# APPENDIX C
# FIELD DATA RECORDS (FDRS)

# APPENDIX C-1
# SUSPENDED MATERIAL COLLECTION FDRS

amec foster wheeler

# Penobscot River Mercury Study - Phase III Engineering Evaluation

## SUSPENDED SOLIDS AND PONAR GRAB LOG

| | | | |
|---|---|---|---|
| Owner: USDC, District of Maine | Project No.: 3616166052 | Tidal Target Depth (+/- MLLW): 19' | Logger: ~~MB~~ KC |
| Date: 7/24/17 | WO: 4A-060 | Tidal Target Time: 9:15 | Crew: KC, MB, MM |
| Time: 1001 | Tablet #: 4 | Tidal Phase: (Rising) Falling | Vessel: Pamola 2 |
| Location ID (GPS Point Name): A01 1 | | Coordinates: Lat 44.6075690 7 | Long -68.83422534 |
| Sample Name (Tidal Traget SS): — | | Sample Name (Ponar): — | |
| Weather: Cloudy, 68 Winds: — | Waters: — | Traffic: — | Water Temp: — °F |

| ~~1 meter~~ Below MWD Water Parameters | Midpoint Water Parameters | ~~1 meter~~ Above Mudline Water Parameters |
|---|---|---|
| pH: — | pH: — | pH: — |
| EC (mS/cm): — | EC (mS/cm): — | EC (mS/cm): — |
| TDS (ppm/ppt): — | TDS (ppm/ppt): — | TDS (ppm/ppt): — |
| Salinity (ppt): — | Salinity (ppt): — | Salinity (ppt): — |
| Temp. (°F): — | Temp. (°F): — | Temp. (°F): — |
| Comments: Depth | Comments: Depth = ~~21~~ 22' MWD | Comments: Depth |

| Tidal Target SS Intake Depth Parameters | | Measured Water Depth (ft.): 23' | |
|---|---|---|---|
| Approx. Pump Depth: 21' | | Correction to MLLW: — | |
| Correction to MLLW: — | | Mudline (Corrected Depth) @ MLLW: — | |
| Study Depth (-MLLW): — | | Study Depth (-MLLW): — | |
| Beginning Water Parameters | EC (mS/cm): — | End Water Parameters | EC (mS/cm): — |
| Pump Started: — | TDS (ppm/ppt): — | Pump Stopped: — | TDS (ppt): — |
| Flow Rate: — | Salinity (ppt): — | Flow Rate: — | Salinity (ppt): — |
| pH: — | Temp. (°F): — | pH: — | Temp. (°F): — |
| Plankton Net Comments: — | | Underwater Camera Observations: — | |

General Tidal Target SS Comments:
Unable to reach target depth due to repeated pole failure from current creating max bend failure at pole connections.

| Number of containers and estimated amount: | — | — | Location Photo Numbers |
|---|---|---|---|
| 2-Gallon Buckets with Sample: | Ponar | Tidal Target SS | — |

### Ponar Recovered Quantities are in Percent measured cm by cm (approximately)

| Deployment # | Recovery | Description | Sample ID |
|---|---|---|---|
| — | — | Ponar would not close | — |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

General Ponar Comments: —

Ponar Size Collected In: (Standard) or Petite

Clarifying Information Recorded by (F.Last; Date): K.Casey; 12/6/17

Checked: LMT 12/21/17

amec foster wheeler

# Penobscot River Mercury Study - Phase III Engineering Evaluation

## SUSPENDED SOLIDS AND PONAR GRAB LOG

| | | | |
|---|---|---|---|
| Owner: USDC, District of Maine | Project No.: 3616166052 | Tidal Target Depth (+/- MLLW): — | Logger: KC |
| Date: 7/28/17 | WO: 4A-060 | Tidal Target Time: 9.15 7/23 | Crew: ~~Pamola 2~~ CR, KC, MS, MR |
| Time: 1015 | Tablet #: 4 | Tidal Phase: (Rising) Falling | Vessel: Pamola 2 |
| Location ID (GPS Point Name): AOI 1A ~~01~~ | | Coordinates: Lat 44.60619571 | Long -68.83415607 |
| Sample Name (Tidal Traget SS): — | | Sample Name (Ponar): AOI 1A | |
| Weather: sun, some clouds 72° | Winds: 5-10 knots | Waters: 0-5 knots | Traffic: None - 1 | Water Temp: 66°F |

| 1 meter Below MWD Water Parameters | Midpoint Water Parameters | 1 meter Above Mudline Water Parameters |
|---|---|---|
| pH: — | pH: — | pH: — |
| EC (mS/cm): — | EC (mS/cm): — | EC (mS/cm): — |
| TDS (ppm/ppt): — | TDS (ppm/ppt): — | TDS (ppm/ppt): — |
| Salinity (ppt): — | Salinity (ppt): — | Salinity (ppt): — |
| Temp. (°F): — | Temp. (°F): — | Temp. (°F): — |
| Comments: — | Comments: — | Comments: — |

| Tidal Target SS Intake Depth Parameters | | Measured Water Depth (ft.): 23.0 | |
|---|---|---|---|
| Approx. Pump Depth: — | | Tidal Correction to MLLW: +4.3' | |
| Correction to MLLW: — | | Mudline (Corrected Depth) @ MLLW: -18.2' | |
| Study Depth (-MLLW): — | | Study Depth (-MLLW): — | |
| **Beginning Water Parameters** | EC (mS/cm): — | **End Water Parameters** | EC (mS/cm): — |
| Pump Started: — | TDS (ppm/ppt): — | Pump Stopped: — | TDS (ppt): — |
| Flow Rate: — | Salinity (ppt): — | Flow Rate: — | Salinity (ppt): — |
| pH: — | Temp. (°F): — | pH: — | Temp. (°F): — |

Plankton Net Comments: Hose 2 did pump up some WCH

Underwater Camera Observations: —

General Tidal Target SS Comments: Hose 1 is lower and hooked up second (closer to the mudline). Hose 2 is further from the mudline. Hose 1 was determined to be too close to the mudline. It was adjusted before next deployment.

| Number of containers and estimated amount: | 1 | 2-2gal |
|---|---|---|
| 2-Gallon Buckets with Sample: | Ponar | Tidal Target SS |

Location Photo Numbers: IMG_0475 to IMG_0478

### Ponar Recovered Quantities are in Percent measured cm by cm (approximately)

| Deployment # | Recovery | Description | Sample ID |
|---|---|---|---|
| 1 | 30% | Top 1 cm silt, coh, few pins, TR leaves, TR sawdust WCH 10YR 5/3; Bottom 1 cm silt, some fine sand, TR twigs, coh, few pins. | → 10YR 6/2 |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

General Ponar Comments: 2 photos taken @ 1150am

Ponar Size Collected In: (Standard) or Petite

Clarifying Information Recorded by (F. Last) Date): K. Casey; 12/7/2017

Checked by: LMT 12/21/17

amec foster wheeler

# Penobscot River Mercury Study - Phase III Engineering Evaluation

## SUSPENDED SOLIDS AND PONAR GRAB LOG

| | | | |
|---|---|---|---|
| Owner: USDC, District of Maine | Project No.: 3616166052 | Tidal Target Depth (+/- MLLW): — | Logger: KC |
| Date: 7/28/17 | WO: 4A-060 | Tidal Target Time: — | Crew: KC, MM, MB |
| Time: — | Tablet #: 4 | Tidal Phase: Rising (Falling) | Vessel: Pamola 2 |
| Location ID (GPS Point Name): AOI 1A - falling | Coordinates: Lat 44.606455 | | Long -68.832805 |
| Sample Name (Tidal Traget SS): — | Sample Name (Ponar): — | | |
| Weather: SUN 77° | Winds: 0-5 knots | Waters: 0-5 knots | Traffic: 0-1 boats | Water Temp: 61 °F |

| 1 meter Below MWD Water Parameters | Midpoint Water Parameters | 1 meter Above Mudline Water Parameters |
|---|---|---|
| pH: — | pH: — | pH: — |
| EC (mS/cm): — | EC (mS/cm): — | EC (mS/cm): — |
| TDS (ppm/ppt): — | TDS (ppm/ppt): — | TDS (ppm/ppt): — |
| Salinity (ppt): — | Salinity (ppt): — | Salinity (ppt): — |
| Temp. (°F): — | Temp. (°F): — | Temp. (°F): — |
| Comments: — | Comments: — | Comments: — |

| Tidal Target SS Intake Depth Parameters | | Measured Water Depth (ft.): 27.9' | |
|---|---|---|---|
| Approx. Pump Depth: 18" above mudline for TTSS 2 | | Correction to MLLW: — | |
| Correction to MLLW: — | | Mudline (Corrected Depth) @ MLLW: — | |
| Study Depth (-MLLW): — | | Study Depth (-MLLW): — | |
| **Beginning Water Parameters** | EC (mS/cm): — | **End Water Parameters** | EC (mS/cm): — |
| Pump Started: — | TDS (ppm/ppt): — | Pump Stopped: — | TDS (ppt): — |
| Flow Rate: — | Salinity (ppt): — | Flow Rate: — | Salinity (ppt): — |
| pH: — | Temp. (°F): — | pH: — | Temp. (°F): — |
| Plankton Net Comments: — | | Underwater Camera Observations: — | |

General Tidal Target SS Comments:

Pump test w/ #2 hose left TTSS detritus (dead mouth gear) in #40 sieve; no other material observed

| Number of containers and estimated amount: | — | 2-2gal |
|---|---|---|
| 2-Gallon Buckets with Sample: | Ponar | Tidal Target SS |

Location Photo Numbers: —

## Ponar Recovered Quantities are in Percent measured cm by cm (approximately)

| Deployment # | Recovery | Description | Sample ID |
|---|---|---|---|
| — | - | Similar to AOI 1A | — |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

General Ponar Comments: —

Ponar Size Collected In: ~~Standard~~ or ~~Petite~~

Clarifying Information Recorded by (F. Last; Date): K. Casey; 12/7/2017

checked by: LMT 12/21/17

amec foster wheeler

# Penobscot River Mercury Study - Phase III Engineering Evaluation

## SUSPENDED SOLIDS AND PONAR GRAB LOG

| | | | |
|---|---|---|---|
| Owner: USDC, District of Maine | Project No.: 3616166052 | Tidal Target Depth (+/- MLLW): — | Logger: KC |
| Date: 7/28/17 | WO: 4A-060 | Tidal Target Time: 9:15 | Crew: CF, KC, MB, MW |
| Time: 1210 | Tablet #: 4 | Tidal Phase: (Rising) Falling | Vessel: Pamola 2 |
| Location ID (GPS Point Name): AOI 1B | | Coordinates: Lat 44.6095762 | Long -68.8365327 |
| Sample Name (Tidal Traget SS): AOI 1B 072817_SS_N15 | | Sample Name (Ponar): — | |
| Weather: Sun 75° | Winds: 5 -10 knots | Waters: 0 - 5 Knots | Traffic: 0 - 1 | Water Temp: 65 °F |

| 1 meter Below MWD Water Parameters | Midpoint Water Parameters | 1 meter Above Mudline Water Parameters |
|---|---|---|
| pH: — | pH: — | pH: — |
| EC (mS/cm): — | EC (mS/cm): — | EC (mS/cm): — |
| TDS (ppm/ppt): — | TDS (ppm/ppt): — | TDS (ppm/ppt): — |
| Salinity (ppt): — | Salinity (ppt): — | Salinity (ppt): — |
| Temp. (°F): — | Temp. (°F): — | Temp. (°F): — |
| Comments: — | Comments: — | Comments: — |

| Tidal Target SS Intake Depth Parameters | | Measured Water Depth (ft.): | 15.5 |
|---|---|---|---|
| Approx. Pump Depth: — | | Tidal Correction to MLLW: | +4.3' |
| Correction to MLLW: — | | Mudline (Corrected Depth) @ MLLW: | -10.2' |
| Study Depth (-MLLW): — | | Study Depth (-MLLW): | — |
| **Beginning Water Parameters** | EC (mS/cm): — | **End Water Parameters** | EC (mS/cm): — |
| Pump Started: — | TDS (ppm/ppt): — | Pump Stopped: — | TDS (ppt): — |
| Flow Rate: — | Salinity (ppt): — | Flow Rate: — | Salinity (ppt): — |
| pH: — | Temp. (°F): — | pH: — | Temp. (°F): — |
| Plankton Net Comments: — | | Underwater Camera Observations: — | |

General Tidal Target SS Comments: Adjusted hose #1 to a slightly higher position. 2-buckets taken from AOI 1A and 2 buckets from AOI 1B.

| Number of containers and estimated amount: | — | 2 - 2gal | Location Photo Numbers |
|---|---|---|---|
| 2-Gallon Buckets with Sample: | Ponar | Tidal Target SS | IMG_0470 to IMG_0474 |

### Ponar Recovered Quantities are in Percent measured cm by cm (approximately)

| Deployment # | Recovery | Description | Sample ID |
|---|---|---|---|
| — | — | Similar to AOI 1A | — |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

General Ponar Comments: —

Ponar Size Collected In: ~~Standard~~ or ~~Petite~~

Clarifying Information Recorded by (F. Last; Date): K. Casey; 12/7/2017

checked by: LMT 12/21/17

amec foster wheeler

# Penobscot River Mercury Study - Phase III Engineering Evaluation

## SUSPENDED SOLIDS AND PONAR GRAB LOG

| | | | |
|---|---|---|---|
| Owner: USDC, District of Maine | Project No.: 3616166052 | Tidal Target Depth (+/- MLLW): — | Logger: KC |
| Date: 7/28/17 | WO: 4A-060 | Tidal Target Time: — | Crew: MM, MB, KC |
| Time: ~~16:45~~ MB 17:00 | Tablet #: 4 | Tidal Phase: Rising (Falling) | Vessel: Pamola |
| Location ID (GPS Point Name): A01 ~~Baseline 2~~ | | Coordinates: Lat 44.607525 | Long -68.836375 |
| Sample Name (Tidal Traget SS): — | | Sample Name (Ponar): — | |
| Weather: Sun 79° | Winds: 0-5 knots | Waters: 0-5 knots | Traffic: 0-1 | Water Temp: 62°F |

| 1 meter Below MWD Water Parameters | Midpoint Water Parameters | 1 meter Above Mudline Water Parameters |
|---|---|---|
| pH: — | pH: — | pH: — |
| EC (mS/cm): — | EC (mS/cm): — | EC (mS/cm): — |
| TDS (ppm/ppt): — | TDS (ppm/ppt): — | TDS (ppm/ppt): — |
| Salinity (ppt): — | Salinity (ppt): — | Salinity (ppt): — |
| Temp. (°F): — | Temp. (°F): — | Temp. (°F): — |
| Comments: — | Comments: — | Comments: — |

| Tidal Target SS Intake Depth Parameters | | Measured Water Depth (ft.): 22.5 | |
|---|---|---|---|
| Approx. Pump Depth: 18" above mudline | | Correction to MLLW: +10.4' | |
| Correction to MLLW: +10.4' | | Mudline (Corrected Depth) @ MLLW: -12.1' | |
| Study Depth (-MLLW): -10.5' | | Study Depth (-MLLW): ~~-11.0'~~ -12.0' | |
| **Beginning Water Parameters** | EC (mS/cm): — | **End Water Parameters** | EC (mS/cm): — |
| Pump Started: — | TDS (ppm/ppt): — | Pump Stopped: — | TDS (ppt): — |
| Flow Rate: — | Salinity (ppt): — | Flow Rate: — | Salinity (ppt): — |
| pH: — | Temp. (°F): — | pH: — | Temp. (°F): — |

~~Plankton Net Comments:~~ Sieve + Flow Rate exp ~~Underwater Camera Observations:~~ —

Total time = 5 min, ~~Hose~~ Hose 2 used
# of 5 gallon buckets = III → GPM 5 gallons/min
Sieves: #40 → #60 + #200 were not retained material so they were ommited. Nothing retained in the #40 sieve. NTUs observed via YSI = 15 NTU

General Tidal Target SS Comments: Hose 1 v. 2" from bottom → Begain another 5min experiment
Total Time = 5 minutes
# of Gallons = 7.5 gal → 1.5 GPM
Some suspended solids observed in #40 sieve

| Number of containers and estimated amount: | — | 1-2 gal bucket | Location Photo Numbers |
|---|---|---|---|
| 2-Gallon Buckets with Sample: | Ponar | Tidal Target SS | — |

### Ponar Recovered Quantities are in Percent measured cm by cm (approximately)

| Deployment # | Recovery | Description | Sample ID |
|---|---|---|---|
| 1 | ~~20~~ 30% | 2cm: cobble gravel, scattered sand, some mussels, 10YR4/3 | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

General Ponar Comments: —

Ponar Size Collected In: ~~Standard~~ or (Petite)

Clarifying Information Recorded by (F. Last; Date): K. Casey 12/7/17
Checked by: LMT 12/21/17

amec foster wheeler

# Penobscot River Mercury Study - Phase III Engineering Evaluation

## SUSPENDED SOLIDS AND PONAR GRAB LOG

| | | | |
|---|---|---|---|
| Owner: USDC, District of Maine | Project No.: 3616166052 | Tidal Target Depth (+/- MLLW): — | Logger: KC |
| Date: 7/28/17 | WO: 4A-060 | Tidal Target Time: — | Crew: MM, MB, KC |
| Time: 16:00 | Tablet #: 4 | Tidal Phase: Rising (Falling) | Vessel: Pamola 2 |
| Location ID (GPS Point Name): ADI MM 1 | Coordinates: Lat 44.58[illegible]983 | | Long -68.8609655 |
| Sample Name (Tidal Traget SS): ADI_MM_1_072817_SS_N15 | Sample Name (Ponar): — | | |
| Weather: Sun, 75°F Winds: 5-10 knots Waters: 0-5 knots Traffic: 0-1 boats | | | Water Temp: 69°F |

| 1 meter Below MWD Water Parameters | Midpoint Water Parameters | 1 meter Above Mudline Water Parameters |
|---|---|---|
| pH: — | pH: — | pH: — |
| EC (mS/cm): — | EC (mS/cm): — | EC (mS/cm): — |
| TDS (ppm/ppt): — | TDS (ppm/ppt): — | TDS (ppm/ppt): — |
| Salinity (ppt): — | Salinity (ppt): — | Salinity (ppt): — |
| Temp. (°F): — | Temp. (°F): — | Temp. (°F): — |
| Comments: — | Comments: — | Comments: — |

| Tidal Target SS Intake Depth Parameters | | Measured Water Depth (ft.): 15.3 | |
|---|---|---|---|
| Approx. Pump Depth: 10" above mud line | | Correction to MLLW: +11.3' | |
| Correction to MLLW: +11.3' | | Mudline (Corrected Depth) @ MLLW: -4.0' | |
| Study Depth (-MLLW): -2.5' | | Study Depth (-MLLW): — | |
| Beginning Water Parameters | EC (mS/cm): — | End Water Parameters | EC (mS/cm): — |
| Pump Started: — | TDS (ppm/ppt): — | Pump Stopped: — | TDS (ppt): — |
| Flow Rate: — | Salinity (ppt): — | Flow Rate: — | Salinity (ppt): — |
| pH: — | Temp. (°F): — | pH: — | Temp. (°F): — |

~~Plankton Net Comments:~~ —

~~Underwater Camera Observations:~~ —

Began sieve and flow rate experiment, Total time = 5 minutes (Hose 2 18" above bottom)
# of 5 gallon buckets = 1 1/4 → GPM = 5 gallons / minute
Sieves #40, #60, + #200 → No observed suspended solids in sieves, Nothing retained

~~General Tidal Target SS Comments:~~ Hose 1, pumped out liquid that appears to be on mudline, pump turned of to prevent pump damage TSS samples taken

| Number of containers and estimated amount: | — | — | Location Photo Numbers |
|---|---|---|---|
| 2-Gallon Buckets with Sample: | Ponar | Tidal Target SS | IMG_0469 |

## Ponar Recovered Quantities are in Percent measured cm by cm (approximately)

| Deployment # | Recovery | Description | Sample ID |
|---|---|---|---|
| — | — | — | — |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

General Ponar Comments: —

Ponar Size Collected In: ~~Standard~~ or ~~Petite~~

Clarifying Information Recorded by (F. Last; Date): K. Casey; 12/7/17

Checked by: LMF 12/21/17

amec foster wheeler

# Penobscot River Mercury Study - Phase III Engineering Evaluation

## SUSPENDED SOLIDS AND PONAR GRAB LOG

| | | | |
|---|---|---|---|
| Owner: USDC, District of Maine | Project No.: 3616166052 | Tidal Target Depth (+/- MLLW): — | Logger: KC |
| Date: ~~AUG~~ OR-1 | WO: 4A-060 | Tidal Target Time: — | Crew: MB, KC, MM |
| Time: 13:50 | Tablet #: 4 | Tidal Phase: (Rising) Falling | Vessel: Pamola 2 |
| Location ID (GPS Point Name): AOI-OR-1 | | Coordinates: Lat 44.560380 76 | Long -68.744607 78 |
| Sample Name (Tidal Traget SS): | | Sample Name (Ponar): AOI-OR-1 | |
| Weather: Sun, 75° | Winds: 0-5 knots | Waters: 0-5 knots | Traffic: 0-1 | Water Temp: 61 °F |

| 1 meter Below MWD Water Parameters | Midpoint Water Parameters | 1 meter Above Mudline Water Parameters |
|---|---|---|
| pH: — | pH: — | pH: — |
| EC (mS/cm): — | EC (mS/cm): — | EC (mS/cm): — |
| TDS (ppm/ppt): — | TDS (ppm/ppt): — | TDS (ppm/ppt): — |
| Salinity (ppt): — | Salinity (ppt): — | Salinity (ppt): — |
| Temp. (°F): — | Temp. (°F): — | Temp. (°F): — |
| ~~Comments:~~ → TSS; AOI-1-OR-07292017-SS-N08-R1 -R2 -R3 + Total Hg | ~~Comments:~~ | ~~Comments:~~ |

| Tidal Target SS Intake Depth Parameters | | Measured Water Depth (ft.): 10.0 | |
|---|---|---|---|
| Approx. Pump Depth: 10" above bottom | | Correction to MLLW: +7.0' | |
| Correction to MLLW: +7.0' | | Mudline (Corrected Depth) @ MLLW: -3.0' | |
| Study Depth (-MLLW): -2.2' | | Study Depth (-MLLW): -3.3' | |
| **Beginning Water Parameters** | EC (mS/cm): — | **End Water Parameters** | EC (mS/cm): — |
| Pump Started: — | TDS (ppm/ppt): — | Pump Stopped: — | TDS (ppt): — |
| Flow Rate: — | Salinity (ppt): — | Flow Rate: — | Salinity (ppt): — |
| pH: — | Temp. (°F): — | pH: — | Temp. (°F): — |

~~Plankton Net Comments:~~ Observed mulch possible SS material in rising tide. Stopped to deploy equipment rig. Rig was deployed w/ less weight.

~~Underwater Camera Observations:~~ on dual frequency in Orland River in

**General Tidal Target SS Comments:**

highly variable amounts of wrack while pump is going over timed intervals. See fieldbook

| Number of containers and estimated amount: | 1-2 gal | 3-TSS bottles | Location Photo Numbers |
|---|---|---|---|
| 2-Gallon Buckets with Sample: | Ponar | Tidal Target SS | IMG_0492 to IMG_0499 |

### Ponar Recovered Quantities are in Percent measured cm by cm (approximately)

| Deployment # | Recovery | Description | Sample ID |
|---|---|---|---|
| 1 | 90% | 9cm = SiH TR FN sand, occasional wrack, some fibrous material, gradient 10YR 4/3 to 10YR 5/1 | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

**General Ponar Comments:**

wrack crab in PONAR, crab returned to Penob.

Ponar Size Collected In: Standard or (Petite)

(Clarifying Information Recorded by (F. Last; Date): K. Casey; 12/12/17

Checked by: LMT 12/21/17

amec foster wheeler

# Penobscot River Mercury Study - Phase III Engineering Evaluation

## SUSPENDED SOLIDS AND PONAR GRAB LOG

| | | | |
|---|---|---|---|
| Owner: USDC, District of Maine | Project No.: 3616166052 | Tidal Target Depth (+/- MLLW): — | Logger: KC |
| Date: 7/29/17 | WO: 4A-060 | Tidal Target Time: — | Crew: MB, MM, KC |
| Time: 1015 | Tablet #: 4 | Tidal Phase: Rising (Falling) | Vessel: Pamola 2 |

**Location ID** (GPS Point Name): AOI-VN-1 (AOI-12) **Coordinates:** Lat 44.55749929 **Long** -68.76878815

**Sample Name** (Tidal Traget SS): — **Sample Name** (Ponar): AOI-VN-1

Weather: Sun, 66° Winds: 5-10 Knots Waters: 0-5 knots Traffic: 0-3 boats Water Temp: 59 °F

| 1 meter Below MWD Water Parameters | Midpoint Water Parameters | 1 meter Above Mudline Water Parameters |
|---|---|---|
| pH: — | pH: — | pH: — |
| EC (mS/cm): — | EC (mS/cm): — | EC (mS/cm): — |
| TDS (ppm/ppt): — | TDS (ppm/ppt): — | TDS (ppm/ppt): — |
| Salinity (ppt): — | Salinity (ppt): — | Salinity (ppt): — |
| Temp. (°F): — | Temp. (°F): — | Temp. (°F): — |
| Comments: — | Comments: — | Comments: — |

| Tidal Target SS Intake Depth Parameters | | Measured Water Depth (ft.): ~~6.2'~~ MB 7.0' |
|---|---|---|
| Approx. Pump Depth: 18" above bottom (Hose 2) | | Correction to MLLW: +0.7' |
| Correction to MLLW: +0.7' | | Mudline (Corrected Depth) @ MLLW: -6.3' |
| Study Depth (-MLLW): -4.8' | | Study Depth (-MLLW): ~~-5.0'~~ KC -6.5' |
| **Beginning Water Parameters** | EC (mS/cm): — | **End Water Parameters** EC (mS/cm): — |
| Pump Started: — | TDS (ppm/ppt): — | Pump Stopped: — TDS (ppt): — |
| Flow Rate: — | Salinity (ppt): — | Flow Rate: — Salinity (ppt): — |
| pH: — | Temp. (°F): — | pH: — Temp. (°F): — |

**Plankton Net Comments:**
Hose #2: 5GPM
TR WCH retained on 40 sieve, not enough to bag

**Underwater Camera Observations:** —

**General Tidal Target SS Comments:**
Hose #1: GPM = $\frac{24.5}{5}$ = 4.9 GPM
TR WCH retained on #40, #60, #200 sieves, not enough to bag

| Number of containers and estimated amount: | 1 | — | Location Photo Numbers |
|---|---|---|---|
| 2-Gallon Buckets with Sample: | Ponar | Tidal Target SS | IMG_0482 to IMG_0485 |

### Ponar Recovered Quantities are in Percent measured cm by cm (approximately)

| Deployment # | Recovery | Description | Sample ID |
|---|---|---|---|
| 1 | 10% | Silty clay, scattered gravel, TR sand, coh, non-plas, 10YR 4/1 TR mottled | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

**General Ponar Comments:** —

**Ponar Size Collected In:** Standard or (Petite)

Clarifying Information Recorded by (F. Last, Date): K. Casey, 12/7/17
Checked by: LMT 12/21/17

amec foster wheeler

# Penobscot River Mercury Study - Phase III Engineering Evaluation

## SUSPENDED SOLIDS AND PONAR GRAB LOG

| | | | |
|---|---|---|---|
| Owner: USDC, District of Maine | Project No.: 3616166052 | Tidal Target Depth (+/- MLLW): ~~8.5'~~ | Logger: KC |
| Date: 7/24/17 | WO: 4A-060 | Tidal Target Time: 9.25 | Crew: KC, MB, MM |
| Time: 1200 | Tablet #: 4 | Tidal Phase: (Rising) Falling | Vessel: Pamola 2 |
| Location ID (GPS Point Name): AOI 2 | | Coordinates: Lat 44.61009552 | Long - 68.82565462 |
| Sample Name (Tidal Traget SS): AOI2_072417_SS_1321 | | Sample Name (Ponar): AOI 2 | |
| Weather: cloudy, 67°F Winds: Calm | Waters: Mostly Calm | Traffic: None - 1 boat | Water Temp: 57 °F |

| ~~1-meter~~ Below MWD Water Parameters | | Midpoint Water Parameters | | ~~1-meter~~ Above Mudline Water Parameters | |
|---|---|---|---|---|---|
| pH: | 7.80 | pH: | ~~7.74~~ MD 7.82 | pH: | ~~7.92~~ MD 7.84 |
| EC (mS/cm): | 19.99 | EC (mS/cm): | 19.99 | EC (mS/cm): | 19.99 |
| TDS (ppm/ppt): | 10.00 | TDS (ppm/ppt): | 10.00 | TDS (ppm/ppt): | 10.00 |
| Salinity (ppt): | 10.00 | Salinity (ppt): | 10.00 | Salinity (ppt): | 10.00 |
| Temp. (°F): | 19°C | Temp. (°F): | 18.6°C | Temp. (°F): | 18°C |
| Comments: depth = 10' | | Comments: depth = 8' | | Comments: depth = 6' | |

| Tidal Target SS Intake Depth Parameters | | Measured Water Depth (ft.): | 10.1' |
|---|---|---|---|
| Approx. Pump Depth: | 8' - middle | Tidal Correction to MLLW: | +13.3' |
| Correction to MLLW: | +13.3' | Mudline (Corrected Depth) @ MLLW: | +3.2' |
| Study Depth (-MLLW): | +5.3' | Study Depth (-MLLW): | +3.3' |

| Beginning Water Parameters | EC (mS/cm): — | End Water Parameters | EC (mS/cm): — |
|---|---|---|---|
| Pump Started: — | TDS (ppm/ppt): — | Pump Stopped: — | TDS (ppt): — |
| Flow Rate: — | Salinity (ppt): — | Flow Rate: — | Salinity (ppt): — |
| pH: — | Temp. (°F): — | pH: — | Temp. (°F): — |
| Plankton Net Comments: — | | Underwater Camera Observations: — | |

General Tidal Target SS Comments: 3-2gallon buckets at 6', 8', and 10' of unsieved grab samples mudline

| Number of containers and estimated amount: | | | Location Photo Numbers |
|---|---|---|---|
| 2-Gallon Buckets with Sample: | Ponar: 1 | Tidal Target SS: 3-2gallon buckets | — |

### Ponar Recovered Quantities are in Percent measured cm by cm (approximately)

| Deployment # | Recovery | Description | Sample ID |
|---|---|---|---|
| 1 | 30% | 10YR 4/3 silt, non plastic, non-coh., TR particles WCH; | |
| | | silt, TR clay, coh, low plasticity | 10YR 5/4, TR shell fragment |
| 2 | 20% | 1 cm of silt, non-plas, non-coh, 10YR 5/4; | |
| | | below 1 cm silt, fine sands, non-plas, non-coh, 10YR 4/1 | |
| 3 | 10% | 1 cm of silt, non-coh, non-plas, 10YR 5/4; | |
| | | below 1 cm silt, non-coh, non-plas, TR | WCH, 10YR 4/1 |

General Ponar Comments: —

Ponar Size Collected In: (Standard) or Petite

Clarifying Information Recorded by (F. Last; Date): K. Casey; 12/6/17

Checked by: EMT 12/21/17

amec foster wheeler

# Penobscot River Mercury Study - Phase III Engineering Evaluation

## SUSPENDED SOLIDS AND PONAR GRAB LOG

| | | | |
|---|---|---|---|
| Owner: USDC, District of Maine | Project No.: 3616166052 | Tidal Target Depth (+/- MLLW): — | Logger: KC |
| Date: 7/24/17 | WO: 4A-060 | Tidal Target Time: 1030 | Crew: KC, MB, MM |
| Time: 1355 | Tablet #: 4 | Tidal Phase: (Rising) Falling | Vessel: Pamola2 |
| Location ID (GPS Point Name): AOI 7 | | Coordinates: Lat 44.61755577 | Long - 68.83652716 |
| Sample Name (Tidal Traget SS): AOI_7_072417_SS_N10 | | Sample Name (Ponar): AOI 7 | |
| Weather: cloudy 67°F Winds: mild | Waters: somewhat calm | Traffic: None | Water Temp: 71.2°F |

| 1 meter Below MWD Water Parameters | | Midpoint Water Parameters | | 1 meter Above Mudline Water Parameters | |
|---|---|---|---|---|---|
| pH: | 7.86 | pH: | 7.85 | pH: | 7.82 |
| EC (mS/cm): | 19.99 | EC (mS/cm): | 19.99 | EC (mS/cm): | 19.97 |
| TDS (ppm/ppt): | 10.00 | TDS (ppm/ppt): | 10.00 | TDS (ppm/ppt): | 10.00 |
| Salinity (ppt): | 10.00 | Salinity (ppt): | 10.00 | Salinity (ppt): | 10.00 |
| Temp. (°F): | 17.9°C | Temp. (°F): | 17.3°C | Temp. (°F): | 18.1°C |
| Comments: depth = 5' | | Comments: depth = 4' | | Comments: depth = 3' | |

| Tidal Target SS Intake Depth Parameters | | | | Measured Water Depth (ft.): | 6.4' | | |
|---|---|---|---|---|---|---|---|
| Approx. Pump Depth: | 4' | | | Correction to MLLW: | +12.0' | | |
| Correction to MLLW: | +12.0' | | | Mudline (Corrected Depth) @ MLLW: | + 5.6' | | |
| Study Depth (-MLLW): | +8.0' | | | Study Depth (-MLLW): | — | | |
| Beginning Water Parameters | | EC (mS/cm): | — | End Water Parameters | | EC (mS/cm): | — |
| Pump Started: | — | TDS (ppm/ppt): | — | Pump Stopped: | — | TDS (ppt): | — |
| Flow Rate: | — | Salinity (ppt): | — | Flow Rate: | — | Salinity (ppt): | — |
| pH: | — | Temp. (°F): | — | pH: | — | Temp. (°F): | — |
| Plankton Net Comments: — | | | | Underwater Camera Observations: — | | | |

General Tidal Target SS Comments: 6-2 gallon buckets of SS at 3', 4', and 5' of unsieved grab samples

| Number of containers and estimated amount: | | | Location Photo Numbers |
|---|---|---|---|
| 2-Gallon Buckets with Sample: | Ponar | Tidal Target SS | — |
| | 1 | | |

### Ponar Recovered Quantities are in Percent measured cm by cm (approximately)

| Deployment # | Recovery | Description | Sample ID |
|---|---|---|---|
| 1 | 30% | 1 mm silt 10YR 6/2, non-coh, non-plas, TR sawdust Woodchips, TR particle woodchip; below 1mm = silt, 10YR 4/3, coh, non-plastic, TR fibers; roots | |
| | | | |
| | | | |
| | | | |
| | | | |

General Ponar Comments: —

Ponar Size Collected In: (Standard) or Petite

Clarifying Information Recorded by (F. Last; Date): K. Casey; 12/6/17

checked by: LMT 12/21/17

amec foster wheeler

# Penobscot River Mercury Study - Phase III Engineering Evaluation

## SUSPENDED SOLIDS AND PONAR GRAB LOG

| | | | |
|---|---|---|---|
| Owner: USDC, District of Maine | Project No.: 3616166052 | Tidal Target Depth (+/- MLLW): — | Logger: KC |
| Date: 7/25/17 | WO: 4A-060 | Tidal Target Time: 1155 | Crew: KC, MO, MM, KA |
| Time: 1155 | Tablet #: 4 | Tidal Phase: (Rising) Falling | Vessel: Pamola 2 |
| Location ID (GPS Point Name): AOI 11 | | Coordinates: Lat 44.54870283 | Long -68.77108800 |
| Sample Name (Tidal Traget SS): AOI_11_072517_SS_N08 | | Sample Name (Ponar): AOI 11 | |
| Weather: cloudy 68° Winds: 0-5 knots Waters: mostly calm | | Traffic: None | Water Temp: 59 °F |

| 1 meter Below MWD Water Parameters | Midpoint Water Parameters | 1 meter Above Mudline Water Parameters |
|---|---|---|
| pH: — | pH: — | pH: — |
| EC (mS/cm): — | EC (mS/cm): — | EC (mS/cm): — |
| TDS (ppm/ppt): — | TDS (ppm/ppt): — | TDS (ppm/ppt): — |
| Salinity (ppt): — | Salinity (ppt): — | Salinity (ppt): — |
| Temp. (°F): — | Temp. (°F): — | Temp. (°F): — |
| Comments: — | Comments: — | Comments: — |

| Tidal Target SS Intake Depth Parameters | | Measured Water Depth (ft.): | 10.3' |
|---|---|---|---|
| Approx. Pump Depth: | 9.5' | Correction to MLLW: | +10.8' |
| Correction to MLLW: | +10.8' | Mudline (Corrected Depth) @ MLLW: | +0.5' |
| Study Depth (-MLLW): | +1.3' | Study Depth (-MLLW): | — |

| Beginning Water Parameters | | End Water Parameters | |
|---|---|---|---|
| EC (mS/cm): — | | EC (mS/cm): — | |
| Pump Started: — | TDS (ppm/ppt): — | Pump Stopped: — | TDS (ppt): — |
| Flow Rate: — | Salinity (ppt): — | Flow Rate: — | Salinity (ppt): — |
| pH: — | Temp. (°F): — | pH: — | Temp. (°F): — |
| Plankton Net Comments: — | | Underwater Camera Observations: — | |

General Tidal Target SS Comments:
No observed suspended solids at ~8' and 9.5'

IMG_6274 shows 5-2gallon unsieved grab samples with 1 TSS Jar

| Number of containers and estimated amount: | 1 container approx ¾ full | ↓ | Location Photo Numbers |
|---|---|---|---|
| 2-Gallon Buckets with Sample: | Ponar | Tidal Target SS | IMGs 6274-6290 based on the time and date taken |

### Ponar Recovered Quantities are in Percent measured cm by cm (approximately)

| Deployment # | Recovery | Description | Sample ID |
|---|---|---|---|
| 1 | 0% | No recovery | |
| 2 | 5% | Silt, TR clay, coh, non-plas, TR sand, dk H, WCH | 10YR 5/1 |
| 3 | 1% | Silt, TR clay, coh, non-plas, TR sand, dk H, WCH, 10YR 5/3 | |
| | | | |
| | | | |
| | | | |

General Ponar Comments: —

Ponar Size Collected In: Standard or Petite

Clarifying Information Recorded by F. Last; Date): K. Casey; 12/6/17
Checked by: LMT 12/21/17

amec foster wheeler

# Penobscot River Mercury Study - Phase III Engineering Evaluation

## SUSPENDED SOLIDS AND PONAR GRAB LOG

| | | | |
|---|---|---|---|
| Owner: USDC, District of Maine | Project No.: 3616166052 | Tidal Target Depth (+/- MLLW): — | Logger: KC |
| Date: 7/25/17 | WO: 4A-060 | Tidal Target Time: 1255 | Crew: KC, MB, MM, KA, CP |
| Time: 1355 | Tablet #: 4 | Tidal Phase: Rising (Falling) | Vessel: Pamola 2 |
| Location ID (GPS Point Name): ADI 14 | | Coordinates: Lat 44.564239 67 | Long - 68.7443 700 |
| Sample Name (Tidal Traget SS): — | | Sample Name (Ponar): — | |
| Weather: Partially Cloudy Winds: 0-5 knots Waters: mostly calm | | Traffic: 0-1 boats | Water Temp: 59 °F |

| 1 meter Below MWD Water Parameters | Midpoint Water Parameters | 1 meter Above Mudline Water Parameters |
|---|---|---|
| pH: — | pH: — | pH: — |
| EC (mS/cm): — | EC (mS/cm): — | EC (mS/cm): — |
| TDS (ppm/ppt): — | TDS (ppm/ppt): — | TDS (ppm/ppt): — |
| Salinity (ppt): — | Salinity (ppt): — | Salinity (ppt): — |
| Temp. (°F): — | Temp. (°F): — | Temp. (°F): — |
| Comments: (1) DTB: 4' DFB = 1.5' (pump) MWD = 5.5' | Comments: (2) DTB 3.5' DFB 2' MWD = 5.5' PUMP | Comments: (3) PUMP DTB = MWD = DFB = |

DTB 4
DFB 1.5

| Tidal Target SS Intake Depth Parameters | | Measured Water Depth (ft.): ~~7.1 MB~~ ~~5.0 MB~~ 5.5' |
|---|---|---|
| Approx. Pump Depth: 4' | | Tidal Correction to MLLW: + 11.5' |
| Correction to MLLW: + 11.5' | | Mudline (Corrected Depth) @ MLLW: + 6.0' |
| Study Depth (-MLLW): + 7.5' | | Study Depth (-MLLW): — |
| **Beginning Water Parameters** | EC (mS/cm): — | **End Water Parameters** EC (mS/cm): — |
| Pump Started: — | TDS (ppm/ppt): — | Pump Stopped: — TDS (ppt): — |
| Flow Rate: — | Salinity (ppt): — | Flow Rate: — Salinity (ppt): — |
| pH: — | Temp. (°F): — | pH: — Temp. (°F): — |
| Plankton Net Comments: — | | Underwater Camera Observations: — |

General Tidal Target SS Comments: —

| Number of containers and estimated amount: | — | — | Location Photo Numbers |
|---|---|---|---|
| 2-Gallon Buckets with Sample: | Ponar | Tidal Target SS | — |

### Ponar Recovered Quantities are in Percent measured cm by cm (approximately)

| Deployment # | Recovery | Description | Sample ID |
|---|---|---|---|
| — | — | — | — |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

General Ponar Comments: —

Ponar Size Collected In: Standard or Petite

Clarifying Information Recorded by (F. Last, Date): K. Casey 12/6/17
Checked by: LMT 12/21/17

amec foster wheeler

# Penobscot River Mercury Study - Phase III Engineering Evaluation

## SUSPENDED SOLIDS AND PONAR GRAB LOG

| | | | |
|---|---|---|---|
| Owner: USDC, District of Maine | Project No.: 3616166052 | Tidal Target Depth (+/- MLLW): — | Logger: KC |
| Date: 7/25/17 | WO: 4A-060 | Tidal Target Time: 1515 | Crew: KC, MB, MM, KA, CA |
| Time: 1600 | Tablet #: 4 | Tidal Phase: Rising (Falling) | Vessel: Pamola 2 |
| Location ID (GPS Point Name): AOI 20 | | Coordinates: Lat 44.52666483 | Long -68.75144100 |
| Sample Name (Tidal Traget SS): → | | Sample Name (Ponar): — | |
| Weather: Sunny, 72° | Winds: 0-3 kmh | Waters: 0.5 knots @ heart stop | Traffic: None |
| | | | Water Temp: 57 °F |

| 1 meter Below MWD Water Parameters | Midpoint Water Parameters | 1 meter Above Mudline Water Parameters |
|---|---|---|
| pH: — | pH: — | pH: — |
| EC (mS/cm): — | EC (mS/cm): — | EC (mS/cm): — |
| TDS (ppm/ppt): — | TDS (ppm/ppt): — | TDS (ppm/ppt): — |
| Salinity (ppt): — | Salinity (ppt): — | Salinity (ppt): — |
| Temp. (°F): — | Temp. (°F): — | Temp. (°F): — |
| ~~Comments:~~ Attempted to lower camera and pump to bottom, but current and water resistance on way down caused pipes (made of aluminum) to break. | ~~Comments:~~ | ~~Comments:~~ |

DTB: ✓
DFB =

| Tidal Target SS Intake Depth Parameters | | Measured Water Depth (ft.): — | |
|---|---|---|---|
| Approx. Pump Depth: 0.8' above mudline | | Correction to MLLW: — | |
| Correction to MLLW: — | | Mudline (Corrected Depth) @ MLLW: — | |
| Study Depth (-MLLW): — | | Study Depth (-MLLW): — | |
| **Beginning Water Parameters** | EC (mS/cm): — | **End Water Parameters** | EC (mS/cm): — |
| Pump Started: — | TDS (ppm/ppt): — | Pump Stopped: — | TDS (ppt): — |
| Flow Rate: — | Salinity (ppt): — | Flow Rate: — | Salinity (ppt): — |
| pH: — | Temp. (°F): — | pH: — | Temp. (°F): — |

~~Plankton Net Comments:~~ Changed TSS collection method due to broken pipes. Lowered hose for pump to bottom using PONAR as a weight and attatched YSI to ponar to determine depth. Hose successfully made it to the bottom. YSI depth cross-referenced w/ garmin to confirmed hose at bottom. Crew turned pump on and began taking samples.

~~Underwater Camera Observations:~~ —

General Tidal Target SS Comments: T4 TSS Grab samples collected
VE-AOI-072517-SS-N20
AOI-072517-SS-N08-R1
-R2
-R3

* Wet bucket 20/20 for lab experiment on 7/27/17

AOI-072517-SS-N08 also analyzed for THg and TOC KC

| Number of containers and estimated amount: | 20 | K | Location Photo Numbers |
|---|---|---|---|
| 2-Gallon Buckets with Sample: | Ponar | Tidal Target SS | — |

### Ponar Recovered Quantities are in Percent measured cm by cm (approximately)

| Deployment # | Recovery | Description | Sample ID |
|---|---|---|---|
| 1 | 5% | No closure but observed WCH in screen | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

General Ponar Comments: Hard bottom observed via GARMIN GPS

Ponar Size Collected In: Standard or Petite

Clarifying Information Recorded by (F. Last / Date): K. Casey 12/7/2017

Checked by: LMT 12/21/17

amec foster wheeler

# Penobscot River Mercury Study - Phase III Engineering Evaluation

## SUSPENDED SOLIDS AND PONAR GRAB LOG

| | | | |
|---|---|---|---|
| Owner: USDC, District of Maine | Project No.: 3616166052 | Tidal Target Depth (+/- MLLW): — | Logger: — |
| Date: 7/26/17 | WO: 4A-060 | Tidal Target Time: — | Crew: CP, KA, DY, MB, MM, KC |
| Time: 1545 | Tablet #: 4 | Tidal Phase: Rising (Falling) | Vessel: Pamola 2 |
| Location ID (GPS Point Name): AOI 21 | | Coordinates: Lat 44.50647500 | Long -68.76990467 |
| Sample Name (Tidal Traget SS): | | Sample Name (Ponar): — | |

Weather: Sunny, 80°F Winds: 5-10 knots Waters: 1-5 knots Traffic: 1-2 boats Water Temp: 57 °F

| 1 meter Below MWD Water Parameters | Midpoint Water Parameters | 1 meter Above Mudline Water Parameters |
|---|---|---|
| pH: — | pH: — | pH: — |
| EC (mS/cm): — | EC (mS/cm): — | EC (mS/cm): — |
| TDS (ppm/ppt): — | TDS (ppm/ppt): — | TDS (ppm/ppt): — |
| Salinity (ppt): — | Salinity (ppt): — | Salinity (ppt): — |
| Temp. (°F): — | Temp. (°F): — | Temp. (°F): — |
| Comments: TSS: AOI-21_080117_SS-17 + Material Retained Solids: AOI_21_080117_SS-17 | Comments: AOI21_P250_101202017_SW_R1, -R2, -R3 | Comments: 006_R1, _R2, _R3 |

| Tidal Target SS Intake Depth Parameters | | Measured Water Depth (ft.): 47' |
|---|---|---|
| Approx. Pump Depth: ≈ 0.66' above bottom | | Tidal Correction to MLLW: +9.8' |
| Correction to MLLW: +9.8' | | Mudline (Corrected Depth) @ MLLW: -37' |
| Study Depth (-MLLW): -36' | | Study Depth (-MLLW): — |

| Beginning Water Parameters | | End Water Parameters | |
|---|---|---|---|
| Pump Started: — | EC (mS/cm): — | Pump Stopped: — | EC (mS/cm): — |
| Flow Rate: — | TDS (ppm/ppt): — | Flow Rate: — | TDS (ppt): — |
| pH: — | Salinity (ppt): — | pH: — | Salinity (ppt): — |
| | Temp. (°F): — | | Temp. (°F): — |

Plankton Net Comments: Conducted pump rate test using 2gallon bucket and timer. Then pumped for 15 minutes into plankton net to assess amount of WCH collected over times.

~~Underwater Camera Observations:~~

General Tidal Target SS Comments: Used modified apperatus based on the experience from AOI 20. The modified apperatus used a bench press with 100 lbs on one end, as a weight. A lower valve hose and pump were used on the apparatus. The hose intlvent, camera, and sonde were clamped on above the weights.

| Number of containers and estimated amount: | — | ← | Location Photo Numbers |
|---|---|---|---|
| 2-Gallon Buckets with Sample: | Ponar | Tidal Target SS | Collected 12-2gallons buckets, 1 TSS, and 1 gallon bag of material retained in plankton net |

### Ponar Recovered Quantities are in Percent measured cm by cm (approximately)

| Deployment # | Recovery | Description | Sample ID |
|---|---|---|---|
| — | — | — | — |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

General Ponar Comments: Pamola 2 drifted southwest from original position

Ponar Size Collected In: ~~Standard~~ or ~~Petite~~

Clarifying Information Recorded by (F. Last, Date): K. Casey, 12/7/17

Checked by: LMT 12/21/17

amec foster wheeler

# Penobscot River Mercury Study - Phase III Engineering Evaluation

## SUSPENDED SOLIDS AND PONAR GRAB LOG

| | | | |
|---|---|---|---|
| Owner: USDC, District of Maine | Project No.: 3616166052 | Tidal Target Depth (+/- MLLW): — | Logger: KC |
| Date: 7/29/17 | WO: 4A-060 | Tidal Target Time: — | Crew: MB, MM, KC |
| Time: 1200 | Tablet #: 4 | Tidal Phase: (Rising) Falling | Vessel: Pamola 2 |
| Location ID (GPS Point Name): AOI-29 | | Coordinates: Lat 44.51042309 | Long - 68.7869314 |
| Sample Name (Tidal Traget SS): — | | Sample Name (Ponar): AOI-29 | |
| Weather: Sun, 73° | Winds: 5-10 knots | Waters: 0-5 knots | Traffic: 0-2 boats | Water Temp: 61 °F |

| 1 meter Below MWD Water Parameters | Midpoint Water Parameters | 1 meter Above Mudline Water Parameters |
|---|---|---|
| pH: — | pH: — | pH: — |
| EC (mS/cm): — | EC (mS/cm): — | EC (mS/cm): — |
| TDS (ppm/ppt): — | TDS (ppm/ppt): — | TDS (ppm/ppt): — |
| Salinity (ppt): — | Salinity (ppt): — | Salinity (ppt): — |
| Temp. (°F): — | Temp. (°F): — | Temp. (°F): — |
| Comments: — | Comments: — | Comments: — |

| Tidal Target SS Intake Depth Parameters | | Measured Water Depth (ft.): — → see YSI |
|---|---|---|
| Approx. Pump Depth: — | | Correction to MLLW: — |
| Correction to MLLW: — | | Mudline (Corrected Depth) @ MLLW: — |
| Study Depth (-MLLW): — | | Study Depth (-MLLW): — |
| **Beginning Water Parameters** | EC (mS/cm): — | **End Water Parameters** EC (mS/cm): — |
| Pump Started: — | TDS (ppm/ppt): — | Pump Stopped: — TDS (ppt): — |
| Flow Rate: — | Salinity (ppt): — | Flow Rate: — Salinity (ppt): — |
| pH: — | Temp. (°F): — | pH: — Temp. (°F): — |
| Plankton Net Comments: — | | Underwater Camera Observations: — |

General Tidal Target SS Comments:
Hose 2 → No material retained (0.1 #40 sieve) Hose 1 → sucked up mudline, ended 5-minute test early
5 GPM
~18" from Bottom
#40, ~~#60~~, ~~#200~~ KC

| Number of containers and estimated amount: | 1-2 gal | — | Location Photo Numbers |
|---|---|---|---|
| 2-Gallon Buckets with Sample: | Ponar | Tidal Target SS | IMG_0487 to IMG_0491 |

### Ponar Recovered Quantities are in Percent measured cm by cm (approximately)

| Deployment # | Recovery | Description | Sample ID |
|---|---|---|---|
| 1 | 90% | Large rock in mouth of ponar that fell out upon bringing on board; Top 2cm = 10YR 6/3 silt, TR wood, non-coh, non-plas, TR sand; | |
| | | 1 cm of SOM silt, TR twigs, TR sand, non-coh, non-plas, 10YR 7/2; | |
| | | 3 cm of silt, TR FN sand, non-coh, non-plas | 10YR 6/2 |
| | | | |
| | | | |
| | | | |

General Ponar Comments:
Picture taken
Clarifying Information Recorded by (F.Last, Date): K. Casey; 12/7/2017
Checked by: LMT 12/21/17

Ponar Size Collected In: Standard or (Petite)

# Penobscot River Mercury Study - Phase III Engineering Evaluation

## SUSPENDED SEDIMENT/WOODY DEBRIS FIELD LAB PROCESSING LOG

Owner: USDC, District of Maine | Project No.: 3616166052 | Start Date: 10.08.17 | End Date: 10/08/2017 | Prepared by: J. Tillery

Sample ID: AOI20 | WO: 4A-060 | Start Time: 12:25 | End Time: — | K. Casey (Initials of field lead and assists)

### Field Bucket ID / Bucket Observations / Initial Sample Weight

| | Field Bucket ID | Biota | Settling Solids | Floating Solids | Sheen | Other: | Full wt of full total bucket (g) | Empty wt of empty bucket (g) | Net wt contains of bucket (g) |
|---|---|---|---|---|---|---|---|---|---|
| 1) | AOI20 bucket 8/20 | Ø | Y (N) | Y (N) | Y (N) | Ø | 7500 | 420 | 7080 |
| 2) | AOI20 bucket 5/20 | Ø | Y (N) | Y (N) | Y (N) | Ø | 7750 | 422 | 7328 |
| 3) | AOI20 bucket 15/20 | Ø | Y (N) | Y (N) | Y (N) | Ø | 8000 | 430 | 7570 |
| 4) | AOI20 bucket 18/20 | Ø | Y (N) | Y (N) | Y (N) | Ø | 7000 | 425 | 6575 |
| 5) | AOI20 bucket 11/20 | Ø | Y (N) | Y (N) | Y (N) | Ø | 7500 | 434 | 7066 |
| 6) | AOI20 bucket 17/20 | Ø | Y (N) | Y (N) | Y (N) | Ø | 6000 | 428 | 5572 |
| 7) | AOI20 bucket 14/20 | Ø | Y (N) | Y (N) | Y (N) | Ø | 7750 | 426 | 7324 |
| 8) | AOI20 bucket 18/20 | Ø | Y (N) | Y (N) | Y (N) | Ø | 7250 | 434 | 6816 |
| 9) | AOI20 bucket 3/20 | Ø | Y (N) | Y (N) | Y (N) | Ø | 7500 | 435 | 7065 |
| 10) | AOI20 bucket 12/20 | Ø | Y (N) | Y (N) | Y (N) | Ø | 7750 | 428 | 7322 |
| 11) | AOI20 bucket 7/20 | Ø | Y (N) | Y (N) | Y (N) | Ø | 7000 | 431 | 6569 |

### Wet Sieving

| | Start | End |
|---|---|---|
| Date: | 10.08.17 | 10.08.17 |
| Time: | 12:45 | 16:15 |

# 40 / # 60 / # 200 → Retained Photos → Combine & Weigh (wet)

### Wet Coarse Fraction Solids Weights

| Full wt (g) | Empty wt (g) | Net wt (g) |
|---|---|---|
| 7543 | 2435 | 2108 |

Drying Oven (225°F) →

### Dry Coarse Fraction Solids Weights

| Full wt (g) | Empty wt (g) | Net wt (g) |
|---|---|---|
| — | — | — |

### Sieve Passing Mixing

| | Start | End |
|---|---|---|
| Date: | 10.08.17 | 10.08.17 |
| Time: | 16:27 | 17:04 |

### Sieve Passing

| TSS Sample Name | Full wt of full total bucket (g) | Empty wt of empty bucket (g) | Net wt contains of bucket (g) |
|---|---|---|---|
| AOI20_P200_10082017_SW_R1 @1815 | 6250 | 425 | 5825 |
| AOI20_P200_10082017_SW_R2 | 6500 | 430 | 6070 |
| AOI20_P200_10082017_SW_R3 @1825 | 6000 | 428 | 5572 |
| @1820 | 6500 | 427 | 6073 |
| — | 6750 | 431 | 6319 |
| — | 6500 | 426 | 6074 |
| — | 6500 | 426 | 6074 |
| — | 6250 | 430 | 5820 |
| — | 6250 | 427 | 5823 |

### Final Liquid Weight

| Full wt of full total bucket (g) | Empty wt of empty bucket (g) | Net wt contains of bucket (g) |
|---|---|---|
| 6500 | 427 | 6073 |
| 5750 | 432 | 5318 |
| 3750 | 430 | 3320 |
| — | — | — |
| — | — | — |
| — | — | — |
| — | — | — |
| — | — | — |
| — | — | — |

### Field Office TSS Calculations

| | | | |
|---|---|---|---|
| $C_w$ (g) | 2108.0 | | |
| $F_w$ (g) | 217.27 | $W_w$ (g) = | 2325.27 |
| $C_d$ (g) | 171.8 | | |
| $F_d$ (g) | 60.00 | $W_d$ (g) = | 231.78 |
| S (g) | 125,865.00 | Sal (ppm) = | 26,366.58 |
| Percent SS (%) = | — | KMC | |
| Total Filter Passing Vol (mL) (L) = | 68.36 | | |
| | 117,019.00g → 117.02L | | |

Comments: —

W/ Fish Scale | w/ Electronic Balance

Same method for other weights taken

Clarifying Information Recorded by (F. Last; Date): K. Casey; 12/7/2017

Checked by: LMT 12/21/17

amec foster wheeler

# Penobscot River Mercury Study - Phase III Engineering Evaluation

## SUSPENDED SEDIMENT/WOODY DEBRIS FIELD LAB PROCESSING LOG

Owner: USDC, District of Maine | Project No.: 3616166052 | Start Date: 10/08/2017 | End Date: 10/08/2017 | Prepared by: K. Casey

Sample ID: AOI 20 | WO: 4A-060 | Start Time: 12:25 | End Time: — | J. Tiller (Initials of Field lead and assists)

### Field Bucket ID / Bucket Observations / Initial Sample Weight

| | Field Bucket ID | Biota | Settling Solids | Floating Solids | Sheen | Other: | Full wt of full total bucket (g) | Empty wt of empty bucket (g) | Net wt contains of bucket (g) |
|---|---|---|---|---|---|---|---|---|---|
| 1) | AOI 20 bucket 2/20 | Ø | Y (N) | Y (N) | Y (N) | Ø | 7500 | 431 | 7069 |
| 2) | AOI 20 bucket 9/20 | Ø | Y (N) | Y (N) | Y (N) | Ø | 7500 | 426 | 7074 |
| 3) | AOI 20 bucket 20/20 | Ø | Y (N) | Y (N) | Y (N) | Ø | 2750 | 427 | 2323 |
| 4) | AOI 20 bucket 6/20 | Ø | Y (N) | Y (N) | Y (N) | Ø | 7500 | 425 | 7075 |
| 5) | AOI 20 bucket 13/20 | Ø | Y (N) | Y (N) | Y (N) | Ø | 7500 | 433 | 7067 |
| 6) | AOI 20 bucket 19/20 | Ø | Y (N) | Y (N) | Y (N) | Ø | 7500 | 427 | 7073 |
| 7) | AOI 20 bucket 16/20 | Ø | Y (N) | Y (N) | Y (N) | Ø | 7250 | 425 | 6825 |
| 8) | AOI 20 bucket 4/20 | Ø | Y (N) | Y (N) | Y (N) | Ø | 5500 | 428 | 5072 |
| 9) | — | — | Y N | Y N | Y N | — | — | — | — |
| 10) | — | — | Y N | Y N | Y N | — | — | — | — |
| 11) | — | — | Y N | Y N | Y N | — | — | — | — |

### Wet Sieving

| | Start | End |
|---|---|---|
| Date: | — | — |
| Time: | — | — |

Retained Photos: # 40, # 60, # 200 → Combine & Weigh (wet)

### Wet Coarse Fraction Solids Weights

~~200 g~~ KC

| Full wt (g) | Empty wt (g) | Net wt (g) |
|---|---|---|
| — | — | — |

Drying Oven (225°F) →

### Dry Coarse Fraction Solids Weights

| Full wt (g) | Empty wt (g) | Net wt (g) |
|---|---|---|
| — | — | — |

### Sieve Passing Mixing

| | Start | End |
|---|---|---|
| Date: | — | — |
| Time: | — | — |

### Sieve Passing

| TSS Sample Name |
|---|
| — |
| — |
| — |
| — |
| — |
| — |
| — |
| — |
| — |
| — |
| — |
| — |

### Final Liquid Weight

| Full wt of full total bucket (g) | Empty wt of empty bucket (g) | Net wt contains of bucket (g) | Full wt of full total bucket (g) | Empty wt of empty bucket (g) | Net wt contains of bucket (g) |
|---|---|---|---|---|---|
| 6250 | 429 | 5821 | — | — | — |
| 6000 | 424 | 5576 | — | — | — |
| 5500 | 422 | 5078 | — | — | — |
| 6500 | 423 | 6077 | — | — | — |
| 5500 | 428 | 5072 | — | — | — |
| 6000 | 428 | 5572 | — | — | — |
| 5250 | 428 | 4822 | — | — | — |
| 5500 | 431 | 5069 | — | — | — |
| 6000 | 429 | 5571 | — | — | — |

### Field Office TSS Calculations

$C_w$ (g) = — → $W_w$ (g) = —

$F_w$ (g) = —

$C_d$ (g) = — → $W_d$ (g) = —

$F_d$ (g) = —

S (g) = — Sal (ppm) = —

Percent SS (%) = —

Total Filter Passing Vol (ml) = —

Comments: —

Clarifying Information Recorded by (F.Last, Date): K. Casey; 12/7/2017 Checked by: LMT 12/21/17

amec foster wheeler

# Penobscot River Mercury Study - Phase III Engineering Evaluation

## SUSPENDED SEDIMENT/WOODY DEBRIS FIELD LAB PROCESSING LOG

Owner: USDC, District of Maine | Project No.: 3616166052 | Start Date: 10/10/2017 | End Date: 10/10/2017 | Prepared by: LMC + JKT (Initials of field lead and assists)

Sample ID: AOI21 | WO: 4A-060 | Start Time: 0900 | End Time: —

### Field Bucket ID / Bucket Observations / Initial Sample Weight

| | Field Bucket ID | Biota | Settling Solids | Floating Solids | Sheen | Other: | Full wt of full total bucket (g) | Empty wt of empty bucket (g) | Net wt contains of bucket (g) |
|---|---|---|---|---|---|---|---|---|---|
| 1) | AOI21 | — | Y N | Y N | Y N | — | 8217.5 | 434.3 | 7783.1 |
| 2) | AOI21 | — | Y N | Y N | Y N | — | 7400.7 | 421.2 | 6979.5 |
| 3) | AOI21 | — | Y N | Y N | Y N | — | 7161.6 | 417.1 | 6744.5 |
| 4) | AOI21 | — | Y N | Y N | Y N | — | 7512.9 | 432.9 | 7081.0 |
| 5) | AOI21 | — | Y N | Y N | Y N | — | 8914.6 | 436.9 | 8477.7 |
| 6) | AOI21 | — | Y N | Y N | Y N | — | 8441.1 | 430.8 | 8010.3 |
| 7) | AOI21 | — | Y N | Y N | Y N | — | 8339.3 | 434.1 | 7905.2 |
| 8) | AOI21 | — | Y N | Y N | Y N | — | 7836.8 | 433.3 | 7403.5 |
| 9) ~~10)~~ | AOI21 | — | Y N | Y N | Y N | — | 8279.6 | 438.8 | 7840.8 |
| ~~10)~~ 11) | — | — | Y N | Y N | Y N | — | — | — | — |

### Wet Sieving

| | Start | End |
|---|---|---|
| Date: | ~~10/10/17~~ | 10/10/17 |
| Time: | 1000 | 1055 |

Retained Photos: # 40, # 60, # 200 → Combine & Weigh (wet)

### Wet Coarse Fraction Solids Weights

| Full wt (g) | Empty wt (g) | Net wt (g) |
|---|---|---|
| 2445 | 2363 | 82g |

Drying Oven (225°F) →

### Dry Coarse Fraction Solids Weights

| Full wt (g) | Empty wt (g) | Net wt (g) |
|---|---|---|
| — | — | — |

### Sieve Passing Mixing

| | Start | End |
|---|---|---|
| Date: | 10/10/17 | 10/10/17 |
| Time: | ~~0811~~ 1148 | 1200 |

### Sieve Passing

### Final Liquid Weight

| TSS Sample Name | Full wt of full total bucket (g) | Empty wt of empty bucket (g) | Net wt contains of bucket (g) | Full wt of full total bucket (g) | Empty wt of empty bucket (g) | Net wt contains of bucket (g) |
|---|---|---|---|---|---|---|
| ACI21_P200_10102017_SW_R1 | 5426 | 435 | 4991 | — | — | — |
| ACI21_P200_10102017_SW_R2 | 6974 | 439 | 6535 | — | — | — |
| AOI21_P200_10102017_SW_R3 | 6972 | 430 | 6542 | — | — | — |
| — | 7610 | 439 | 7171 | — | — | — |
| — | 7369 | 429 | 6940 | — | — | — |
| — | 7997 | 436 | 7561 | — | — | — |
| — | 7979 | 431 | 7548 | — | — | — |
| — | 7353 | 426 | 6927 | — | — | — |
| — | 7872 | 428 | 7444 | — | — | — |
| — | 2928 | 425 | 2503 | — | — | — |

### Field Office TSS Calculations

| | | | |
|---|---|---|---|
| $C_w$ (g) | 82.0 | | |
| $F_w$ (g) | 10.12 | $W_w$ (g) = | 92.12 |
| $C_d$ (g) | 6.7 | | |
| $F_d$ (g) | 4.18 | $W_d$ (g) = | 10.87 |
| S (g) | 68,225.60 | Sal (ppm) = | 29,602.31 |
| Percent SS (%) = | — | | |
| Total Filter Passing Vol ~~(ml)~~ (L) = | 64.16 | | |

Comments: All weights collected with an electronic balance

Clarifying Information Recorded by (F.Last; Date): K. Casey; 12/7/2017 CHECKED BY: LMT 12/21/17

## WET TO DRY WEIGHT CONVERSION FORM

(In General Accordance with ASTM D2216)

PROJECT NAME: PENOBSCOT RIVER PHASE III ENGINEERING STUDY
PROJECT NUMBER: 3616166052

| | | | | | | |
|---|---|---|---|---|---|---|
| DATE: | 11/21/2017 | 11/21/2017 | 11/22/2017 | 11/22/2017 | 11/22/2017 | 11/22/2017 |
| TIME: | 13:30 | 18:45 | 08:35 | 09:45 | 10:55 | 12:05 |
| ELAPSED TIME (mins): | 0 | 315 | 1,145 | 1,215 | 1,285 | 1,355 |

| CORE LOCATION | SAMPLE NO. | SAMPLE DEPTH (ft) | TARE WEIGHT (g) | TARE + WET SOIL (g) | 1 TARE + DRY SOIL (g) | 2 TARE + DRY SOIL (g) | 3 TARE + DRY SOIL (g) | 4 TARE + DRY SOIL (g) | 5 TARE + DRY SOIL (g) | PERCENT CHANGE (%) | WET WEIGHT OF SAMPLE (g)[1] | DRY WEIGHT OF SAMPLE (g) | WET CONTENT OF SAMPLE (%)[2] | DRY CONTENT OF SAMPLE (%)[3] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VE-05-01 | Sample 1 | 1-1.5 | 654.77 | 777.45 | 667.28 | 667.99 | 667.06 | 666.89 | 666.78 | 0.014% | 141.99 | 12.01 | 1,182 | 8.5 |
| VE-05-01 | Sample 2 | 1-1.5 | 185.55 | 298.39 | 194.49 | 195.12 | 194.49 | 194.34 | 194.32 | 0.007% | 121.79 | 8.77 | 1,389 | 7.2 |
| VE-05-01 | Sample 3 | 1-1.5 | 182.12 | 288.15 | 193.01 | 193.56 | 192.85 | 192.71 | 192.70 | 0.003% | 117.48 | 10.58 | 1,110 | 9.0 |

Notes:
1. Determined during sample preparation.
2. With respect to dry basis (e.g., (wet weight / dry weight) * 100).
3. With respect to wet basis (e.g., (dry weight / wet weight) * 100).

Prepared by: DRY 5/8/2018
Checked by: KMC 5/8/2018

Abbreviations:
% = Percent
ft = feet/foot
g = grams

# APPENDIX C-2
# EROSIONAL INDICATOR MEASUREMENT FDRS

**Penobscot River Mercury Study - Phase III Engineering Study**

**EROSIVE INDICATOR MEASUREMENT LOG - FIELD RECORD**

| | | |
|---|---|---|
| Owner: USDC, District of Maine | Project No.: 3616166052 | **Measurement Taker: Julia Tillery** |
| Sub: NA | WO: 4A060 | **Crew: Karina Casey (CAPTAIN), Julia Tillery, Meg Stemper** |
| Tablet #: | **Date: 9-26-17** Time : 7:00 am | **Vessel(s): Skiff, kayak** |
| PLAN.: 10 AREAS, 10 MEASUREMENTS AT EACH | | **Tidal Restricted Location? YES** |

**ACTIVITIES:**
**(1) COLLECTED RIVULET MEASUREMENTS AT ORRRINGTON RIVER: EASTERN SHORELINE (ON-RV-1 THROUGH ON-RV-5) & WESTERN SHORELINE (ON-RV-6 THROUGH ON-RV-10)**
**NOTE: Not able to access mudline for direct measurements. Developed estimated size as follows and marked on rulers:**
**Small (S) = 0 to 5 inches / Medium (M) = 5 to 10 inches / Large (L) = 10 to 15 inches / Extra Large (XL) = Greater than 15 inches**
**Conversion of estimates in inches to centimeters is average of each measurement (rounded up to nearest cm) as follows:**
**S = 0 to 5 inches > converted to average of 2.5 inches x 2.34 cm/inch = 6 cm**
**M = 5 to 10 inches > converted to average of 7.5 inches x 2.34 cm/inch = 18 cm**
**L = 10 to 15 inches > converted to average of 12.5 inches x 2.34 cm/inch = 30 cm**
**XL = > 15 inches (assume 25.5 inches average) x 2.34 cm/inch = 60 cm**

**FIELD NOTES & OBSERVATIONS**

| | | | | |
|---|---|---|---|---|
| **Weather: Sunny** | **Winds: Breezy** | **Water: Choppy** | **Traffic: Powerboats, yachts** | **Water Temp: _____ °F** |

**Erosive Feature Identification**

**Naming Convention = MU(_NAME_)-RV(RIVULET)__NUMBER_ (1-10), e.g. MM-RV-1 WAS 1ST MEASUREMENT TAKEN AT MENDALL MARSH AREA**

**MEASUREMENTS**

| MEASUREMENT # (__ of 10) | MANAGEMENT UNIT (MU) | RIVULET ID | TIME OF MEASUREMENT | WIDTH AT WATERLINE (cm) | VISUAL DEPTH AT WATERLINE (cm) | RULER RESISTANCE AT WATERLINE (cm) | ESTIMATED MEASUREMENTS IF WATERLINE NOT ACCESSIBLE | GPS RECORDED? | PHOTO TAKEN? | LOCATION | Water Present in Rivulet? | Overlying Water Present? | Wood Waste (WW) | Uniform<br>Straight<br>Terraced<br>Zig Zag<br>Eroded Bank | Surface Water Feeding In From River? | Vegetation | Boulders | Approx. Distance To Vegetation, Treeline, Rockline Estimate or GIS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Orrington | RV-1 | 9:00 AM | 18 | 6 | NA | M/S (MEDIUM WIDTH/SMALL DEPTH) | yes | yes | East shoreline | yes | yes | yes, brown surface, black rivulets | 1 long zig zag rivulet that continues upslope behind boulders or into treeline | yes | upslope grasses, reeds | yes | 100 ft estimate |
| 2 | Orrington | RV-2 | 9:20 AM | 6 | 6 | NA | S/S | yes | yes | East shoreline | yes | yes | yes, brown surface, black rivulets | 1 long zig zag rivulet that continues upslope behind boulders or into treeline | yes | upslope grasses, reeds | yes | 100 ft estimate |
| 3 | Orrington | RV-3 | 9:40 AM | 6 | 18 | NA | S/M | yes | yes | East shoreline | yes | yes | yes, brown surface, black rivulets | 1 long zig zag rivulet that continues upslope behind boulders or into treeline | yes | upslope grasses, reeds | yes | 100 ft estimate |
| 4 | Orrington | RV-4 | 10:00 AM | 18 | 18 | NA | M/M | yes | yes | East shoreline | yes | yes | yes, brown surface, black rivulets | 1 long zig zag rivulet that continues upslope behind boulders or into treeline | yes | upslope grasses, reeds | yes | 100 ft estimate |
| 5 | Orrington | RV-5 | 10:30 AM | 18 | 6 | NA | M/S (deeper meters upslope) | yes | yes | East shoreline | yes | yes | yes, brown surface, black rivulets | 1 long zig zag rivulet that continues upslope behind boulders or into treeline | yes | upslope grasses, reeds | yes | 100 ft estimate |
| 6 | Orrington | RV-6 | 11:40 AM | 70 | 12 | 17 | | yes | yes | East shoreline | yes | yes | yes, brown coating on surface | 1 long zig zag rivulet that continues upslope behind boulders or into treeline | yes | upslope grasses, reeds | yes | 100 ft estimate |
| 7 | Orrington | RV-7 | 11:50 AM | 18 | 30 | NA | M/L | yes | yes | West shoreline | yes | yes | yes, brown coating on surface | 1 long zig zag rivulet that continues upslope behind boulders or into treeline | yes | upslope grasses, reeds | yes | 100 ft estimate |
| 8 | Orrington | RV-8 | 12:20 PM | 18 | 6 | NA | M/S | yes | yes | West shoreline | yes | yes | yes, brown coating on surface | 1 long zig zag rivulet that continues upslope behind boulders or into treeline | yes | upslope grasses, reeds | yes | 100 ft estimate |
| 9 | Orrington | RV-9 | 12:30 PM | 18 | 6 | NA | M/S | yes | yes | West shoreline | yes | yes | yes, brown coating on surface | 1 long zig zag rivulet that continues upslope behind boulders or into treeline | yes | upslope grasses, reeds | yes | 100 ft estimate |
| 10 | Orrington | RV-10 | 12:40 PM | 30 | 6 | NA | L/S | yes | yes | West shoreline | yes | yes | yes, brown coating on surface | 1 long zig zag rivulet that continues upslope behind boulders or into treeline | yes | upslope grasses, reeds | yes | 100 ft estimate |
| 11 | Orrington | RV-11 | 12:40 PM | 18 | 18 | NA | M/M | yes | yes | West shoreline | yes | yes | yes, brown coating on surface | 1 long zig zag rivulet that continues upslope behind boulders or into treeline | yes | upslope grasses, reeds | yes | 100 ft estimate |

**PHOTOGRAPHS**

**PHOTO 1**

**PHOTO 2**

**PHOTO 3**

**PHOTO 4**

**PHOTO 5**

**PHOTO 6**

**PHOTO 7**

**PHOTO 8**

**PHOTO 9**

**COMMENTS**: LOW TO RISING TIDE NEEDED TO BE ABLE TO REACH SHORELINE TO TAKE PHYSICAL MEASUREMENT FROM CANOE/KAYAK

| | | | | |
|---|---|---|---|---|
| Aboard Vessel Information Recorded by (F. Last; date): Meg Stemper, 9-26-17 | MS 9-26-17 | TAKE NOTES & PHOTOS & RECORD MEASUREMENTS | Checked By (F. Last; date) | |
| Clarifying Information Recorded by (F. Last; date); | JT 9-26-17 | GPS COORDINATES | D. Young; 12/06/2017 | |
| Landside Information Recorded by (F. Last; date): | NA | | | |

amec foster wheeler

**Penobscot River Mercury Study - Phase III Engineering Study**

**EROSIVE INDICATOR MEASUREMENT LOG - FIELD RECORD**

| | | |
|---|---|---|
| Owner: USDC, District of Maine | Project No.: 3616166052 | **Logger: KC** |
| Sub: NA | WO: 4A060 | **Crew: KC, CP, MS** |
| Tablet #: Android | **Date: 9/23/17** **Time : 9:15AM - 3:15PM** | **Vessels: PONTOON, CANOE** |
| PLAN.: 10 AREAS, 10 MEASUREMENTS AT EACH | | **Tidal Restricted Location? YES** |

**ACTIVITIES:**
**(1) RECON TO IDENTIFY 10 AREAS WHERE MEASUREMENTS WILL BE COLLECTED**
**(2) COLLECTED RIVULET MEASUREMENTS AT BUCKSPORT WESTERN SHORELINE: BU-RV-1 THROUGH BU-RV-5**

**Weather: SUNNY** **Winds: LIGHT BREEZE**

**FIELD NOTES & OBSERVATIONS**

**Erosive Feature Identification**

**Naming Convention = MU(_NAME_)-RV(RIVULET)__NUMBER_ (1-10), e.g. BU-RV-1 WAS 1ST MEASUREMENT TAKEN AT BUCKSPORT AREA**

**MEASUREMENTS**

| MEASUREMENT # (__ of 10) | MANAGEMENT UNIT (MU) | RIVULET # | WIDTH AT WATERLINE (cm) | VISUAL DEPTH AT WATERLINE (cm) | RULER RESISTANCE AT WATERLINE (cm) | GPS RECORDED? | PHOTO TAKEN? | LOCATION | Water Present in Rivulet? | Overlying Water Present? | Wood Waste (WW) | Uniform Straight Terraced Zig Zag Eroded Bank | Surface Water Feeding In From River? | Vegetation | Boulders | Approx. Distance To Vegetation, Treeline, Rockline |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Bucksport | RV-1 | 56 | 8 | 12 | YES | PHOTO 1 BELOW | BETWEEN GROINS | YES | NO | FINE BROWN WW FILM AT SHORELINE WIDE BAND OF THICKER WW TOP OF SHORELINE IN VEGETATED AREAWITH MANY SMALL RIVULETS IN WW | UNIFORM (ONE RIVULET) ZIG ZAG (SOFT CURVES) | NO BUT LIKELY STREAMFED FROM TOP OF SHORELINE AT OTHER TIMES | GRASSES TOP OF SHORELINE | SOME TOP OF SHORELINE | >50 FEET TO GRASSES >100 FEET TO TREELINE |
| 2 | Bucksport | RV-2 | 34 | 5 | 6 | YES | PHOTO 2 BELOW | BETWEEN GROINS | YES | NO | FINE BROWN WW FILM AT SHORELINE WIDE BAND OF THICKER WW TOP OF SHORELINE IN VEGETATED AREAWITH MANY SMALL RIVULETS IN WW | UNIFORM (ONE RIVULET) ZIG ZAG (SOFT CURVES) | NO BUT LIKELY STREAMFED FROM TOP OF SHORELINE AT OTHER TIMES | GRASSES TOP OF SHORELINE | SOME TOP OF SHORELINE | >50 FEET TO GRASSES >100 FEET TO TREELINE |
| 3 | Bucksport | RV-3 | 39 | 6 | 6 | YES | NO | BETWEEN GROINS | YES | NO | FINE BROWN WW FILM AT SHORELINE WIDE BAND OF THICKER WW TOP OF SHORELINE IN VEGETATED AREAWITH MANY SMALL RIVULETS IN WW | UNIFORM (ONE RIVULET) ZIG ZAG (SOFT CURVES) | NO BUT LIKELY STREAMFED FROM TOP OF SHORELINE AT OTHER TIMES | GRASSES TOP OF SHORELINE | SOME TOP OF SHORELINE | >50 FEET TO GRASSES >100 FEET TO TREELINE |
| 4 | Bucksport | RV-4 | 54 | 7 | 7 | YES | NO | BETWEEN GROINS | YES | NO | FINE BROWN WW FILM AT SHORELINE WIDE BAND OF THICKER WW TOP OF SHORELINE IN VEGETATED AREAWITH MANY SMALL RIVULETS IN WW | UNIFORM (ONE RIVULET) ZIG ZAG (SOFT CURVES) | NO BUT LIKELY STREAMFED FROM TOP OF SHORELINE AT OTHER TIMES | GRASSES TOP OF SHORELINE | SOME TOP OF SHORELINE | >50 FEET TO GRASSES >100 FEET TO TREELINE |
| 5 | Bucksport | RV-5 | 100 | 18 | 18 | YES | NO | BETWEEN GROINS | YES | NO | FINE BROWN WW FILM AT SHORELINE WIDE BAND OF THICKER WW TOP OF SHORELINE IN VEGETATED AREAWITH MANY SMALL RIVULETS IN WW | UNIFORM (ONE RIVULET) ZIG ZAG (SOFT CURVES) | NO BUT LIKELY STREAMFED FROM TOP OF SHORELINE AT OTHER TIMES | GRASSES TOP OF SHORELINE | SOME TOP OF SHORELINE | >50 FEET TO GRASSES >100 FEET TO TREELINE |

**PHOTOGRAPHS**

**PHOTO 1**

**PHOTO 2**

**Comments**

LOW TO RISING TIDE NEEDED TO BE ABLE TO REACH SHORELINE TO TAKE PHYSICAL MEASUREMENT FROM CANOE

| | | | |
|---|---|---|---|
| Aboard Vessel Information Recorded by (F. Last; date): | MS 9/23/17 | TAKE NOTES & RECORD MEASUREMENTS | Checked By (F. Last; date) |
| Clarifying Information Recorded by (F. Last; date); | KC 9/2/317 | GPS COORDINATES | D. Young; 12/06/2017 |
| Landside Information Recorded by (F. Last; date): | NA | | |

**Penobscot River Mercury Study - Phase III Engineering Study**

**EROSIVE INDICATOR MEASUREMENT LOG - FIELD RECORD**

| | | |
|---|---|---|
| Owner: USDC, District of Maine | Project No.: 3616166052 | Logger: KC |
| Sub: NA | WO: 4A060 | Crew: KC, CP, MS |
| Tablet #: Android | Date: 9/27/17 | Time : 9:15AM - 1:45 PM |
| | | Vessels: PONTOON, CANOE |
| PLAN.: 2 AREAS, 5-10 MEASUREMENTS AT EACH | | Tidal Restricted Location? YES |

**ACTIVITIES:**
**COLLECTED RIVULET MEASUREMENTS AT BUCKSPORT WESTERN SHORELINE: BU-RV-6 THROUGH BU-RV-10 & AT FRANKFORT FLATS WESTERN SHORELINE: FF-RV-1 THROUGH FF-RV-2**

**FIELD NOTES & OBSERVATIONS**

**Weather: SUNNY** | **Winds: LIGHT BREEZE**

**Erosive Feature Identification**

**Naming Convention = MU(_NAME_)-RV(RIVULET)__NUMBER_(1-10), e.g. BU-RV-1 WAS 1ST MEASUREMENT TAKEN AT BUCKSPORT AREA**

**MEASUREMENTS**

| MEASUREMENT # (__ of 10) | MANAGEMENT UNIT (MU) | RIVULET ID | WIDTH AT WATERLINE (cm) | VISUAL DEPTH AT WATERLINE (cm) | RULER RESISTANCE AT WATERLINE (cm) | ESTIMATED WIDTH/DEPTH IF UNABLE TO MEASURE | GPS RECORDED? | PHOTO TAKEN? | LOCATION | Water Present in Rivulet? | Overlying Water Present? | Wood Waste (WW) | Uniform Straight Terraced Zig Zag Eroded Bank | Surface Water Feeding In From River? | Vegetation | Boulders | Approx. Distance To Vegetation, Treeline, Rockline |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | BUCKSPORT | RV-6 | 6 | 6 | NA | SMALL WITH OVERLYING WATER | YES | YES | BETWEEN GROINS | YES | YES | FINE REDDISH BROWN WW FILM AT SHORELINE APPROX. 3 METER WIDE BAND ALONG SHORELINE THAT FOLLOWS RIVULET UP SHORELINE INTO VEGETATED AREA WITH MANY SMALL RIVULETS IN WW | UNIFORM (ONE RIVULET) ZIG ZAG (SOFT CURVES) | NO BUT LIKELY STREAMFED FROM TOP OF SHORELINE AT OTHER TIMES | GRASSES TOP OF SHORELINE | SOME TOP OF SHORELINE | >50 FEET TO GRASSES >100 FEET TO TREELINE |
| 2 | BUCKSPORT | RV-7 | 8 | 3 | 5 | NA | YES | YES | BETWEEN GROINS | YES | NO | FINE REDDISH BROWN WW FILM AT SHORELINE APPROX. 3 METER WIDE BAND ALONG SHORELINE THAT FOLLOWS RIVULET UP SHORELINE INTO VEGETATED AREA WITH MANY SMALL RIVULETS IN WW | UNIFORM (ONE RIVULET) ZIG ZAG (SOFT CURVES) | NO BUT LIKELY STREAMFED FROM TOP OF SHORELINE AT OTHER TIMES | GRASSES TOP OF SHORELINE | SOME TOP OF SHORELINE | >50 FEET TO GRASSES >100 FEET TO TREELINE |
| 3 | BUCKSPORT | RV-8 | 9 | 3 | 4 | NA | YES | YES | BETWEEN GROINS | YES | NO | FINE REDDISH BROWN WW FILM AT SHORELINE APPROX. 3 METER WIDE BAND ALONG SHORELINE THAT FOLLOWS RIVULET UP SHORELINE INTO VEGETATED AREA WITH MANY SMALL RIVULETS IN WW | UNIFORM (ONE RIVULET) ZIG ZAG (SOFT CURVES) | NO BUT LIKELY STREAMFED FROM TOP OF SHORELINE AT OTHER TIMES | GRASSES TOP OF SHORELINE | SOME TOP OF SHORELINE | >50 FEET TO GRASSES >100 FEET TO TREELINE |
| 4 | BUCKSPORT | RV-9 | 12 | 5 | 6 | NA | YES | YES | BETWEEN GROINS | YES | NO | FINE REDDISH BROWN WW FILM AT SHORELINE APPROX. 3 METER WIDE BAND ALONG SHORELINE THAT FOLLOWS RIVULET UP SHORELINE INTO VEGETATED AREA WITH MANY SMALL RIVULETS IN WW | UNIFORM (ONE RIVULET) ZIG ZAG (SOFT CURVES) | NO BUT LIKELY STREAMFED FROM TOP OF SHORELINE AT OTHER TIMES | GRASSES TOP OF SHORELINE | SOME TOP OF SHORELINE | >50 FEET TO GRASSES >100 FEET TO TREELINE |
| 5 | BUCKSPORT | RV-10 | 1700 | 550 | NA | 17 METERS LONG PARALLEL TO SHORE 5-6 METERS WIDE PERPENDICULAR TO SHORE | YES | YES | BETWEEN GROINS | YES | NO | FINE REDDISH BROWN WW FILM AT SHORELINE APPROX. 3 METER WIDE BAND ALONG SHORELINE THAT FOLLOWS RIVULET UP SHORELINE INTO VEGETATED AREA WITH MANY SMALL RIVULETS IN WW | UNIFORM (ONE RIVULET) ZIG ZAG (SOFT CURVES) | NO BUT LIKELY STREAMFED FROM TOP OF SHORELINE AT OTHER TIMES | GRASSES TOP OF SHORELINE | SOME TOP OF SHORELINE | >50 FEET TO GRASSES >100 FEET TO TREELINE |
| 1 | FRANFORT FLATS | RV-1 | 1500 | 500 | NA | 15 METERS LONG ERODED BANK 5 METER WIDE PERPENDICULAR TO SHORE | YES | YES | EASTERN SHORE | YES | NO | FINE REDDISH BROWN WW FILM AT SHORELINE APPROX. 3 METER WIDE BAND ALONG SHORELINE THAT FOLLOWS RIVULET UP SHORELINE INTO VEGETATED AREA WITH MANY SMALL RIVULETS IN WW | UNIFORM ERODED BANK PARALLEL TO SHORE UNIFORM LARGE RIVULET PERPENDICULAR TO SHORE BEHIND ERODED BANK | NO BUT LIKELY STREAMFED FROM TOP OF SHORELINE AT OTHER TIMES | GRASSES TOP OF SHORELINE | SOME TOP OF SHORELINE | >50 FEET TO GRASSES >100 FEET TO TREELINE |
| 2 | FRANFORT FLATS | RV-2 | 1500 | 500 | NA | 16 METERS LONG ERODED BANK 5 METER WIDE PERPENDICULAR TO SHORE | YES | YES | EASTERN SHORE | YES | NO | FINE REDDISH BROWN WW FILM AT SHORELINE APPROX. 3 METER WIDE BAND ALONG SHORELINE THAT FOLLOWS RIVULET UP SHORELINE INTO VEGETATED AREA WITH MANY SMALL RIVULETS IN WW | UNIFORM ERODED BANK PARALLEL TO SHORE UNIFORM LARGE RIVULET PERPENDICULAR TO SHORE BEHIND ERODED BANK | NO BUT LIKELY STREAMFED FROM TOP OF SHORELINE AT OTHER TIMES | GRASSES TOP OF SHORELINE | SOME TOP OF SHORELINE | >50 FEET TO GRASSES >100 FEET TO TREELINE |

**PHOTOGRAPHS**

PHOTO 1

PHOTO 2

PHOTO 3

PHOTO 4

**Comments**

LOW TO RISING TIDE NEEDED TO BE ABLE TO REACH SHORELINE TO TAKE PHYSICAL MEASUREMENT FROM CANOE OR KAYAK

| | | | | |
|---|---|---|---|---|
| Aboard Vessel Information Recorded by (F. Last; date): | | MS 9/27/17 | TAKE NOTES & RECORD MEASUREMENTS | Checked By (F. Last; date) |
| Clarifying Information Recorded by (F. Last; date); | | JT 9/27/317 | GPS COORDINATES | D. Young; 12/06/2017 |
| Landside Information Recorded by (F. Last; date): | | NA | | |

**Penobscot River Mercury Study - Phase III Engineering Study**

**EROSIVE INDICATOR MEASUREMENT LOG - FIELD RECORD**

| | | |
|---|---|---|
| Owner: USDC, District of Maine | Project No.: 3616166052 | **Measurement Taker: Julia Tillery** |
| Sub: NA | WO: 4A060 | **Crew: Karina Casey (CAPTAIN), Julia Tillery, Meg Stemper** |
| Tablet #: | **Date: 9-25-17** Time : 9:15 am | **Vessel(s): Pontoon, canoe** |
| PLAN.: 10 AREAS, 10 MEASUREMENTS AT EACH | | **Tidal Restricted Location? YES** |

**ACTIVITIES:**
**(1) COLLECTED RIVULET MEASUREMENTS AT Mendall Marh: EASTERN SHORELINE (MM-RV-1 THROUGH MM-RV-5) & WESTERN SHORELINE (MM-RV-6 THROUGH MM-RV-10)**

**FIELD NOTES & OBSERVATIONS**

| | | | |
|---|---|---|---|
| **Weather: Sunny** | **Winds: Breezy** | **Water: Choppy** | **Water Temp: _____ °F** |

**Erosive Feature Identification**

**Naming Convention = MU(_NAME_)-RV(RIVULET)__NUMBER_ (1-10), e.g. MM-RV-1 WAS 1ST MEASUREMENT TAKEN AT MENDALL MARSH AREA**

**MEASUREMENTS**

| MEASUREMENT # (__ of 10) | MANAGEMENT UNIT (MU) | RIVULET ID | TIME OF MEASUREMENT | WIDTH AT WATERLINE (cm) | VISUAL DEPTH AT WATERLINE (cm) | RULER RESISTANCE AT WATERLINE (cm) | GPS RECORDED? | PHOTO TAKEN? | LOCATION | Water Present in Rivulet? | Overlying Water Present? | Wood Waste (WW) | Uniform Straight Terraced Zig Zag Eroded Bank | Surface Water Feeding In From River? | Vegetation | Boulders | Approx. Distance To Vegetation, Treeline, Rockline Estimate or GIS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Mendall Marsh | RV-1 | 10:00 AM | 62 | 5.5 | 5.5 | yes | yes | East shoreline | yes | yes | yes, fine brown film | 1 main uniform rivulet, 2 smaller rivulets at waterline | yes | upslope grasses, reeds | no | 100 ft estimate |
| 2 | Mendall Marsh | RV-2 | 10:05 AM | 27 | 4 | 6.5 | yes | yes | East shoreline | yes | yes | yes, fine brown film | 1 smaller zig zag rivulet | yes | upslope grasses, reeds | no | 100 ft estimate |
| 3 | Mendall Marsh | RV-3 | 10:10 AM | 8 | 2 | 5 | yes | yes | East shoreline | yes | yes | yes, fine brown film | 1 smaller zig zag rivulet | yes | upslope grasses, reeds | no | 100 ft estimate |
| 4 | Mendall Marsh | RV-4 | 10:20 AM | 25 | 12 | 12 | yes | yes | East shoreline | yes | yes | yes, fine brown film | 1 deep cut uniform rivulet | yes | upslope grasses, reeds | no | 100 ft estimate |
| 5 | Mendall Marsh | RV-5 | 10:30 AM | 15 | 5 | 8 | yes | yes | East shoreline | yes | yes | yes, fine brown film | 1 deep cut uniform rivulet | yes | upslope grasses, reeds | no | 100 ft estimate |
| 6 | Mendall Marsh | RV-6 | 10:50 AM | 40 | 6 | 11 | yes | yes | West shoreline | yes | yes | yes, fine brown film | 1 shallow uniform rivulet | yes | upslope grasses, reeds | no | 100 ft estimate |
| 7 | Mendall Marsh | RV-7 | 11:00 AM | 70 | 11 | 15 | yes | yes | West shoreline | yes | yes | yes, fine brown film | 1 deep cut zig zag rivulet | yes | upslope grasses, reeds | no | 100 ft estimate |
| 8 | Mendall Marsh | RV-8 | 11:15 AM | 88 | 9 | 12 | yes | yes | West shoreline | yes | yes | yes, fine brown film | 1 deep cut zig zag rivulet | yes | upslope grasses, reeds | no | 100 ft estimate |
| 9 | Mendall Marsh | RV-9 | 11:20 AM | 25 | 5 | 7 | yes | yes | West shoreline | yes | yes | yes, fine brown film | 1 deep cut zig zag rivulet | yes | upslope grasses, reeds | no | 100 ft estimate |
| 10 | Mendall Marsh | RV-10 | 11:30 AM | 45 | 7 | 11 | yes | yes | West shoreline | yes | yes | yes, fine brown film | 1 deep cut zig zag rivulet | yes | upslope grasses, reeds | no | 100 ft estimate |

**PHOTOGRAPHS**

**PHOTO 1**

**PHOTO 2**

**PHOTO 3**

**PHOTO 4**

**PHOTO 5**

**PHOTO 6**

**PHOTO 7**

**PHOTO 8**

**PHOTO 9**

**PHOTO 10**

**COMMENTS**: LOW TO RISING TIDE NEEDED TO BE ABLE TO REACH SHORELINE TO TAKE PHYSICAL MEASUREMENT FROM CANOE/KAYAK

| | | | | |
|---|---|---|---|---|
| Aboard Vessel Information Recorded by (F. Last; date): Meg Stemper, 9-25-17 | | MS 9-25-17 | TAKE NOTES & PHOTOS & RECORD MEASUREMENTS | Checked By (F. Last; date) |
| Clarifying Information Recorded by (F. Last; date); | | JT 9-25-17 | GPS COORDINATES | D. Young; 12/06/2017 |
| Landside Information Recorded by (F. Last; date): | | NA | | |

# APPENDIX D
# PHOTO LOGS

# APPENDIX D-1
# SUSPENDED MATERIAL COLLECTION PHOTO LOG

**PHOTO 1:**
Phase 1 of sampling method using metal rods to extend sampling hose into water column.

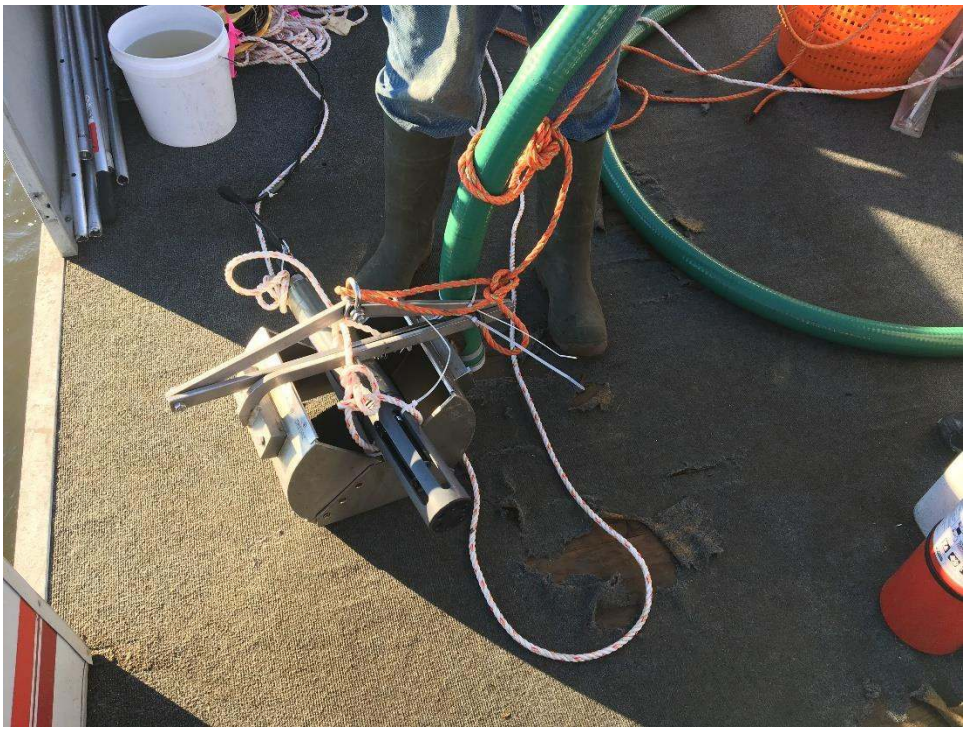

**PHOTO 2:**
Adaptation of phase 1 of sampling method using petite ponar to lower sampling hose and sonde probe into water column.

**PHOTO 3:**
Phase 2 of sampling method using weighted apparatus and 2 hoses for sample collection.


**PHOTO 4:**
Adjusted and final phase 2 sampling method using weighted apparatus, sonde probe, single hose, and water camera for sample collection.

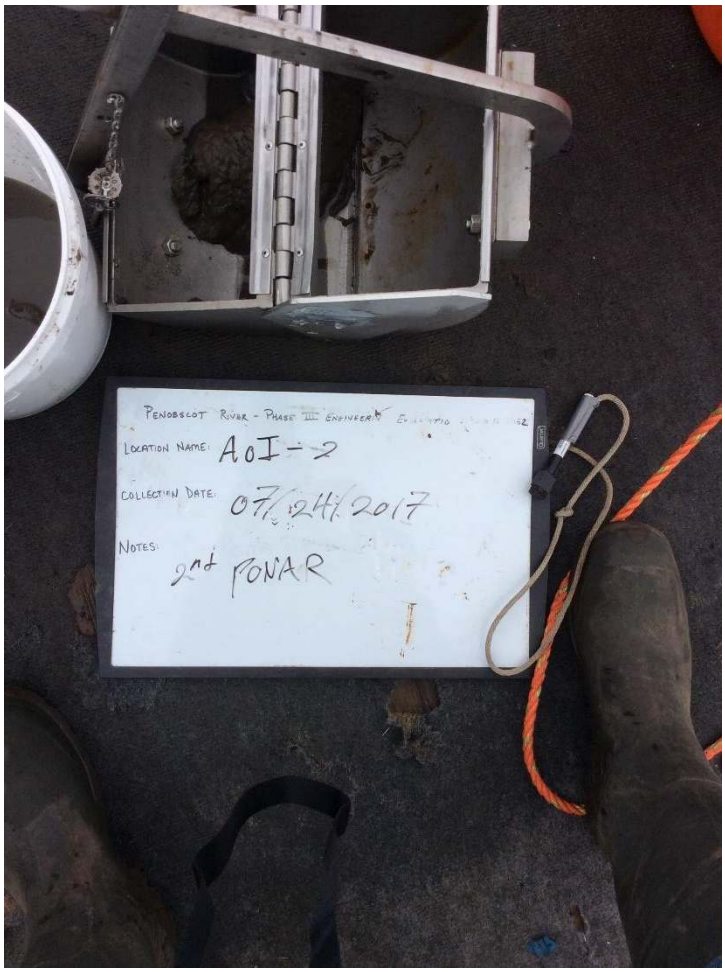


**PHOTO 5:**
AOI-2 ponar grab sample. Sample was mixture of silt and wood waste.

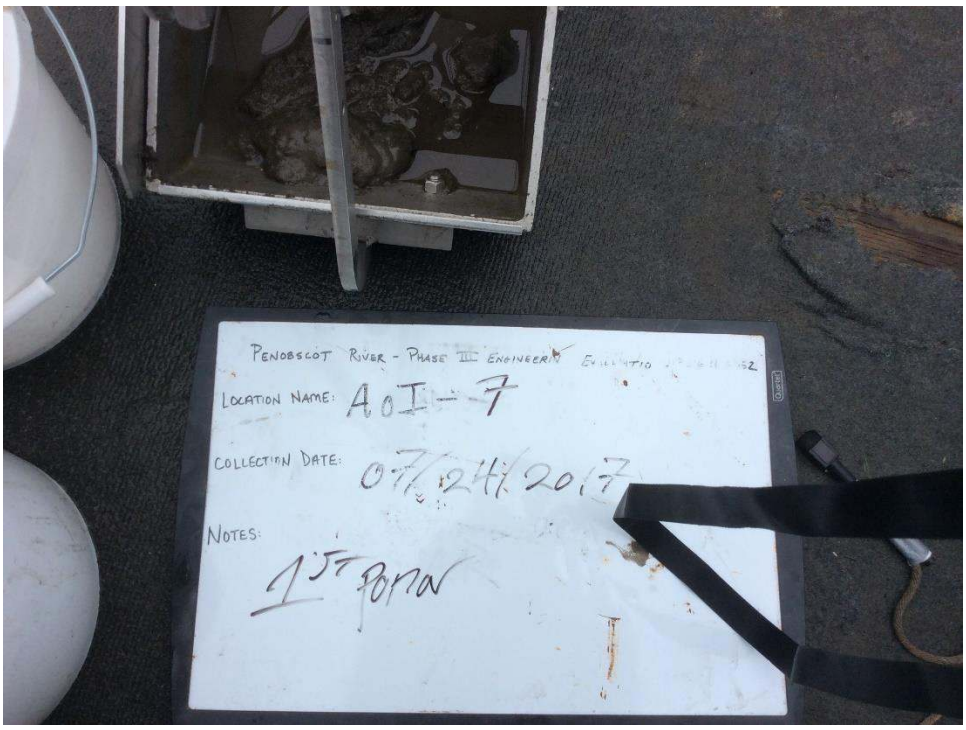


**PHOTO 6:**
AOI-7 ponar grab sample. Sample was mixture of silt and wood waste.

**PHOTO 7:**
AOI-11 ponar grab sample. Sample was mainly silt.

**PHOTO 8:**
Petite ponar grab sample method.

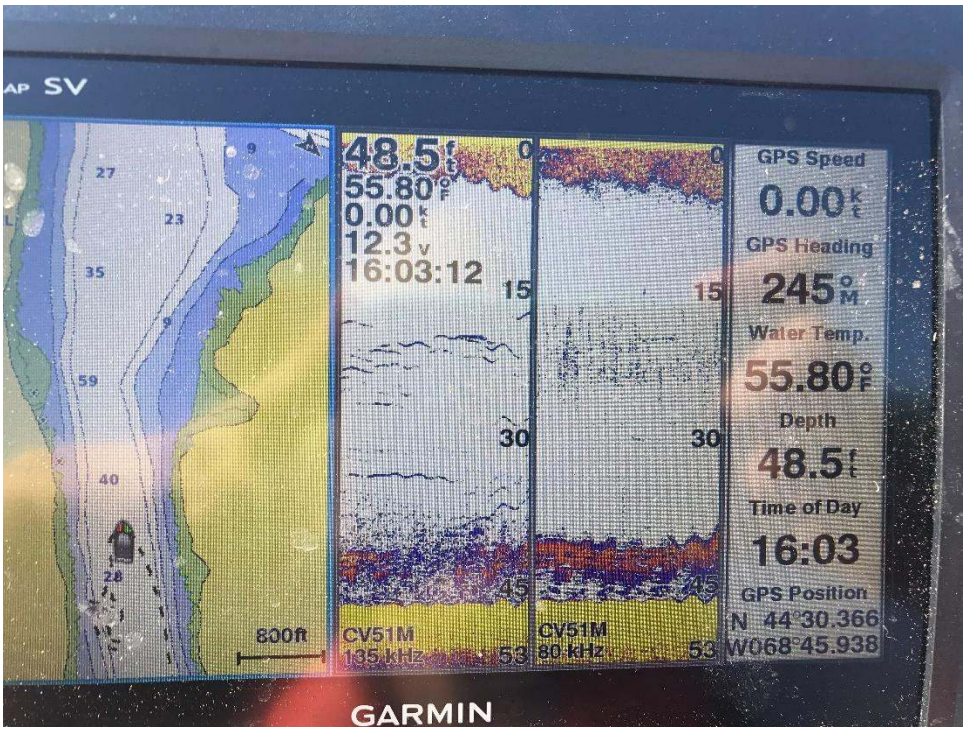


**PHOTO 9:**
Potential suspended sediment (blue and red color) observed over river bottom (yellow color) on Garmin sonar at AOI-21.

**PHOTO 10:**
Sonde and hose apparatus used for the September 19, 2017 sampling event.

**PHOTO 11:**
Wood waste collected from the sonde and hose apparatus during the September 19, 2017 sampling event.

**PHOTO 12:**
The net apparatus used for the September 19, 2017 sampling event.

**PHOTO 13:**
Wood waste collected in the net apparatus during the September 19, 2017 sampling event.

# APPENDIX D-2
# BEDROCK, BOULDER AND HARDPAN COVERAGE EVALUATION PHOTO LOG

**PHOTO 1:**
**Reach:** Bangor
**Location Name:** BBR-01
**Photo Direction:** North

**PHOTO 2:**
**Reach:** Bangor
**Location Name:** BBR-02
**Photo Direction:** Southeast

**PHOTO 3:**
**Reach:** Orrington
**Location Name:** BBR-03
**Photo Direction:** Southeast

**PHOTO 4:**
**Reach:** Orrington
**Location Name:** BBR-04
**Photo Direction:** Northwest

**PHOTO 5:**
**Reach:** Winterport
**Location Name:** BBR-05
**Photo Direction:** Northwest

**PHOTO 6:**
**Reach:** Winterport
**Location Name:** BBR-06
**Photo Direction:** Southeast

**PHOTO 7:**
**Reach:** Verona Northeast
**Location Name:** BBR-07
**Photo Direction:** Northwest

**PHOTO 8:**
**Reach:** Verona Northeast
**Location Name:** BBR-08
**Photo Direction:** Southeast

**PHOTO 9:**
**Reach:** Bucksport Thalweg
**Location Name:** BBR-09
**Photo Direction:** West

**PHOTO 10:**
**Reach:** Bucksport Thalweg
**Location Name:** BBR-10
**Photo Direction:** East

**PHOTO 11:**
**Reach:** Verona West
**Location Name:** BBR-11
**Photo Direction:** East

**PHOTO 12:**
**Reach:** Verona West
**Location Name:** BBR-12
**Photo Direction:** West

**PHOTO 13:**
**Reach:** Verona East
**Location Name:** BBR-13
**Photo Direction:** Northwest

**PHOTO 14:**
**Reach:** Verona East
**Location Name:** BBR-14
**Photo Direction:** South

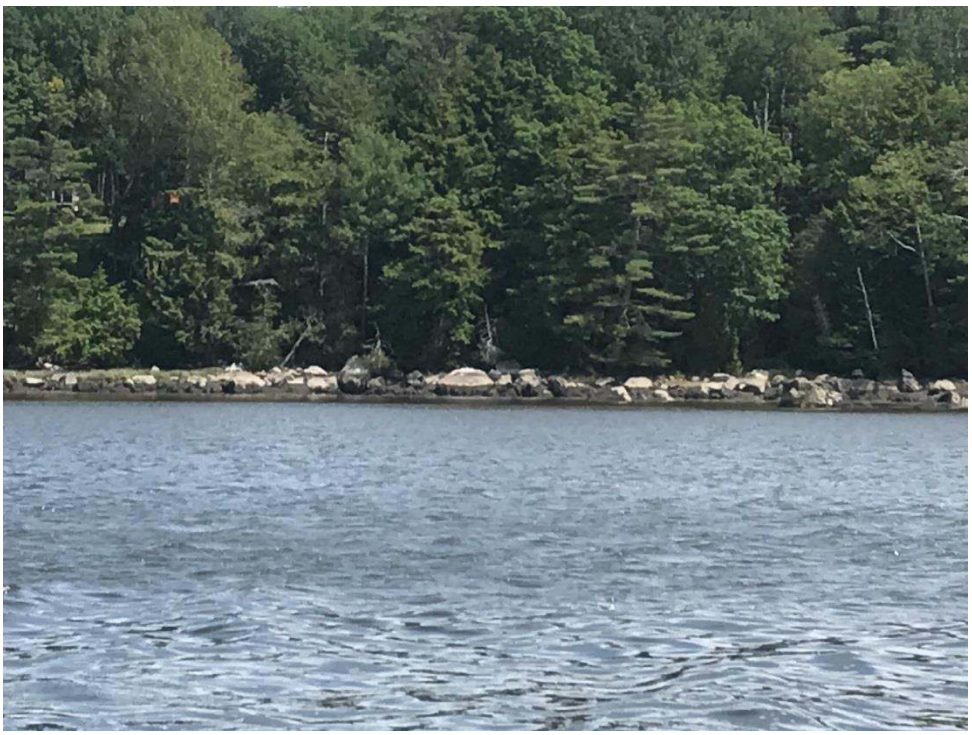

**PHOTO 15:**
**Reach:** Orland River
**Location Name:** BBR-15
**Photo Direction:** East

**PHOTO 16:**
**Reach:** Orland River
**Location Name:** BBR-16
**Photo Direction:** West