Technical Memorandum

Date: May 11, 2018

To: Hon. Susan Calkins, Special Master, United States District Court

From: Nelson Walter, PE, Amec Foster Wheeler

Ref: Penobscot River Phase III Engineering Study

Re: 2017 Marsh Platform Sediment Characterization

Amec Foster Wheeler Project No. 3616166052

Background

This technical memorandum describes the results of sediment investigations and analyses conducted in the Penobscot River Estuary (Estuary) (**Figure 1**) in 2017 under Amec Foster Wheeler Work Order (WO) 4A-030: 2017 Marsh Platform Sediment Characterization (Marsh Platform Characterization). The purpose of the investigation was to better characterize the distribution and concentration of total mercury and methyl mercury in marsh platform sediments in the Estuary, including in pocket and fringe marshes, Mendall Marsh, and marshes in the Orland River. The work described herein is part of the Phase III Engineering Study to identify and evaluate potential and cost-effective measures to remediate mercury in the Estuary.

The specific objectives of the Marsh Platform Characterization were as follows:

- Assess total mercury and methyl mercury concentrations in marsh platform sediments that had not been previously sampled or required increased data density;
- Assess spatial gradients in total mercury and methyl mercury across the marsh platform in Mendall Marsh (as recommended by Phase II Study Panel); and
- Provide better delineation of marsh and adjacent intertidal sediments in the Orland River.

The data from these investigations will improve the spatial delineation of total mercury and methyl mercury in marsh and intertidal sediments and, once integrated with data collected under other Amec Foster Wheeler work orders, will be used to refine the evaluation for marsh platforms in general, as well as the intertidal zone in Orland River. The integration of site data, including historic data (where appropriate), will be applied in the development and presentation of remedial alternatives in the Alternatives Evaluation Report. Therefore, this Technical Memorandum is intended as an interim data summary report and includes only that portion of Amec Foster Wheeler data that were collected to fill the data gap scoped in the associated work order.

Additional marsh platform sediment characterization data for the Estuary can be found in the following documents:

- PRMSP, 2013a. Results of 2012 Monitoring of Mercury in the Penobscot River and Bay with Comparisons to Previous Years. Penobscot River Mercury Study Panel.
- PRMSP, 2013b. Final Report: Mercury Contamination of the Penobscot River Estuary: Current Situation, Remediation Targets, and Possible Remediation Procedures. Penobscot River Mercury Study Panel.
- Amec Foster Wheeler, 2017. Final 2016 Sediment and Water Quality Monitoring Report, Penobscot River Phase III Engineering Study, Penobscot River, Maine. Amec Foster Wheeler Environment & Infrastructure, Inc.
- Amec Foster Wheeler, 2018a. Final 2017 Sediment and Water Quality Monitoring Report, Penobscot River Phase III Engineering Study, Penobscot River, Maine. Amec Foster Wheeler Environment & Infrastructure, Inc.

  Amec Foster Wheeler, 2018b. Thin Interval Core Sampling Report, Penobscot River Phase III Engineering Study, Penobscot River, Maine. Amec Foster Wheeler Environment & Infrastructure, Inc.

Summary of Sampling Activities

The rationale for sampling activities defined in the scope of work presented in WO 4A-030 are summarized below.

Field activities for this work order were performed between July 17, 2017 and August 17, 2017. As described above, sediment sampling was conducted on marsh platforms and some adjacent intertidal areas with the goal of improving the spatial characterization of total mercury and methyl mercury in marsh platform and intertidal zone sediments. Sampling locations are presented in **Figure 2** through **Figure 5**. Results are grouped as: (1) pocket and fringe marshes (including Orrington, Winterport, Frankfort Flats, Verona Northeast and Verona West); (2) Mendall Marsh; and (3) Orland River.

Sampling in support of this spatial characterization involved the recovery of 1-foot (ft) sediment cores at the following locations:

River Reach	Area	Marsh Platform Sediment Cores	Intertidal Sediment Cores
Orrington	Bald Hill Cove	2	2
Winterport	Coves south of Oak Point; Parker Point	5	2
Frankfort Flats	Dracham Point	3	1
Verona Northeast	Northeast tip of Verona Island	2	1
Verona West	Mill Cove	2	-
Mendall Marsh	Penobscot River south to Route 174	24	-
Orland River	Town of Orland to Gross Point	5	10
	Total Cores:	43	16

Sediment collection followed the Amec Foster Wheeler Field Sampling Plan (Amec Foster Wheeler, 2016a) and Quality Assurance Project Program (Amec Foster Wheeler, 2016b). Sediment cores were collected via either a push-core or a slide-hammer lined with a disposable Lexan (or equivalent) sleeve. In general, the marsh sediments were collected using a slide-hammer lined with a Lexan core sleeve; intertidal sediments were collected using a Lexan core sleeve directly as a push-core. Following recovery, cores were frozen at the field office and sliced into four intervals: 0-0.1 ft; 0.1-0.3 ft; 0.3-0.5 ft; and 0.5-1.0 ft. The rationale for the core sectioning was as follows:

- The surface interval of 0-0.1 ft is equivalent to the Phase II Study Panel surface sampling interval of 0-3 centimeters (cm);
- The subsequent two intervals (0.1-0.3 ft and 0.3-0.5 ft) provide a level of spatial (depth) resolution that was not included in the Amec Foster Wheeler 2016 sampling program;
- The sum of the surface three intervals (0-0.5 ft) is consistent with the aquatic biotic zone or "bioactive zone'' as defined in ecological risk assessment guidance for estuarine environments (USEPA 2015);
- For total mercury, concentration trends over the top foot of the sediment profile (i.e., the three intervals consistent with the bioactive zone + a fourth interval that includes 0.5-1.0 ft) allows assessment of whether mercury concentrations are either increasing or decreasing over time between the bioactive zone and underlying sediment and provides a measure of spatial (depth) resolution of the data that will be useful for remedial evaluation; and
- For methyl mercury, because net methylation and methyl mercury accumulation are often higher in saturated surface sediments than deeper in the sediment profile, analysis of the top two depth intervals (0-0.1 and 0.1-0.3 ft) allows assessment of potential biological exposure to methyl mercury within surface sediment.

Regarding analyses for methyl mercury, the zone of biological mixing (and therefore exposure) in the Penobscot River Estuary was poorly characterized, but was suggested in the Phase II Study as spanning the top 3 cm (approximately 1.2 inches) of sediment (PRMS 2013). Current sampling over 3.6 inches (i.e., 0.3 ft), therefore provides a balance between what was suggested in the

Phase II Study, and guidance regarding the average depth of biological mixing (15 cm or approximately 0.5 ft) in estuarine environments (USEPA 2015).

Prior to analysis, frozen sections were thawed and homogenized; analysis of thawed and homogenized samples included total mercury (Method 1631e), total organic carbon (TOC) [Lloyd Kahn method], and sediment organic content (ASTM D2974-C) for all depth intervals, and methyl mercury (Method 1630 using KOH extraction) for the top two depth intervals of each core. Eurofins Frontier Global Sciences, Inc. (Eurofins; Bothell, Washington) performed the mercury and methyl mercury analyses; Alpha Analytical (Mansfield, Massachusetts) performed the TOC analysis. Samples were analyzed for organic content at 550 degrees Celsius and classified via the Unified Soil Classification System (USCS) at the Amec Foster Wheeler laboratory (Raleigh, North Carolina). The analytical matrix for the Marsh Platform and Intertidal Sediment Characterization investigation is presented as **Table 1**. Sediment was collected from all proposed sampling locations and there were no significant deviations from the proposed scope of work. Field Data Records are included as **Attachment A;** a photo log of sample collection and processing is included as **Attachment B**.

Data Quality Summary

A Stage IIb data validation was completed on all laboratory sample delivery groups (SDGs) from Eurofins and Alpha Analytical. A Stage III data validation was performed on ten percent of samples. Data validation was completed using National Functional Guidelines for Inorganic Superfund Data Review (USEPA, 2014) and EPA New England Environmental Data Review Supplement for Regional Data Review Elements and Superfund Specific Guidance/Procedures (USEPA, 2013) where applicable. Data quality evaluations were completed using quality control (QC) limits specified in the draft Penobscot River Estuary Phase III Engineering Evaluation Quality Assurance Project Plan (Amec Foster Wheeler, 2016b). Laboratory analytical reports and the laboratory analytical data validation report are presented as **Attachment C** and **Attachment D**, respectively.

Data qualifications were completed if necessary in accordance with the guidelines or the professional judgment of the project chemist. The following qualifiers as applied during data validation or as reported by the laboratory are included in the final data set:

J = The reported concentration is considered an estimated value

U = The target compound was not detected above the method detection limit

Validation reason codes were applied to results associated with QC measurements outside project QC goals. The validation qualification actions and associated validation reason codes applied to sample results are summarized in Table 2 of **Attachment D**. The following data validation reason codes were applied to one or more sample results:

LD = Lab Duplicate limit exceeded

LR = Lab Replicate limit exceeded

MS-H = MS and/or MSD recovery high

MS-L = MS and/or MSD recovery low

MS-RPD = MS/MSD RPD limit exceeded

HT = Holding time exceeded

Although results of a small subset of the data were qualified as estimated ("J"), none of analytical results were rejected as a result of validation, and all results are considered useable (see **Attachment D**).

The impacts of sample heterogeneity were evaluated by conducting triplicate laboratory analyses for total mercury and methyl mercury on a subset of the sediment samples collected under this investigation. Heterogeneity, as defined here, refers to the natural variability of field samples that are composed of a mixture of mineral sediment and wood waste that requires adequate homogenization prior to laboratory analysis.

A total of 31 sediment samples were analyzed in triplicate for total mercury. Results for 28 of the samples (90%) were within the range of acceptable variance for laboratory QA/QC, in which the variance between results for duplicate analyses should be < 30%. Of the remaining 3 samples (10%) in which variance was > 30%, samples exhibited low percent solids relative to the remainder of the data set. For the other analytes measured – TOC and organic content – results for the three samples with variance > 30% were within the range of measurements for the remainder of the data set. Broader discussion of field heterogeneity that focuses on heterogeneity of the natural environment is a component of the Alternatives Evaluation Report (Amec Foster Wheeler 2018c).

A total of 16 samples were analyzed in triplicate for methyl mercury. The results for methyl mercury were within the range of acceptable variance for laboratory QA/QC. One sample out of the total of 16 samples had the overall results qualified as estimated (J) based on the low measured methyl mercury concentration in all three of the triplicate samples.

Marsh Platform and Intertidal Sediment Characterization Analytical Results

Analytical results from the marsh platform and intertidal sediment sampling program are presented in **Table 2;** a statistical summary of analytical data is presented in **Table 3**. Total mercury and methyl mercury sediment analytical results are presented in **Figure 6** through **Figure 9**. The data collected in support of this characterization program will be integrated with all Phase III Study data, as well as with relevant historic data, and used in the development and presentation of remedial alternatives in the Alternatives Evaluation Report.

Pocket and Fringe Marsh Sediments - Analytical Results

Pocket and fringe marsh sediments include samples from the Orrington, Winterport, Frankfort Flats, Verona Northeast, and Verona West reaches of the Estuary (**Figure 2** and **Figure 3**).

Total Mercury

For marsh platform sediments in the pocket and fringe marshes, the concentration of total mercury in the surface interval (0-0.1 ft) of recovered cores ranged from 13.8 nanograms per gram (ng/g) to 987 ng/g, and for the 0.1-0.3 ft interval ranged from 11.4 ng/g to 1,893 ng/g. The concentration of total mercury for depth intervals ranged from 7.46 ng/g to 3,480 ng/g (**Table 3**). The highest mercury concentrations within recovered cores were detected in the 0.3-0.5 ft and 0.5-1.0 ft intervals, with total mercury maximum concentrations of 3,480 ng/g and 3,200 ng/g, respectively. The mean total mercury concentrations by depth interval were greatest in the 0.3-0.5 ft (1,163 ng/g) and 0.5-1.0 ft (1,014 ng/g) intervals. The two cores with total mercury concentrations > 3,000 ng/g were recovered from the Frankfort Flats reach of the Estuary.

For intertidal sediments adjacent to the marsh platforms in pocket and fringe marshes, the concentration of total mercury in the surface (0-0.1 ft) interval of recovered cores ranged from 357 ng/g to 1,350 ng/g, and for the 0.1-0.3 ft interval ranged from 64.0 ng/g to 1,140 ng/g. The concentration of total mercury for all depth intervals ranged from 23.0 ng/g to 1,350 ng/g (**Table 3**). The mean concentrations of total mercury within each of the four sample intervals were generally consistent, ranging from 707 ng/g to 844 ng/g. Total mercury concentrations > 1,000 ng/g were found in intertidal sediments from the Orrington (Bald Hill Cove), Winterport, and Frankfort Flats reaches of the Estuary (**Figure 6**).

Methyl Mercury

For marsh platform sediments in the pocket and fringe marshes, the concentrations of methyl mercury in the surface interval (0-0.1 ft) of recovered cores ranged from 0.53 ng/g to 37.5 ng/g, and for the 0.1-0.3 ft interval ranged from 0.60 ng/g to 35.7 ng/g. The concentrations of methyl mercury for all depth intervals range from 0.53 ng/g to 37.5 ng/g (**Table 3**). Mean concentrations of methyl mercury in the 0-0.1 ft and 0.1-0.3 ft intervals were 13.0 ng/g and 9.79 ng/g, respectively. The highest methyl mercury concentrations within recovered cores were from the Winterport reach, with three sample concentrations exceeding 30 ng/g (**Figure 6**). The mean percentage of total mercury measurable as methyl mercury was 4.3% in the 0.0-0.1 ft interval, and 2.6% in the 0.1-0.3 ft interval.

For intertidal sediments adjacent to the marsh platforms in the pocket and fringe marshes, the concentration of methyl mercury in the surface (0-0.1 ft) interval of recovered cores ranged from 6.90 ng/g to 15.7 ng/g, and for the 0.1-0.3 ft interval from 1.10 ng/g to 11.6 ng/g. The concentrations of methyl mercury in samples ranged from 1.10 ng/g to 15.7 ng/g (**Table 3**). Methyl mercury concentrations in pocket and fringe marsh intertidal sediments were generally higher in the 0.0-0.1 ft interval than the 0.1-0.3 ft interval. Methyl mercury concentrations > 10.0 ng/g were found in intertidal sediments from the Orrington (Bald Hill Cove), Winterport, Frankfort Flats, and Verona Northeast reaches of the Estuary (**Figure 6** and **Figure 7**). The mean percentage of total mercury measurable as methyl mercury was 1.6% in the 0.0-0.1 ft interval, and 1.1% in the 0.1-0.3 ft interval.

Organic Content

For marsh platform sediments in the pocket and fringe marshes, organic content at 550 degrees Celsius ranged from 2.2% to 59.1% in the 0.0-0.1 ft interval, and 2.1% to 44.6% in the 0.1-0.3 ft interval (**Table 3**). The organic content of marsh platform sediments was relatively low in the Orrington reach cores W-104-A and W-104-B relative to the organic content in other cores from the pocket and fringe marshes (**Table 2**). The mean organic content for the four sampled depth intervals for cores in the marsh platform sediments ranged from 24.8% (0.3-0.5 ft) to 30.1% (0.0-0.1 ft) (**Table 3**).

For intertidal sediments adjacent to the marsh platforms, organic content ranged from 9.0% to 21.8% in the 0.0-0.1 ft interval, and 9.3% to 20.6% in the 0.1-0.3 ft interval (**Table 3**). The organic content in intertidal sediments was relatively high in the Frankfort Flats reach core W-102-INTA (21.8%) (**Table 2**) relative to the organic content in other intertidal sediment cores from the pocket and fringe marshes (9.0% to 14.8%) (**Table 3**). The mean organic content for the four sampled depth intervals for cores in the intertidal sediments ranged from 13.4% (0.1-0.3 ft) to 17.1% (0.3-0.5 ft) (**Table 3**).

Total Organic Carbon

For marsh platform sediments in the pocket and fringe marshes, TOC ranged from 0.52% to 30.1% in the 0.0-0.1 ft interval, and 0.45% to 22.0% in the 0.1-0.3 ft interval. TOC in marsh platform sediments was relatively low in the Orrington and Winterport reaches relative to TOC in other cores from the pocket and fringe marshes (**Table 2**). The mean TOC for the four sampled depth intervals for cores in the marsh platform sediments ranged from 13.3% (0.1-0.3 ft) to 14.9% (0.5-1.0 ft) (**Table 3**).

For intertidal sediments adjacent to the marsh platforms, TOC ranged from 3.7% to 11.0% in the 0.0-0.1 ft interval, and 2.8% to 10.0% in the 0.1-0.3 ft interval. TOC in marsh platform sediments was relatively high in the Frankfort Flats reach core W-102-INTA relative to TOC in other intertidal sediment cores from the pocket and fringe marshes (**Table 2**). The mean TOC for the four sampled depth intervals for cores in the intertidal sediments ranged from 6.38% (0.1-0.3 ft) to 8.11% (0.5-1.0 ft) (**Table 3**).

Mendall Marsh Sediments - Analytical Results

Total Mercury

For Mendall Marsh platform sediments, the concentrations of total mercury in the surface interval (0-0.1 ft) of recovered cores ranged from 56.9 ng/g to 658 ng/g, and for the 0.1-0.3 ft interval from 93.4 ng/g to 1,160 ng/g (**Figure 8**). The concentration of total mercury for all depth intervals ranged from 52.6 ng/g to 3,370 ng/g (**Table 3**). Overall, the highest mercury concentrations within recovered cores were detected in the 0.3-0.5 ft and 0.5-1.0 ft intervals, with total mercury maximum concentrations of 3,370 ng/g and 1,780 ng/g, respectively. For marsh platform sediments in Mendall Marsh, the mean concentration of total mercury (650 ng/g) was highest in the 0.3-0.5 ft depth interval.

Methyl Mercury

For marsh platform sediments in Mendall Marsh, the concentrations of methyl mercury in the surface interval (0-0.1 ft) of recovered cores ranged from 1.4 ng/g to 51.8 ng/g, and for the 0.1-0.3 ft interval ranged from 0.40 ng/g to 26.6 ng/g (**Table 3**). Mean concentrations of methyl mercury for the 0-0.1 and 0.1-0.3 ft intervals were 12.8 ng/g and 10.3 ng/g, respectively. The maximum concentration of methyl mercury detected in Mendall Marsh sediments was in the 0-0.1 ft depth interval of core W-MM-01, with a concentration of 51.8 ng/g (**Figure 8**). The mean percentage of total mercury measurable as methyl mercury was 4.0% in the 0.0-0.1 ft interval, and 1.9% in the 0.1-0.3 ft interval.

Organic Content

For marsh platform sediments in Mendall Marsh, organic content at 550 degrees Celsius ranged from 17.9% to 60.3% in the 0.0-0.1 ft interval, and from 16.0% to 56.8% in the 0.1-0.3 ft interval (**Table 3)**. Organic content ranged from 1.6% to 60.3% for all sample depths in Mendall Marsh sediment cores (**Table 3**). The mean organic content for the four sampled depth intervals for Mendall Marsh cores ranged from 27.1% (0.5-1.0 ft) to 36.7% (0.0-0.1 ft) (**Table 3**).

Total Organic Carbon

For marsh platform sediments in Mendall Marsh, TOC ranged from 8.0% to 39.6% in the 0.0-0.1 ft interval, and from 7.4% to 39.0% in the 0.1-0.3 ft interval. TOC in Mendall Marsh platform sediments ranged from 7.4% to 61.6% for all sample depths (**Table 3**). The mean TOC content for the four sampled depth intervals for Mendall Marsh platform cores ranged from 16.8% (0.1-0.3 ft) to 23.3% (0.3-0.5 ft) (**Table 3**).

Orland River Sediments - Analytical Results

Total Mercury

For marsh platform sediments in the Orland River, the concentrations of total mercury in the surface interval (0-0.1 ft) of recovered cores ranged from 456 ng/g to 669 ng/g, and for the 0.1-0.3 ft interval ranged from 512 ng/g to 1,060 ng/g. Overall, concentrations of total mercury for all depth intervals ranged from 29.3 ng/g to 2,990 ng/g (**Table 3**) with the highest concentration in the 0.5-1.0 ft interval (**Figure 9**). The highest mean total mercury concentration for Orland River marsh platform sediments was in the 0.3- 0.5 ft depth interval (1,444 ng/g).

For intertidal sediments adjacent to the marsh platforms in the Orland River, the concentration of total mercury in the surface (0-0.1 ft) interval of recovered cores ranged from 547 ng/g to 1080 ng/g, and for the 0.1-0.3 ft interval ranged from 689 ng/g to 1,100 ng/g. Overall, concentrations of total mercury for all depth intervals ranged from 260 ng/g to 3,210 ng/g, with the highest concentration in the 0.5 – 1.0 ft interval (**Table 3**). The highest mean concentration of total mercury for intertidal sediment (1,471 ng/g) was in the 0.5-1.0 ft interval.

Methyl Mercury

For marsh platform sediments in the Orland River, the concentrations of methyl mercury in the surface interval (0-0.1 ft) of recovered cores ranged from 3.70 ng/g to 30.6 ng/g, and for the 0.1-0.3 ft interval ranged from 1.90 ng/g to 28.6 ng/g (**Table 3**). Mean concentrations of methyl mercury were 12.2 ng/g and 10.5 ng/g for the 0-0.1 ft and 0.1-0.3 ft depth intervals, respectively. The mean percentage of total mercury measurable as methyl mercury in Orland River marsh platform sediments was 2.3% in the 0.0-0.1 ft interval, and 1.3% in the 0.1-0.3 ft interval.

For intertidal sediments of the Orland River, the concentration of methyl mercury in the surface (0-0.1 ft) interval of recovered cores ranged from 4.10 ng/g to 20.4 ng/g, and for the 0.1-0.3 ft interval ranged from 4.70 ng/g to 17.7 ng/g (**Table 3**). The mean percentage of total mercury measurable as methyl mercury in Orland River intertidal sediments was 1.2% from the 0.0-0.1 ft interval, and 1.3% in the 0.1-0.3 ft interval.

Organic Content

For marsh platform sediments in the Orland River, organic content at 550 degrees Celsius ranged from 13.4% to 21.9% in the 0.0-0.1 ft interval, and from 1.4% to 24.8% in the 0.1-0.3 ft interval and was relatively consistent throughout Orland River cores (**Table 2**). Overall for marsh platform sediment, the mean organic content across all depth intervals ranged from 15.5% (0.1-0.3 ft) to 19.1% (0.3-0.5 ft) (**Table 3**).

For intertidal sediments adjacent to the marsh platforms, organic content ranged from 10.6% to 18.4% in the 0.0-0.1 ft interval, and from 12.0% to 20.3% in the 0.1-0.3 ft interval and was relatively consistent across Orland River cores (**Table 2**). Overall for intertidal sediment, the mean organic content across all depth intervals ranged from 14.3% (0.3-0.5 ft) to 15.6% (0.1-0.3 ft) (**Table 3**).

Total Organic Carbon

For marsh platform sediments in the Orland River, TOC ranged from 6.5% to 12.4% in the 0.0-0.1 ft interval, and from 6.8% to 12.4% in the 0.1-0.3 ft interval and was relatively consistent across all core depths (**Table 2**). The mean TOC content for marsh platform cores ranged from 8.8% (0.3-0.5 ft) to 10.1% (0.1-0.3 ft) (**Table 3**).

For intertidal sediments adjacent to the marsh platforms, TOC ranged from 5.3% to 13.8% in the 0.0-0.1 ft interval, and from 6.2% to 18.6% in the 0.1-0.3 ft interval. The mean TOC content for intertidal cores ranged from 7.19% (0.3-0.5 ft) to 8.32% (0.1-0.3 ft) (**Table 3**).

Summary of Observations

Figure 10 through **Figure 13** present a statistical evaluation of the marsh platform data, by area and depth interval for total mercury, methyl mercury, methyl mercury as a percentage of total mercury, and TOC. Box and whisker plots are used for this evaluation as a visual tool for presenting multiple measures of central tendency (i.e., median and mean values), as well as the overall shape of the data distribution for multiple depth intervals across the areas studied. Notes on the figures explain the different components of the box and whisker plots.

- By area, the highest mean concentration of total mercury in marsh platform sediments and the associated depth interval are as follows (**Table 3**; **Figure 10**):
    - Mendall Marsh: mean = 650 ng/g (0.3-0.5 ft)
    - Orland River: mean = 1,444 ng/g (0.5-1.0 ft)
    - Pocket and Fringe Marshes: mean = 1,163 ng/g (0.3-0.5 ft)

- For Mendall Marsh, mean and median total mercury concentrations are generally similar for the 0-0.1 ft and 0.1-0.3 ft depth intervals; for the 0.3-0.5 ft and 0.5-1.0 ft depth intervals, the mean concentration is greater than the median concentration. For this data set, the highest total mercury concentration for Mendall Marsh was from a core collected near the mouth of the Marsh River (3,370 ng/g at a depth of 0.3-0.5 ft; **Figure 8**).

- Concentrations of total mercury in marsh platform sediments from the Orland River are generally higher than concentrations in marsh platform sediments from Mendall Marsh. For the Orland River, the mean total mercury concentration increases consistently with depth, whereas for the other areas the mean total mercury concentration in the 0.5-1.0 ft depth interval is lower than the mean total mercury concentration in the 0.3-0.5 ft depth interval (**Figure 10**).
- For methyl mercury, the mean concentration in marsh platform sediments for all three sampling areas is slightly higher in the surface interval (0-0.1 ft) than in the sub-surface interval (0.1-0.3 ft) (**Table 3**). Likewise, for all areas mean values are higher than median values, although the difference between these measures of central tendency can be small (**Figure 11)**. The highest methyl mercury concentrations for each sampling area are in the surface intervals of collected cores.
- The percentage of total mercury measurable as methyl mercury ranges from 0.05% to 19.3% (**Table 3**), although the highest percent methyl mercury is calculated from a qualified value for methyl mercury. The highest individual sample values for the percentage of total mercury measurable as methyl mercury are found in marsh platform sediments: 19.3% (Pocket and Fringe Marshes; qualified value); 12.1% (Mendall Marsh); and 5.5% (Orland River) (**Figure 12**). For the three areas, the percentage of total mercury measurable as methyl mercury was higher in the surface interval than in the subsurface interval.
- For both organic content and TOC, concentrations were highest in Mendall Marsh followed by the pocket and fringe marshes (**Figure 13**). The organic content and TOC concentration of Orland River sediment was approximately 50% of the organic content or TOC concentration of Mendall Marsh sediment.
- The impacts of sample heterogeneity were evaluated by conducting triplicate laboratory analyses for total mercury and methyl mercury on a subset of the sediment samples collected for this investigation. For these samples, 90% of total mercury results, and 100% of methyl mercury results had a variance < 30%, indicating consistent and effective laboratory homogenization and extraction techniques.

The data collected under WO 4A-030 and summarized in this Technical Memorandum have been integrated into the project database along with data collected under other Amec Foster Wheeler work orders. The complete Amec Foster Wheeler data set will be used to support the ecological risk assessment, improve the conceptual site understanding, and aid the evaluation and development of remedial alternatives for the Estuary. The integration of site data, including historic data (where appropriate), will be applied in the development of remedial alternatives and presented in the Alternatives Evaluation Report.

References

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Tables

Figures

Attachments

TABLES

TABLE 1
2017 MARSH AND INTERTIDAL SEDIMENT ANALYTICAL MATRIX

PENOBSCOT RIVER PHASE III ENGINEERING STUDY

River Reach	Media	Location ID	Longitude/Latitude		Collection Method	Sample Top Depth (feet bgs)	Sample Bottom Depth (feet bgs)	Sample Date	Analyte	Sediment: Mercury	Sediment: Methyl Mercury	Sediment: Total Organic Carbon	Sediment: Organic Content
									Method	1631e[1]	1630[2]	Lloyd-Kahn[3]	ASTM D2974-C[3]
									Preservation	4° C	Frozen	4° C	N/A
									Field Sample ID				
Orrington	Marsh Platform Sediment	W-104-A	-68.8441	44.6980	Slide Hammer	0	0.1	7/18/2017	W-104-A_071817_SED_00-01	1	1	1	1
						0.1	0.3	7/18/2017	W-104-A_071817_SED_01-03	1	1	1	1
						0.3	0.5	7/19/2017	W-104-A_071917_SED_03-05	1		1	1
						0.5	1	7/19/2017	W-104-A_071917_SED_05-10	1		1	1
		W-104-B	-68.8462	44.6951	Slide Hammer	0	0.1	8/1/2017	W-104-B_080117_SED_00-01	1	1	1	1
						0.1	0.3	8/1/2017	W-104-B_080117_SED_01-03	1	1	1	1
						0.3	0.5	8/3/2017	W-104-B_080317_SED_03-05	1		1	1
						0.5	1	8/3/2017	W-104-B_080317_SED_05-10	1		1	1
	Intertidal Sediment	W-104-INTA	-68.8426	44.6981	PushCore	0	0.1	7/25/2017	W-104-INTA_072517_SED_00-01	1	1	1	1
						0.1	0.3	7/25/2017	W-104-INTA_072517_SED_01-03	1	1	1	1
						0.3	0.5	7/26/2017	W-104-INTA_072617_SED_03-05	1		1	1
						0.5	1	7/26/2017	W-104-INTA_072617_SED_05-10	1		1	1
		W-104-INTB	-68.8408	44.6949	PushCore	0	0.1	8/1/2017	W-104-INTB_080117_SED_00-01	1	1	1	1
						0.1	0.3	8/1/2017	W-104-INTB_080117_SED_01-03	1	1	1	1
						0.3	0.5	8/3/2017	W-104-INTB_080317_SED_03-05	1		1	1
						0.5	1	8/3/2017	W-104-INTB_080317_SED_05-10	1		1	1
Winterport	Marsh Platform Sediment	W-14-A	-68.8311	44.6585	Slide Hammer	0	0.1	7/25/2017	W-14-A_072517_SED_00-01	1	1	1	1
						0.1	0.3	7/25/2017	W-14-A_072517_SED_01-03	1	1	1	1
						0.3	0.5	7/25/2017	W-14-A_072517_SED_03-05	1		1	1
						0.5	1	7/25/2017	W-14-A_072517_SED_05-10	1		1	1
		W-14-B	-68.8328	44.6574	Slide Hammer	0	0.1	7/25/2017	W-14-B_072517_SED_00-01	1	1	1	1
						0.1	0.3	7/25/2017	W-14-B_072517_SED_01-03	1	1	1	1
						0.3	0.5	7/25/2017	W-14-B_072517_SED_03-05	1		1	1
						0.5	1	7/25/2017	W-14-B_072517_SED_05-10	1		1	1
		W-14-C	-68.8330	44.6569	Slide Hammer	0	0.1	7/24/2017	W-14-C_072417_SED_00-01	1	1	1	1
						0.1	0.3	7/24/2017	W-14-C_072417_SED_01-03	1	1	1	1
						0.3	0.5	7/25/2017	W-14-C_072517_SED_03-05	1		1	1
						0.5	1	7/25/2017	W-14-C_072517_SED_05-10	1		1	1
	Intertidal Sediment	W-14-INTA	-68.8306	44.6574	PushCore	0	0.1	7/25/2017	W-14-INTA_072517_SED_00-01	1	1	1	1
						0.1	0.3	7/25/2017	W-14-INTA_072517_SED_01-03	1	1	1	1
						0.3	0.5	7/26/2017	W-14-INTA_072617_SED_03-05	1		1	1
						0.5	1	7/26/2017	W-14-INTA_072617_SED_05-10	1		1	1

TABLE 1
2017 MARSH AND INTERTIDAL SEDIMENT ANALYTICAL MATRIX

PENOBSCOT RIVER PHASE III ENGINEERING STUDY

River Reach	Media	Location ID	Longitude/Latitude		Collection Method	Sample Top Depth (feet bgs)	Sample Bottom Depth (feet bgs)	Sample Date		Sediment			
									Analyte	Mercury	Methyl Mercury	Total Organic Carbon	Organic Content
									Method	1631e[1]	1630[2]	Lloyd-Kahn[3]	ASTM D2974-C[3]
									Preservation	4° C	Frozen	4° C	N/A
									Field Sample ID				
Winterport	Marsh Platform Sediment	W-103-A	-68.8293	44.6477	Slide Hammer	0	0.1	7/24/2017	W-103-A_072417_SED_00-01	1	1	1	1
						0.1	0.3	7/24/2017	W-103-A_072417_SED_01-03	1	1	1	1
						0.3	0.5	7/25/2017	W-103-A_072517_SED_03-05	1		1	1
						0.5	1	7/25/2017	W-103-A_072517_SED_05-10	1		1	1
		W-103-B	-68.8292	44.6463	Slide Hammer	0	0.1	7/24/2017	W-103-B_072417_SED_00-01	1	1	1	1
						0.1	0.3	7/24/2017	W-103-B_072417_SED_01-03	1	1	1	1
						0.3	0.5	7/25/2017	W-103-B_072517_SED_03-05	1		1	1
						0.5	1	7/25/2017	W-103-B_072517_SED_05-10	1		1	1
	Intertidal Sediment	W-103-INTA	-68.8299	44.6470	PushCore	0	0.1	7/25/2017	W-103-INTA_072517_SED_00-01	1	1	1	1
						0.1	0.3	7/25/2017	W-103-INTA_072517_SED_01-03	1	1	1	1
						0.3	0.5	7/26/2017	W-103-INTA_072617_SED_03-05	1		1	1
						0.5	1	7/26/2017	W-103-INTA_072617_SED_05-10	1		1	1
Frankfort Flats	Marsh Platform Sediment	W-102-A	-68.8403	44.6218	Slide Hammer	0	0.1	8/15/2017	W-102-A_081517_SED_00-01	1	1	1	1
						0.1	0.3	8/15/2017	W-102-A_081517_SED_01-03	1	1	1	1
						0.3	0.5	8/17/2017	W-102-A_081717_SED_03-05	1		1	1
						0.5	1	8/17/2017	W-102-A_081717_SED_05-10	1		1	1
		W-102-B	-68.8387	44.6204	Slide Hammer	0	0.1	8/15/2017	W-102-B_081517_SED_00-01	1	1	1	1
						0.1	0.3	8/15/2017	W-102-B_081517_SED_01-03	1	1	1	1
						0.3	0.5	8/17/2017	W-102-B_081717_SED_03-05	1		1	1
						0.5	1	8/17/2017	W-102-B_081717_SED_05-10	1		1	1
		W-102-C	-68.8388	44.6195	Slide Hammer	0	0.1	8/15/2017	W-102-C_081517_SED_00-01	1	1	1	1
						0.1	0.3	8/15/2017	W-102-C_081517_SED_01-03	1	1	1	1
						0.3	0.5	8/17/2017	W-102-C_081717_SED_03-05	1		1	1
						0.5	1	8/17/2017	W-102-C_081717_SED_05-10	1		1	1
	Intertidal Sediment	W-102-INTA	-68.8371	44.6193	PushCore	0	0.1	7/25/2017	W-102-INTA_072517_SED_00-01	1	1	1	1
						0.1	0.3	7/25/2017	W-102-INTA_072517_SED_01-03	1	1	1	1
						0.3	0.5	7/26/2017	W-102-INTA_072617_SED_03-05	1		1	1
						0.5	1	7/26/2017	W-102-INTA_072617_SED_05-10	1		1	1
Verona Northeast	Marsh Platform Sediment	W-101-A	-68.7759	44.5626	Slide Hammer	0	0.1	8/15/2017	W-101-A_081517_SED_00-01	1	1	1	1
						0.1	0.3	8/15/2017	W-101-A_081517_SED_01-03	1	1	1	1
						0.3	0.5	8/17/2017	W-101-A_081717_SED_03-05	1		1	1
						0.5	1	8/17/2017	W-101-A_081717_SED_05-10	1		1	1

TABLE 1
2017 MARSH AND INTERTIDAL SEDIMENT ANALYTICAL MATRIX

PENOBSCOT RIVER PHASE III ENGINEERING STUDY

River Reach	Media	Location ID	Longitude/Latitude		Collection Method	Sample Top Depth (feet bgs)	Sample Bottom Depth (feet bgs)	Sample Date		Sediment			
									Analyte	Mercury	Methyl Mercury	Total Organic Carbon	Organic Content
									Method	1631e[1]	1630[2]	Lloyd-Kahn[3]	ASTM D2974-C[3]
									Preservation	4° C	Frozen	4° C	N/A
									Field Sample ID				
Verona Northeast	Marsh Platform Sediment	W-101-B	-68.7758	44.5615	Slide Hammer	0	0.1	8/15/2017	W-101-B_081517_SED_00-01	1	1	1	1
						0.1	0.3	8/15/2017	W-101-B_081517_SED_01-03	1	1	1	1
						0.3	0.5	8/17/2017	W-101-B_081717_SED_03-05	1		1	1
						0.5	1	8/17/2017	W-101-B_081717_SED_05-10	1		1	1
	Intertidal Sediment	W-101-INTA	-68.7754	44.5631	PushCore	0	0.1	8/1/2017	W-101-INTA_080117_SED_00-01	1	1	1	1
						0.1	0.3	8/1/2017	W-101-INTA_080117_SED_01-03	1	1	1	1
						0.3	0.5	8/3/2017	W-101-INTA_080317_SED_03-05	1		1	1
						0.5	1	8/3/2017	W-101-INTA_080317_SED_05-10	1		1	1
Verona West	Marsh Platform Sediment	W-109-A	-68.8063	44.5049	Slide Hammer	0	0.1	8/1/2017	W-109-A_080117_SED_00-01	1	1	1	1
						0.1	0.3	8/1/2017	W-109-A_080117_SED_01-03	1	1	1	1
						0.3	0.5	8/3/2017	W-109-A_080317_SED_03-05	1		1	1
						0.5	1	8/3/2017	W-109-A_080317_SED_05-10	1		1	1
		W-110-A	-68.8091	44.5090	Slide Hammer	0	0.1	8/1/2017	W-110-A_080117_SED_00-01	1	1	1	1
						0.1	0.3	8/1/2017	W-110-A_080117_SED_01-03	1	1	1	1
						0.3	0.5	8/3/2017	W-110-A_080317_SED_03-05	1		1	1
						0.5	1	8/3/2017	W-110-A_080317_SED_05-10	1		1	1
Mendall Marsh	Marsh Platform Sediment	W-MM-01	-68.8579	44.5999	Slide Hammer	0	0.1	7/25/2017	W-MM-01_072517_SED_00-01	1	1	1	1
						0.1	0.3	7/25/2017	W-MM-01_072517_SED_01-03	1	1	1	1
						0.3	0.5	7/26/2017	W-MM-01_072617_SED_03-05	1		1	1
						0.5	1	7/26/2017	W-MM-01_072617_SED_05-10	1		1	1
		W-MM-02	-68.8617	44.5982	Slide Hammer	0	0.1	7/25/2017	W-MM-02_072517_SED_00-01	1	1	1	1
						0.1	0.3	7/25/2017	W-MM-02_072517_SED_01-03	1	1	1	1
						0.3	0.5	7/26/2017	W-MM-02_072617_SED_03-05	1		1	1
						0.5	1	7/26/2017	W-MM-02_072617_SED_05-10	1		1	1
		W-MM-03	-68.8645	44.5947	Slide Hammer	0	0.1	7/17/2017	W-MM-03_071717_SED_00-01	1	1	1	1
						0.1	0.3	7/17/2017	W-MM-03_071717_SED_01-03	1	1	1	1
						0.3	0.5	7/18/2017	W-MM-03_071817_SED_03-05	1		1	1
						0.5	1	7/18/2017	W-MM-03_071817_SED_05-10	1		1	1
		W-MM-04	-68.8649	44.5895	Slide Hammer	0	0.1	7/17/2017	W-MM-04_071717_SED_00-01	1	1	1	1
						0.1	0.3	7/17/2017	W-MM-04_071717_SED_01-03	1	1	1	1
						0.3	0.5	7/18/2017	W-MM-04_071817_SED_03-05	1		1	1
						0.5	1	7/18/2017	W-MM-04_071817_SED_05-10	1		1	1
		W-MM-05	-68.8647	44.5870	Slide Hammer	0	0.1	7/18/2017	W-MM-05_071817_SED_00-01	1	1	1	1
						0.1	0.3	7/18/2017	W-MM-05_071817_SED_01-03	1	1	1	1
						0.3	0.5	7/19/2017	W-MM-05_071917_SED_03-05	1		1	1
						0.5	1	7/19/2017	W-MM-05_071917_SED_05-10	1		1	1
		W-MM-06	-68.8631	44.5853	Slide Hammer	0	0.1	7/24/2017	W-MM-06_072417_SED_00-01	1	1	1	1
						0.1	0.3	7/24/2017	W-MM-06_072417_SED_01-03	1	1	1	1
						0.3	0.5	7/25/2017	W-MM-06_072517_SED_03-05	1		1	1
						0.5	1	7/25/2017	W-MM-06_072517_SED_05-10	1		1	1

TABLE 1
2017 MARSH AND INTERTIDAL SEDIMENT ANALYTICAL MATRIX

PENOBSCOT RIVER PHASE III ENGINEERING STUDY

River Reach	Media	Location ID	Longitude/Latitude		Collection Method	Sample Top Depth (feet bgs)	Sample Bottom Depth (feet bgs)	Sample Date	Analyte	Sediment			
										Mercury	Methyl Mercury	Total Organic Carbon	Organic Content
									Method	1631e[1]	1630[2]	Lloyd-Kahn[3]	ASTM D2974-C[3]
									Preservation	4° C	Frozen	4° C	N/A
									Field Sample ID				
Mendall Marsh	Marsh Platform Sediment	W-MM-07	-68.8623	44.5834	Slide Hammer	0	0.1	7/25/2017	W-MM-07_072517_SED_00-01	1	1	1	1
						0.1	0.3	7/25/2017	W-MM-07_072517_SED_01-03	1	1	1	1
						0.3	0.5	7/26/2017	W-MM-07_072617_SED_03-05	1		1	1
						0.5	1	7/26/2017	W-MM-07_072617_SED_05-10	1		1	1
		W-MM-08	-68.8600	44.5822	Slide Hammer	0	0.1	7/18/2017	W-MM-08_071817_SED_00-01	1	1	1	1
						0.1	0.3	7/18/2017	W-MM-08_071817_SED_01-03	1	1	1	1
						0.3	0.5	7/19/2017	W-MM-08_071917_SED_03-05	1		1	1
						0.5	1	7/19/2017	W-MM-08_071917_SED_05-10	1		1	1
		W-MM-09	-68.8611	44.5786	Slide Hammer	0	0.1	8/1/2017	W-MM-09_080117_SED_00-01	1	1	1	1
						0.1	0.3	8/1/2017	W-MM-09_080117_SED_01-03	1	1	1	1
						0.3	0.5	8/3/2017	W-MM-09_080317_SED_03-05	1		1	1
						0.5	1	8/3/2017	W-MM-09_080317_SED_05-10	1		1	1
		W-MM-10	-68.8584	44.5778	Slide Hammer	0	0.1	8/1/2017	W-MM-10_080117_SED_00-01	1	1	1	1
						0.1	0.3	8/1/2017	W-MM-10_080117_SED_01-03	1	1	1	1
						0.3	0.5	8/3/2017	W-MM-10_080317_SED_03-05	1		1	1
						0.5	1	8/3/2017	W-MM-10_080317_SED_05-10	1		1	1
		W-MM-11	-68.8612	44.5889	Slide Hammer	0	0.1	7/18/2017	W-MM-11_071817_SED_00-01	1	1	1	1
						0.1	0.3	7/18/2017	W-MM-11_071817_SED_01-03	1	1	1	1
						0.3	0.5	7/19/2017	W-MM-11_071917_SED_03-05	1		1	1
						0.5	1	7/19/2017	W-MM-11_071917_SED_05-10	1		1	1
		W-MM-12	-68.8588	44.5892	Slide Hammer	0	0.1	7/18/2017	W-MM-12_071817_SED_00-01	1	1	1	1
						0.1	0.3	7/18/2017	W-MM-12_071817_SED_01-03	1	1	1	1
						0.3	0.5	7/19/2017	W-MM-12_071917_SED_03-05	1		1	1
						0.5	1	7/19/2017	W-MM-12_071917_SED_05-10	1		1	1
		W-MM-13	-68.8559	44.5877	Slide Hammer	0	0.1	7/18/2017	W-MM-13_071817_SED_00-01	1	1	1	1
						0.1	0.3	7/18/2017	W-MM-13_071817_SED_01-03	1	1	1	1
						0.3	0.5	7/19/2017	W-MM-13_071917_SED_03-05	1		1	1
						0.5	1	7/19/2017	W-MM-13_071917_SED_05-10	1		1	1
		W-MM-14	-68.8573	44.5841	Slide Hammer	0	0.1	7/18/2017	W-MM-14_071817_SED_00-01	1	1	1	1
						0.1	0.3	7/18/2017	W-MM-14_071817_SED_01-03	1	1	1	1
						0.3	0.5	7/19/2017	W-MM-14_071917_SED_03-05	1		1	1
						0.5	1	7/19/2017	W-MM-14_071917_SED_05-10	1		1	1
		W-MM-15	-68.8544	44.5776	Slide Hammer	0	0.1	8/1/2017	W-MM-15_080117_SED_00-01	1	1	1	1
						0.1	0.3	8/1/2017	W-MM-15_080117_SED_01-03	1	1	1	1
						0.3	0.5	8/3/2017	W-MM-15_080317_SED_03-05	1		1	1
						0.5	1	8/3/2017	W-MM-15_080317_SED_05-10	1		1	1
		W-MM-16	-68.8559	44.5696	Slide Hammer	0	0.1	8/1/2017	W-MM-16_080117_SED_00-01	1	1	1	1
						0.1	0.3	8/1/2017	W-MM-16_080117_SED_01-03	1	1	1	1
						0.3	0.5	8/3/2017	W-MM-16_080317_SED_03-05	1		1	1
						0.5	1	8/3/2017	W-MM-16_080317_SED_05-10	1		1	1

TABLE 1
2017 MARSH AND INTERTIDAL SEDIMENT ANALYTICAL MATRIX

PENOBSCOT RIVER PHASE III ENGINEERING STUDY

River Reach	Media	Location ID	Longitude/Latitude		Collection Method	Sample Top Depth (feet bgs)	Sample Bottom Depth (feet bgs)	Sample Date	Analyte	Sediment: Mercury	Sediment: Methyl Mercury	Sediment: Total Organic Carbon	Sediment: Organic Content
									Method	1631e[1]	1630[2]	Lloyd-Kahn[3]	ASTM D2974-C[3]
									Preservation	4° C	Frozen	4° C	N/A
									Field Sample ID				
Mendall Marsh	Marsh Platform Sediment	W-MM-17	-68.8556	44.5625	Slide Hammer	0	0.1	7/25/2017	W-MM-17_072517_SED_00-01	1	1	1	1
						0.1	0.3	7/25/2017	W-MM-17_072517_SED_01-03	1	1	1	1
						0.3	0.5	7/26/2017	W-MM-17_072617_SED_03-05	1		1	1
						0.5	1	7/26/2017	W-MM-17_072617_SED_05-10	1		1	1
		W-MM-18	-68.8529	44.5634	Slide Hammer	0	0.1	7/25/2017	W-MM-18_072517_SED_00-01	1	1	1	1
						0.1	0.3	7/25/2017	W-MM-18_072517_SED_01-03	1	1	1	1
						0.3	0.5	7/25/2017	W-MM-18_072517_SED_03-05	1		1	1
						0.5	1	7/25/2017	W-MM-18_072517_SED_05-10	1		1	1
		W-MM-19	-68.8569	44.5594	Slide Hammer	0	0.1	7/24/2017	W-MM-19_072417_SED_00-01	1	1	1	1
						0.1	0.3	7/24/2017	W-MM-19_072417_SED_01-03	1	1	1	1
						0.3	0.5	7/25/2017	W-MM-19_072517_SED_03-05	1		1	1
						0.5	1	7/25/2017	W-MM-19_072517_SED_05-10	1		1	1
		W-MM-20	-68.8610	44.5595	Slide Hammer	0	0.1	8/1/2017	W-MM-20_080117_SED_00-01	1	1	1	1
						0.1	0.3	8/1/2017	W-MM-20_080117_SED_01-03	1	1	1	1
						0.3	0.5	8/3/2017	W-MM-20_080317_SED_03-05	1		1	1
						0.5	1	8/3/2017	W-MM-20_080317_SED_05-10	1		1	1
		W-MM-21	-68.8610	44.5565	Slide Hammer	0	0.1	8/1/2017	W-MM-21_080117_SED_00-01	1	1	1	1
						0.1	0.3	8/1/2017	W-MM-21_080117_SED_01-03	1	1	1	1
						0.3	0.5	8/3/2017	W-MM-21_080317_SED_03-05	1		1	1
						0.5	1	8/3/2017	W-MM-21_080317_SED_05-10	1		1	1
		W-MM-22	-68.8563	44.5546	Slide Hammer	0	0.1	7/24/2017	W-MM-22_072417_SED_00-01	1	1	1	1
						0.1	0.3	7/24/2017	W-MM-22_072417_SED_01-03	1	1	1	1
						0.3	0.5	7/25/2017	W-MM-22_072517_SED_03-05	1		1	1
						0.5	1	7/25/2017	W-MM-22_072517_SED_05-10	1		1	1
		W-MM-23	-68.8561	44.5516	Slide Hammer	0	0.1	7/24/2017	W-MM-23_072417_SED_00-01	1	1	1	1
						0.1	0.3	7/24/2017	W-MM-23_072417_SED_01-03	1	1	1	1
						0.3	0.5	7/25/2017	W-MM-23_072517_SED_03-05	1		1	1
						0.5	1	7/25/2017	W-MM-23_072517_SED_05-10	1		1	1
		W-MM-24	-68.8580	44.5475	Slide Hammer	0	0.1	7/24/2017	W-MM-24_072417_SED_00-01	1	1	1	1
						0.1	0.3	7/24/2017	W-MM-24_072417_SED_01-03	1	1	1	1
						0.3	0.5	7/25/2017	W-MM-24_072517_SED_03-05	1		1	1
						0.5	1	7/25/2017	W-MM-24_072517_SED_05-10	1		1	1
Orland River	Marsh Platform Sediment	W-27-A	-68.7464	44.5594	Slide Hammer	0	0.1	7/25/2017	W-27-A_072517_SED_00-01	1	1	1	1
						0.1	0.3	7/25/2017	W-27-A_072517_SED_01-03	1	1	1	1
						0.3	0.5	7/26/2017	W-27-A_072617_SED_03-05	1		1	1
						0.5	1	7/26/2017	W-27-A_072617_SED_05-10	1		1	1
		W-100-A	-68.7532	44.5445	Slide Hammer	0	0.1	8/1/2017	W-100-A_080117_SED_00-01	1	1	1	1
						0.1	0.3	8/1/2017	W-100-A_080117_SED_01-03	1	1	1	1
						0.3	0.5	8/3/2017	W-100-A_080317_SED_03-05	1		1	1
						0.5	1	8/3/2017	W-100-A_080317_SED_05-10	1		1	1

TABLE 1
2017 MARSH AND INTERTIDAL SEDIMENT ANALYTICAL MATRIX

PENOBSCOT RIVER PHASE III ENGINEERING STUDY

River Reach	Media	Location ID	Longitude/Latitude		Collection Method	Sample Top Depth (feet bgs)	Sample Bottom Depth (feet bgs)	Sample Date		Sediment			
									Analyte	Mercury	Methyl Mercury	Total Organic Carbon	Organic Content
									Method	1631e[1]	1630[2]	Lloyd-Kahn[3]	ASTM D2974-C[3]
									Preservation	4° C	Frozen	4° C	N/A
									Field Sample ID				
Orland River	Marsh Platform Sediment	W-106-A	-68.7456	44.5573	Slide Hammer	0	0.1	8/1/2017	W-106-A_080117_SED_00-01	1	1	1	1
						0.1	0.3	8/1/2017	W-106-A_080117_SED_01-03	1	1	1	1
						0.3	0.5	8/3/2017	W-106-A_080317_SED_03-05	1		1	1
						0.5	1	8/3/2017	W-106-A_080317_SED_05-10	1		1	1
		W-107-A	-68.7469	44.5424	Slide Hammer	0	0.1	8/1/2017	W-107-A_080117_SED_00-01	1	1	1	1
						0.1	0.3	8/1/2017	W-107-A_080117_SED_01-03	1	1	1	1
						0.3	0.5	8/3/2017	W-107-A_080317_SED_03-05	1		1	1
						0.5	1	8/3/2017	W-107-A_080317_SED_05-10	1		1	1
		W-108-A	-68.7554	44.5391	Slide Hammer	0	0.1	8/15/2017	W-108-A_081517_SED_00-01	1	1	1	1
						0.1	0.3	8/15/2017	W-108-A_081517_SED_01-03	1	1	1	1
						0.3	0.5	8/17/2017	W-108-A_081717_SED_03-05	1		1	1
						0.5	1	8/17/2017	W-108-A_081717_SED_05-10	1		1	1
Orland River	Intertidal Sediment	OR-01-01	-68.7449	44.5664	PushCore	0	0.1	7/24/2017	OR-01-01_072417_SED_00-01	1	1	1	1
						0.1	0.3	7/24/2017	OR-01-01_072417_SED_01-03	1	1	1	1
						0.3	0.5	7/25/2017	OR-01-01_072517_SED_03-05	1		1	1
						0.5	1	7/25/2017	OR-01-01_072517_SED_05-10	1		1	1
		OR-01-02	-68.7470	44.5618	PushCore	0	0.1	7/24/2017	OR-01-02_072417_SED_00-01	1	1	1	1
						0.1	0.3	7/24/2017	OR-01-02_072417_SED_01-03	1	1	1	1
						0.3	0.5	7/25/2017	OR-01-02_072517_SED_03-05	1		1	1
						0.5	1	7/25/2017	OR-01-02_072517_SED_05-10	1		1	1
		OR-01-03	-68.7445	44.5559	PushCore	0	0.1	7/24/2017	OR-01-03_072417_SED_00-01	1	1	1	1
						0.1	0.3	7/24/2017	OR-01-03_072417_SED_01-03	1	1	1	1
						0.3	0.5	7/25/2017	OR-01-03_072517_SED_03-05	1		1	1
						0.5	1	7/25/2017	OR-01-03_072517_SED_05-10	1		1	1
		OR-01-04	-68.7513	44.5466	PushCore	0	0.1	7/25/2017	OR-01-04_072517_SED_00-01	1	1	1	1
						0.1	0.3	7/25/2017	OR-01-04_072517_SED_01-03	1	1	1	1
						0.3	0.5	7/25/2017	OR-01-04_072517_SED_03-05	1		1	1
						0.5	1	7/25/2017	OR-01-04_072517_SED_05-10	1		1	1
		OR-01-05	-68.7517	44.5434	PushCore	0	0.1	7/24/2017	OR-01-05_072417_SED_00-01	1	1	1	1
						0.1	0.3	7/24/2017	OR-01-05_072417_SED_01-03	1	1	1	1
						0.3	0.5	7/25/2017	OR-01-05_072517_SED_03-05	1		1	1
						0.5	1	7/25/2017	OR-01-05_072517_SED_05-10	1		1	1
		OR-02-01	-68.7431	44.5661	PushCore	0	0.1	7/24/2017	OR-02-01_072417_SED_00-01	1	1	1	1
						0.1	0.3	7/24/2017	OR-02-01_072417_SED_01-03	1	1	1	1
						0.3	0.5	7/25/2017	OR-02-01_072517_SED_03-05	1		1	1
						0.5	1	7/25/2017	OR-02-01_072517_SED_05-10	1		1	1
		OR-02-02	-68.7424	44.5570	PushCore	0	0.1	7/24/2017	OR-02-02_072417_SED_00-01	1	1	1	1
						0.1	0.3	7/24/2017	OR-02-02_072417_SED_01-03	1	1	1	1
						0.3	0.5	7/25/2017	OR-02-02_072517_SED_03-05	1		1	1
						0.5	1	7/25/2017	OR-02-02_072517_SED_05-10	1		1	1

TABLE 1
2017 MARSH AND INTERTIDAL SEDIMENT ANALYTICAL MATRIX

PENOBSCOT RIVER PHASE III ENGINEERING STUDY

River Reach	Media	Location ID	Longitude/Latitude		Collection Method	Sample Top Depth (feet bgs)	Sample Bottom Depth (feet bgs)	Sample Date	Analyte	Sediment: Mercury	Sediment: Methyl Mercury	Sediment: Total Organic Carbon	Sediment: Organic Content
									Method	1631e[1]	1630[2]	Lloyd-Kahn[3]	ASTM D2974-C[3]
									Preservation	4° C	Frozen	4° C	N/A
									Field Sample ID				
Orland River	Intertidal Sediment	OR-02-03	-68.7498	44.5388	PushCore	0	0.1	8/1/2017	OR-02-03_080117_SED_00-01	1	1	1	1
						0.1	0.3	8/1/2017	OR-02-03_080117_SED_01-03	1	1	1	1
						0.3	0.5	8/3/2017	OR-02-03_080317_SED_03-05	1		1	1
						0.5	1	8/3/2017	OR-02-03_080317_SED_05-10	1		1	1
		W-105-A	-68.7443	44.5622	PushCore	0	0.1	7/24/2017	W-105-A_072417_SED_00-01	1	1	1	1
						0.1	0.3	7/24/2017	W-105-A_072417_SED_01-03	1	1	1	1
						0.3	0.5	7/25/2017	W-105-A_072517_SED_03-05	1		1	1
						0.5	1	7/25/2017	W-105-A_072517_SED_05-10	1		1	1
		W-27-INTA	-68.7460	44.5584	PushCore	0	0.1	7/24/2017	W-27-INTA_072417_SED_00-01	1	1	1	1
						0.1	0.3	7/24/2017	W-27-INTA_072417_SED_01-03	1	1	1	1
						0.3	0.5	7/25/2017	W-27-INTA_072517_SED_03-05	1		1	1
						0.5	1	7/25/2017	W-27-INTA_072517_SED_05-10	1		1	1

Notes:
bgs - below ground surface
N/A - Not applicable
Dup/MS/MSD locations were selected in the field dependent on sample volume available
Duplicate samples were collected at a rate of one per 10 field samples

MS/MSD samples were collected at a rate of one per 20 field samples
Sample Date identifies the date on which the sample aliquot was prepared for laboratory analysis.
Sample handling procedures are detailed in the QAPP (Amec Foster Wheeler 2016b).
1 - 1631e; hot aqua regia digestion
2 - 1630; methanolic KOH extraction
3 - Combustion at 550° C

Created by: BPW 11/30/17
Checked by: DRP 12/06/17
Revised by: KAM 05/10/18

TABLE 2
MARSH AND INTERTIDAL SEDIMENT ANALYTICAL RESULTS

Penobscot River Phase III Engineering Study

								Parameter	Mercury		Methyl Mercury		Percent Methyl Mercury	Percent Solids		Organic Content at 550 C	Total Organic Carbon		USCS Visual Classification
								Units	ng/g		ng/g		Percent	Percent		Percent	Percent		
River Reach	Media	Location ID	Study Area	Marsh/Intertidal	Sample ID	Sample Date	Top Depth (ft)	Bottom Depth (ft)	Result	Qual	Result	Qual	Result	Result	Qual	Result	Result	Qual	Result
Orrington	Marsh Platform Sediment	W-104-A	PF	M	W-104-A_071817_SED_00-01	7/18/2017	0	0.1	13.8		2.10	U	15.2	83.8		2.2	0.5	J	OL
			PF	M	W-104-A_071817_SED_01-03	7/18/2017	0.1	0.3	11.4		2.20	U	19.3	84.6		2.0	0.4		OL
			PF	M	W-104-A_071917_SED_03-05	7/19/2017	0.3	0.5	10.5		(-)		(-)	84.8		2.46	0.37		SC
			PF	M	W-104-A_071917_SED_05-10	7/19/2017	0.5	1	7.46		(-)		(-)	83.4		1.76	0.35		SC
		W-104-B	PF	M	W-104-B_080117_SED_00-01	8/1/2017	0	0.1	82.3		1.00	J	1.22	54.3		5.6	2.4		CL
			PF	M	W-104-B_080117_SED_01-03	8/1/2017	0.1	0.3	461		0.60	J	0.13	59.8		6.9	2.5		CL
			PF	M	W-104-B_080317_SED_03-05	8/3/2017	0.3	0.5	522	*	(-)		(-)	53.4		8.80	4.31		ML
			PF	M	W-104-B_080317_SED_05-10	8/3/2017	0.5	1	296		(-)		(-)	51.3		24.4	5.14		SM
	Intertidal Sediment	W-104-INTA	PF	I	W-104-INTA_072517_SED_00-01	7/25/2017	0	0.1	1,090		15.7		1.44	32.0		14.8	6.8		SC
			PF	I	W-104-INTA_072517_SED_01-03	7/25/2017	0.1	0.3	733		7.40		1.01	35.8		14.0	6.4		CL
			PF	I	W-104-INTA_072617_SED_03-05	7/26/2017	0.3	0.5	715	*	(-)		(-)	37.6		14.1	7.2		CL
			PF	I	W-104-INTA_072617_SED_05-10	7/26/2017	0.5	1	826		(-)		(-)	42.7		14.9	6.0		CL
		W-104-INTB	PF	I	W-104-INTB_080117_SED_00-01	8/1/2017	0	0.1	549		6.90		1.26	25.4		14.4	6.4		CL
			PF	I	W-104-INTB_080117_SED_01-03	8/1/2017	0.1	0.3	698		3.70		0.53	33.4		13.5	6.8		CL
			PF	I	W-104-INTB_080317_SED_03-05	8/3/2017	0.3	0.5	977		(-)		(-)	37.2		16.2	7.1		SM
			PF	I	W-104-INTB_080317_SED_05-10	8/3/2017	0.5	1	1,040		(-)		(-)	41.9		14.3	6.8	J	SC
Winterport	Marsh Platform Sediment	W-14-A	PF	M	W-14-A_072517_SED_00-01	7/25/2017	0	0.1	456	*	30.9	*	6.8	27.6		28.7	14.2		OL
			PF	M	W-14-A_072517_SED_01-03	7/25/2017	0.1	0.3	673		7.90		1.17	29.6		27.3	12.5		OL
			PF	M	W-14-A_072517_SED_03-05	7/25/2017	0.3	0.5	1,000		(-)		(-)	30.3		17.3	14.6		CL
			PF	M	W-14-A_072517_SED_05-10	7/25/2017	0.5	1	2,810		(-)		(-)	29.4		26.3	15.9		CL
		W-14-B	PF	M	W-14-B_072517_SED_00-01	7/25/2017	0	0.1	787		5.60		0.71	42.8		20.9	9.3		SC
			PF	M	W-14-B_072517_SED_01-03	7/25/2017	0.1	0.3	823		2.20	J	0.27	44.4		18.7	8.4		SC
			PF	M	W-14-B_072517_SED_03-05	7/25/2017	0.3	0.5	1,070		(-)		(-)	42.4		18.7	8.88		OL
			PF	M	W-14-B_072517_SED_05-10	7/25/2017	0.5	1	967	*	(-)		(-)	61.5		9.30	6.30		OL
		W-14-C	PF	M	W-14-C_072417_SED_00-01	7/24/2017	0	0.1	515		26.8		5.20	26.7		30.1	13.9		OL
			PF	M	W-14-C_072417_SED_01-03	7/24/2017	0.1	0.3	696	*	20.0	*	2.87	27.3		30.3	19.6	J	OL
			PF	M	W-14-C_072517_SED_03-05	7/25/2017	0.3	0.5	989		(-)		(-)	27.9		28.7	15.6		SC
			PF	M	W-14-C_072517_SED_05-10	7/25/2017	0.5	1	2,130		(-)		(-)	26.4		36.9	17.6		OL
	Intertidal Sediment	W-14-INTA	PF	I	W-14-INTA_072517_SED_00-01	7/25/2017	0	0.1	357		9.0		2.52	57.6		9.0	3.7		SC
			PF	I	W-14-INTA_072517_SED_01-03	7/25/2017	0.1	0.3	64.0		1.1	J	1.72	61.6		9.3	2.8		SC
			PF	I	W-14-INTA_072617_SED_03-05	7/26/2017	0.3	0.5	33.2	*	(-)		(-)	64.2		5.5	1.9		SM
			PF	I	W-14-INTA_072617_SED_05-10	7/26/2017	0.5	1	23.0		(-)		(-)	64.9		4.4	1.9		SM
Winterport	Marsh Platform Sediment	W-103-A	PF	M	W-103-A_072417_SED_00-01	7/24/2017	0	0.1	171		17.1		10.0	17.0		34.6	15.2		CL
			PF	M	W-103-A_072417_SED_01-03	7/24/2017	0.1	0.3	742		35.7		4.81	23.1		35.6	15.0		CL
			PF	M	W-103-A_072517_SED_03-05	7/25/2017	0.3	0.5	1,100		(-)		(-)	28.5		30.3	14.4		ML
			PF	M	W-103-A_072517_SED_05-10	7/25/2017	0.5	1	672	J*	(-)		(-)	24.7		37.5	19.1		CL
		W-103-B	PF	M	W-103-B_072417_SED_00-01	7/24/2017	0	0.1	491	*	37.5	*	7.64	22.2		43.2	19.6		OL
			PF	M	W-103-B_072417_SED_01-03	7/24/2017	0.1	0.3	1,150		28.9		2.51	26.1		34.7	18.4		OL
			PF	M	W-103-B_072517_SED_03-05	7/25/2017	0.3	0.5	936		(-)		(-)	27.5		30.7	13.9		SC
			PF	M	W-103-B_072517_SED_05-10	7/25/2017	0.5	1	106		(-)		(-)	32.5		25.6	13.7		SM
	Intertidal Sediment	W-103-INTA	PF	I	W-103-INTA_072517_SED_00-01	7/25/2017	0	0.1	643		9.90		1.54	41.0		10.7	4.6		CL
			PF	I	W-103-INTA_072517_SED_01-03	7/25/2017	0.1	0.3	720	*	10.9	*	1.51	41.7		12.3	6.9		CL
			PF	I	W-103-INTA_072617_SED_03-05	7/26/2017	0.3	0.5	1,100		(-)		(-)	42.7		14.3	7.3		SM
			PF	I	W-103-INTA_072617_SED_05-10	7/26/2017	0.5	1	841		(-)		(-)	43.5		16.7	8.5		SM
Frankfort Flats	Marsh Platform Sediment	W-102-A	PF	M	W-102-A_081517_SED_00-01	8/15/2017	0	0.1	731		22.4		3.06	25.4		29.8	15.4		OL
			PF	M	W-102-A_081517_SED_01-03	8/15/2017	0.1	0.3	1750		15.5		0.89	27.2		44.6	17.9		OL
			PF	M	W-102-A_081717_SED_03-05	8/17/2017	0.3	0.5	3,480		(-)		(-)	23.7		35.1	23.0		OL
			PF	M	W-102-A_081717_SED_05-10	8/17/2017	0.5	1	1,540		(-)		(-)	17.0		34.6	31.1		OL
		W-102-B	PF	M	W-102-B_081517_SED_00-01	8/15/2017	0	0.1	250		7.60		3.04	17.6		46.8	26.2		OL
			PF	M	W-102-B_081517_SED_01-03	8/15/2017	0.1	0.3	748		4.50		0.60	20.9		37.0	22.0		OL
			PF	M	W-102-B_081717_SED_03-05	8/17/2017	0.3	0.5	599		(-)		(-)	18.4		40.8	28.3		OL
			PF	M	W-102-B_081717_SED_05-10	8/17/2017	0.5	1	445		(-)		(-)	19.7		48.7	30.3		OL
	Marsh Platform Sediment	W-102-C	PF	M	W-102-C_081517_SED_00-01	8/15/2017	0	0.1	987		21.7		2.20	31.1		32.9	14.9		OL
			PF	M	W-102-C_081517_SED_01-03	8/15/2017	0.1	0.3	946		6.20		0.66	27.1		19.1	13.9		CL
			PF	M	W-102-C_081717_SED_03-05	8/17/2017	0.3	0.5	1,530		(-)		(-)	27.6		37.2	20.3		OL
			PF	M	W-102-C_081717_SED_05-10	8/17/2017	0.5	1	3,200		(-)		(-)	17.9		44.3	33.5		OL

TABLE 2
MARSH AND INTERTIDAL SEDIMENT ANALYTICAL RESULTS

Penobscot River Phase III Engineering Study

								Parameter	Mercury		Methyl Mercury		Percent Methyl Mercury	Percent Solids		Organic Content at 550 C	Total Organic Carbon		USCS Visual Classification
								Units	ng/g		ng/g		Percent	Percent		Percent	Percent		
River Reach	Media	Location ID	Study Area	Marsh/Intertidal	Sample ID	Sample Date	Top Depth (ft)	Bottom Depth (ft)	Result	Qual	Result	Qual	Result	Result	Qual	Result	Result	Qual	Result
Frankfort Flats	Intertidal Sediment	W-102-INTA	PF	I	W-102-INTA_072517_SED_00-01	7/25/2017	0	0.1	1,350		15.1		1.12	28.3		21.8	11.0		SM
			PF	I	W-102-INTA_072517_SED_01-03	7/25/2017	0.1	0.3	1,140		11.6		1.02	30.6		20.6	10.0		CL
			PF	I	W-102-INTA_072617_SED_03-05	7/26/2017	0.3	0.5	1,310		(-)		(-)	24.2		38.1	10.6		OL
			PF	I	W-102-INTA_072617_SED_05-10	7/26/2017	0.5	1	1,113	*	(-)		(-)	28.0		26.9	15.4		OL
Verona Northeast	Marsh Platform Sediment	W-101-A	PF	M	W-101-A_081517_SED_00-01	8/15/2017	0	0.1	854		5.70		0.67	37.0		21.5	8.3		OL
			PF	M	W-101-A_081517_SED_01-03	8/15/2017	0.1	0.3	900		4.90		0.54	36.8		17.5	9.4		CL
			PF	M	W-101-A_081717_SED_03-05	8/17/2017	0.3	0.5	2,380		(-)		(-)	34.8		16.9	14.0		CL
			PF	M	W-101-A_081717_SED_05-10	8/17/2017	0.5	1	1,330		(-)		(-)	33.0		22.1	14.5		CL
		W-101-B	PF	M	W-101-B_081517_SED_00-01	8/15/2017	0	0.1	878		1.40	J	0.16	25.1		23.9	9.8		OL
			PF	M	W-101-B_081517_SED_01-03	8/15/2017	0.1	0.3	1,893	*	3.33	*	0.18	28.7		31.4	11.7		OL
			PF	M	W-101-B_081717_SED_03-05	8/17/2017	0.3	0.5	2,270		(-)		(-)	31.3		22.7	15.2		CL
			PF	M	W-101-B_081717_SED_05-10	8/17/2017	0.5	1	631	*	(-)		(-)	30.1		20.0	15.6		CL
	Intertidal Sediment	W-101-INTA	PF	I	W-101-INTA_080117_SED_00-01	8/1/2017	0	0.1	766		13.3		1.74	29.5		10.7	6.0		CL
			PF	I	W-101-INTA_080117_SED_01-03	8/1/2017	0.1	0.3	888	*	4.70	*	0.53	41.4		10.8	5.3		CL
			PF	I	W-101-INTA_080317_SED_03-05	8/3/2017	0.3	0.5	929		(-)		(-)	41.0		14.6	6.8		SM
			PF	I	W-101-INTA_080317_SED_05-10	8/3/2017	0.5	1	583		(-)		(-)	37.5		24.1	10.1		SM
Verona West	Marsh Platform Sediment	W-109-A	PF	M	W-109-A_080117_SED_00-01	8/1/2017	0	0.1	92.5		1.90	U		24.1		59.1	30.1		OL
			PF	M	W-109-A_080117_SED_01-03	8/1/2017	0.1	0.3	90.8		0.60	J	0.66	30.0		31.0	17.2		OL
			PF	M	W-109-A_080317_SED_03-05	8/3/2017	0.3	0.5	206		(-)		(-)	28.3		41.3	22.5		OL
			PF	M	W-109-A_080317_SED_05-10	8/3/2017	0.5	1	37.8	*	(-)		(-)	58.2		12.8	3.90		OL
		W-110-A	PF	M	W-110-A_080117_SED_00-01	8/1/2017	0	0.1	210	*	0.53	J*	0.25	24.4		41.5	17.7		OL
			PF	M	W-110-A_080117_SED_01-03	8/1/2017	0.1	0.3	433		4.50		1.04	26.0		29.3	17.2		OL
			PF	M	W-110-A_080317_SED_03-05	8/3/2017	0.3	0.5	187		(-)		(-)	42.8		15.8	6.75		OL
			PF	M	W-110-A_080317_SED_05-10	8/3/2017	0.5	1	30.2		(-)		(-)	70.6		5.02	2.13		ML
Mendall Marsh	Marsh Platform Sediment	W-MM-01	MM	M	W-MM-01_072517_SED_00-01	7/25/2017	0	0.1	456		51.8		11.4	24.8		24.1	16.5		CL
			MM	M	W-MM-01_072517_SED_01-03	7/25/2017	0.1	0.3	867	*	19.3	*	2.23	27.7		40.2	16.0		CL
			MM	M	W-MM-01_072617_SED_03-05	7/26/2017	0.3	0.5	3,370		(-)		(-)	22.0		38.2	17.7		OL
			MM	M	W-MM-01_072617_SED_05-10	7/26/2017	0.5	1	1,200		(-)		(-)	27.8		29.2	13.9		SM
		W-MM-02	MM	M	W-MM-02_072517_SED_00-01	7/25/2017	0	0.1	434		13.5		3.11	24.5		44.5	17.8		ML
			MM	M	W-MM-02_072517_SED_01-03	7/25/2017	0.1	0.3	697		22.1		3.17	24.3		41.1	18.4		ML
			MM	M	W-MM-02_072617_SED_03-05	7/26/2017	0.3	0.5	205		(-)		(-)	24.1		32.6	23.3		OL
			MM	M	W-MM-02_072617_SED_05-10	7/26/2017	0.5	1	38.1		(-)		(-)	30.6		26.8	11.2		OL
		W-MM-03	MM	M	W-MM-03_071717_SED_00-01	7/17/2017	0	0.1	56.9		3.8	J	6.68	14.9		56.5	30.6		OL
			MM	M	W-MM-03_071717_SED_01-03	7/17/2017	0.1	0.3	201		3.7	J	1.84	16.2		47.7	24.6		OL
			MM	M	W-MM-03_071817_SED_03-05	7/18/2017	0.3	0.5	52.6		(-)		(-)	19.4		45.4	49.6		OL
			MM	M	W-MM-03_071817_SED_05-10	7/18/2017	0.5	1	21.5		(-)		(-)	15.8		45.3	50.3		OL
		W-MM-04	MM	M	W-MM-04_071717_SED_00-01	7/17/2017	0	0.1	540		10.9		2.02	36.1		19.7	9.4		CL
			MM	M	W-MM-04_071717_SED_01-03	7/17/2017	0.1	0.3	93.4		4.70		5.03	37.5		18.6	8.6		SC
			MM	M	W-MM-04_071817_SED_03-05	7/18/2017	0.3	0.5	933		(-)		(-)	38.6		19.5	22.6		OL
			MM	M	W-MM-04_071817_SED_05-10	7/18/2017	0.5	1	1,780		(-)		(-)	39.7		18.1	21.5		OL
		W-MM-05	MM	M	W-MM-05_071817_SED_00-01	7/18/2017	0	0.1	654		9.00		1.38	41.8		17.9	8.0		CL
			MM	M	W-MM-05_071817_SED_01-03	7/18/2017	0.1	0.3	689		17.9		2.60	44.7		16.0	7.4		SM
			MM	M	W-MM-05_071917_SED_03-05	7/19/2017	0.3	0.5	712		(-)		(-)	54.4		9.5	10.0		OL
			MM	M	W-MM-05_071917_SED_05-10	7/19/2017	0.5	1	1,480		(-)		(-)	47.6		1.6	14.1		ML
		W-MM-06	MM	M	W-MM-06_072417_SED_00-01	7/24/2017	0	0.1	420		15.1		3.60	22.5		35.7	39.6		OL
			MM	M	W-MM-06_072417_SED_01-03	7/24/2017	0.1	0.3	1,050		11.7		1.11	25.7		37.4	39.0		OL
			MM	M	W-MM-06_072517_SED_03-05	7/25/2017	0.3	0.5	290	*	(-)		(-)	27.5		28.7	16.0		OL
			MM	M	W-MM-06_072517_SED_05-10	7/25/2017	0.5	1	96.8		(-)		(-)	31.5		25.0	12.0		OL
		W-MM-07	MM	M	W-MM-07_072517_SED_00-01	7/25/2017	0	0.1	321		10.6		3.30	22.9		41.8	19.6		CL
			MM	M	W-MM-07_072517_SED_01-03	7/25/2017	0.1	0.3	558	*	12.3	*	2.20	23.7		39.7	17.2		ML
			MM	M	W-MM-07_072617_SED_03-05	7/26/2017	0.3	0.5	682		(-)		(-)	20.6		47.8	24.1		OL
			MM	M	W-MM-07_072617_SED_05-10	7/26/2017	0.5	1	212		(-)		(-)	31.7		25.3	14.3		ML
		W-MM-08	MM	M	W-MM-08_071817_SED_00-01	7/18/2017	0	0.1	641		20.4		3.18	38.0		19.3	10.5		CL
			MM	M	W-MM-08_071817_SED_01-03	7/18/2017	0.1	0.3	964		15.9		1.65	40.2		19.6	9.0		OL
			MM	M	W-MM-08_071917_SED_03-05	7/19/2017	0.3	0.5	697		(-)		(-)	39.6		19.6	22.3		OL
			MM	M	W-MM-08_071917_SED_05-10	7/19/2017	0.5	1	1,420		(-)		(-)	37.1		24.0	26.3		OL
		W-MM-09	MM	M	W-MM-09_080117_SED_00-01	8/1/2017	0	0.1	237		2.90		1.22	25.4		35.1	16.6		OL
			MM	M	W-MM-09_080117_SED_01-03	8/1/2017	0.1	0.3	725		2.20		0.30	23.7		34.1	19.6		OL
			MM	M	W-MM-09_080317_SED_03-05	8/3/2017	0.3	0.5	594		(-)		(-)	23.3		38.7	19.6		OL
			MM	M	W-MM-09_080317_SED_05-10	8/3/2017	0.5	1	33.4		(-)		(-)	25.9		27.2	18.0		OL

TABLE 2
MARSH AND INTERTIDAL SEDIMENT ANALYTICAL RESULTS

Penobscot River Phase III Engineering Study

							Parameter		Mercury		Methyl Mercury		Percent Methyl Mercury	Percent Solids		Organic Content at 550 C	Total Organic Carbon		USCS Visual Classification
							Units		ng/g		ng/g		Percent	Percent		Percent	Percent		
River Reach	Media	Location ID	Study Area	Marsh/Intertidal	Sample ID	Sample Date	Top Depth (ft)	Bottom Depth (ft)	Result	Qual	Result	Qual	Result	Result	Qual	Result	Result	Qual	Result
Mendall Marsh	Marsh Platform Sediment	W-MM-10	MM	M	W-MM-10_080117_SED_00-01	8/1/2017	0	0.1	183		1.4	J	0.77	14.4		53.4	25.0		OL
			MM	M	W-MM-10_080117_SED_01-03	8/1/2017	0.1	0.3	357		2.7		0.76	15.8		44.4	23.9		OL
			MM	M	W-MM-10_080317_SED_03-05	8/3/2017	0.3	0.5	116		(-)		(-)	20.8		41.7	21.8		OL
			MM	M	W-MM-10_080317_SED_05-10	8/3/2017	0.5	1	16.5		(-)		(-)	22.5		29.9	18.5		OL
		W-MM-11	MM	M	W-MM-11_071817_SED_00-01	7/18/2017	0	0.1	658		11.2		1.70	34.6		25.2	13.0		SC
			MM	M	W-MM-11_071817_SED_01-03	7/18/2017	0.1	0.3	699		18.2		2.60	31.1		28.5	14.2		OL
			MM	M	W-MM-11_071917_SED_03-05	7/19/2017	0.3	0.5	1,640		(-)		(-)	29.7		25.8	27.7		OL
			MM	M	W-MM-11_071917_SED_05-10	7/19/2017	0.5	1	1,180		(-)		(-)	27.3		28.5	32.2		OL
		W-MM-12	MM	M	W-MM-12_071817_SED_00-01	7/18/2017	0	0.1	448		10.2		2.28	31.7		28.0	13.2		OL
			MM	M	W-MM-12_071817_SED_01-03	7/18/2017	0.1	0.3	538		6.50		1.21	29.0		30.3	16.2		OL
			MM	M	W-MM-12_071917_SED_03-05	7/19/2017	0.3	0.5	282		(-)		(-)	22.4		36.8	46.7		OL
			MM	M	W-MM-12_071917_SED_05-10	7/19/2017	0.5	1	27.4		(-)		(-)	18.7		47.8	52.1		OL
		W-MM-13	MM	M	W-MM-13_071817_SED_00-01	7/18/2017	0	0.1	229		10.5		4.59	18.4		52.2	24.0		OL
			MM	M	W-MM-13_071817_SED_01-03	7/18/2017	0.1	0.3	371		11.1		2.99	18.1		56.8	26.1		OL
			MM	M	W-MM-13_071917_SED_03-05	7/19/2017	0.3	0.5	281		(-)		(-)	18.5		58.3	61.6		OL
			MM	M	W-MM-13_071917_SED_05-10	7/19/2017	0.5	1	29.3		(-)		(-)	18.3		46.9	54.6		OL
		W-MM-14	MM	M	W-MM-14_071817_SED_00-01	7/18/2017	0	0.1	446		19.7		4.42	23.8		38.2	21.8		OL
			MM	M	W-MM-14_071817_SED_01-03	7/18/2017	0.1	0.3	1,160		18.6		1.60	21.7		42.1	19.1		OL
			MM	M	W-MM-14_071917_SED_03-05	7/19/2017	0.3	0.5	205		(-)		(-)	23.8		37.9	41.9		SC
			MM	M	W-MM-14_071917_SED_05-10	7/19/2017	0.5	1	23.7		(-)		(-)	25.0		36.8	45.1		SC
		W-MM-15	MM	M	W-MM-15_080117_SED_00-01	8/1/2017	0	0.1	282		6.00		2.13	25.1		35.0	16.6		OL
			MM	M	W-MM-15_080117_SED_01-03	8/1/2017	0.1	0.3	266		2.10		0.79	25.4		32.0	16.1		OL
			MM	M	W-MM-15_080317_SED_03-05	8/3/2017	0.3	0.5	237		(-)		(-)	27.6		28.4	14.9		OL
			MM	M	W-MM-15_080317_SED_05-10	8/3/2017	0.5	1	47.7		(-)		(-)	30.0		19.8	10.7		OL
		W-MM-16	MM	M	W-MM-16_080117_SED_00-01	8/1/2017	0	0.1	144		1.80		1.25	20.0		48.5	24.1		OL
			MM	M	W-MM-16_080117_SED_01-03	8/1/2017	0.1	0.3	734		0.40	J	0.05	35.0		38.2	13.0		OL
			MM	M	W-MM-16_080317_SED_03-05	8/3/2017	0.3	0.5	86.6		(-)		(-)	31.3		30.0	15.9		OL
			MM	M	W-MM-16_080317_SED_05-10	8/3/2017	0.5	1	23.4		(-)		(-)	35.2		24.6	13.7		OL
		W-MM-17	MM	M	W-MM-17_072517_SED_00-01	7/25/2017	0	0.1	162		19.4		12.0	18.4		57.2	25.4		ML
			MM	M	W-MM-17_072517_SED_01-03	7/25/2017	0.1	0.3	294		3.00	J	1.02	20.1		37.5	21.4		CL
			MM	M	W-MM-17_072617_SED_03-05	7/26/2017	0.3	0.5	101	J*	(-)		(-)	24.3		33.1	16.4		OL
			MM	M	W-MM-17_072617_SED_05-10	7/26/2017	0.5	1	26.7		(-)		(-)	28.0		22.4	11.0		OL
		W-MM-18	MM	M	W-MM-18_072517_SED_00-01	7/25/2017	0	0.1	212		25.6		12.1	22.0		49.1	22.7		CL
			MM	M	W-MM-18_072517_SED_01-03	7/25/2017	0.1	0.3	564		26.6		4.72	24.2		34.8	19.5		CL
			MM	M	W-MM-18_072517_SED_03-05	7/25/2017	0.3	0.5	888	*	(-)		(-)	24.5		42.3	22.6		OL
			MM	M	W-MM-18_072517_SED_05-10	7/25/2017	0.5	1	53.3	J	(-)		(-)	26.9		33.7	19.3		OL
		W-MM-19	MM	M	W-MM-19_072417_SED_00-01	7/24/2017	0	0.1	360		16.4		4.56	29.8		51.4	22.3		OL
			MM	M	W-MM-19_072417_SED_01-03	7/24/2017	0.1	0.3	655		16.0		2.44	40.2		25.0	12.0		OL
			MM	M	W-MM-19_072517_SED_03-05	7/25/2017	0.3	0.5	190		(-)		(-)	44.4		17.8	9.82		CL
			MM	M	W-MM-19_072517_SED_05-10	7/25/2017	0.5	1	244	*	(-)		(-)	29.2		38.8	22.2		OL
		W-MM-20	MM	M	W-MM-20_080117_SED_00-01	8/1/2017	0	0.1	348		2.90		0.83	34.3		18.4	9.7		CL
			MM	M	W-MM-20_080117_SED_01-03	8/1/2017	0.1	0.3	532		2.50		0.47	38.7		21.6	8.0		CL
			MM	M	W-MM-20_080317_SED_03-05	8/3/2017	0.3	0.5	1,130		(-)		(-)	35.3		21.6	12.5		OL
			MM	M	W-MM-20_080317_SED_05-10	8/3/2017	0.5	1	299		(-)		(-)	43.6		17.9	10.4		OL
		W-MM-21	MM	M	W-MM-21_080117_SED_00-01	8/1/2017	0	0.1	435		2.20		0.51	33.5		25.6	11.8		OL
			MM	M	W-MM-21_080117_SED_01-03	8/1/2017	0.1	0.3	634		1.90		0.30	30.4		26.7	13.0		OL
			MM	M	W-MM-21_080317_SED_03-05	8/3/2017	0.3	0.5	949	J	(-)		(-)	26.1		31.7	19.4		OL
			MM	M	W-MM-21_080317_SED_05-10	8/3/2017	0.5	1	141	J	(-)		(-)	28.7		22.6	16.2		OL
		W-MM-22	MM	M	W-MM-22_072417_SED_00-01	7/24/2017	0	0.1	276		28.9		10.5	23.1		60.3	24.6		OL
			MM	M	W-MM-22_072417_SED_01-03	7/24/2017	0.1	0.3	417		15.6		3.74	27.6		36.2	18.6		OL
			MM	M	W-MM-22_072517_SED_03-05	7/25/2017	0.3	0.5	584		(-)		(-)	25.5		42.2	21.1		OL
			MM	M	W-MM-22_072517_SED_05-10	7/25/2017	0.5	1	48.3	*	(-)		(-)	31.7		27.0	15.5		OL
		W-MM-23	MM	M	W-MM-23_072417_SED_00-01	7/24/2017	0	0.1	417	*	7.27	*	1.74	33.2		23.2	10.8		OL
			MM	M	W-MM-23_072417_SED_01-03	7/24/2017	0.1	0.3	596		8.80		1.48	35.5		25.2	13.0		OL
			MM	M	W-MM-23_072517_SED_03-05	7/25/2017	0.3	0.5	1,080		(-)		(-)	36.8		23.5	12.0		OL
			MM	M	W-MM-23_072517_SED_05-10	7/25/2017	0.5	1	288		(-)		(-)	40.2		18.6	10.6		OL
		W-MM-24	MM	M	W-MM-24_072417_SED_00-01	7/24/2017	0	0.1	480		5.80		1.21	33.2		20.4	12.2		SM
			MM	M	W-MM-24_072417_SED_01-03	7/24/2017	0.1	0.3	385	*	4.50	*	1.17	39.5		20.4	10.8		OL
			MM	M	W-MM-24_072517_SED_03-05	7/25/2017	0.3	0.5	302		(-)		(-)	42.1		19.5	9.73		CL
			MM	M	W-MM-24_072517_SED_05-10	7/25/2017	0.5	1	140		(-)		(-)	45.5		12.9	8.07		CL

TABLE 2
MARSH AND INTERTIDAL SEDIMENT ANALYTICAL RESULTS

Penobscot River Phase III Engineering Study

								Parameter	Mercury		Methyl Mercury		Percent Methyl Mercury	Percent Solids		Organic Content at 550 C	Total Organic Carbon		USCS Visual Classification
								Units	ng/g		ng/g		Percent	Percent		Percent	Percent		
River Reach	Media	Location ID	Study Area	Marsh/Intertidal	Sample ID	Sample Date	Top Depth (ft)	Bottom Depth (ft)	Result	Qual	Result	Qual	Result	Result	Qual	Result	Result	Qual	Result
Orland River	Marsh Platform Sediment	W-27-A	ORL	M	W-27-A_072517_SED_00-01	7/25/2017	0	0.1	456	*	15.3	*	3.36	26.7		21.5	9.3		OL
			ORL	M	W-27-A_072517_SED_01-03	7/25/2017	0.1	0.3	651		10.3		1.58	24.1		24.8	12.4		CL
			ORL	M	W-27-A_072617_SED_03-05	7/26/2017	0.3	0.5	1,520		(-)		(-)	31.1		20.8	9.8		CL
			ORL	M	W-27-A_072617_SED_05-10	7/26/2017	0.5	1	2,110		(-)		(-)	30.0		12.8	11.3		CL
		W-100-A	ORL	M	W-100-A_080117_SED_00-01	8/1/2017	0	0.1	554		30.6		5.52	28.4		21.9	12.4		CL
			ORL	M	W-100-A_080117_SED_01-03	8/1/2017	0.1	0.3	837		28.6		3.42	33.9		1.4	10.9		CL
			ORL	M	W-100-A_080317_SED_03-05	8/3/2017	0.3	0.5	1,620		(-)		(-)	28.2		26.6	11.5		OL
			ORL	M	W-100-A_080317_SED_05-10	8/3/2017	0.5	1	1,180		(-)		(-)	25.5		24.1	13.4		OL
		W-106-A	ORL	M	W-106-A_080117_SED_00-01	8/1/2017	0	0.1	669		3.70		0.55	28.2		20.1	9.7		CL
			ORL	M	W-106-A_080117_SED_01-03	8/1/2017	0.1	0.3	922		3.60		0.39	29.1		22.5	11.8		CL
			ORL	M	W-106-A_080317_SED_03-05	8/3/2017	0.3	0.5	1,720		(-)		(-)	33.3		19.3	10.0		OL
			ORL	M	W-106-A_080317_SED_05-10	8/3/2017	0.5	1	2,990		(-)		(-)	31.5		20.9	11.6		OL
		W-107-A	ORL	M	W-107-A_080117_SED_00-01	8/1/2017	0	0.1	513		5.90		1.15	41.0		13.4	6.5		CL
			ORL	M	W-107-A_080117_SED_01-03	8/1/2017	0.1	0.3	1,060		8.20		0.77	44.2		15.9	8.5		CL
			ORL	M	W-107-A_080317_SED_03-05	8/3/2017	0.3	0.5	2,200		(-)		(-)	35.6		19.7	8.59		OL
			ORL	M	W-107-A_080317_SED_05-10	8/3/2017	0.5	1	651		(-)		(-)	44.8		11.5	6.10		OL
		W-108-A	ORL	M	W-108-A_081517_SED_00-01	8/15/2017	0	0.1	465		5.40		1.16	41.2		14.5	8.2		CL
			ORL	M	W-108-A_081517_SED_01-03	8/15/2017	0.1	0.3	512		1.90		0.37	39.1		12.6	6.8		CL
			ORL	M	W-108-A_081717_SED_03-05	8/17/2017	0.3	0.5	162		(-)		(-)	55.2		8.97	4.26		CL
			ORL	M	W-108-A_081717_SED_05-10	8/17/2017	0.5	1	29.3		(-)		(-)	50.1		15.1	4.80		CL
	Intertidal Sediment	OR-01-01	ORL	I	OR-01-01_072417_SED_00-01	7/24/2017	0	0.1	919	*	7.23	*	0.79	32.8		15.0	6.6	J	CL
			ORL	I	OR-01-01_072417_SED_01-03	7/24/2017	0.1	0.3	1,100		9.00		0.82	42.7		14.2	6.7	J	CL
			ORL	I	OR-01-01_072517_SED_03-05	7/25/2017	0.3	0.5	863		(-)		(-)	45.5		16.5	4.6		CL
			ORL	I	OR-01-01_072517_SED_05-10	7/25/2017	0.5	1	260		(-)		(-)	49.1		12.8	6.4		CL
		OR-01-02	ORL	I	OR-01-02_072417_SED_00-01	7/24/2017	0	0.1	882		9.20		1.04	33.2		16.8	7.2		CL
			ORL	I	OR-01-02_072417_SED_01-03	7/24/2017	0.1	0.3	937		15.6		1.66	33.1		16.4	7.0		CL
			ORL	I	OR-01-02_072517_SED_03-05	7/25/2017	0.3	0.5	856		(-)		(-)	38.8		15.9	10.8		CL
			ORL	I	OR-01-02_072517_SED_05-10	7/25/2017	0.5	1	1,180		(-)		(-)	40.0		15.5	8.3		CL
		OR-01-03	ORL	I	OR-01-03_072417_SED_00-01	7/24/2017	0	0.1	858		20.4		2.38	34.2		16.3	7.3		CL
			ORL	I	OR-01-03_072417_SED_01-03	7/24/2017	0.1	0.3	689		17.7		2.57	32.1		16.0	7.6		ML
			ORL	I	OR-01-03_072517_SED_03-05	7/25/2017	0.3	0.5	898		(-)		(-)	41.9		14.3	7.0		CL
			ORL	I	OR-01-03_072517_SED_05-10	7/25/2017	0.5	1	1,220	*	(-)		(-)	41.9		14.8	7.1		CL
Orland River	Intertidal Sediment	OR-01-04	ORL	I	OR-01-04_072517_SED_00-01	7/25/2017	0	0.1	965	J*	9.70	*	1.01	24.1		12.1	6.8		CL
			ORL	I	OR-01-04_072517_SED_01-03	7/25/2017	0.1	0.3	935		10.3		1.10	40.0		13.8	6.7		CL
			ORL	I	OR-01-04_072517_SED_03-05	7/25/2017	0.3	0.5	870		(-)		(-)	45.6		11.9	5.8		CL
			ORL	I	OR-01-04_072517_SED_05-10	7/25/2017	0.5	1	2,020		(-)		(-)	45.3		15.2	7.6		CL
		OR-01-05	ORL	I	OR-01-05_072417_SED_00-01	7/24/2017	0	0.1	735	*	10.3	*	1.40	34.5		13.6	6.6	J	ML
			ORL	I	OR-01-05_072417_SED_01-03	7/24/2017	0.1	0.3	715		13.1		1.83	41.8		13.2	6.6		CL
			ORL	I	OR-01-05_072517_SED_03-05	7/25/2017	0.3	0.5	961		(-)		(-)	45.3		11.5	6.0		CL
			ORL	I	OR-01-05_072517_SED_05-10	7/25/2017	0.5	1	1,120		(-)		(-)	48.6		12.0	6.3		CL
		OR-02-01	ORL	I	OR-02-01_072417_SED_00-01	7/24/2017	0	0.1	1,080		9.30		0.86	30.0		17.2	7.7		CL
			ORL	I	OR-02-01_072417_SED_01-03	7/24/2017	0.1	0.3	817	*	12.5	*	1.53	30.8		16.4	7.1		CL
			ORL	I	OR-02-01_072517_SED_03-05	7/25/2017	0.3	0.5	1,210		(-)		(-)	36.2		13.0	8.5		CL
			ORL	I	OR-02-01_072517_SED_05-10	7/25/2017	0.5	1	3,210		(-)		(-)	37.6		17.3	12.5		SM
		OR-02-02	ORL	I	OR-02-02_072417_SED_00-01	7/24/2017	0	0.1	901		15.7		1.74	35.1		12.8	6.7		CL
			ORL	I	OR-02-02_072417_SED_01-03	7/24/2017	0.1	0.3	903		11.6		1.28	32.6		16.9	8.0		CL
			ORL	I	OR-02-02_072517_SED_03-05	7/25/2017	0.3	0.5	1,033	*	(-)		(-)	39.3		14.8	7.2		CL
			ORL	I	OR-02-02_072517_SED_05-10	7/25/2017	0.5	1	1,500		(-)		(-)	40.9		14.9	9.2		CL
		OR-02-03	ORL	I	OR-02-03_080117_SED_00-01	8/1/2017	0	0.1	547		4.10		0.75	35.0		10.6	5.3		CL
			ORL	I	OR-02-03_080117_SED_01-03	8/1/2017	0.1	0.3	766		4.70	J	0.61	38.2		12.0	6.2		CL
			ORL	I	OR-02-03_080317_SED_03-05	8/3/2017	0.3	0.5	915		(-)		(-)	38.4		13.5	6.1		CL
			ORL	I	OR-02-03_080317_SED_05-10	8/3/2017	0.5	1	1,190		(-)		(-)	40.5		14.5	6.8		CL

TABLE 2
MARSH AND INTERTIDAL SEDIMENT ANALYTICAL RESULTS

Penobscot River Phase III Engineering Study

								Parameter	Mercury		Methyl Mercury		Percent Methyl Mercury	Percent Solids		Organic Content at 550 C	Total Organic Carbon		USCS Visual Classification
								Units	ng/g		ng/g		Percent	Percent		Percent	Percent		
River Reach	Media	Location ID	Study Area	Marsh/Intertidal	Sample ID	Sample Date	Top Depth (ft)	Bottom Depth (ft)	Result	Qual	Result	Qual	Result	Result	Qual	Result	Result	Qual	Result
Orland River	Intertidal Sediment	W-105-A	ORL	I	W-105-A_072417_SED_00-01	7/24/2017	0	0.1	713		10.6		1.49	23.4		18.4	9.7		OL
			ORL	I	W-105-A_072417_SED_01-03	7/24/2017	0.1	0.3	719		5.30		0.74	27.0		20.3	8.6		OL
			ORL	I	W-105-A_072517_SED_03-05	7/25/2017	0.3	0.5	894		(-)		(-)	35.8		15.2	7.6		CL
			ORL	I	W-105-A_072517_SED_05-10	7/25/2017	0.5	1	1,540		(-)		(-)	39.2		16.5	8.9		SM
		W-27-INTA	ORL	I	W-27-INTA_072417_SED_00-01	7/24/2017	0	0.1	905		7.60		0.84	32.4		15.4	13.8	J	CL
			ORL	I	W-27-INTA_072417_SED_01-03	7/24/2017	0.1	0.3	931		8.90		0.96	31.1		16.9	18.6		CL
			ORL	I	W-27-INTA_072517_SED_03-05	7/25/2017	0.3	0.5	1,340		(-)		(-)	43.4		16.4	8.3		OL
			ORL	I	W-27-INTA_072517_SED_05-10	7/25/2017	0.5	1	1,470		(-)		(-)	42.6		17.1	8.1		SM

Notes:
1. (-) = Interval not sampled for methyl mercury
2. Data qualifiers are as follows:
J = Reported value is estimated
U = Reported value is non-detect
* = average result of three replicate sample concentrations
3. Sample Date identifies the date on which the sample aliquot was prepared for laboratory analysis. Sample handling procedures are detailed in the QAPP (Amec Foster Wheeler 2016b)

Created by: BPW 12/05/17
Checked by: DRP 12/07/17
Revised by: KAM 05/10/18

Abbreviations:
CL - Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
I - Intertidal
M - Marsh
ML - Inorganic silts and very fine sands, rock flour, silty of clayey fine sands or clayey silts with slight plasticity
MM - Mendall Marsh
ng/g = nanograms per gram
OL - Organic silts and organic silty clays of low plasticity
ORL - Orland River
PF - Pocket and Fringe Marshes
SC - Clayey sands, sand-silt mixtures
SM - Silty sands, sand-clay mixture
USCS = Unified Soil Classification System

TABLE 3
MARSH AND INTERTIDAL SEDIMENT SUMMARY STATISTICS

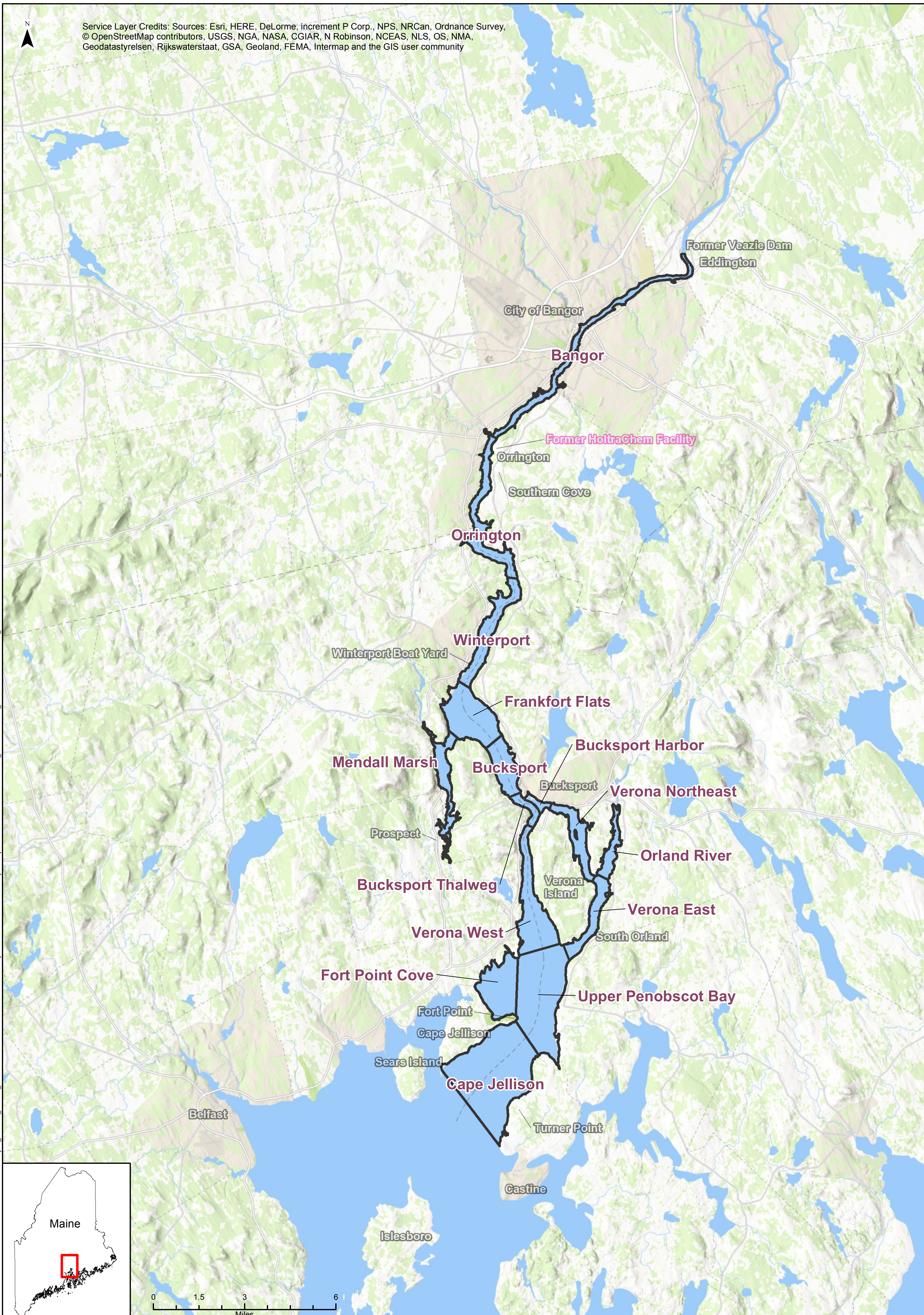
Penobscot River Phase III Engineering Study

					Mercury Results (ng/g)		Methyl Mercury Results (ng/g)		% MeHg	% Solids		% OC		% TOC	
Study Area	Media	Top Depth (feet)	Bottom Depth (feet)	Count	Range	Mean	Range	Mean	Mean	Range	Mean	Range	Mean	Range	Mean
Pocket & Fringe Marshes	Marsh Sediment	0	0.1	14	13.8 - 987	466	0.53 - 37.5	13.0	4.3	17.0 - 83.8	32.8	2.21 - 59.1	30.1	0.524 - 30.1	14.1
		0.1	0.3	14	11.4 - 1893	808	0.60 - 35.7	9.79	2.5	20.9 - 84.6	35.1	2.05 - 44.6	26.1	0.449 - 22.0	13.3
		0.3	0.5	14	10.5 - 3480	1,163	(-)	(-)	(-)	18.4 - 84.8	35.8	2.46 - 41.3	24.8	0.371 - 28.3	14.4
		0.5	1	14	7.46 - 3200	1,014	(-)	(-)	(-)	17.0 - 83.4	39.7	1.76 - 48.7	24.9	0.346 - 33.5	14.9
Pocket & Fringe Marshes	Intertidal Sediment	0	0.1	6	357 - 1350	793	6.90 - 15.7	11.7	1.6	25.4 - 57.6	35.6	9.00 - 21.8	13.6	3.71 - 11.0	6.41
		0.1	0.3	6	64 - 1140	707	1.10 - 11.6	6.57	1.1	30.6 - 61.6	40.8	9.31 - 20.6	13.4	2.77 - 10.0	6.38
		0.3	0.5	6	33.2 - 1310	844	(-)	(-)	(-)	24.2 - 64.2	41.2	5.45 - 38.1	17.1	1.86 - 10.6	6.81
		0.5	1	6	23 - 1113	738	(-)	(-)	(-)	28.0 - 64.9	43.1	4.38 - 26.9	16.9	1.88 - 15.4	8.11
Mendall Marsh	Marsh Sediment	0	0.1	24	56.9 - 658	368	1.40 - 51.8	12.8	4.0	14.4 - 41.8	26.9	17.9 - 60.3	36.7	8.04 - 39.6	18.6
		0.1	0.3	24	93.4 - 1160	585	0.40 - 26.6	10.3	1.9	15.8 - 44.7	29.0	16.0 - 56.8	33.1	7.36 - 39.0	16.8
		0.3	0.5	24	52.6 - 3370	650	(-)	(-)	(-)	18.5 - 54.4	29.3	9.53 - 58.3	32.1	9.73 - 61.6	23.3
		0.5	1	24	16.5 - 1780	370	(-)	(-)	(-)	15.8 - 47.6	30.8	1.55 - 47.8	27.1	8.07 - 54.6	21.7
Orland River	Marsh Sediment	0	0.1	5	456 - 669	531	3.70 - 30.6	12.2	2.3	26.7 - 41.2	33.1	13.4 - 21.9	18.3	6.48 - 12.4	9.21
		0.1	0.3	5	512 - 1060	796	1.90 - 28.6	10.5	1.3	24.1 - 44.2	34.1	1.36 - 24.8	15.5	6.83 - 12.4	10.1
		0.3	0.5	5	162 - 2200	1,444	(-)	(-)	(-)	28.2 - 55.2	36.7	8.97 - 26.6	19.1	4.26 - 11.5	8.83
		0.5	1	5	29.3 - 2990	1,392	(-)	(-)	(-)	25.5 - 50.1	36.4	11.5 - 24.1	16.9	4.80 - 13.4	9.42
Orland River	Intertidal Sediment	0	0.1	10	547 - 1080	851	4.10 - 20.4	10.4	1.2	23.4 - 35.1	31.5	10.6 - 18.4	14.8	5.25 - 13.8	7.76
		0.1	0.3	10	689 - 1100	851	4.70 - 17.7	10.9	1.3	27.0 - 42.7	34.9	12.0 - 20.3	15.6	6.24 - 18.6	8.32
		0.3	0.5	10	856 - 1340	984	(-)	(-)	(-)	35.8 - 45.6	41.0	11.5 - 16.5	14.3	4.58 - 10.8	7.19
		0.5	1	10	260 - 3210	1,471	(-)	(-)	(-)	37.6 - 49.1	42.6	12.0 - 17.3	15.0	6.31 - 12.5	8.12

Notes:
% = percent
(-) = Interval not sampled for methyl mercury
mean = artithmetic mean
MeHg = methyl mercury
ng/g = nanograms per gram
OC = organic content
TOC = total organic carbon

Created by: BPW 12/05/17
Checked by: DRP 12/07/17
Revised by: KAM 05/10/18

FIGURES



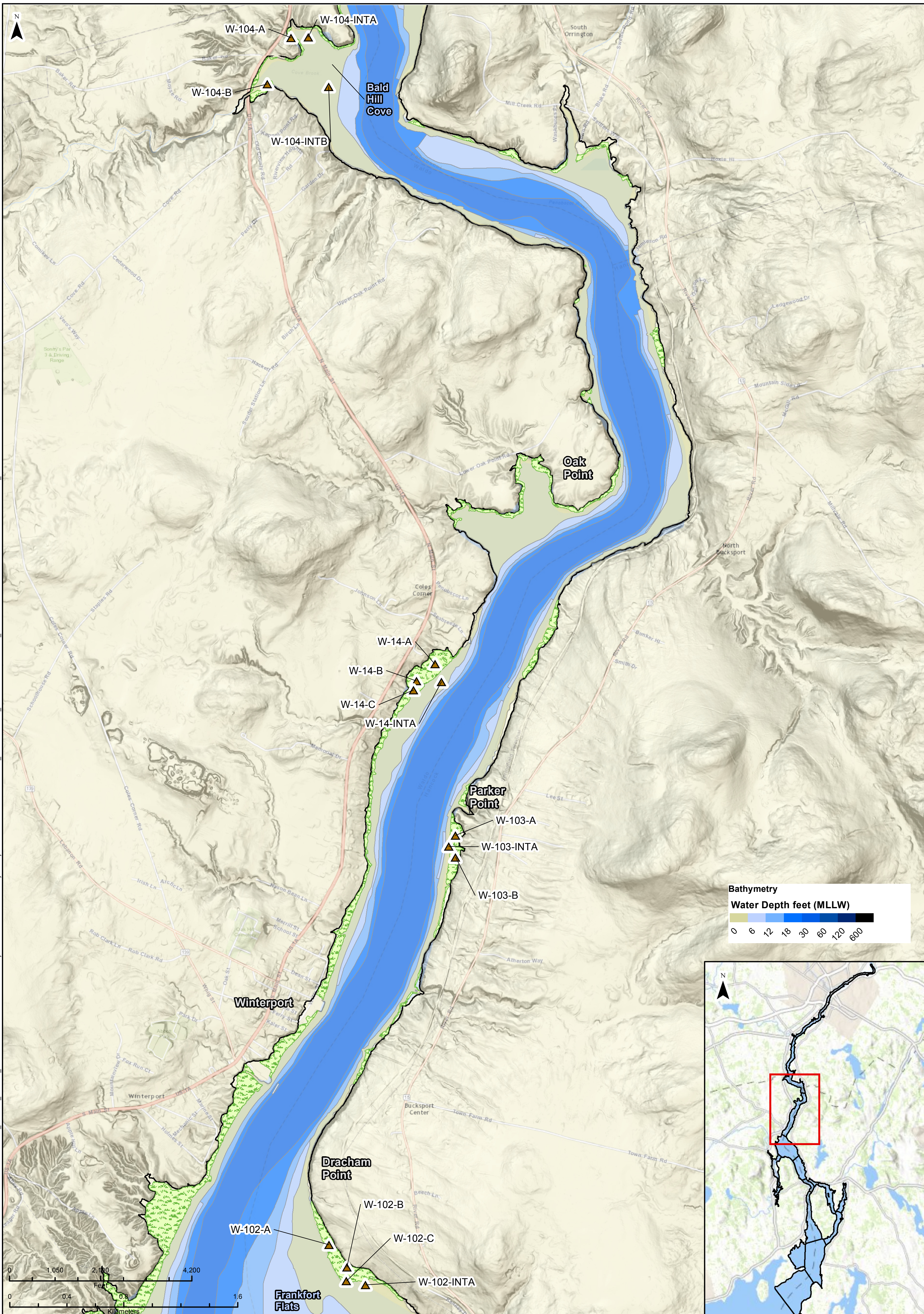
Legend

Reach boundary

Figure 1
Site Location and Reaches

2017 Marsh Platform Sediment Characterization
Penobscot River Phase III Engineering Study

Project: 3616166052	Prepared: ICD 12/8/2017	Checked: BPW 12/8/2017



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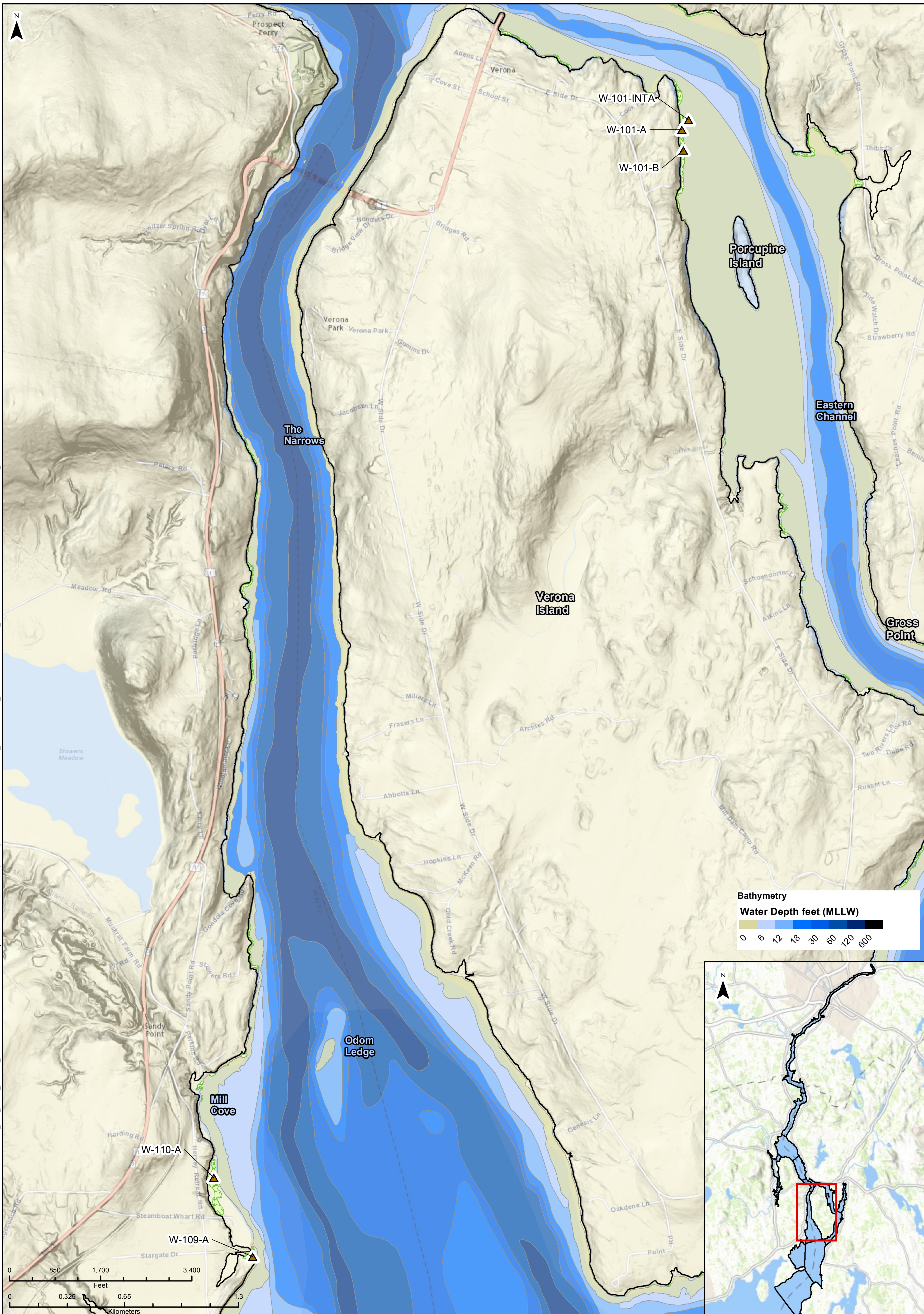
Symbol Key

- Sediment Sampling Location
- Marsh Platform
- Intertidal Zone

Figure 2
Sampling Locations
Orrington, Winterport, and Frankfort Flats

2017 Marsh Platform Sediment Characterization
Penobscot River Phase III Engineering Study

Project: 3616166052	Prepared: ICD 12/8/2017	Checked: BPW 12/8/2017



Symbol Key

- Sediment Sampling Location
- Marsh Platform
- Intertidal Zone

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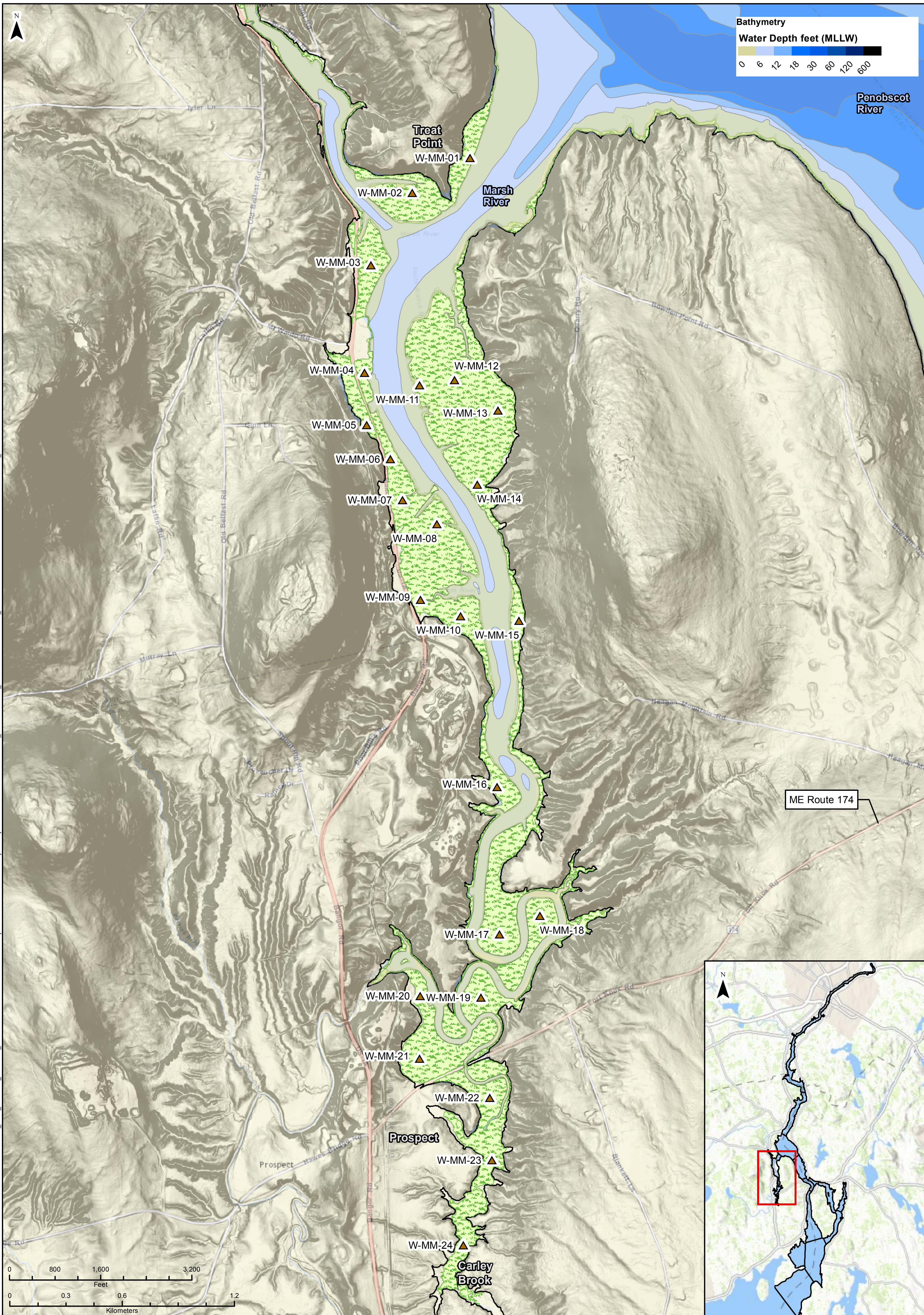
Figure 3
Sampling Locations
Verona Northeast and Verona West

2017 Marsh Platform Sediment Characterization
Penobscot River Phase III Engineering Study

Project: 3616166052	Prepared: ICD 12/8/2017	Checked: BPW 12/8/2017



Symbol Key

- ▲ Sediment Sampling Location
- Marsh Platform
- Intertidal Zone

Figure 4
Sampling Locations
Mendall Marsh

2017 Marsh Platform Sediment Characterization
Penobscot River Phase III Engineering Study

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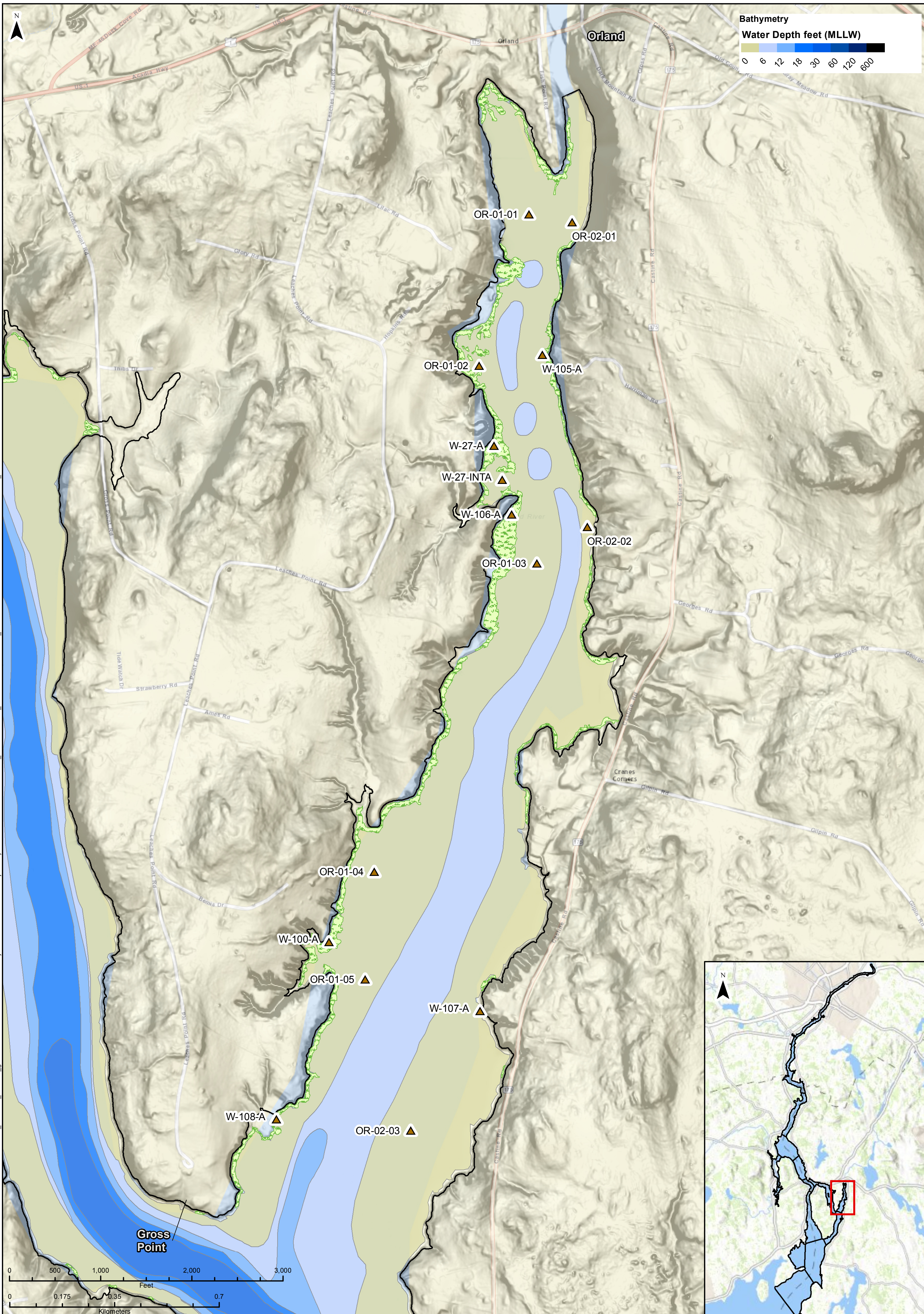
Project: 3616166052	Prepared: ICD 12/8/2017	Checked: BPW 12/8/2017



Symbol Key

- Sediment Sampling Location
- Marsh Platform
- Intertidal Zone

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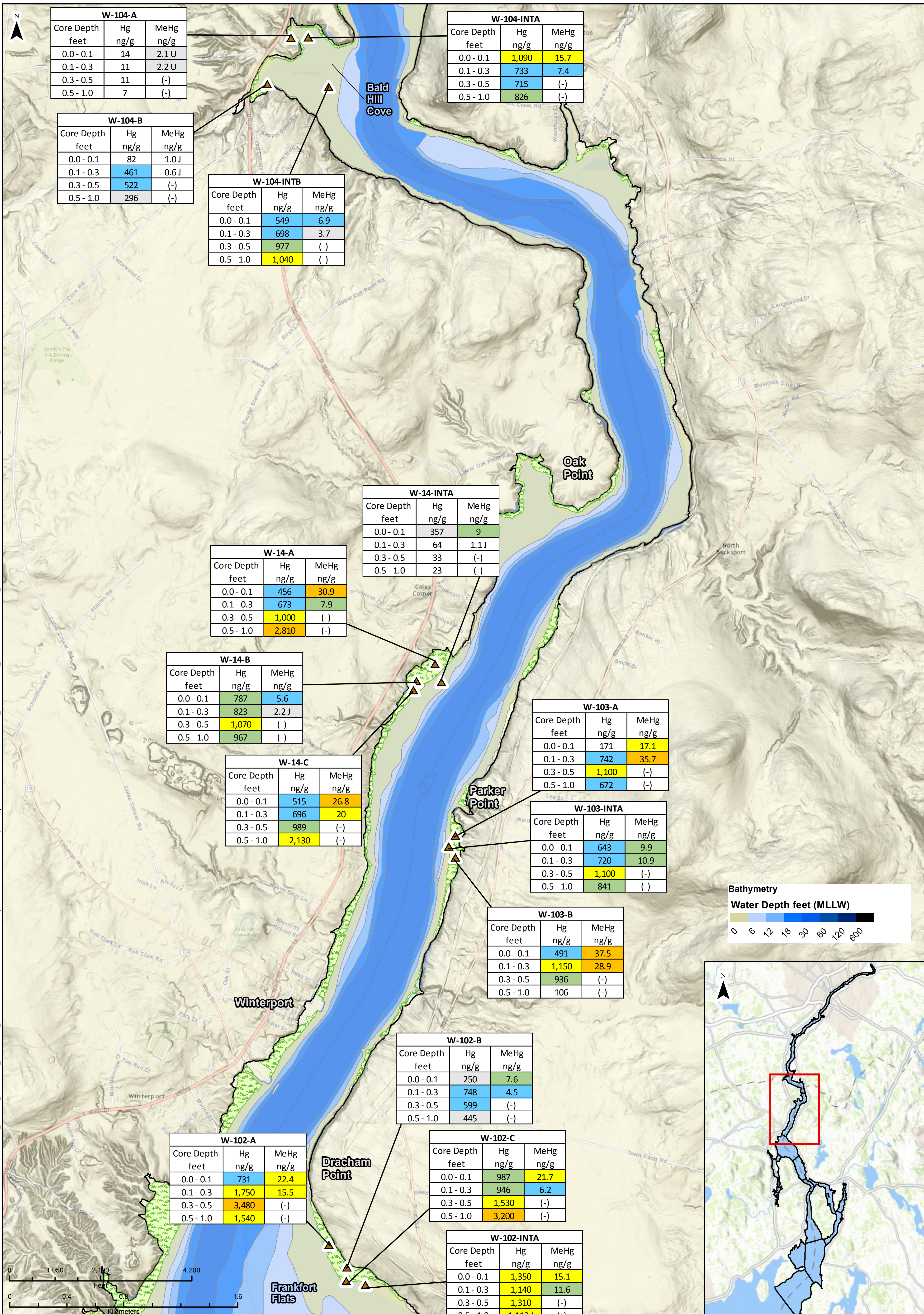
Figure 5
Sampling Locations
Orland River

2017 Marsh Platform Sediment Characterization
Penobscot River Phase III Engineering Study

Project: 3616166052	Prepared: ICD 12/8/2017	Checked: BPW 12/8/2017



W-104-A

Core Depth feet	Hg ng/g	MeHg ng/g
0.0 - 0.1	14	2.1 U
0.1 - 0.3	11	2.2 U
0.3 - 0.5	11	(-)
0.5 - 1.0	7	(-)

W-104-INTA

Core Depth feet	Hg ng/g	MeHg ng/g
0.0 - 0.1	1,090	15.7
0.1 - 0.3	733	7.4
0.3 - 0.5	715	(-)
0.5 - 1.0	826	(-)

W-104-B

Core Depth feet	Hg ng/g	MeHg ng/g
0.0 - 0.1	82	1.0 J
0.1 - 0.3	461	0.6 J
0.3 - 0.5	522	(-)
0.5 - 1.0	296	(-)

W-104-INTB

Core Depth feet	Hg ng/g	MeHg ng/g
0.0 - 0.1	549	6.9
0.1 - 0.3	698	3.7
0.3 - 0.5	977	(-)
0.5 - 1.0	1,040	(-)

W-14-INTA

Core Depth feet	Hg ng/g	MeHg ng/g
0.0 - 0.1	357	9
0.1 - 0.3	64	1.1 J
0.3 - 0.5	33	(-)
0.5 - 1.0	23	(-)

W-14-A

Core Depth feet	Hg ng/g	MeHg ng/g
0.0 - 0.1	456	30.9
0.1 - 0.3	673	7.9
0.3 - 0.5	1,000	(-)
0.5 - 1.0	2,810	(-)

W-14-B

Core Depth feet	Hg ng/g	MeHg ng/g
0.0 - 0.1	787	5.6
0.1 - 0.3	823	2.2 J
0.3 - 0.5	1,070	(-)
0.5 - 1.0	967	(-)

W-103-A

Core Depth feet	Hg ng/g	MeHg ng/g
0.0 - 0.1	171	17.1
0.1 - 0.3	742	35.7
0.3 - 0.5	1,100	(-)
0.5 - 1.0	672	(-)

W-14-C

Core Depth feet	Hg ng/g	MeHg ng/g
0.0 - 0.1	515	26.8
0.1 - 0.3	696	20
0.3 - 0.5	989	(-)
0.5 - 1.0	2,130	(-)

W-103-INTA

Core Depth feet	Hg ng/g	MeHg ng/g
0.0 - 0.1	643	9.9
0.1 - 0.3	720	10.9
0.3 - 0.5	1,100	(-)
0.5 - 1.0	841	(-)

W-103-B

Core Depth feet	Hg ng/g	MeHg ng/g
0.0 - 0.1	491	37.5
0.1 - 0.3	1,150	28.9
0.3 - 0.5	936	(-)
0.5 - 1.0	106	(-)

W-102-B

Core Depth feet	Hg ng/g	MeHg ng/g
0.0 - 0.1	250	7.6
0.1 - 0.3	748	4.5
0.3 - 0.5	599	(-)
0.5 - 1.0	445	(-)

W-102-A

Core Depth feet	Hg ng/g	MeHg ng/g
0.0 - 0.1	731	22.4
0.1 - 0.3	1,750	15.5
0.3 - 0.5	3,480	(-)
0.5 - 1.0	1,540	(-)

W-102-C

Core Depth feet	Hg ng/g	MeHg ng/g
0.0 - 0.1	987	21.7
0.1 - 0.3	946	6.2
0.3 - 0.5	1,530	(-)
0.5 - 1.0	3,200	(-)

W-102-INTA

Core Depth feet	Hg ng/g	MeHg ng/g
0.0 - 0.1	1,350	15.1
0.1 - 0.3	1,140	11.6
0.3 - 0.5	1,310	(-)
0.5 - 1.0	1,113 J	(-)

amec foster wheeler

Symbol Key

- Sediment Sampling Location
- Marsh Platform
- Intertidal Zone

(-) Interval not analyzed for MeHg
J - Estimated value
ND - Non Detect
(ng/g) micrograms/gram

Mercury [Hg] (ng/g)	Methyl Mercury [MeHg] (ng/g)
ND	ND
< 200	< 2
200 - 450	2 - 4.5
450 - 750	4.5 - 7.5
750 - 1,000	7.5 - 15
1,000 - 2,200	15 - 25
2,200 - 5,000	25 - 50
> 5,000	> 50

Figure 6
Mercury and Methyl Mercury Results
Orrington, Winterport, and Frankfort Flats

2017 Marsh Platform Sediment Characterization
Penobscot River Phase III Engineering Study

Project: 3616166052 | Prepared: ICD 12/8/2017 | Checked: BPW 12/8/2017

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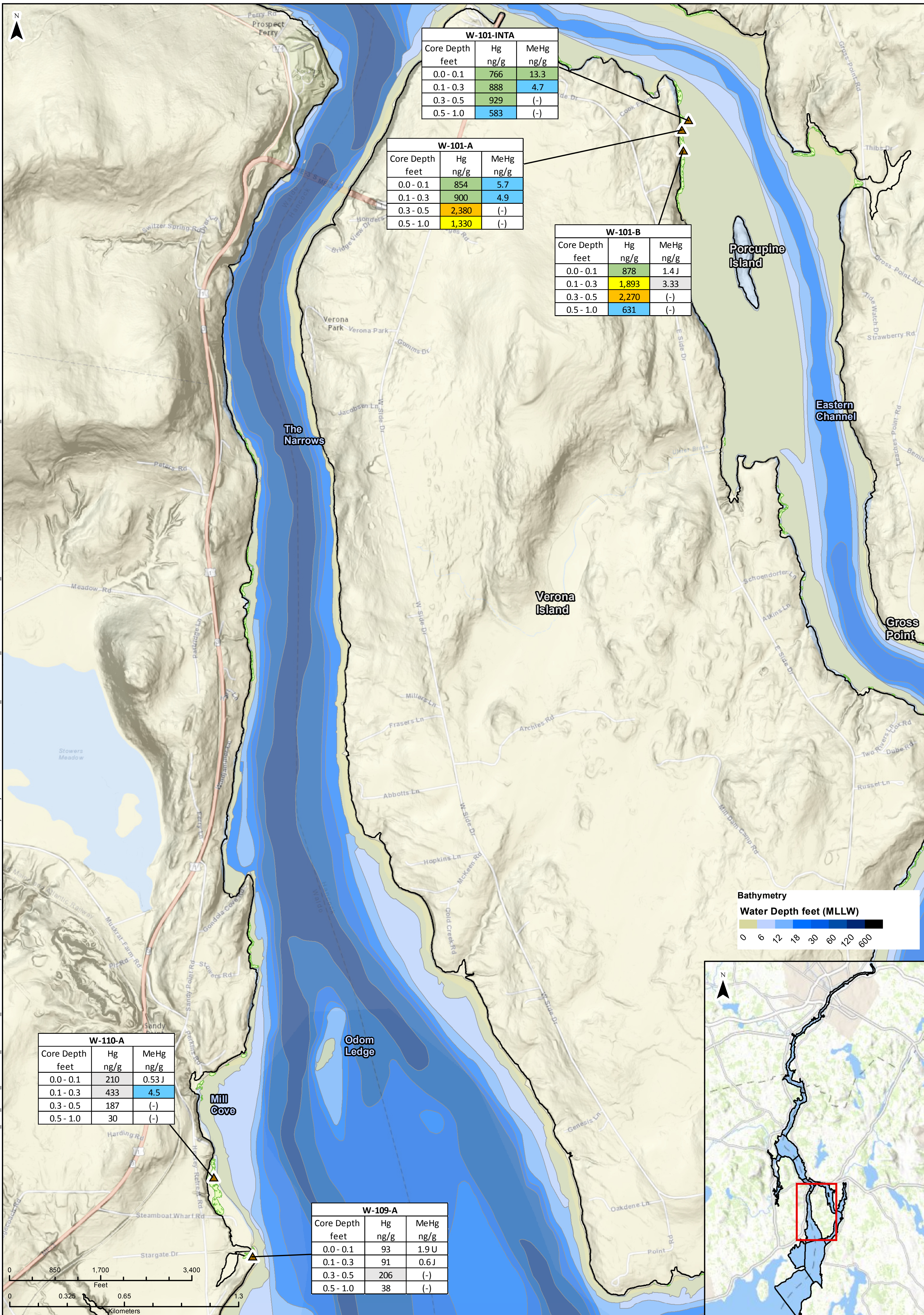


W-101-INTA

Core Depth feet	Hg ng/g	MeHg ng/g
0.0 - 0.1	766	13.3
0.1 - 0.3	888	4.7
0.3 - 0.5	929	(-)
0.5 - 1.0	583	(-)

W-101-A

Core Depth feet	Hg ng/g	MeHg ng/g
0.0 - 0.1	854	5.7
0.1 - 0.3	900	4.9
0.3 - 0.5	2,380	(-)
0.5 - 1.0	1,330	(-)

W-101-B

Core Depth feet	Hg ng/g	MeHg ng/g
0.0 - 0.1	878	1.4 J
0.1 - 0.3	1,893	3.33
0.3 - 0.5	2,270	(-)
0.5 - 1.0	631	(-)

W-110-A

Core Depth feet	Hg ng/g	MeHg ng/g
0.0 - 0.1	210	0.53 J
0.1 - 0.3	433	4.5
0.3 - 0.5	187	(-)
0.5 - 1.0	30	(-)

W-109-A

Core Depth feet	Hg ng/g	MeHg ng/g
0.0 - 0.1	93	1.9 U
0.1 - 0.3	91	0.6 J
0.3 - 0.5	206	(-)
0.5 - 1.0	38	(-)

amec foster wheeler

Symbol Key

- Sediment Sampling Location
- Marsh Platform
- Intertidal Zone

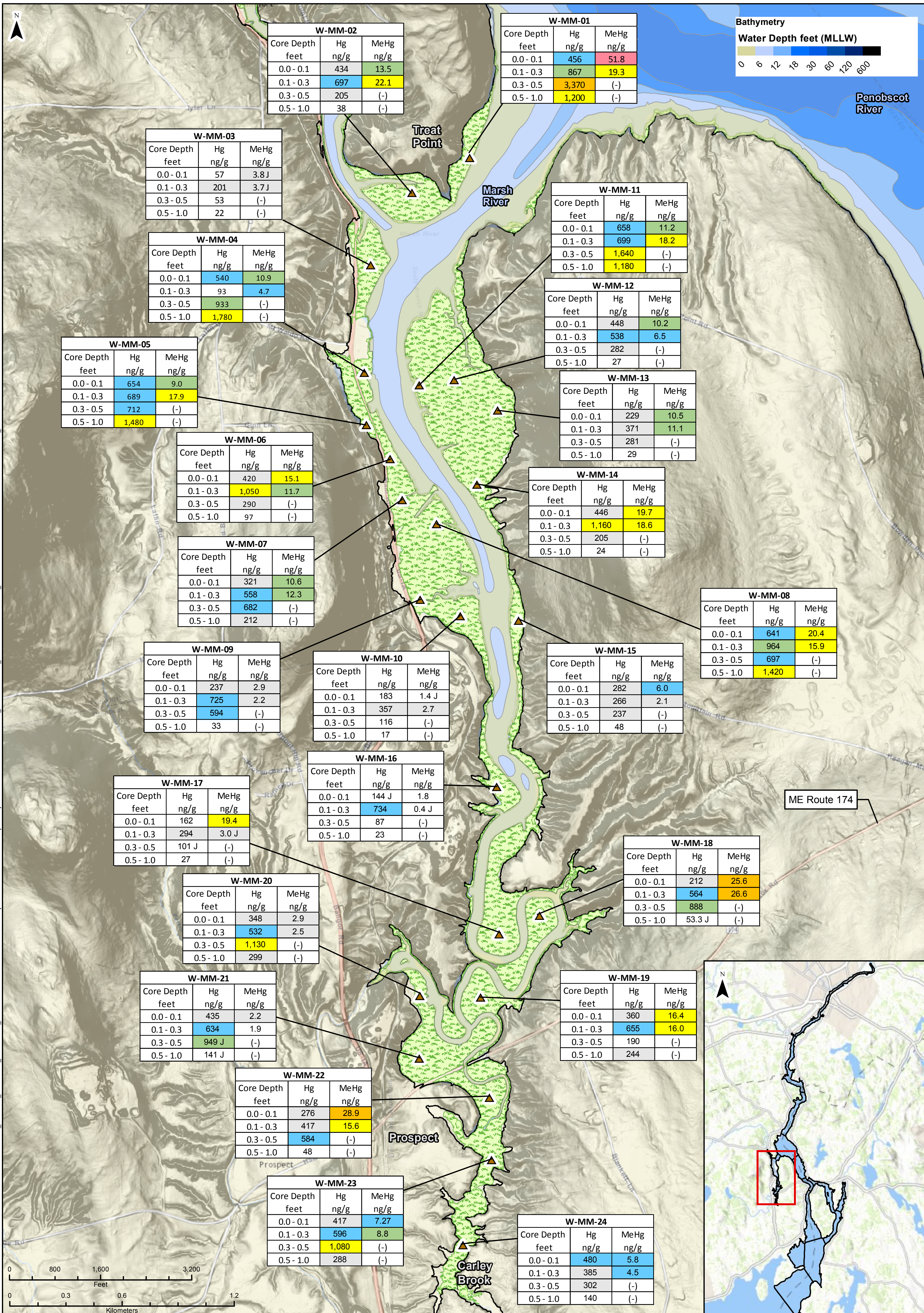
(-) Interval not analyzed for MeHg
J - Estimated value
ND - Non Detect
(ng/g) micrograms/gram

Mercury [Hg] (ng/g)	Methyl Mercury [MeHg] (ng/g)
ND	ND
< 200	< 2
200 - 450	2 - 4.5
450 - 750	4.5 - 7.5
750 - 1,000	7.5 - 15
1,000 - 2,200	15 - 25
2,200 - 5,000	25 - 50
> 5,000	> 50

Figure 7
Mercury and Methyl Mercury Results
Verona Northeast and Verona West

2017 Marsh Platform Sediment Characterization
Penobscot River Phase III Engineering Study

Project: 3616166052 | Prepared: ICD 12/8/2017 | Checked: BPW 12/8/2017



W-MM-01		
Core Depth feet	Hg ng/g	MeHg ng/g
0.0 - 0.1	456	51.8
0.1 - 0.3	867	19.3
0.3 - 0.5	3,370	(-)
0.5 - 1.0	1,200	(-)

W-MM-02		
Core Depth feet	Hg ng/g	MeHg ng/g
0.0 - 0.1	434	13.5
0.1 - 0.3	697	22.1
0.3 - 0.5	205	(-)
0.5 - 1.0	38	(-)

W-MM-03		
Core Depth feet	Hg ng/g	MeHg ng/g
0.0 - 0.1	57	3.8 J
0.1 - 0.3	201	3.7 J
0.3 - 0.5	53	(-)
0.5 - 1.0	22	(-)

W-MM-04		
Core Depth feet	Hg ng/g	MeHg ng/g
0.0 - 0.1	540	10.9
0.1 - 0.3	93	4.7
0.3 - 0.5	933	(-)
0.5 - 1.0	1,780	(-)

W-MM-05		
Core Depth feet	Hg ng/g	MeHg ng/g
0.0 - 0.1	654	9.0
0.1 - 0.3	689	17.9
0.3 - 0.5	712	(-)
0.5 - 1.0	1,480	(-)

W-MM-06		
Core Depth feet	Hg ng/g	MeHg ng/g
0.0 - 0.1	420	15.1
0.1 - 0.3	1,050	11.7
0.3 - 0.5	290	(-)
0.5 - 1.0	97	(-)

W-MM-07		
Core Depth feet	Hg ng/g	MeHg ng/g
0.0 - 0.1	321	10.6
0.1 - 0.3	558	12.3
0.3 - 0.5	682	(-)
0.5 - 1.0	212	(-)

W-MM-08		
Core Depth feet	Hg ng/g	MeHg ng/g
0.0 - 0.1	641	20.4
0.1 - 0.3	964	15.9
0.3 - 0.5	697	(-)
0.5 - 1.0	1,420	(-)

W-MM-09		
Core Depth feet	Hg ng/g	MeHg ng/g
0.0 - 0.1	237	2.9
0.1 - 0.3	725	2.2
0.3 - 0.5	594	(-)
0.5 - 1.0	33	(-)

W-MM-10		
Core Depth feet	Hg ng/g	MeHg ng/g
0.0 - 0.1	183	1.4 J
0.1 - 0.3	357	2.7
0.3 - 0.5	116	(-)
0.5 - 1.0	17	(-)

W-MM-11		
Core Depth feet	Hg ng/g	MeHg ng/g
0.0 - 0.1	658	11.2
0.1 - 0.3	699	18.2
0.3 - 0.5	1,640	(-)
0.5 - 1.0	1,180	(-)

W-MM-12		
Core Depth feet	Hg ng/g	MeHg ng/g
0.0 - 0.1	448	10.2
0.1 - 0.3	538	6.5
0.3 - 0.5	282	(-)
0.5 - 1.0	27	(-)

W-MM-13		
Core Depth feet	Hg ng/g	MeHg ng/g
0.0 - 0.1	229	10.5
0.1 - 0.3	371	11.1
0.3 - 0.5	281	(-)
0.5 - 1.0	29	(-)

W-MM-14		
Core Depth feet	Hg ng/g	MeHg ng/g
0.0 - 0.1	446	19.7
0.1 - 0.3	1,160	18.6
0.3 - 0.5	205	(-)
0.5 - 1.0	24	(-)

W-MM-15		
Core Depth feet	Hg ng/g	MeHg ng/g
0.0 - 0.1	282	6.0
0.1 - 0.3	266	2.1
0.3 - 0.5	237	(-)
0.5 - 1.0	48	(-)

W-MM-16		
Core Depth feet	Hg ng/g	MeHg ng/g
0.0 - 0.1	144 J	1.8
0.1 - 0.3	734	0.4 J
0.3 - 0.5	87	(-)
0.5 - 1.0	23	(-)

W-MM-17		
Core Depth feet	Hg ng/g	MeHg ng/g
0.0 - 0.1	162	19.4
0.1 - 0.3	294	3.0 J
0.3 - 0.5	101 J	(-)
0.5 - 1.0	27	(-)

W-MM-18		
Core Depth feet	Hg ng/g	MeHg ng/g
0.0 - 0.1	212	25.6
0.1 - 0.3	564	26.6
0.3 - 0.5	888	(-)
0.5 - 1.0	53.3 J	(-)

W-MM-19		
Core Depth feet	Hg ng/g	MeHg ng/g
0.0 - 0.1	360	16.4
0.1 - 0.3	655	16.0
0.3 - 0.5	190	(-)
0.5 - 1.0	244	(-)

W-MM-20		
Core Depth feet	Hg ng/g	MeHg ng/g
0.0 - 0.1	348	2.9
0.1 - 0.3	532	2.5
0.3 - 0.5	1,130	(-)
0.5 - 1.0	299	(-)

W-MM-21		
Core Depth feet	Hg ng/g	MeHg ng/g
0.0 - 0.1	435	2.2
0.1 - 0.3	634	1.9
0.3 - 0.5	949 J	(-)
0.5 - 1.0	141 J	(-)

W-MM-22		
Core Depth feet	Hg ng/g	MeHg ng/g
0.0 - 0.1	276	28.9
0.1 - 0.3	417	15.6
0.3 - 0.5	584	(-)
0.5 - 1.0	48	(-)

W-MM-23		
Core Depth feet	Hg ng/g	MeHg ng/g
0.0 - 0.1	417	7.27
0.1 - 0.3	596	8.8
0.3 - 0.5	1,080	(-)
0.5 - 1.0	288	(-)

W-MM-24		
Core Depth feet	Hg ng/g	MeHg ng/g
0.0 - 0.1	480	5.8
0.1 - 0.3	385	4.5
0.3 - 0.5	302	(-)
0.5 - 1.0	140	(-)

amec foster wheeler

Symbol Key
- Sediment Sampling Location
- Marsh Platform
- Intertidal Zone

(-) Interval not analyzed for MeHg
J - Estimated value
ND - Non Detect
(ng/g) micrograms/gram

Mercury [Hg] (ng/g)	Methyl Mercury [MeHg] (ng/g)
ND	ND
< 200	< 2
200 - 450	2 - 4.5
450 - 750	4.5 - 7.5
750 - 1,000	7.5 - 15
1,000 - 2,200	15 - 25
2,200 - 5,000	25 - 50
> 5,000	> 50

Figure 8
Mercury and Methyl Mercury Results
Mendall Marsh

2017 Marsh Platform Sediment Characterization
Penobscot River Phase III Engineering Study

Project: 3616166052 | Prepared: ICD 12/8/2017 | Checked: BPW 12/8/2017

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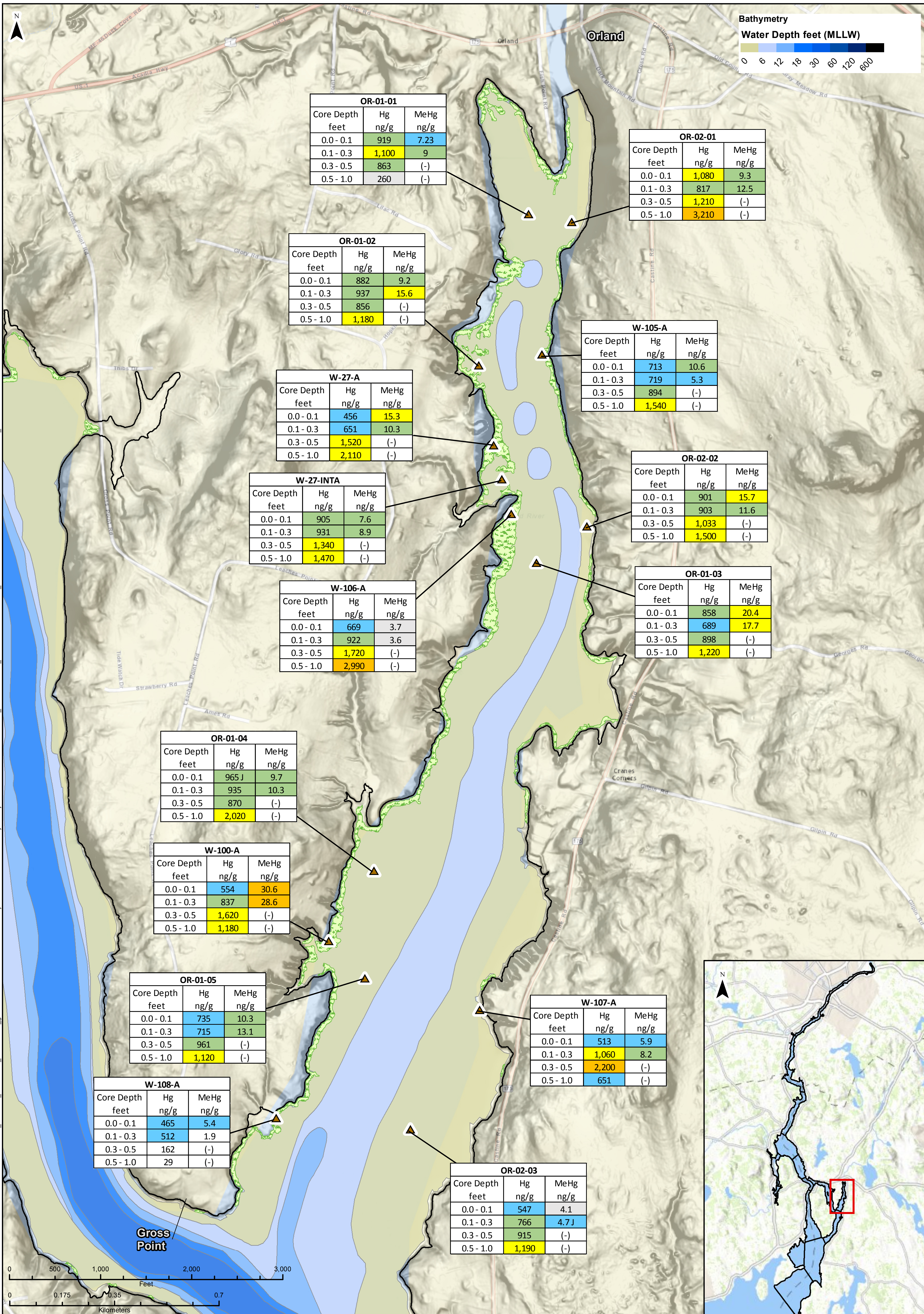

OR-01-01

Core Depth feet	Hg ng/g	MeHg ng/g
0.0 - 0.1	919	7.23
0.1 - 0.3	1,100	9
0.3 - 0.5	863	(-)
0.5 - 1.0	260	(-)

OR-02-01

Core Depth feet	Hg ng/g	MeHg ng/g
0.0 - 0.1	1,080	9.3
0.1 - 0.3	817	12.5
0.3 - 0.5	1,210	(-)
0.5 - 1.0	3,210	(-)

OR-01-02

Core Depth feet	Hg ng/g	MeHg ng/g
0.0 - 0.1	882	9.2
0.1 - 0.3	937	15.6
0.3 - 0.5	856	(-)
0.5 - 1.0	1,180	(-)

W-105-A

Core Depth feet	Hg ng/g	MeHg ng/g
0.0 - 0.1	713	10.6
0.1 - 0.3	719	5.3
0.3 - 0.5	894	(-)
0.5 - 1.0	1,540	(-)

W-27-A

Core Depth feet	Hg ng/g	MeHg ng/g
0.0 - 0.1	456	15.3
0.1 - 0.3	651	10.3
0.3 - 0.5	1,520	(-)
0.5 - 1.0	2,110	(-)

OR-02-02

Core Depth feet	Hg ng/g	MeHg ng/g
0.0 - 0.1	901	15.7
0.1 - 0.3	903	11.6
0.3 - 0.5	1,033	(-)
0.5 - 1.0	1,500	(-)

W-27-INTA

Core Depth feet	Hg ng/g	MeHg ng/g
0.0 - 0.1	905	7.6
0.1 - 0.3	931	8.9
0.3 - 0.5	1,340	(-)
0.5 - 1.0	1,470	(-)

OR-01-03

Core Depth feet	Hg ng/g	MeHg ng/g
0.0 - 0.1	858	20.4
0.1 - 0.3	689	17.7
0.3 - 0.5	898	(-)
0.5 - 1.0	1,220	(-)

W-106-A

Core Depth feet	Hg ng/g	MeHg ng/g
0.0 - 0.1	669	3.7
0.1 - 0.3	922	3.6
0.3 - 0.5	1,720	(-)
0.5 - 1.0	2,990	(-)

OR-01-04

Core Depth feet	Hg ng/g	MeHg ng/g
0.0 - 0.1	965 J	9.7
0.1 - 0.3	935	10.3
0.3 - 0.5	870	(-)
0.5 - 1.0	2,020	(-)

W-100-A

Core Depth feet	Hg ng/g	MeHg ng/g
0.0 - 0.1	554	30.6
0.1 - 0.3	837	28.6
0.3 - 0.5	1,620	(-)
0.5 - 1.0	1,180	(-)

OR-01-05

Core Depth feet	Hg ng/g	MeHg ng/g
0.0 - 0.1	735	10.3
0.1 - 0.3	715	13.1
0.3 - 0.5	961	(-)
0.5 - 1.0	1,120	(-)

W-107-A

Core Depth feet	Hg ng/g	MeHg ng/g
0.0 - 0.1	513	5.9
0.1 - 0.3	1,060	8.2
0.3 - 0.5	2,200	(-)
0.5 - 1.0	651	(-)

W-108-A

Core Depth feet	Hg ng/g	MeHg ng/g
0.0 - 0.1	465	5.4
0.1 - 0.3	512	1.9
0.3 - 0.5	162	(-)
0.5 - 1.0	29	(-)

OR-02-03

Core Depth feet	Hg ng/g	MeHg ng/g
0.0 - 0.1	547	4.1
0.1 - 0.3	766	4.7 J
0.3 - 0.5	915	(-)
0.5 - 1.0	1,190	(-)

Symbol Key

- Sediment Sampling Location
- Marsh Platform
- Intertidal Zone

(-) Interval not analyzed for MeHg
J - Estimated value
ND - Non Detect
(ng/g) micrograms/gram

Mercury [Hg] (ng/g)	Methyl Mercury [MeHg] (ng/g)
ND	ND
< 200	< 2
200 - 450	2 - 4.5
450 - 750	4.5 - 7.5
750 - 1,000	7.5 - 15
1,000 - 2,200	15 - 25
2,200 - 5,000	25 - 50
> 5,000	> 50

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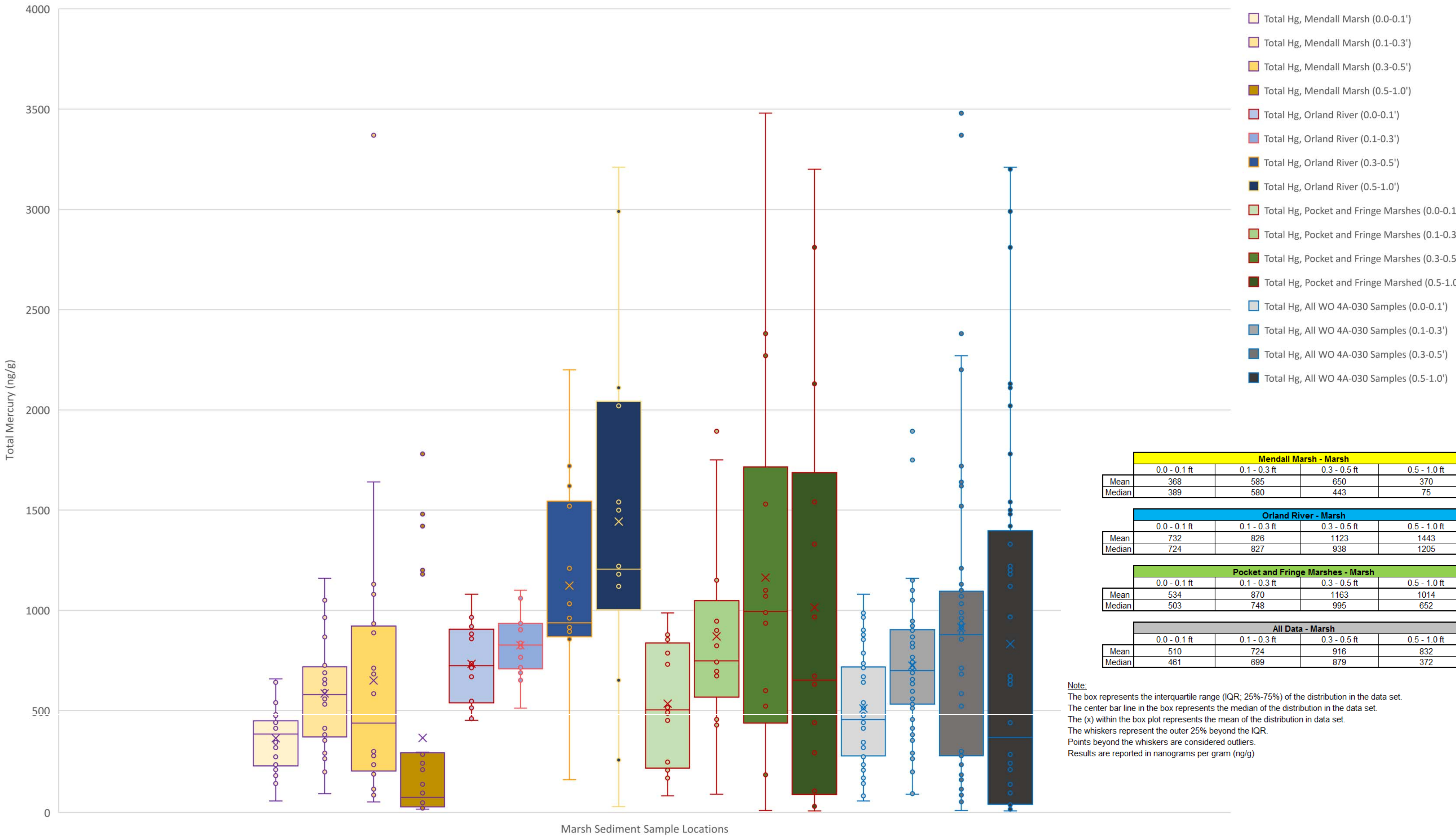
Figure 9
Mercury and Methyl Mercury Results
Orland River

2017 Marsh Platform Sediment Characterization
Penobscot River Phase III Engineering Study

Project: 3616166052 | Prepared: ICD 12/8/2017 | Checked: BPW 12/8/2017

Figure 10 - Total Mercury by Depth Interval
Marsh Samples



	Mendall Marsh - Marsh			
	0.0 - 0.1 ft	0.1 - 0.3 ft	0.3 - 0.5 ft	0.5 - 1.0 ft
Mean	368	585	650	370
Median	389	580	443	75

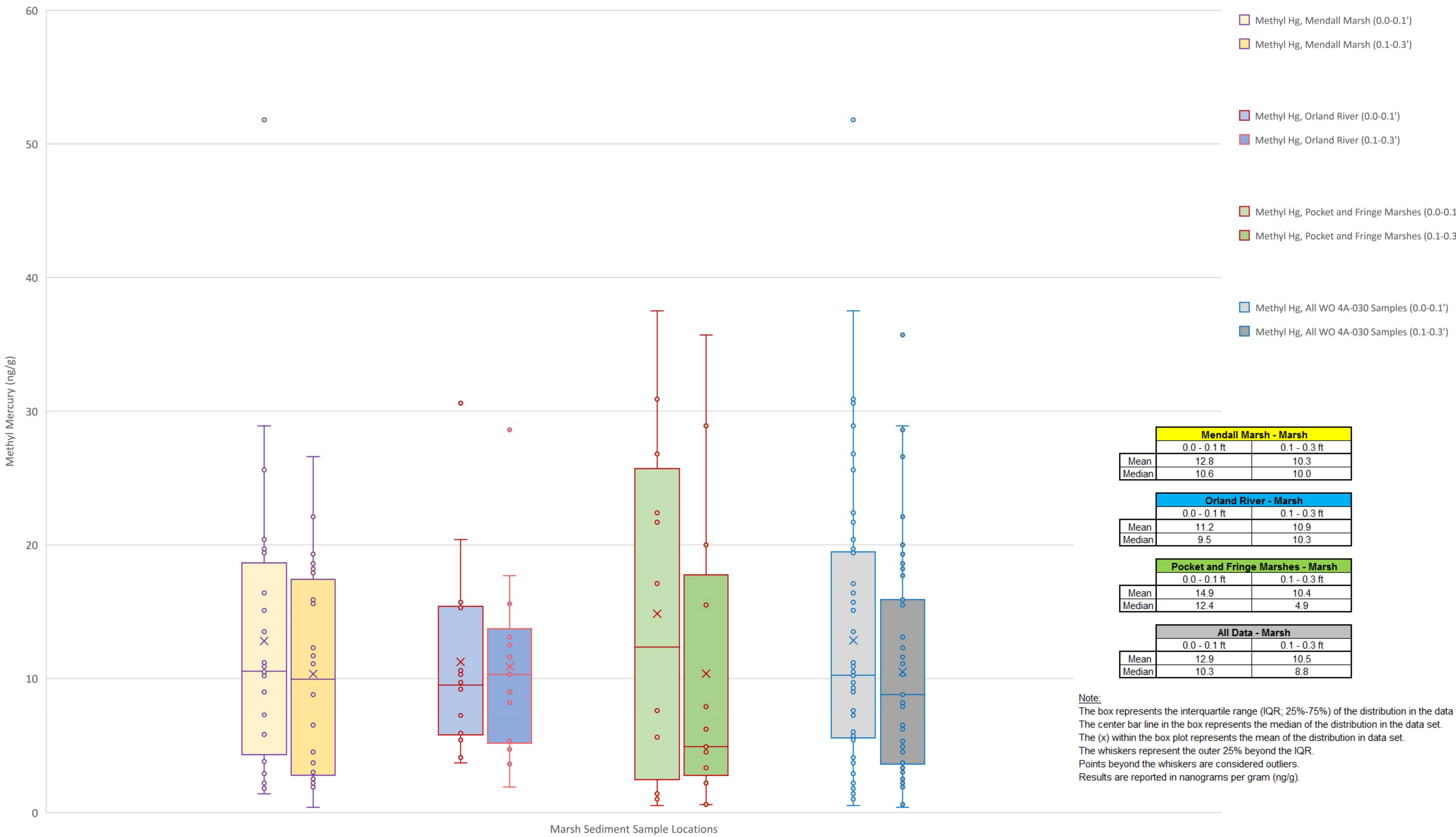
	Orland River - Marsh			
	0.0 - 0.1 ft	0.1 - 0.3 ft	0.3 - 0.5 ft	0.5 - 1.0 ft
Mean	732	826	1123	1443
Median	724	827	938	1205

	Pocket and Fringe Marshes - Marsh			
	0.0 - 0.1 ft	0.1 - 0.3 ft	0.3 - 0.5 ft	0.5 - 1.0 ft
Mean	534	870	1163	1014
Median	503	748	995	652

	All Data - Marsh			
	0.0 - 0.1 ft	0.1 - 0.3 ft	0.3 - 0.5 ft	0.5 - 1.0 ft
Mean	510	724	916	832
Median	461	699	879	372

Note:
The box represents the interquartile range (IQR; 25%-75%) of the distribution in the data set.
The center bar line in the box represents the median of the distribution in the data set.
The (x) within the box plot represents the mean of the distribution in data set.
The whiskers represent the outer 25% beyond the IQR.
Points beyond the whiskers are considered outliers.
Results are reported in nanograms per gram (ng/g)

Figure 11 - Methyl Mercury by Depth Interval
Marsh Samples



	Mendall Marsh - Marsh	
	0.0 - 0.1 ft	0.1 - 0.3 ft
Mean	12.8	10.3
Median	10.6	10.0

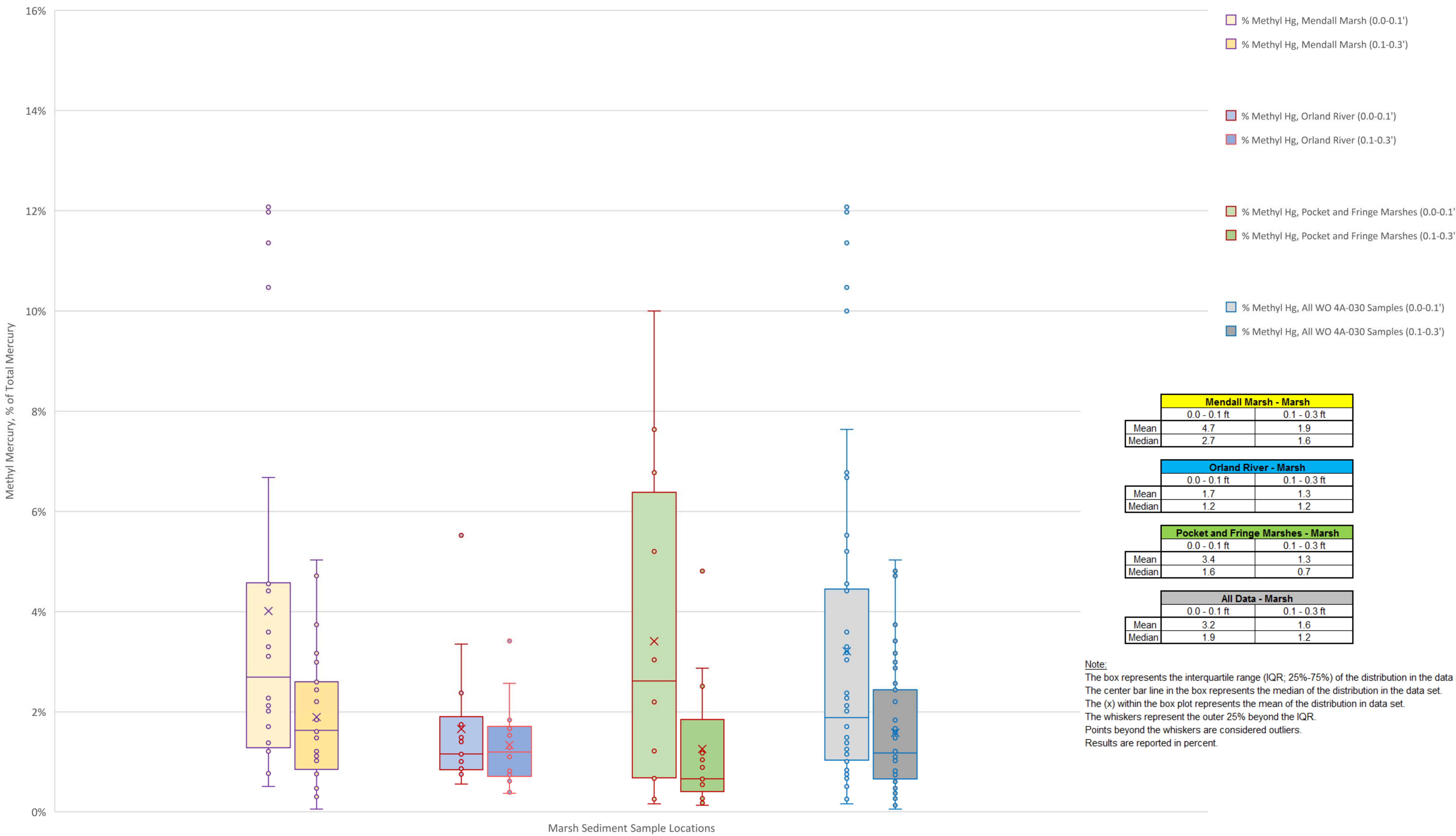
	Orland River - Marsh	
	0.0 - 0.1 ft	0.1 - 0.3 ft
Mean	11.2	10.9
Median	9.5	10.3

	Pocket and Fringe Marshes - Marsh	
	0.0 - 0.1 ft	0.1 - 0.3 ft
Mean	14.9	10.4
Median	12.4	4.9

	All Data - Marsh	
	0.0 - 0.1 ft	0.1 - 0.3 ft
Mean	12.9	10.5
Median	10.3	8.8

Note:
The box represents the interquartile range (IQR; 25%-75%) of the distribution in the data set.
The center bar line in the box represents the median of the distribution in the data set.
The (x) within the box plot represents the mean of the distribution in data set.
The whiskers represent the outer 25% beyond the IQR.
Points beyond the whiskers are considered outliers.
Results are reported in nanograms per gram (ng/g).

Figure 12 - Percent Methyl Mercury of Total Mercury by Depth Interval
Marsh Samples



	Mendall Marsh - Marsh	
	0.0 - 0.1 ft	0.1 - 0.3 ft
Mean	4.7	1.9
Median	2.7	1.6

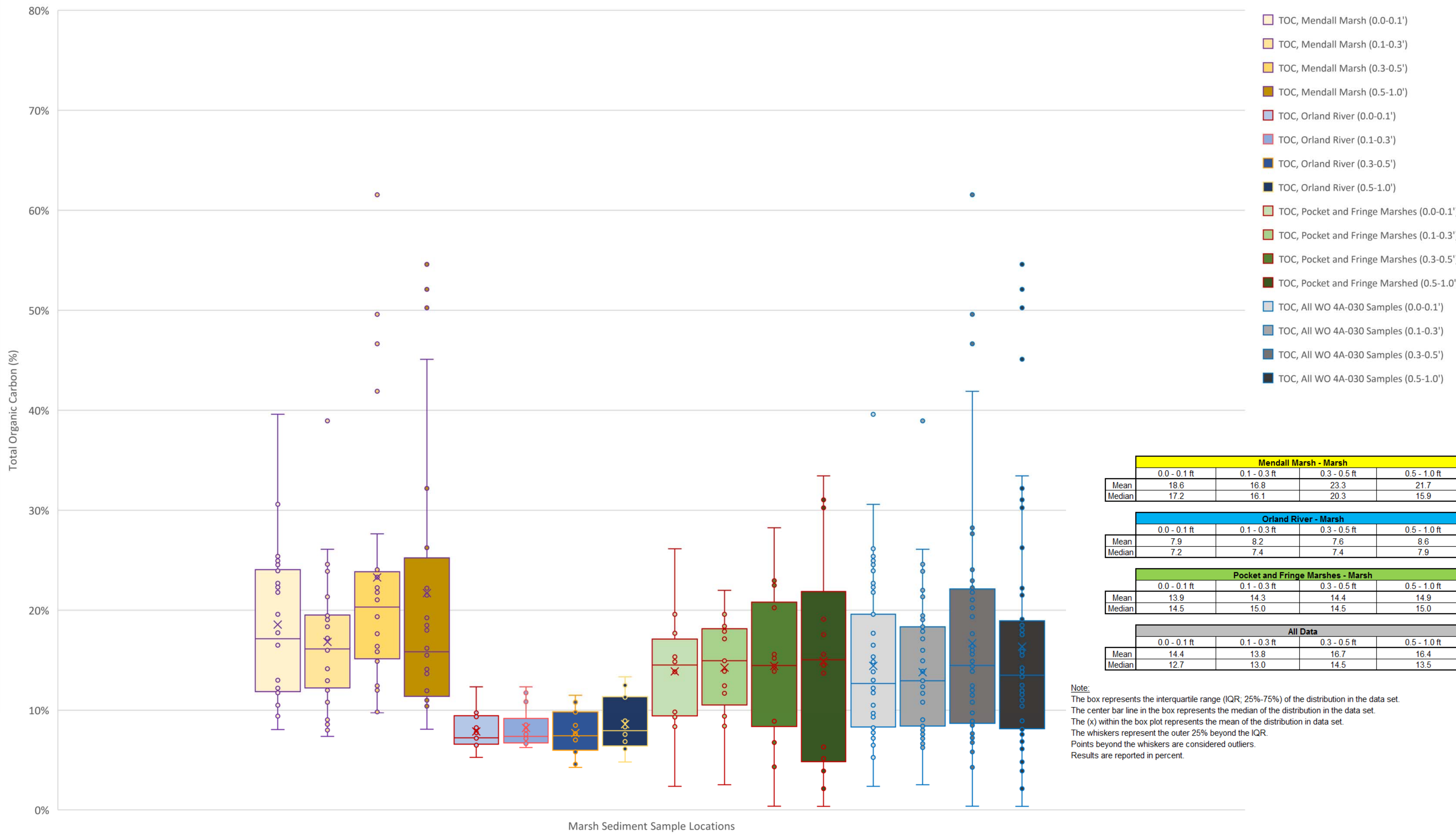
	Orland River - Marsh	
	0.0 - 0.1 ft	0.1 - 0.3 ft
Mean	1.7	1.3
Median	1.2	1.2

	Pocket and Fringe Marshes - Marsh	
	0.0 - 0.1 ft	0.1 - 0.3 ft
Mean	3.4	1.3
Median	1.6	0.7

	All Data - Marsh	
	0.0 - 0.1 ft	0.1 - 0.3 ft
Mean	3.2	1.6
Median	1.9	1.2

Note:
The box represents the interquartile range (IQR; 25%-75%) of the distribution in the data set.
The center bar line in the box represents the median of the distribution in the data set.
The (x) within the box plot represents the mean of the distribution in data set.
The whiskers represent the outer 25% beyond the IQR.
Points beyond the whiskers are considered outliers.
Results are reported in percent.

Figure 13 - Total Organic Carbon by Depth Interval
Marsh Samples



	Mendall Marsh - Marsh			
	0.0 - 0.1 ft	0.1 - 0.3 ft	0.3 - 0.5 ft	0.5 - 1.0 ft
Mean	18.6	16.8	23.3	21.7
Median	17.2	16.1	20.3	15.9

	Orland River - Marsh			
	0.0 - 0.1 ft	0.1 - 0.3 ft	0.3 - 0.5 ft	0.5 - 1.0 ft
Mean	7.9	8.2	7.6	8.6
Median	7.2	7.4	7.4	7.9

	Pocket and Fringe Marshes - Marsh			
	0.0 - 0.1 ft	0.1 - 0.3 ft	0.3 - 0.5 ft	0.5 - 1.0 ft
Mean	13.9	14.3	14.4	14.9
Median	14.5	15.0	14.5	15.0

	All Data			
	0.0 - 0.1 ft	0.1 - 0.3 ft	0.3 - 0.5 ft	0.5 - 1.0 ft
Mean	14.4	13.8	16.7	16.4
Median	12.7	13.0	14.5	13.5

Note:
The box represents the interquartile range (IQR; 25%-75%) of the distribution in the data set.
The center bar line in the box represents the median of the distribution in the data set.
The (x) within the box plot represents the mean of the distribution in data set.
The whiskers represent the outer 25% beyond the IQR.
Points beyond the whiskers are considered outliers.
Results are reported in percent.