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November 21, 2017

Mr. Pablo Valentin  
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Region 5  
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Chicago, Illinois 60604-3590

RE: 2017 Surface Sediment Monitoring Report  
Sheboygan River and Inner Harbor Superfund Site  
Sheboygan, Kohler and Sheboygan Falls, Wisconsin  
SME Project No. 069638.00.032.001  
Serial Letter #44

Dear Pablo:

Enclosed please find the 2017 Surface Sediment Monitoring Report for the Sheboygan River and Inner Harbor Superfund Site. On behalf of our client, PRS, SME revised and is submitting the report.

If you have questions regarding the report, feel free to contact Keith Egan at (513) 319-8919 or [egan@sme-usa.com](mailto:egan@sme-usa.com).

Respectfully,

**SME**

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# 2017 SURFACE SEDIMENT MONITORING REPORT

SHEBOYGAN RIVER AND INNER HARBOR SUPERFUND SITE  
SHEBOYGAN, KOHLER AND SHEBOYGAN FALLS, WISCONSIN

SME Project Number: 069638.00.032.001

November 21, 2017

Prepared for United States Environmental Protection Agency Region 5



# TABLE OF CONTENTS

<b>1. INTRODUCTION</b> .....	<b>1</b>
1.1 SITE HISTORY .....	1
1.2 PRIOR SWAC CONCENTRATIONS.....	2
<b>2. SAMPLING AND ANALYSIS</b> .....	<b>3</b>
2.1 SUMMARY OF SAMPLING PLAN .....	3
2.2 SAMPLE LOCATIONS AND COLLECTION .....	3
2.2.1 UPPER RIVER SAMPLE LOCATIONS .....	4
2.2.2 MIDDLE RIVER SAMPLE LOCATIONS .....	4
2.2.4 LOWER RIVER SAMPLE LOCATIONS .....	4
2.2.5 INNER HARBOR SAMPLE LOCATIONS.....	5
2.3 FIELD QUALITY ASSURANCE .....	5
2.4 CHEMICAL ANALYSIS.....	5
<b>3. SAMPLING RESULTS</b> .....	<b>5</b>
3.1 SEDIMENT RESULTS.....	5
3.2 DATA VERIFICATION/VALIDATION AND USABILITY .....	5
3.2.1 FIELD QUALITY CONTROL SAMPLES .....	6
3.2.2 LABORATORY QUALITY CONTROL SAMPLES .....	6
<b>4. DATA ANALYSIS</b> .....	<b>7</b>
4.1 2017 SAMPLE RESULTS ANALYSIS.....	7
4.2 CURRENT AND HISTORICAL RESULTS COMPARISON .....	8
<b>5. FUTURE PHASE I MONITORING</b> .....	<b>9</b>
<b>6. REFERENCES</b> .....	<b>10</b>

## TABLES

TABLE 1	SUMMARY OF 2017 SEDIMENT RESULTS – UPPER RIVER
TABLE 2	SUMMARY OF 2017 SEDIMENT RESULTS – MIDDLE RIVER
TABLE 3	SUMMARY OF 2017 SEDIMENT RESULTS – LOWER RIVER
TABLE 4	SUMMARY OF 2017 SEDIMENT RESULTS – INNER HARBOR
TABLE 5	SUMMARY OF 2017 SEDIMENT RESULTS – OVERALL RIVER
TABLE 6	SUMMARY OF FIELD DUPLICATE SAMPLE RESULTS

## **FIGURES**

- FIGURE 1 SHEBOYGAN RIVER LOCATION MAP**
- FIGURE 2 SHEBOYGAN RIVER REACH LOCATION**
- FIGURE 3 UPPER RIVER 00+00 TO 50+00**
- FIGURE 4 UPPER RIVER 50+00 TO 160+00**
- FIGURE 5 UPPER RIVER 160+00 TO 195+95**
- FIGURE 6 MIDDLE RIVER 195+95 TO 455+00**
- FIGURE 7 MIDDLE RIVER 400+00 TO 550+00**
- FIGURE 8 LOWER RIVER DISCRETE DEPOSITS 545+00 TO 605+00**
- FIGURE 9 LOWER RIVER GRIDS 575+00 TO 660+00**
- FIGURE 10 INNER HARBOR GRIDS 640+00 TO 700+00**

## **APPENDIX A**

### **PHOTOGRAPHS**

## **APPENDIX B**

### **ANALYTICAL LABORATORY REPORTS**

# 1. INTRODUCTION

This *Sheboygan River and Harbor Superfund Site 2017 Surface Sediment Monitoring Report* presents the results of the post-remedial sediment monitoring conducted by SME on the Sheboygan River and Harbor Superfund Site (Site) in accordance with the *Post-Remediation Monitoring Plan* (PMP) (PRS, 2008) and the *Quality Assurance Project Plan* (QAPP) (PRS QAPP, 2008). These plans were conditionally approved by the United States Environmental Protection Agency (USEPA) with comments on August 13, 2008. The objective of this monitoring is to document changes over time in Surface Weighted Average Concentration (SWAC) of polychlorinated biphenyls (PCBs) following the completion of the remedial action performed in this river.

As stated in the PMP, the post-remediation sediment monitoring is being conducted in two phases consisting of the following:

- Phase 1 Sediment Monitoring – Post-remedial monitoring will be conducted to verify that the SWAC continues to decrease toward the remedial objective of 0.5 parts per million (ppm).<sup>1</sup> This will include a sampling event every five years.
- Phase 2 Sediment Monitoring – Once the Phase 1 results indicate the remedial SWAC of 0.5 ppm has been met, sampling will be performed annually for up to three years to confirm the sediment results have reached the SWAC goal of 0.5 ppm.

The remediation of the Upper River was completed in 2007 and the Lower River and Inner Harbor was completed in 2012. This report documents the first post-remedial monitoring of the entire river since remediation was completed. This report presents the 2017 Phase 1 Sediment Monitoring results for the Upper River, Middle River, Lower River, and Inner Harbor reaches of the Sheboygan River and Harbor Superfund Site.

## 1.1 SITE HISTORY

Sediment samples collected near the former Tecumseh facility in 1989 and 1990 had PCB concentrations from 1.4 ppm to 4,500 ppm (USEPA, 2000). PCB-contaminated sediment was removed from this area in 1990 and 1991. Subsequent sampling of the same area showed concentrations ranging from less than laboratory reporting limits up to 840 ppm (USEPA, 2000). Other areas of the Tecumseh facility were investigated beginning in 2015 and the investigation continues to date.

The Upper and Middle River reaches consists of discrete Soft Sediment deposits and non-Soft Sediment areas which include a mix of Soft Sediment, rocks, cobbles, and bare river bottom. The sediment contamination in the Upper River acts as a partial source of PCB-contaminated sediment for the rest of the river system during high river conditions in addition to the other sources identified in the Middle River, Lower River, and Inner Harbor. The soft sediment in the Lower River occurs in discrete deposits within the first few hundred feet of the reach but its presence is continuous from that point to the end of the and Inner Harbor.

Remedial Design (RD) and Remedial Action (RA) work at the Site was implemented by PRS in phases in order to achieve proper source control prior to initiating down river work (PRS, 2006, 2007). Phase I RA work for the Upper River was performed in 2004 and included the Tecumseh plant soils, groundwater, and adjoining riverbank soils. Phase II RA work for the Upper River was performed in 2006 and 2007 and included addressing the Near-Shore Sediments, Armored Areas, and Soft Sediment deposits. Phase III RA work for the Lower River was performed in 2011 and 2012 and included addressing Soft Sediment grids from the Lower River and Inner Harbor.

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<sup>1</sup> “ppm” is equivalent to milligrams to kilogram (mg/Kg)

The concentrations of PCBs in the sediment vary due to the dynamic nature of this river reach. During 2006 and 2007, sediment was removed from nine (9) Armored Area Remedial Management Units (RMUs) and 122 Soft Sediment RMUs<sup>2</sup>. The Soft Sediment RMUs and Armored Area RMUs removed in 2006/2007 contained the majority of the PCB mass within the Upper River. This remedial action removed 20,728 cubic yards of sediment and 552 pounds of PCBs for a total mass removal percentage of 94.1%, exceeding the PCB mass reduction objective of 88%.

In addition to the soft sediments in the Upper River, floodplain areas along the Upper River were found to have PCB contaminated soil ranging from 4 to 220 ppm. PCB-contaminated soil posed a risk to wildlife that come in contact with contaminated floodplain soil. The USEPA analyzed ecological risk, in consultation with the natural resource trustees. Although the optimal cleanup goal would be to achieve 0.81 ppm in floodplain soil, USEPA concluded that a cleanup goal of approximately 10 ppm PCBs in floodplain soils would be sufficient (USEPA 1999). The *Floodplain Pre-Design Investigation Report* (PRS, 2005) identified concentrations of polychlorinated biphenyls (PCBs) in various samples collected within five of the floodplains associated with this river (i.e., Floodplains 3, 4, 5, 6, and 7). Floodplain remediation was performed in the late summer of 2012 and the *Floodplain Completion Report* (PRS, 2013) presented the results of the remedial actions performed for Floodplains 3, 4, and 6. No remedial action was required in Floodplains 5 and 7 as the pre-design investigation report results met the criteria established by the USEPA in the Record of Decision (ROD).

Implementation of the remedial action for the Middle River, Lower River, and Inner Harbor was conducted over the 2011 and 2012 construction seasons. Mobilization activities for the 2011 construction season began in April 2011, in accordance with the construction schedule and included all activities necessary to prepare the site for the sediment remedial action. Mobilization was performed in accordance with the Remedial Action Work Plan (RAWP). Actual dredging in the Lower River began in May 2011 using a cutterhead dredge. Dredging activities were completed for the construction season in November 2011 and 21,740 cubic yards of PCB-contaminated sediment were removed. Mobilization activities for the 2012 construction season began in March 2012. Mobilization was performed in accordance with the RAWP. Actual dredging in the Lower River for the 2012 season began in May 2012 using a cutterhead dredge. Dredging activities were completed on December 17, 2012, and 43,148 cubic yards of PCB-contaminated sediment were removed.

## 1.2 PRIOR SWAC CONCENTRATIONS

The SWAC calculation methodology used is described in the Engineering Computation provided in the USEPA-approved *Upper River Phase II Sediment Removal Design* (PRS, 2006).

According to the 2000 Record of Decision (ROD) the 2000 pre-remedial SWAC for the Upper River was 3.6 ppm (USEPA, 2000). According to a pre-remedial investigation conducted on the Upper River reaches in 2004 (PRS, 2005), the 2004 Upper River pre-remedial SWAC was 5.9 ppm. Phase II RA work for the Upper River was performed in 2006 and 2007. According to sediment sampling conducted during completion of the RA in 2007, the 2007 Upper River post-dredge SWAC was 1.96 ppm (PRS, 2007). PRS conducted post-remedial sediment monitoring conducted on the Upper River reach in 2012; the Upper River post-dredge SWAC was 0.78 ppm (PRS, 2013).

According to the 2000 USEPA Superfund Record of Decision (ROD) the 2000 pre-remedial SWAC for the Middle River was 1.5 ppm (USEPA, 2000). During the pre-remedial investigation conducted on the Middle River by PRS in 2009, the 2009 Middle River SWAC was 1.71 ppm (PRS Pre-Design Investigation, 2010).

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<sup>2</sup> The definition for a Remedial Management Unit (RMU) will be defined in Section 2.0.

The Record of Decision (ROD) reported the 2000 pre-remedial SWAC for the Lower River was 5.5 ppm (USEPA, 2000). According to a pre-remedial investigation conducted on the Lower River by PRS in 2009, the 2009 pre-remedial Lower River SWAC was 5.29 ppm (PRS Pre-Design Investigation, 2010). Following the pre-remedial investigation conducted on the Inner Harbor by PRS in 2009, the 2009 Inner Harbor SWAC was 1.63 ppm (PRS Pre-Design Investigation, 2010). According to a pre-remedial investigation associated with Great Lakes Legacy Act Dredging project and conducted by C2HM Hill (a USEPA oversight contractor), the combined Lower River and Inner Harbor SWAC was 4.17 ppm (C2HM Hill, 2011). Phase III RA work for the Lower River was performed in 2011 and 2012 and included the Lower River and Inner Harbor. In addition, four dredging projects (including the Strategic Navigational Dredging Project, Camp Marina and the Legacy Act Project) were conducted on the Lower River and Inner Harbor between 2011 and 2013. Based on the verification sampling conducted by C2HM Hill following the completion of the dredging projects in 2013, the combined Lower River and Inner Harbor SWAC for the was 1.09 ppm (estimated based on placement of sand cover materials) (C2HM Hill, 2013). According to a compilation of verification sampling results and post-remedial sampling conducted on Inner Harbor (downstream of the 8<sup>th</sup> street dam) by PRS in 2015, the SWAC for the Lower River and Inner Harbor were 2.2 ppm and 0.66 ppm, respectively (SME, 2015).

## 2. SAMPLING AND ANALYSIS

### 2.1 SUMMARY OF SAMPLING PLAN

In order to maintain sampling location consistency throughout the duration of this Superfund project (i.e., pre-design investigation, post-dredge verification, and post-remediation monitoring), the concept of a defined unit was established. A defined unit for the Upper River is identified as a Remedial Management Unit (RMU), which encompasses up to 2,700 square feet in area. A defined unit for the Middle River and Lower River where sediment is found intermittently is a Deposit, which consists of 313 to 625 cubic yards in volume. A defined unit for the Lower River and Inner Harbor (where sediment exists continuously) is a Grid, which encompasses 8,100 square feet in area. The locations of the previous sediment samples were obtained from the sediment sample figures included in the previous reports. GPS coordinates were determined, using AutoCAD, for the center of each of RMU (Upper River), Deposit or Sub-deposit (Middle and Lower River soft sediment deposits) or Grid (Lower River and Inner Harbor continuous sediment).

### 2.2 SAMPLE LOCATIONS AND COLLECTION

The former sediment deposit locations were downloaded into the onboard Global Positioning System (GPS, Trimble GeoXT 2006) and used for navigation. The sampling was conducted in accordance with the Post Remedial Monitoring Plan (PRS, 2008).

For soft sediment deposit locations (Upper, Middle and portions of the Lower River), the sample team navigated to the location of the former deposits using the GPS unit and inspected for the presence of soft sediment. The area of the defined unit (RMU or deposit) was determined by probing the soft sediment using the previously identified spacing used during characterization starting two (2) feet from the bank. The two foot starting point was used to be consistent with the procedures in the *Upper River Verification Sampling Plan* (PRS 100% Design) and the dredge limit established (1 foot from bank) in Section 4.3 of the *Upper River Mitigation Plan* (PRS 100% Design). Probing was performed to determine where soft sediment thickness exists greater than one (1) foot to set the boundaries of the sediment. For large deposits, we used the GPS unit to collect measurements as we traversed the boundaries of the sediment. If the deposit was greater than 2,700-square feet, the deposit was sub-divided into equally sized RMU. For small deposits, we used a measuring tape to collect measurements for the boundaries of the sediment. Sediment samples were randomly collected from the defined units containing at least one foot of sediment.

For continuous sediment locations (portions of the Lower River and Inner Harbor), the sample team used the GPS unit to returned to the defined Grid location. Sediment is present in a continuous deposit in this portion of the river and therefore verification of sediment size in the Grid was not necessary. As part of the 2012 Lower River and Inner Harbor remediation efforts, sand was placed on the river bottom at select locations to act as cover material. If the first sediment grab sample contained primarily sand, the sample team made at least three additional attempts to locate sediment in the Grid.

Sediment grab samples were randomly collected using a Petite Ponar Dredge from four locations within each RMU, Deposit, or Grid. The four discrete samples were placed into a disposable aluminum pan and composited into a single homogenous sample. The composited sediment samples were placed into four-ounce jars with labels affixed and each jar then placed into a cooler.

The following provides a summary of the sampling locations and efforts in each reach of the river.

### 2.2.1 UPPER RIVER SAMPLE LOCATIONS

For the Upper River, sediment sampling was performed by SME from September 18, 2017 through September 21, 2017. A total of 372 discrete samples were collected, which were composited into 93 samples. Three attempts were made in DEP3, DEP11, DEP12, DEP24, DEP25, DEP29 and DEP30 with no retrieval of soft sediment. These RMUs were deemed as hardpan and the laboratory (Pace) detection limit of 0.043 ppm was applied as the result per the *Verification Sampling Plan* (Appendix E, PRS, 2006). Figures 3 through 5 show approximate locations of RMUs previously identified by PRS and verified in the field by SME.

### 2.2.2 MIDDLE RIVER SAMPLE LOCATIONS

For the Middle River, the sediment sampling was performed by SME on September 25 and September 26, 2017. A total of 168 discrete samples were collected, which were composited into 42 samples. Three attempts were made in DEP10, DEP12, DEP14, DEP16, DEP22, DEP29, DEP34, DEP38, DEP43, DEP50, DEP58, DEP59 and DEP60 with no retrieval of soft sediment. These deposits were deemed as hardpan and the laboratory (Pace) detection limit of 0.043 ppm was applied as the result per the *Verification Sampling Plan* (Appendix E, PRS, 2006). Figure 6 and 7 shows the approximate locations of deposits previously identified by PRS and verified in the field by SME.

### 2.2.4 LOWER RIVER SAMPLE LOCATIONS

The Lower River discrete sediment deposits sampling was performed by SME on September 22 and September 27, 2017. The Lower River continuous sediment sampling (GRID317 through GRID189-odds and GRID316 through GRID198-evens) was performed by SME from September 27, 2017 through October 2, 2017. A total of 472 discrete samples were collected, which were composited into 118 samples. Three attempts were made in the discrete deposit DEP8 with no retrieval of soft sediment. Additionally, three attempts were made in GRID316, GRID 314, GRID312, GRID310, GRID278, GRID277, GRID275, GRID274, GRID271, GRID267, GRID265, GRID264, GRID263, GRID261, GRID259, GRID257 and GRID253 with no retrieval of soft sediment. These grids were deemed as sand "cover material" placed during remediation activities in 2012 and half of the laboratory (Pace) detection limit of 0.043 ppm was applied as the result per the *Verification Sampling Plan* (Appendix E, PRS 100% Design, 2010). Figure 8 shows the approximate locations of the discrete deposits previously identified by PRS and verified in the field by SME. Figure 9 shows the approximate locations of the continuous sediment grids previously identified by PRS.



## 2.2.5 INNER HARBOR SAMPLE LOCATIONS

The Inner Harbor continuous sediment sampling was performed by SME from September 27 through October 11, 2017. A total of 724 discrete samples were collected, which were composited into 181 samples. Three attempts were made in GRID170, GRID168, GRID162, GRID160, GRID158, GRID154, GRID152, GRID146 and GRID120 with no retrieval of soft sediment. These grids were deemed as sand “cover material” placed during remediation activities in 2012 and half of the laboratory (Pace) detection limit of 0.043 ppm was applied as the result per the *Verification Sampling Plan* (Appendix E, PRS 100% Design, 2010). GRID112 and GRID114 were located beneath the 8<sup>th</sup> Street Bridge and were inaccessible at the time of sampling due to bridge maintenance. Data from the 2009 Pre-Design Investigation was substituted at these two points in order to perform the SWAC calculation. Figure 10 shows the approximate locations of continuous sediment grids previously identified by PRS.

## 2.3 FIELD QUALITY ASSURANCE

Our field team members wore a new pair of disposable nitrile sampling gloves during collection of each sample to minimize cross-contamination. The analytical laboratory supplied pre-cleaned containers for sample collection. Following collection, the sediment samples were placed into a cooler, leaving enough room for bagged ice on top of the jars. A chain-of-custody form was placed in a sealable plastic bag and kept with samples for the duration of the custody period. The coolers were collected by the laboratory and as such, custody seals were not necessary. Field instrument calibration, sample handling and custody requirements, and QA procedures were in general accordance with our standard operating procedures.

## 2.4 CHEMICAL ANALYSIS

We submitted 434 sediment samples to Pace Analytical Services (Pace) of Green Bay, Wisconsin (Wisconsin-certified laboratory) for chemical analyses of total PCBs (Aroclor basis) and percent solids. Pace prepared and analyzed the samples in accordance with analytical method USEPA SW846-8082 Modified and Laboratory Standard Operating Procedures (SOPs). The Pace reported PCB method detection limit was 0.043 mg/kg. Laboratory quality assurance/quality control (QA/QC) samples consisted of a matrix spike and matrix spike duplicate. A minimum of one matrix spike/matrix spike duplicate analysis was performed with every sample batch analyzed for PCBs. Batch sizes were limited to no more than 20 samples.

# 3. SAMPLING RESULTS

## 3.1 SEDIMENT RESULTS

A summary of the individual dredge management unit PCB concentrations and deposit size are provided in Table 1 for the Upper River Reach, Table 2 for the Middle River Reach, Table 3 for the Lower River Reach, Table 4 for the Inner Harbor Reach and Table 5 for the Combined River. Copies of the analytical laboratory reports are provided in Appendix B.

## 3.2 DATA VERIFICATION/VALIDATION AND USABILITY

We evaluated the representativeness of the data collected during our sediment sampling activities to determine if the data set was valid and of usable quality. Our discussion of field and laboratory quality control samples and conclusions are summarized below.

### 3.2.1 FIELD QUALITY CONTROL SAMPLES

Field duplicate samples were collected in pair with 22 composite sediment samples. The comparative results of the duplicate sample pairs are shown in Table 6. The relative percent differences (RPDs) in duplicate samples ranged from 3% to 78%. The RPDs in analysis results for total PCBs in the duplicate samples were within the target of 50% in 20 of the 22 samples. The RPD of two of the duplicate pair samples (Dup-5/MR-Dep-17 and Dup-11/LR/IH-DEP(GRID)-237) were 67% and 78%, respectively. The high RPDs in two of the 22 duplicate samples indicated the slight heterogeneity and variability in the sediment samples and may indicate slightly low precision in the chemical analysis results. The slight heterogeneity and variability in the sediment sample and low precision for analyses did not affect the usability of the data collected as no decisions are being made at this time.

### 3.2.2 LABORATORY QUALITY CONTROL SAMPLES

The laboratory performs a validation of the analytical procedure using the quality control sample results, as applicable. This validation is discussed in the Narrative and QC section of each of the twenty-five (25) lab reports generated by this sampling and analysis event. The laboratory reported the following:

- There were no problems with the initial or continuing calibrations,
- All laboratory control spikes were within the allowable range,
- Surrogate recoveries above control limits in 18 samples from 9 of the 25 sample batches due to sample dilution,
- Surrogate recoveries were not compared against control limits in 2 samples from 1 of the 25 sample batches due to sample dilution,
- Matrix spike/spike duplicate samples above control limits in 5 sample batches due to sample dilution,
- The PCB arochlor distribution pattern could not be determined in 3 samples from 2 sample batches due to interference from large quantities of other PCB arochlors.
- PCBs were not detected in the method blanks.

The matrix spike/spike duplicate, surrogate recovery, arochlor distribution, and duplicate pair discrepancies noted above do not affect the usability of the data collected as no decisions are being made at this time.

## 4. DATA ANALYSIS

### 4.1 2017 SAMPLE RESULTS ANALYSIS

The SWAC calculation methodology previously described, the SWAC for each reach of the river and the combined SWAC for all of the river reaches was determined. The following table shows the SWAC for each river reach, the combined river SWAC and the target SWAC per the USEPA ROD (USEPA, 2000).

River Reach	Summary Statistics				
	Median PCB Concentration (ppm)	Total Surface Area (sq. ft.)	Total Contribution to SWAC (sq. ft. x ppm)	Calculated SWAC (mg/Kg)	Target SWAC (ppm)
Upper River	0.78	192,957	352,081	1.82	0.5
Middle River	0.28	54,089	11,951	0.22	
Lower River	0.33	563,466	168,907	0.29	
Inner Harbor	0.51	1,093,363	532,749	0.49	
Overall River	0.68	1,898,258	1,064,977	0.56	

As shown above, the SWAC for the Middle River, Lower River and Inner Harbor was less than the ROD target SWAC of 0.5 ppm. The SWAC for the Upper River was significantly above the target SWAC and therefore, also the Overall River SWAC was above the target SWAC.

A comparison between 2012 and 2017 Upper River data shows a significant increase in PCB concentrations in Deposit 26. In 2012, PRS determined that Deposit 26 was two distinct units (sampled as Dep26A-1 through Dep26A-12 and Dep26B-13 through Dep26B-15). When the deposit boundaries were verified in the field by SME it was determined that Deposit 26 was one continuous unit. Data from the 2017 sample analysis indicated that that the highest PCB concentrations in this deposit were from the subdivided deposit areas not previously sampled by PRS in 2012. The 2017 Upper River data show that Deposit 26 accounts for approximately 62.6% of the total 2017 SWAC from the Upper River. If the Upper River Deposit 26 were to be removed from the data set, the Upper River SWAC would be 0.84 ppm and would still exceed the target SWAC; therefore, further evaluation of removal of Upper River Deposit 26 is not necessary at this time.

## 4.2 CURRENT AND HISTORICAL RESULTS COMPARISON

The following table and chart provide summaries of the available SWAC data for each river reach from the ROD in 2000 to the most recent sampling results in 2017.

River Reach	SWAC Historical Summary (ppm)								ROD Target
	1997 <sup>1</sup>	2004 <sup>2</sup>	2007 <sup>3</sup>	2009 <sup>4</sup>	2011 <sup>5</sup>	2012 <sup>6,7</sup>	2015 <sup>8</sup>	2017	
Upper River	3.6	5.9	1.96	-	-	0.78	-	1.82	0.5
Middle River	1.5	-	-	1.71	-	-	-	0.22	
Lower River	5.5	-	-	5.29	4.17	1.09	2.2	0.30	
Inner Harbor	-	-	-	1.63	-	-	0.66	0.43	
Overall River	-	-	-	-	-	-	-	0.56	

- = no available data

Highlighted = above ROD Target SWAC of 0.5 ppm

<sup>1</sup> United States Environmental Protection Agency. Record of Decision. May 2000

<sup>2</sup> Pollution Risk Services, LLC. Pre-Design Investigation Results. April 2005

<sup>3</sup> Pollution Risk Services, LLC. 2007 Post Construction Documentation Report. November 2007

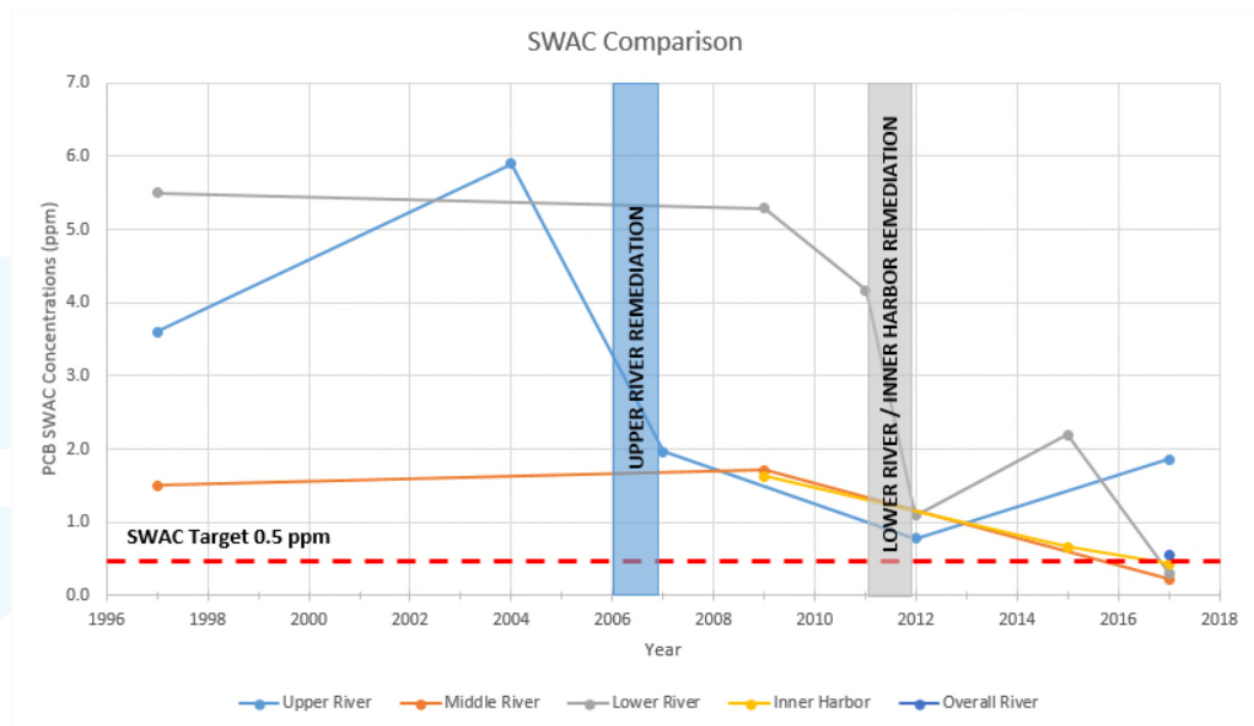
<sup>4</sup> Pollution Risk Services, LLC. Pre-Design Investigation Report. March 2010.

<sup>5</sup> C2HM Hill. Final Remediation Investigation Report. Lower River and Inner Harbor of the Sheboygan River. June 2011.

<sup>6</sup> C2HM Hill. Final Cleanup Validation Report. Great Lakes Legacy Act Dredging - Sheboygan River. August 2013.

<sup>7</sup> Pollution Risk Services, LLC. Upper River Sediment Monitoring Report. January 2013

<sup>8</sup> SME. Serial Letter #24. Sheboygan River and Harbor Site. November 2015.



As is shown in the above, sediment sampling across the river was historically completed as needed for specific purposes (i.e. pre-remedial river reach design investigations, post-remedial verification sampling or post-remedial river reach monitoring). In each of the river reaches, the 2017 PCB concentrations have significantly decreased from the ROD and pre-remediation concentrations. A significant decrease in SWAC following remedial efforts in the Upper River also appears to have a significant decrease in the Middle River SWAC. As discussed above, the data analysis demonstrated a significant decrease in the SWAC since the pre-remedial investigations (2004, 2009) for the following reaches:

- the Upper River SWAC has decreased from 5.9 ppm (2004) to 1.82 ppm,
- the Middle River SWAC has decreased from 1.71 ppm (2004) to 0.22 ppm,
- the Lower River SWAC has decreased from 5.29 ppm (2009) to 0.30 ppm, and
- the Inner Harbor SWAC has decreased from 1.63 ppm (2009) to 0.49 ppm.

In addition, since a full evaluation of the sediment across all reaches of the river has never been conducted at one time, the 2017 sampling event is the first evaluation of the SWAC of the combined reaches of the Sheboygan River. The SWAC of the combined reaches of the Sheboygan River is 0.56 ppm and near the ROD target 0.5 ppm.

## 5. FUTURE PHASE I MONITORING

As part of the five-year review required for the Superfund project's PMP, surface sediment sampling will be conducted on the Upper, Middle and Lower River and the Inner Harbor reaches in 2022 to document the reduction of the SWAC over time.

## 6. REFERENCES

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PRS, 2005: Pollution Risk Services, LLC. *Upper River Pre-Design Investigation Report*. April 2005.

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USEPA, 2009: United States Environmental Protection Agency. *Statement of Work for Remedial Design Action for the Lower River Sediment at the Sheboygan River and Harbor Superfund Site*. January 2009.

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PRS, 2013: Pollution Risk Services, LLC. *Upper River Sediment Monitoring Report*. January 2013.

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SME, 2015: SME Inc., 2015, *Serial Letter #24*, November 2015.

## **TABLES**

<b>TABLE 1</b>	<b>SUMMARY OF 2017 SEDIMENT RESULTS – UPPER RIVER</b>
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<b>TABLE 4</b>	<b>SUMMARY OF 2017 SEDIMENT RESULTS – INNER HARBOR</b>
<b>TABLE 5</b>	<b>SUMMARY OF 2017 SEDIMENT RESULTS – OVERALL RIVER</b>
<b>TABLE 6</b>	<b>SUMMARY OF FIELD DUPLICATE SAMPLE RESULTS</b>



**TABLE 1**  
**SUMMARY OF 2017 SEDIMENT RESULTS -**  
**UPPER RIVER**  
**SHEBOYGAN RIVER SUPERFUND SITE**  
**SHEBOYGAN, WISCONSIN**  
**SME PROJECT NO. 069638.00.032.001**

Identifier	Calculated Surface Area	PCB Concentration	RMU Contribution to SWAC	% of RMU Contribution to SWAC
	(sq. ft.)	(mg/Kg)	(sq.ft*mg/Kg)	
AA1	414	0.599	248	0.07%
AA2	2,100	2.150	4,515	1.28%
AA3	1,125	1.370	1,541	0.44%
AA4	735	3.370	2,477	0.70%
AA5A	1,625	<b>0.043</b>	70	0.02%
AA7	1,125	0.958	1,078	0.31%
AA8/10	2,400	0.873	2,095	0.60%
AA11	900	0.952	857	0.24%
Dep01	400	1.900	760	0.22%
Dep02	2,400	0.056	135	0.04%
Dep03	<b>337</b>	<b>0.043</b>	14	0.00%
Dep04	36	1.020	37	0.01%
Dep05-1	813	1.230	999	0.28%
Dep05-2	813	0.815	662	0.19%
Dep06-1	1,563	0.234	366	0.10%
Dep06-2	1,563	0.211	330	0.09%
Dep07-1	2,550	0.551	1,405	0.40%
Dep08-1	1,375	0.881	1,211	0.34%
Dep09-1A	1,680	2.330	3,914	1.11%
Dep09-1	2,000	0.809	1,618	0.46%
Dep09-2	2,000	0.934	1,868	0.53%
Dep09-3	2,000	1.220	2,440	0.69%
Dep09-4	2,000	2.000	4,000	1.14%
Dep09-5	2,000	1.310	2,620	0.74%
Dep09-6	2,000	0.281	562	0.16%
Dep09-7	2,000	0.720	1,440	0.41%
Dep10	800	0.386	309	0.09%
Dep11	<b>147</b>	<b>0.043</b>	6.3	0.00%
Dep12	<b>29</b>	<b>0.043</b>	1.2	0.00%
Dep13-1	1,500	0.998	1,497	0.43%
Dep13-2	1,500	1.210	1,815	0.52%
Dep13-3	1,500	0.373	560	0.16%
Dep13-4	1,500	1.460	2,190	0.62%
Dep14-1	2,600	0.492	1,279	0.36%
Dep14-2	2,600	0.201	523	0.15%
Dep14-3	2,600	0.602	1,565	0.44%
Dep14-4	500	0.632	316	0.09%
Dep14-5	1,875	1.230	2,306	0.66%
Dep14-6	1,875	0.934	1,751	0.50%
Dep14-7	1,875	1.060	1,988	0.56%
Dep15	400	0.440	176	0.05%





**TABLE 1**  
**SUMMARY OF 2017 SEDIMENT RESULTS -**  
**UPPER RIVER**  
**SHEBOYGAN RIVER SUPERFUND SITE**  
**SHEBOYGAN, WISCONSIN**  
**SME PROJECT NO. 069638.00.032.001**

Identifier	Calculated Surface Area	PCB Concentration	RMU Contribution to SWAC	% of RMU Contribution to SWAC
	(sq. ft.)	(mg/Kg)	(sq.ft*mg/Kg)	
Dep16-1	1,350	0.263	355	0.10%
Dep16-2	1,350	0.278	375	0.11%
Dep16-3	1,350	0.668	902	0.26%
Dep17-1	1,000	0.538	538	0.15%
Dep17-2	1,500	0.644	966	0.27%
Dep18-1	2,600	0.893	2,322	0.66%
Dep18-2	2,600	1.440	3,744	1.06%
Dep18-3	2,600	0.952	2,475	0.70%
Dep19	450	0.541	243	0.07%
Dep20-1	2,500	0.377	943	0.27%
Dep20-2	2,500	0.548	1,370	0.39%
Dep20-3	2,500	2.010	5,025	1.43%
Dep20-4	2,500	0.736	1,840	0.52%
Dep20-5	2,500	0.286	715	0.20%
Dep20-6	2,500	1.040	2,600	0.74%
Dep20-7	2,500	0.470	1,175	0.33%
Dep20-8	2,500	1.170	2,925	0.83%
Dep20-9	2,500	1.420	3,550	1.01%
Dep20-10	2,500	0.972	2,430	0.69%
Dep20-11	2,500	0.898	2,245	0.64%
Dep20-12	2,500	0.829	2,073	0.59%
Dep20-13	1,300	1.440	1,872	0.53%
Dep21	1,050	0.392	412	0.12%
Dep22	1,500	0.429	644	0.18%
Dep23	1,750	0.724	1,267	0.36%
Dep24	4,097	<b>0.043</b>	176	0.05%
Dep25	80	<b>0.043</b>	3	0.00%
Dep26-1	2,600	0.649	1,687	0.48%
Dep26-2	2,600	1.530	3,978	1.13%
Dep26-3	2,600	1.270	3,302	0.94%
Dep26-4	2,600	1.430	3,718	1.06%
Dep26-5	2,600	0.277	720	0.20%
Dep26-6	2,600	0.360	936	0.27%
Dep26-7	2,600	0.395	1,027	0.29%
Dep26-8	2,600	0.699	1,817	0.52%
Dep26-9	2,600	0.833	2,166	0.62%
Dep26-10	2,600	53.400	138,840	39.43%
Dep26-11	2,600	10.800	28,080	7.98%
Dep26-12	2,600	13.000	33,800	9.60%
Dep27-1	2,400	0.457	1,097	0.31%
Dep27-2	2,400	0.359	862	0.24%



**TABLE 1**  
**SUMMARY OF 2017 SEDIMENT RESULTS -**  
**UPPER RIVER**  
**SHEBOYGAN RIVER SUPERFUND SITE**  
**SHEBOYGAN, WISCONSIN**  
**SME PROJECT NO. 069638.00.032.001**

Identifier	Calculated Surface Area	PCB Concentration	RMU Contribution to SWAC	% of RMU Contribution to SWAC
	(sq. ft.)	(mg/Kg)	(sq.ft*mg/Kg)	
Dep28	780	1.120	874	0.25%
Dep29	2,672	<b>0.043</b>	115	0.03%
Dep30	1,790	<b>0.043</b>	77	0.02%
Dep31-1	2,678	1.190	3,186	0.90%
Dep31-2	2,678	1.110	2,972	0.84%
Dep32-1	2,505	0.421	1,055	0.30%
Dep32-2	2,505	0.750	1,879	0.53%
Dep32-3	2,505	0.497	1,245	0.35%
Dep32-4	2,505	0.744	1,864	0.53%
Dep32-5	2,505	0.982	2,460	0.70%
Dep32-6	2,505	0.743	1,861	0.53%
Dep33-1	2,500	1.000	2,500	0.71%
Dep33-2	2,500	1.140	2,850	0.81%
Dep33-3	2,500	0.668	1,670	0.47%
Dep33-4	2,500	0.979	2,448	0.70%
Dep33-5	2,500	0.882	2,205	0.63%
Dep33-6	2,500	0.648	1,620	0.46%
Dep33-7	2,500	0.977	2,443	0.69%

<b>Median PCB Concentration (mg/Kg)</b>	<b>0.78</b>
<b>Total Surface Area (sq. ft.)</b>	<b>192,957</b>
<b>Total RMU Contribution (sq. ft. x mg/Kg)</b>	<b>352,081</b>
<b>Target SWAC (mg/Kg)</b>	<b>0.5</b>
<b>ESTIMATED SWAC (mg/Kg)</b>	<b>1.82</b>

**Note:**

1. Per the Verification Sampling Plan (Section 3.1.3 of Appendix E of the *Upper River Phase II Sediment Removal Design*) submitted and approved, if hardpan or consolidated material is determined, a value equal to the detection limit (0.043 ppm) will be assigned to this location and used in the SWAC calculation. The value of 0.043 ppm represents the Pace detection limit. For locations where hardpan or consolidated material is determined, the 2007 design surface area was used in the SWAC calculation. For these locations and replacements, the detection limit and design surface area values are shown in italics and bolded.



**TABLE 2**  
**SUMMARY OF 2017 SEDIMENT RESULTS**  
**MIDDLE RIVER**  
**SHEBOYGAN RIVER SUPERFUND SITE**  
**SHEBOYGAN, WISCONSIN**  
**SME PROJECT NO. 069638.00.032.001**

Identifier	Calculated Surface Area	PCB Concentration	RMU Contribution to SWAC	% Contribution to SWAC
	(sq. ft.)	(mg/Kg)	(sq. ft.*mg/Kg)	
DEP-10	<b>3,170</b>	<b>0.043</b>	136	1.14%
DEP-11	160	0.106	17	0.14%
DEP-12	<b>737</b>	<b>0.043</b>	32	0.27%
DEP-13	120	3.360	403	3.37%
DEP-14	<b>1,925</b>	<b>0.043</b>	83	0.69%
DEP-15	140	0.612	86	0.72%
DEP-16	<b>499</b>	<b>0.043</b>	21	0.18%
DEP-17	125	0.288	36	0.30%
DEP-18	<b>457</b>	<b>0.043</b>	20	0.16%
DEP-19	520	0.386	201	1.68%
DEP-20	75	0.733	55	0.46%
DEP-21	75	0.489	37	0.31%
DEP-22	<b>3,874</b>	<b>0.043</b>	167	1.39%
DEP-23	200	0.892	178	1.49%
DEP-24	1,200	0.282	338	2.83%
DEP-25	1,900	0.258	490	4.10%
DEP-26-1	2,850	0.369	1,052	8.80%
DEP-26-2	2,850	0.371	1,057	8.85%
DEP-27	960	0.362	348	2.91%
DEP-28	720	0.114	82	0.69%
DEP-29	<b>3,621</b>	<b>0.043</b>	156	1.30%
DEP-30	1,050	0.245	257	2.15%
DEP-31	1,400	0.304	426	3.56%
DEP-32	1,300	0.187	243	2.03%
DEP-33	180	0.239	43	0.36%
DEP-34	<b>3,221</b>	<b>0.043</b>	138	1.16%
DEP-35	200	0.383	77	0.64%
DEP-36	100	0.283	28	0.24%
DEP-37	1,037	0.498	517	4.32%
DEP-38	<b>1,670</b>	<b>0.043</b>	72	0.60%
DEP-39	200	0.325	65	0.54%
DEP-40	280	0.140	39	0.33%
DEP-41	260	2.110	549	4.59%
DEP-42	825	0.388	320	2.68%
DEP-43	<b>2,436</b>	<b>0.043</b>	105	0.88%
DEP-44	225	0.227	51	0.43%
DEP-45	180	0.197	35	0.30%
DEP-46	60	0.367	22	0.18%
DEP-47	300	0.812	244	2.04%
DEP-48	48	0.185	9	0.07%



**TABLE 2**  
**SUMMARY OF 2017 SEDIMENT RESULTS**  
**MIDDLE RIVER**  
**SHEBOYGAN RIVER SUPERFUND SITE**  
**SHEBOYGAN, WISCONSIN**  
**SME PROJECT NO. 069638.00.032.001**

Identifier	Calculated Surface Area	PCB Concentration	RMU Contribution to SWAC	% Contribution to SWAC
	(sq. ft.)	(mg/Kg)	(sq. ft.*mg/Kg)	
DEP-49	315	0.102	32	0.27%
DEP-50	<b>2,225</b>	<b>0.043</b>	96	0.80%
DEP-51	80	0.577	46	0.39%
DEP-52	40	1.100	44	0.37%
DEP-53	680	0.054	36	0.30%
DEP-54	75	0.630	47	0.40%
DEP-55	90	1.740	157	1.31%
DEP-56	200	1.200	240	2.01%
DEP-57	225	0.506	114	0.95%
DEP-58	<b>1,336</b>	<b>0.043</b>	57	0.48%
DEP-59	<b>1,065</b>	<b>0.043</b>	46	0.38%
DEP-60	<b>1,582</b>	<b>0.043</b>	68	0.57%
DEP-61	225	0.237	53	0.45%
DEP-62	500	0.547	274	2.29%
DEP-63	1,000	0.807	807	6.75%
DEP-64	3,300	0.485	1,601	13.39%

<b>Median PCB Concentration (mg/Kg)</b>	<b>0.28</b>
<b>Total Surface Area (sq. ft.)</b>	<b>54,089</b>
<b>Total RMU Contribution (sq. ft. * mg/Kg)</b>	<b>11,951</b>
<b>Target SWAC (mg/Kg)</b>	<b>0.5</b>
<b>ESTIMATED SWAC</b>	<b>0.22</b>

**Note:**

1. Per the Verification Sampling Plan (Section 3.1.3 of Appendix E of the Upper River Phase II Sediment Removal Design) submitted and approved, if hardpan or consolidated material is determined, a value equal to the detection limit (0.043 ppm) will be assigned to this location and used in the SWAC calculation. The value of 0.043 ppm represents the Pace detection limit. For locations where hardpan or consolidated material is determined, the 2007 design surface area was used in the SWAC calculation. For these locations and replacements, the detection limit and design surface area values are shown in *italics and bolded*.



**TABLE 3**  
**SUMMARY OF 2017 SEDIMENT RESULTS**  
**LOWER RIVER**  
**SHEBOYGAN RIVER SUPERFUND SITE**  
**SHEBOYGAN, WISCONSIN**  
**SME PROJECT NO. 069638.00.032.001**

Identifier	Calculated Grid Size	PCB Concentration	Contribution to total SWAC	Contribution to total SWAC
	(sq. ft.)	(mg/Kg )	(sq. ft. * mg/Kg)	(%)
DEP1	1,000	0.261	261	0.16%
DEP2	1,575	0.265	417	0.25%
DEP3	6,750	0.342	2,309	1.39%
DEP4	2,625	0.440	1,155	0.70%
DEP5	650	0.306	199	0.12%
DEP6	140	0.176	25	0.01%
DEP7-1	2,550	0.369	941	0.57%
DEP7-2	2,550	0.536	1,367	0.82%
DEP7-3	2,550	0.395	1,007	0.61%
DEP8	<b>4,617</b>	<b>0.022</b>	102	0.06%
DEP9	450	0.208	94	0.06%
DEP(GRID)-189	1,609	0.585	941	0.14%
DEP(GRID)-191	1,367	0.531	726	0.44%
DEP(GRID)-193	1,837	0.434	797	0.48%
DEP(GRID)-195	2,206	0.516	1,138	0.69%
DEP(GRID)-197	2,415	0.450	1,087	0.66%
DEP(GRID)-198	8,046	0.783	6,300	0.91%
DEP(GRID)-199	2,096	0.630	1,320	0.80%
DEP(GRID)-200	8,100	0.715	5,792	3.49%
DEP(GRID)-201	2,228	0.581	1,294	0.78%
DEP(GRID)-202	472	0.738	348	0.21%
DEP(GRID)-203	2,581	0.812	2,096	1.26%
DEP(GRID)-204	2,361	0.722	1,705	1.03%
DEP(GRID)-205	2,589	0.736	1,906	1.15%
DEP(GRID)-206	2,555	0.699	1,786	1.08%
DEP(GRID)-207	2,351	0.669	1,573	0.95%
DEP(GRID)-208	2,249	0.572	1,286	0.78%
DEP(GRID)-209	2,580	0.672	1,734	1.05%
DEP(GRID)-210	2,165	0.896	1,940	1.17%
DEP(GRID)-211	2,849	0.647	1,843	1.11%
DEP(GRID)-212	2,080	0.854	1,776	1.07%
DEP(GRID)-213	2,428	0.684	1,661	1.00%
DEP(GRID)-214	1,673	0.779	1,303	0.79%
DEP(GRID)-215	2,042	0.581	1,186	0.72%
DEP(GRID)-216	1,436	0.856	1,229	0.74%
DEP(GRID)-217	2,039	0.712	1,452	0.88%
DEP(GRID)-218	1,264	0.881	1,114	0.67%
DEP(GRID)-219	1,986	0.516	1,025	0.62%
DEP(GRID)-220	1,127	0.829	934	0.56%
DEP(GRID)-221	1,615	0.234	378	0.23%
DEP(GRID)-222	253	0.740	187	0.11%
DEP(GRID)-223	1,548	0.595	921	0.56%



**TABLE 3**  
**SUMMARY OF 2017 SEDIMENT RESULTS**  
**LOWER RIVER**  
**SHEBOYGAN RIVER SUPERFUND SITE**  
**SHEBOYGAN, WISCONSIN**  
**SME PROJECT NO. 069638.00.032.001**

Identifier	Calculated Grid Size	PCB Concentration	Contribution to total SWAC	Contribution to total SWAC
	(sq. ft.)	(mg/Kg )	(sq. ft. * mg/Kg)	(%)
DEP(GRID)-224	6,989	0.765	5,347	3.22%
DEP(GRID)-225	1,452	0.368	534	0.32%
DEP(GRID)-226	7,142	0.736	5,257	3.17%
DEP(GRID)-227	1,052	0.557	586	0.35%
DEP(GRID)-228	946	0.709	671	0.40%
DEP(GRID)-229	1,114	0.732	815	0.49%
DEP(GRID)-230	7,464	<b>0.022</b>	164	0.10%
DEP(GRID)-231	1,152	0.572	659	0.40%
DEP(GRID)-232	7,465	<b>0.022</b>	164	0.10%
DEP(GRID)-233	1,200	0.609	731	0.44%
DEP(GRID)-234	7,424	<b>0.022</b>	163	0.10%
DEP(GRID)-235	1,304	0.684	892	0.54%
DEP(GRID)-236	737	<b>0.022</b>	16	0.01%
DEP(GRID)-237	1,260	0.651	820	0.49%
DEP(GRID)-238	2,135	<b>0.022</b>	47	0.03%
DEP(GRID)-239	7,015	0.401	2,813	1.70%
DEP(GRID)-240	1,798	0.649	1,167	0.70%
DEP(GRID)-241	6,243	0.429	2,678	1.62%
DEP(GRID)-242	2,482	0.738	1,832	1.10%
DEP(GRID)-243	5,097	0.323	1,646	0.99%
DEP(GRID)-244	3,150	0.411	1,295	0.78%
DEP(GRID)-245	5,520	0.326	1,800	1.09%
DEP(GRID)-246	4,029	0.556	2,240	1.35%
DEP(GRID)-247	7,702	0.129	994	0.60%
DEP(GRID)-248	4,930	0.480	2,366	1.43%
DEP(GRID)-249	8,644	0.407	3,518	2.12%
DEP(GRID)-250	622	0.456	284	0.17%
DEP(GRID)-251	7,052	0.155	1,093	0.66%
DEP(GRID)-252	453	0.469	212	0.13%
DEP(GRID)-253	7,168	<b>0.022</b>	158	0.10%
DEP(GRID)-254	217	0.461	100	0.06%
DEP(GRID)-255	8,592	0.323	2,775	1.67%
DEP(GRID)-256	655	0.368	241	0.15%
DEP(GRID)-257	7,031	<b>0.022</b>	155	0.09%
DEP(GRID)-258	6,035	0.194	1,171	0.71%
DEP(GRID)-259	7,320	<b>0.022</b>	161	0.10%
DEP(GRID)-260	3,706	0.180	667	0.40%
DEP(GRID)-261	8,427	<b>0.022</b>	185	0.11%
DEP(GRID)-262	4,609	0.195	899	0.54%
DEP(GRID)-263	8,155	<b>0.022</b>	179	0.11%
DEP(GRID)-264	7,658	<b>0.022</b>	168	0.10%
DEP(GRID)-265	8,178	<b>0.022</b>	180	0.11%



**TABLE 3**  
**SUMMARY OF 2017 SEDIMENT RESULTS**  
**LOWER RIVER**  
**SHEBOYGAN RIVER SUPERFUND SITE**  
**SHEBOYGAN, WISCONSIN**  
**SME PROJECT NO. 069638.00.032.001**

Identifier	Calculated Grid Size	PCB Concentration	Contribution to total SWAC	Contribution to total SWAC
	(sq. ft.)	(mg/Kg )	(sq. ft. * mg/Kg)	(%)
DEP(GRID)-266	2,025	0.053	107	0.06%
DEP(GRID)-267	8,478	<b>0.022</b>	187	0.11%
DEP(GRID)-268	6,826	0.371	2,532	1.53%
DEP(GRID)-269	5,930	0.264	1,566	0.94%
DEP(GRID)-270	6,574	0.236	1,551	0.94%
DEP(GRID)-271	2,807	<b>0.022</b>	62	0.04%
DEP(GRID)-272	7,930	0.113	896	0.54%
DEP(GRID)-273	6,472	0.119	770	0.46%
DEP(GRID)-274	8,099	<b>0.022</b>	178	0.11%
DEP(GRID)-275	4,985	<b>0.022</b>	110	0.07%
DEP(GRID)-276	3,313	0.119	394	0.24%
DEP(GRID)-277	6,232	<b>0.022</b>	137	0.08%
DEP(GRID)-278	1,180	<b>0.022</b>	26	0.02%
DEP(GRID)-279	2,920	0.124	362	0.22%
DEP(GRID)-280	2,552	0.431	1,100	0.66%
DEP(GRID)-281	3,286	0.302	992	0.60%
DEP(GRID)-282	4,432	0.267	1,183	0.71%
DEP(GRID)-283	353	0.296	104	0.06%
DEP(GRID)-284	8,141	0.131	1,066	0.64%
DEP(GRID)-285	100	0.158	16	0.01%
DEP(GRID)-286	2,991	0.106	317	0.19%



**TABLE 3**  
**SUMMARY OF 2017 SEDIMENT RESULTS**  
**LOWER RIVER**  
**SHEBOYGAN RIVER SUPERFUND SITE**  
**SHEBOYGAN, WISCONSIN**  
**SME PROJECT NO. 069638.00.032.001**

Identifier	Calculated Grid Size	PCB Concentration	Contribution to total SWAC	Contribution to total SWAC
	(sq. ft.)	(mg/Kg )	(sq. ft. * mg/Kg)	(%)
DEP(GRID)-287	3,269	0.204	667	0.40%
DEP(GRID)-288	3,082	0.141	435	0.26%
DEP(GRID)-289	5,017	0.253	1,269	0.77%
DEP(GRID)-290	6,316	0.108	682	0.41%
DEP(GRID)-291	7,633	0.356	2,717	1.64%
DEP(GRID)-292	8,100	0.174	1,409	0.85%
DEP(GRID)-293	6,796	0.297	2,018	1.22%
DEP(GRID)-294	8,110	0.297	2,409	1.45%
DEP(GRID)-295	3,705	0.153	567	0.34%
DEP(GRID)-296	8,093	0.988	7,996	4.82%
DEP(GRID)-297	3,452	0.423	1,460	0.88%
DEP(GRID)-298	8,098	0.190	1,539	0.93%
DEP(GRID)-299	3,820	0.492	1,879	1.13%
DEP(GRID)-300	7,993	0.206	1,647	0.99%
DEP(GRID)-301	3,700	0.465	1,721	1.04%
DEP(GRID)-302	8,100	0.382	3,094	1.87%
DEP(GRID)-303	3,260	0.551	1,796	1.08%
DEP(GRID)-304	8,098	0.326	2,640	1.59%
DEP(GRID)-305	3,258	0.353	1,150	0.69%
DEP(GRID)-306	7,656	0.203	1,554	0.94%
DEP(GRID)-307	3,258	0.416	1,355	0.82%
DEP(GRID)-308	7,750	0.296	2,294	1.38%
DEP(GRID)-309	3,605	0.220	793	0.48%
DEP(GRID)-310	8,123	<b>0.022</b>	179	0.11%
DEP(GRID)-311	1,302	0.209	272	0.16%
DEP(GRID)-312	8,080	<b>0.022</b>	178	0.11%
DEP(GRID)-313	7,193	0.314	2,259	1.36%
DEP(GRID)-314	8,098	<b>0.022</b>	178	0.11%
DEP(GRID)-315	1,830	0.230	421	0.25%





**TABLE 3**  
**SUMMARY OF 2017 SEDIMENT RESULTS**  
**LOWER RIVER**  
**SHEBOYGAN RIVER SUPERFUND SITE**  
**SHEBOYGAN, WISCONSIN**  
**SME PROJECT NO. 069638.00.032.001**

Identifier	Calculated Grid Size	PCB Concentration	Contribution to total SWAC	Contribution to total SWAC
	(sq. ft.)	(mg/Kg)	(sq. ft. * mg/Kg)	(%)
DEP(GRID)-316	8,100	<b><i>0.022</i></b>	178	0.11%
DEP(GRID)-317	4,017	0.221	888	0.54%

Median PCB Concentration (mg/Kg)	0.33
Total Surface Area (sq. ft.)	563,466
Total RMU Contribution (sq. ft. x mg/Kg)	165,800
Target SWAC (mg/Kg)	0.5
<b>ESTIMATED SWAC</b>	<b>0.29</b>

**Note:**

1. Per the Verification Sampling Plan (Section 2.7 of Appendix E of the Lower River 100% Design) submitted and approved, if no sediment was recovered (i.e. sand cover areas), a value equal to the half detection limit (0.022 ppm) will be assigned to this location and used in the SWAC calculation. The value of 0.022 ppm represents the half Pace detection limit of 0.043. For these locations and replacements, the half detection limit value is shown in italics and bolded.



**TABLE 4**  
**SUMMARY OF 2017 SEDIMENT RESULTS**  
**INNER HARBOR**  
**SHEBOYGAN RIVER SUPERFUND SITE**  
**SHEBOYGAN, WISCONSIN**  
**SME PROJECT NO. 069638.00.032.001**

Identifier	Calculated Grid Size	PCB Concentration	Contribution to total SWAC	Contribution to total SWAC
	(sq. ft.)	(mg/Kg )	(sq. ft. * mg/Kg)	(%)
DEP(GRID)-1	8,352	0.397	3,316	0.62%
DEP(GRID)-2	8,596	0.451	3,877	0.73%
DEP(GRID)-3	7,990	0.386	3,084	0.58%
DEP(GRID)-4	8,740	0.545	4,763	0.89%
DEP(GRID)-5	7,594	0.411	3,121	0.59%
DEP(GRID)-6	8,367	0.329	2,753	0.52%
DEP(GRID)-7	7,642	0.355	2,713	0.51%
DEP(GRID)-8	8,367	0.357	2,987	0.56%
DEP(GRID)-9	7,900	0.402	3,176	0.60%
DEP(GRID)-10	8,407	0.365	3,069	0.58%
DEP(GRID)-11	7,867	0.399	3,139	0.59%
DEP(GRID)-12	8,378	0.325	2,723	0.51%
DEP(GRID)-13	7,798	0.242	1,887	0.35%
DEP(GRID)-14	8,361	0.344	2,876	0.54%
DEP(GRID)-15	7,623	0.461	3,514	0.66%
DEP(GRID)-16	8,339	0.472	3,936	0.74%
DEP(GRID)-17	8,079	0.409	3,304	0.62%
DEP(GRID)-18	8,357	0.401	3,351	0.63%
DEP(GRID)-19	7,783	0.374	2,911	0.55%
DEP(GRID)-20	8,231	0.422	3,473	0.65%
DEP(GRID)-21	7,644	0.475	3,631	0.68%
DEP(GRID)-22	8,271	0.472	3,904	0.73%
DEP(GRID)-23	7,554	0.469	3,543	0.67%
DEP(GRID)-24	8,298	0.307	2,547	0.48%
DEP(GRID)-25	7,534	0.457	3,443	0.65%
DEP(GRID)-26	8,338	0.318	2,651	0.50%
DEP(GRID)-27	7,541	1.030	7,767	1.46%
DEP(GRID)-28	8,370	0.270	2,260	0.42%
DEP(GRID)-29	7,529	0.316	2,379	0.45%
DEP(GRID)-30	8,370	0.293	2,452	0.46%
DEP(GRID)-31	7,515	0.607	4,562	0.86%
DEP(GRID)-32	8,363	0.450	3,763	0.71%
DEP(GRID)-33	7,280	0.421	3,065	0.58%
DEP(GRID)-34	8,325	0.269	2,239	0.42%
DEP(GRID)-35	7,029	0.631	4,435	0.83%



**TABLE 4**  
**SUMMARY OF 2017 SEDIMENT RESULTS**  
**INNER HARBOR**  
**SHEBOYGAN RIVER SUPERFUND SITE**  
**SHEBOYGAN, WISCONSIN**  
**SME PROJECT NO. 069638.00.032.001**

Identifier	Calculated Grid Size	PCB Concentration	Contribution to total SWAC	Contribution to total SWAC
	(sq. ft.)	(mg/Kg )	(sq. ft. * mg/Kg)	(%)
DEP(GRID)-36	8,315	0.318	2,644	0.50%
DEP(GRID)-37	6,942	0.547	3,797	0.71%
DEP(GRID)-38	8,330	0.316	2,632	0.49%
DEP(GRID)-39	7,218	0.435	3,140	0.59%
DEP(GRID)-40	8,337	0.513	4,277	0.80%
DEP(GRID)-41	7,393	0.356	2,632	0.49%
DEP(GRID)-42	8,295	0.319	2,646	0.50%
DEP(GRID)-43	7,601	0.538	4,089	0.77%
DEP(GRID)-44	8,270	0.420	3,473	0.65%
DEP(GRID)-45	7,627	0.555	4,233	0.79%
DEP(GRID)-46	8,064	0.383	3,089	0.58%
DEP(GRID)-47	7,642	0.738	5,640	1.06%
DEP(GRID)-48	8,252	0.394	3,251	0.61%
DEP(GRID)-49	8,024	0.464	3,723	0.70%
DEP(GRID)-50	7,978	0.296	2,361	0.44%
DEP(GRID)-51	7,449	0.682	5,080	0.95%
DEP(GRID)-52	6,598	0.418	2,758	0.52%
DEP(GRID)-53	7,423	0.474	3,519	0.66%
DEP(GRID)-54	7,337	0.394	2,891	0.54%
DEP(GRID)-55	8,043	0.348	2,799	0.53%
DEP(GRID)-56	7,108	0.383	2,722	0.51%
DEP(GRID)-57	7,982	0.304	2,427	0.46%
DEP(GRID)-58	6,872	0.531	3,649	0.69%
DEP(GRID)-59	7,931	0.487	3,862	0.73%
DEP(GRID)-60	6,586	0.512	3,372	0.63%
DEP(GRID)-61	7,972	0.612	4,879	0.92%
DEP(GRID)-62	5,891	0.669	3,941	0.74%
DEP(GRID)-63	7,841	0.351	2,752	0.52%
DEP(GRID)-64	7,927	0.830	6,579	1.24%
DEP(GRID)-65	7,046	0.479	3,375	0.63%
DEP(GRID)-66	8,406	0.638	5,363	1.01%
DEP(GRID)-67	8,034	0.362	2,908	0.55%
DEP(GRID)-68	8,513	0.433	3,686	0.69%
DEP(GRID)-69	8,337	0.369	3,076	0.58%
DEP(GRID)-70	7,745	0.412	3,191	0.60%



**TABLE 4**  
**SUMMARY OF 2017 SEDIMENT RESULTS**  
**INNER HARBOR**  
**SHEBOYGAN RIVER SUPERFUND SITE**  
**SHEBOYGAN, WISCONSIN**  
**SME PROJECT NO. 069638.00.032.001**

Identifier	Calculated Grid Size	PCB Concentration	Contribution to total SWAC	Contribution to total SWAC
	(sq. ft.)	(mg/Kg )	(sq. ft. * mg/Kg)	(%)
DEP(GRID)-71	6,896	0.324	2,234	0.42%
DEP(GRID)-72	8,152	0.865	7,051	1.32%
DEP(GRID)-73	7,765	0.278	2,159	0.41%
DEP(GRID)-74	8,069	0.768	6,197	1.16%
DEP(GRID)-75	8,998	0.464	4,175	0.78%
DEP(GRID)-76	8,033	0.719	5,776	1.08%
DEP(GRID)-77	7,670	0.460	3,528	0.66%
DEP(GRID)-78	8,105	0.477	3,866	0.73%
DEP(GRID)-79	7,855	0.399	3,134	0.59%
DEP(GRID)-80	8,228	0.546	4,492	0.84%
DEP(GRID)-81	79,014	0.522	41,245	7.74%
DEP(GRID)-82	8,202	0.351	2,879	0.54%
DEP(GRID)-83	8,042	0.832	6,691	1.26%
DEP(GRID)-84	8,008	0.477	3,820	0.72%
DEP(GRID)-85	8,147	0.651	5,304	1.00%
DEP(GRID)-86	7,315	0.555	4,060	0.76%
DEP(GRID)-87	7,949	0.543	4,316	0.81%
DEP(GRID)-88	8,222	1.240	10,195	1.91%
DEP(GRID)-89	8,665	0.686	5,944	1.12%
DEP(GRID)-90	8,161	0.542	4,423	0.83%
DEP(GRID)-91	7,638	0.528	4,033	0.76%
DEP(GRID)-92	8,174	0.421	3,441	0.65%
DEP(GRID)-93	7,836	0.527	4,130	0.78%
DEP(GRID)-94	7,771	0.507	3,940	0.74%
DEP(GRID)-95	7,622	0.417	3,178	0.60%
DEP(GRID)-96	5,840	0.569	3,323	0.62%
DEP(GRID)-97	7,368	0.412	3,036	0.57%
DEP(GRID)-98	5,500	0.392	2,156	0.40%
DEP(GRID)-99	6,799	0.437	2,971	0.56%
DEP(GRID)-100	7,507	0.399	2,995	0.56%
DEP(GRID)-101	5,912	0.508	3,003	0.56%
DEP(GRID)-102	8,111	0.457	3,707	0.70%
DEP(GRID)-103	8,020	0.524	4,202	0.79%
DEP(GRID)-104	8,252	0.306	2,525	0.47%
DEP(GRID)-105	7,325	0.493	3,611	0.68%



**TABLE 4**  
**SUMMARY OF 2017 SEDIMENT RESULTS**  
**INNER HARBOR**  
**SHEBOYGAN RIVER SUPERFUND SITE**  
**SHEBOYGAN, WISCONSIN**  
**SME PROJECT NO. 069638.00.032.001**

Identifier	Calculated Grid Size	PCB Concentration	Contribution to total SWAC	Contribution to total SWAC
	(sq. ft.)	(mg/Kg )	(sq. ft. * mg/Kg)	(%)
DEP(GRID)-106	8,217	0.469	3,854	0.72%
DEP(GRID)-107	7,234	0.524	3,791	0.71%
DEP(GRID)-108	8,382	0.240	2,012	0.38%
DEP(GRID)-109	7,274	0.612	4,452	0.84%
DEP(GRID)-110	8,789	0.304	2,672	0.50%
DEP(GRID)-111	7,644	0.885	6,765	1.27%
DEP(GRID)-112	8,145	0.016	129	0.02%
DEP(GRID)-113	7,954	1.240	9,863	1.85%
DEP(GRID)-114	6,540	0.019	124	0.02%
DEP(GRID)-115	4,617	0.734	3,389	0.64%
DEP(GRID)-116	547	0.961	526	0.10%
DEP(GRID)-117	1,353	0.280	379	0.07%
DEP(GRID)-118	466	0.452	211	0.04%
DEP(GRID)-119	1,871	0.383	717	0.13%
DEP(GRID)-120	467	<b>0.022</b>	10	0.00%
DEP(GRID)-121	1,601	0.351	562	0.11%
DEP(GRID)-122	572	0.657	376	0.07%
DEP(GRID)-123	990	0.586	580	0.11%
DEP(GRID)-124	656	0.590	387	0.07%
DEP(GRID)-125	182	0.718	131	0.02%
DEP(GRID)-126	616	0.660	407	0.08%
DEP(GRID)-127	182	0.528	96	0.02%
DEP(GRID)-128	599	0.514	308	0.06%
DEP(GRID)-129	281	0.612	172	0.03%
DEP(GRID)-130	434	0.639	277	0.05%
DEP(GRID)-131	789	0.743	586	0.11%
DEP(GRID)-132	210	0.702	147	0.03%
DEP(GRID)-133	807	0.644	520	0.10%
DEP(GRID)-134	247	0.743	184	0.03%
DEP(GRID)-135	1,164	0.603	702	0.13%
DEP(GRID)-136	138	0.713	98	0.02%
DEP(GRID)-137	1,094	0.601	657	0.12%
DEP(GRID)-138	8,246	0.686	5,657	1.06%
DEP(GRID)-139	1,583	0.635	1,005	0.19%
DEP(GRID)-140	7,319	0.686	5,021	0.94%



**TABLE 4**  
**SUMMARY OF 2017 SEDIMENT RESULTS**  
**INNER HARBOR**  
**SHEBOYGAN RIVER SUPERFUND SITE**  
**SHEBOYGAN, WISCONSIN**  
**SME PROJECT NO. 069638.00.032.001**

Identifier	Calculated Grid Size	PCB Concentration	Contribution to total SWAC	Contribution to total SWAC
	(sq. ft.)	(mg/Kg )	(sq. ft. * mg/Kg)	(%)
DEP(GRID)-141	2,371	0.596	1,413	0.27%
DEP(GRID)-142	7,024	0.651	4,573	0.86%
DEP(GRID)-143	1,490	0.569	848	0.16%
DEP(GRID)-144	290	0.527	153	0.03%
DEP(GRID)-145	945	0.689	651	0.12%
DEP(GRID)-146	514	<b>0.022</b>	11	0.00%
DEP(GRID)-147	1,651	0.585	966	0.18%
DEP(GRID)-148	1,106	0.586	648	0.12%
DEP(GRID)-149	1,743	0.606	1,056	0.20%
DEP(GRID)-150	1,107	0.761	842	0.16%
DEP(GRID)-151	1,550	0.969	1,502	0.28%
DEP(GRID)-152	1,059	<b>0.022</b>	23	0.00%
DEP(GRID)-153	1,325	0.671	889	0.17%
DEP(GRID)-154	1,014	<b>0.022</b>	22	0.00%
DEP(GRID)-155	1,219	0.627	764	0.14%
DEP(GRID)-156	1,098	0.428	470	0.09%
DEP(GRID)-157	2,164	0.548	1,186	0.22%
DEP(GRID)-158	1,437	<b>0.022</b>	32	0.01%
DEP(GRID)-159	1,265	0.691	874	0.16%
DEP(GRID)-160	1,347	<b>0.022</b>	30	0.01%
DEP(GRID)-161	1,190	0.683	813	0.15%
DEP(GRID)-162	1,043	<b>0.022</b>	23	0.00%
DEP(GRID)-163	4,855	0.560	2,719	0.51%
DEP(GRID)-164	1,024	0.743	761	0.14%
DEP(GRID)-165	3,542	0.615	2,178	0.41%
DEP(GRID)-166	1,026	0.475	487	0.09%
DEP(GRID)-167	2,052	0.624	1,280	0.24%
DEP(GRID)-168	1,362	0.604	823	0.15%
DEP(GRID)-169	3,266	0.483	1,577	0.30%
DEP(GRID)-170	1,433	0.525	752	0.14%
DEP(GRID)-171	1,295	0.568	736	0.14%
DEP(GRID)-172	898	0.530	476	0.09%
DEP(GRID)-173	1,020	0.533	544	0.10%
DEP(GRID)-174	296	0.581	172	0.03%
DEP(GRID)-175	964	0.533	514	0.10%



**TABLE 4**  
**SUMMARY OF 2017 SEDIMENT RESULTS**  
**INNER HARBOR**  
**SHEBOYGAN RIVER SUPERFUND SITE**  
**SHEBOYGAN, WISCONSIN**  
**SME PROJECT NO. 069638.00.032.001**

Identifier	Calculated Grid Size	PCB Concentration	Contribution to total SWAC	Contribution to total SWAC
	(sq. ft.)	(mg/Kg )	(sq. ft. * mg/Kg)	(%)
DEP(GRID)-176	8,285	0.581	4,814	0.90%
DEP(GRID)-177	1,416	0.585	828	0.16%
DEP(GRID)-178	64	0.733	47	0.01%
DEP(GRID)-179	1,313	0.637	836	0.16%
DEP(GRID)-180	423	0.662	280	0.05%
DEP(GRID)-181	7,492	0.568	4,255	0.80%
DEP(GRID)-182	554	0.717	397	0.07%
DEP(GRID)-183	68	0.639	43	0.01%
DEP(GRID)-184	930	0.869	808	0.15%
DEP(GRID)-185	299	<b>0.022</b>	7	0.00%
DEP(GRID)-186	442	0.796	352	0.07%
DEP(GRID)-187	187	0.592	111	0.02%
DEP(GRID)-188	554	0.746	413	0.08%
DEP(GRID)-190	298	0.663	198	0.04%
DEP(GRID)-192	298	0.380	113	0.02%
DEP(GRID)-194	7,774	0.668	5,193	0.98%
DEP(GRID)-196	7,539	0.466	3,513	0.66%

<b>Median PCB Concentration (mg/Kg)</b>	<b>0.51</b>
<b>Total Surface Area (sq. ft.)</b>	<b>1,093,363</b>
<b>Total RMU Contribution (sq. ft. x mg/Kg)</b>	<b>532,598</b>
<b>Target SWAC (mg/Kg)</b>	<b>0.5</b>
<b>ESTIMATED SWAC</b>	<b>0.49</b>

**Note:**

1. Per the Verification Sampling Plan (Section 2.7 of Appendix E of the Lower River 100% Design) submitted and approved, if no sediment was recovered (i.e. sand cover areas), a value equal to the half detection limit (0.022 ppm) will be assigned to this location and used in the SWAC calculation. The value of 0.022 ppm represents the half Pace detection limit of 0.043. For these locations and replacements, the half detection limit value is shown in italics and bolded.



**TABLE 5**  
**SUMMARY OF 2017 SEDIMENT RESULTS**  
**OVERALL RIVER**  
**SHEBOYGAN RIVER SUPERFUND SITE**  
**SHEBOYGAN, WISCONSIN**  
**SME PROJECT NO. 069638.00.032.001**

River Reach	Surface Area (sq. ft.)	% of Total Sediment	Median PCB Concentration (mg/Kg)	SWAC (mg/Kg)	Contribution to SWAC (sq. ft. * mg/Kg)	% of Contribution to total SWAC
Upper River	192,957	10%	0.78	1.82	352,081	33.14%
Middle River	54,089	2.8%	0.28	0.22	11,951	1.12%
Lower River	563,466	30%	0.33	0.29	165,800	15.61%
Inner Harbor	1,093,363	57%	0.51	0.49	532,598	50.13%

<b>Median PCB Concentration (mg/Kg)</b>	<b>0.68</b>
<b>Total Surface Area (sq. ft.)</b>	<b>1,903,875</b>
<b>Total Contribution (sq. ft. x mg/Kg)</b>	<b>1,062,430</b>
<b>Target SWAC (mg/Kg)</b>	<b>0.5</b>
<b>ESTIMATED OVERALL SWAC</b>	<b>0.56</b>





**TABLE 6**  
**SUMMARY FIELD DUPLICATE**  
**SAMPLE RESULTS**  
**SHEBOYGAN RIVER SUPERFUND SITE**  
**SHEBOYGAN, WISCONSIN**  
**SME PROJECT NO. 069638.00.032.001**

Duplicate Identifier	PCB Concentration (mg/Kg)	Sample Identifier	PCB Concentration (mg/Kg)	Relative Percent Difference
Dup-1	0.77	UR-Dep-14-3	0.602	24%
Dup-2	0.473	UR-Dep-19	0.541	13%
Dup-3	1.430	UR-Dep-33-1	1.000	35%
Dup-4	0.229	LR-Dep-5	0.306	29%
Dup-5	0.143	MR-Dep-17	0.288	67%
Dup-6	1.10	MR-Dep-55	1.740	45%
Dup-7	0.512	MR-Dep-64	0.485	5%
Dup-8	0.597	LR-Dep-7-2	0.536	11%
Dup-9	0.172	LR-Dep-9	0.208	19%
Dup-10	0.401	LR/IH-DEP(GRID)-254	0.461	14%
Dup-11	0.285	LR/IH-DEP(GRID)-237	0.651	78%
Dup-12	0.695	LR/IH-DEP(GRID)-222	0.740	6%
Dup-13	0.479	LR/IH-DEP(GRID)-196	0.466	3%
Dup-14	0.49	LR/IH-DEP(GRID)-166	0.475	3%
Dup-15	0.665	LR/IH-DEP(GRID)-139	0.635	5%
Dup-16	0.408	LR/IH-DEP(GRID)-129	0.612	40%
Dup-17	0.764	LR/IH-DEP(GRID)-109	0.612	22%
Dup-18	0.94	LR/IH-DEP(GRID)-89	0.686	31%
Dup-19	0.828	LR/IH-DEP(GRID)-66	0.638	26%
Dup-20	0.582	LR/IH-DEP(GRID)-52	0.418	33%
Dup-21	0.609	LR/IH-DEP(GRID)-45	0.555	9%
Dup-22	0.437	LR/IH-DEP(GRID)-6	0.329	28%

Duplicate relative percent difference (RPD) target of 50% per PRS QAPP (PRS, 2009)  
 Highlighted values exceed the target RPD

## **FIGURES**

- FIGURE 1 SHEBOYGAN RIVER LOCATION MAP**
- FIGURE 2 SHEBOYGAB RIVER REACH LOCATIONS**
- FIGURE 3 UPPER RIVER 0+00 TO 50+00**
- FIGURE 4 UPPER RIVER 50+00 TO 160+00**
- FIGURE 5 UPPER RIVER 160+00 TO 195+95**
- FIGURE 6 MIDDLE RIVER 195+95 TO 455+00**
- FIGURE 7 MR MIDDLE RIVER 400+00 TO 550+00**
- FIGURE 8 LOWER RIVER DISCREET DEPOSITS 545+00 TO 605+00**
- FIGURE 9 LOWER RIVER GRIDS 575+00 TO 660+00**
- FIGURE 10 INNER HARBOR GRIDS 640+00 TO 700+00**

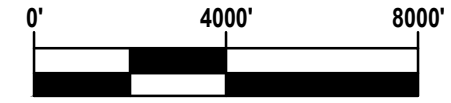
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**COUNTY LOCATION**  
(SHEBOYGAN COUNTY)

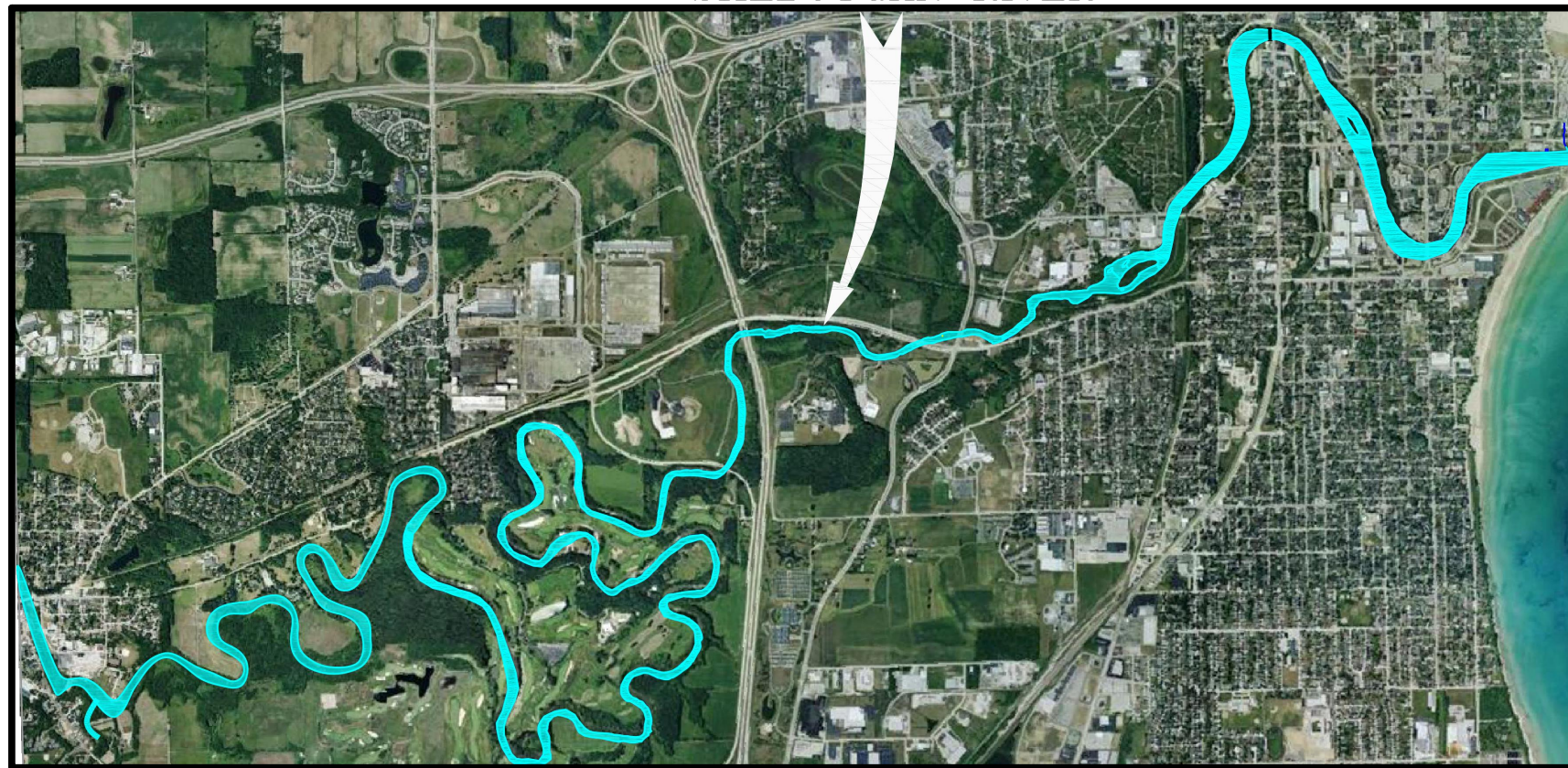
**COUNTY LOCATION MAP**

NOT TO SCALE



GRAPHIC SCALE: 1" = 4000'

**SHEBOYGAN RIVER**



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**Project**  
**SHEBOYGAN RIVER AND INNER HARBOR SUPERFUND SITE - 2017 SURFACE SEDIMENT MONITORING REPORT**

**Project Location**  
**SHEBOYGAN RIVER, SHEBOYGAN COUNTY, WISCONSIN**

**Sheet Name**  
**SHEBOYGAN RIVER LOCATION MAP**

No.	Revision Date

**Date** 11-8-17

**CADD** JAB

**Designer** MY

**Scale** 1" = 4000'

**Project** 069638.00.032.001

**Figure No.** 1

NOTE:  
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**Project**  
**SHEBOYGAN RIVER AND INNER HARBOR SUPERFUND SITE - 2017 SURFACE SEDIMENT MONITORING REPORT**

**Project Location**  
**SHEBOYGAN RIVER, SHEBOYGAN COUNTY, WISCONSIN**

**Sheet Name**  
**SHEBOYGAN RIVER REACH LOCATIONS**

No.	Revision Date

Date **11-8-17**

CADD **JAB**

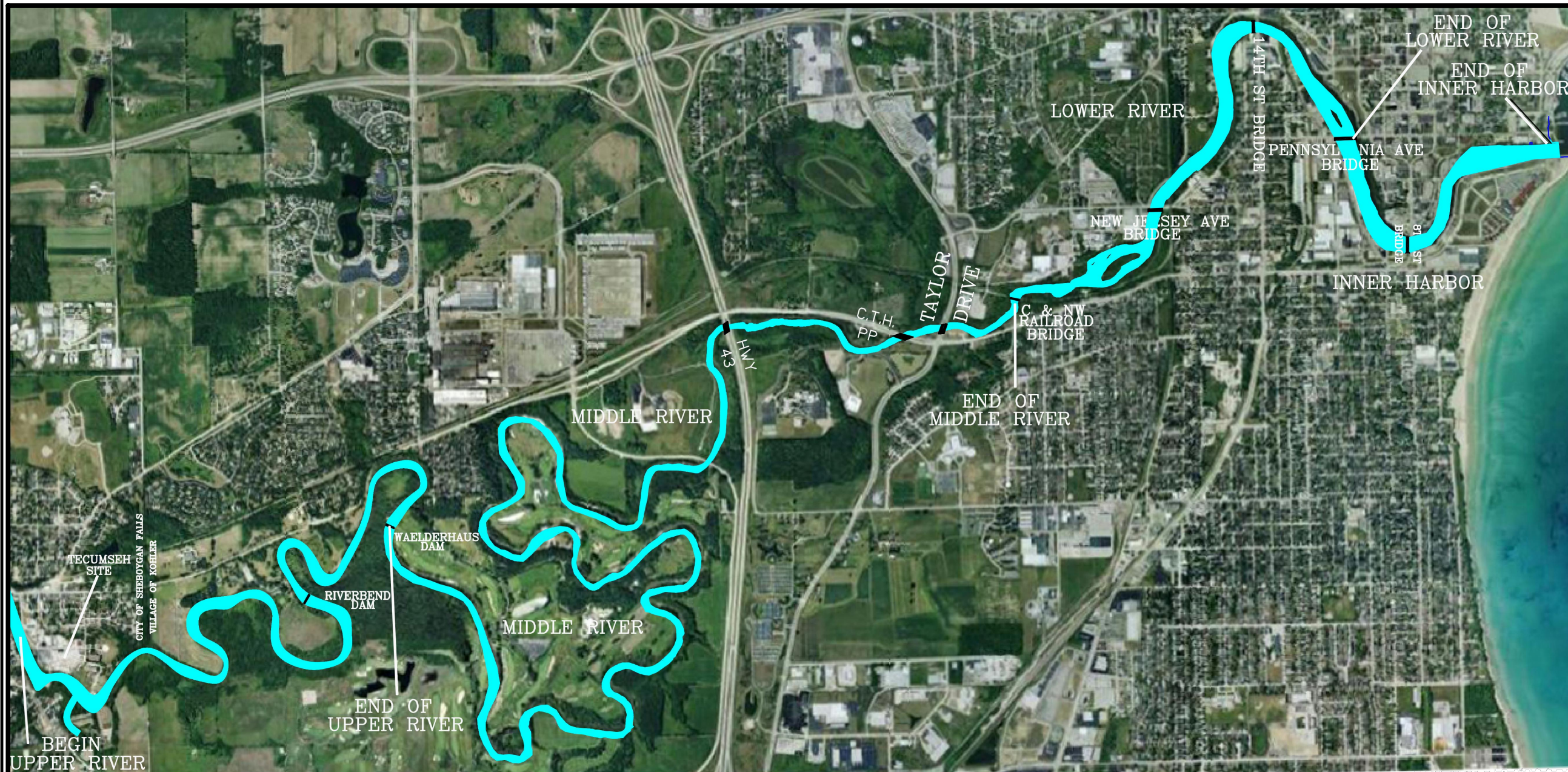
Designer **MY**

Scale **1" = 2000'**

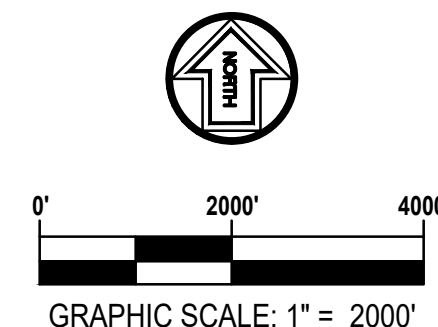
Project **069638.00.032.001**

Figure No. **2**

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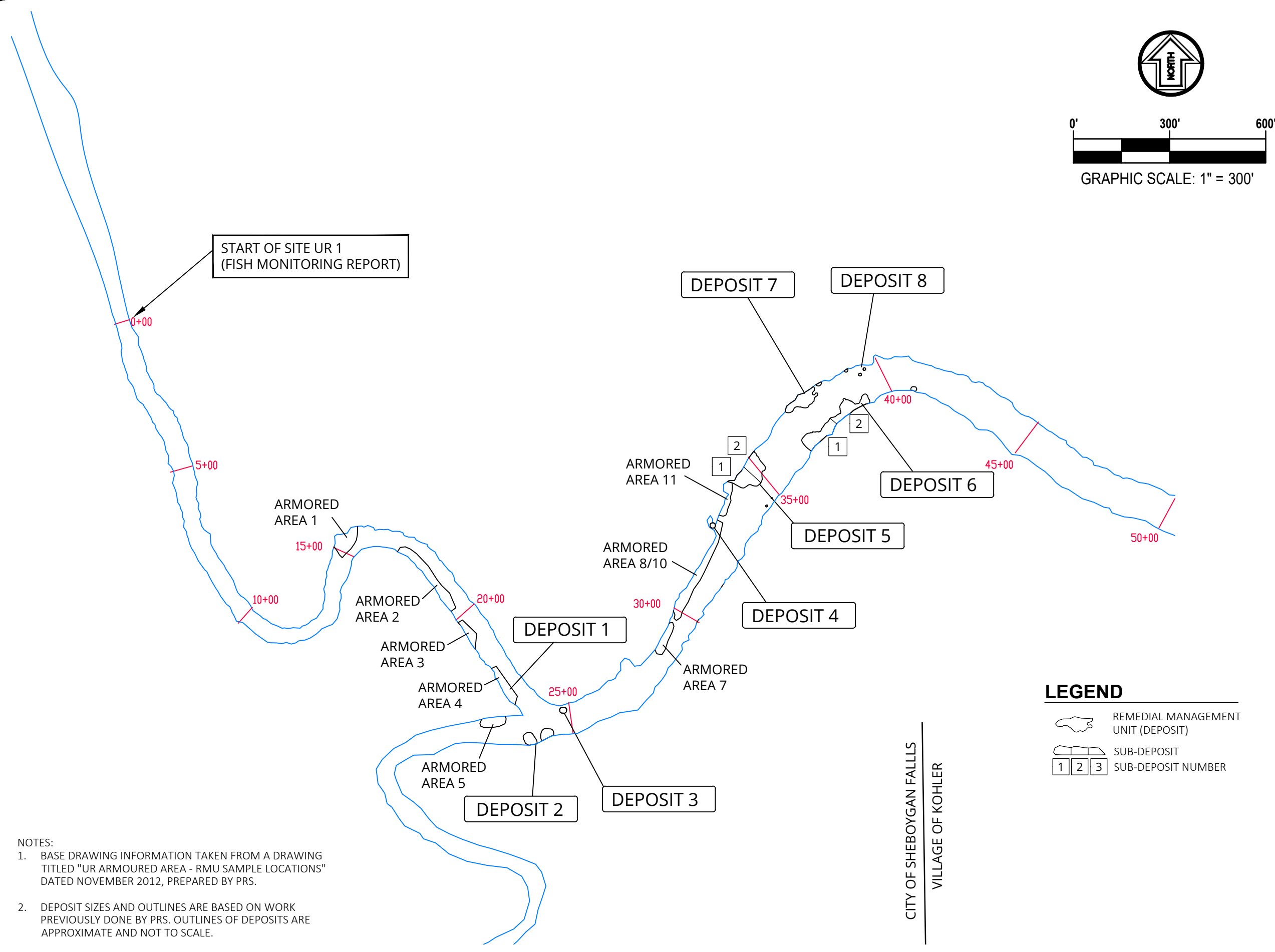
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Nov 08, 2017 - 1:07pm - jblake

PLOT DATE:

- NOTES:
1. BASE DRAWING INFORMATION TAKEN FROM A DRAWING TITLED "UR ARMoured AREA - RMU SAMPLE LOCATIONS" DATED NOVEMBER 2012, PREPARED BY PRS.
  2. DEPOSIT SIZES AND OUTLINES ARE BASED ON WORK PREVIOUSLY DONE BY PRS. OUTLINES OF DEPOSITS ARE APPROXIMATE AND NOT TO SCALE.



**LEGEND**

- REMEDIAL MANAGEMENT UNIT (DEPOSIT)
- SUB-DEPOSIT
- SUB-DEPOSIT NUMBER



**Project**  
**SHEBOYGAN RIVER AND INNER HARBOR SUPERFUND SITE - 2017 SURFACE SEDIMENT MONITORING REPORT**

**Project Location**  
**SHEBOYGAN RIVER, SHEBOYGAN COUNTY, WISCONSIN**

**Sheet Name**  
**UPPER RIVER 0+00 TO 50+00**

No.	Revision Date

Date	11-8-17
CADD	JAB
Designer	MY
Scale	1' = 300'
Project	069638.00.032.001
Figure No.	3

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**Project**  
**SHEBOYGAN RIVER AND INNER HARBOR SUPERFUND SITE - 2017 SURFACE SEDIMENT MONITORING REPORT**

**Project Location**  
**SHEBOYGAN RIVER, SHEBOYGAN COUNTY, WISCONSIN**

**Sheet Name**  
**UPPER RIVER 50+00 TO 160+00**

No. Revision Date

Date **11-8-17**

CADD **JAB**

Designer **MY**




Scale **1" = 300'**

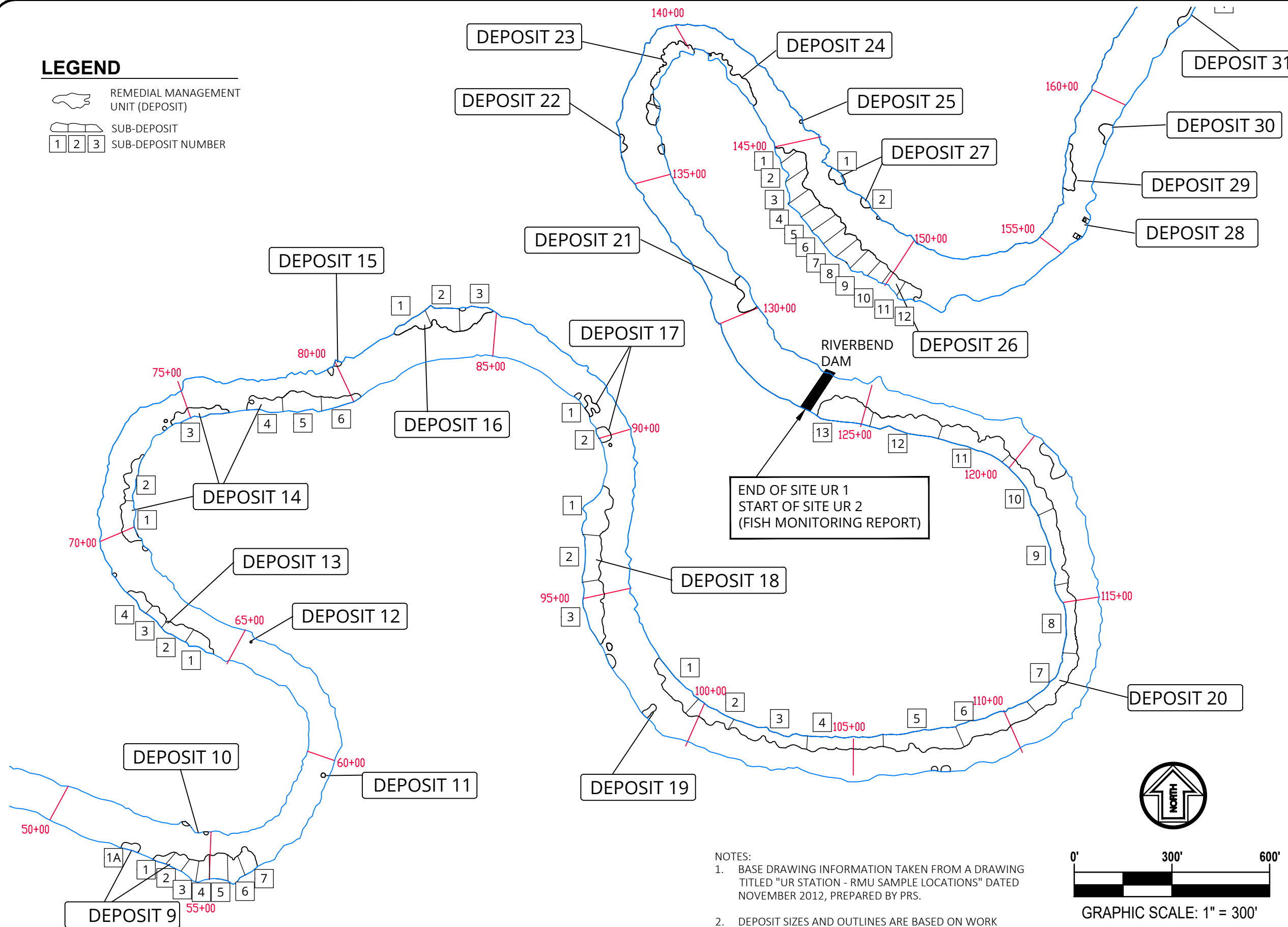
Project **069638.00.032.001**

Figure No. **4**

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**LEGEND**

-  REMEDIAL MANAGEMENT UNIT (DEPOSIT)
-  SUB-DEPOSIT
-  SUB-DEPOSIT NUMBER



- NOTES:
1. BASE DRAWING INFORMATION TAKEN FROM A DRAWING TITLED "UR STATION - RMU SAMPLE LOCATIONS" DATED NOVEMBER 2012, PREPARED BY PRS.
  2. DEPOSIT SIZES AND OUTLINES ARE BASED ON WORK PREVIOUSLY DONE BY PRS. OUTLINES OF DEPOSITS ARE APPROXIMATE AND NOT TO SCALE.

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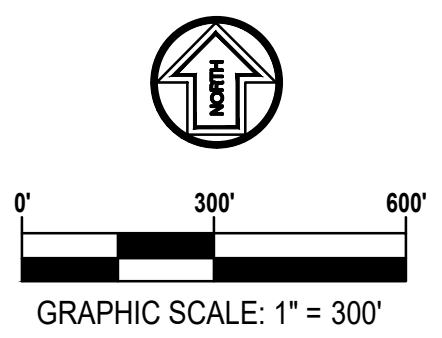
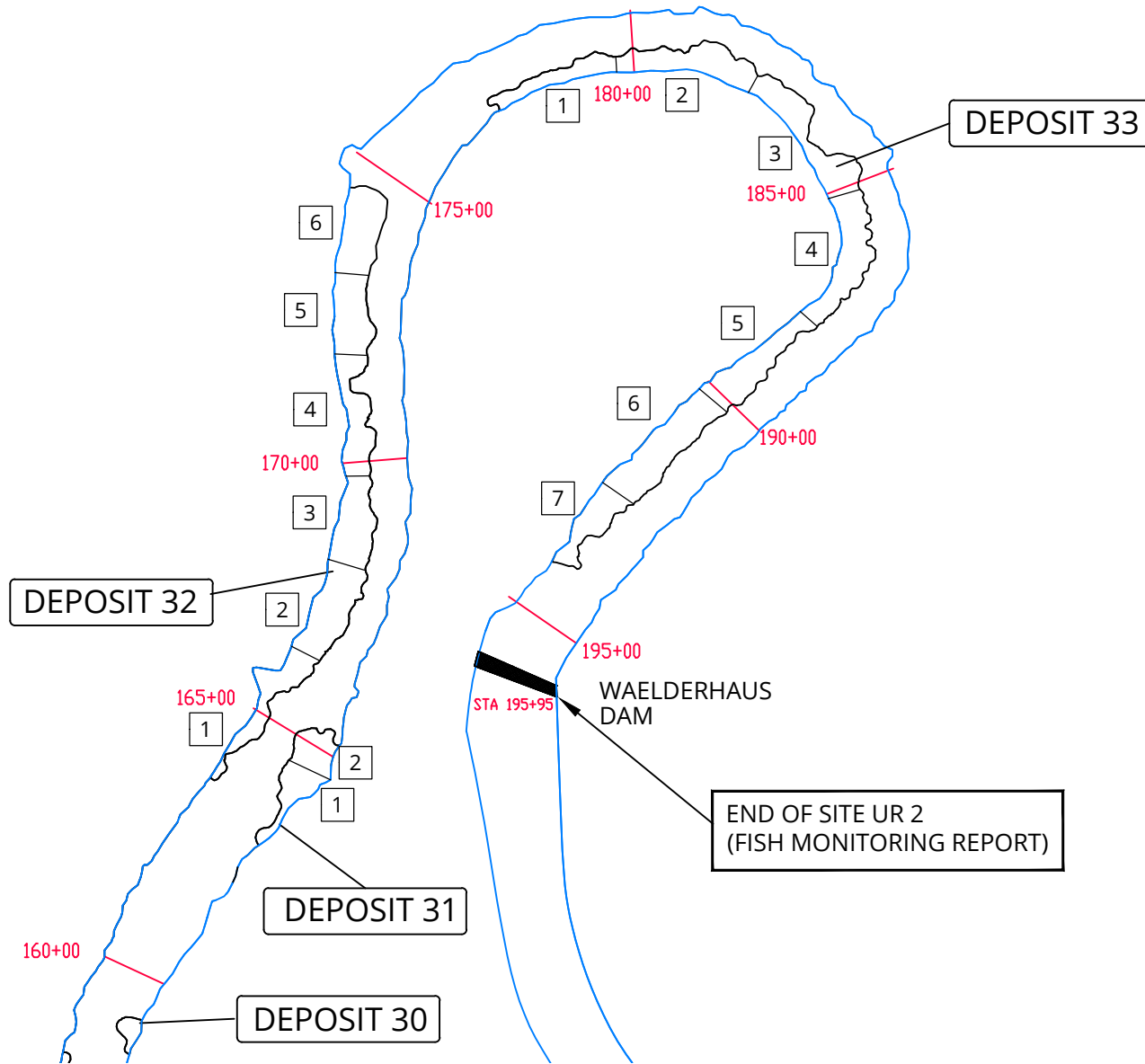
Nov 08, 2017 - 1:07pm - jblake

PLOT DATE:


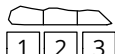
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Nov 08, 2017 - 1:08pm - jblake

PLOT DATE:



**LEGEND**

-  REMEDIAL MANAGEMENT UNIT (DEPOSIT)
-  SUB-DEPOSIT  
SUB-DEPOSIT NUMBER

- NOTES:
1. BASE DRAWING INFORMATION TAKEN FROM A DRAWING TITLED "UR STATION - RMU SAMPLE LOCATIONS" DATED NOVEMBER 2012, PREPARED BY PRS.
  2. DEPOSIT SIZES AND OUTLINES ARE BASED ON WORK PREVIOUSLY DONE BY PRS. OUTLINES OF DEPOSITS ARE APPROXIMATE AND NOT TO SCALE.



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**Project**  
**SHEBOYGAN RIVER AND INNER HARBOR SUPERFUND SITE - 2017 SURFACE SEDIMENT MONITORING REPORT**

**Project Location**  
**SHEBOYGAN RIVER, SHEBOYGAN COUNTY, WISCONSIN**

**Sheet Name**  
**UPPER RIVER 160+00 TO 195+95**

No.	Revision Date

Date **11-8-17**

CADD **JAB**

Designer **MY**

Scale **1' = 300'**

Project **069638.00.032.001**

Figure No. **5**

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**SHEBOYGAN RIVER AND INNER HARBOR SUPERFUND SITE - 2017 SURFACE SEDIMENT MONITORING REPORT**

**Project Location**  
**SHEBOYGAN RIVER, SHEBOYGAN COUNTY, WISCONSIN**

**Sheet Name**  
**MIDDLE RIVER 195+95 TO 455+00**

No.	Revision Date

**Date** 11-8-17

**CADD** JAB

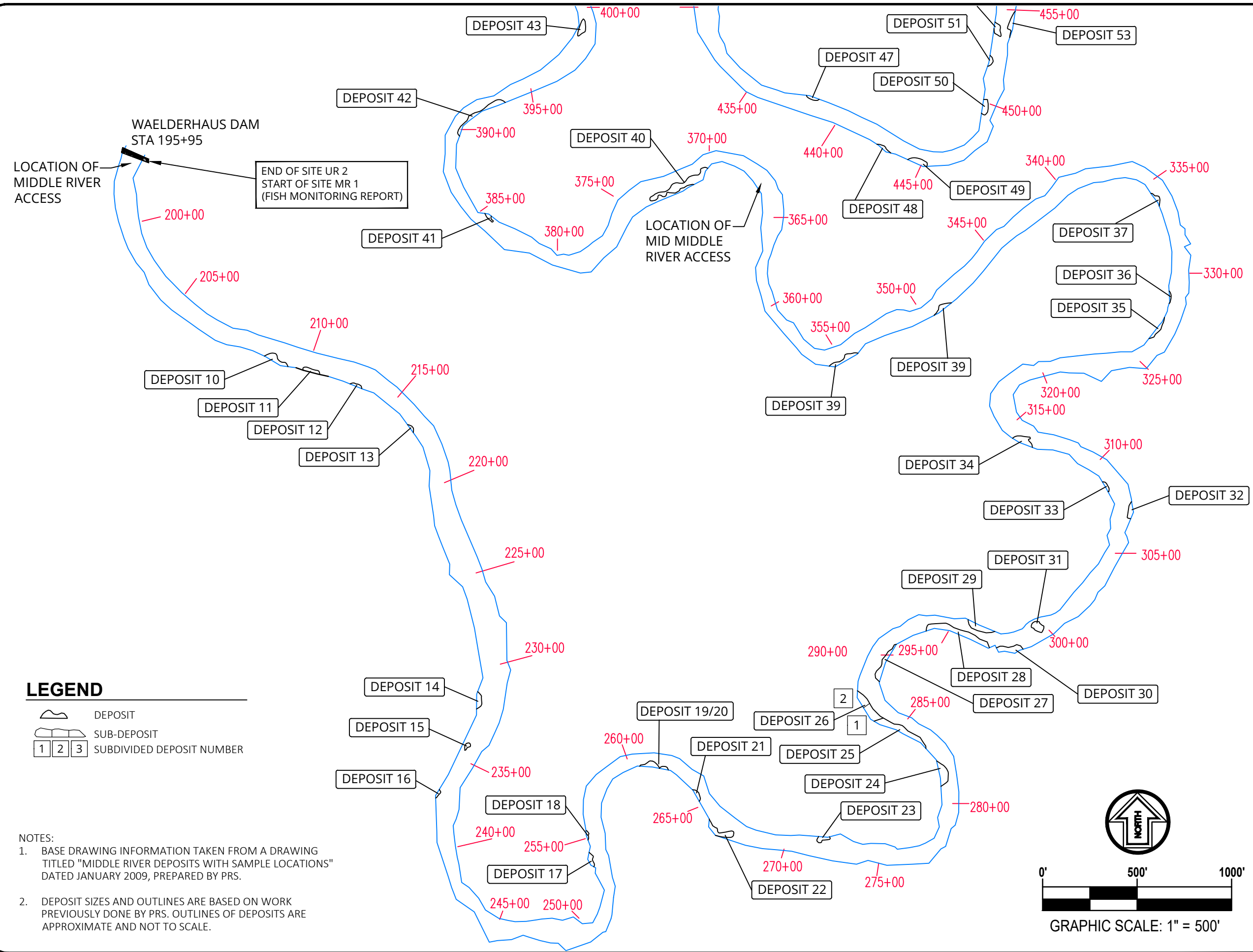
**Designer** MY

**Scale** 1" = 500'

**Project** 069638.00.032.001

**Figure No.** 6

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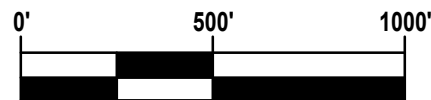


**LEGEND**

- DEPOSIT
- SUB-DEPOSIT
- SUBDIVIDED DEPOSIT NUMBER

- NOTES:**
- BASE DRAWING INFORMATION TAKEN FROM A DRAWING TITLED "MIDDLE RIVER DEPOSITS WITH SAMPLE LOCATIONS" DATED JANUARY 2009, PREPARED BY PRS.
  - DEPOSIT SIZES AND OUTLINES ARE BASED ON WORK PREVIOUSLY DONE BY PRS. OUTLINES OF DEPOSITS ARE APPROXIMATE AND NOT TO SCALE.





GRAPHIC SCALE: 1" = 500'

NOTES:

1. BASE DRAWING INFORMATION TAKEN FROM A DRAWING TITLED "MIDDLE RIVER DEPOSITS WITH SAMPLE LOCATIONS" DATED JANUARY 2009, PREPARED BY PRS.
2. DEPOSIT SIZES AND OUTLINES ARE BASED ON WORK PREVIOUSLY DONE BY PRS. OUTLINES OF DEPOSITS ARE APPROXIMATE AND NOT TO SCALE.

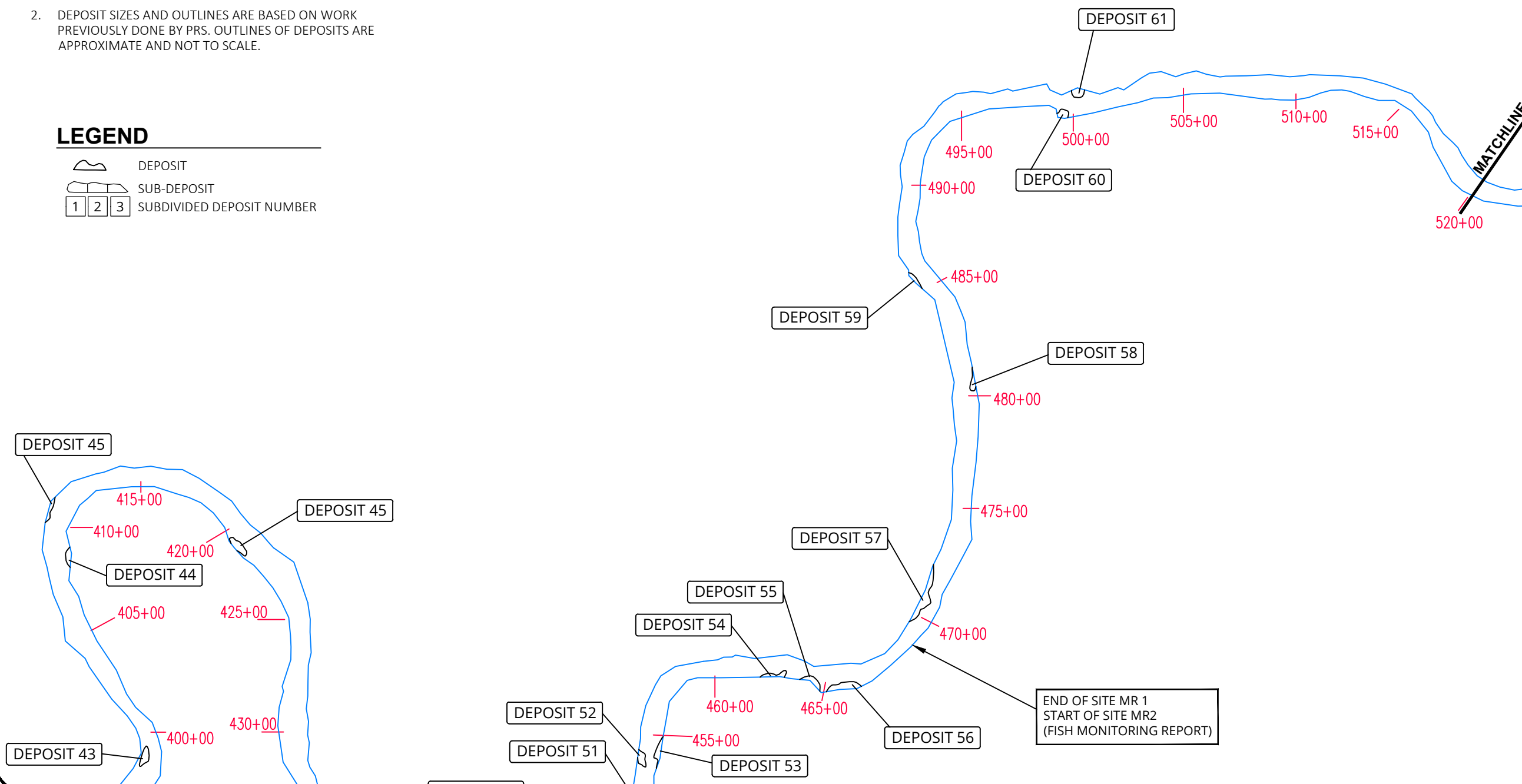
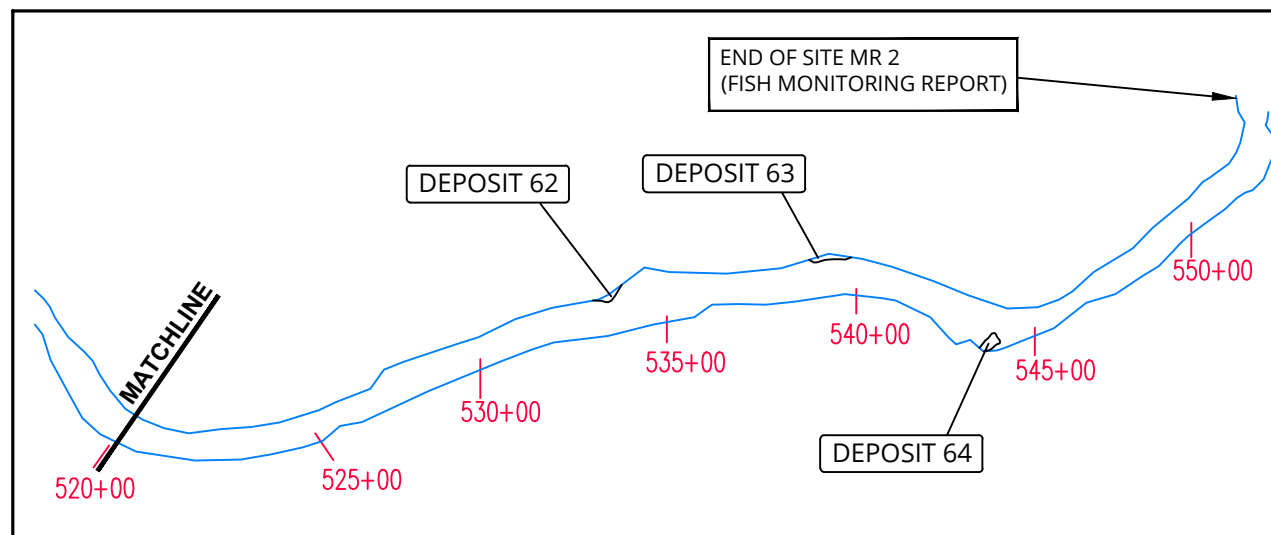
LEGEND

- DEPOSIT
- SUB-DEPOSIT
- SUBDIVIDED DEPOSIT NUMBER

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Project  
**SHEBOYGAN RIVER  
 AND INNER HARBOR  
 SUPERFUND SITE -  
 2017 SURFACE  
 SEDIMENT  
 MONITORING REPORT**

Project Location  
**SHEBOYGAN RIVER,  
 SHEBOYGAN  
 COUNTY,  
 WISCONSIN**

Sheet Name  
**MIDDLE RIVER  
 400+00 TO 550+00**

No.	Revision Date

Date **11-8-17**

CADD **JAB**

Designer **MY**

Scale **1' = 500'**

Project **069638.00.032.001**

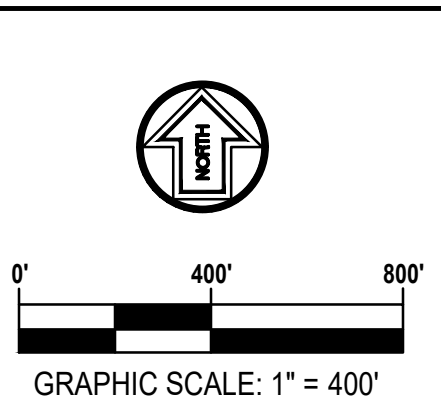
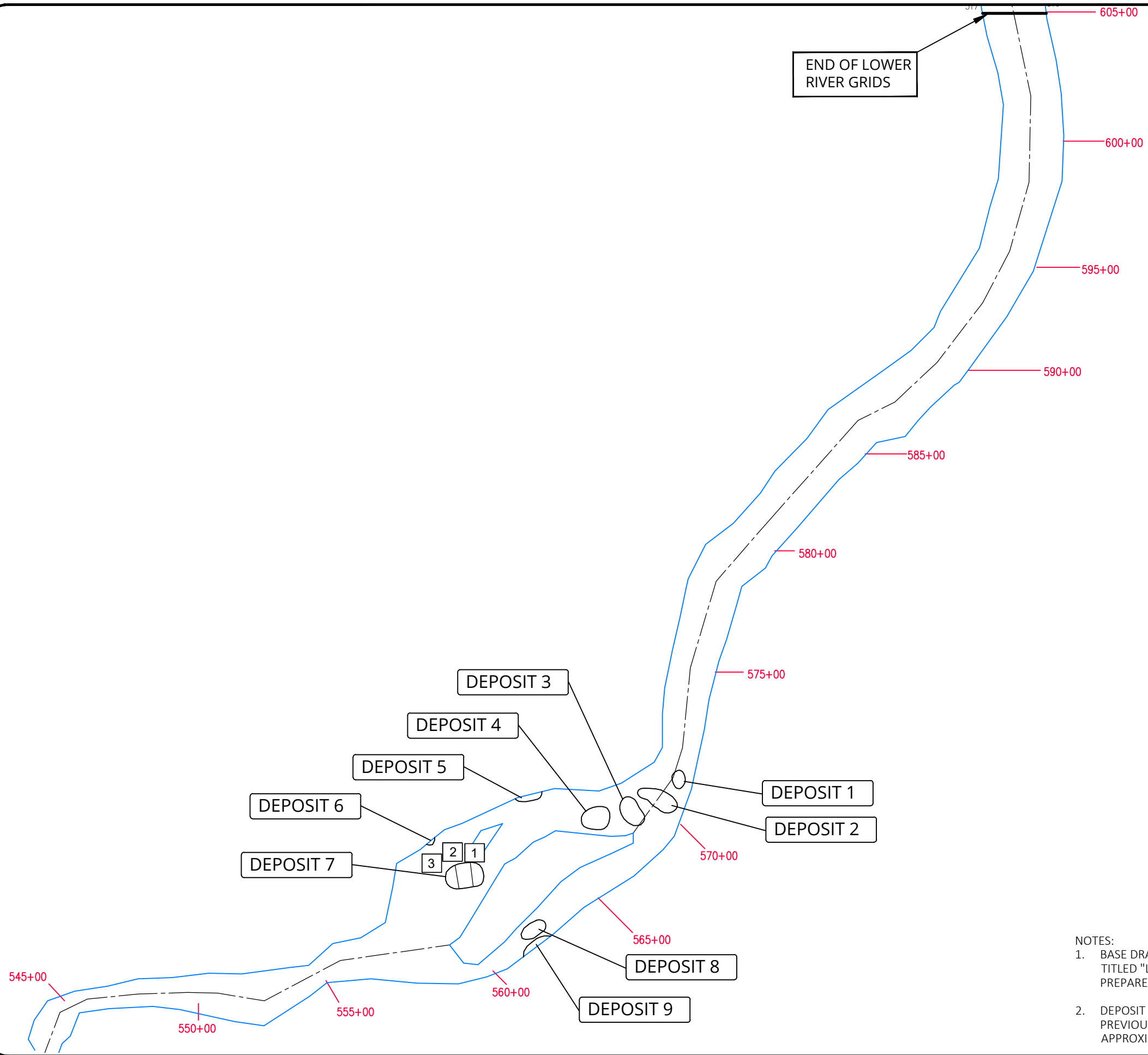
Figure No. **7**

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
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Nov 08, 2017 - 2:19pm - jblake

PLOT DATE:



**LEGEND**

-  DEPOSIT
-  SUB-DEPOSIT
-  SUBDIVIDED DEPOSIT NUMBER

- NOTES:
1. BASE DRAWING INFORMATION TAKEN FROM A DRAWING TITLED "LOWER RIVER GRID LAYOUT" DATED 2008, PREPARED BY PRS.
  2. DEPOSIT SIZES AND OUTLINES ARE BASED ON WORK PREVIOUSLY DONE BY PRS. OUTLINES OF DEPOSITS ARE APPROXIMATE AND NOT TO SCALE.



Project  
**SHEBOYGAN RIVER  
 AND INNER HARBOR  
 SUPERFUND SITE -  
 2017 SURFACE  
 SEDIMENT  
 MONITORING REPORT**

Project Location  
**SHEBOYGAN RIVER,  
 SHEBOYGAN  
 COUNTY,  
 WISCONSIN**

Sheet Name  
**LOWER RIVER  
 DISCREET DEPOSITS  
 545+00 TO 605+00**

No.	Revision Date

Date **11-8-17**

CADD **JAB**

Designer **MY**

Scale **1' = 400'**

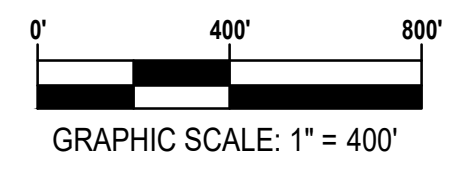
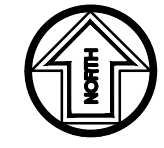
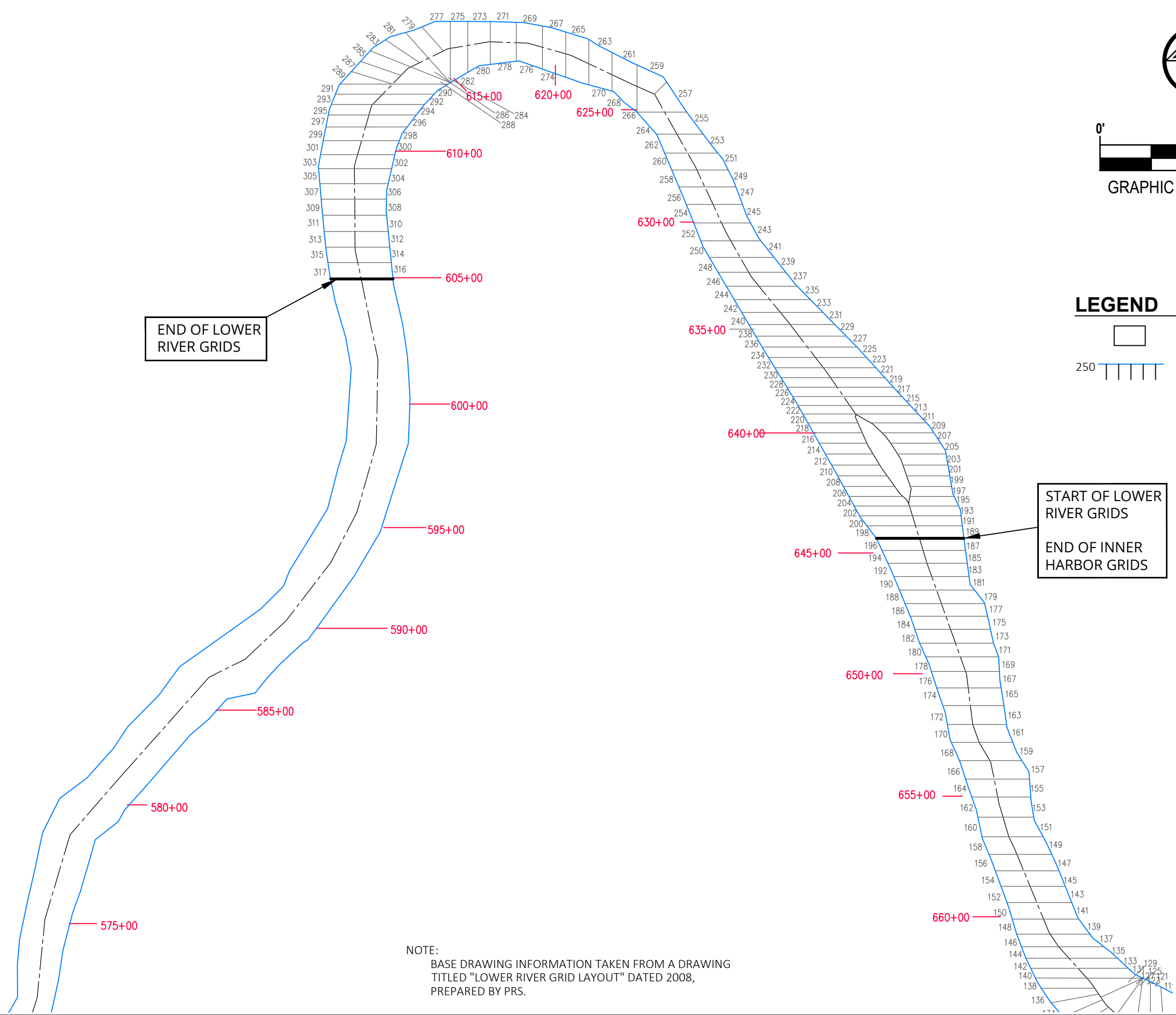
Project **069638.00.032.001**

Figure No.  
**8**

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**LEGEND**

- LEGACY PROJECT GRID
- PRE-DESIGN MANAGEMENT UNIT NUMBER

END OF LOWER RIVER GRIDS

START OF LOWER RIVER GRIDS  
END OF INNER HARBOR GRIDS

NOTE:  
BASE DRAWING INFORMATION TAKEN FROM A DRAWING TITLED "LOWER RIVER GRID LAYOUT" DATED 2008, PREPARED BY PRS.



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**Project**  
**SHEBOYGAN RIVER AND INNER HARBOR SUPERFUND SITE - 2017 SURFACE SEDIMENT MONITORING REPORT**

**Project Location**  
**SHEBOYGAN RIVER, SHEBOYGAN COUNTY, WISCONSIN**

**Sheet Name**  
**LOWER RIVER GRIDS 575+00 TO 660+00**

No.	Revision Date

**Date** 11-8-17

**CADD** JAB

**Designer** MY

**Scale** 1' = 400'

**Project** 069638.00.032.001

**Figure No.** 9

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# Project SHEBOYGAN RIVER AND INNER HARBOR SUPERFUND SITE - 2017 SURFACE SEDIMENT MONITORING REPORT

Project Location

## SHEBOYGAN RIVER, SHEBOYGAN COUNTY, WISCONSIN

Sheet Name

### INNER HARBOR GRIDS 640+00 TO 700+00

No.	Revision Date

Date **11-8-17**

CADD **JAB**

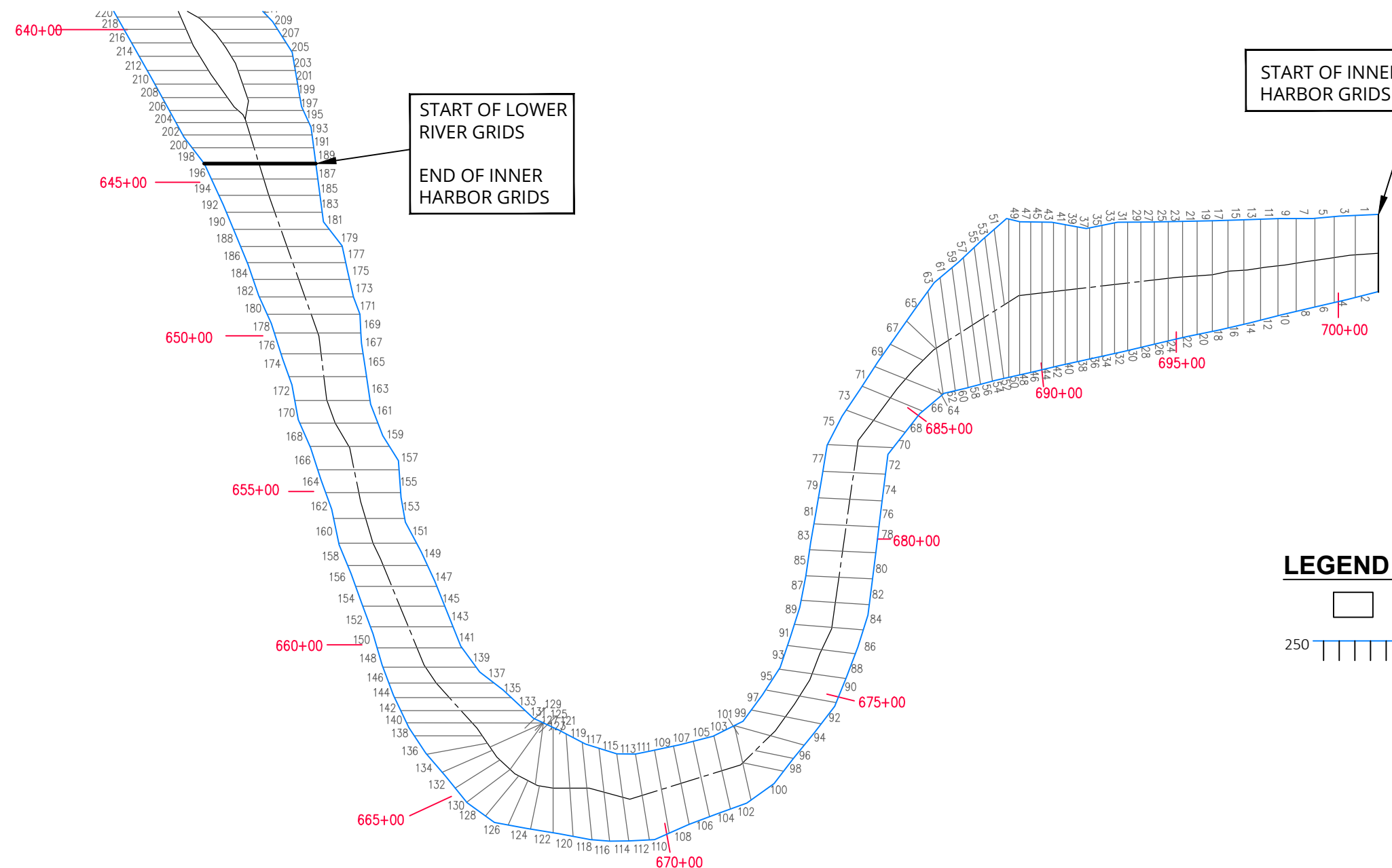
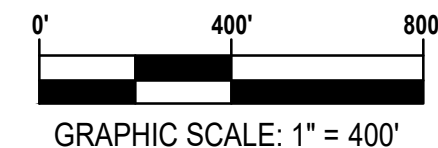
Designer **MY**

Scale **1' = 400'**



Project **069638.00.032.001**

Figure No. **10**

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### LEGEND

-  LEGACY PROJECT GRID
-  PRE-DESIGN MANAGEMENT UNIT NUMBER

NOTE:  
BASE DRAWING INFORMATION TAKEN FROM A DRAWING TITLED " INNER HARBOR GRID LAYOUT WITH SAMPLE LOCATIONS" DATED 2009, PREPARED BY PRS.

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Nov 08, 2017 - 2:17pm - jblake

PLOT DATE:

**APPENDIX A**  
**PHOTOGRAPHS**



PHOTO NO. 1: View of the general Upper River reach (typical).



PHOTO NO. 2: View of the general Middle River reach (typical).

SME Project No.:	069638.00.032.001
Photographs by:	Aaron Lammers / Michael Yergin
Date:	September 2017
Project:	Sheboygan River and Harbor Superfund Site
Location:	Sheboygan, Wisconsin



PHOTO NO. 3: View of GPS locating of sediment deposits (typical Upper and Middle River).



PHOTO NO. 4: View of sediment sampling method (typical Upper and Middle River).

SME Project No.:	069638.00.032.001
Photographs by:	Aaron Lammers / Michael Yergin
Date:	September 2017
Project:	Sheboygan River and Harbor Superfund Site
Location:	Sheboygan, Wisconsin



PHOTO NO. 5: View of collected sediment sample (typical Upper and Middle River).



PHOTO NO. 6: View of the location of Upper River Deposit 26

SME Project No.:	069638.00.032.001
Photographs by:	Aaron Lammers / Michael Yergin
Date:	September 2017
Project:	Sheboygan River and Harbor Superfund Site
Location:	Sheboygan, Wisconsin





PHOTO NO. 7: View of the general Lower River and Inner Harbor (typical).



PHOTO NO. 8: View of sediment sampling method (typical Lower River and Inner Harbor).

SME Project No.:	069638.00.032.001
Photographs by:	Aaron Lammers / Michael Yergin
Date:	September 2017
Project:	Sheboygan River and Harbor Superfund Site
Location:	Sheboygan, Wisconsin



PHOTO NO. 9: View of collected sediment sample (typical Lower River and Inner Harbor).



PHOTO NO. 10: View of collected sand cover (typical Lower River and Inner Harbor).

SME Project No.:	069638.00.032.001
Photographs by:	Aaron Lammers / Michael Yergin
Date:	September 2017
Project:	Sheboygan River and Harbor Superfund Site
Location:	Sheboygan, Wisconsin



PHOTO NO. 11: View of the inaccessible area of the Inner Harbor (Grids 112 and 114) beneath the southern portion of the 8<sup>th</sup> Street Bridge.

SME Project No.:	069638.00.032.001
Photographs by:	Aaron Lammers / Michael Yergin
Date:	September 2017
Project:	Sheboygan River and Harbor Superfund Site
Location:	Sheboygan, Wisconsin

**APPENDIX B**  
**LABORATORY ANALYTICAL REPORTS**

September 27, 2017

Keith Egan  
Pollution Risk Services LLC  
One North Commerce Park  
Suite 318  
Cincinnati, OH 452153174

RE: Project: 069638.00.032.001 SHEYBOYGAN R  
Pace Project No.: 40157272

Dear Keith Egan:

Enclosed are the analytical results for sample(s) received by the laboratory on September 22, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,



Tod Noltemeyer  
tod.noltemeyer@pacelabs.com  
(920)469-2436  
Project Manager

Enclosures



## REPORT OF LABORATORY ANALYSIS

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