mg/kg	50	48.3	97	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 278049 278050

Parameter	Units	4029654037 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	mg/kg	46.6	401	404	453	449	101	100	75-125	.8	20	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA

Project: 7201.15 KEWAUNEE MARSH
Pace Project No.: 4029654

QC Batch: MPRP/3807 Analysis Method: EPA 6010
QC Batch Method: EPA 3050 Analysis Description: 6010 MET
Associated Lab Samples: 4029654057, 4029654058, 4029654059, 4029654060, 4029654061, 4029654062, 4029654063, 4029654064, 4029654065, 4029654066, 4029654067, 4029654068, 4029654069

METHOD BLANK: 278216 Matrix: Solid
Associated Lab Samples: 4029654057, 4029654058, 4029654059, 4029654060, 4029654061, 4029654062, 4029654063, 4029654064, 4029654065, 4029654066, 4029654067, 4029654068, 4029654069

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Arsenic	mg/kg	0.15J	2.0	03/25/10 17:03	

LABORATORY CONTROL SAMPLE: 278217

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	mg/kg	50	47.7	95	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 278218 278219

Parameter	Units	4029668002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	mg/kg	7.7	56.2	55.9	57.0	56.9	88	88	75-125	.03	20	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA

Project: 7201.15 KEWAUNEE MARSH
Pace Project No.: 4029654

QC Batch: MPRP/3810
QC Batch Method: EPA 3050
Analysis Method: EPA 6010
Analysis Description: 6010 MET
Associated Lab Samples: 4029654070, 4029654071

METHOD BLANK: 278614 Matrix: Solid
Associated Lab Samples: 4029654070, 4029654071

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Arsenic	mg/kg	<0.12	2.0	03/26/10 14:34	

LABORATORY CONTROL SAMPLE: 278615

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	mg/kg	50	48.9	98	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 278616 278617

Parameter	Units	4029669005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	mg/kg	0.53J	52.1	51.9	50.0	50.3	95	96	75-125	.5	20	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA

Project: 7201.15 KEWAUNEE MARSH
Pace Project No.: 4029654

QC Batch: PMST/3750 Analysis Method: ASTM D2974-87
QC Batch Method: ASTM D2974-87 Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 4029654001, 4029654002, 4029654003, 4029654004, 4029654005, 4029654006, 4029654007, 4029654008, 4029654009, 4029654010, 4029654011, 4029654012, 4029654013, 4029654014, 4029654015, 4029654016, 4029654017, 4029654018, 4029654019, 4029654020

SAMPLE DUPLICATE: 278467

Parameter	Units	4029654001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	43.9	44.6	2	10	

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA

Project: 7201.15 KEWAUNEE MARSH
Pace Project No.: 4029654

QC Batch: PMST/3751 Analysis Method: ASTM D2974-87
QC Batch Method: ASTM D2974-87 Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 4029654021, 4029654022, 4029654023, 4029654024, 4029654025, 4029654026, 4029654027, 4029654028, 4029654029, 4029654030, 4029654031, 4029654032, 4029654033, 4029654034, 4029654035, 4029654036, 4029654037, 4029654038, 4029654039, 4029654040

SAMPLE DUPLICATE: 278523

Parameter	Units	4029654021 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	48.8	49.5	2	10	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA

Project: 7201.15 KEWAUNEE MARSH
Pace Project No.: 4029654

QC Batch: PMST/3752 Analysis Method: ASTM D2974-87
QC Batch Method: ASTM D2974-87 Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 4029654041, 4029654042, 4029654043, 4029654044, 4029654045, 4029654046, 4029654047, 4029654048, 4029654049, 4029654050, 4029654051, 4029654052, 4029654053, 4029654054, 4029654055, 4029654056, 4029654057, 4029654058, 4029654059, 4029654060

SAMPLE DUPLICATE: 278539

Parameter	Units	4029654041 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	64.1	64.6	.8	10	

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA

Project: 7201.15 KEWAUNEE MARSH
Pace Project No.: 4029654

QC Batch: PMST/3753 Analysis Method: ASTM D2974-87
QC Batch Method: ASTM D2974-87 Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 4029654061, 4029654062, 4029654063, 4029654064, 4029654065, 4029654066, 4029654067, 4029654068, 4029654069, 4029654070, 4029654071

SAMPLE DUPLICATE: 278559

Parameter	Units	4029654061 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	69.3	66.2	5	10	

Pace Analytical Services, Inc.
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALIFIERS

Project: 7201.15 KEWAUNEE MARSH
Pace Project No.: 4029654

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

Pace Analytical is NELAP accredited. Contact your Pace PM for the current list of accredited analytes.

U - Indicates the compound was analyzed for, but not detected.

ANALYTE QUALIFIERS

B	Analyte was detected in the associated method blank.
M0	Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

1

63813

4029654

CHAIN OF CUSTODY RECORD

RMT Inc., 744 Heartland Trail, Madison, WI 53717-1934
Phone 608/831-4444 • Fax 608/831-3334 • www.rmtinc.com

Filtered (Yes/No): N

Preserved (Code): A

Project No.: 7201.15

Project/Client: Kewaunee Marsh

Project Manager/Contact Person: Dick Fisk / Bob Stanforth

Lab No.	Yr. 10 Date	Time	Sample Station ID	Total Number of Containers	MATRIX	Analyses Requested: Arsenic	Comments:
001	3/17		M2A 0-2.5'	1	Soil	X	Sent in 2 plastic bags
002	"		M2A 2.5-5.0	1	"	X	"
003	"		M2A 5.0-7.5	1	"	X	"
004	"		M2A 7.5-10.0	1	"	X	"
005	"		M2B 0-2.5	1	"	X	"
006	"		M2B 2.5-5.0	1	"	X	"
007	"		M2B 5.0-7.5	1	"	X	"
008	"		M2B 7.5-10.0	1	"	X	"
009	↓		M2C 0-2.5	1	↓	X	↓
~~010~~ 010	3/17		M2C 2.5-5.0	1	Soil	X	Sent in 2 plastic bags

PRESERVED CODES
A — NONE
B — HNO_3
C — H_2SO_4
D — NaOH
E — HCl
F — METHANOL
G — _____

SPECIAL INSTRUCTIONS

SAMPLER Relinquished by (Signature) Date/Time: 3/18/10 16:38	Received by (Signature) Date/Time: 3/18/10 0700	HAZARDS ASSOCIATED WITH SAMPLES: ☐ Flammable ☐ Corrosive ☐ Highly Toxic ☐ Other (list) _____
Relinquished by (Signature) Date/Time: 3/19/10 1103	Received by (Signature) Date/Time	
Relinquished by (Signature) Date/Time: CS Logistics 3/20/10 843	Received by (Signature) Date/Time: 3/20/10 843	

Turn Around (circle one): (Normal) Rush

Report Due _____

(For Lab Use Only)

Receipt Temp: ROF

Temp Blank: Y (N)

Receipt pH (Wet/Metals) _____

Custody Seal: Present/(Absent) Intact/Not Intact Seal #s

F-268 (10/05)

WHITE—LABORATORY COPY YELLOW—REPORT APPENDIX PINK—SAMPLER/SUBMITTER

03

2

63806

4029654

CHAIN OF CUSTODY RECORD

RMT Inc., 744 Heartland Trail, Madison, WI 53717-1934
Phone 608/831-4444 • Fax 608/831-3334 • www.rmtinc.com

Project No. 7201.15 | Project/Client: Kewaunee Marsh

Project Manager/Contact Person: Dick Fish / Bob Stanfield

Lab No.	Yr. 10 Date	Time	Sample Station ID	Total Number of Containers	MATRIX	Analyses Requested: Arsenic	Filtered (Yes/No)	Preserved (Code)	Comments:
011	3/17		M2C 5.0-7.5'	1	Soil	X	N	A	Sent in 2 plastic bags
012	"		M2C 7.5-10.0'	1	"	X			"
013	"		M2E 0-2.5'	1	"	X			"
014	"		M2E 2.5-5.0'	1	"	X			"
015	"		M2E 5.0-7.5'	1	"	X			"
016	"		M2E 7.5-10.0'	1	"	X			"
017	"		M2F 0-2.5'	1	"	X			"
018	"		M2F 2.5-5.0'	1	"	X			"
019	↓		M2F 5.0-7.5'	1	↓	X			↓
020	3/17		M2F 7.5-10.0'	1	Soil	X			Sent in 2 plastic bags

PRESERVED CODES
A — NONE
B — HNO_3
C — H_2SO_4
D — NaOH
E — HCl
F — METHANOL
G — _____

SPECIAL INSTRUCTIONS

SAMPLER Relinquished by (Signature) Date/Time: 3/18/10 16:13	Received by (Signature) Date/Time: D. Faivre 3/19/10 0700	HAZARDS ASSOCIATED WITH SAMPLES: ☐ Flammable ☐ Corrosive ☐ Highly Toxic ☐ Other (list) _____
Relinquished by (Signature) Date/Time: D. Faivre 3/19/10 1700	Received by (Signature) Date/Time:	Turn Around (circle one) (Normal) Rush; Report Due _____
Relinquished by (Signature) Date/Time: CS Logistics 3/20/10 843	Received by (Signature) Date/Time: Heather Nelson 3/20/10 843	(For Lab Use Only) Receipt Temp: R UI; Temp Blank Y (N); Receipt pH (Wet/Metals)
Custody Seal: Present/(Absent) Intact/Not Intact Seal #s		

hol

F-268 (10/05)

WHITE—LABORATORY COPY YELLOW—REPORT APPENDIX PINK—SAMPLER/SUBMITTER

3
63807
4029654

CHAIN OF CUSTODY RECORD

RMT Inc., 744 Heartland Trail, Madison, WI 53717-1934
Phone 608/831-4444 • Fax 608/831-3334 • www.rmtinc.com

Project No. 7201.15 | Project/Client: Clewaunee Marsh

Project Manager/Contact Person: Dick Fish / Bob Stanfield

Lab No.	Yr. 10 Dat	Time	Sample Station ID	Total Number of Containers	MATRIX	Analyses Requested: Arsenic	Filtered (Yes/No)	Preserved (Code)	Comments:
							W	A	
021	3/17		MSA 0-2.0'	1	Soil	X			Sent in 2 ziplock bags
022	1		MSA 2-4.0'	1	1	X			1
023	1		MSA 4-6.0'	1	1	X			1
024	1		MSA 6-8.0'	1	1	X			1
025	1		MSA 8-10.0'	1	1	X			1
026	1		MSB 0-2.0'	1	1	X			1
027	1		MSB 2.0-4.0'	1	1	X			1
028	1		MSB 4.0-6.0'	1	1	X			1
029	↓		MSB 6.0-8.0'	1	↓	X			↓
030	3/17		MSB 8.0-10.0'	1	Soil	X			Sent in 2 ziplock bags

PRESERVED CODES
A — NONE
B — HNO_3
C — H_2SO_4
D — NaOH
E — HCl
F — METHANOL
G — _____

SPECIAL INSTRUCTIONS

SAMPLER Relinquished by (Signature) Date/Time: 3/18/10 16:17

Received by (Signature) Date/Time: D. Fenski 3/19/10 0700

Relinquished by (Signature) Date/Time: D. Fenski 3/19/10 1200

Received by (Signature) Date/Time:

Relinquished by (Signature) Date/Time: CS Logistics 3/20/10 845

Received by (Signature) Date/Time: Nicholas Allen 3/20/10 845

Custody Seal: Present/Absent Intact/Not Intact Seal #s

HAZARDS ASSOCIATED WITH SAMPLES
☐ Flammable
☐ Corrosive
☐ Highly Toxic
☐ Other (list) _____

Turn Around (circle one) (Normal) Rush
Report Due _____

(For Lab Us Only)
Receipt Temp: ROI
Temp Blank Y (N)
Rec ipt pH (Wet/Metals)

501

F-26B (10/05)

WHITE—LABORATORY COPY YELLOW—REPORT APPENDIX PINK—SAMPLER/SUBMITTER

4
63808
4029654

CHAIN OF CUSTODY RECORD

RMT Inc., 744 Heartland Trail, Madison, WI 53717-1934
Phone 608/831-4444 • Fax 608/831-3334 • www.rmtinc.com

Project No. 7201.15

Project/Client: Kewaunee Marsh

Project Manager/Contact Person: Dick Fish / Bob Stanforth

Filtered (Yes/No): N

Preserved (Code): A

PRESERVED CODES
A — NONE
B — HNO_3
C — H_2SO_4
D — NaOH
E — HCl
F — METHANOL
G — _____

Lab No.	Yr. 10 Date	Time	Sample Station ID	Total Number of Containers	MATRIX	Analyses Requested: Arsenic	Comments:
031	3/17		MSC 0-2.5'	1	Soil	X	Sent in 2 Ziplock bags
032	1		MSC 2.5-5.0'	1		X	
033	1		MSC 5.0-7.5'	1		X	
034	1		MSC 7.5-10.0'	1		X	
035	1		MSE 0-2.0'	1		X	
036	1		MSE 2.0-4.0'	1		X	
037	1		MSE 4.0-6.0'	1		X	
038	1		MSE 6.0-8.0'	1		X	
039	↓		MSE 8.0-10.0'	1	↓	X	
040	3/17		MSE 10.0-12.0'	1	Soil	X	Sent in Ziplock bags

SPECIAL INSTRUCTIONS

SAMPLER Relinquished by (Signature)	Date/Time	Received by (Signature)	Date/Time
[signature]	3/18/10 16:22	D. Fenner	3/19/10 0700
Relinquished by (Signature)	Date/Time	Received by (Signature)	Date/Time
D. Fenner	3/19/10 1700		
Relinquished by (Signature)	Date/Time	Received by (Signature)	Date/Time
CG Logistics	3/20/10 843	[signature]	3/20/10 843

HAZARDS ASSOCIATED WITH SAMPLES
☐ Flammable
☐ Corrosive
☐ Highly Toxic
☐ Other (list) _____

Turn Around (circle one) (Normal) Rush
Report Due _____

(For Lab Use Only)
Receipt Temp: RCT
Temp Blank Y (N)
Receipt pH (Wet/Metals)

Custody Seal: Present/(Absent) Intact/Not Intact Seal #s

F-268 (10/05)

WHITE—LABORATORY COPY YELLOW—REPORT APPENDIX PINK—SAMPLER/SUBMITTER

101

5
63809
4029654

CHAIN OF CUSTODY RECORD

RMT Inc., 744 Heartland Trail, Madison, WI 53717-1934
Phone 608/831-4444 • Fax 608/831-3334 • www.rmtinc.com

Project No. 7201.15

Project/Client: Kewaunee Marsh

Project Manager/Contact Person: Dick Fish / Bob Stanforth

Lab No.	Yr. 10 Date	Time	Sample Station ID	Total Number of Containers	MATRIX	Analyses Requested: Arsenic	Filtered (Yes/No) N	Preserved (Code) A	Comments:
041	3/17		MSE 12-14'	1	Soil	X			Sent in 2 ziplock bags
042	1		MSE 14-15'	1	1	X			1
043	1		MSF 0-2.5'	1	1	X			1
044	1		MSF 2.5-5.0'	1	1	X			1
045	1		MSF 5.0-7.5'	1	1	X			1
046	1		MSF 7.5-10.0'	1	1	X			1
047	1		MLE 0-4.0'	1	1	X			1
048	1		MLE 4-6.0'	1	1	X			1
049	↓		MLE 6-8.0'	1	↓	X			↓
050	3/17		M7E 0-2.0'	1	Soil	X			Sent in 2 ziplock bags

PRESERVED CODES
A — NONE
B — HNO_3
C — H_2SO_4
D — NaOH
E — HCl
F — METHANOL
G — _____

SPECIAL INSTRUCTIONS

SAMPLER Relinquished by (Signature) Date/Time: 3/18/10 16:17

Received by (Signature) D. Fennel Date/Time: 3/19/10 0700

Relinquished by (Signature) D. Fennel Date/Time: 3/19/10 1700

Received by (Signature) Date/Time

Relinquished by (Signature) CS Logistics Date/Time: 3/20/10 845

Received by (Signature) Heather Newburn Date/Time: 3/20/10 843

Custody Seal: Present/(Absent) Intact/Not Intact Seal #s

HAZARDS ASSOCIATED WITH SAMPLES
- ☐ Flammable
- ☐ Corrosive
- ☐ Highly Toxic
- ☐ Other (list) _____

Turn Around (circle one) (Normal) Rush

Report Due _____

(For Lab Use Only)

Receipt Temp: 20.1

Temp Blank Y (N)

Receipt pH (Wet/Metals) _____

101

6

63810

4029654

CHAIN OF CUSTODY RECORD

RMT Inc., 744 Heartland Trail, Madison, WI 53717-1934
Phone 608/831-4444 • Fax 608/831-3334 • www.rmtinc.com

Filtered (Yes/No) N
Preserved (Code) A

Project No. 7201.15
Project/Client: Kewaunee Marsh
Project Manager/Contact Person: Dick Fisk / Bob Stefanik

Lab No.	Yr. 10 Date	Time	Sample Station ID	Total Number of Containers	MATRIX	Analyses Requested: Arsenic	Comments:
051	3/17		M7E 2-4.0	1	Soil	X	Sent in 2 plastic bags
052	"		M7E 4-6.0	1	"	X	"
053	"		M7E 6-8.0	1	"	X	"
054	"		M8E 0-4.0	1	"	X	"
055	"		M8E 4-6.0	1	"	X	"
056	"		M8E 6-8.0	1	"	X	"
057	"		M9F 0-4.0	1	"	X	"
058	"		M9F 4.0-6.0	1	"	X	"
059	"		M9F 6.0-8.0	1	"	X	"
060	3/17		M10F 0-4.0	1	Soil	X	Sent in 2 plastic bags

PRESERVED CODES
A — NONE
B — HNO_3
C — H_2SO_4
D — NaOH
E — HCl
F — METHANOL
G — _____

SPECIAL INSTRUCTIONS

SAMPLER Relinquished by (Signature) Date/Time: [illegible] 3/18/10 [illegible]:30	Received by (Signature) Date/Time: D. Fenner 3/19/10 0700	HAZARDS ASSOCIATED WITH SAMPLES: ☐ Flammable ☐ Corrosive ☐ Highly Toxic ☐ Other (list) _____
Relinquished by (Signature) Date/Time: D. Fenner 3/19/10 1700	Received by (Signature) Date/Time:	
Relinquished by (Signature) Date/Time: [illegible] 3/20/10 843	Received by (Signature) Date/Time: [illegible] 3/20/10 843	
Custody Seal: Present/(Absent) Intact/Not Intact Seal #s		

Turn Around (circle one) (Normal) Rush
Report Due _____

(For Lab Use Only)
Receipt Temp: 20 ±
Temp Blank Y (N)
Receipt pH Wet/Metals)

801

F-268 (10/05)

WHITE—LABORATORY COPY YELLOW—REPORT APPENDIX PINK—SAMPLER/SUBMITTER

7
63811
4029654

CHAIN OF CUSTODY RECORD

RMT Inc., 744 Heartland Trail, Madison, WI 53717-1934
Phone 608/831-4444 • Fax 608/831-3334 • www.rmtinc.com

Project No. 7201.15 | Project/Client: Icewaunee Marsh

Project Manager/Contact Person: Dick Fisk / Bob Stanforth

Lab No.	Yr. 10 Date	Time	Sample Station ID	Total Number of Containers	MATRIX	Filtered (Yes/No) N	Preserved (Code) H	Analyses Requested: Arsenic	Comments:
061	3/17		M10F 4-6'	1	Soil	X			Sent in 2 zip lock bag
062	"		M10F 6-8.0'	1	"	X			"
063	"		M11F 0-2.0'	1	"	X			"
064	"		M11F 2.0-4.0'	1	"	X			"
065	"		M11F 4.0-6.0'	1	"	X			"
066	"		M11F 6.0-8.0'	1	"	X			"
067	"		M11F 8.0-10.0'	1	"	X			"
068	"		M11F 10.0-12.0'	1	"	X			"
069	↓		M12F 0-4.0'	1	↓	X			↓
070	3/17		M12F 4.0-6.0'	1	Soil	X			Sent in 2 zip lock bag

PRESERVED CODES
A — NONE
B — HNO_3
C — H_2SO_4
D — NaOH
E — HCl
F — METHANOL
G — _____

SPECIAL INSTRUCTIONS

SAMPLER Relinquished by (Signature)	Date/Time	Received by (Signature)	Date/Time
[signature]	3/18/10 16:34	D. Fisk	3/19/10 0700
Relinquished by (Signature)	Date/Time	Received by (Signature)	Date/Time
D. Fisk	3/19/10 1700		
Relinquished by (Signature)	Date/Time	Received by (Signature)	Date/Time
CJ Loginnis	3/20/10 843	[signature]	3/20/10 843

HAZARDS ASSOCIATED WITH SAMPLES
☐ Flammable
☐ Corrosive
☐ Highly Toxic
☐ Other (list) _____

Turn Around (circle one) (Normal) Rush
Report Due _____

(For Lab Use Only)
Receipt Temp: 20.1
Temp Blank Y (N)
Receipt pH (Wet/Metals)

Custody Seal: Present/(Absent) Intact/Not Intact Seal #s

601

F-268 (10/05)

WHITE—LABORATORY COPY YELLOW—REPORT APPENDIX PINK—SAMPLER/SUBMITTER

8

63812

4029654

CHAIN OF CUSTODY RECORD

RMT Inc., 744 Heartland Trail, Madison, WI 53717-1934
Phone 608/831-4444 • Fax 608/831-3334 • www.rmtinc.com

Project No. 7201.15

Project/Client: Kewaunee Marsh

Project Manager/Con ac Person: Dick Fisl / Bob Stanford

Lab No.	Yr. 10 Date	Time	Sample Station ID	Total Number of Containers	MATRIX	Filtered (Yes/No) N	Preserved (Code) A	Analyses Requested: Arsenic	Comments:
011	3/17		M12F 6.0-8.0'	1	Soil	X			Sent in 2 Ziplock bag

PRESERVED CODES
A — NONE
B — HNO_3
C — H_2SO_4
D — NaOH
E — HCl
F — METHANOL
G — _____

SPECIAL INSTRUCTIONS

SAMPLER Relinquished by (Signature)	Date/Time	Received by (Signature)	Date/Time
[signature]	3/18/10 16:35	D. Fisl	3/19/10 0700
Relinquished by (Signature)	Date/Time	Received by (Signature)	Date/Time
Relinquished by (Signature)	Date/Time	Received by (Signature)	Date/Time
CS logistics	3/20/10 8:45	[signature]	3/20/10 8:45

Custody Seal: Present/Absent Intact/Not Intact Seal #s

HAZARDS ASSOCIATED WITH SAMPLES
- ☐ Flammable
- ☐ Corrosive
- ☐ Highly Toxic
- ☐ Other (list) _____

Turn Around (circle one) (Normal) Rush

Repor Due _____

(For Lab Use Only)

Receipt Temp: 20 C

Temp Blank Y (N)

Receipt pH (Wet/Metals) _____

F-268 (10/05)

WHITE—LABORATORY COPY YELLOW—REPORT APPENDIX PINK—SAMPLER/SUBMITTER

Pace Analytical Services, Inc.
1241 Bellevue Street, Suite 9
Green Bay, WI 54302

PaceAnalytical

Sample Condition Upon Receipt

Client Name: RMT Project # 4029654

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☐ Client ☑ Commercial ☐ Pace Other _____

Tracking #: _____

Custody Seal on Cooler/Box Present: ☐ yes ☑ no Seals intact: ☐ yes ☐ no

Custody Seal on Samples Present: ☐ yes ☑ no Seals intact: ☐ yes ☐ no

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☑ None Other

Thermometer Used N/A

Type of Ice: (Wet) Blue Dry None ☐ Samples on ice, cooling process has begun

Cooler Temperature 20.1

Biological Tissue is Frozen: ☐ yes ☐ no

Temp Blank Present: ☐ yes ☑ no

Optional
Proj. Due Date:
Proj. Name:

Person examining contents:
Date: 3/20/10
Initials: JMH

Temp should be above freezing to 6°C for all sample except Biota.
Biota Samples should be received ≤ 0°C.

		Comments:
Chain of Custody Present:	☑Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☑Yes ☐No ☐N/A	2.
Chain of Custody Relinquished:	☑Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☑Yes ☐No ☐N/A	4.
Samples Arrived within Hold Time:	☑Yes ☐No ☐N/A	5.
Short Hold Time Analysis (<72hr):	☐Yes ☑No ☐N/A	6.
Rush Turn Around Time Requested:	☐Yes ☑No ☐N/A	7.
Sufficient Volume:	☑Yes ☐No ☐N/A	8.
Correct Containers Used:	☑Yes ☐No ☐N/A	9.
-Pace Containers Used:	☐Yes ☑No ☐N/A	
Containers Intact:	☑Yes ☐No ☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☑N/A	11.
Sample Labels match COC:	☑Yes ☐No ☐N/A	12. -045 labeled 5.0-7.0, COC is 5.0-7.5. Date matched. only place it fits. AE 3/20/10
-Includes date/time/ID/Analysis Matrix: S		
All containers needing preservation have been checked.	☐Yes ☑No ☐N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation.	☐Yes ☐No ☐N/A	
exceptions: VOA, coliform, TOC, O&G, WI-DRO (water)	☐Yes ☐No	Initial when completed / Lot # of added preservative
Samples checked for dechlorination:	☐Yes ☐No ☑N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes ☐No ☑N/A	15.
Trip Blank Present:	☐Yes ☐No ☑N/A	16.
Trip Blank Custody Seals Present	☐Yes ☐No ☑N/A	
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: [signature] **Date:** 3/22/10

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)