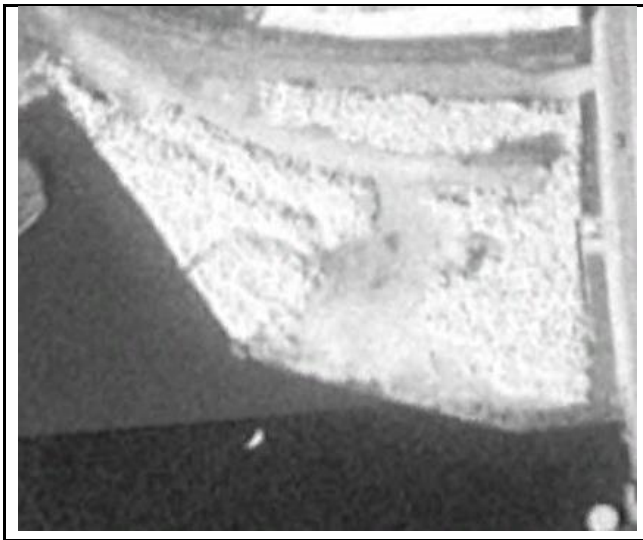
From: Byers, Harris <Harris.Byers@stantec.com>
Sent: Monday, April 4, 2022 7:47 PM
To: Beggs, Tauren R - DNR
Cc: Lennie, Brian; Cull, Whitney; Woelmer, Jacob; Adam Tegen
Subject: Update on 2022 River Point District - Shoreline Enhancements
Attachments: Figure 1 - Sample Locations.pdf; Table 1 - Soil Quality.pdf

Tauren:

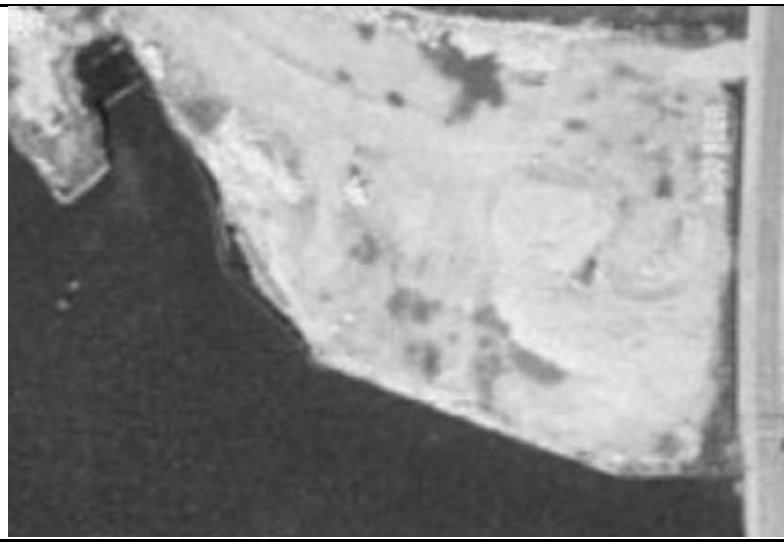
Wanted to keep you in the loop as the City of Manitowoc continues planning for the 2022 River Point District brownfield redevelopment project. I understand the natural resources group at Stantec (cc'd) is working with the permitting side of WDNR to facilitate the shoreline work.

As we discussed earlier this year, the City is targeting 2022 construction activities to the southern portion of the Phase I Redevelopment Area. Specifically, the City is working on shoreline enhancements in the area of the tilted sheet wall and wooden dock wall we discussed last year. This area is completely upland of the bulkhead line.

As illustrated on Figure 1 (attached), Sanborn ® Fire Insurance Maps indicate this portion of the River Point District was filled in the late 19th Century (between 1887 and 1900). In reviewing historic orthophotographs in the Stantec (2019) Phase I ESA and supplemental images available through Google Earth, it appears that the dock wall tilted away from the land between 1992 and 2000 (see below). We have not been able to confirm why the wall tilted; though the most reasonable explanation is the upland ties failed and the wall leaned into the River under the weight/pressure of the large stone blocks being transloaded through the Site.



1992 Orthophotograph (Google Earth)



2000 Orthophotograph (Phase I ESA)

To plan for the 2022 shoreline work, the Stantec engineering team (cc'd) conducted a bathymetric survey last winter (in addition to the work the UWM School of Freshwater Sciences completed last year). The bathymetric surveys indicate the sheet pile and/or dock wall remain in contact with the river bottom, suggesting that although the wall tilted away from the shoreline, it has not resulted in a release of upland soil to the navigational channel.

As you can imagine, the tilted sheet pile and wooden dock (which are likely stressed by lateral forces) wall pose a significant construction risk. So rather than complete removal of the dock wall and driving a

new sheet wall, current plans include partial demolition of the wall below the water surface and constructing a rock revetment to protect the upland area while creating aquatic habitat.

As we discussed earlier, the SI did not include sampling below the River water level. But given the apparent sequence of events, it is likely that some upland soils located immediately adjacent to the River are present below the current water surface. Detected constituents in soil from five sample locations completed near the shoreline in the area of the Property filled around the same time are summarized on the attached table.

To construct a safe slope for the rock revetment, some of the material on the upland side of the wall (below the water surface) is likely to be removed (excavated). To that end, we recently sampled material from below the river level for waste characterization purposes. COCs included heavy metals, polychlorinated biphenys, and semivolatile organic compounds (COCs for upland soils in the SI). We will share that data with you as soon as we receive it (anticipated April 12) to aid in the discussion of material management.

Sincerely,

Harris Byers, Ph.D.
Sr. Brownfields Project Manager
Contaminant Hydrogeologist / Urban Geochemist

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Figure No.
1

Title
Sample Locations and the Historic Bank of the Manitowoc River

Client/Project
Riverfront Enhancement Project Area
River Point District
City of Manitowoc

0 50 100 Feet

Prepared by HLB on 4/4/2022

Legend

- Bank of the Manitowoc River

Previous Stantec Sample Locations Near River

- Monitoring Well
- Soil Boring
- Soil Boring/Temp Well

Additional Stantec Sample Locations

- Monitoring Well
- Soil Boring
- Soil Boring/Temp Well

N

Notes

1. Coordinate System: NAD 1983 StatePlane Wisconsin South FIPS 4803 Feet
2. Historic Site features illustrated on this figure were digitized from multiple historic maps/sources, including City Assessor files, WDNR files, and Sanborn (R) Fire Insurance Maps. These features are provided for illustration purposes only; Stantec makes no warranty as to the accuracy of these features.
3. Orthophotograph: Manitowoc County, 2020

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Table 1
Detected Constituents in Soil Near the Manitowoc River
River Point District
Manitowoc, Wisconsin

Detected Constituents in Soil	Units	Soil Sample Location, Date, Sample Depth Interval, Sample Type (Granular Fill or Native Soil Below Fill)												
		SB-69		SB-73		SB-109					SB-114	SB-115		
		14-Nov-18	14-Nov-18	14-Nov-18	14-Nov-18	25-Feb-21	25-Feb-21	25-Feb-21	25-Feb-21	25-Feb-21	2-Mar-21	2-Mar-21	2-Mar-21	2-Mar-21
		2.5 - 3.5 ft	3.5 - 4 ft	3 - 4 ft	4 - 5 ft	0 - 1 ft	2 - 3 ft	3 - 5 ft	5 - 7 ft	7 - 8.5 ft	3.5 - 5 ft	2 - 3 ft	3 - 4 ft	4 - 4.5 ft
		FILL	BELOW	FILL	BELOW	ABOVE	FILL	FILL	BELOW	BELOW	FILL	ABOVE	FILL	BELOW
Heavy Metals														
Arsenic	mg/kg	4.1	-	3	-	-	-	2.4	2.2	-	0.67 J	-	1.9	1.0 J
Barium	mg/kg	40	-	50	-	-	-	-	-	-	-	-	-	-
Cadmium	mg/kg	0.17 J	-	0.25 J	-	-	-	-	-	-	-	-	-	-
Chromium	mg/kg	11	-	13	-	-	-	-	-	-	-	-	-	-
Lead	mg/kg	17	-	36	-	-	-	40	[56]	19	6.4	-	15	6.2
Mercury	mg/kg	0.018 J	-	0.028	-	-	-	-	-	-	-	-	-	-
Selenium	mg/kg	1.0 J B	-	1.2 J B	-	-	-	-	-	-	-	-	-	-
Silver	mg/kg	<0.14	-	<0.17	-	-	-	-	-	-	-	-	-	-
Polycyclic Aromatic Hydrocarbons														
Acenaphthene	µg/kg	11 J	-	66	-	-	-	8.9 J	13 J	-	<40	-	<140	<40
Acenaphthylene	µg/kg	14 J	-	21 J	-	-	-	13 J	19 J	-	<40	-	<140	<40
Anthracene	µg/kg	29 J	-	160	-	-	-	26 J	33 J	-	<40	-	26 J	<40
Benzo(a)anthracene	µg/kg	82	-	340	-	-	-	65	81	-	<40	-	46 J	<40
Benzo(a)pyrene	µg/kg	110	-	290	-	-	-	84	80	-	<40	-	51 J	<40
Benzo(b)fluoranthene	µg/kg	170	-	420	-	-	-	110	130	-	<40	-	55 J	<40
Benzo(g,h,i)perylene	µg/kg	47	-	120	-	-	-	44	44	-	<40	-	<140	<40
Benzo(k)fluoranthene	µg/kg	63	-	140	-	-	-	40 J	39 J	-	<40	-	<140	<40
Chrysene	µg/kg	91	-	340	-	-	-	79	95	-	<40	-	52 J	<40
Dibenzo(a,h)anthracene	µg/kg	18 J	-	39 J	-	-	-	12 J	13 J	-	<40	-	<140	<40
Fluoranthene	µg/kg	66	-	760	-	-	-	82	130	-	<40	-	64 J	<40
Fluorene	µg/kg	13 J	-	150	-	-	-	8.0 J	16 J	-	<40	-	<140	<40
Indeno(1,2,3-cd)pyrene	µg/kg	49	-	120	-	-	-	48	49	-	<40	-	<140	<40
Methylnaphthalene, 1-	µg/kg	150	-	38 J	-	-	-	72 J	190	-	<81	-	120 J	<81
Methylnaphthalene, 2-	µg/kg	190	-	44 J	-	-	-	81 J	230	-	<81	-	140 J	<81
Naphthalene	µg/kg	130	-	40 J	-	-	-	92	180	-	<40	-	98 J	<40
Phenanthrene	µg/kg	150	-	820	-	-	-	100	180	-	<40	-	140	<40
Pyrene	µg/kg	89	-	600	-	-	-	77	120	-	<40	-	72 J	<40
Volatile Organic Compounds														
Benzene	µg/kg	-	<11 *	-	<13 *	79	13 J	-	-	-	-	<17	-	-
Butylbenzene, n-	µg/kg	-	<29 *	-	<35 *	<86	<62	-	-	-	-	<67	-	-
Butylbenzene, sec- (2-Phenylbutane)	µg/kg	-	<30 *	-	<36 *	35 J	<62	-	-	-	-	<67	-	-
Chloroform (Trichloromethane)	µg/kg	-	<28 *	-	<34 *	<170	<120	-	-	-	-	<130	-	-
Dichloroethene, cis-1,2-	µg/kg	-	<31	-	<37	<86	<62	-	-	-	-	<67	-	-
Ethylbenzene	µg/kg	-	<14	-	<17	150	35	-	-	-	-	<17	-	-
Isopropylbenzene	µg/kg	-	<29 *	-	<35 *	91	32 J	-	-	-	-	<67	-	-
Isopropyltoluene, p- (Cymene)	µg/kg	-	<27 *	-	<33 *	170	<62	-	-	-	-	<67	-	-
Naphthalene	µg/kg	-	<25	-	200	430	110	-	-	-	-	24 J	-	-
Propylbenzene, n-	µg/kg	-	<31	-	<38	130	45 J	-	-	-	-	<67	-	-
Tetrachloroethene (PCE)	µg/kg	-	<28 *	-	<34 *	<86	<62	-	-	-	-	<67	-	-
Toluene	µg/kg	-	<11 *	-	<13 *	570	110	-	-	-	-	<17	-	-
Trichloroethane, 1,1,1-	µg/kg	-	<29 *	-	<35 *	<86	<62	-	-	-	-	<67	-	-
Trichloroethene (TCE)	µg/kg	-	<12 *	-	<15 *	<43	<31	-	-	-	-	<33	-	-
Trichlorofluoromethane (Freon 11)	µg/kg	-	<32	-	<39	<86	<62	-	-	-	-	<67	-	-
Trimethylbenzene, 1,2,4-	µg/kg	-	<27 *	-	160	240	72	-	-	-	-	<67	-	-
Trimethylbenzene, 1,3,5-	µg/kg	-	<29 *	-	<35 *	66 J	<62	-	-	-	-	<67	-	-
Xylenes, Total	µg/kg	-	<17 *	-	<20 *	890	220	-	-	-	-	<33	-	-

Notes

mg/kg	Milligram per Kilogram	B	Indicates analyte was found in associated blank, as well as in the sample.
µg/kg	Microgram per Kilogram	J	The reported result is an estimated value.
<0.03	Analyte was not detected at a concentration greater than the laboratory reporting limit.	*	LCS or LCSD is outside the control limits
-	Parameter not analyzed.	^	Laboratory instrument-related QC is outside acceptance limits.