Item 6A. BCWMC 5-18-17

Appendices

- Appendix A Sediment Sampling Memo—Bassett Creek Park Pond
- Appendix B Sediment Sampling Memo—Winnetka Pond East
- Appendix C Wetland Delineation Report
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Appendix A

Sediment Sampling Memo—Bassett Creek Park Pond



Technical Memorandum

To:Bassett Creek Watershed Management CommissionFrom:Kevin Menken and Candice KantorSubject:Bassett Creek Park Pond Sediment CharacterizationDate:February 27, 2017Project:23/27-0051

Introduction

This memorandum summarizes sediment characterization for sediment samples collected from the Bassett Creek Park Pond in the City of Crystal (City). Sediment samples were collected by Barr Engineering Co. (Barr) on September 28, 2016 on behalf of Bassett Creek Watershed Management Organization.

The purpose of sediment characterization is to determine whether the sediment in the pond, when excavated or dredged, could potentially be reused as fill, or if other management methods such as landfill disposal would be required. The use and/or disposal of excavated or dredged material is determined based on concentrations of potential contaminants in the sediments, including metals and polycyclic aromatic hydrocarbons (PAHs). Excavated sediment and soils that do not exhibit field screening impacts and do not exceed the Minnesota Pollution Control Agency's (MPCA) Soil Reference Values (SRV) or applicable Screening Soil Leaching Values (SLVs) may be considered Unregulated Fill that is suitable for off-site reuse according to the MPCA document *Best Management Practices for the Off-Site Reuse of Unregulated Fill* (MPCA, 2012). Sediment or soil excavated from stormwater ponds with constituents that exceed SRVs or applicable Screening SLVs are often disposed at a solid waste landfill, but other options involving specific land uses (e.g. non-residential) could be explored if there are suitable locations elsewhere at City-owned property.

Sediment Sample Collection

Sediment sampling was conducted in accordance with the MPCA's *Managing Stormwater Sediment, Best Management Practice Guidance* (MPCA, 2015). This document provides technical guidance for characterizing sediment in stormwater ponds, including the number of samples that should be collected and potential contaminants to be analyzed. Barr staff collected four sediment samples, which each sample being the composite of five coring locations, consistent with MPCA guidance recommendations for ponds 4 acres in size or larger. Barr staff used a plastic coring tube for collecting sediment cores where it was possible to push the coring tube in by hand, and used a stainless steel auger where sediment was too firm to push the coring tube. Collected sediment was then composited in a clean plastic 5-gallon bucket. A GPS unit was used to record the locations of the sampling locations, which are shown on Figure 1. Sediment sample BCPP-1 is the composite of coring locations BCPP-1A, BCPP-1A, BCPP-1C, BCPP-1D, and BCPP-1E; sediment sample BCPP-2 is the composite of coring locations BCPP-2A, BCPP-2B, etc. Samples were placed in containers provided by the laboratory, and sent to Pace Analytical laboratory in Minneapolis for analyses of potential contaminants. In addition, a composite of all sampling locations was created (BCPP 1-4 Comp) for waste characterization sampling in the event that material is disposed in a landfill (landfills often require Toxicity Characteristic Leaching Procedure, or TCLP, testing for metals).

The MPCA guidance for stormwater pond sediment management lists the baseline parameters that should be tested for in order to determine whether excavated sediment is contaminated or could be considered Unregulated Fill (MPCA, 2015). The baseline parameters listed in the MPCA guidance are arsenic, copper, and polycyclic aromatic hydrocarbons (PAHs). PAHs are organic compounds that are formed by the incomplete combustion of organic materials, such as wood, oil, and coal. They are also naturally occurring in crude oil and coal. The MPCA determined that coal tar-based sealants are the largest source of PAHs to stormwater ponds, and a state-wide ban of coal tar-based sealants took effect January 1, 2014.

In addition to the baseline parameters, additional parameters may be appropriate with consideration of potential sources of other contaminants in the watershed. A query of MPCA's *What's in My Neighborhood* (WIMN) website was performed for the Bassett Creek Park Pond watershed. *WIMN* is a database maintained by the MPCA that includes potentially contaminated sites (e.g. documented tank leaks), and environmental permits and registrations (e.g. small quantity hazardous waste generator). Based on the WIMN query results and the land uses in the watershed, the sediment samples were analyzed for the MPCA's baseline parameters for stormwater ponds – arsenic, copper, and PAHs. In addition, samples were field screened for potential impacts from chemical impacts, including examination for visual staining, oil sheen, and odors. If field screening indicated possible impacts, additional analytical testing would have been considered.

Laboratory Methodologies and Determination of BaP Equivalents

The parameters analyzed and their laboratory analytical methods are listed below:

- Metals: arsenic, copper (method EPA 6010C)
- Polycyclic aromatic hydrocarbons (PAHs) (method EPA 8270D by SIM)

The PAHs that were analyzed can be grouped into two categories: carcinogenic (i.e. cancer causing) and non-carcinogenic. In order to assess the contamination level of the carcinogenic PAHs in stormwater pond sediment, the MPCA requires the calculation of a "BaP equivalents value". The BaP equivalents value is a single value representing the combined potency of 17 individual carcinogenic PAH compounds with BaP (benzo[a]pyrene) acting as the reference compound. The list of compounds and their respective potency equivalents factors used to calculate the BaP equivalents value can be found in the MPCA guidance

document, along with methods for addressing constituents at concentrations below the detection limit (MPCA 2015).

Laboratory analytical results for the sediment samples are summarized in Table 1. The detailed laboratory report is included in Attachment C, and includes the TCLP metals testing results.

Results of Sediment Characterization

Results of laboratory analytical testing on the sediment samples were compared to the MPCA's current SRVs and Screening SLVs on Table 1. Results of field screening for staining, sheen, or odor, were negative for all four sediment samples. Therefore, no additional analytical testing was conducted beyond the baseline parameter list for stormwater pond sediment characterization.

One of the four sediment samples collected in the pond had a BaP equivalents value exceeding the Screening SLV. Sediment sample BCPP-1 (composite of sampling locations BCPP-1A through BCPP-1E) had a BaP equivalents value of 1.7 mg/kg, exceeding the Screening SLV of 1.4 mg/kg. Results in the other three sediment samples collected from Bassett Creek Park Pond were below Minnesota's SRVs and Screening SLV. The sediment sampling results indicate that the sediment to be removed from the northwest portion of the Bassett Creek Park Pond, as indicated in Figure 1, may need to be taken to a landfill for disposal, and that the rest of the sediment to be removed from the pond is suitable for off-site reuse under MPCA's Unregulated Fill Best Practice (MPCA, 2012).

Screening SLVs represent very conservative criteria. If desired, Barr could assist the City in evaluating other potential re-use sites for the sediment from the northwest portion of the pond, taking into account site-specific factors for the receiving site (e.g., property ownership, depth to groundwater, soil type, etc.). If successful, additional evaluation might reduce the transportation and disposal costs associated with landfilling the sediment.

The MPCA has proposed changes to SRVs that could impact the interpretations in this memo. MPCA had originally intended that the SRV changes would be implemented later this year (2017), but recent conversations with MCPA staff indicated that the timing of these potential changes may not occur in 2017. The proposed changes to the SRVs are included on Table 1 for reference. The status of MPCA's SRV revisions should be reassessed prior to proceeding with the sediment excavation and management.

References

- Minnesota Pollution Control Agency (MPCA), 2012. Best Management Practices for the Off-Site Reuse of Unregulated Fill. February 2012.
- MPCA, 2015. Managing Stormwater Sediment, Best Management Practice Guidance, document wq-strm4-16, June 2015.

Tables

Table 1 – Bassett Creek Park Pond Sediment Analytical Data Summary

Figures

Figure 1 – Bassett Creek Park Pond Sediment Sampling Locations

Attachments

- Attachment A Sediment Core Field Logs
- Attachment B Photographs
- Attachment C Laboratory Analytical Data Report

Tables

Table 1 Bassett Creek Park Pond Sediment Analytical Data Summary Bassett Creek Watershed Management Commission

Sample Date9/28/20169/28/20169/28/20169/28/20169/28/2016ParameterMinnesota Screening Soil Leaching ValuesMinnesota Residential Soil Reference ValuesProposed Minnesota Residential/ No ExceedMinnesota Residential/ No ExceedProposed Minnesota (Minnesota Commercial/ Industrial SRWsProposed Minnesota Commercial/ Industrial SRWsProposed Minnesota Minnesota Commercial/ Industrial SRWsProposed Minnesota Commercial/ Industrial SRWsProposed Minnesota Commercial/ Industrial SRWsProposed Minnesota Commercial/ Diseced No ExceedProposed No ExceedProposed Minnesota Commercial/ Diseced No ExceedNo ExceedNo ExceedNo E							Sample ID:	BCPP-1	BCPP-2	BCPP-3	BCPP-4
ParameterUnitsMinnesota Screening Soil Leaching ValuesMinnesota Residential Soil Residential Soil							Sample Date:	9/28/2016	9/28/2016	9/28/2016	9/28/2016
ParameterMinnesota Screening SollMinnesota Residential Soil Reference ValuesProposed Minnesota Residential Soil Reference ValuesProposed Minnesota Residential Soil Reference ValuesProposed Minnesota Residential Soil Reference ValuesProposed Minnesota Industrial SRVsProposed Minnesota Commercial/ Industrial SRVsProposed Minnesota Commercial/ Industrial SRVsProposed Minnesota Commercial/ Industrial SRVsProposed Minnesota Soil Reference ValuesProposed Minnesota Soil Reference ValuesProposed MolescadeProposed MolescadeProposed MolescadeProposed MolescadeProposed MolescadeProposed MolescadeProposed MolescadeProposed MolescadeProposed MolescadeProposed MolescadeProposed MolescadeProposed<											
Effective Date 06/01/2013 06/22/2009 08/01/2016 06/01/2016 Image: Constraint of the state of	Parameter	Units	Minnesota Screening Soil Leaching Values	Minnesota Residential Soil Reference Values	Proposed Minnesota Residential/ Recreational SRVs	Minnesota Industrial Soil Reference Values	Proposed Minnesota Commercial/ Industrial SRVs				
Exceedance Key Image: Mobility of the state	Effective Date		06/01/2013	06/22/2009	08/01/2016	06/22/2009	08/01/2016				
General Parameters Moisture % Metals Moisture % Moisture % Moisture 41.6 47.3 65.6 62.5 Metals Moisture mg/kg 5.8 9 9 20 9 2.4 3.3 4.9 5.7 Copper mg/kg 700 100 2200 9000 33000 13.3 17.2 21.9 30.0 Carcinogenic PAHs T T T T 0.0235 0.0118 j <0.0043	Exceedance Key		Bold	No Exceed	<u>Underline</u>	No Exceed	No Exceed				
Moisture % /// <	General Parameters										
Metals mg/kg 5.8 9 9 20 9 2.4 3.3 4.9 5.7 Copper mg/kg 700 100 2200 9000 33000 13.3 17.2 21.9 30.0 Carcinogenic PAHs 30.0 3-Methylcholanthrene mg/kg T T T T T 0.0235 0.0118 j <0.0043	Moisture	%						41.6	47.3	65.6	62.5
Arsenic mg/kg 5.8 9 9 20 9 2.4 3.3 4.9 5.7 Copper mg/kg 700 100 2200 9000 33000 13.3 17.2 21.9 30.0 Carcinogenic PAHs 30.0 33000 13.3 17.2 21.9 30.0 Carcinogenic PAHs 3.0 4.9 5.7 3-Methylcholanthrene mg/kg T T T T T 0.0235 0.0118 j <0.0043 j	Metals										
Copper mg/kg 700 100 2200 9000 33000 13.3 17.2 21.9 30.0 Carcinogenic PAHs 30.0 33000 13.3 17.2 21.9 30.0 3-Methylcholanthrene mg/kg T T T T T 0.0235 0.0118 j <0.0043	Arsenic	mg/kg	5.8	9	9	20	9	2.4	3.3	4.9	5.7
Carcinogenic PAHs Image: Marcine Marking Marki	Copper	mg/kg	700	100	2200	9000	33000	13.3	17.2	21.9	30.0
3-Methylcholanthrene mg/kg T T T T T 0.0235 0.0118 j < 0.0043 < 0.0040 5-Methylchrysene mg/kg T T T T T 0.101 0.0139 j < 0.0043 j	Carcinogenic PAHs										
5-Methylchrysene mg/kg T T T T T 0.101 0.0139 j < 0.0035 0.0043 j 7,12-Dimethylbenz(a)anthracene mg/kg T T T T T < 0.0043 j	3-Methylcholanthrene	mg/kg	Т	Т	Т	Т	Т	0.0235	0.0118 j	< 0.0043	< 0.0040
7,12-Dimethylbenz(a)anthracene mg/kg T T T T T < 0.0048 < 0.0053 < 0.0075 7h-Dibenzo(c,g)carbazole mg/kg T T T T T < 0.0029	5-Methylchrysene	mg/kg	Т	Т	Т	Т	Т	0.101	0.0139 j	< 0.0035	0.0043 j
Th-Dibenzo(c,g)carbazole mg/kg T T T T T C 0.0029 < 0.0032 < 0.0049 < 0.0045 Benz(a)anthracene mg/kg T T T T T 0.634 0.325 0.0859 0.0643 Benzo(a)pyrene mg/kg T T T T 0.748 0.43 0.13 0.0980 Chrysene mg/kg T T T T 0.955 0.45 0.15 0.112 Dibenz(a,h)acridine mg/kg T T T T 0.0752 0.0381 0.0150 j 0.0112 j	7,12-Dimethylbenz(a)anthracene	mg/kg	Т	Т	Т	Т	Т	< 0.0048	< 0.0053	< 0.0081	< 0.0075
Benz(a)anthracene mg/kg T T T T 0.634 0.325 0.0859 0.0643 Benzo(a)pyrene mg/kg T T T T 0.748 0.43 0.13 0.0980 Chrysene mg/kg T T T T 0.95 0.45 0.15 0.112 Dibenz(a,h)acridine mg/kg T T T T 0.0752 0.0381 0.0150 j 0.0112 j	7h-Dibenzo(c,g)carbazole	mg/kg	Т	Т	Т	Т	Т	< 0.0029	< 0.0032	< 0.0049	< 0.0045
Benzo(a)pyrene mg/kg T T T T 0.748 0.43 0.13 0.0980 Chrysene mg/kg T T T T 0.95 0.45 0.15 0.112 Dibenz(a,h)acridine mg/kg T T T T 0.0204 0.0104 j < 0.0101	Benz(a)anthracene	mg/kg	Т	Т	Т	Т	Т	0.634	0.325	0.0859	0.0643
Chrysene mg/kg T T T T 0.95 0.45 0.15 0.112 Dibenz(a,h)acridine mg/kg T T T T T 0.0204 0.0104 j < 0.0101	Benzo(a)pyrene	mg/kg	Т	Т	Т	Т	Т	0.748	0.43	0.13	0.0980
Dibenz(a,h)acridine mg/kg T T T T T 0.0204 0.0104 j < 0.0110 < 0.0101 Dibenz(a,h)anthracene mg/kg T T T T T 0.0752 0.0381 0.0150 j 0.0112 j	Chrysene	mg/kg	Т	Т	Т	Т	Т	0.95	0.45	0.15	0.112
Dibenz(a,h)anthracene mg/kg T T T T T 0.0752 0.0381 0.0150 j 0.0112 j	Dibenz(a,h)acridine	mg/kg	Т	Т	Т	Т	Т	0.0204	0.0104 j	< 0.0110	< 0.0101
	Dibenz(a,h)anthracene	mg/kg	Т	Т	Т	Т	Т	0.0752	0.0381	0.0150 j	0.0112 j
Dibenzo(a,e)pyrene mg/kg T T T T T T D.0551 0.0283 0.0144 j 0.0101 j	Dibenzo(a,e)pyrene	mg/kg	Т	Т	Т	Т	Т	0.0551	0.0283	0.0144 j	0.0101 j
Dibenzo(a,h)pyrene mg/kg T T T T T T 0.0214 0.0118 j < 0.0081 < 0.0075	Dibenzo(a,h)pyrene	mg/kg	Т	Т	Т	Т	Т	0.0214	0.0118 j	< 0.0081	< 0.0075
Dibenzo(a,i)pyrene mg/kg T T T T T T 0.0062 j 0.0043 j 0.0032 j 0.0026 j	Dibenzo(a,i)pyrene	mg/kg	Т	Т	Т	Т	Т	0.0062 j	0.0043 j	0.0032 j	0.0026 j
Dibenzo(a,l)pyrene mg/kg T T T T T T 0.0039 j 0.0035 j 0.0038 j 0.0034 j	Dibenzo(a,I)pyrene	mg/kg	Т	Т	Т	Т	Т	0.0039 j	0.0035 j	0.0038 j	0.0034 j
Indeno(1,2,3-cd)pyrene mg/kg T T T T T T 0.273 * 0.148 0.0496 0.0367	Indeno(1,2,3-cd)pyrene	mg/kg	Т	Т	Т	Т	Т	0.273 *	0.148	0.0496	0.0367
BaP Equivalents, calculated using Kaplan-Meier method mg/kg 1.4 T 2 T 1 T 3 T 14 T 1.7 a 0.92 a 0.31 a 0.25 a	BaP Equivalents, calculated using Kaplan-Meier method	mg/kg	1.4 T	2 T	<u>1 T</u>	3 T	14 T	<u>1.7 a</u>	0.92 a	0.31 a	0.25 a
Non-detects % 13.3 a 13.3 a 40.0 a 33.3 a	% Non-detects	%						13.3 a	13.3 a	40.0 a	33.3 a
PAHs I I I I I I I I I I I I I I I I I I I	PAHs										
2-Methylnaphthalene mg/kg 100 39 369 370 0.0047 j 0.0018 j < 0.0019 < 0.0017	2-Methylnaphthalene	mg/kg		100	39	369	370	0.0047 j	0.0018 j	< 0.0019	< 0.0017
Acenaphthene mg/kg 81 1200 1300 5260 19000 0.0624 0.0249 0.0050 j 0.0055 j	Acenaphthene	mg/kg	81	1200	1300	5260	19000	0.0624	0.0249	0.0050 j	0.0055 j
Acenaphthylene mg/kg NA 0.0055 j 0.0154 j 0.0054 j 0.0055 j	Acenaphthylene	mg/kg	NA					0.0385	0.0154 j	0.0054 j	0.0055 j
Anthracene mg/kg 1300 7880 6500 45400 97000 0.168 * 0.0639 0.0139 0.0133 0.0133	Anthracene	mg/kg	1300	7880	6500	45400	97000	0.168 *	0.0639	0.0139 j	0.0133 j
Benzo(g,h,i)perylene mg/kg NA 0.0527 0.0385	Benzo(g,h,i)perylene	mg/kg	NA					0.28 *	0.149	0.0527	0.0385
Benzofluoranthenes mg/kg 1.89 1.04 0.351 0.268	Benzofluoranthenes	mg/kg						1.89	1.04	0.351	0.268
Fluoranthene mg/kg 670 1080 510 6800 6700 2.15 0.887 0.274 0.199	Fluoranthene	mg/kg	670	1080	510	6800	6700	2.15	0.887	0.274	0.199
Fluorene mg/kg 110 850 860 4120 13000 0.0724 0.0276 0.0060 i 0.0060 i	Fluorene	mg/ka	110	850	860	4120	13000	0.0724	0.0276	0.0060 i	0.0060 i
Naphthalene mg/kg 4.5 10 81 28 120 0.0056 i 0.0028 i < 0.0018 < 0.0016	Naphthalene	mg/ka	4.5	10	81	28	120	0.0056 i	0.0028 i	< 0.0018	< 0.0016
Phenanthrene mg/kg NA 1.05 0.321 0.0830 0.0610	Phenanthrene	mg/ka	NA					1.05	0.321	0.0830	0.0610
Pyrene mg/kg 440 890 44 5800 44 1.55 0.658 0.198 0.152	Pyrene	mg/kg	440	890	44	5800	44	1.55	0.658	0.198	0.152

Tabe 1 Data Footnotes and Qualifiers

Barr Standard Footnotes and Qualifiers

*	Estimated value, QA/QC criteria not met.
а	Estimated value, calculated using some or all values that are estimates.
j	Estimated detected value. The reported value is less than the stated laboratory quantitation limit but greater than the laboratory method detection limit.

Minnesota Screening Soil Leaching Values

NA	Criterion value is not available for this analyte.
Т	Value represents a criteria for the total carcinogenic PAHs as BaP.

Minnesota Soil Reference Values

Т	Value represents a criteria for the total carcinogenic PAHs as BaP.

Figures



Attachment A

Sediment/Soil Coring Logs

	Proji Colle Ice T Wate	4 ection D hickness er Depth	10053 ate(s): s (feet): n (feet):	9 21 N Nor	1 16 16 16	GPS GPS GPS	:: Bass x: c y: G z: G	sett -PI -PI PS	(rec	ength Re	of Pusi covery % Re	Gen (feet) (feet) covery) : <u>saebelv</u> o : (r : (r	VC: vibracore VC: vibracore Popush core - HA Core/Boring#: Qudam Core/Boring#: Core/Boring#: Qudam Core/Boring#: Core/Boring#: Qudam Core/Boring#: Core/Boring#: Core/Boring# Core/Boring#: Core/Boring# Cor	ナ ナ ナ ナ
			Comple		-	1	1	Pro	perti	es	-	7	1	-	1
	Dep	oth (ft.)	Interval and number	Aoisture	Density or Consistency	lasticity	ohesiveness	articles	dor	taining	neen	STM / USCS lassification	raphic Log	Description	
BCPP-1A	0	1.9	1	S		Righ	4.11	2.2.00	aris	N	N	01/1	nu o	Prk brown organic silt Ant	1.2 ft
BCPP-1B	0	1.5	2	5		2000	iow	ortonia		N	N	SP		Woodium grey sould will lower of	aggett
DCPP-1C	0	21	3	S		Low	من ا	N.		N	2	SR.		Grey medium sand (SP) w/ small	4" 3.0' K
Bc9P-10	O	1.5	ч	5		High	1.1	book.		N	4	orli	10	Deh brown arrange still will arranic	20'
BCPP-1E	0	1.5	5	S		mil	Med	sone Sand		6-1	2	D17	ML	Material. Och brown organic sill will some and sound + organics.	1.2'
										-					

	Sediment Core/Boring Log BARR Proj#: 23270051 Project: basseff Creek Park lead Collection Date(s): 92816 GPS X: GPS Length of Push (feet): NA Water Depth (feet): Vaced Barret GPS Z: GPS Z: GPS Barret % Recovery:													page	12
					-	1		Pr	operti	es		-			
NAMe	Dep	oth (ft.)	Sample Interval and number	Moisture	Density or Consistency	Plasticity	Cohesiveness	articles	Ddor	taining	heen	STM / USCS	iraphic Log	Description	ra. Sur Lave
BCPP-2A	0	1	1	5		401	in	0	P	N.	N	₹0 Şl	0	Gray med-course sand	WART
BCPP-2B	0	1	2	5		iri.gil be	Talph Lu:	Urgan Urgan	200	22	2	se Prot	54:1	This layer of ollow QC.5' This layer Was plastic and colorise price prep clayer or some organics price proper peaky soil fire fland deposit.	0.9'
Bapp-2c	0	1	3	S		Hiji	Du depir	Organo	5 2	N	N	cils	c	ork brown stilly clay we organics. Some course sand also observed (small anomal	1.0'
BCPP-20	0	1	4	5		Low	40	ogani	N I	2	N	se		Med give sand we organics and some	0.8'
BOPP-ZE	U	1	5	5		Bor	PLOS Med	Organ	<u>a</u> 2	2	4	MY	lent	Once brown organic stit. At it promitions to brown organic soil wetland deposit will shalls.	1.41

BCPP - 2 comp sampled @ 1300

2

	B Proje Colle Ice T Wate	Proj#: A3A70051 Project: Barett Creek Pack Pod Collection Date(s): 9122116 GPS X: GPS Length of Push (feet): Getwo Ice Thickness (feet): 9122116 GPS Y: G									pageof VC: vibracore C: push core Core/Boring#: Quadra Driller: BARK Drilling Method: Push core Crew: Kom/Rima Logged by: Puma Observer: Checked by:	mF 3			
	Dep	oth (ft.)	Sample Interval and number	Moisture	Density or Consistency	lasticity	ohesiveness	Pr	operti	es	een	STM / USCS assification	aphic Log		
BCPP-3A	0	1	1	5		Low	10	orga	nius p	N V	N Sh	ML	ö	Description Deh house organic self al organics	Water dopt
BCPD-3B	0.9	0.8	2	5		Low	w	O (Jan 1)	in N	N	N N	ML		Brown brown organic sittle ettend deposit w/ shells or brown organic sitt w/ critinics + shells brown brown organic sittle ettend deposition of shells	2.81
Bepp-3c	3	1.4	3	5		High	Tw dept-	orga.	aN	N	N	ML		ork brown organic silt	4.0'
BCPP-30	0	1	4	5		HjL	Au dept-	страно	4	~	~	ml		Drh brown organic silt (very surger considency)	3,1'
A LPP-3E	0	0.6	5	5		mid	Mad	-	2	Brony	N 	SC		Crey sondy clay we It brown staining, some gravel included (small smalling) (Photo Tanen)	0.6'
1															

BCPP-3 comp sampled @1340

A-13

	Proj Colle Ice 1 Wat	ARF #: 22 ection D Thicknes er Depti	2700 ate(s): s (feet): h (feet):	51 920 Var	edin	Project GPS GPS GPS	t Co t: Box X: Gr Y: G-P Z: G-P	ssett	Cree	ing عاد ال Length R	Log of Pus ecover % Re	Pord h (feet): y (feet): ecovery:	Sas Belor	pageof VC: vibracore Core/Boring#: Quadrount Core/Boring#: Quadrount Drilling Method: Push Core Crew: KOM/PIMA Logged by: PsmA Observer:Checked by: KOM	- 4
			Sample	-	1	1	1	Pr	opert	ies	1	-		_	
	De	oth (ft.)	Interval and number	Moisture	Density or Z	olasticity	Cohesiveness	articles	dor	taining	heen	STM / USCS lassification	raphic Log	Description	interdoot
ВСРР-ЧА	0	.5'	1	5	Derve	100	med	50	2	2	N	0L	O	ORyanic clay (some silf). This and sound seam also observed. Firm, high organic (Firme)	3.3
BOPP-4B	0	1.6	2	5	Samp	ingt	ni dept-	210	N	2	2	ML		Dr. h. brown organic silt. Organics decrease and depth. Little to no oppinics at bottom of come	4.7'
BUPP-4C	0	1.5	3	5	Sandit	hiji	D_l depm	03	N	N	N	ML		Dik brown aganie silt. Organide & al depth. Little to no aganies at bottom of carts. Increased density wil dooth.	5.0'
BCPD-40	0	١,	4	5	Sanda	hijt	22 dep	-	N	N	2	ML		Doth brown againing silt. Some arguinies in first 6" @ 1", med brown gry sand.	3.0'
ВСРР-ЧЕ	0	1.5	5	5	Seinpry	hij	nu doph	-	2	N	N	ML		Ork brown urpanic silt. No fibrois organics observed.	5,1
							-								

BCPP-4(0-p sampled @1420 OCPP-2-4-comp sampled @1430

Attachment B

Photographs



Photograph #1: Sediment core collected with push core sampling device.



Photograph #2: Sediment core collected with push core sampling device.

Attachment C

Laboratory Analytical Data



Pace Analytical Services, LLC 1700 Elm Street - Suite 200 Minneapolis, MN 55414 (612)607-1700

November 11, 2016

Terri Olson Barr Engineering 4300 MarketPointe Drive Suite 200 Minneapolis, MN 55435

RE: Project: 23270051.37 PND BassettCrk RE2 Pace Project No.: 10364126

Dear Terri Olson:

Enclosed are the analytical results for sample(s) received by the laboratory on September 28, 2016. 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.

This report was revised on October 14, 2016 to report some results for Pace samples #001 and 002 for 8270D at a lower dilution, per client request.

This report was further revised on November 11, 2016 to include TCLP RCRA8 metals results for Pace sample # 005, per client request.

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

Sincerely,

amanda J albeecht

Amanda Albrecht amanda.albrecht@pacelabs.com Project Manager

Enclosures

cc: BarrDM, Barr Engineering



REPORT OF LABORATORY ANALYSIS

Kevin Menken, Barr Engineering



Pace Analytical Services, LLC 1700 Elm Street - Suite 200 Minneapolis, MN 55414 (612)607-1700

CERTIFICATIONS

Project: 23270051.37 PND BassettCrk RE2 Pace Project No.: 10364126

Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414 525 N 8th Street, Salina, KS 67401 Alaska Certification UST-107 A2LA Certification #: 2926.01 Alaska Certification #: UST-078 Alaska Certification #MN00064 Alabama Certification #40770 Arizona Certification #: AZ-0014 Arkansas Certification #: 88-0680 California Certification #: 01155CA Colorado Certification #Pace Connecticut Certification #: PH-0256 EPA Region 8 Certification #: 8TMS-L Florida/NELAP Certification #: E87605 Guam Certification #:14-008r Georgia Certification #: 959 Georgia EPD #: Pace Idaho Certification #: MN00064 Hawaii Certification #MN00064 Illinois Certification #: 200011 Indiana Certification#C-MN-01 Iowa Certification #: 368 Kansas Certification #: E-10167 Kentucky Dept of Envi. Protection - DW #90062 Kentucky Dept of Envi. Protection - WW #:90062 Louisiana DEQ Certification #: 3086 Louisiana DHH #: LA140001 Maine Certification #: 2013011 Maryland Certification #: 322

Michigan DEPH Certification #: 9909 Minnesota Certification #: 027-053-137 Mississippi Certification #: Pace Montana Certification #: MT0092 Nevada Certification #: MN_00064 Nebraska Certification #: Pace New Jersey Certification #: MN-002 New York Certification #: 11647 North Carolina Certification #: 530 North Carolina State Public Health #: 27700 North Dakota Certification #: R-036 Ohio EPA #: 4150 Ohio VAP Certification #: CL101 Oklahoma Certification #: 9507 Oregon Certification #: MN200001 Oregon Certification #: MN300001 Pennsylvania Certification #: 68-00563 Puerto Rico Certification Saipan (CNMI) #:MP0003 South Carolina #:74003001 Texas Certification #: T104704192 Tennessee Certification #: 02818 Utah Certification #: MN000642013-4 Virginia DGS Certification #: 251 Virginia/VELAP Certification #: Pace Washington Certification #: C486 West Virginia Certification #: 382 West Virginia DHHR #:9952C Wisconsin Certification #: 999407970

REPORT OF LABORATORY ANALYSIS



SAMPLE SUMMARY

Project: 23270051.37 PND BassettCrk RE2

Pace Project No.: 103

0.:	10364126	

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10364126001	BCPP-1 Comp	Solid	09/28/16 12:10	09/28/16 16:20
10364126002	BCPP-2 Comp	Solid	09/28/16 13:00	09/28/16 16:20
10364126003	BCPP-3 Comp	Solid	09/28/16 13:40	09/28/16 16:20
10364126004	BCPP-4 Comp	Solid	09/28/16 14:20	09/28/16 16:20
10364126005	BCPP-1-4 Comp	Solid	09/28/16 14:30	09/28/16 16:20

REPORT OF LABORATORY ANALYSIS



SAMPLE ANALYTE COUNT

Project: 23270051.37 PND BassettCrk RE2

Pace Project No.: 10364126

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10364126001	BCPP-1 Comp	EPA 6010C	DM	2	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D by SIM	JLR	27	PASI-M
10364126002	BCPP-2 Comp	EPA 6010C	DM	2	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D by SIM	JLR	27	PASI-M
10364126003	BCPP-3 Comp	EPA 6010C	DM	2	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D by SIM	JLR	27	PASI-M
10364126004	BCPP-4 Comp	EPA 6010C	DM	2	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D by SIM	JLR	27	PASI-M
10364126005	BCPP-1-4 Comp	EPA 6010C	IP	7	PASI-M
		EPA 7470A	LMW	1	PASI-M

REPORT OF LABORATORY ANALYSIS



PROJECT NARRATIVE

Project: 23270051.37 PND BassettCrk RE2

Pace Project No.: 10364126

Date: November 11, 2016

Case Narrative

Semi-Volatile Organics Analysis

8270D CPAH

Refering to data qualifiers that appear later in the report:

SS - The 7,12 dimethylbenz(a)anthracene result associated with batch QC did not meet secondary source verification criteria. It was recovered at 175% (recovery limits are 50-150%). The high recovery leads to a high bias in the QC but does not impact sample results.

IS - One internal standard (perylene) failed low for both Pace samples #001 and #002 with recoveries of 42% and 33%, respectively. The recovery limits are 50-200%. The low recovery leads to a high bias for the associates analytes and are flagged accordingly.

REPORT OF LABORATORY ANALYSIS



Project: 23270051.37 PND BassettCrk RE2

Pace Project No.: 10364126

Sample: BCPP-1 Comp	Lab ID: 10364126001	Collected: 09/28/16 12:10	Received: 09/28/16 16:20	Matrix: Solid
Results reported on a "dry weight" bas	is and are adjusted for p	ercent moisture, sample siz	e and any dilutions.	

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010C MET ICP	Analytical	Method: EPA	A 6010C Prepa	aration Met	hod: E	PA 3050			
Arsenic	2.4	mg/kg	1.4	0.29	1	10/04/16 09:12	10/06/16 17:20	7440-38-2	
Copper	13.3	mg/kg	0.71	0.057	1	10/04/16 09:12	10/06/16 17:20	7440-50-8	
Dry Weight	Analytical	Method: AS	TM D2974						
Percent Moisture	41.6	%	0.10	0.10	1		10/05/16 14:00		
8270D MSSV CPAH by SIM	Analytical	Method: EPA	4 8270D by SIN	/ Prepara	tion Me	ethod: EPA 3550			
Acenaphthene	62.4	ug/kg	17.1	1.0	1	09/29/16 06:44	10/04/16 17:07	83-32-9	
Acenaphthylene	38.5	ug/kg	17.1	0.97	1	09/29/16 06:44	10/04/16 17:07	208-96-8	
Anthracene	168	ug/kg	17.1	0.99	1	09/29/16 06:44	10/04/16 17:07	120-12-7	M6,R1
Benzo(a)anthracene	634	ug/kg	171	25.6	10	09/29/16 06:44	10/05/16 15:25	56-55-3	M6,R1
Benzo(a)pyrene	748	ug/kg	171	22.2	10	09/29/16 06:44	10/05/16 15:25	50-32-8	M6,R1
Benzo(g,h,i)perylene	280	ug/kg	171	49.5	10	09/29/16 06:44	10/05/16 15:25	191-24-2	M6,R1
Benzofluoranthenes (Total)	1890	ug/kg	512	188	10	09/29/16 06:44	10/05/16 15:25		M6,R1
Chrysene	950	ug/kg	171	9.0	10	09/29/16 06:44	10/05/16 15:25	218-01-9	M6,R1
Dibenz(a,h)acridine	20.4	ug/kg	17.1	6.5	1	09/29/16 06:44	10/04/16 17:07	226-36-8	IS
Dibenz(a,h)anthracene	75.2	ug/kg	17.1	5.8	1	09/29/16 06:44	10/04/16 17:07	53-70-3	IS
Dibenzo(a,e)pyrene	55.1	ug/kg	17.1	1.6	1	09/29/16 06:44	10/04/16 17:07	192-65-4	IS,M6
Dibenzo(a,h)pyrene	21.4	ug/kg	17.1	4.8	1	09/29/16 06:44	10/04/16 17:07	189-64-0	IS,M6
Dibenzo(a,i)pyrene	6.2J	ug/kg	17.1	1.7	1	09/29/16 06:44	10/04/16 17:07	189-55-9	IS,M6
Dibenzo(a.l)pyrene	3.9J	ug/kg	17.1	0.97	1	09/29/16 06:44	10/04/16 17:07	191-30-0	IS,M6
7H-Dibenzo(c,g)carbazole	<2.9	ug/kg	17.1	2.9	1	09/29/16 06:44	10/04/16 17:07	194-59-2	IS
7,12-Dimethylbenz(a)anthracene	<4.8	ug/kg	17.1	4.8	1	09/29/16 06:44	10/04/16 17:07	57-97-6	
Fluoranthene	2150	ug/kg	171	12.6	10	09/29/16 06:44	10/05/16 15:25	206-44-0	M6,R1
Fluorene	72.4	ug/kg	17.1	0.97	1	09/29/16 06:44	10/04/16 17:07	86-73-7	
Indeno(1,2,3-cd)pyrene	273	ug/kg	171	51.2	10	09/29/16 06:44	10/05/16 15:25	193-39-5	M6,R1
3-Methylcholanthrene	23.5	ua/ka	17.1	2.6	1	09/29/16 06:44	10/04/16 17:07	56-49-5	IS.M6
5-Methylchrysene	101	ua/ka	17.1	2.0	1	09/29/16 06:44	10/04/16 17:07	3697-24-3	-, -
2-Methylnaphthalene	4.7J	ua/ka	17.1	1.1	1	09/29/16 06:44	10/04/16 17:07	91-57-6	M6
Naphthalene	5.6J	ua/ka	17.1	1.0	1	09/29/16 06:44	10/04/16 17:07	91-20-3	
Phenanthrene	1050	ua/ka	171	10.4	10	09/29/16 06:44	10/05/16 15:25	85-01-8	M6.R1
Pyrene	1550	ug/ka	171	12.8	10	09/29/16 06.44	10/05/16 15:25	129-00-0	M6 R1
Surrogates		~9,119		12.0		20,20,10 00.44	10.00,10 10.20	0 00 0	
2-Fluorobiphenyl (S)	69	%.	46-125		1	09/29/16 06:44	10/04/16 17:07	321-60-8	
p-Terphenyl-d14 (S)	98	%.	46-125		1	09/29/16 06:44	10/04/16 17:07	1718-51-0	

REPORT OF LABORATORY ANALYSIS



Project: 23270051.37 PND BassettCrk RE2

Pace Project No.: 10364126

Sample: BCPP-2 Comp	Lab ID: 10364126002	Collected: 09/28/16 13:00	Received: 09/28/16 16:20	Matrix: Solid
Results reported on a "dry weight" bas	is and are adjusted for p	ercent moisture, sample siz	e and any dilutions.	

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010C MET ICP	Analytical	Method: EP/	A 6010C Prepa	ration Met	hod: E	PA 3050			
Arsenic	3.3	mg/kg	1.7	0.35	1	10/04/16 09:12	10/06/16 17:33	7440-38-2	
Copper	17.2	mg/kg	0.86	0.069	1	10/04/16 09:12	10/06/16 17:33	7440-50-8	
Dry Weight	Analytical	Method: AS	TM D2974						
Percent Moisture	47.3	%	0.10	0.10	1		10/05/16 15:05		
8270D MSSV CPAH by SIM	Analytical	Method: EP/	4 8270D by SIM	l Preparat	ion Me	ethod: EPA 3550			
Acenaphthene	24.9	ug/kg	18.9	1.2	1	09/29/16 06:44	10/04/16 18:34	83-32-9	
Acenaphthylene	15.4J	ug/kg	18.9	1.1	1	09/29/16 06:44	10/04/16 18:34	208-96-8	
Anthracene	63.9	ug/kg	18.9	1.1	1	09/29/16 06:44	10/04/16 18:34	120-12-7	
Benzo(a)anthracene	325	ug/kg	94.6	14.2	5	09/29/16 06:44	10/05/16 16:52	56-55-3	
Benzo(a)pyrene	430	ug/kg	94.6	12.3	5	09/29/16 06:44	10/05/16 16:52	50-32-8	
Benzo(g,h,i)perylene	149	ug/kg	94.6	27.4	5	09/29/16 06:44	10/05/16 16:52	191-24-2	
Benzofluoranthenes (Total)	1040	ug/kg	284	104	5	09/29/16 06:44	10/05/16 16:52		
Chrysene	450	ug/kg	94.6	5.0	5	09/29/16 06:44	10/05/16 16:52	218-01-9	
Dibenz(a,h)acridine	10.4J	ug/kg	18.9	7.2	1	09/29/16 06:44	10/04/16 18:34	226-36-8	IS
Dibenz(a,h)anthracene	38.1	ug/kg	18.9	6.4	1	09/29/16 06:44	10/04/16 18:34	53-70-3	IS
Dibenzo(a,e)pyrene	28.3	ug/kg	18.9	1.7	1	09/29/16 06:44	10/04/16 18:34	192-65-4	IS
Dibenzo(a,h)pyrene	11.8J	ug/kg	18.9	5.3	1	09/29/16 06:44	10/04/16 18:34	189-64-0	IS
Dibenzo(a,i)pyrene	4.3J	ug/kg	18.9	1.8	1	09/29/16 06:44	10/04/16 18:34	189-55-9	IS
Dibenzo(a,I)pyrene	3.5J	ug/kg	18.9	1.1	1	09/29/16 06:44	10/04/16 18:34	191-30-0	IS
7H-Dibenzo(c,g)carbazole	<3.2	ug/kg	18.9	3.2	1	09/29/16 06:44	10/04/16 18:34	194-59-2	
7,12-Dimethylbenz(a)anthracene	<5.3	ug/kg	18.9	5.3	1	09/29/16 06:44	10/04/16 18:34	57-97-6	
Fluoranthene	887	ug/kg	94.6	7.0	5	09/29/16 06:44	10/05/16 16:52	206-44-0	
Fluorene	27.6	ug/kg	18.9	1.1	1	09/29/16 06:44	10/04/16 18:34	86-73-7	
Indeno(1,2,3-cd)pyrene	148	ug/kg	94.6	28.4	5	09/29/16 06:44	10/05/16 16:52	193-39-5	
3-Methylcholanthrene	11.8J	ug/kg	18.9	2.8	1	09/29/16 06:44	10/04/16 18:34	56-49-5	IS
5-Methylchrysene	13.9J	ug/kg	18.9	2.3	1	09/29/16 06:44	10/04/16 18:34	3697-24-3	
2-Methylnaphthalene	1.8J	ug/kg	18.9	1.2	1	09/29/16 06:44	10/04/16 18:34	91-57-6	
Naphthalene	2.8J	ug/kg	18.9	1.2	1	09/29/16 06:44	10/04/16 18:34	91-20-3	
Phenanthrene	321	ug/kg	94.6	5.8	5	09/29/16 06:44	10/05/16 16:52	85-01-8	
Pyrene	658	ug/kg	94.6	7.1	5	09/29/16 06:44	10/05/16 16:52	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	66	%.	46-125		1	09/29/16 06:44	10/04/16 18:34	321-60-8	
p-Terphenyl-d14 (S)	109	%.	46-125		1	09/29/16 06:44	10/04/16 18:34	1718-51-0	

REPORT OF LABORATORY ANALYSIS



Project: 23270051.37 PND BassettCrk RE2

Pace Project No.: 10364126

Sample: BCPP-3 Comp	Lab ID: 10364126003	Collected: 09/28/16 13:40	Received: 09/28/16 16:20	Matrix: Solid
Results reported on a "dry weight" bas	is and are adjusted for p	ercent moisture, sample siz	e and any dilutions.	

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010C MET ICP	Analytical	Method: EPA	A6010C Prepa	ration Met	hod: E	PA 3050			
Arsenic	4.9	mg/kg	2.5	0.51	1	10/04/16 09:12	10/06/16 17:36	7440-38-2	
Copper	21.9	mg/kg	1.3	0.10	1	10/04/16 09:12	10/06/16 17:36	7440-50-8	
Dry Weight	Analytical	Method: AST	FM D2974						
Percent Moisture	65.6	%	0.10	0.10	1		10/05/16 15:05		
8270D MSSV CPAH by SIM	Analytical	Method: EPA	A 8270D by SIM	Preparat	tion Me	ethod: EPA 3550			
Acenaphthene	5.0J	ug/kg	29.0	1.8	1	09/29/16 06:44	10/05/16 17:20	83-32-9	
Acenaphthylene	5.4J	ug/kg	29.0	1.7	1	09/29/16 06:44	10/05/16 17:20	208-96-8	
Anthracene	13.9J	ug/kg	29.0	1.7	1	09/29/16 06:44	10/05/16 17:20	120-12-7	
Benzo(a)anthracene	85.9	ug/kg	29.0	4.3	1	09/29/16 06:44	10/05/16 17:20	56-55-3	
Benzo(a)pyrene	130	ug/kg	29.0	3.8	1	09/29/16 06:44	10/05/16 17:20	50-32-8	
Benzo(g,h,i)perylene	52.7	ug/kg	29.0	8.4	1	09/29/16 06:44	10/05/16 17:20	191-24-2	
Benzofluoranthenes (Total)	351	ug/kg	86.9	31.9	1	09/29/16 06:44	10/05/16 17:20		
Chrysene	150	ug/kg	29.0	1.5	1	09/29/16 06:44	10/05/16 17:20	218-01-9	
Dibenz(a,h)acridine	<11.0	ug/kg	29.0	11.0	1	09/29/16 06:44	10/05/16 17:20	226-36-8	
Dibenz(a,h)anthracene	15.0J	ug/kg	29.0	9.9	1	09/29/16 06:44	10/05/16 17:20	53-70-3	
Dibenzo(a,e)pyrene	14.4J	ug/kg	29.0	2.7	1	09/29/16 06:44	10/05/16 17:20	192-65-4	
Dibenzo(a,h)pyrene	<8.1	ug/kg	29.0	8.1	1	09/29/16 06:44	10/05/16 17:20	189-64-0	
Dibenzo(a,i)pyrene	3.2J	ug/kg	29.0	2.8	1	09/29/16 06:44	10/05/16 17:20	189-55-9	
Dibenzo(a,I)pyrene	3.8J	ug/kg	29.0	1.7	1	09/29/16 06:44	10/05/16 17:20	191-30-0	
7H-Dibenzo(c,g)carbazole	<4.9	ug/kg	29.0	4.9	1	09/29/16 06:44	10/05/16 17:20	194-59-2	
7,12-Dimethylbenz(a)anthracene	<8.1	ug/kg	29.0	8.1	1	09/29/16 06:44	10/05/16 17:20	57-97-6	
Fluoranthene	274	ug/kg	29.0	2.1	1	09/29/16 06:44	10/05/16 17:20	206-44-0	
Fluorene	6.0J	ug/kg	29.0	1.7	1	09/29/16 06:44	10/05/16 17:20	86-73-7	
Indeno(1,2,3-cd)pyrene	49.6	ug/kg	29.0	8.7	1	09/29/16 06:44	10/05/16 17:20	193-39-5	
3-Methylcholanthrene	<4.3	ug/kg	29.0	4.3	1	09/29/16 06:44	10/05/16 17:20	56-49-5	
5-Methylchrysene	<3.5	ug/kg	29.0	3.5	1	09/29/16 06:44	10/05/16 17:20	3697-24-3	
2-Methylnaphthalene	<1.9	ug/kg	29.0	1.9	1	09/29/16 06:44	10/05/16 17:20	91-57-6	
Naphthalene	<1.8	ua/ka	29.0	1.8	1	09/29/16 06:44	10/05/16 17:20	91-20-3	
Phenanthrene	83.0	ua/ka	29.0	1.8	1	09/29/16 06:44	10/05/16 17:20	85-01-8	
Pvrene	198	ua/ka	29.0	2.2	1	09/29/16 06:44	10/05/16 17:20	129-00-0	
Surrogates		~3,3	_0.0		•				
2-Fluorobiphenyl (S)	72	%.	46-125		1	09/29/16 06:44	10/05/16 17:20	321-60-8	
p-Terphenyl-d14 (S)	75	%.	46-125		1	09/29/16 06:44	10/05/16 17:20	1718-51-0	

REPORT OF LABORATORY ANALYSIS



Project: 23270051.37 PND BassettCrk RE2

Pace Project No.: 10364126

Sample: BCPP-4 Comp	Lab ID: 10364126004	Collected: 09/28/16 14:20	Received: 09/28/16 16:20	Matrix: Solid
Results reported on a "dry weight" bas	is and are adjusted for p	ercent moisture, sample size	e and any dilutions.	

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010C MET ICP	Analytical	Method: EPA	A6010C Prepa	ration Met	hod: E	PA 3050			
Arsenic	5.7	mg/kg	2.3	0.46	1	10/04/16 09:12	10/06/16 17:39	7440-38-2	
Copper	30.0	mg/kg	1.1	0.092	1	10/04/16 09:12	10/06/16 17:39	7440-50-8	
Dry Weight	Analytical	Method: AS	FM D2974						
Percent Moisture	62.5	%	0.10	0.10	1		10/05/16 15:05		
8270D MSSV CPAH by SIM	Analytical	Method: EPA	A 8270D by SIM	1 Preparat	tion Me	ethod: EPA 3550			
Acenaphthene	5.5J	ug/kg	26.7	1.6	1	09/29/16 06:44	10/05/16 17:49	83-32-9	
Acenaphthylene	5.5J	ug/kg	26.7	1.5	1	09/29/16 06:44	10/05/16 17:49	208-96-8	
Anthracene	13.3J	ug/kg	26.7	1.5	1	09/29/16 06:44	10/05/16 17:49	120-12-7	
Benzo(a)anthracene	64.3	ug/kg	26.7	4.0	1	09/29/16 06:44	10/05/16 17:49	56-55-3	
Benzo(a)pyrene	98.0	ug/kg	26.7	3.5	1	09/29/16 06:44	10/05/16 17:49	50-32-8	
Benzo(g,h,i)perylene	38.5	ug/kg	26.7	7.7	1	09/29/16 06:44	10/05/16 17:49	191-24-2	
Benzofluoranthenes (Total)	268	ug/kg	80.0	29.3	1	09/29/16 06:44	10/05/16 17:49		
Chrysene	112	ug/kg	26.7	1.4	1	09/29/16 06:44	10/05/16 17:49	218-01-9	
Dibenz(a,h)acridine	<10.1	ug/kg	26.7	10.1	1	09/29/16 06:44	10/05/16 17:49	226-36-8	
Dibenz(a,h)anthracene	11.2J	ug/kg	26.7	9.1	1	09/29/16 06:44	10/05/16 17:49	53-70-3	
Dibenzo(a,e)pyrene	10.1J	ug/kg	26.7	2.5	1	09/29/16 06:44	10/05/16 17:49	192-65-4	
Dibenzo(a,h)pyrene	<7.5	ug/kg	26.7	7.5	1	09/29/16 06:44	10/05/16 17:49	189-64-0	
Dibenzo(a,i)pyrene	2.6J	ug/kg	26.7	2.6	1	09/29/16 06:44	10/05/16 17:49	189-55-9	
Dibenzo(a,l)pyrene	3.4J	ug/kg	26.7	1.5	1	09/29/16 06:44	10/05/16 17:49	191-30-0	
7H-Dibenzo(c,q)carbazole	<4.5	ug/kg	26.7	4.5	1	09/29/16 06:44	10/05/16 17:49	194-59-2	
7.12-Dimethylbenz(a)anthracene	<7.5	ua/ka	26.7	7.5	1	09/29/16 06:44	10/05/16 17:49	57-97-6	
Fluoranthene	199	ug/kg	26.7	2.0	1	09/29/16 06:44	10/05/16 17:49	206-44-0	
Fluorene	6.0J	ug/kg	26.7	1.5	1	09/29/16 06:44	10/05/16 17:49	86-73-7	
Indeno(1.2.3-cd)pyrene	36.7	ua/ka	26.7	8.0	1	09/29/16 06:44	10/05/16 17:49	193-39-5	
3-Methylcholanthrene	<4.0	ua/ka	26.7	4.0	1	09/29/16 06:44	10/05/16 17:49	56-49-5	
5-Methylchrysene	4.3J	ua/ka	26.7	3.2	1	09/29/16 06:44	10/05/16 17:49	3697-24-3	
2-Methylnaphthalene	<1.7	ua/ka	26.7	1.7	1	09/29/16 06:44	10/05/16 17:49	91-57-6	
Naphthalene	<1.6	ua/ka	26.7	1.6	1	09/29/16 06:44	10/05/16 17:49	91-20-3	
Phenanthrene	61.0	ua/ka	26.7	1.6	1	09/29/16 06:44	10/05/16 17:49	85-01-8	
Pyrene	152	ua/ka	26.7	20	1	09/29/16 06:44	10/05/16 17:49	129-00-0	
Surrogates		~9,9	20.7	2.0	•	00,20,10,00.44		0 00 0	
2-Fluorobiphenyl (S)	69	%.	46-125		1	09/29/16 06:44	10/05/16 17:49	321-60-8	
p-Terphenyl-d14 (S)	71	%.	46-125		1	09/29/16 06:44	10/05/16 17:49	1718-51-0	
· · · · · ·									

REPORT OF LABORATORY ANALYSIS



Project: 23270051.37 PND BassettCrk RE2

Pace Project No.:

10364126

Sample: BCPP-1-4 Comp	Lab ID: 1	0364126005	Collecte	d: 09/28/16	6 14:30	Received: 09/	28/16 16:20 Ma	atrix: Solid	
Results reported on a "wet-wei	ght" basis								
Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010C MET ICP, TCLP	Analytical N	/lethod: EPA 6	010C Prep	aration Met	hod: EF	PA 3010			
	Leachate M	lethod/Date: E	PA 1311; 1	1/09/16 14:2	26 Initia	al pH: 8.15; Final	pH: 3.06		
Arsenic	<0.034	mg/L	0.10	0.034	1	11/10/16 10:22	11/10/16 17:30	7440-38-2	
Barium	0.73	mg/L	0.20	0.079	1	11/10/16 10:22	11/10/16 17:30	7440-39-3	
Cadmium	0.0016J	mg/L	0.015	0.0011	1	11/10/16 10:22	11/10/16 17:30	7440-43-9	
Chromium	<0.0046	mg/L	0.050	0.0046	1	11/10/16 10:22	11/10/16 17:30	7440-47-3	
Lead	0.021J	mg/L	0.050	0.0091	1	11/10/16 10:22	11/10/16 17:30	7439-92-1	
Selenium	<0.051	mg/L	0.12	0.051	1	11/10/16 10:22	11/10/16 17:30	7782-49-2	
Silver	<0.0050	mg/L	0.050	0.0050	1	11/10/16 10:22	11/10/16 17:30	7440-22-4	
7470A Mercury, TCLP	Analytical N	/lethod: EPA 7-	470A Prep	aration Met	hod: EP	A 7470A			
	Leachate M	lethod/Date: E	PA 1311; 1	1/09/16 14:2	26 Initia	al pH: 8.15; Final	pH: 3.06		
Mercury	<0.094	ug/L	0.60	0.094	1	11/10/16 08:35	11/10/16 13:39	7439-97-6	H3

REPORT OF LABORATORY ANALYSIS



Project:	2327005	1.37 PND B	assettCrk RE2										
Pace Project No.:	1036412	6											
QC Batch:	446183	3		Analysi	is Method:	E	PA 7470A						
QC Batch Method:	EPA 74	70A		Analysi	is Descript	tion: 74	470A Mercu	ry TCLP					
Associated Lab San	nples:	1036412600	5										
METHOD BLANK:	2438626	;		N	latrix: Wa	ter							
Associated Lab San	nples:	1036412600	5										
_				Blank	R	eporting				-			
Paran	neter		Units	Result	: 	Limit	MDL		Analyzed	Qu	alifiers		
Mercury			ug/L	<0	0.094	0.60	0	.094 11	/10/16 13:35	i			
METHOD BLANK:	2436110			N	latrix: Wa	ter							
Associated Lab San	nples:	1036412600	5										
				Blank	R	eporting							
Paran	neter		Units	Result	t	Limit	MDL		Analyzed	Qu	alifiers		
Mercury			ug/L	<0	.094	0.60	0	.094 11	/10/16 13:58	5			
METHOD BLANK:	2436111			N	latrix: Wa	ter							
Associated Lab San	nples:	1036412600	5										
				Blank	R	eporting							
Paran	neter		Units	Result	t	Limit	MDL		Analyzed	Qu	alifiers		
Mercury			ug/L	<0	.094	0.60	0	.094 11	/10/16 14:00)			
LABORATORY COM	NTROL SA	AMPLE: 2	438627										
				Spike	LCS	;	LCS	% Re	С				
Paran	neter		Units	Conc.	Resu	lt	% Rec	Limit	s Qu	alifiers	_		
Mercury			ug/L	15		15.9	106	8	0-120				
MATRIX SPIKE & M	IATRIX SF	PIKE DUPLI	CATE: 24386	28		2438629							
				MS	MSD								
Deremete		ما ا	10364126005	Spike	Spike	MS	MSD	MS % Dec	MSD	% Rec		Max	Qual
Paramete	*1				CONC.	Result	Result	% Rec	% Kec	Limits	KPD		Quai
Mercury		ug/L	<0.094	15	15	16.0	15.6	107	104	80-120	3	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS



Project: 232	70051.37 PND BassettCrk F	RE2				
Pace Project No.: 103	64126					
QC Batch: 44	6181	Analysis Met	hod: EP	A 6010C		
QC Batch Method: EF	PA 3010	Analysis Des	cription: 601	IOC TCLP		
Associated Lab Samples	: 10364126005					
METHOD BLANK: 243	8608	Matrix:	Water			
Associated Lab Samples	10364126005					
		Blank	Reporting			
Parameter	Units	Result	Limit	MDL	Analyzed	Qualifiers
Arsenic	mg/L	< 0.034	0.10	0.034	11/10/16 17:12	
Barium	mg/L	<0.079	0.20	0.079	11/10/16 17:12	
Cadmium	mg/L	<0.0011	0.015	0.0011	11/10/16 17:12	
Chromium	mg/L	<0.0046	0.050	0.0046	11/10/16 17:12	
Lead	mg/L	<0.0091	0.050	0.0091	11/10/16 17:12	
Selenium	mg/L	<0.051	0.12	0.051	11/10/16 17:12	
Silver	mg/L	<0.0050	0.050	0.0050	11/10/16 17:12	
METHOD BLANK: 243	6110	Matrix:	Water			
Associated Lab Samples	10364126005					
Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Arsenic	mg/L	<0.034	0.10	0.034	11/10/16 17:51	
Barium	ma/L	<0.079	0.20	0.079	11/10/16 17:51	
Cadmium	ma/L	< 0.0011	0.015	0.0011	11/10/16 17:51	
Chromium	mg/L	<0.0046	0.050	0.0046	11/10/16 17:51	
Lead	mg/L	<0.0091	0.050	0.0091	11/10/16 17:51	
Selenium	mg/L	<0.051	0.12	0.051	11/10/16 17:51	

METHOD BLANK: 2436111

Silver

Associated Lab Samples: 10364126005

mg/L

Blank Reporting Limit Qualifiers Parameter Units Result MDL Analyzed < 0.034 0.034 11/10/16 17:54 Arsenic 0.10 mg/L <0.079 0.20 0.079 Barium mg/L 11/10/16 17:54 <0.0011 0.015 0.0011 Cadmium mg/L 11/10/16 17:54 Chromium mg/L < 0.0046 0.050 0.0046 11/10/16 17:54 Lead mg/L <0.0091 0.050 0.0091 11/10/16 17:54 Selenium mg/L < 0.051 0.12 0.051 11/10/16 17:54 Silver mg/L <0.0050 0.050 0.0050 11/10/16 17:54 LABORATORY CONTROL SAMPLE: 2438609 LCS LCS % Rec Spike Parameter Units Conc. Result % Rec Limits Qualifiers 80-120 Arsenic mg/L 5 4.9 98

Matrix: Water

< 0.0050

0.050

0.0050

11/10/16 17:51

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS



Project: 23270051.37 PND BassettCrk RE2

Pace Project No.: 10364126

LABORATORY CONTROL SAMPLE: 2438609

Parameter Units Conc. Result % Rec Limits Qualifie
Barium mg/L 5 4.7 95 80-120
Cadmium mg/L 5 4.7 95 80-120
Chromium mg/L 5 4.6 92 80-120
Lead mg/L 5 4.7 94 80-120
Selenium mg/L 5 5.2 104 80-120
Silver mg/L 2.5 2.5 99 80-120

MATRIX SPIKE & MATRIX SPIKE	E DUPLIC	ATE: 24386		2438611								
			MS	MSD								
		10364126005	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Arsenic	mg/L	<0.034	5	5	5.1	5.0	101	100	75-125	1	30	
Barium	mg/L	0.73	5	5	5.5	5.5	96	95	75-125	1	30	
Cadmium	mg/L	0.0016J	5	5	4.8	4.8	97	96	75-125	1	30	
Chromium	mg/L	<0.0046	5	5	4.6	4.6	93	92	75-125	1	30	
Lead	mg/L	0.021J	5	5	4.8	4.7	95	95	75-125	0	30	
Selenium	mg/L	<0.051	5	5	5.3	5.3	107	106	75-125	1	30	
Silver	mg/L	<0.0050	2.5	2.5	2.5	2.5	102	101	75-125	1	30	

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REPORT OF LABORATORY ANALYSIS



Project:	23270051.37 F	PND Basset	tCrk RE2										
Pace Project No.:	10364126												
QC Batch: 438500			Analysis Method:			EPA 6010C							
QC Batch Method: EPA 3050			Analysis Description:			6010C Solids							
Associated Lab Sar	nples: 10364	126001, 103	364126002,	10364126	003, 1036	4126004							
METHOD BLANK:	2381790			N	latrix: Sol	id							
Associated Lab Sar	nples: 10364	126001, 103	364126002,	, 10364126 Blank	003, 1036 R	4126004 eporting							
Paran	neter	ι	Jnits	Result	t	Limit	MDL		Analyzed	Qu	alifiers		
Arsenic		m	ng/kg	<	:0.19	0.94	4	0.19 1	0/06/16 17:	:15			
Copper		m	ng/kg	<0	0.038	0.4	7 (0.038 1	0/06/16 17:	:15			
LABORATORY COI	NTROL SAMPL	E: 238179	91										
				Spike	LCS	5	LCS	% R	lec				
Paran	neter	ι	Jnits	Conc.	Resu	lt	% Rec	Lim	its	Qualifiers			
Arsenic		n	ng/kg	42.7		40.4	95	-	80-120				
Copper		rr	ng/kg	42.7		41.3	97		80-120				
MATRIX SPIKE & M	ATRIX SPIKE I	OUPLICATE	: 238179	92		2381793	i						
				MS	MSD								
		1036	64126001	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Paramete	er	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Arsenic		mg/kg	2.4	68	66.4	63.3	61.2	9	8 0	89 75-125	3	20	
Copper	I	mg/kg	13.3	68	66.4	78.3	3 77.0	9	6 9	6 75-125	2	20	

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REPORT OF LABORATORY ANALYSIS



Project:	23270051.37 PND B	assettCrk RE2	2							
Pace Project No.:	10364126									
QC Batch:	439254		Analysis Meth	ASTM D2974						
QC Batch Method: ASTM D2974			Analysis Description:		Dry Weight/Percent Moisture					
Associated Lab Sar	mples: 1036412600	1								
SAMPLE DUPLICA	TE: 2386803									
			1276140001	Dup			Max			
Para	neter	Units	Result	Result	RPD		RPD		Qualifiers	
Percent Moisture		%	2.8	2	.8	0		30		
SAMPLE DUPLICA	TE: 2386804									
			10364126001	Dup			Max			
Parameter		Units	Result	Result	RPD		RPD		Qualifiers	
Percent Moisture		%	41.6	42	.5	2		30		

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REPORT OF LABORATORY ANALYSIS



Project:	23270051.37 PND	BassettCrk RE2								
Pace Project No.:	10364126									
QC Batch:	439284		Analysis Meth	ASTM D2974						
QC Batch Method:	Batch Method: ASTM D2974			Analysis Description:		Dry Weight/Percent Moisture				
Associated Lab Sar	mples: 10364126	002, 10364126003	3, 10364126004							
SAMPLE DUPLICA	TE: 2387015									
			10364272007	Dup			Max			
Parameter		Units	Result	Result	RPD		RPD		Qualifiers	
Percent Moisture		%	19.5	19	.1	2		30		
SAMPLE DUPLICA	TE: 2387193									
			10364126002	Dup			Max			
Parameter		Units	Result	Result	RPD		RPD		Qualifiers	
Percent Moisture		%	47.3	47	.8	1		30		

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS


Project: 23270051.37 PND BassettCrk RE2

Pace Project No.: 10364126

QC Batch:	43814	5		Analysis Me	ethod:	EPA 8270D by SIM	
QC Batch Method:	EPA 3	550		Analysis De	escription:	8270D CPAH by SIM MSSV	
Associated Lab Samp	oles:	10364126001,	10364126002,	10364126003,	10364126004		

Matrix: Solid

METHOD BLANK:	2380189

Associated Lab Samples: 103	64126001, 10364126002,	10364126003, 10	0364126004			
		Blank	Reporting			
Parameter	Units	Result	Limit	MDL	Analyzed	Qualifiers
2-Methylnaphthalene	ug/kg	<0.64	10.0	0.64	10/04/16 13:44	
3-Methylcholanthrene	ug/kg	<1.5	10.0	1.5	10/04/16 13:44	
5-Methylchrysene	ug/kg	<1.2	10.0	1.2	10/04/16 13:44	
7,12-Dimethylbenz(a)anthracene	e ug/kg	<2.8	10.0	2.8	10/04/16 13:44	
7H-Dibenzo(c,g)carbazole	ug/kg	<1.7	10.0	1.7	10/04/16 13:44	
Acenaphthene	ug/kg	<0.61	10.0	0.61	10/04/16 13:44	
Acenaphthylene	ug/kg	<0.57	10.0	0.57	10/04/16 13:44	
Anthracene	ug/kg	<0.58	10.0	0.58	10/04/16 13:44	
Benzo(a)anthracene	ug/kg	<1.5	10.0	1.5	10/04/16 13:44	
Benzo(a)pyrene	ug/kg	<1.3	10.0	1.3	10/04/16 13:44	
Benzo(g,h,i)perylene	ug/kg	<2.9	10.0	2.9	10/04/16 13:44	
Benzofluoranthenes (Total)	ug/kg	<11.0	30.0	11.0	10/04/16 13:44	
Chrysene	ug/kg	<0.53	10.0	0.53	10/04/16 13:44	
Dibenz(a,h)acridine	ug/kg	<3.8	10.0	3.8	10/04/16 13:44	
Dibenz(a,h)anthracene	ug/kg	<3.4	10.0	3.4	10/04/16 13:44	
Dibenzo(a,e)pyrene	ug/kg	<0.92	10.0	0.92	10/04/16 13:44	
Dibenzo(a,h)pyrene	ug/kg	<2.8	10.0	2.8	10/04/16 13:44	
Dibenzo(a,i)pyrene	ug/kg	<0.97	10.0	0.97	10/04/16 13:44	
Dibenzo(a,I)pyrene	ug/kg	<0.57	10.0	0.57	10/04/16 13:44	
Fluoranthene	ug/kg	<0.74	10.0	0.74	10/04/16 13:44	
Fluorene	ug/kg	<0.57	10.0	0.57	10/04/16 13:44	
Indeno(1,2,3-cd)pyrene	ug/kg	<3.0	10.0	3.0	10/04/16 13:44	
Naphthalene	ug/kg	<0.61	10.0	0.61	10/04/16 13:44	
Phenanthrene	ug/kg	<0.61	10.0	0.61	10/04/16 13:44	
Pyrene	ug/kg	<0.75	10.0	0.75	10/04/16 13:44	
2-Fluorobiphenyl (S)	%.	80	46-125		10/04/16 13:44	
p-Terphenyl-d14 (S)	%.	101	46-125		10/04/16 13:44	

LABORATORY CONTROL SAMPLE: 2380190

		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
2-Methylnaphthalene	ug/kg	100	70.1	70	41-125	
3-Methylcholanthrene	ug/kg	100	32.1	32	30-125	
5-Methylchrysene	ug/kg	100	89.5	90	67-125	
7,12-Dimethylbenz(a)anthracene	ug/kg	100	57.2	57	31-125	SS
7H-Dibenzo(c,g)carbazole	ug/kg	100	89.1	89	51-125	
Acenaphthene	ug/kg	100	76.0	76	49-125	
Acenaphthylene	ug/kg	100	75.5	76	48-125	
Anthracene	ug/kg	100	79.3	79	63-125	
Benzo(a)anthracene	ug/kg	100	86.0	86	60-125	

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REPORT OF LABORATORY ANALYSIS

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Project: 23270051.37 PND BassettCrk RE2

Pace Project No.: 10364126

LABORATORY CONTROL SAMPLE: 2380190

		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Benzo(a)pyrene	ug/kg	100	90.2	90	63-125	
Benzo(g,h,i)perylene	ug/kg	100	85.6	86	59-125	
Benzofluoranthenes (Total)	ug/kg	300	281	94	67-125	
Chrysene	ug/kg	100	85.8	86	62-125	
Dibenz(a,h)acridine	ug/kg	100	89.3	89	61-125	
Dibenz(a,h)anthracene	ug/kg	100	87.5	88	59-125	
Dibenzo(a,e)pyrene	ug/kg	100	89.1	89	48-125	
Dibenzo(a,h)pyrene	ug/kg	100	96.7	97	41-128	
Dibenzo(a,i)pyrene	ug/kg	100	83.1	83	33-125	
Dibenzo(a,I)pyrene	ug/kg	100	66.2	66	30-125	
Fluoranthene	ug/kg	100	81.9	82	65-125	
Fluorene	ug/kg	100	77.5	77	58-125	
Indeno(1,2,3-cd)pyrene	ug/kg	100	88.1	88	60-125	
Naphthalene	ug/kg	100	65.6	66	38-125	
Phenanthrene	ug/kg	100	81.4	81	62-125	
Pyrene	ug/kg	100	97.9	98	61-125	
2-Fluorobiphenyl (S)	%.			64	46-125	
p-Terphenyl-d14 (S)	%.			86	46-125	

IATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2380191 2380192												
			MS	MSD								
	1	0364126001	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
2-Methylnaphthalene	ug/kg	4.7J	171	171	121J	81.4J	68	45	47-125		30	M6
3-Methylcholanthrene	ug/kg	23.5	171	171	74.8J	66.2J	30	25	30-150		30	M6
5-Methylchrysene	ug/kg	101	171	171	193	215	54	66	46-125	11	30	
7,12-	ug/kg	<4.8	171	171	121J	90.0J	70	53	30-150		30	SS
	ua/ka	<2.0	171	171	76.01	56.21	45	22	20 120		20	
A sereptide to a	ug/kg	~2.9	171	171	70.9J	100.00	40	33	20-130		30	
Acenaphtnene	ug/kg	62.4	1/1	171	154J	1385	54	44	30-144		30	
Acenaphthylene	ug/kg	38.5	171	1/1	137J	115J	58	45	36-125		30	
Anthracene	ug/kg	168	171	171	187	279	11	65	34-125	39	30	M6,R1
Benzo(a)anthracene	ug/kg	634	171	171	559	923	-43	169	30-150	49	30	M6,R1
Benzo(a)pyrene	ug/kg	748	171	171	692	1190	-33	259	30-150	53	30	M6,R1
Benzo(g,h,i)perylene	ug/kg	280	171	171	294	456	8	103	30-148	43	30	M6,R1
Benzofluoranthenes (Total)	ug/kg	1890	514	514	1850	3010	-8	218	30-150	48	30	M6,R1
Chrysene	ug/kg	950	171	171	771	1290	-105	196	30-150	50	30	M6,R1
Dibenz(a,h)acridine	ug/kg	20.4	171	171	117J	98.7J	56	46	30-127		30	
Dibenz(a,h)anthracene	ug/kg	75.2	171	171	148J	169J	43	55	30-137		30	
Dibenzo(a,e)pyrene	ug/kg	55.1	171	171	105J	134J	29	46	30-150		30	M6
Dibenzo(a,h)pyrene	ug/kg	21.4	171	171	58.5J	62.0J	22	24	30-125		30	M6
Dibenzo(a,i)pyrene	ug/kg	6.2J	171	171	40.1J	32.7J	20	15	30-125		30	M6
Dibenzo(a,I)pyrene	ug/kg	3.9J	171	171	36.1J	32.4J	19	17	30-125		30	M6
Fluoranthene	ug/kg	2150	171	171	1530	2700	-364	321	30-150	56	30	M6,R1
Fluorene	ug/kg	72.4	171	171	160J	171	51	58	38-125		30	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full, without the written consent of Pace Analytical Services, LLC.



Project: 23270051.37 PND BassettCrk RE2

Pace Project No.: 10364126

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2380191 2380192												
			MS	MSD								
		10364126001	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Indeno(1,2,3-cd)pyrene	ug/kg	273	171	171	291	440	11	98	30-150	41	30	M6,R1
Naphthalene	ug/kg	5.6J	171	171	108J	78.6J	60	43	38-125		30	
Phenanthrene	ug/kg	1050	171	171	762	1300	-166	147	30-150	52	30	M6,R1
Pyrene	ug/kg	1550	171	171	1140	1920	-239	215	30-150	51	30	M6,R1
2-Fluorobiphenyl (S)	%.						91	98	46-125			D3
p-Terphenyl-d14 (S)	%.						83	89	46-125			

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



QUALIFIERS

Project: 23270051.37 PND BassettCrk RE2

Pace Project No.: 10364126

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

WORKORDER QUALIFIERS

WO: 10364126

[1] Samples were received outside of the recommended temperature range of 0-6 degrees Celsius. The samples were received from the field on ice, indicating the cool down process had begun.

ANALYTE QUALIFIERS

- D3 Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
- H3 Sample was received or analysis requested beyond the recognized method holding time.
- IS The internal standard recovery associated with this result exceeds the lower control limit. The reported result should be considered an estimated value.
- M6 Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.
- R1 RPD value was outside control limits.
- SS This analyte did not meet the secondary source verification criteria for the initial calibration. The reported result should be considered an estimated value.



QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 23270051.37 PND BassettCrk RE2

Pace Project No.: 10364126

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10364126005	BCPP-1-4 Comp	EPA 3010	446181	EPA 6010C	446348
10364126001	BCPP-1 Comp	EPA 3050	438500	EPA 6010C	439084
10364126002	BCPP-2 Comp	EPA 3050	438500	EPA 6010C	439084
10364126003	BCPP-3 Comp	EPA 3050	438500	EPA 6010C	439084
10364126004	BCPP-4 Comp	EPA 3050	438500	EPA 6010C	439084
10364126005	BCPP-1-4 Comp	EPA 7470A	446183	EPA 7470A	446370
10364126001	BCPP-1 Comp	ASTM D2974	439254		
10364126002	BCPP-2 Comp	ASTM D2974	439284		
10364126003	BCPP-3 Comp	ASTM D2974	439284		
10364126004	BCPP-4 Comp	ASTM D2974	439284		
10364126001	BCPP-1 Comp	EPA 3550	438145	EPA 8270D by SIM	438967
10364126002	BCPP-2 Comp	EPA 3550	438145	EPA 8270D by SIM	438967
10364126003	BCPP-3 Comp	EPA 3550	438145	EPA 8270D by SIM	438967
10364126004	BCPP-4 Comp	EPA 3550	438145	EPA 8270D by SIM	438967

					· .	10364126
Barr Engineering Co. Chaii	n of Custody	Sample Origination State:		Analysis Requested		mber: 51923
Ann Arbor 🗌 Duluth	Jefferson City	\square MI \square ND Other:		/ater Soil		\ of
BARR Bismarck Hibbing	Minneapolis	4CIMN □ SD				
REPORT TO	INV	OICE TO			GW = G	roundwater A = None
Company: BARK FNGINEGRENC	Company:		ers		SW = SL	urface Water B = HCl
Address: 4300 Market Pointe Pr	Address: A	*	Lai N		DW = D	rinking Water $D = H_2 SO_4$
Name:	Name:	M C	> luo	d d	S = Sc SD = Se	poll/Solid E = NaOH
email:	email:			Ne I	0 = 01	ther $G = NaHSO_4$
Copy to: datamgt@barr.com	P.O.		er (MS			$H = Na_2S_2O_3$ I = Ascorbic Acid
Project Name: Bicsett Creek Parkle	Barr Project No: 232	70051.37 PND	₩ W W	A A A	olid	$J = NH_4CI$
Sa	nple Depth Collect	tion Collection		A GF	%	O = Other
Location Start	Stop Unit Date	e Time Cod			Preservat	ive Code
	or in.) (mm/dd/	(yyyy) (hh:mm)	a P		Field Filter	red Y
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3 BCPP - 3 Comp		1340	v 2		THO	LD BCPP-1-4-10-1 4-2
* BCPP - 4 Comp		1420	J 2			Trup mapuly
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Barr Proj. Manager: KOM	keiinquisnea by:	On Ice?		Received by:		
Barr DQ Manager: TAO	Samples Shipped VIA:	Courier Exercised Exercise	press 🗌 Sample	r Air Bill Number:		Requested Due Date:
Lab Name: PACE		Other:	· · · · · · · · · · · · · · · · · · ·			Standard Turn Around Time
Rab Location: Minnerpells, MN	Lab WO:	Temperature on Receip	t (°C): Cus	stody Seal Intact? 🗆 Y 🗆	N 🗆 None	L' Rush 알 (mm/dd/yyyy) 약

Distribution - White-Original: Accompanies Shipment to Laboratory; Yellow Copy: Include in Field Documents; Pink Copy: Send to Data Management Administrators.

	as and	Di	ocument	Name:		Document Revised: 02Aug2016]
	Pace Analytical*	Sample Con	dition Up	oon Rece	ipt Form	Page 1 of 2	-
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l containers lecked? l containers	needing acid/base preservation have needing preservation are found to be ith EBA recommendation?	been Yes in	□No	ja(n/a	13. 🛄 HI Sample #	NO ₃ ☐H₂SO₄ ☐NaOH []нсі
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Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

Appendix B

Sediment Sampling Memo—Winnetka Pond East





Technical Memorandum

To:Bassett Creek Watershed Management CommissionFrom:Kevin Menken and Candice KantorSubject:Winnetka Pond East Sediment CharacterizationDate:February 27, 2017Project:23/27-0051

Introduction

This memorandum summarizes sediment characterization for sediment samples collected from the Winnetka Pond East in the City of Crystal (City). Sediment samples were collected by Barr Engineering Co. (Barr) on September 28, 2016 on behalf of Bassett Creek Watershed Management Organization.

The purpose of sediment characterization is to determine whether the sediment in the pond, when excavated or dredged, could potentially be reused as fill, or if other management methods such as landfill disposal would be required. The use and/or disposal of excavated or dredged material is determined based on concentrations of potential contaminants in the sediments, including metals and polycyclic aromatic hydrocarbons (PAHs). Excavated sediment and soils that do not exhibit field screening impacts and do not exceed the Minnesota Pollution Control Agency's (MPCA) Soil Reference Values (SRV) or applicable Screening Soil Leaching Values (SLVs) may be considered Unregulated Fill that is suitable for off-site reuse according to the MPCA document *Best Management Practices for the Off-Site Reuse of Unregulated Fill* (MPCA, 2012). Sediment or soil excavated from stormwater ponds with constituents that exceed SRVs or applicable Screening SLVs are often disposed at a solid waste landfill, but other options involving specific land uses (e.g. non-residential) could be explored if there are suitable locations elsewhere at City-owned property.

Sediment Sample Collection

Sediment sampling was conducted in accordance with the MPCA's *Managing Stormwater Sediment, Best Management Practice Guidance* (MPCA, 2015). This document provides technical guidance for characterizing sediment in stormwater ponds, including the number of samples that should be collected and potential contaminants to be analyzed. Barr staff collected three sediment samples, consistent with MPCA guidance recommendations for ponds 2 to 3 acres in size. Sampling locations were recorded with a handheld GPS unit; locations are shown on Figure 1. Barr staff used aluminum coring tubes for collecting sediment cores. The entire depth of the sediment core was homogenized in a clean stainless steel bowl before transferring portions to sample containers provided by the laboratory. Samples were sent to Pace Analytical laboratory in Minneapolis for analyses of potential contaminants. The MPCA guidance for stormwater pond sediment management lists the baseline parameters that should be tested for in order to determine whether excavated sediment is contaminated or could be considered Unregulated Fill (MPCA, 2015). The baseline parameters listed in the MPCA guidance are arsenic, copper, and polycyclic aromatic hydrocarbons (PAHs). PAHs are organic compounds that are formed by the incomplete combustion of organic materials, such as wood, oil, and coal. They are also naturally occurring in crude oil and coal. The MPCA determined that coal tar-based sealants are the largest source of PAHs to stormwater ponds, and a state-wide ban of coal tar-based sealants took effect January 1, 2014.

In addition to the baseline parameters, additional parameters may be appropriate with consideration of potential sources of other contaminants in the watershed. A query of MPCA's *What's in My Neighborhood* (WIMN) website was performed for the Winnetka Pond East watershed. *WIMN* is a database maintained by the MPCA that includes potentially contaminated sites (e.g. documented tank leaks), and environmental permits and registrations (e.g. small quantity hazardous waste generator). Based on the WIMN query results and the land uses in the watershed, the sediment samples were analyzed for the MPCA's baseline parameters for stormwater ponds – arsenic, copper, and PAHs. In addition, samples were field screened for potential impacts from chemical impacts, including examination for visual staining, oil sheen, and odors. If field screening indicated possible impacts, additional analytical testing would have been considered.

Laboratory Methodologies and Determination of BaP Equivalents

The parameters analyzed and their laboratory analytical methods are listed below:

- Metals: arsenic, copper (method EPA 6010C)
- Polycyclic aromatic hydrocarbons (PAHs) (method EPA 8270D by SIM)

The PAHs that were analyzed can be grouped into two categories: carcinogenic (i.e. cancer causing) and non-carcinogenic. In order to assess the contamination level of the carcinogenic PAHs in stormwater pond sediment, the MPCA requires the calculation of a "BaP equivalents value". The BaP equivalents value is a single value representing the combined potency of 17 individual carcinogenic PAH compounds with BaP (benzo[a]pyrene) acting as the reference compound. The list of compounds and their respective potency equivalents factors used to calculate the BaP equivalents value can be found in the MPCA guidance document, along with methods for addressing constituents at concentrations below the detection limit (MPCA 2015).

Laboratory analytical results for the sediment samples are summarized in Table 1. The detailed laboratory report is included in Attachment C.

Results of Sediment Characterization

Results of laboratory analytical testing on the sediment samples were compared to the MPCA's current SRVs and Screening SLVs on Table 1. Results of field screening for staining, sheen, or odor, were negative for all three sediment samples; therefore, no additional analytical testing was conducted beyond the baseline parameter list for stormwater pond sediment characterization. Results of arsenic, copper, and PAHs in the sediment of Winnetka Pond East were below Minnesota's SRVs and Screening SLVs for all three samples collected from the pond, with the exception of the arsenic Screening SLV. Sample WPE-01 had an arsenic concentration of 6.3 mg/kg, which is slightly above the SLV of 5.8 mg/kg. However, MPCA guidance for Screening SLVs states that SLVs for metals should only be applied if there has been a significant release of metals documented. Since no significant release of metals has been documented in the pond's watershed, the observed arsenic concentration of 6.3 mg/kg in sample WPE-01 should not preclude the reuse of the material as Unregulated Fill. Overall, the sediment sampling results indicate that the sediment to be removed from Winnetka Pond East is suitable for off-site reuse under MPCA's Unregulated Fill Best Practice (MPCA, 2012).

Results of sediment testing were also compared to the MPCA's proposed changes to SRVs in Table 1. Results of arsenic, copper, and PAHs were below the proposed changes to SRVs for all three of the sediment samples collected from Winnetka Pond East. The MPCA had originally intended that the SRV changes would be implemented later this year (2017), but recent conversations with MCPA staff indicated that the timing of these potential changes may not occur in 2017. The status of MPCA's SRV revisions should be reassessed prior to proceeding with the sediment excavation and management.

References

- Minnesota Pollution Control Agency (MPCA), 2012. Best Management Practices for the Off-Site Reuse of Unregulated Fill. February 2012.
- MPCA, 2015. Managing Stormwater Sediment, Best Management Practice Guidance, document wq-strm4-16, June 2015.

Tables

Table 1 – Winnetka Pond East Sediment Analytical Data Summary

Figures

Figure 1 – Winnetka Pond East Sediment Sampling Locations

Attachments

- Attachment A Sediment Core Field Logs
- Attachment B Photographs
- Attachment C Laboratory Analytical Data Report

Tables

Table 1Winnetka Pond East Sediment Analytical Data SummaryBassett Creek Watershed Management Commission

						Sample ID:	WPE-01	WPE-02	WPE-03
						Sample Date:	9/23/2016	9/23/2016	9/23/2016
		Minnesota	Minnesota	Proposed Minnesota	Minnesota Industrial	Proposed Minnesota			
Parameter	Units	Screening Soil	Residential Soil	Residential/	Soil Reference	Commercial/			
		Leaching Values	Reference Values	Recreational SRVs	Values	Industrial SRVs			
Effective Date		06/01/2013	06/22/2009	08/01/2016	06/22/2009	08/01/2016			
Exceedance Key		Bold	No Exceed	No Exceed	No Exceed	No Exceed			
General Parameters									
Moisture	%						64.7	19.6	28.8
Metals									
Arsenic	mg/kg	5.8	9	9	20	9	6.3	2.3	2.9
Copper	mg/kg	700	100	2200	9000	33000	33.1	24.5	15.3
Carcinogenic PAHs									
3-Methylcholanthrene	mg/kg	Т	Т	Т	Т	Т	0.0062 j*	0.0088 j	0.0049 j
5-Methylchrysene	mg/kg	Т	Т	Т	Т	Т	0.0258 j	0.0384	0.0289
7,12-Dimethylbenz(a)anthracene	mg/kg	Т	Т	Т	Т	Т	< 0.0079	< 0.0035	< 0.0039
7h-Dibenzo(c,g)carbazole	mg/kg	Т	Т	Т	Т	Т	< 0.0048	< 0.0021	< 0.0024
Benz(a)anthracene	mg/kg	Т	Т	Т	Т	Т	0.114	0.192	0.112
Benzo(a)pyrene	mg/kg	Т	Т	Т	Т	Т	0.182	0.256	0.171
Chrysene	mg/kg	Т	Т	Т	Т	Т	0.207	0.298	0.198
Dibenz(a,h)acridine	mg/kg	Т	Т	Т	Т	Т	< 0.0107	0.0080 j	0.0056 j
Dibenz(a,h)anthracene	mg/kg	Т	Т	Т	Т	Т	0.0223 j	0.0238	0.0169
Dibenzo(a,e)pyrene	mg/kg	Т	Т	Т	Т	Т	0.0237 j*	0.0193	< 0.0013
Dibenzo(a,h)pyrene	mg/kg	Т	Т	Т	Т	Т	0.0114 j*	0.0075 j	0.0070 j
Dibenzo(a,i)pyrene	mg/kg	Т	Т	Т	Т	Т	0.0040 j*	0.0026 j	0.0027 j
Dibenzo(a,l)pyrene	mg/kg	Т	Т	Т	Т	Т	0.0046 j*	0.0024 j	0.0025 j
Indeno(1,2,3-cd)pyrene	mg/kg	Т	Т	Т	Т	Т	0.0769	0.0791	0.0595
BaP Equivalents, calculated using Kaplan-Meier method	mg/kg	1.4 T	2 T	1 T	3 T	14 T	0.57 a^	0.60 a	0.43 a
% Non-detects	%						20.0 a	13.3 a	20.0 a
PAHs									
2-Methylnaphthalene	mg/kg		100	39	369	370	0.0019 j	0.0024 j	0.0023 j
Acenaphthene	mg/kg	81	1200	1300	5260	19000	0.0066 j	0.0139	0.0121 j
Acenaphthylene	mg/kg	NA					0.0091 j	0.0090 j	0.0110 j
Anthracene	mg/kg	1300	7880	6500	45400	97000	0.0222 j	0.0370	0.0321
Benzo(g,h,i)perylene	mg/kg	NA					0.0881 *	0.0764	0.0656
Benzofluoranthenes	mg/kg						0.478	0.635	0.453
Fluoranthene	mg/kg	670	1080	510	6800	6700	0.344	0.523	0.419
Fluorene	mg/kg	110	850	860	4120	13000	0.0093 j	0.0207	0.0151
Naphthalene	mg/kg	4.5	10	81	28	120	0.0021 j	0.0018 j	0.0020 j
Phenanthrene	mg/kg	NA					0.101	0.223	0.144
Pyrene	mg/kg	440	890	44	5800	44	0.254	0.361	0.252

Table 1 Data Footnotes and Qualifiers

Barr Standard Footnotes and Qualifiers

*	Estimated value, QA/QC criteria not met.
а	Estimated value, calculated using some or all values that are estimates.
j	Estimated detected value. The reported value is less than the stated laboratory quantitation limit but greater than the laboratory method detection limit.
٨	Possible low bias due to four BaP compounds having low MS/MSD (dibenz(a,e)pyrene,dibenz(a,h)pyrene, dibenz(a,i)pyrene, dibenz(a

Minnesota Screening Soil Leaching Values

NA	Criterion value is not available for this analyte.
Т	Value represents a criteria for the total carcinogenic PAHs as BaP.

Minnesota Soil Reference Values

T Value represents a criteria for the total carcinogenic PAHs as BaP.		
	Т	Value represents a criteria for the total carcinogenic PAHs as BaP.

Figures



Attachment A

Sediment/Soil Coring Logs

$\begin{array}{c c c c c c c c c c c c c c c c c c c $	BARR Proj#: <u>2327005</u> Collection Date(s): Ice Thickness (feet): Water Depth (feet):
Sample Interval and number Sample and number N N N N O 0 1 W K N N N N N 0 2.1 0 0 1 V N N N 1 2.1 0 2.1 0 0 0 0 0 1 2.1 0 0 0 0 0 0 0 1 2.1 0 0 0 0 0 0 0 1 2.1 0 0 0 0 0 0 0 1 2.1 0 0 0 0 0 0 0 1 2.1 0 0 0 0 0 0 0 1 2.1 0 0 0 0 0 0 0 1 2.1 0 0 0 0 0 0 0 1 2.1 0 0 0 0 0 0 0 1 2.1 0 0 0 0 0 0 0 1 0 0 <td< th=""><th></th></td<>	
0-2.1 0-2.1 1 2.1 Story N Low Februs N N N Offer (Pen) Refused @ 2.3 Refused @ 2.3	Depth (ft.)
1 2.1 Story N Low Fibrows N N N Offort ILO'-2,1= Black to Vdark brown organic pent spongy and fibrows Refasel@2.3	0 1
1 2.1 Story N Low Fibrows N N N dog 1.0-21 = Black to Vdark brown organic peat spongy and Fibrows Refasal@2.3	Odil
Refasal@2.3'	[2.]
Refusal@ 2.3'	
	*

B-11

BA Proj#: Collec Ice Th Water	tion Da ickness	27005 ate(s): : (feet): (feet):	Se 1. 1. 1. 1. 2.	edim P -16 0	ent roject: GPS X GPS Y GPS Z	Col Wi, Bass	re/B nnetk sett (Boril Greek Le	ng L nd Ea ford ength o Rea	.0g 5 f Push covery % Rec	(feet): (feet): covery:	2.7	pageof VC: vibracore PC: push core Core/Boring#: WPE- Driller: Barr Drilling Method: VC Crew: Jut/Kby Logged by: Just Observer: Checked by: KDM
Dept	h (ft.)	Sample Interval and number	E Moisture	Density or Consistency	Plasticity	Cohesiveness	Particles		Staining	Sheen	ASTM / USCS Classification	Graphic Log	Description
		0-23		10050		~				/~	SM		U-1, 3 - Black Silty Land ty-cg w/ trace fine gravel
1.3	2.3		Set	Soff S Medso	Low	¥is	\mathcal{N}	×	٢	\mathcal{N}	OU S CL		1.3-2.3=Blact to olive blue color SoftBluck)Organic rilts guades to (oliveblue) lean of nedsoft trace coarse send throughout
8													Refusal @ 2.7
													· · ·

			Se	dim	ent	Co	re/B	Boriı	ng L	log			pageof
Proj# Collec Ice Th Wate	: <u>2</u> ction Da nickness r Depth	32700 ate(s): s (feet): a (feet):	51 a-23 2.4	р - 16 1	GPS X GPS X GPS Y GPS Z	Win (: ::	netki	Le	ength c	of Push covery % Re	r (feet): / (feet): covery:	3.6	Driller: Barr Drilling Method: VC Crew: JwJ/KDM Logged by: JwJ Observer: Checked by: KDM
							Pro	pertie	es				
Dep	th (ft.)	Sample Interval and number	Moisture	Density or Consistency	Plasticity	Cohesiveness	Particles	Odor	Staining	Sheen	ASTM / USCS Classification	Graphic Log	Description
0	1.5	0-3.6	W	Loose	N	N	N	N	N	N	SM		0-1.5= Black Pilty send w roots fy-cg and
1.5	2.5		W	foft	N	Yes	N	N	N	N	Olfor.	1	1.5-2.5= Black perty silts w/ Sand
2.5	B .(e		L	54- E	Low	425	N	\mathcal{N}	N	N	CL		2.5-3.6= bray lean clay up gravel and rand fg-cg.
*													
		-											
					-					1			

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Attachment B

Photographs



Photograph #1: Sediment core WPE-01.



Photograph #2: Sediment core WPE-02.



Photograph #3: Sediment core WPE-03, 0-2.5' interval.



Photograph #4: Sediment core WPE-03, 1.5-3.5' interval.

Attachment C

Laboratory Analytical Data



Pace Analytical Services, LLC 1700 Elm Street - Suite 200 Minneapolis, MN 55414 (612)607-1700

October 11, 2016

Terri Olson Barr Engineering 4300 MarketPointe Drive Suite 200 Minneapolis, MN 55435

RE: Project: 23270051.37 Pond Zoo Bassett Pace Project No.: 10363579

Dear Terri Olson:

Enclosed are the analytical results for sample(s) received by the laboratory on September 23, 2016. 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,

amanda J albeedet

Amanda Albrecht amanda.albrecht@pacelabs.com Project Manager

Enclosures

cc: BarrDM, Barr Engineering Kevin Menken, Barr Engineering



REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, LLC 1700 Elm Street - Suite 200 Minneapolis, MN 55414 (612)607-1700

CERTIFICATIONS

Project: 23270051.37 Pond Zoo Bassett Pace Project No.: 10363579

Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414 Alaska Certification UST-107 525 N 8th Street, Salina, KS 67401 A2LA Certification #: 2926.01 Alaska Certification #: UST-078 Alaska Certification #MN00064 Alabama Certification #40770 Arizona Certification #: AZ-0014 Arkansas Certification #: 88-0680 California Certification #: 01155CA Colorado Certification #Pace Connecticut Certification #: PH-0256 EPA Region 8 Certification #: 8TMS-L Florida/NELAP Certification #: E87605 Guam Certification #:14-008r Georgia Certification #: 959 Georgia EPD #: Pace Idaho Certification #: MN00064 Hawaii Certification #MN00064 Illinois Certification #: 200011 Indiana Certification#C-MN-01 Iowa Certification #: 368 Kansas Certification #: E-10167 Kentucky Dept of Envi. Protection - DW #90062 Kentucky Dept of Envi. Protection - WW #:90062 Louisiana DEQ Certification #: 3086 Louisiana DHH #: LA140001 Maine Certification #: 2013011 Maryland Certification #: 322

Michigan DEPH Certification #: 9909 Minnesota Certification #: 027-053-137 Mississippi Certification #: Pace Montana Certification #: MT0092 Nevada Certification #: MN_00064 Nebraska Certification #: Pace New Jersey Certification #: MN-002 New York Certification #: 11647 North Carolina Certification #: 530 North Carolina State Public Health #: 27700 North Dakota Certification #: R-036 Ohio EPA #: 4150 Ohio VAP Certification #: CL101 Oklahoma Certification #: 9507 Oregon Certification #: MN200001 Oregon Certification #: MN300001 Pennsylvania Certification #: 68-00563 Puerto Rico Certification Saipan (CNMI) #:MP0003 South Carolina #:74003001 Texas Certification #: T104704192 Tennessee Certification #: 02818 Utah Certification #: MN000642013-4 Virginia DGS Certification #: 251 Virginia/VELAP Certification #: Pace Washington Certification #: C486 West Virginia Certification #: 382 West Virginia DHHR #:9952C Wisconsin Certification #: 999407970



SAMPLE SUMMARY

Project: 23270051.37 Pond Zoo Bassett

Pace Project No.: 10363579

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10363579001	WPE-01	Solid	09/23/16 11:45	09/23/16 15:20
10363579002	WPE-02	Solid	09/23/16 12:00	09/23/16 15:20
10363579003	WPE-03	Solid	09/23/16 12:30	09/23/16 15:20
10363579004	WPE-Comp	Solid	09/23/16 12:38	09/23/16 15:20

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project:23270051.37 Pond Zoo BassettPace Project No.:10363579

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10363579001	WPE-01	EPA 6010C	DM	2	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D by SIM	JLR	27	PASI-M
10363579002	WPE-02	EPA 6010C	DM	2	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D by SIM	JLR	27	PASI-M
10363579003	WPE-03	EPA 6010C	DM	2	PASI-M
		ASTM D2974	JDL	1	PASI-M
		EPA 8270D by SIM	JLR	27	PASI-M



PROJECT NARRATIVE

Project: 23270051.37 Pond Zoo Bassett

Pace Project No.: 10363579

Date: October 11, 2016

Case Narrative

Semi-Volatile Organics Analysis

8270D CPAH

Refering to data qualifiers that appear later in the report:

SS - The 7,12 dimethylbenz(a)anthracene result associated with batch QC did not meet secondary source verification criteria. It was recovered at 175% (recovery limits are 50-150%). The high recovery leads to a high bias in the QC but does not impact any results.



ANALYTICAL RESULTS

Project: 23270051.37 Pond Zoo Bassett

Pace Project No.: 10363579

 Sample:
 WPE-01
 Lab ID: 10363579001
 Collected: 09/23/16 11:45
 Received: 09/23/16 15:20
 Matrix: Solid

 Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.
 Parameters
 Results
 Units
 POI
 MDI
 DE
 Prepared
 Analyzed
 CAS No
 Qual

Parameters	Results	Units	PQL	MDL			Analyzeu	CAS NO.	Quai
6010C MET ICP	Analytical	Method: EP	A 6010C Prep	aration Met	thod: E	PA 3050			
Arsenic	6.3	mg/kg	2.8	0.56	1	09/27/16 11:54	09/30/16 11:03	7440-38-2	
Copper	33.1	mg/kg	1.4	0.11	1	09/27/16 11:54	09/30/16 11:03	7440-50-8	
Dry Weight	Analytical	Method: AS	TM D2974						
Percent Moisture	64.7	%	0.10	0.10	1		09/30/16 11:49		
8270D MSSV CPAH by SIM	Analytical	Method: EP	A 8270D by SI	M Prepara	tion Me	ethod: EPA 3550			
Acenaphthene	6.6J	ug/kg	28.3	1.7	1	09/26/16 07:13	10/04/16 14:42	83-32-9	
Acenaphthylene	9.1J	ug/kg	28.3	1.6	1	09/26/16 07:13	10/04/16 14:42	208-96-8	
Anthracene	22.2J	ug/kg	28.3	1.6	1	09/26/16 07:13	10/04/16 14:42	120-12-7	
Benzo(a)anthracene	114	ug/kg	28.3	4.2	1	09/26/16 07:13	10/04/16 14:42	56-55-3	
Benzo(a)pyrene	182	ug/kg	28.3	3.7	1	09/26/16 07:13	10/04/16 14:42	50-32-8	
Benzo(g,h,i)perylene	88.1	ug/kg	28.3	8.2	1	09/26/16 07:13	10/04/16 14:42	191-24-2	M1
Benzofluoranthenes (Total)	478	ug/kg	84.8	31.1	1	09/26/16 07:13	10/04/16 14:42		
Chrysene	207	ug/kg	28.3	1.5	1	09/26/16 07:13	10/04/16 14:42	218-01-9	
Dibenz(a,h)acridine	<10.7	ug/kg	28.3	10.7	1	09/26/16 07:13	10/04/16 14:42	226-36-8	
Dibenz(a,h)anthracene	22.3J	ug/kg	28.3	9.6	1	09/26/16 07:13	10/04/16 14:42	53-70-3	
Dibenzo(a,e)pyrene	23.7J	ug/kg	28.3	2.6	1	09/26/16 07:13	10/04/16 14:42	192-65-4	M1
Dibenzo(a,h)pyrene	11.4J	ug/kg	28.3	7.9	1	09/26/16 07:13	10/04/16 14:42	189-64-0	M1
Dibenzo(a,i)pyrene	4.0J	ug/kg	28.3	2.7	1	09/26/16 07:13	10/04/16 14:42	189-55-9	M1
Dibenzo(a,I)pyrene	4.6J	ug/kg	28.3	1.6	1	09/26/16 07:13	10/04/16 14:42	191-30-0	M1
7H-Dibenzo(c,g)carbazole	<4.8	ug/kg	28.3	4.8	1	09/26/16 07:13	10/04/16 14:42	194-59-2	
7,12-Dimethylbenz(a)anthracene	<7.9	ug/kg	28.3	7.9	1	09/26/16 07:13	10/04/16 14:42	57-97-6	
Fluoranthene	344	ug/kg	28.3	2.1	1	09/26/16 07:13	10/04/16 14:42	206-44-0	
Fluorene	9.3J	ug/kg	28.3	1.6	1	09/26/16 07:13	10/04/16 14:42	86-73-7	
Indeno(1,2,3-cd)pyrene	76.9	ug/kg	28.3	8.5	1	09/26/16 07:13	10/04/16 14:42	193-39-5	
3-Methylcholanthrene	6.2J	ug/kg	28.3	4.2	1	09/26/16 07:13	10/04/16 14:42	56-49-5	L2
5-Methylchrysene	25.8J	ug/kg	28.3	3.4	1	09/26/16 07:13	10/04/16 14:42	3697-24-3	
2-Methylnaphthalene	1.9J	ug/kg	28.3	1.8	1	09/26/16 07:13	10/04/16 14:42	91-57-6	
Naphthalene	2.1J	ug/kg	28.3	1.7	1	09/26/16 07:13	10/04/16 14:42	91-20-3	
Phenanthrene	101	ug/kg	28.3	1.7	1	09/26/16 07:13	10/04/16 14:42	85-01-8	
Pyrene	254	ug/kg	28.3	2.1	1	09/26/16 07:13	10/04/16 14:42	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	65	%.	46-125		1	09/26/16 07:13	10/04/16 14:42	321-60-8	
p-Terphenyl-d14 (S)	65	%.	46-125		1	09/26/16 07:13	10/04/16 14:42	1718-51-0	



ANALYTICAL RESULTS

Project: 23270051.37 Pond Zoo Bassett 10363579

Pace Project No.:

Sample: WPE-02	Lab ID	: 10363579002	Collected:	09/23/16	6 12:00	Received:	09/23/16 15:20	Matrix: Solid	
Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.									
Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual

6010C MET ICP	Analytical N	/lethod: EPA	6010C Prepar	ation Meth	nod: E	PA 3050			
Arsenic	2.3	mg/kg	1.1	0.22	1	09/27/16 11:54	09/30/16 11:29	7440-38-2	
Copper	24.5	mg/kg	0.55	0.044	1	09/27/16 11:54	09/30/16 11:29	7440-50-8	
Dry Weight	Analytical N	/lethod: AST	M D2974						
Percent Moisture	19.6	%	0.10	0.10	1		09/30/16 11:49		
8270D MSSV CPAH by SIM	Analytical N	/lethod: EPA	8270D by SIM	Preparati	on Me	ethod: EPA 3550			
Acenaphthene	13.9	ug/kg	12.4	0.76	1	09/26/16 07:13	10/04/16 16:09	83-32-9	
Acenaphthylene	9.0J	ug/kg	12.4	0.71	1	09/26/16 07:13	10/04/16 16:09	208-96-8	
Anthracene	37.0	ug/kg	12.4	0.72	1	09/26/16 07:13	10/04/16 16:09	120-12-7	
Benzo(a)anthracene	192	ug/kg	12.4	1.9	1	09/26/16 07:13	10/04/16 16:09	56-55-3	
Benzo(a)pyrene	256	ug/kg	12.4	1.6	1	09/26/16 07:13	10/04/16 16:09	50-32-8	
Benzo(g,h,i)perylene	76.4	ug/kg	12.4	3.6	1	09/26/16 07:13	10/04/16 16:09	191-24-2	
Benzofluoranthenes (Total)	635	ug/kg	186	68.2	5	09/26/16 07:13	10/05/16 14:56		
Chrysene	298	ug/kg	12.4	0.66	1	09/26/16 07:13	10/04/16 16:09	218-01-9	
Dibenz(a,h)acridine	8.0J	ug/kg	12.4	4.7	1	09/26/16 07:13	10/04/16 16:09	226-36-8	
Dibenz(a,h)anthracene	23.8	ug/kg	12.4	4.2	1	09/26/16 07:13	10/04/16 16:09	53-70-3	
Dibenzo(a,e)pyrene	19.3	ug/kg	12.4	1.1	1	09/26/16 07:13	10/04/16 16:09	192-65-4	
Dibenzo(a,h)pyrene	7.5J	ug/kg	12.4	3.5	1	09/26/16 07:13	10/04/16 16:09	189-64-0	
Dibenzo(a,i)pyrene	2.6J	ug/kg	12.4	1.2	1	09/26/16 07:13	10/04/16 16:09	189-55-9	
Dibenzo(a,I)pyrene	2.4J	ug/kg	12.4	0.71	1	09/26/16 07:13	10/04/16 16:09	191-30-0	
7H-Dibenzo(c,g)carbazole	<2.1	ug/kg	12.4	2.1	1	09/26/16 07:13	10/04/16 16:09	194-59-2	
7,12-Dimethylbenz(a)anthracene	<3.5	ug/kg	12.4	3.5	1	09/26/16 07:13	10/04/16 16:09	57-97-6	
Fluoranthene	523	ug/kg	62.0	4.6	5	09/26/16 07:13	10/05/16 14:56	206-44-0	
Fluorene	20.7	ug/kg	12.4	0.71	1	09/26/16 07:13	10/04/16 16:09	86-73-7	
Indeno(1,2,3-cd)pyrene	79.1	ug/kg	12.4	3.7	1	09/26/16 07:13	10/04/16 16:09	193-39-5	
3-Methylcholanthrene	8.8J	ug/kg	12.4	1.9	1	09/26/16 07:13	10/04/16 16:09	56-49-5	L2
5-Methylchrysene	38.4	ug/kg	12.4	1.5	1	09/26/16 07:13	10/04/16 16:09	3697-24-3	
2-Methylnaphthalene	2.4J	ug/kg	12.4	0.79	1	09/26/16 07:13	10/04/16 16:09	91-57-6	
Naphthalene	1.8J	ug/kg	12.4	0.76	1	09/26/16 07:13	10/04/16 16:09	91-20-3	
Phenanthrene	223	ug/kg	12.4	0.76	1	09/26/16 07:13	10/04/16 16:09	85-01-8	
Pyrene	361	ug/kg	62.0	4.6	5	09/26/16 07:13	10/05/16 14:56	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	67	%.	46-125		1	09/26/16 07:13	10/04/16 16:09	321-60-8	
p-Terphenyl-d14 (S)	90	%.	46-125		1	09/26/16 07:13	10/04/16 16:09	1718-51-0	



ANALYTICAL RESULTS

Project: 23270051.37 Pond Zoo Bassett

Pace Project No.: 10363579									
Sample: WPE-03	Lab ID:	10363579003	Collected	1: 09/23/16	6 12:30	Received: 09/	23/16 15:20 M	atrix: Solid	
Results reported on a "dry weigh	t" basis and are	e adjusted for	percent mo	isture, saı	mple si	ize and any dilut	ions.		
Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010C MET ICP	Analytical	Method: EPA 6	010C Prepa	aration Met	thod: El	PA 3050			
Arsenic	2.9	mg/kg	1.3	0.26	1	09/27/16 11:54	09/30/16 11:31	7440-38-2	
Copper	15.3	mg/kg	0.64	0.051	1	09/27/16 11:54	09/30/16 11:31	7440-50-8	
Dry Weight	Analytical	Method: ASTM	D2974						
Percent Moisture	28.8	%	0.10	0.10	1		09/30/16 11:49		
8270D MSSV CPAH by SIM	Analytical	Method: EPA 8	270D by SI	M Prepara	tion Me	ethod: EPA 3550			
Acenaphthene	12.1J	ug/kg	14.0	0.86	1	09/26/16 07:13	10/05/16 14:27	83-32-9	
Acenaphthylene	11.0J	ug/kg	14.0	0.80	1	09/26/16 07:13	10/05/16 14:27	208-96-8	
Anthracene	32.1	ug/kg	14.0	0.81	1	09/26/16 07:13	10/05/16 14:27	120-12-7	
Benzo(a)anthracene	112	ug/kg	14.0	2.1	1	09/26/16 07:13	10/05/16 14:27	56-55-3	
Benzo(a)pyrene	171	ug/kg	14.0	1.8	1	09/26/16 07:13	10/05/16 14:27	50-32-8	
Benzo(g,h,i)perylene	65.6	ug/kg	14.0	4.1	1	09/26/16 07:13	10/05/16 14:27	191-24-2	
Benzofluoranthenes (Total)	453	ug/kg	42.1	15.5	1	09/26/16 07:13	10/05/16 14:27		
Chrysene	198	ug/kg	14.0	0.74	1	09/26/16 07:13	10/05/16 14:27	218-01-9	
Dibenz(a,h)acridine	5.6J	ug/kg	14.0	5.3	1	09/26/16 07:13	10/05/16 14:27	226-36-8	
Dibenz(a,h)anthracene	16.9	ug/kg	14.0	4.8	1	09/26/16 07:13	10/05/16 14:27	53-70-3	
Dibenzo(a,e)pyrene	<1.3	ug/kg	14.0	1.3	1	09/26/16 07:13	10/05/16 14:27	192-65-4	
Dibenzo(a,h)pyrene	7.0J	ug/kg	14.0	3.9	1	09/26/16 07:13	10/05/16 14:27	189-64-0	
Dibenzo(a,i)pyrene	2.7J	ug/kg	14.0	1.4	1	09/26/16 07:13	10/05/16 14:27	189-55-9	
Dibenzo(a,I)pyrene	2.5J	ug/kg	14.0	0.80	1	09/26/16 07:13	10/05/16 14:27	191-30-0	
7H-Dibenzo(c,g)carbazole	<2.4	ug/kg	14.0	2.4	1	09/26/16 07:13	10/05/16 14:27	194-59-2	
7,12-Dimethylbenz(a)anthracene	<3.9	ug/kg	14.0	3.9	1	09/26/16 07:13	10/05/16 14:27	57-97-6	
Fluoranthene	419	ug/kg	14.0	1.0	1	09/26/16 07:13	10/05/16 14:27	206-44-0	
Fluorene	15.1	ug/kg	14.0	0.80	1	09/26/16 07:13	10/05/16 14:27	86-73-7	
Indeno(1,2,3-cd)pyrene	59.5	ug/kg	14.0	4.2	1	09/26/16 07:13	10/05/16 14:27	193-39-5	
3-Methylcholanthrene	4.9J	ug/kg	14.0	2.1	1	09/26/16 07:13	10/05/16 14:27	56-49-5	L2
5-Methylchrysene	28.9	ug/kg	14.0	1.7	1	09/26/16 07:13	10/05/16 14:27	3697-24-3	
2-Methylnaphthalene	2.3J	ug/kg	14.0	0.90	1	09/26/16 07:13	10/05/16 14:27	91-57-6	
Naphthalene	2.0J	ug/kg	14.0	0.86	1	09/26/16 07:13	10/05/16 14:27	91-20-3	
Phenanthrene	144	ug/kg	14.0	0.86	1	09/26/16 07:13	10/05/16 14:27	85-01-8	
Pyrene	252	ug/kg	14.0	1.1	1	09/26/16 07:13	10/05/16 14:27	129-00-0	

REPORT OF LABORATORY ANALYSIS

46-125

46-125

1

1

09/26/16 07:13 10/05/16 14:27 321-60-8

09/26/16 07:13 10/05/16 14:27 1718-51-0

74

69

%.

%.

Surrogates 2-Fluorobiphenyl (S)

p-Terphenyl-d14 (S)



Project:	23270051.37 Por	id Zoo Bassett										
Pace Project No.:	10363579											
QC Batch:	437522		Analys	is Method	:	EPA 6010C						
QC Batch Method:	EPA 3050		Analysi	is Descrip	tion:	6010C Solids	;					
Associated Lab Sar	nples: 10363579	9001, 10363579002	, 103635790	003								
METHOD BLANK:	2377135		N	latrix: Sol	id							
Associated Lab Sar	nples: 10363579	9001, 10363579002	, 10363579	003								
			Blank	R	eporting							
Parar	neter	Units	Result	t	Limit	MDL		Analyzed	Qu	alifiers		
Arsenic		mg/kg	<	:0.19	0.9	6	0.19 09	/30/16 10:5	2		_	
Copper		mg/kg	<0).038	0.4	8 C	0.038 09)/30/16 10:5	2			
LABORATORY CO	NTROL SAMPLE:	2377136										
			Spike	LCS	6	LCS	% Re	ec				
Parar	neter	Units	Conc.	Resu	ılt	% Rec	Limi	ts Q	ualifiers			
Arsenic		mg/kg	49.5		46.3	94		80-120		-		
Copper		mg/kg	49.5		49.3	100	8	80-120				
MATRIX SPIKE & M		PLICATE: 23771	37		2377138	1						
		2011	MS	MSD	2011100	·						
		10363579001	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Paramete	er Un	its Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Arsenic	mg	/kg 6.3	129	120	123	3 121	90	96	75-125	1	20	
Copper	mg	/kg 33.1	129	120	162	2 147	100) 95	75-125	10	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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Project:	23270051.37 Pond	d Zoo Bassett								
Pace Project No.:	10363579									
QC Batch:	438463		Analysis Meth	iod:	ASTM D2974	•				
QC Batch Method:	ASTM D2974		Analysis Desc	cription:	Dry Weight/P	ercent I	Moisture			
Associated Lab Sar	mples: 10363579	001, 1036357900	2, 10363579003							
SAMPLE DUPLICA	TE: 2381583									
			10364275001	Dup			Max			
Parar	meter	Units	Result	Result	RPD		RPD		Qualifiers	
Percent Moisture		%	8.2	7	.3	11		30		
SAMPLE DUPLICA	TE: 2381605									
			10363579003	Dup			Max			
Parar	meter	Units	Result	Result	RPD		RPD		Qualifiers	
Percent Moisture		%		29	.3	2		30		

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



Project: 23270051.37 Pond Zoo Bassett

Pace Project No.:

10363579

QC Batch:	437411	Analysis Method:	EPA 8270D by SIM
QC Batch Method:	EPA 3550	Analysis Description:	8270D CPAH by SIM MSSV
Associated Lab Samp	les: 10363579001, 10363579002, 10	0363579003	

Matrix: Solid

METHOD BLANK: 2376626 Associated Lab Samples: 10363579001, 10363579002, 10363579003

Parameter Units Result Limit MDL Analyzed Qualifiers 2-Methylnaphthalene ug/kg <0.64 10.0 0.64 10/04/16 12:45 3-Methylcholanthracene ug/kg <1.5 10.0 1.2 10/04/16 12:45 7.12-Dimethylbenz(a)anthracene ug/kg <2.8 10.0 2.8 10/04/16 12:45 7.12-Dimethylbenz(a)anthracene ug/kg <0.61 10.0 0.61 10/04/16 12:45 </th <th></th> <th></th> <th>Blank</th> <th>Reporting</th> <th></th> <th></th> <th></th>			Blank	Reporting			
2-Methylnaphthalene ug/kg <0.64	Parameter	Units	Result	Limit	MDL	Analyzed	Qualifiers
B-Methylcholanthrene ug/kg <1.5 10.0 1.5 10/04/16 12:45 5-Methylchrysene ug/kg <1.2	2-Methylnaphthalene	ug/kg	<0.64	10.0	0.64	10/04/16 12:45	
5-Methylchrysene ug/kg <1.2 10.0 1.2 10/04/16 12:45 /12-Dimethylbenz(a)anthracene ug/kg <2.8	3-Methylcholanthrene	ug/kg	<1.5	10.0	1.5	10/04/16 12:45	
7,12-Dimethylbenz(a)anthracene ug/kg <2.8	5-Methylchrysene	ug/kg	<1.2	10.0	1.2	10/04/16 12:45	
7H-Dibenzo(c,g)carbazole ug/kg <1.7	7,12-Dimethylbenz(a)anthracene	ug/kg	<2.8	10.0	2.8	10/04/16 12:45	
Acenaphthene ug/kg <0.61 10.0 0.61 10/04/16 12:45 Acenaphthylene ug/kg <0.57	7H-Dibenzo(c,g)carbazole	ug/kg	<1.7	10.0	1.7	10/04/16 12:45	
Acenaphthyleneug/kg<0.5710.00.5710/04/1612:45Anthraceneug/kg<0.58	Acenaphthene	ug/kg	<0.61	10.0	0.61	10/04/16 12:45	
Anthraceneug/kg<0.5810.00.5810/04/1612:45Benzo(a)anthraceneug/kg<1.5	Acenaphthylene	ug/kg	<0.57	10.0	0.57	10/04/16 12:45	
Benzo(a)anthracene ug/kg <1.5 10.0 1.5 10/04/16 12:45 Benzo(a)pyrene ug/kg <1.3	Anthracene	ug/kg	<0.58	10.0	0.58	10/04/16 12:45	
Benzo(a)pyreneug/kg<1.310.01.310/04/1612:45Benzo(g,h,i)peryleneug/kg<2.9	Benzo(a)anthracene	ug/kg	<1.5	10.0	1.5	10/04/16 12:45	
Banzo(g,h,i)peryleneug/kg<2.910.02.910/04/1612:45Banzofluoranthenes (Total)ug/kg<11.0	Benzo(a)pyrene	ug/kg	<1.3	10.0	1.3	10/04/16 12:45	
Benzofluoranthenes (Total)ug/kg<11.030.011.010/04/1612:45Chryseneug/kg<0.53	Benzo(g,h,i)perylene	ug/kg	<2.9	10.0	2.9	10/04/16 12:45	
Chryseneug/kg<0.5310.00.5310/04/1612:45Dibenz(a,h)acridineug/kg<3.8	Benzofluoranthenes (Total)	ug/kg	<11.0	30.0	11.0	10/04/16 12:45	
Dibenz(a,h)acridineug/kg<3.810.03.810/04/16 12:45Dibenz(a,h)anthraceneug/kg<3.4	Chrysene	ug/kg	<0.53	10.0	0.53	10/04/16 12:45	
Dibenz(a,h)anthraceneug/kg<3.410.03.410/04/16 12:45Dibenzo(a,e)pyreneug/kg<0.92	Dibenz(a,h)acridine	ug/kg	<3.8	10.0	3.8	10/04/16 12:45	
Dibenzo(a,e)pyreneug/kg<0.9210.00.9210/04/16 12:45Dibenzo(a,h)pyreneug/kg<2.8	Dibenz(a,h)anthracene	ug/kg	<3.4	10.0	3.4	10/04/16 12:45	
Dibenzo(a,h)pyreneug/kg<2.810.02.810/04/16 12:45Dibenzo(a,i)pyreneug/kg<0.97	Dibenzo(a,e)pyrene	ug/kg	<0.92	10.0	0.92	10/04/16 12:45	
Dibenzo(a,i)pyreneug/kg<0.9710.00.9710/04/16 12:45Dibenzo(a,l)pyreneug/kg<0.57	Dibenzo(a,h)pyrene	ug/kg	<2.8	10.0	2.8	10/04/16 12:45	
Dibenzo(a,l)pyreneug/kg<0.5710.00.5710/04/16 12:45Fluorantheneug/kg<0.74	Dibenzo(a,i)pyrene	ug/kg	<0.97	10.0	0.97	10/04/16 12:45	
Fluoranthene ug/kg <0.74 10.0 0.74 10/04/16 12:45 Fluorene ug/kg <0.57	Dibenzo(a,I)pyrene	ug/kg	<0.57	10.0	0.57	10/04/16 12:45	
Fluorene ug/kg <0.57 10.0 0.57 10/04/16 12:45 ndeno(1,2,3-cd)pyrene ug/kg <3.0	Fluoranthene	ug/kg	<0.74	10.0	0.74	10/04/16 12:45	
ndeno(1,2,3-cd)pyreneug/kg<3.010.03.010/04/16 12:45Naphthaleneug/kg<0.61	Fluorene	ug/kg	<0.57	10.0	0.57	10/04/16 12:45	
Naphthaleneug/kg<0.6110.00.6110/04/16 12:45Phenanthreneug/kg<0.61	Indeno(1,2,3-cd)pyrene	ug/kg	<3.0	10.0	3.0	10/04/16 12:45	
Phenanthrene ug/kg <0.61 10.0 0.61 10/04/16 12:45 Pyrene ug/kg <0.75	Naphthalene	ug/kg	<0.61	10.0	0.61	10/04/16 12:45	
Pyrene ug/kg <0.75 10.0 0.75 10/04/16 12:45 2-Fluorobiphenyl (S) %. 75 46-125 10/04/16 12:45 p-Terphenyl-d14 (S) %. 101 46-125 10/04/16 12:45	Phenanthrene	ug/kg	<0.61	10.0	0.61	10/04/16 12:45	
2-Fluorobiphenyl (S) %. 75 46-125 10/04/16 12:45 p-Terphenyl-d14 (S) %. 101 46-125 10/04/16 12:45	Pyrene	ug/kg	<0.75	10.0	0.75	10/04/16 12:45	
p-Terphenyl-d14 (S) %. 101 46-125 10/04/16 12:45	2-Fluorobiphenyl (S)	%.	75	46-125		10/04/16 12:45	
	p-Terphenyl-d14 (S)	%.	101	46-125		10/04/16 12:45	

LABORATORY CONTROL SAMPLE: 2376627

		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
2-Methylnaphthalene	ug/kg	100	52.9	53	41-125	
3-Methylcholanthrene	ug/kg	100	26.5	26	30-125	LO
5-Methylchrysene	ug/kg	100	94.0	94	67-125	
7,12-Dimethylbenz(a)anthracene	ug/kg	100	35.8	36	31-125	SS
7H-Dibenzo(c,g)carbazole	ug/kg	100	92.9	93	51-125	
Acenaphthene	ug/kg	100	59.5	60	49-125	
Acenaphthylene	ug/kg	100	57.8	58	48-125	
Anthracene	ug/kg	100	78.4	78	63-125	
Benzo(a)anthracene	ug/kg	100	89.5	90	60-125	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 23270051.37 Pond Zoo Bassett

Pace Project No.: 10363579

LABORATORY CONTROL SAMPLE: 2376627

		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Benzo(a)pyrene	ug/kg	100	93.4	93	63-125	
Benzo(g,h,i)perylene	ug/kg	100	86.7	87	59-125	
Benzofluoranthenes (Total)	ug/kg	300	292	97	67-125	
Chrysene	ug/kg	100	89.3	89	62-125	
Dibenz(a,h)acridine	ug/kg	100	93.6	94	61-125	
Dibenz(a,h)anthracene	ug/kg	100	90.2	90	59-125	
Dibenzo(a,e)pyrene	ug/kg	100	88.2	88	48-125	
Dibenzo(a,h)pyrene	ug/kg	100	100	100	41-128	
Dibenzo(a,i)pyrene	ug/kg	100	84.7	85	33-125	
Dibenzo(a,I)pyrene	ug/kg	100	64.2	64	30-125	
Fluoranthene	ug/kg	100	84.0	84	65-125	
Fluorene	ug/kg	100	67.7	68	58-125	
Indeno(1,2,3-cd)pyrene	ug/kg	100	90.4	90	60-125	
Naphthalene	ug/kg	100	51.1	51	38-125	
Phenanthrene	ug/kg	100	79.8	80	62-125	
Pyrene	ug/kg	100	102	102	61-125	
2-Fluorobiphenyl (S)	%.			48	46-125	
p-Terphenyl-d14 (S)	%.			91	46-125	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2376628 2376629												
		10262570001	MS	MSD Spilke	MC	MED	MC	MCD	% Dee		Max	
Parameter	Units	Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	% Rec	RPD	RPD	Qual
2 Mothylpanhthalono			284	283	193	217	64	76	47 125	17	30	
2 Methylabolanthrono	ug/kg	1.90	204	200	00 7	217	20	25	20 150	16	20	
5-Methylebraspe	ug/kg	0.23	204	200	200.7	100	29	30	46 105	10	30	
	ug/kg	20.0J	204	203	209	239	00	10	40-120	13	30	~~
7,12- Dimethylbenz(a)anthracene	ug/kg	<7.9	284	283	225	283	79	100	30-150	23	30	88
7H-Dibenzo(c,g)carbazole	ug/kg	<4.8	284	283	104	110	37	39	30-130	5	30	
Acenaphthene	ug/kg	6.6J	284	283	197	229	67	79	30-144	15	30	
Acenaphthylene	ug/kg	9.1J	284	283	199	231	67	78	36-125	15	30	
Anthracene	ug/kg	22.2J	284	283	194	229	61	73	34-125	17	30	
Benzo(a)anthracene	ug/kg	114	284	283	283	334	60	78	30-150	17	30	
Benzo(a)pyrene	ug/kg	182	284	283	356	424	61	86	30-150	18	30	
Benzo(g,h,i)perylene	ug/kg	88.1	284	283	157	166	24	28	30-148	6	30	M1
Benzofluoranthenes (Total)	ug/kg	478	851	848	1180	1470	83	117	30-150	22	30	
Chrysene	ug/kg	207	284	283	348	413	50	73	30-150	17	30	
Dibenz(a,h)acridine	ug/kg	<10.7	284	283	152	168	51	57	30-127	10	30	
Dibenz(a,h)anthracene	ug/kg	22.3J	284	283	146	154	44	46	30-137	5	30	
Dibenzo(a,e)pyrene	ug/kg	23.7J	284	283	74.3	76.2	18	19	30-150	2	30	M1
Dibenzo(a,h)pyrene	ug/kg	11.4J	284	283	51.3	53.0	14	15	30-125	3	30	M1
Dibenzo(a,i)pyrene	ug/kg	4.0J	284	283	37.9	39.1	12	12	30-125	3	30	M1
Dibenzo(a,I)pyrene	ug/kg	4.6J	284	283	30.6	31.3	9	9	30-125	2	30	M1
Fluoranthene	ug/kg	344	284	283	450	540	37	69	30-150	18	30	
Fluorene	ug/kg	9.3J	284	283	195	225	65	76	38-125	14	30	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 23270051.37 Pond Zoo Bassett

Pace Project No.: 10363579

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2376628 2376629													
			MS	MSD									
		10363579001	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max		
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual	
Indeno(1,2,3-cd)pyrene	ug/kg	76.9	284	283	176	191	35	40	30-150	8	30		
Naphthalene	ug/kg	2.1J	284	283	153	188	53	66	38-125	20	30		
Phenanthrene	ug/kg	101	284	283	238	282	48	64	30-150	17	30		
Pyrene	ug/kg	254	284	283	380	479	45	80	30-150	23	30		
2-Fluorobiphenyl (S)	%.						58	67	46-125				
p-Terphenyl-d14 (S)	%.						63	78	46-125				

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS



QUALIFIERS

Project: 23270051.37 Pond Zoo Bassett

Pace Project No.: 10363579

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

ANALYTE QUALIFIERS

- L0 Analyte recovery in the laboratory control sample (LCS) was outside QC limits.
- L2 Analyte recovery in the laboratory control sample (LCS) was below QC limits. Results may be biased low.
- M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
- SS This analyte did not meet the secondary source verification criteria for the initial calibration. The reported result should be considered an estimated value.

REPORT OF LABORATORY ANALYSIS



QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project:23270051.37 Pond Zoo BassettPace Project No.:10363579

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10363579001	WPE-01	EPA 3050	437522	EPA 6010C	437880
10363579002	WPE-02	EPA 3050	437522	EPA 6010C	437880
10363579003	WPE-03	EPA 3050	437522	EPA 6010C	437880
10363579001	WPE-01	ASTM D2974	438463		
10363579002	WPE-02	ASTM D2974	438463		
10363579003	WPE-03	ASTM D2974	438463		
10363579001	WPE-01	EPA 3550	437411	EPA 8270D by SIM	438966
10363579002	WPE-02	EPA 3550	437411	EPA 8270D by SIM	438966
10363579003	WPE-03	EPA 3550	437411	EPA 8270D by SIM	438966

REPORT OF LABORATORY ANALYSIS

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ARR 🗆 Ann Arbor 🔅 Duluth] ק	∃ Jeffers ✔ Minne	on City anolis	— □ MI		Other:								301		Г	coc _	of	/	
REPORT TO	¥		apono		<u> </u>		┨						prov	Mel			Matrix	Code:	Preser	vative Code:
Company: Rarr Engineers	~	Comp	any:	Barr Fra	-			s				5	er (N.			GW = Gro SW = Sur	oundwater face Water	A = B =	None HCl
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Name: Kevin Munken		Name	: Ke	Nin Mer	eken		>	ont				20	10.2	1			S = Soil	l/Solid liment	E =	
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1*:	San	nple De T	epth	Collection	Collection	Matrix	orm	Ī				å	U	£		%		. .	0 =	Other
Location	Start	Stop	(m./ft.	Date (mm/dd/yyyy)	(hh:mm)	Code	Perf	Tota				A	A/	4	_		Preservativ	/e Code vd V/N		
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WPE-01				9/23/16	11:45	50		ζ			<u> </u>	М	스		_					أورث
WPE-02				9/23/16	12:00	SD		2				X	X			Х				Ŵ
WPE-03				9/23/16	12:30	SD		2				Х	X			Х				603
WAF-COMP				9/23/16	1z:38	50		1					•	হু			hold f	r TCLA	pend	y attor
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arr DQ Manager: Terri Olson Samples Shipped VIA: Courier Federal E						ederal Exp	oress] Sam	pler	Air	Bill I	Num	nber:				Requ	iested D	ue Date:
ab Name: Pace - Mp/5 Other:						•												□ Stand	ard Turn /	Around Time
ab Location: Mp 5		Lab W	VO:		Temperature c	n Receipt	(°C): <i>O</i> :	5	Custo	dy Sea	Int	act?	ΖY		IN	None	🗆 Rush .	(mm/dd/y	yy)

Distribution - White-Original: Accompanies Shipment to Laboratory; Yellow Copy: Include in Field Documents; Pink Copy: Send to Data Management Administrators.

Γ	\$	Di Samula Con	ocument	Name:	int Form	Document Revis	ed: 02Aug2016	
	Pace Analytical*	Sample Con	Documer	nt No.:		Issuing Au	thority:	_
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Commerci	al Pace Spee	Dee Other:		<u> </u>	10363	579	L	
Tracking Nu	imber:				<u> </u>	· .		<u> </u>
Custody Sea	al on Cooler/Box Present?	No	Seals int	act?]Yes □No	Optional: Proj.	Due Date: Proj.	Name:
Packing Mat	terial: Bubble Wrap	ble Bags 🗌 Non	e 🗌	Other:		Temp	Blank? Yes	JN0
Thermomete Used:	er (151401163 0888A 151401164 0888A	912167504 Түр 0143310098 Түр	e of Ice:	_ Zwe	t 🔲 Blue	None Sample	s on ice, cooling proc	ess has begur
Cooler Temp emp should	be above freezing to 6°C Correc	emp Corrected (°C tion Factor:); <u>() -</u>) <u>. 1</u> '	<u> </u>	Bio Bio and Initials o	ological Tissue Frozen? of Person Examining Co	$\frac{\Box}{Ves} \frac{\Box}{Vo}$	<u> 7/6 5</u>
JSDA Regula Did samples of AS, NC, NM, N	ted Soil ([_] N/A, water sample) riginate in a quarantine zone within th NY, OK, OR, SC, TN, TX or VA (check ma If Yes to either question, fill c	e United States: AL, , ps)? put a Regulated Soi	AR, AZ, C I Checkli	A, FL, GA, Yes st (F-MN·	ID, LA Dia No inc Q-338) and inc	d samples originate from a cluding Hawaii and Puerto clude with SCUR/COC p	i foreign source (inter Rico)? []Yo aperwork.	nationally s
<u></u>				•		COMME	NTS:	
Chain of Cust	tody Present? 09/26/16	AAI Yes		□n/A	1.			
Chain of Cust	tody Filled Out?	Yes	□ No	□n/A	2.			
Chain of Cust	tody Relinquished?	Yes	∐No	□n/a	3.			
Sampler Nan	ne and/or Signature on COC?	Z Yes	□No	□n/A	4.			
Samples Arri	ved within Hold Time?	Z Î¥es	□No	□n/a	5.			
Short Hold T	īme Analysis (<72 hr)?	Yes		□N/A	6.			
Rush Turn A	round Time Requested?			<u>N/A</u>	7.			
Sufficient Vo	lume?	Yes		∐n/A	8.			
Correct Cont	ainers Used?	Z Yes	□No	∐n/A	9.			
-Pace Con	tainers Used?	V Yes	No	□n/a				
Containers Ir	ntact?	Z Yes	No	<u>□</u> N/A	10.			
Filtered Volu	me Received for Dissolved Tests?	Yes	No	⊿ł Ń/A	11. Note if s	sediment is visible in the	dissolved container	
Sample Labe	Is Match COC?	. ZYes	□No	∐n/A	12.			
-Includes All container checked? All container compliance v	Date/Time/ID/Analysis Matrix: 20 s needing acid/base preservation have s needing preservation are found to be with EPA recommendation?	e been Yes e in	□No		13. [Sample #	☐HNO₃ ☐H₂SO₄	∏ NaOH	□нсі
(HNO ₃ , H ₂ SC Exceptions: \	04, HCl<2; NaOH >9 5ulfide, NaOH>12 /OA, Coliform, TOC, Oil and Grease,	Cyanide) 🔲 Yes	⊡No		Initial when	Lot #	of added	
UKU/8015 (V	vater) DUC	∐Yes ∽₁v			completed:	prese	rvative:	
neauspace If					15			
Trin Blank Pr	would :							
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Trip Blank Pr Trip Blank Cu Pace Trip Bla	ustody Seals Present? Ink Lot # (if purchased): CLIENT NOTIFICATION/RESOLUTION					Field Data R	equired? Yes	No
Trip Blank Pr Trip Blank Cu Pace Trip Bla C Person Cont	ustody Seals Present? Ink Lot # (if purchased): CLIENT NOTIFICATION/RESOLUTION cacted:			<u> </u>	Date/Time:	Field Data R	equired? 🗌 Yes	No

Date: 09/26/16

Project Manager Review: ______ Date: ______ Date: ______ 09/26/16 Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

£.

Appendix C

Wetland Delineation Report

Wetland Delineation Report

Basset Creek Park Pond & Winnetka Pond - East

Prepared for Bassett Creek Watershed Management Commission

November 8, 2016

Wetland Delineation Report

November 8, 2016

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1.0 Introduction

The Bassett Creek Watershed Management Commission is submitting a Wetland Delineation Report in preparation for a sediment dredging project within Basset Creek Park Pond and Winnetka Pond. The project sites are located in the City of Crystal, Hennepin County, Minnesota. Basset Creek Park Pond is located at 32nd Avenue North and Xenia Avenue North within Section 21 of Township 118 North, Range 21 West. Winnetka Pond is located south of the Winnetka Village Apartments at 7710 36th Avenue North within Section 17 of Township 118 North, Range 21 West. See **Figure 1** for a project location map depicting both pond locations.

Bassett Creek Park Pond and Winnetka Pond were field delineated to identify the wetland extent of each pond. Wetland plant communities within each delineated pond were also identified.

This Wetland Delineation Report has been prepared in accordance with the U.S. Army Corps of Engineers 1987 Wetland Delineation Manual ("1987 Manual", USACE, 1987), the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (USACE, 2010) and the requirements of the Minnesota Wetland Conservation Act (WCA) of 1991. Barr delineated the wetland boundary and determined wetland types within the evaluation area on October 11, 2016.

This report includes general environmental information (Section 2.0), descriptions of the delineated wetland area (Section 3.0), and a discussion of regulations and the administering authorities (Section 4.0). The **Tables** section includes the precipitation data. The **Figures** section includes the Site Location Map, Topography Maps, National Wetland Inventory (NWI) Maps, Public Waters Inventory (PWI), Soil Survey Maps, and Wetland Boundary Maps. **Appendix A** includes Wetland Data Forms, and site photographs are included in **Appendix B**.

2.0 General Environmental Setting

2.1 Site Description

The proposed dredging project sites are located in the City of Crystal. Bassett Creek Park Pond is located in Bassett Creek Park, which consists of open grassy fields used for sports and recreation, wooded uplands, and various wetland communities. Bassett Creek Park is surrounded by medium density residential area. Winnetka Pond is located south of the Winnetka Village Apartments and is partially surrounded by a narrow buffer of hardwood trees, and grasses with manicured lawn further upslope. Areas surrounding Winnetka Pond consist of commercial and industrial area with medium density residential area located further beyond (**Figure 1**).

2.2 Topography

The Bassett Creek Park Pond project site generally has steep topography in areas leading into the pond along the delineated edges. Topography within the basin generally has moderate undulations in areas that are not open water. Adjacent upland areas are generally flat or moderately undulating throughout most of the park area with the exception of some steep hilly areas to the west (**Figure 2**).

The Winnetka Pond project site generally has steep topography in areas leading into the pond along the delineated edges. Floodplain forest wetland has a more gradual topographic transition from upland to wetland and moderate undulations within it. Adjacent upland areas are generally flat in developed areas and hillier in areas of open greenspace (**Figure 3**).

2.3 Precipitation

Recent precipitation data were compared to historic data for evaluating annual and monthly deviations from normal conditions. Simulated precipitation data were obtained from the Minnesota Climatology Working Group, Wetland Delineation Precipitation Data Retrieval from a Gridded Database (http://climate.umn.edu/gridded_data/precip/wetland/wetland.asp) for wetlands in Hennepin County, Township 118 North, Range 21 West, Section 17.

Antecedent (preceding) moisture conditions were within the wetter than the normal range based on precipitation for the three months prior to the October 11, 2016 site visit. July through September were all within the wetter than the normal range. These data were obtained from NRCS climate station 215838, New Hope Weather Station (**Table 1**). The water year has varied between normal and wet for the past six years from 2011 through 2016 (**Table 2**).

2.4 National Wetland Inventory

The NWI Map has identified five wetland types at the Bassett Creek Park Pond project site: shallow open water community (PUBG), shrub swamp (PSS1A), floodplain forest (PFO1A), seasonally flooded basin (PEM1A), and deep marsh (PABG) (**Figure 4**). One wetland type was identified at the Winnetka Pond project site: shallow open water (PUBGx) (**Figure 5**).

2.5 Water Resources

The Minnesota Department of Natural Resources (MnDNR) Public Waters Inventory (PWI) has identified Basset Creek Park Pond (27-646P) and Winnetka Pond (27-629P) as public water wetlands, which are within the delineated wetland boundaries of both ponds (**Figure 6**). Bassett Creek Park Pond and Winnetka Pond are not identified by the Minnesota Pollution Control Agency (MPCA) as impaired waters.

2.6 Soil Resources

Soil information for the project site was obtained from the Natural Resources Conservation Service SSURGO Database. One soil map unit was identified within the Bassett Creek Park Pond project site: Udorthents, wet substratum, 0 to 2 percent slopes (U2A) (**Figure 7**). Four soil map units were identified within the Winnetka Pond project site: Udorthents wet substratum, complex, 0 to 2 percent slopes (U1A); Udorthents wet substratum, 0 to 2 percent slopes (U2A); Urban land-Udorthents (cut and fill) complex, 0 to 6 percent slopes (U6B); Urban land-Lester complex, 2 to 18 percent slopes (L52C) (**Figure 8**). Remaining areas within both pond sites are identified as Water (W) in the SSURGO Database. All soils within both of these project sites are identified as non-hydric.

3.0 Wetland Delineation

3.1 Wetland Delineation and Classification Methods

Wetlands within the Bassett Creek Park Pond and Winnetka Pond project sites were delineated and classified during a site visit on October 11, 2016. The wetland delineation was established according to the Routine On-Site Determination Method specified in the U.S. Army Corps of Engineers Wetlands Delineation Manual (1987 Edition) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (USACE, 2010).

The delineated wetland boundaries and sample points were surveyed using a Global Positioning System (GPS) with sub-meter accuracy (**Figures 9 & 10**).

Wetlands were classified using the U.S. Fish and Wildlife Service (USFWS) Cowardin System (Cowardin et al., 1979), the USFWS Circular 39 system (Shaw and Fredine, 1956), and the Eggers and Reed Wetland Classification System (Eggers and Reed, 1977).

Soil borings were placed in and around wetland areas, to a depth of at least 24 inches below the ground surface where possible. Representative soil samples from each boring were examined for the presence of hydric soil indicators using the Natural Resources Conservation Service (NRCS) hydric soil indicators (Version 7.0). Soil colors (e.g., 7.5YR 4/2, etc.) were determined using a Munsell® soil color chart and noted on the Wetland Data Forms **Appendix A**.

Hydrologic conditions were evaluated at each soil boring, and this information was also noted on the Wetland Data Forms. The dominant plant species were identified, and the corresponding wetland indicator status of each plant species was determined and noted on the Wetland Data Forms (**Appendix A**). Photographs taken at the time of the site visit are provided in **Appendix B**.

3.2 Wetland Descriptions

One wetland boundary was delineated within the Bassett Creek Park Pond project site consisting of five wetland communities. One wetland boundary was delineated within the Winnetka Pond project site consisting of two wetland communities. Descriptions and assessments of these wetland areas are provided below, with representative photographs in **Appendix B**.

3.2.1 Bassett Creek Park Pond

Bassett Creek Park Pond is an 11.3 acre wetland complex made up of five wetland communities (**Figure 9**). Each wetland community type within Bassett Creek Park Pond is identified below using Eggers & Reed, Circular 39, and Cowardin wetland classification systems respectively:

- Shallow Open Water, Type 5, PUBG
- Shrub Swamp, Type 6, PSS1A
- Shallow Marsh, Type 3, PEMC
- Floodplain Forest, Type 1L, PFO1A
- Deep Marsh, Type 4, PUBGx

Shallow open water community is the dominant wetland type within Bassett Creek Park Pond and totals approximately 9.3 acres. Shallow open water community is mostly located in the central and southern areas of Bassett Creek Park Pond and generally has a steep and abrupt wetland boundary. Dominant vegetation observed was lesser duckweed (*Lemna minor*) near the shoreline in some areas, but no other emergent, floating-leaf, or submerged aquatic vegetation was observed from the shoreline within shallow open water community. Reed canary grass (*Phalaris arundinacea*) was dominant along the periphery of shallow open water community.

Shrub swamp community is located on the northwest side of Bassett Creek Park Pond (0.9 acres); and in the west-central (0.3 acres) and southwest-central (0.1 acres) areas of the pond surrounded by shallow open water community. The total area of shrub swamp community located in Bassett Creek Park Pond is 1.2 acres. Dominant shrubs observed were sand-bar willow (*Salix interior*). Topography within both areas is generally flat or moderately undulating. Bassett Creek extends south through floodplain forest community and then through shrub swamp community toward the shallow open water areas of Bassett Creek Park Pond.

Floodplain forest community is located at the northwest tip of Bassett Creek Park Pond and totals approximately 0.3 acres. Dominant trees within the floodplain forest are ash-leaf maple (*Acer negundo*), quaking aspen (*Populus tremuloides*), and Eastern cottonwood (*Populus deltoides*). There is moderately undulating topography throughout the floodplain forest community but steep and abrupt slopes leading into it from the east side. Bassett Creek extends south through floodplain forest community and then through shrub swamp community toward the shallow open water areas of Bassett Creek Park Pond.

Shallow marsh community fringes portions of Bassett Creek Park Pond on the northeast, and western sides. The two shallow marsh areas are approximately 0.1 acres each totaling 0.2 acres. Both shallow marsh areas are dominated by narrow-leaf cattail (*Typha angustifolia*) and have flat topography.

Deep marsh community is located within the shrub swamp community on the northwest side of Bassett Creek Park Pond and totals approximately 0.2 acres. This area was likely excavated based on the steep and abrupt slopes leading into it from the shrub swamp community and its regular oval shape. Lesser duckweed covers the entire surface water area of the deep marsh community. Sample data was collected along the delineated wetland boundary of Bassett Creek Park Pond. Sample data was collected within shallow marsh community on the northeast side, shrub swamp community on the north-central side, and floodplain forest area on the northwest side.

Dominant vegetation within shallow marsh community at wetland Sample Point B-1w was narrow-leaf cattail, stinging nettle (*Urtica dioica*), and fowl blue grass (*Poa palustris*). Primary hydrology indicators included high water table (A2) at 3 inches below the soil surface, and saturation (A3) at the soil surface. Secondary indicators of hydrology present were geomorphic position (D2), and a positive FAC-neutral test (D5). Soils had loamy textures with peat intermixed throughout the soil profile and a low chroma and value matrix with prominent redox features at the surface down to 8 inches. Hydric soil indicators identified were loamy mucky mineral (F1) and redox dark surface (F6). The transition to upland was defined by an absence of hydrology and hydric soil indicators at upland Sample Point B-1u.

Dominant vegetation within shrub swamp community at wetland Sample Point B-2w was sandbar willow, reed canary grass, water smartweed (*Persicaria amphibia*), and late goldenrod (*Solidago gigantea*). Saturation (A3) at the soil surface was the only primary indicator of hydrology present. Secondary indicators of hydrology present were geomorphic position (D2), and a positive FAC-neutral test (D5). Soil textures included silt loams at the surface and transitioned to peat soils. Low chroma and value matrix colors were present throughout the profile with prominent redox concentrations from 8 to 15 inches below the soil surface. The identified hydric soil indicator was redox dark surface (F6). The transition to upland was defined by an absence of vegetation, hydrology and hydric soil indicators at upland Sample Point B-2u.

Dominant trees and herbaceous vegetation within floodplain forest community at wetland Sample Point B-3w was Eastern cottonwood, quaking aspen, ash-leaf maple, reed canary grass and stinging nettle. There were no primary hydrology indicators, but secondary indicators of hydrology included geomorphic position (D2), and a positive FAC-neutral test (D5). Soils had silt loam textures with a low chroma and value matrix colors throughout the 40-inch soil profile and prominent redox concentrations from 7 to 40 inches. The identified hydric soil indicator was redox dark surface (F6). The transition to upland was defined by an absence of hydrology and hydric soil indicators at upland Sample Point B-3u.

3.2.2 Winnetka Pond

Winnetka Pond is a 3.5 acre wetland complex made up of two wetland communities (**Figure 10**). Both wetland community types within Winnetka Pond are identified below using Eggers & Reed, Circular 39, and Cowardin wetland classification systems respectively:

- Shallow Open Water, Type 5, PUBGx
- Floodplain Forest, Type 1L, PFO1A

Shallow open water community is the dominant wetland type within Winnetka Pond and totals approximately 3.2 acres. Topography is generally steep and abrupt along the wetland boundary leading into the pond. No emergent, floating-leaf, or submerged aquatic vegetation was observed within shallow open water community during the time of the site visit. Reed canary grass and Canada goldenrod was present along the fringes of the shallow open water community mostly in uplands.

Floodplain forest community is located along the eastern fringe of Winnetka Pond and totals approximately 0.3 acres. Dominant trees within the floodplain forest are ash-leaf maple, quaking aspen, and Eastern cottonwood. Topography is mostly flat throughout the floodplain forest community but is steep and abrupt leading into it from upland areas on the east side.

Dominant trees and herbaceous vegetation within floodplain forest community at wetland Sample Point W-1w was quaking aspen, ash-leaf maple, reed canary grass and river club-rush (*Schoenoplectus fluviatilis*). Primary hydrology indicators included high water table (A2) at 9 inches below the soil surface, saturation (A3) at 2 inches below the soil surface, and aquatic fauna (B13). Secondary indicators of hydrology present were geomorphic position (D2), and a positive FAC-neutral test (D5). Soils had clay loam textures at the surface and transitioned to clay textures from 10 inches to 24 inches. Soil matrix colors had a low chroma and value and had prominent redox concentrations throughout the 24-inch soil profile. The identified hydric soil indicator was redox dark surface (F6). The transition to upland was defined by an absence of hydrology and hydric soil indicators at upland Sample Point B-3u.

4.0 Regulatory Overview

The USACE regulates the placement of dredge or fill materials into wetlands that are located adjacent to or are hydrologically connected to interstate or navigable waters under the authority of Section 404 of the Clean Water Act. If the USACE has jurisdiction over any portion of a project, they may also review impacts to wetlands under the authority of the National Environmental Policy Act.

Filling, excavating, and draining wetlands are also regulated by the Minnesota Wetland Conservation Act (WCA), and the Minnesota Public Waters Work Permit Program, which are administered by the City of Crystal and the Minnesota Department of Natural Resources (MnDNR) respectively. The USACE, the City of Crystal and the DNR should be contacted before altering any wetlands. In addition, delineated wetland boundaries may be reviewed by a Technical Evaluation Panel (TEP) consisting of representatives from the City of Crystal, Minnesota Board of Water and Soil Resources, and Hennepin County. Representatives from the MnDNR, and the USACE may also review this wetland delineation and make a determination as to whether they will take jurisdiction.

5.0 References

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Tables

Table 1Antecedent Moisture Conditions Prior to October 11, 2016 SiteVisit Bassett Creek Park Pond & Winnetka Pond Wetland DelineationCrystal, MN

Precipitation Worksheet Using Gridded Database

Precipitation data for target wetland location:											
County: Hennepin	Township Number: 118N										
Township Name: Brooklyn Center	Range Number: 21W										
Nearest Community: Crystal	Section Number: 17										

Aerial photograph or site visit date:

Tuesday, October 11, 2016

Score using 1981-2010 Summary Statistics

(value are in inches)	first prior month:	second prior month:	third prior month:				
	September 2016	August 2016	July 2016				
estimated precipitation total for this location:	6.58R	7.48R	6.53				
there is a 30% chance this location will have less	2.24	2 / 0	2 02				
than:	2.34	2.40	2.02				
there is a 30% chance this location will have	2 01	5.07	1 30				
more than:	3.31	5.07	4.59				
type of month: dry normal wet	wet	wet	wet				
monthly score	3 * <mark>3</mark> = 9	2 * <mark>3</mark> = 6	1 * <mark>3</mark> = 3				
multi-month score:		18 (Mot)					
6 to 9 (dry) 10 to 14 (normal) 15 to 18 (wet)	18 (Wet)						

Table 2Precipitation in Comparison to WETS DataBassett Creek Park Pond & Winnetka Pond WetlandDelineation Crystal, MN

Precipitation data for target wetland location:

County: Hennepin	Township Number: 118N
Township Name: Brooklyn Center	Range Number: 21W
Nearest Community: Crystal	Section Number: 17

Precipitation Totals are in Inches										
Color Key	Multi-month Totals:									
total is in lowest 30th percentile of the period-of-record distribution	WARM = warm season (May thru September)									
total is => 30th and <= 70th percentile	ANN = calendar year (January thru December)									
total is in highest 30th percentile of the period-of-record distribution	WAT = water year (Oct. previous year thru Sep.									
	present year)									

A 'R' following a monthly total indicates a provisional value derived from radar-based estimates.

						Period-	of-Recor	d Summa	ry Statist	tics					
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	WARM	ANN	WAT
30%	0.53	0.50	1.14	1.63	2.61	3.23	2.38	2.75	1.89	1.20	0.74	0.57	16.16	26.01	26.07
70%	1.10	1.19	2.07	2.78	4.37	5.55	4.37	4.47	3.84	2.72	1.92	1.35	21.34	32.30	32.02
mean	0.89	0.90	1.66	2.44	3.69	4.48	3.85	3.66	3.08	2.21	1.53	1.03	18.76	29.35	29.45
						198 [.]	1-2010 Si	ummary S	Statistics						
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	WARM	ANN	WAT
30%	0.54	0.42	1.38	2.28	2.83	3.52	2.82	3.48	2.34	1.32	1.06	0.70	18.51	30.76	28.63
70%	1.21	1.03	2.10	3.14	4.61	5.77	4.39	5.07	3.91	3.60	2.15	1.40	22.46	35.08	35.77
mean	0.87	0.80	1.92	2.89	3.79	4.68	4.30	4.22	3.47	2.57	1.81	1.23	20.45	32.53	32.34
							Year-te	o-Year Da	nta						
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	WARM	ANN	WAT
2016	0.31	0.79	1.60	3.66	2.38	2.84	6.53	7.48R	6.58R				25.81		40.86
2015	0.33	0.27	0.63	2.07	4.40	3.31	6.95	3.48	3.94	2.82	4.19	1.68	22.08	34.07	28.80
2014	1.15	1.37	0.80	7.26	4.26	10.16	3.31	3.12	1.50	1.16	1.20	1.06	22.35	36.35	39.62
2013	0.68	1.20	2.12	4.60	4.80	7.81	4.21	1.31	1.27	4.44	0.61	1.64	19.40	34.69	32.00
2012	0.53	2.05	1.32	2.87	9.61	4.21	4.24	1.33	0.54	1.44	0.90	1.66	19.93	30.70	28.65
2011	0.93	0.89	2.20	3.21	6.38	3.92	7.83	4.46	0.49	0.91	0.17	0.87	23.08	32.26	37.66
2010	0.59	0.85	0.93	2.02	2.86	6.25	3.64	5.85	5.69	1.96	2.14	3.25	24.29	36.03	37.47
2009	0.48	1.02	1.87	1.53	0.45	3.90	1.07	6.41	0.71	5.95	0.57	2.27	12.54	26.23	21.76
2008	0.14	0.52	2.08	4.05	2.64	4.41	2.15	2.53	2.19	1.64	1.17	1.51	13.92	25.03	28.02
2007	0.59	1.40	3.53	2.51	3.22	2.10	2.32	5.89	5.02	5.39	0.06	1.86	18.55	33.89	30.89
2006	0.64	0.41	1.88	3.83	4.61	4.32	1.84	5.13	3.41	0.68	1.07	2.56	19.31	30.38	33.67
2005	1.27	1.06	1.32	2.53	3.62	6.26	2.52	4.00	7.54	4.34	1.86	1.40	23.94	37.72	35.23
2004	0.55	1.54	2.14	2.67	5.87	5.02	3.66	1.69	4.95	3.57	1.05	0.49	21.19	33.20	31.19
2003	0.27	0.98	1.66	3.05	5.61	8.29	1.74	0.35	2.43	1.00	1.12	0.98	18.42	27.48	28.65
2002	0.58	0.56	1.98	4.18	4.73	8.80	7.69	6.32	4.08	3.94	0.08	0.25	31.62	43.19	43.74
2001	1.38	1.49	1.01	7.52	5.30	4.66	2.59	3.61	3.84	0.97	3.22	0.63	20.00	36.22	37.78
2000	0.97	1.23	1.04	1.56	3.54	3.64	6.43	3.75	2.55	0.97	4.06	1.35	19.91	31.09	26.50
1999	1.34	0.35	1.75	3.40	5.94	5.57	4.87	3.88	2.40	0.63	0.80	0.36	22.66	31.29	34.89
1998	1.31	0.85	3.94	2.30	4.17	4.40	2.92	5.23	1.33	2.88	1.82	0.69	18.05	31.84	29.44
1997	1.79	0.23	1.40	1.13	1.85	2.95	10.93	4.39	2.61	1.98	0.75	0.26	22.73	30.27	38.08

Figures















BARF

C-23 **FIGURE 7**







Appendix A

Wetland Data Forms

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site:	Bassett (Pond (Ea	<u>Creek F</u> ast)	ark Pond 8	Winnetka	Applicant/O	wner: <u>BCWMC</u>		City/County: <u>Cr</u>	rystal/Hen	nepin State:	<u>MN</u>	Sampling Date: <u>10/11/16</u>
Investigator(s):	<u>BKB</u>				Section:	<u>21</u>		Township: <u>118</u>	<u>3N</u>	Range	e: <u>21W</u>	Sampling Point: <u>B-1u</u>
Land Form:	<u>Hillslope</u>	<u>.</u>			Local Relie	ef: <u>Convex</u>		Slope %: <u>7</u>	Soi	il Map Unit Narr	e: <u>Udor</u>	hents, wet sub, 0-2% slopes
Subregion (LRR,): <u>M</u>				Latitude:	<u>4984296</u>		Longitude: 472	2147	Datur	n: <u>UTM N</u>	ad 83 Zone 15N
Cowardin Classi	fication:	<u>Uplar</u>	<u>nd</u>		Circular 39	Classification: U	pland		1	Mapped NWI C	lassificatio	n: <u>Upland</u>
Are climatic/hydr	ologic cona	litions c	n the site ty	pical for this	time of year	r? <u>No</u> (If n	o, expla	ain in remarks)		Eggers & Reed	(primary).	<u>Upland</u>
Are vegetation	No	Soil	No	Hvdroloav	No	sianificantly disturbed	d?	Are "normal	<u>Yes</u>	Eggers & Reed	(seconda	ry):
· · · · · · · · · · · · · · · · · · ·	<u></u>				<u></u>	- g		nresent?		Eggers & Reed	(tertiary):	
Are vegetation	No	Soil	<u>No</u>	Hydrology	<u>No</u> r	naturally problematic?	?	prosenti		Eggers & Reed	(quaterna	ry):

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic vegetation present?	<u>Yes</u>	General Remarks	Conditions are wetter than normal within the three months prior to the site visit.
Hydric soil present?	<u>No</u>	(explain any	
Indicators of wetland hydrology present?	<u>No</u>	answers if needed):	
Is the sampled area within a wetland?	<u>No</u>	lf yes, optional Wetla	and Site ID: Upland

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VEGETATION

	Tree Stratum	(Plot Size: _	<u>30 ft</u>)	<u>Absolute</u> <u>% Cover</u>	<u>Dominant</u> Species?	<u>Indicator</u> <u>Status</u>	50/20 Thresholds: Tree Stratum		<u>20%</u> 0	<u></u>	0
1. 2.				0			Sapling/Shrub Stratum Herb Stratum Woody Vine Stratum		0 18.4 1		0 46 2.5
3. 4.				0			Dominance Test Worksheet:				
	Sanling/Shruh Stratum	(Plot Size:	Total Cover:	<u>0</u>			Number of Dominant Species That Are OBL, FACW or FAC:		3 (/	4)	
1.		(11010120.	/	0			Total Number of Dominant Species Across All Strata:		4 (E	3)	
2. 3.				0			Percent of Dominant Species That Are OBL, FACW or FAC:	75.0	0% (/	VB)	
4. 5.				0			Prevalence Index Worksheet:				
			Total Cover:	<u>0</u>			Total % Cover of:	<u> </u>	Multiply	by:	
	<u>Herb Stratum</u>	(Plot Size: <u></u>	<u>5 ft</u>)				OBL Species			0	
1.	Alliaria petiolata			35	Yes	FAC	FACW Species	30 X 2		60	
2.	Urtica dioica			25	Yes	FACW	FAC Species	35 X 3		105	
3.	Cirsium arvense			20	Yes	FACU	FACU Species	32 X 4		128	
4.	Parthenocissus quinquefolia	l		10	INU	FACU	UPL Species	0 X 5		0	
5.	Taraxacum officinale			1	No	FACU	Column Totals:	97 (A)		293	(B)
6. 7	Arctium minus			1	No	FACU	Prevalence Inde	ex = B/A =		3.02	
7. 0				0			Hydrophytic Vegetation Indica	ors:			
0.			Total Cover:	0			No Rapid Test for Hyd	onhytic Veget	ation		
	Maadu Mina Stratum	(Dlot Sizo:	20 #	<u>92</u>			Yes Dominance Test is	>50%	ation		
		(1101 3126. <u>.</u>	<u>, , , , , , , , , , , , , , , , , , , </u>			E 1 011/	No Prevalence Index ≤	3.0 [1]			
1.	Vitis riparia			5	Yes	FACW	No Morphological Ada	otations [1] (p	rovide sup	oportin	g data
Ζ.			Total Course	0			in vegetation remai	ks or on a sep	arate shee	et)	
			Total Cover:	<u>5</u>			No Problematic Hydro	onytic vegetat	ion [1] (EX	olain)	
% B	are Ground in Herb Stratum	:		% Sphagnui	m Moss Cove	r:	[1] Indicators of hydric soil & wetlar disturbed or problematic.	d hydrology mu:	st be presen	it, unles	S
Veg	etation Remarks: (include p	hoto numbers	here or on a separate :	sheet)			Hydrophytic vegetation present	Yes			

WETLAND DETERMINATION DATA FORM - Midwest Region

Profile Description: (Describe to the depth ne						Sampli	ing Point:			
	eded to docu	ment the indicator or confir	rm the a	bscence o	f indicators)					
Depth Matrix		Redox F	eatures	upo [1]	100[2]	Touturo	Domorko			
(Incres) Color (moist)	<u>%</u>	Color (moist) %	% <u>[]</u>	ype [1]	LOC [2]		Remarks			
$\frac{0-10}{10+16} = \frac{10 \text{ yr } 3/2}{10 \text{ yr } 3/1}$	98 10	<u>7R 4/3</u>		C	M	Sandy Loam				
16 - 25 10YR 3/1	100					Sand	gravelly			
· · ·						-				
·										
1] Type: C=Concentration, D=Depletion, RM=	Reduced Mai	rix, MS=Masked Sand Graii	ns [2]] Location:	PL=Pore L	ining, M=Matrix.				
lydric Soil Indicators: (applicable to all LRRs	, unless othe	rwise noted)			Indi	icators for Problematic Hydri	c Soils [3]:			
Histosol (A1)		Sandy Gleyed	Matrix (S	54)		Coast Prairie Redox (A16)				
Histic Epipedon (A2)		Sandy Redox ((S5)] Dark Surface (S7)				
Black Histic (A3)		Stripped Matrix	x (S6)			Iron-Manganese Masses (F12))			
Hydrogen Sulfide (A4)		Loamy Mucky	Mineral ((F1)] Very Shallow Dark Surface (TF12)				
Stratified Layers (A5)		🗌 Loamy Gleyed	Matrix (I	F2)		Other (explain in soil remarks)				
] 2 cm Muck (A10)		Depleted Matri	ix (F3)							
Depleted Below Dark Surface (A11)		Redox Dark Su	urface (F	6)						
Thick Dark Surface (A12)		Depleted Dark	Surface	(F7)						
Sandy Mucky Mineral (S1)		Redox Depres:	sions (F&	8)	[3] I mu:	א וואנכאנטרא טו וואטרטאזער vegetation and wetland hydrology must be present, unless disturbed or problematic.				
\Box 5 cm Mucky Peat or Peat (S3)										
Restrictive Layer (if present): Type:		Depth (in	ches):		_	Hydric soil present?	No			
Soil Remarks										
YDROLOGY										
Netland Hydrology Indicators:										
Primary Indicators (minimum of one required;	check all tha	t apply)			Con					
Surface Water (A1)] Water-Stained Leaves (B	9)		Sec	condary Indicators (minimum	of two required)			
\neg High Water Table (A2)	Г					Sondary Indicators (minimum	of two required)			
		Aquatic Fauna (B13)				ondary Indicators (minimum Surface Soil Cracks (B6) Drainage Patterns (B10)	of two required)			
Saturation (A3)	с Г	Aquatic Fauna (B13))			ondary Indicators (minimum Surface Soil Cracks (B6) Drainage Patterns (B10) Drv-Season Water Table (C2)	of two required)			
Saturation (A3)		Aquatic Fauna (B13) True Aquatic Plants (B14) Hydrogen Sulfide Oder (C)			ondary Indicators (minimum Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2) Cravifich Burrows (C2)	of two required)			
Saturation (A3) Water Marks (B1)		Aquatic Fauna (B13) True Aquatic Plants (B14) Hydrogen Sulfide Odor (C) 21)	Poots (C2)		ondary Indicators (minimum Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Vicible on Aorial Im	of two required)			
Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Properties (B2)		 Aquatic Fauna (B13) True Aquatic Plants (B14) Hydrogen Sulfide Odor (C Oxidized Rhizospheres on) C1) n Living F	Roots (C3)		ondary Indicators (minimum Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Ima	of two required) agery (C9)			
Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3)		 Aquatic Fauna (B13) True Aquatic Plants (B14) Hydrogen Sulfide Odor (C Oxidized Rhizospheres on Presence of Reduced Iron) 1) 1 Living F 1 (C4)	Roots (C3)		ondary Indicators (minimum Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Ima Stunted or Stressed Plants (D1	of two required) agery (C9)			
Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4)		 Aquatic Fauna (B13) True Aquatic Plants (B14) Hydrogen Sulfide Odor (C Oxidized Rhizospheres on Presence of Reduced Iron Recent Iron Reduction in) n Living F n (C4) Tilled So	Roots (C3) hils (C6)		ondary Indicators (minimum Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Ima Stunted or Stressed Plants (D1 Geomorphic Position (D2)	of two required) agery (C9) 1)			
 Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) 		 Aquatic Fauna (B13) True Aquatic Plants (B14) Hydrogen Sulfide Odor (C Oxidized Rhizospheres or Presence of Reduced Iron Recent Iron Reduction in Thin Muck Surface (C7)) n Living F n (C4) Tilled So	Roots (C3) vils (C6)		ondary Indicators (minimum Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Ima Stunted or Stressed Plants (D1 Geomorphic Position (D2) FAC-Neutral Test (D5)	of two required) agery (C9)			
 Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) 		 Aquatic Fauna (B13) True Aquatic Plants (B14) Hydrogen Sulfide Odor (C Oxidized Rhizospheres or Presence of Reduced Iror. Recent Iron Reduction in Thin Muck Surface (C7) Gauge or Well Data (D9)) n Living F n (C4) Tilled So	Roots (C3) bils (C6)		ondary Indicators (minimum Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Ima Stunted or Stressed Plants (D1 Geomorphic Position (D2) FAC-Neutral Test (D5)	of two required) agery (C9)			
 Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Sparsely Vegetated Concave Surface (B8) 		 Aquatic Fauna (B13) True Aquatic Plants (B14) Hydrogen Sulfide Odor (C Oxidized Rhizospheres or Presence of Reduced Iron Recent Iron Reduction in Thin Muck Surface (C7) Gauge or Well Data (D9) Other (explain in remarks)) n Living F n (C4) Tilled So	Roots (C3) vils (C6)		ondary Indicators (minimum Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Ima Stunted or Stressed Plants (D1 Geomorphic Position (D2) FAC-Neutral Test (D5)	of two required) agery (C9) 1)			
 Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Sparsely Vegetated Concave Surface (B8) 		 Aquatic Fauna (B13) True Aquatic Plants (B14) Hydrogen Sulfide Odor (C Oxidized Rhizospheres or Presence of Reduced Iror Recent Iron Reduction in Thin Muck Surface (C7) Gauge or Well Data (D9) Other (explain in remarks)) n Living F n (C4) Tilled So	Roots (C3) bils (C6)		ondary Indicators (minimum Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Ima Stunted or Stressed Plants (D1 Geomorphic Position (D2) FAC-Neutral Test (D5) Indicators of wetland hydi	of two required) agery (C9) 1) rology present? <u>No</u>			
 Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Sparsely Vegetated Concave Surface (B8) Field Observations: Surface water present? 		Aquatic Fauna (B13) True Aquatic Plants (B14) Hydrogen Sulfide Odor (C Oxidized Rhizospheres or Presence of Reduced Iror Recent Iron Reduction in Thin Muck Surface (C7) Gauge or Well Data (D9) Other (explain in remarks)) n Living F n (C4) Tilled So) s):	Roots (C3) bils (C6)		ondary Indicators (minimum Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Ima Stunted or Stressed Plants (D1 Geomorphic Position (D2) FAC-Neutral Test (D5) Indicators of wetland hydi Describe Recorded Data:	of two required) agery (C9) 1) rology present? <u>No</u>			
 Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Sparsely Vegetated Concave Surface (B8) Field Observations: Surface water present? Vater table present? 		Aquatic Fauna (B13) True Aquatic Plants (B14) Hydrogen Sulfide Odor (C Oxidized Rhizospheres or Presence of Reduced Iror Recent Iron Reduction in Thin Muck Surface (C7) Gauge or Well Data (D9) Other (explain in remarks)) n Living F n (C4) Tilled So) s):	Roots (C3) hils (C6)		ondary Indicators (minimum Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Ima Stunted or Stressed Plants (D1 Geomorphic Position (D2) FAC-Neutral Test (D5) Indicators of wetland hydi Describe Recorded Data:	of two required) agery (C9) 1) rology present? <u>No</u>			
Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Sparsely Vegetated Concave Surface (B8) Field Observations: Surface water present? Vater table present? Saturation present? (includes capillary fringe)		 Aquatic Fauna (B13) True Aquatic Plants (B14) Hydrogen Sulfide Odor (C Oxidized Rhizospheres or Presence of Reduced Iror Recent Iron Reduction in Thin Muck Surface (C7) Gauge or Well Data (D9) Other (explain in remarks) Surface Water Depth (inches): Saturation Depth (inches):) 1 Living F 1 (C4) Tilled So) s):	Roots (C3) bils (C6)		ondary Indicators (minimum Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Ima Stunted or Stressed Plants (D1 Geomorphic Position (D2) FAC-Neutral Test (D5) Indicators of wetland hydi Describe Recorded Data:	of two required) agery (C9) 1) rology present? <u>No</u>			
Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Sparsely Vegetated Concave Surface (B8) Field Observations: Surface water present? Nater table present? Saturation present? (includes capillary fringe) Recorded Data: Aerial Photo Areial Photo		Aquatic Fauna (B13) True Aquatic Plants (B14) Hydrogen Sulfide Odor (C Oxidized Rhizospheres or Presence of Reduced Iror Recent Iron Reduction in Thin Muck Surface (C7) Gauge or Well Data (D9) Other (explain in remarks) Gurface Water Depth (inches): aturation Depth (inches): ell Stream Gauge) n Living F n (C4) Tilled So) s): Prev	Roots (C3) pils (C6) 15 vious Inspe		ondary Indicators (minimum Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Ima Stunted or Stressed Plants (D1 Geomorphic Position (D2) FAC-Neutral Test (D5) Indicators of wetland hydi Describe Recorded Data:	of two required) agery (C9) 1) rology present? <u>No</u>			
Project/Site:	<u>Bassett Cree</u> Pond (East)	<u>k Park Por</u>	nd & Winnetka	Applicant/Ow	ner: <u>BCWMC</u>	City/County: <u>Crystal/H</u> e	<u>ennepin State: MN</u> Sa	ampling Date: <u>10/11/16</u>		
-------------------	------------------------------------	-------------------	---------------------	---------------	-------------------------------	---------------------------------------	---	-------------------------------		
Investigator(s):	<u>BKB</u>			Section:	<u>21</u>	Township: <u>118N</u>	Range: <u>21W</u> S	ampling Point: <u>B-1w</u>		
Land Form:	Toeslope			Local Relief:	<u>Concave</u>	Slope %: <u>1</u> S	Soil Map Unit Name: Udorther	nts, wet sub, 0-2% slopes		
Subregion (LRR,): <u>M</u>			Latitude:	<u>4984289</u>	Longitude: <u>472146</u>	Datum: UTM Nad	83 Zone 15N		
Cowardin Classi	fication: P	<u>EMC</u>		Circular 39 C	Classification: <u>Type 3</u>		Mapped NWI Classification:	PUBG		
Are climatic/hydr	ologic conditior	is on the sit	te typical for this	time of year?	e <u>No</u> (If no, ex	olain in remarks)	Eggers & Reed (primary):	Shallow Marsh		
Are vegetation	<u>No</u> Si	oil <u>No</u>	Hydrology	<u>No</u> si	ignificantly disturbed?	Are "normal <u>Yes</u> circumstances"	Eggers & Reed (secondary): Eggers & Reed (tertiary):			
Are vegetation	<u>No</u> S	oil <u>No</u>	Hydrology	<u>No</u> na	aturally problematic?	present?	Eggers & Reed (quaternary):			
SUMMARY	OF FINDII	VGS - A	Attach site	map sho	wing sampling	point locations,	transects, importan	t features, etc.		

Hydrophytic vegetation present? Hydric soil present? Indicators of wetland hydrology present?	<u>Yes</u> <u>Yes</u> <u>Yes</u>	General Remarks (explain any answers if needed):	Conditions are wetter than normal within the three months prior to the site	visit.
Is the sampled area within a wetland?	<u>Yes</u>	lf yes, optional Wetla	nd Site ID: Bassett Cr Park Pond	

VEGETATION

	Tree Stratum	(Plot Size:	<u>30 ft</u>)	<u>Absolute</u> <u>% Cover</u>	<u>Dominant</u> <u>Species?</u>	<u>Indicator</u> <u>Status</u>	50/20 Thresholds: Tree Stratum		-	<u>20%</u> 0	<u>50%</u> 0
1. 2. 3					0			Herb Stratum Woody Vine Stratur	זיוט	-	0 17 3	42.5 7.5
4.					0			Dominance Test Wo	rksheet:			
	Sanling/Shruh Stratum	(Diot Sizo)	Total C	over:	<u>0</u>			Number of Dominar That Are OBL, FAC	t Species V or FAC:		4 (A)	
1.		(FIOL SIZE.	<u>1511</u>	,	0			Total Number of Do Species Across All	minant Strata:		4 (B)	
2. 3.					0			Percent of Dominan That Are OBL, FACV	t Species V or FAC:	100.00	% (A/B))
4. 5.					0			Prevalence Index W	orksheet:			
			Total C	over:	<u>0</u>			Total % Cove	er of:	I	Multiply by:	
	Herb Stratum	(Plot Size:	<u>5 ft</u>)				OBL Species	30	X 1	:	30
1.	Typha angustifolia				20	Yes	OBL	FACW Species	55	X 2	1	10
2.	Urtica dioica				15	Yes	FACW	FAC Species	5	Х З		15
3.	Poa palustris				15	Yes	FACW	FACU Species	10	X 4		40
4.	Phalaris arundinacea				10	No	FACW	IIPI Species	0	X 5		0
5.	Cirsium arvense				10	No	FACU	Column Totalo	100	(A)	1	95 (B)
6.	Lemna minor				10	No	OBL	COIUITIIT TOTAIS: Prove	lence Index -	R/Δ -	1	<u>05</u> (=)
7.	Alliaria petiolata				5	No	FAC	Lludrophytic Vogotat			1.	35
8.					0					• • • • • • • • •		
	Woody Vine Stratum	(Plot Size:	1 otal C <u>30 ft</u>	over:)	<u>85</u>			No Rapid Te. Yes Dominan	st for Hydropr ce Test is >50	iytic Vegetat % 	ion	
1.	Vitis riparia				15	Yes	FACW	Yes Prevalence	ce index ≤ 3.0	[1]	uldo ouppo	rting data
2.					0			in vegeta	tion remarks o	ons [1] (pro or on a separ	ate sheet)	i iliy uala
			Total C	over:	<u>15</u>			No Problema	tic Hydrophyt	ic Vegetatio	n [1] (Explai	in)
% E	are Ground in Herb Stratum		_	%	5 Sphagnu	m Moss Cove	r:	[1] Indicators of hydric s disturbed or problemation	coil & wetland hy	drology must	be present, u	nless
Veg	etation Remarks: (include p	hoto number:	s here or on a se	eparate sh	neet)			Hydrophytic vegetatic	n present?	Yes		

							ing ronn.	
ofile Description: (Describe to the depth need	led to a	locument the indicator or c	confirm the	e abscence	of indicators).		
(inches) Color (moist)	%	Color (moist)	ox Featur	Type [1]	Loc [2]	Texture	Romar	rks
	//		- <u></u>		LUC [2]	Sandy Loom		NS
8 - 20 N 2 5/0	98	10YR 4/3			IVI	Sandy Loam Silt Loam	neat intermixed	
20 - 30 10 YR 3/1	100		·			Silt Loam	shells present	
-							,	
] Type: C=Concentration, D=Depletion, RM=Re	educea	Matrix, MS=Masked Sand	Grains	[2] Locatio	n: PL=Pore L	ining, M=Matrix.		
dric Soil Indicators: (applicable to all LRRs, u	unless o	otherwise noted)			Inc	licators for Problematic Hyd	ric Soils [3]:	
] Histosol (A1)		📃 Sandy Glé	eyed Matrix	x (S4)		Coast Prairie Redox (A16)		
] Histic Epipedon (A2)		🗌 Sandy Re	dox (S5)			Dark Surface (S7)		
Black Histic (A3)		Stripped N	Aatrix (S6)			Iron-Manganese Masses (F1)	?)	
] Hydrogen Sulfide (A4)		✓ Loamy Mu	ucky Miner	al (F1)		Very Shallow Dark Surface (1	F12)	
Stratified Lavers (A5)		🗌 Loamv Gl	eved Matri	x (F2)		Other (explain in soil remarks)	
2 cm Muck (A10)			Matrix (F3))				
Depleted Below Dark Surface (A11)		Redox Da	rk Surface	(F6)				
Thick Dark Surface (A12)			Dark Surfa	(F7)				
Sandy Mucky Minoral (S1)		Beday De		(EQ)	[3]	Indicators of hydrophytic ve	getation and wetland I	hydrolo
Sandy Mucky Milleral (ST)			pressions	(10)	mι	ist be present, unless disturi	oed or problematic.	
estrictive Laver (if present): Type:		Denti	h (inches).		Hydric soil present	2 Yes	
Pestrictive Layer (if present): Type:		Depti	h (inches)):		Hydric soil present	2 <u>Yes</u>	
Cestrictive Layer (if present): Type:		Depti	h (inches)):		Hydric soil present	2 <u>Yes</u>	
Soil Remarks:		Depti	h (inches)):		Hydric soil present	2 <u>Yes</u>	
estrictive Layer (if present): Type:		Depti	h (inches)):		Hydric soil present	? <u>Yes</u>	
iestrictive Layer (if present): Type: oil Remarks: YDROLOGY /etland Hydrology Indicators:	backal	Depti	h (inches)):		Hydric soil present	² <u>Yes</u>	
estrictive Layer (if present): Type: pil Remarks: /DROLOGY fetland Hydrology Indicators: rimary Indicators (minimum of one required; cf	heck ali	Depti	h (inches)):		Hydric soil present	2 <u>Yes</u>	
estrictive Layer (if present): Type: oil Remarks: YDROLOGY /etland Hydrology Indicators: rimary Indicators (minimum of one required; cf] Surface Water (A1)	heck ali	Depti	h (inches)):		Hydric soil present condary Indicators (minimur Surface Soil Cracks (B6)	² <u>Yes</u> n of two required)	
estrictive Layer (if present): Type: oil Remarks: YDROLOGY /etland Hydrology Indicators: rimary Indicators (minimum of one required; cf] Surface Water (A1)] High Water Table (A2)	heck ali	Depti that apply) Water-Stained Leave Aquatic Fauna (B13)	h (inches) •s (B9)):		Hydric soil present condary Indicators (minimur Surface Soil Cracks (B6) Drainage Patterns (B10)	? <u>Yes</u>	
estrictive Layer (if present): Type: oil Remarks: YDROLOGY /etland Hydrology Indicators: rimary Indicators (minimum of one required; ch] Surface Water (A1)] High Water Table (A2)] Saturation (A3)	heck alı		h (inches) (B9) (B14)):		Hydric soil present condary Indicators (minimur Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2	2 <u>Yes</u>	_
estrictive Layer (if present): Type: oil Remarks: YDROLOGY /etland Hydrology Indicators: rimary Indicators (minimum of one required; ch] Surface Water (A1)] High Water Table (A2)] Saturation (A3)] Water Marks (B1)	heck ali	Depti that apply) Water-Stained Leave Aquatic Fauna (B13) True Aquatic Plants (Hydrogen Sulfide Od	h (inches) es (B9) (B14) or (C1)):		Hydric soil present condary Indicators (minimur Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2 Crayfish Burrows (C8)	2 <u>Yes</u> n of two required)	_
estrictive Layer (if present): Type: oil Remarks: /DROLOGY /etland Hydrology Indicators: rimary Indicators (minimum of one required; cf] Surface Water (A1)] High Water Table (A2)] Saturation (A3)] Water Marks (B1)] Sediment Deposits (B2)	heck alı	Depti that apply) Water-Stained Leave Aquatic Fauna (B13) True Aquatic Plants (Hydrogen Sulfide Od Oxidized Rhizosphere	h (inches) es (B9) (B14) or (C1) es on Livin):		Hydric soil present condary Indicators (minimur Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2 Crayfish Burrows (C8) Saturation Visible on Aerial In	2 <u>Yes</u> n of two required)	_
Pestrictive Layer (if present): Type: ioil Remarks: YDROLOGY /etland Hydrology Indicators: rimary Indicators (minimum of one required; cf] Surface Water (A1)] High Water Table (A2)] Saturation (A3)] Water Marks (B1)] Sediment Deposits (B2)] Drift Deposits (B3)	heck ali	Depti Depti Depti Depti Depti Deption	h (inches) h (inches) es (B9) (B14) for (C1) es on Livin d Iron (C4)):	See	Hydric soil present condary Indicators (minimur Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2 Crayfish Burrows (C8) Saturation Visible on Aerial In Stunted or Stressed Plants (E	2 <u>Yes</u> n of two required)	_
<pre>testrictive Layer (if present): Type: oil Remarks: YDROLOGY /etland Hydrology Indicators: rimary Indicators (minimum of one required; cf] Surface Water (A1) [High Water Table (A2) [Saturation (A3)] Water Marks (B1) [Sediment Deposits (B2)] Drift Deposits (B3)] Algal Mat or Crust (B4)</pre>	heck al	Depti that apply) Water-Stained Leave Aquatic Fauna (B13) True Aquatic Plants (Hydrogen Sulfide Od Oxidized Rhizosphere Presence of Reduced Recent Iron Reductic	h (inches) h (inches) cs (B9) (B14) for (C1) es on Livin d Iron (C4) on in Tilled): g Roots (C3, Soils (C6)		Hydric soil present condary Indicators (minimur Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial In Stunted or Stressed Plants (E Geomorphic Position (D2)	2 <u>Yes</u> n of two required)) hagery (C9)	
<pre>iestrictive Layer (if present): Type: oil Remarks: YDROLOGY /etland Hydrology Indicators: rimary Indicators (minimum of one required; cf] Surface Water (A1)] High Water Table (A2)] Saturation (A3)] Water Marks (B1)] Sediment Deposits (B2)] Drift Deposits (B3)] Algal Mat or Crust (B4)] Iron Deposits (B5)</pre>	heck alı	that apply) Water-Stained Leave Aquatic Fauna (B13) True Aquatic Plants (Hydrogen Sulfide Od Oxidized Rhizosphere Presence of Reduced Recent Iron Reductic Thin Muck Surface (C)	h (inches) h (inches) s (B9) B14) or (C1) es on Livin d Iron (C4) yn in Tilled C7)): g Roots (C3, Soils (C6)	Se.	Hydric soil present condary Indicators (minimur Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2 Crayfish Burrows (C8) Saturation Visible on Aerial In Stunted or Stressed Plants (E Geomorphic Position (D2) FAC-Neutral Test (D5)	2 <u>Yes</u> n of two required)	
<pre>testrictive Layer (if present): Type: oil Remarks: YDROLOGY /etland Hydrology Indicators: rimary Indicators (minimum of one required; cf] Surface Water (A1)] High Water Table (A2)] Saturation (A3)] Water Marks (B1)] Sediment Deposits (B2)] Drift Deposits (B3)] Algal Mat or Crust (B4)] Iron Deposits (B5) </pre>	heck ali		h (inches) h (inches) (B14) or (C1) es on Livin d Iron (C4) in in Tilled (C7) (D9)): g Roots (C3, Soils (C6)		Hydric soil present condary Indicators (minimur Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2 Crayfish Burrows (C8) Saturation Visible on Aerial In Stunted or Stressed Plants (E Geomorphic Position (D2) FAC-Neutral Test (D5)	2 <u>Yes</u> n of two required)	_
estrictive Layer (if present): Type: oil Remarks: YDROLOGY /etland Hydrology Indicators: rimary Indicators (minimum of one required; cf] Surface Water (A1)] High Water Table (A2)] Saturation (A3)] Water Marks (B1)] Sediment Deposits (B2)] Drift Deposits (B3)] Algal Mat or Crust (B4)] Iron Deposits (B5)] Inundation Visible on Aerial Imagery (B7)] Sparsely Vegetated Concave Surface (B8)	heck ali		h (inches) h (inches) B (B9) (B14) for (C1) es on Livin d Iron (C4) n in Tilled C7) (D9) arks)): g Roots (C3, Soils (C6)		Hydric soil present condary Indicators (minimur Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2 Crayfish Burrows (C8) Saturation Visible on Aerial In Stunted or Stressed Plants (D Geomorphic Position (D2) FAC-Neutral Test (D5)	2 <u>Yes</u> n of two required)	
Pestrictive Layer (if present): Type: oil Remarks: YDROLOGY /etland Hydrology Indicators: rrimary Indicators (minimum of one required; ch Surface Water (A1) I High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) I Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Sparsely Vegetated Concave Surface (B8)	heck ali	Depti that apply) Water-Stained Leave Aquatic Fauna (B13) True Aquatic Plants (Hydrogen Sulfide Od Oxidized Rhizosphere Presence of Reduced Recent Iron Reductic Thin Muck Surface (C Gauge or Well Data (Other (explain in rem	h (inches) h (inches) (B14) for (C1) es on Livin d Iron (C4) (D1) n in Tilled (C7) (D9) arks)): Ig Roots (C3, Soils (C6)	Se Se U U U U V V	Hydric soil present condary Indicators (minimur Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2, Crayfish Burrows (C8) Saturation Visible on Aerial In Stunted or Stressed Plants (D Geomorphic Position (D2) FAC-Neutral Test (D5)	2 <u>Yes</u> n of two required) nagery (C9) 11)	
Pestrictive Layer (if present): Type: oil Remarks: YDROLOGY /etland Hydrology Indicators: rimary Indicators (minimum of one required; cf Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Sparsely Vegetated Concave Surface (B8) ield Observations: urface water present?	heck alı		h (inches) h (inches) B (B9) (B14) for (C1) es on Livin d Iron (C4) on in Tilled (C7) (D9) arks) aches):): g Roots (C3, Soils (C6)		Hydric soil present condary Indicators (minimur Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2 Crayfish Burrows (C8) Saturation Visible on Aerial In Stunted or Stressed Plants (E Geomorphic Position (D2) FAC-Neutral Test (D5)	2 <u>Yes</u> n of two required) nagery (C9) 1)	
Pestrictive Layer (if present): Type: foil Remarks: YDROLOGY Vetland Hydrology Indicators: rrimary Indicators (minimum of one required; cf] Surface Water (A1)] High Water Table (A2)] Saturation (A3)] Water Marks (B1)] Sediment Deposits (B2)] Drift Deposits (B3)] Algal Mat or Crust (B4)] Iron Deposits (B5)] Inundation Visible on Aerial Imagery (B7)] Sparsely Vegetated Concave Surface (B8) iield Observations: iurface water present?	heck alı	Depti that apply) Water-Stained Leave Aquatic Fauna (B13) True Aquatic Plants (Hydrogen Sulfide Od Oxidized Rhizosphere Presence of Reduced Recent Iron Reduction Thin Muck Surface (C Gauge or Well Data (Other (explain in rem Surface Water Depth (ir Water Table Deoth (incl	h (inches) h (inches) s (B9) (B14) for (C1) es on Livin d Iron (C4) on in Tilled (C7) (D9) arks) hches): hess):):	Se.	Hydric soil present condary Indicators (minimur Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2 Crayfish Burrows (C8) Saturation Visible on Aerial In Stunted or Stressed Plants (D Geomorphic Position (D2) FAC-Neutral Test (D5) Indicators of wetland hy Describe Recorded Data	2 <u>Yes</u> n of two required) nagery (C9) 11)	- Yes
Restrictive Layer (if present): Type: Soil Remarks: YDROLOGY Vetland Hydrology Indicators: Primary Indicators (minimum of one required; ch Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Sparsely Vegetated Concave Surface (B8) ield Observations: urface water present? /ater table present?	heck all		h (inches) h (inches) ss (B9) (B14) lor (C1) es on Livin d Iron (C4) on in Tilled C7) (D9) arks) nches): nes): nes): ess):):		Hydric soil present condary Indicators (minimur Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2, Crayfish Burrows (C8) Saturation Visible on Aerial In Stunted or Stressed Plants (E Geomorphic Position (D2) FAC-Neutral Test (D5) Indicators of wetland hy Describe Recorded Data	2 <u>Yes</u>	- Y <u>es</u>

Project/Site:	<u>Bassett (</u> Pond (Ea	<u>Creek F</u> ast)	ark Pond 8	Winnetka	Applicant/C	Dwner: <u>BCWMC</u>	City/County: Crystal/H	<u>lennepin</u> State: <u>N</u>	IN Sampling Date: 10/11/16
Investigator(s):	<u>BKB</u>				Section:	<u>21</u>	Township: <u>118N</u>	Range: 2	21W Sampling Point: B-2u
Land Form:	<u>Summit</u>				Local Reli	ef: <u>None</u>	Slope %: <u>3</u>	Soil Map Unit Name:	Udorthents, wet sub, 0-2% slopes
Subregion (LRR): <u>M</u>				Latitude:	4984248	Longitude: 472133	Datum: <u>L</u>	JTM Nad 83 Zone 15N
Cowardin Classi	fication:	<u>Uplar</u>	<u>nd</u>		Circular 39	Classification: Upland		Mapped NWI Class	ification: Upland
Are climatic/hydr	ologic cond	litions o	n the site ty	pical for this	time of yea	nr? <u>No</u> (If no, exp	olain in remarks)	Eggers & Reed (pri	imary): <u>Upland</u>
Are vegetation	No	Soil	No	Hydrology	No	significantly disturbed?	Are "normal <u>Yes</u>	Eggers & Reed (se	condary):
			_	5 55		5 5	present?	Eggers & Reed (ter	tiary):
Are vegetation	No	Soil	<u>No</u>	Hydrology	<u>No</u>	naturally problematic?	P	Eggers & Reed (qu	aternary):

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic vegetation present?	<u>No</u>	General Remarks	Conditions are wetter than normal within the three months prior to the site visit.
Hydric soil present?	<u>No</u>	(explain any	
Indicators of wetland hydrology present?	No	answers if needed):	
Is the sampled area within a wetland?	<u>No</u>	lf yes, optional Wetla	nd Site ID: Upland

VEGETATION

	Tree Stratum	(Plot Size:	<u>30 ft</u>	<u>Absolute</u> <u>% Cover</u>	<u>Dominant</u> <u>Species?</u>	<u>Indicator</u> <u>Status</u>	50/20 Thresholds: Tree Stratum		<u>20%</u> 0	<u>50%</u> 0
1. 2. 3.							Herb Stratum Woody Vine Stratum		20	50
4.				0			Dominance Test Worksheet:			
	Sanling/Shruh Stratum	(Plot Size:	Total Cover:	<u>0</u>			Number of Dominant Species That Are OBL, FACW or FAC:		1 (A)	
1.	Salix interior	(1 101 3120.		1	No	FACW	Total Number of Dominant Species Across All Strata:		2 (B)	
2. 3.				0			Percent of Dominant Species That Are OBL, FACW or FAC:	50.00)% (A/B,)
4. 5.				0			Prevalence Index Worksheet:			
			Total Cover:	1		<u> </u>	Total % Cover of:		Multiply by:	
	Herb Stratum	(Plot Size:	<u>5 ft</u>				OBL Species 0	X 1		0
1.	Glechoma hederacea			70	Yes	FACU	FACW Species1	X 2		2
2.	Poa pratensis			30	Yes	FAC	FAC Species 30	Х З		90
3.				0			FACU Species 70	X 4	2	80
4. E				0			UPL Species 0	X 5		0
э. 6				0			Column Totals: 101	(A)	3	72 (B)
0. 7.				0			Prevalence Index =	<i>B</i> /A =	3.	68
8.				0			Hydrophytic Vegetation Indicators	<u>a</u>		
			Total Cover:	100			No Rapid Test for Hydropl	nytic Vegeta	ition	
	Woody Vine Stratum	(Plot Size:	<u>30 ft</u>				No Dominance Test is >50	%		
1.							No Prevalence Index \leq 3.0	[1]	ouldo ouppo	uting data
2.				0			in vegetation remarks	ons [1] (pro pr on a sepa	arate sheet)	n in iy uala
			Total Cover:				No Problematic Hydrophy	tic Vegetatic	on [1] (Expla	in)
% E	are Ground in Herb Stratun	<u>.</u>	_	% Sphagnu	m Moss Cove	r:	[1] Indicators of hydric soil & wetland h disturbed or problematic.	/drology must	t be present, u	nless
Veg	etation Remarks: (include p	hoto number	s here or on a separate	sheet)			Hydrophytic vegetation present?	No		

ile Description: (Describe to the depth n	needed to	document the indicator or c	confirm th	e abscence i	of indicators).		
Depth Matrix		Red	lox Featur	res		<i>.</i>		
(inches) Color (moist)	%	Color (moist)	%	Type [1]	Loc [2]	Texture	Ren	narks
0 - 10 N 2.5/0	100					Silt Loam		
10 - 24 N 2.5/0	98	10YR 3/3	2	С	М	Silt Loam	Peat intermixe	d
	·		·					
	·		·					
Type: C=Concentration, D=Depletion, RM	1=Reduce	d Matrix, MS=Masked Sand	Grains	[2] Locatior	: PL=Pore L	ining, M=Matrix.		
dric Soil Indicators: (applicable to all LRR	Rs, unless	otherwise noted)			Inc	licators for Problematic Hy	dric Soils [3]:	
Histosol (A1)		📃 Sandy Gle	eyed Matri	ix (S4)		Coast Prairie Redox (A16)		
Histic Epipedon (A2)	🗌 Sandy Re	dox (S5)			Dark Surface (S7)			
Black Histic (A3)	Stripped N	Matrix (S6))		Iron-Manganese Masses (F	12)		
Hydrogen Sulfide (A4)		Very Shallow Dark Surface	(TF12)					
Stratified Layers (A5)		Other (explain in soil remark	ks)					
2 cm Muck (A10)			Matrix (F3	?)				
Depleted Below Dark Surface (A11)		Redox Da	nrk Surface	, e (F6)				
Thick Dark Surface (A12)		Depleted	Dark Surfa	ace (E7)				
Sandy Mucky Mineral (S1)		Redax De		(F8)	[3]	Indicators of hydrophytic	vegetation and wetlar	nd hydrold
E cm Mucky Post or Post (S2)			.pressions	(10)	mL	ist be present, unless distu	irbed or problematic.	
strictive Laver (if present): Type:		Dent	h (inches	.).		Hydric soil preser	nt2 No	
strictive Layer (if present): Type:		Depti	h (inches):		Hydric soil preser	nt? <u>No</u>	
strictive Layer (if present): Type:		Dept	h (inches	:):		Hydric soil preser	nt? <u>No</u>	
strictive Layer (if present): Type:		Depti	h (inches	;):		Hydric soil preser	nt? <u>No</u>	
strictive Layer (if present): Type: il Remarks: DROLOGY		Depti	h (inches	:):		Hydric soil preser	nt? <u>No</u>	
strictive Layer (if present): Type: il Remarks: DROLOGY tland Hydrology Indicators:			h (inches	:):		Hydric soil preser	nt? <u>No</u>	
strictive Layer (if present): Type: il Remarks: DROLOGY tland Hydrology Indicators: mary Indicators (minimum of one required	d; check a	II that apply)	h (inches	;):		Hydric soil preser	nt? <u>No</u>	
strictive Layer (if present): Type: il Remarks: DROLOGY tland Hydrology Indicators: mary Indicators (minimum of one required Surface Water (A1)	1; check a		h (inches	:):		Hydric soil preser condary Indicators (minimu Surface Soil Cracks (B6)	nt? <u>No</u>	
strictive Layer (if present): Type: Il Remarks: DROLOGY tland Hydrology Indicators: mary Indicators (minimum of one required Surface Water (A1) High Water Table (A2)	1; check a		h (inches	;):		Hydric soil preser condary Indicators (minimu Surface Soil Cracks (B6) Drainage Patterns (B10)	nt? <u>No</u> um of two required)	
strictive Layer (if present): Type: Il Remarks: DROLOGY tland Hydrology Indicators: mary Indicators (minimum of one required Surface Water (A1) High Water Table (A2) Saturation (A3)	l; check a	Il that apply) Use Aquatic Fauna (B13) True Aquatic Plants (h (inches es (B9) (B14)	;):		Hydric soil preser condary Indicators (minimu Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C	nt? <u>No</u> um of two required)	
strictive Layer (if present): Type: il Remarks: DROLOGY tland Hydrology Indicators: mary Indicators (minimum of one required Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1)	d; check a	It that apply) Water-Stained Leave Aquatic Fauna (B13) True Aquatic Plants (Hydrogen Sulfide Od	h (inches h (inches es (B9) (B14) lor (C1)	;):		Hydric soil preser condary Indicators (minimu Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C Crayfish Burrows (C8)	nt? <u>No</u> um of two required)	
strictive Layer (if present): Type: il Remarks: DROLOGY tland Hydrology Indicators: mary Indicators (minimum of one required Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2)	1; check a		h (inches h (inches 25 (B9) (B14) lor (C1) es on Livir	;):		Hydric soil preser condary Indicators (minimu Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C Crayfish Burrows (C8) Saturation Visible on Aerial	nt? <u>No</u> um of two required) 22) Imagery (C9)	
strictive Layer (if present): Type: I Remarks: DROLOGY tland Hydrology Indicators: mary Indicators (minimum of one required Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3)	d; check a	Il that apply) UVater-Stained Leave Aquatic Fauna (B13) Aquatic Fauna (B13) Hydrogen Sulfide Od Oxidized Rhizosphere Presence of Reduced	h (inches h (inches 25 (B9) (B14) lor (C1) es on Livir d Iron (C4)	n):		Hydric soil preser condary Indicators (minimu Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C Crayfish Burrows (C8) Saturation Visible on Aerial Stunted or Stressed Plants	nt? <u>No</u> um of two required) 22) Imagery (C9) (D1)	
strictive Layer (if present): Type: il Remarks: DROLOGY tland Hydrology Indicators: mary Indicators (minimum of one required Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4)	1; check a	I that apply) Utater-Stained Leave Aquatic Fauna (B13) True Aquatic Plants (Hydrogen Sulfide Od Oxidized Rhizosphere Presence of Reduced Recent Iron Reductic	h (inches h (inches cs (B9) (B14) lor (C1) es on Livir d Iron (C4) on in Tilled	ng Roots (C3)		Hydric soil preser condary Indicators (minimu Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C Crayfish Burrows (C8) Saturation Visible on Aerial Stunted or Stressed Plants Geomorphic Position (D2)	nt? <u>No</u> um of two required) 22) Imagery (C9) (D1)	
strictive Layer (if present): Type:	l; check a		h (inches h (inches 28 (B9) (B14) lor (C1) es on Livir d Iron (C4) on in Tilled C7)	r); ng Roots (C3)) I Soils (C6)		Hydric soil preser condary Indicators (minimu Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C Crayfish Burrows (C8) Saturation Visible on Aerial Stunted or Stressed Plants Geomorphic Position (D2) FAC-Neutral Test (D5)	nt? <u>No</u> um of two required) 22) Imagery (C9) (D1)	
strictive Layer (if present): Type: il Remarks: DROLOGY tland Hydrology Indicators: mary Indicators (minimum of one required Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5)	d; check a	It that apply) Water-Stained Leave Aquatic Fauna (B13) True Aquatic Plants (Hydrogen Sulfide Od Oxidized Rhizosphere Presence of Reduced Recent Iron Reductic Thin Muck Surface (C Gauge or Well Data	h (inches h (inches ss (B9) (B14) lor (C1) es on Livir d Iron (C4) on in Tilled (C7) (D9)	ng Roots (C3)) Soils (C6)		Hydric soil preser condary Indicators (minimu Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C Crayfish Burrows (C8) Saturation Visible on Aerial Stunted or Stressed Plants Geomorphic Position (D2) FAC-Neutral Test (D5)	nt? <u>No</u> um of two required) (22) Imagery (C9) (D1)	
strictive Layer (if present): Type:	1; check a	I that apply) Utater-Stained Leave Aquatic Fauna (B13) Aquatic Fauna (B13) True Aquatic Plants (Hydrogen Sulfide Od Oxidized Rhizosphere Presence of Reduced Recent Iron Reductic Thin Muck Surface (C) Gauge or Well Data (Other (explain in rem	h (inches h (inches B) (B14) lor (C1) lor (C1) es on Livir d Iron (C4) on in Tilled (C7) (D9) iarks)	ng Roots (C3)) I Soils (C6)		Hydric soil preser condary Indicators (minimu Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C Crayfish Burrows (C8) Saturation Visible on Aerial Stunted or Stressed Plants Geomorphic Position (D2) FAC-Neutral Test (D5)	nt? <u>No</u> um of two required) 22) Imagery (C9) (D1)	
strictive Layer (if present): Type: il Remarks: DROLOGY tland Hydrology Indicators: mary Indicators (minimum of one required Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Sparsely Vegetated Concave Surface (B8)	d; check a	It that apply) Water-Stained Leave Aquatic Fauna (B13) True Aquatic Plants (Hydrogen Sulfide Od Oxidized Rhizosphere Presence of Reduced Recent Iron Reductic Thin Muck Surface (0 Other (explain in rem	h (inches h (inches (B14) lor (C1) es on Livir d Iron (C4) on in Tilled (C7) (D9) varks)	ng Roots (C3)		Hydric soil preser condary Indicators (minimu Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C Crayfish Burrows (C8) Saturation Visible on Aerial Stunted or Stressed Plants Geomorphic Position (D2) FAC-Neutral Test (D5)	nt? <u>No</u> um of two required) (22) Imagery (C9) (D1)	
strictive Layer (if present): Type:	l; check a	I that apply) Utater-Stained Leave Aquatic Fauna (B13) True Aquatic Plants (Hydrogen Sulfide Od Oxidized Rhizosphere Presence of Reduced Recent Iron Reductic Thin Muck Surface (C) Gauge or Well Data (Other (explain in rem	h (inches h (inches cs (B9) (B14) lor (C1) es on Livir d Iron (C4) on in Tilled (C7) (D9) arks) aches):	ng Roots (C3)) I Soils (C6)		Hydric soil preser condary Indicators (minimu Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C Crayfish Burrows (C8) Saturation Visible on Aerial Stunted or Stressed Plants Geomorphic Position (D2) FAC-Neutral Test (D5) Indicators of wetland h Describe Recorded Da	nt? <u>No</u> um of two required) (22) Imagery (C9) (D1)	<u></u>
strictive Layer (if present): Type:	d; check a		h (inches h (inches 28 (B9) (B14) for (C1) es on Livir d Iron (C4) on in Tilled (C7) (D9) arks) nches): hes):	t):		Hydric soil preser condary Indicators (minimu Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C Crayfish Burrows (C8) Saturation Visible on Aerial Stunted or Stressed Plants Geomorphic Position (D2) FAC-Neutral Test (D5) Indicators of wetland h Describe Recorded Da	nt? <u>No</u> um of two required) (2) Imagery (C9) (D1) pydrology present? ta:	<u>No</u>
strictive Layer (if present): Type:	d; check a		h (inches h (inches ss (B9) (B14) lor (C1) es on Livir d Iron (C4) on in Tilled C7) (D9) harks) nches): hes): hes): hes):	<pre>:):</pre>		Hydric soil preser	nt? <u>No</u> um of two required) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2	<u>No</u>

WETLAND DETERMINIATION DATA FORM Midwost Pogion

WEILAND DEIER		ATAFUR	vi - ivilawest Regio	חכ
Project/Site: Bassett Creek Park Pond & Winnetka Applicant/C Pond (East)	wner: <u>BCWMC</u>	City/County: <u>Crys</u>	<u>tal/Hennepin</u> State: <u>MN</u> Sa	ampling Date: <u>10/11/16</u>
Investigator(s): BKB Section:	<u>21</u>	Township: <u>118N</u>	Range: <u>21W</u> S	ampling Point: <u>B-2w</u>
Land Form: <u>Footslope</u> Local Relie	ef: <u>Concave</u>	Slope %: <u>1</u>	Soil Map Unit Name: Udorther	nts, wet sub, 0-2% slopes
Subregion (LRR): M Latitude:	4984251	Longitude: 47213	7 Datum: UTM Nad 8	83 Zone 15N
Cowardin Classification: PSS1A Circular 39	Classification: Type 6		Mapped NWI Classification:	Upland
Are climatic/hydrologic conditions on the site typical for this time of yea	r? <u>No</u> (If no, exp	lain in remarks)	Eggers & Reed (primary):	Shrub-Carr
Are vegetation No Soil No Hydrology No	significantly disturbed?	Are "normal	Yes Eggers & Reed (secondary):	
	aturally problematic?	present?	Eggers & Reed (tertiary):	
			Eggers & Reeu (quaternary):	
SUMMARY OF FINDINGS - Attach site map sh	iowing sampling	point locatioi	ns, transects, importan	t features, etc.
Hydrophytic vegetation present? Yes General Remainance Hydric soil present? Yes (explain any answers if need Indicators of wetland hydrology present? Yes answers if need Is the sampled area within a wetland? Yes If yes, optionance	rks Conditions are w ded): I Wetland Site ID: <u>Ba</u>	etter than normal with ssett Cr Park Pond	nin the three months prior to the site	visit.
VEGETATION				
	<u>Absolute</u> <u>Domina</u>	<u>nt Indicator</u>	50/20 Thresholds:	<u>20%</u> 50%
Tree Stratum (Plot Size: <u>30 ft</u>) <u>% Cover</u> <u>Species</u>	<u>? Status</u>	Tree Stratum	0 0
1.	0		Sapling/Shrub Stratum	3 7.5
2.	0		Herb Stratum Woody Vine Stratum	
3.	0			
4.	0		Dominance Test Worksheet:	
I otal Cover	<u>0</u>		Number of Dominant Species That Are OBL, FACW or FAC:	4 (A)
Sapiniyistirub Siratumi (Piot Size: <u>15 it</u>		FACW	Total Number of Dominant	A (D)
	0	FACW	Species Across All Strata:	4 (D)
3.	0		Percent of Dominant Species That Are OBL, FACW or FAC:	100.00% (A/B)
4.	0			
5.	0		Prevalence Index Worksheet:	
Total Cover:	<u>15</u>		Total % Cover of:	Multiply by:
<u>Herb Stratum</u> (Plot Size: <u>5 ft</u>)		OBL Species 20	$\frac{1}{20}$
1. Phalaris arundinacea	40 Yes	FACW	FACW Species8	5 X2 170
2. Persicaria amphibia	20 Yes	OBL	FAC Species	$5 \times 3 \qquad 15$
Solidago gigantea	10 No	FACW	FACU Species 10	$\frac{0}{2}$ X 4 $\frac{40}{2}$
5. Geranium maculatum	10 No	FACU	UPL Species	$\frac{0}{2}$ x 5 $\frac{0}{2}$ (1)
6. Alliaria petiolata	5 No	FAC	Column Totals: 120	0 (A) <u>245</u> (B)
7.	0		Prevalence Index	K = B/A = 2.04
8.	0		Hydrophytic Vegetation Indicato	D <u>rs:</u>
Total Cover:	<u>105</u>		No Rapid Test for Hydro	phytic Vegetation
<u>Woody Vine Stratum</u> (Plot Size: <u>30 ft</u>)	,	Yes Prevalence Index ≤ 3	3.0 <i>[</i> 1]
1.			No Morphological Adapt	tations [1] (provide supporting data
ZTotal Course			in vegetation remark.	s or on a separate sheet)
TOTAL COVEL.	<u>U</u>		11 Indicators of bydric coil & wetters	Tytic vegetation [1] (EXPIAIN)
% Bare Ground in Herb Stratum:	% Sphagnum Moss C	over:	disturbed or problematic.	myarology must be present, unless

Vegetation Remarks: (include photo numbers here or on a separate sheet)

Yes

Hydrophytic vegetation present?

Profile Description: (Describe to the depth needed to document the indicator or confirm the abscence of indicators and the indicator or confirm the abscence of indicators and the indicators of the indicator or confirm the abscence of indicators and the indicators of the indindicators of the indicators of the indicators of the i	ators). Z] Texture Remarks Silt Loam Peat intermixed Silt Loam Peat Peat Peat Point Peat Point Peat Point Peat Point Peat Peat Peat Pint Peat Pint Peat Pint Peat Pint Pint Pint Pint Pint Pint Pint Pint Pint Pint
Depth Matrix Redox Features (inches) Color (moist) % Type [1] Loc [2 1. 0 - 8 N 2.5/0 98 10YR 3/3 2 C M 2. 8 - 15 N 2.5/0 98 10YR 3/3 2 C M 3. 15 - 30 N 2.5/0 98 10YR 3/3 2 C M 4. -	Texture Remarks Silt Loam Peat intermixed Silt Loam Peat Peat Peat Ore Lining, M=Matrix. Indicators for Problematic Hydric Soils [3]:
(Inches) Color (moist) % Color (moist) % Type [1] Loc [2] 1. 0-8 N 2.5/0 98 10YR 3/3 2 C M 2. 8-15 N 2.5/0 98 10YR 3/3 2 C M 3. 15 - 30 N 2.5/0 98 10YR 3/3 2 C M 4. -	2] Texture Remarks Silt Loam Peat intermixed Silt Loam Peat Peat Peat Pore Lining, M=Matrix. Indicators for Problematic Hydric Soils [3]:
1. 0 - 8 N 2.5/0 98 10YR 3/3 2 C M 2. 8 - 15 N 2.5/0 98 10YR 3/3 2 C M 3. 15 - 30 N 2.5/0 98 10YR 3/3 2 C M 4. -	Silt Loam Peat intermixed Peat Peat Peat Pore Lining, M=Matrix. Indicators for Problematic Hydric Soils [3]:
2. 6 - 15 N 2.5/0 98 10 YR 3/3 2 C M 3. 15 - 30 N 2.5/0	Peat Peat Peat Peat Peat Peat Peat Peat
3. 10 000 11 2.500 4. -	Pore Lining, M=Matrix.
The second se	Pore Lining, M=Matrix. Indicators for Problematic Hydric Soils [3]:
6 [1] Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains [2] Location: PL=Po Hydric Soil Indicators: (applicable to all LRRs, unless otherwise noted) Histosol (A1) Sandy Gleyed Matrix (S4) Histic Epipedon (A2) Sandy Redox (S5) Black Histic (A3) Stripped Matrix (S6)	Pore Lining, M=Matrix. Indicators for Problematic Hydric Soils [3]:
[1] Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains [2] Location: PL=Performance Hydric Soil Indicators: (applicable to all LRRs, unless otherwise noted)	Pore Lining, M=Matrix. Indicators for Problematic Hydric Soils [3]:
Hydric Soil Indicators: (applicable to all LRRs, unless otherwise noted) Histosol (A1) Sandy Gleyed Matrix (S4) Histic Epipedon (A2) Sandy Redox (S5) Black Histic (A3) Stripped Matrix (S6)	Indicators for Problematic Hydric Soils [3]:
Histosol (A1) Sandy Gleyed Matrix (S4) Histic Epipedon (A2) Sandy Redox (S5) Black Histic (A3) Stripped Matrix (S6)	
Histic Epipedon (A2) Sandy Redox (S5) Black Histic (A3) Stripped Matrix (S6)	🗌 Coast Prairie Redox (A16)
Black Histic (A3)	Dark Surface (S7)
	Iron-Manganese Masses (F12)
Hydrogen Sulfide (A4)	\bigvee Very Shallow Dark Surface (TE12)
Stratified Layers (45)	$\square \text{ Other (evplain in soil remarks)}$
$ = 2 \operatorname{cm} \operatorname{Muck} (A10) $	
2 cill Much (ATO) Depleted Polevy Dark Surface (A11) Baday Dark Surface (A11)	
Depleted Below Dark Surface (A11)	
Thick Dark Surface (A12) Depieted Dark Surface (F7)	[3] Indicators of hydrophytic vegetation and wetland hydrology
Sandy Mucky Mineral (S1)	must be present, unless disturbed or problematic.
5 cm Mucky Peat or Peat (S3)	
Restrictive Layer (if present): Type: Depth (inches):	Hydric soil present? <u>Yes</u>
Soil Remarks:	
IYDROLOGY	
Wetland Hydrology Indicators:	
Primary Indicators (minimum of one required; check all that apply)	Secondary Indicators (minimum of two required)
Surface Water (A1) Water-Stained Leaves (B9)	Surface Soil Cracks (B6)
High Water Table (A2) Aquatic Fauna (B13)	Drainage Patterns (B10)
✓ Saturation (A3) True Aquatic Plants (B14)	Dry-Season Water Table (C2)
Water Marks (B1)	$\Box Cravfish Burrows (C8)$
Sediment Denosite (P2)	\square Saturation Visible on Aerial Imageny (CQ)
	Saturation visible on Aenai Inagery (C9)
DHIL Deposits (B3) Presence of Reduced from (C4)	$\Box Stanled of Stressed Plants (D1)$
Algal Mat or Crust (B4)	Geomorphic Position (D2)
_ Iron Deposits (B5) Thin Muck Surface (C7)	✓ FAC-Neutral Test (D5)
Inundation Visible on Aerial Imagery (B7) Gauge or Well Data (D9)	
Sparsely Vegetated Concave Surface (B8) Other (explain in remarks)	
	Indicators of wetland hydrology present? Yes
Field Observations:	
Field Observations: Surface water present? Surface Water Depth (inches):	Describe Recorded Data:
Field Observations: Surface water present? Surface Water Depth (inches): Water table present? Water Table Depth (inches):	Describe Recorded Data:
Field Observations: Surface water present? Water table present? Water table present? Saturation present? (includes capillary fringe) Saturation Depth (inches): 6	Describe Recorded Data:

Project/Site:	Bassett (Pond (Ea	<u>Creek F</u> <u>ist)</u>	ark Pond &	<u>Winnetka</u>	Applicant/C	Owner: <u>BCWMC</u>	City/County: <u>Crystal/I</u>	<u>'Hennepin</u> State: <u>MN</u>	Sampling Date: <u>10/11/16</u>
Investigator(s):	<u>BKB</u>				Section:	<u>21</u>	Township: <u>118N</u>	Range: <u>21W</u>	Sampling Point: <u>B-3u</u>
Land Form:	<u>Hillslope</u>				Local Reli	ef: <u>Concave</u>	Slope %: <u>2</u>	Soil Map Unit Name: Udd	orthents, wet sub, 0-2% slopes
Subregion (LRR).	: <u>M</u>				Latitude:	<u>4984301</u>	Longitude: 472021	Datum: UTM	Nad 83 Zone 15N
Cowardin Classifi	ication:	<u>Uplar</u>	nd		Circular 39	9 Classification: Upland		Mapped NWI Classificat	ion: <u>Upland</u>
Are climatic/hydro	ologic cond	itions o	n the site ty	pical for this	time of yea	ar? <u>No</u> (If no, exp	lain in remarks)	Eggers & Reed (primary): <u>Upland</u>
Are vegetation	No	Soil	No	Hydrology	No	significantly disturbed?	Are "normal Yes	s Eggers & Reed (second	ary):
5				5 55	_	5 5	nresent?	Eggers & Reed (tertiary));
Are vegetation	No	Soil	No	Hydrology	No	naturally problematic?	prosont:	Eggers & Reed (quaterr	hary):

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic vegetation present?	<u>Yes</u>	General Remarks	Conditions are wetter than normal within the three months prior to the site visit.
Hydric soil present?	<u>No</u>	(explain any	
Indicators of wetland hydrology present?	<u>No</u>	answers if needed):	
Is the sampled area within a wetland?	<u>No</u>	lf yes, optional Wetla	nd Site ID: Upland

VEGETATION

1. 2.	Tree Stratum Acer negundo Populus tremuloides	(Plot Size:	<u>30 ft</u>	Absolute <u>% Cover</u> 10 10	Dominant Species? Yes Yes	Indicator Status FAC FAC	50/20 Thresholds: Tree Stratum Sapling/Shrub Strat Herb Stratum Waody Viao Stratur	um		20% 4 0 16	<u>50%</u> 10 0 40
 3. 4. 1. 2. 	Sapling/Shrub Stratum	(Plot Size:	Total Cover: <u>15 ft</u>) 0 20) 0 0			Dominance Test Wo Number of Dominar That Are OBL, FACV Total Number of Do Species Across All Percent of Dominar	r <u>rksheet:</u> nt Species N or FAC: minant Strata: nt Species		2 (A) 3 (B)	
3. 4. 5.	Herb Stratum	(Plot Size:	Total Cover: <u>5 ft</u>) 0 0 0 0			That Are OBL, FACU <u>Prevalence Index Wa</u> Total % Cove OBL Species	V or FAC: <u>prksheet:</u> er of: 0	66.67 X 1	Multiply by:	0
 1. 2. 3. 4. 5. 6. 7 	Glechoma hederacea Taraxacum officinale Poa pratensis Parthenocissus quinquefolia	3		65 5 5 0 0	Yes No No	FACU FACU FAC FACU	FACW Species FAC Species FACU Species UPL Species Column Totals: Preva	0 25 75 0 100	X 2 X 3 X 4 X 5 (A) B/A =	3 3 3.	0 75 00 0 75 (B) 75
7. 8. 1. 2. % E Veg	Woody Vine Stratum	(Plot Size: : :	Total Cover: <u>30 ft</u> Total Cover: s here or on a separat	0 0 80) 0 0 % Sphagnu e sheet)	Im Moss Cove	[]	Hydrophytic Vegetat No Rapid Te. Yes Dominan No Prevalence No Morpholic in vegeta Mo No Problema [1] Indicators of hydric s disturbed or problematic Hydrophytic vegetatic	ion Indicators. st for Hydroph ce Test is >50 ce Index ≤ 3.0 ogical Adaptati tion remarks c atic Hydrophyt soil & wetland hy c.	ytic Vegeta % [1] ions [1] (pro r on a sepa ic Vegetatic drology must <u>Yes</u>	tion ovide suppo rate sheet) on [1] (Expla be present, u	orting data in) nless

SOIL						Sampling Po	pint:	<u>B-</u> :
Profile Description: (Describe to the depth nee	eded to docu	ment the indicator or	confirm th	e abscence	of indicators	;).		
Depth Matrix		Rec	dox Featu	res	1 [2]	Tartan	Dem	
	<i>%</i>	Color (moist)	<u>%</u>	Type[1]	LOC [2]		Rema	arks
1. $0 - 15$ N 2.5/0	05 10					Silt Loam		
2. 15 - 30 N 2.5/0	95 10	YR 3/3	5		IVI	Slit Loam		
3								
ч								
6								
[1] Type: C=Concentration, D=Depletion, RM=1	Reduced Mai	trix, MS=Masked Sand	l Grains	[2] Locatior	a: PL=Pore L	ining, M=Matrix.		
Hydric Soil Indicators: (applicable to all LRRs,	unless othe	rwise noted)			Inc	licators for Problematic Hydric Sol	ls [3]:	
Histosol (A1)		Sandy G	leyed Matri	ix (S4)		Coast Prairie Redox (A16)		
Histic Epipedon (A2)		Sandy R	edox (S5)			Dark Surface (S7)		
Black Histic (A3)		Stripped	Matrix (S6))		Iron-Manganese Masses (F12)		
Hydrogen Sulfide (A4)		Loamy N	lucky Mine	ral (F1)		Verv Shallow Dark Surface (TE12)		
Stratified Lavers (A5)			leved Matr	ix (F2)		Other (explain in soil remarks)		
2 cm Muck (A10)			I Matrix (E3	() ()				
Depleted Below Dark Surface (A11)		Reday D	ark Surface	/ 				
Thick Dark Surface (A12)			I Dark Surf	= (FO)				
Sandy Mucley Minoral (S1)		[3]	Indicators of hydrophytic vegetati	on and wetland	d hydrology			
			epressions	(F8)	mι	ist be present, unless disturbed or	problematic.	
Destrictive Lover (if present), T			a.c. 1	<u>,</u>		Iludria coil procent?	Ne	
Restrictive Layer (ii present). Type:			in (inches			nyunc son present?	<u>INU</u>	
Soil Remarks:								
IYDROLOGY								
Wetland Hydrology Indicators:		t such à			6.			
Primary Indicators (minimum of one required; (спеск ан tha г	t apply)	(= -)		<u>Se</u>	condary indicators (minimum of tv	/o required)	
Surface Water (A1)	L	Water-Stained Leav	'es (B9)			Surface Soil Cracks (B6)		
High Water Table (A2)		Aquatic Fauna (B13)			Drainage Patterns (B10)		
Saturation (A3)		True Aquatic Plants	(B14)			Dry-Season Water Table (C2)		
Water Marks (B1)		Hydrogen Sulfide O	dor (C1)			Crayfish Burrows (C8)		
Sediment Deposits (B2)		Oxidized Rhizosphe	res on Livir	ng Roots (C3)		Saturation Visible on Aerial Imagery	· (C9)	
Drift Deposits (B3)		Presence of Reduce	ed Iron (C4,)		Stunted or Stressed Plants (D1)		
Algal Mat or Crust (B4)		Recent Iron Reducti	ion in Tillea	l Soils (C6)		Geomorphic Position (D2)		
Iron Deposits (B5)	Γ	Thin Muck Surface ((C7)			FAC-Neutral Test (D5)		
Inundation Visible on Aerial Imageny (P7)	Г	Gauge or Well Data	(D9)					
Sparsely Vegetated Concave Surface (B8)		 Other (explain in ren	narks)					
Field Observations:		•				Indicators of wetland hydrolog	v present?	No
Surface water present?		Surface Water Depth (i	inches):			Describe Recorded Data:	,	<u></u>
Water table present?		Vater Table Depth (inc	ches):					
Saturation present? (includes capillary fringe)		Saturation Depth (inch	es):					
,			- /			1		
Pecorded Data: Acrial Photo	Monitoring M	All C Stroom Cour		Provinue Incr	actions			
Recorded Data: Aerial Photo	Monitoring W	lell 🔲 Stream Gau	ge 🗌 F	Previous Insp	pections			

Project/Site:	<u>Bassett (</u> Pond (Ea	<u>Creek F</u> a <u>st)</u>	ark Pond 8	Winnetka	Applicant/	Owner:	BCWMC		City/County:	<u>Crystal/He</u>	ennepin	State:	<u>MN</u>	Sampling Date: <u>10/11/16</u>
Investigator(s):	<u>BKB</u>				Section:	<u>21</u>			Township: <u>1</u>	<u>18N</u>		Range:	<u>21W</u>	Sampling Point: <u>B-3w</u>
Land Form:	<u>Toeslop</u>	<u>e</u>			Local Reli	ief: <u>Con</u>	icave		Slope %: <u>4</u>	S	oil Map Ur	nit Name:	Udorth	nents, wet sub, 0-2% slopes
Subregion (LRR,): <u>M</u>				Latitude:	4984	4300		Longitude: <u>4</u>	72029		Datum:	<u>UTM Na</u>	ad 83 Zone 15N
Cowardin Classi	fication:	<u>PFO</u>	IA		Circular 3	9 Classifi	ication:	<u>Type 1L</u>			Mapped	NWI Cla	ssificatior	n: <u>Upland</u>
Are climatic/hydr	ologic cond	litions c	n the site ty	pical for this	time of yea	ar?	<u>No</u> (If	^r no, expla	ain in remarks)		Eggers a	& Reed (orimary):	Floodplain Forest
Are vegetation	No	Soil	No	Hvdroloav	No	sianifica	antlv disturb	oed?	Are "normal	Yes	Eggers a	& Reed (s	secondar <u>.</u>	y):
									present?	5	Eggers a	& Reed (I	ertiary):	, ,
Are vegetation	<u>No</u>	Soll	No	Hydrology	No	naturally	y problemat	IC?	'		Eggers a	& Reed (d	quaternar	y):

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic vegetation present?	<u>Yes</u>	General Remarks	Conditions are wetter than normal within the three months prior to the site visit.
Hydric soil present?	<u>Yes</u>	(explain any	
Indicators of wetland hydrology present?	Yes	answers if needed):	
Is the sampled area within a wetland?	<u>Yes</u>	lf yes, optional Wetla	tland Site ID: Bassett Cr Park Pond

VEGETATION

1. 2.	Tree Stratum Populus deltoides Populus tremuloides	(Plot Size:	<u>30 ft</u>)	Absolute <u>% Cover</u> 10 5	Dominant Species? Yes Yes	Indicator Status FAC FAC	50/20 Thresholds: Tree Stratum Sapling/Shrub Strat Herb Stratum Woody Vine Stratun	um		20% 4 0 20	50% 10 0 50
3.	Acer negundo			5	Yes	FAC		1			
4.				0			Dominance Test Wo	<u>rksheet:</u>			
	Sanling/Shruh Stratum	(Plot Size:	Total Cover:	<u>20</u>			Number of Dominar That Are OBL, FACV	it Species V or FAC:		5 (A)	
1.		(11013)20.	<u>1511</u>)	0			Total Number of Do Species Across All	minant Strata:		5 (B)	
2. 3.				0			Percent of Dominan That Are OBL, FACV	t Species V or FAC:	100.00	% (A/E	3)
5.				0			Prevalence Index Wo	orksheet:			
			Total Cover:	<u>0</u>			Total % Cove	er of:		Multiply by	(:
	Herb Stratum	(Plot Size:	<u>5 ft</u>)				OBL Species	0	X 1		0
1.	Phalaris arundinacea		,	75	Yes	FACW	FACW Species	95	X 2		190
2.	Urtica dioica			20	Yes	FACW	FAC Species	20	Х З		60
3.	Parthenocissus quinquefoli	а		5	No	FACU	FACU Species	5	X 4		20
4.				0			UPL Species	0	X 5		0
5.				0			Column Totals:	120	(A)	1	270 (B)
0. 7				0			Preva	lence Index =	B/A =	2	.25
8.				0			Hydrophytic Vegetat	ion Indicators:			
	Woody Vine Stratum	(Plot Size:	Total Cover:	100			No Rapid Tes Yes Dominan	st for Hydroph ce Test is >509	ytic Vegetat %	ion	
1.			···· ,	0			Yes Prevalence No Morpholo	ce Index ≤ 3.0 Igical Adaptati	[1] ions [1] (pro	vide supp	orting data
Ζ.			Total Cover	0			In vegeta No Problema	tion remarks o atic Hydronhyt	ir on a sepai ic Vegetatio	'ate sheet) n [1] (Exnl.	ain)
% E	are Ground in Herb Stratun	1:		<u>~</u> % Sphagnu	ım Moss Cove	r:	[1] Indicators of hydric s disturbed or problematic	oil & wetland hyd 2.	drology must	be present, i	unless
Veg	etation Remarks: (include p	hoto number	s here or on a separate	sheet)			Hydrophytic vegetatic	n present?	<u>Yes</u>		

SOIL	_		_			Sampling P	oint:
Profile Description: (Describe to the depth ne	eded to a	document the indicator or co	nfirm th	ne abscence (of indicators,).	
Depth Matrix		Redo	x Featu	res			
(inches) Color (moist)	%	Color (moist)	%	Type [1]	Loc [2]	Texture	Remarks
1. $0-7$ N 2.5/0	100	10/0 2/2	F			Silt Loam	
2. 7 - 40 <u>N 2.5/0</u>	95	10YR 3/3	5	U	IVI	SIILLOAM	
3							
5							
6							
[1] Type: C=Concentration, D=Depletion, RM=	Reduced	d Matrix, MS=Masked Sand G	irains	[2] Locatior	: PL=Pore L	ining, M=Matrix.	
Hydric Soil Indicators: (applicable to all LRRs	, unless	otherwise noted)			Ind	icators for Problematic Hydric So	ils [3]:
Histosol (A1)		Sandy Gley	ed Matr	ix (S4)		Coast Prairie Redox (A16)	
🗌 Histic Epipedon (A2)		Sandy Red	ox (S5)			Dark Surface (S7)	
📃 Black Histic (A3)		Stripped Ma	atrix (S6)		Iron-Manganese Masses (F12)	
🔲 Hydrogen Sulfide (A4)		🗌 Loamy Muc	ky Mine	ral (F1)		Very Shallow Dark Surface (TF12)	
Stratified Layers (A5)		🗌 Loamy Gley	yed Mati	rix (F2)		Other (explain in soil remarks)	
2 cm Muck (A10)		Depleted M	latrix (F3	3)			
Depleted Below Dark Surface (A11)		🖌 Redox Dark	s Surface	e (F6)			
Thick Dark Surface (A12)		Depleted D	ark Surf	ace (F7)			
Sandy Mucky Mineral (S1)		Redox Dep	ressions	s (F8)	[3]	Indicators of hydrophytic vegetat	ion and wetland hydrolog
\Box 5 cm Mucky Peat or Peat (S3)					mu	si be present, uniess uisturbeu o	problematic.
Restrictive Layer (if present): Type:		Depth	(inches	s):		Hydric soil present?	Yes
SOIL REMAIRS:							
IYDROLOGY							
Wetland Hydrology Indicators:							
Primary Indicators (minimum of one required;	check al	ll that apply)			Sec	condary Indicators (minimum of t	vo required)
Surface Water (A1)		Water-Stained Leaves	(B9)			Surface Soil Cracks (B6)	
High Water Table (A2)		Aquatic Fauna (B13)				Drainage Patterns (B10)	
Saturation (A3)		$\Box True Aquatic Plants (B)$	14)			Dry-Season Water Table (C2)	
Water Marks (B1)		Hvdrogen Sulfide Odo	r (C1)			Cravfish Burrows (C8)	
Sediment Deposits (B2)			on Livi	na Poots (C3)		Saturation Visible on Aerial Imager	u(C0)
Drift Deposite (P2)			Iron (CA			Stunted or Stressed Plants (D1)	((0))
Drin Deposits (B3)			11011 (C4			Coomerchie Decition (D2)	
Algar Mat or Crust (B4)			111 T IIIeC	1 SOIIS (C6)		Geomorphic Position (D2)	
			()		\checkmark	FAC-Neuliai resi (D5)	
□ Inundation Visible on Aerial Imagery (B7)		Gauge or Well Data (L					
Sparsely Vegetated Concave Surface (B8)		Other (explain in remain	rks)				
Field Observations:						Indicators of wetland hydrolog	gy present? Yes
Surrace water present?		Surface Water Depth (inc	nes):			Describe Recorded Data:	
Water table present?] Water Table Depth (inche	es):				
Saturation present? (includes capillary fringe)] Saturation Depth (inches	:):				
Recorded Data: Aerial Photo	Monitorii	ng Well 🔲 Stream Gauge		Previous Insp	ections		
Hydrology Remarks:							

Project/Site:	<u>Bassett</u> Pond (E	<u>Creek F</u> <u>ast)</u>	Park Pond	& Winnetka	Applicant/0	Owner: <u>BCWMC</u>	City/County: Crystal	/Hennepin	State:	<u>MN</u>	Sampling Date:	<u>10/11/16</u>
Investigator(s):	<u>BKB</u>				Section:	<u>17</u>	Township: <u>118N</u>		Range:	<u>21W</u>	Sampling Point:	<u>W-1u</u>
Land Form:	<u>Shoulde</u>	<u>er</u>			Local Reli	ief: <u>Convex</u>	Slope %: <u>18</u>	Soil Map U	Init Name	: <u>Urban</u>	land-Udorthents	<u>, wet sub, complex</u>
Subregion (LRR)	: <u>M</u>				Latitude:	<u>4985483</u>	Longitude: 470427		Datum:	<u>UTM Na</u>	<u>d 83 Zone 15N</u>	
Cowardin Classii	fication:				Circular 39	9 Classification:		Маррес	i NWI Cla	ssification	<u>Upland</u>	
Are climatic/hydro	ologic cond	ditions o	n the site	typical for this	time of yea	ar? <u>No</u> (If no, exp	lain in remarks)	Eggers	& Reed ('primary):		
Are vegetation	No	Soil	No	Hydrology	No	significantly disturbed?	Are "normal Ye	<u>es</u> Eggers	& Reed ('secondary	/):	
The vegetation	110	0011	110	riyarology	110	significantly distarbed.	circumstances"	Eggers	& Reed ('tertiary):		
Are vegetation	No	Soil	No	Hydrology	No	naturally problematic?	present	Eggers	& Reed (quaternar	y):	

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic vegetation present?	<u>Yes</u>	General Remarks	Conditions are wetter than normal within the three months prior to the site visit.
Hydric soil present?	<u>No</u>	(explain any	
Indicators of wetland hydrology present?	<u>No</u>	answers if needed):	
Is the sampled area within a wetland?	<u>No</u>	lf yes, optional Wetla	nd Site ID: Upland

VEGETATION

1. 2. 3.	Tree Stratum Acer negundo	(Plot Size:	<u>30 ft</u>	<u>Absolute</u> <u>% Cover</u> 50 0	Dominant Species? Yes	Indicator Status FAC	50/20 Thresholds: Tree Stratum Sapling/Shrub Stratu Herb Stratum Woody Vine Stratum	ım 1		20% 10 8 11 0	50% 25 20 27.5 0	_
4.				0			Dominance Test Wo	<u>rksheet:</u>				
	Canling/Chrub Stratum	(Diot Size)	Total Cover.	50			Number of Dominan That Are OBL, FACW	t Species / or FAC:		3 (A)		
1.	Rhamnus cathartica	(PIOL SIZE:	<u>15 II</u>	40	Yes	FAC	Total Number of Dor Species Across All S	ninant Strata:		4 (B)		
2. 3.				0			Percent of Dominant That Are OBL, FACW	Species / or FAC:	75.0	0% (A/I	3)	
4. 5.				0			Prevalence Index Wo	rksheet:				
			Total Cover:	<u>40</u>			Total % Cove	r of:		Multiply by	/:	
	<u>Herb Stratum</u>	(Plot Size:	<u>5 ft</u>)			OBL Species	0	X 1		0	_
1.	Glechoma hederacea			35	Yes	FACU	FACW Species	0	X 2		0	
2.	Rhamnus cathartica			20	Yes	FAC	FAC Species	110	Х З	;	330	
3.				0			FACU Species	35	X 4		140	
4. E				0			UPL Species	0	X 5		0	
э. 6							Column Totals:	145	(A)		470 (B)
7.				0			Preva	ence Index =	B/A =	3	3.24	
8.				0			Hydrophytic Vegetati	on Indicators:				
1. 2.	Woody Vine Stratum	(Plot Size:	Total Cover: 30 ft)) 0 0			No Rapid Tes Yes Dominand No Prevalenc No Morpholog in vegetat	t for Hydroph e Test is >509 e Index ≤ 3.0 gical Adaptati ion remarks c tic Ludrophyd	ytic Vegeta % [1] ions [1] (pr or on a sepa	ition ovide supp arate sheet)	orting dat	ta
			Total Cover.	<u>U</u>			[1] Indicators of bydric si	лс пушорну. oil & wotland by	ic vegetatio	t ha procopt	dii i) unloss	
% B	are Ground in Herb Stratum		_	% Sphagnu	ım Moss Cove	r:	disturbed or problematic	лга wettanu hy	ur ology mus	i be present,	uriitess	
Veg	etation Remarks: (include p	hoto number.	s here or on a separa	te sheet)			Hydrophytic vegetation	n present?	<u>Yes</u>			

			Sampling Po	pint:	7		
eded to document the indicator or con	firm the abscence of	of indicators;					
Color (moist)	Features	1 oc [2]	Taxtura	Pomar	Ve		
		LUC [2]		Remai	NS		
100			Luamy Sand				
98 10YR 3/3	C	M	Sandy Clay Loam				
=Reduced Matrix, MS=Masked Sand Gra	ains [2] Location	: PL=Pore L	ining, M=Matrix.				
s, unless otherwise noted)		Ind	icators for Problematic Hydric Soi	ils [3]:			
🗌 Sandy Gleye	d Matrix (S4)		Coast Prairie Redox (A16)				
Sandy Redo;	к (S5)		Dark Surface (S7)				
Stripped Mat	rix (S6)		Iron-Manganese Masses (F12)				
Loamy Muck	y Mineral (F1)		Very Shallow Dark Surface (TF12)				
🗌 Loamy Gleye	ed Matrix (F2)		Other (explain in soil remarks)				
Depleted Ma	trix (F3)						
Redox Dark :	Surface (F6)						
Depleted Da	rk Surface (F7)						
Redax Depre	essions (F8)	[3]	[3] Indicators of hydrophytic vegetation and wetland hydrolog must be present unless disturbed or problematic				
		mu	st be present, unless disturbed or	problematic.			
Depth ()	inches):		Hydric soil present?	No			
check all that apply)		Sec	condary Indicators (minimum of tw	vo required)			
check all that apply)	39)	Sec	condary Indicators (minimum of tw Surface Soil Cracks (B6)	vo required)	_		
check all that apply) U Water-Stained Leaves (Aquatic Fauna (B13)	B9)	Sec	condary Indicators (minimum of tw Surface Soil Cracks (B6) Drainage Patterns (B10)	vo required)	-		
check all that apply) Utater-Stained Leaves (i Aquatic Fauna (B13) True Aquatic Plants (B1-	B9) 4)	Sec	condary Indicators (minimum of tw Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2)	vo required)	_		
check all that apply) Water-Stained Leaves (Aquatic Fauna (B13) True Aquatic Plants (B1) Hydrogen Sulfide Odor (B9) 4) 'C1)		condary Indicators (minimum of tw Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8)	vo required)	-		
check all that apply) Water-Stained Leaves (Aquatic Fauna (B13) True Aquatic Plants (B1) Hydrogen Sulfide Odor (Oxidized Rhizospheres (89) 4) 'C1) 2n Livina Roots (C3)		condary Indicators (minimum of tw Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery	vo required)	_		
check all that apply) Water-Stained Leaves (Aquatic Fauna (B13) True Aquatic Plants (B1- Hydrogen Sulfide Odor (Oxidized Rhizospheres of Presence of Reduced In	B9) 4) 'C1) 2n Living Roots (C3) 2n (C4)		condary Indicators (minimum of tw Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery Stunted or Stressed Plants (D1)	vo required) (C9)	-		
	B9) 4) (C1) 2n Living Roots (C3) 2n (C4) 1 Tilled Soils (C6)		condary Indicators (minimum of tw Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery Stunted or Stressed Plants (D1) Geomorphic Position (D2)	vo required) (C9)	-		
check all that apply) Water-Stained Leaves (Aquatic Fauna (B13) True Aquatic Plants (B1 Hydrogen Sulfide Odor (Oxidized Rhizospheres (Presence of Reduced In Recent Iron Reduction ii Thin Murck Surface (C1)	B9) 4) 'C1) 2n Living Roots (C3) 2n (C4) 1 Tilled Soils (C6)		condary Indicators (minimum of tw Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery Stunted or Stressed Plants (D1) Geomorphic Position (D2) EAC-Neutral Test (D5)	vo required) (C9)	-		
check all that apply) Water-Stained Leaves (Aquatic Fauna (B13) True Aquatic Plants (B1 Hydrogen Sulfide Odor (Oxidized Rhizospheres of Recent Iron Reduction ii Thin Muck Surface (C7) Gauge or Well Data (Data)	B9) 4) 'C1) on Living Roots (C3) on (C4) n Tilled Soils (C6)		condary Indicators (minimum of tw Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery Stunted or Stressed Plants (D1) Geomorphic Position (D2) FAC-Neutral Test (D5)	vo required) • (C9)			
check all that apply) Water-Stained Leaves (Aquatic Fauna (B13) Krue Aquatic Plants (B1 Krue Aquat	B9) 4) (C1) כח Living Roots (C3) כח (C4) ר Tilled Soils (C6)	Sec	condary Indicators (minimum of tw Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery Stunted or Stressed Plants (D1) Geomorphic Position (D2) FAC-Neutral Test (D5)	vo required) (C9)			
 check all that apply) Water-Stained Leaves (Aquatic Fauna (B13) True Aquatic Plants (B1 Hydrogen Sulfide Odor (Oxidized Rhizospheres of Presence of Reduced Ird Recent Iron Reduction in Thin Muck Surface (C7) Gauge or Well Data (D9 Other (explain in remark 	89) (C1) on Living Roots (C3) on (C4) n Tilled Soils (C6) ;) s)		condary Indicators (minimum of tw Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery Stunted or Stressed Plants (D1) Geomorphic Position (D2) FAC-Neutral Test (D5)	vo required) r (C9)	-		
check all that apply) Water-Stained Leaves (Aquatic Fauna (B13) Kurden Aquatic Plants (B1) Kurden Aquatic Plants (B1) Kurden Aquatic Plants (B1) Check Addition Additio	B9) 4) (C1) on Living Roots (C3) on (C4) n Tilled Soils (C6) 1) s)		condary Indicators (minimum of tw Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery Stunted or Stressed Plants (D1) Geomorphic Position (D2) FAC-Neutral Test (D5) Indicators of wetland hydrolog	vo required) (C9) y present?			
 check all that apply) Water-Stained Leaves (. Aquatic Fauna (B13) True Aquatic Plants (B1 Hydrogen Sulfide Odor (Oxidized Rhizospheres (Presence of Reduced Ira Recent Iron Reduction ii Thin Muck Surface (C7) Gauge or Well Data (D9 Other (explain in remark) 	B9) (C1) on Living Roots (C3) on (C4) n Tilled Soils (C6)) s) es):		condary Indicators (minimum of tw Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery Stunted or Stressed Plants (D1) Geomorphic Position (D2) FAC-Neutral Test (D5) Indicators of wetland hydrolog Describe Recorded Data:	vo required) (C9) ty present?	- <u>No</u>		
check all that apply) Water-Stained Leaves (Aquatic Fauna (B13) True Aquatic Plants (B1 Hydrogen Sulfide Odor (Oxidized Rhizospheres (Oxidized Rhizospheres (Recent Iron Reduction it Recent Iron Reduction it Gauge or Well Data (D9 Other (explain in remark) Surface Water Depth (inches)	B9) (C1) on Living Roots (C3) on (C4) n Tilled Soils (C6)) s) es): 		condary Indicators (minimum of tw Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery Stunted or Stressed Plants (D1) Geomorphic Position (D2) FAC-Neutral Test (D5)	vo required) (C9) 1y present?	- <u>No</u>		
 check all that apply) Water-Stained Leaves (Aquatic Fauna (B13) True Aquatic Plants (B1 Hydrogen Sulfide Odor (Oxidized Rhizospheres (Presence of Reduced In Recent Iron Reduction in Thin Muck Surface (C7) Gauge or Well Data (D9 Other (explain in remark) Surface Water Depth (inches) Saturation Depth (inches): 	B9) 4) (C1) on Living Roots (C3) on (C4) n Tilled Soils (C6) ') s) es): 	Sec 	condary Indicators (minimum of tw Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery Stunted or Stressed Plants (D1) Geomorphic Position (D2) FAC-Neutral Test (D5) Indicators of wetland hydrolog Describe Recorded Data:	vo required) (C9) 1y present?	- <u>No</u>		
check all that apply) Water-Stained Leaves (Aquatic Fauna (B13) True Aquatic Plants (B1 Hydrogen Sulfide Odor (Oxidized Rhizospheres (Oxidized Rhizospheres (Presence of Reduced In Recent Iron Reduction ii Recent Iron Reduction ii Gauge or Well Data (D9 Other (explain in remark Surface Water Depth (inches)) Saturation Depth (inches): Monitoring Well Stream Gauge	B9) (C1) on Living Roots (C3) on (C4) n Tilled Soils (C6)) s) es): :: Previous Insp	ections	condary Indicators (minimum of tw Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery Stunted or Stressed Plants (D1) Geomorphic Position (D2) FAC-Neutral Test (D5) Indicators of wetland hydrolog Describe Recorded Data:	vo required)	<u>No</u>		
	eded to document the indicator or com Redox % Color (moist) 100 100 98 10YR 3/3 	reded to document the indicator or confirm the abscence of Redox Features % Color (moist) % Type [1] 100	reded to document the indicator or confirm the abscence of indicators) Redox Features % Color (moist) % Type [1] Loc [2] 100	Redox Features % Color (moist) % Type [1] Loc [2] Texture 100	Redox Features % Color (moist) % Type [1] Loc [2] Texture Remar 100		

Project/Site:	<u>Bassett (</u> Pond (Ea	<u>Creek F</u> ast)	ark Pond 8	Winnetka	Applicant/	Owner: <u>BCWMC</u>	City/County: <u>Crystal/He</u>	ennepin State:	<u>MN</u>	Sampling Date: <u>10/11/16</u>
Investigator(s):	<u>BKB</u>				Section:	<u>17</u>	Township: <u>118N</u>	Range	<u>21W</u>	Sampling Point: <u>W-1w</u>
Land Form:	<u>Footslop</u>	<u>)e</u>			Local Rel	ief: <u>Concave</u>	Slope %: <u>8</u> S	Soil Map Unit Nam	e: <u>Water</u>	
Subregion (LRR,): <u>M</u>				Latitude:	<u>4985483</u>	Longitude: 470427	Datum	: <u>UTM Na</u>	<u>d 83 Zone 15N</u>
Cowardin Classi	fication:	<u>PF01</u>	A		Circular 3	9 Classification: <u>Type 1L</u>		Mapped NWI Cl	assification	y Upland
Are climatic/hydr	ologic cond	litions o	n the site ty	pical for this	time of yea	ar? <u>No</u> (If no, expl	ain in remarks)	Eggers & Reed	(primary):	Floodplain Forest
Are vegetation	No	Soil	No	Hydrology	No	significantly disturbed?	Are "normal Yes	Eggers & Reed	(secondary	<i>ı):</i>
Are us satation	Ne	Call	Ne	, , , , , , , , , , , , , , , , , , ,	Ne	naturally making	present?	Eggers & Reed	(tertiary):	.).
Are vegetation	INO	Soli	<u>INO</u>	нуагоюду	INO	naturally problematic?		Eggers & Reea	(quaternar	y):

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic vegetation present?	<u>Yes</u>	General Remarks	Conditions are wetter than normal within the three months prior to the site visit.
Hydric soil present?	<u>Yes</u>	(explain any	
Indicators of wetland bydrology present?	Ves	answers if needed):	
Is the sampled area within a wetland?	<u>Yes</u>	lf yes, optional Wetla	and Site ID: <u>Winnetka Pond - East</u>

VEGETATION

1.	Tree Stratum Populus tremuloides	(Plot Size:	<u>30 ft</u>)	Absolute <u>% Cover</u> 15 10	Dominant Species? Yes Yes	Indicator Status FAC	50/20 Thresholds: Tree Stratum Sapling/Shrub Stra Herb Stratum	tum		20% 5 2 19	50% 12.5 5 47.5
3.					0		1710	Woody Vine Stratu	m		0	0
4.					0			Dominance Test W	'orksheet:			
			45.0	Total Cover:	<u>25</u>			Number of Domina That Are OBL, FAC	nt Species W or FAC:		4 (A)	
	Sapling/Snrub Stratum	(Plot Size:	<u>15 ft</u>)	10		540	Total Number of Do	ominant		(5)	
1. ว	Rhamnus cathartica				10	Yes	FAC	Species Across Al	Strata:		4 (B)	
2. 3.					0			Percent of Domina That Are OBL, FAC	nt Species W or FAC:	100.00)% (A/B _j)
4. E					0			Prevalence Index V	/orksheet:			
э.				Total Cover [.]	10			Total % Cov	ver of:		Multiply by:	
	Herb Stratum	(Plot Size:	5 ft)	<u></u>			OBL Species	10	X 1		10
1.	Phalaris arundinacea	`)	75	Yes	FACW	, FACW Species	75	X 2	1	50
2.	Schoenoplectus fluviatilis				10	No	OBL	FAC Species	35	Х З	1	05
3.	Solidago canadensis				10	No	FACU	, FACU Species	10	X 4		40
4.					0			UPL Species	0	X 5		0
5.					0			Column Totals:	130	(A)	3	05 (B)
6. 7					0			Prev	alence Index =	B/A =	2.	35
7. 8.					0			Hydrophytic Vegeta	tion Indicators:			
				Total Cover:	<u>95</u>			No Rapid Te	est for Hydroph	ytic Vegeta [%]	tion	
	Woody Vine Stratum	(Plot Size:	<u>30 ft</u>)			1	Yes Prevaler	the results >50 .	∞ [1]		
1.					0			No Morphol	ogical Adaptati	ons [1] (pr	ovide suppo	rting data
2.				Total Cover:	0			in veget	ation remarks c atic Undrophyt	ir on a sepa lo Voqotatio	rate sheet)	in)
				Total Cover.	<u>U</u>			INU Problem	soil & wotland by	drology musi	the precept u	nloss
% B	are Ground in Herb Stratum	:	_		% Sphagnu	m Moss Cove	r:	disturbed or problemat	ic.	urology musi	i be present, u	111033
Veg	etation Remarks: (include p	hoto number	s here o	r on a separate :	sheet)			Hydrophytic vegetat	ion present?	<u>Yes</u>		

OIL							Sampling F	Point: <u>V</u>
Profile Descriptic	on: (Describe to the depth r	needed to a	ocument the indicator or c	onfirm the	e abscence	of indicators).	
Depth	Matrix		Rea	lox Featur	es	1 [0]	T (
(inches)	Color (moist)	<u>%</u>	Color (moist)	% 	Type [1]	LOC [2]		Remarks
0 - 10	10YR 3/1	96	10YR 4/3	2		M	Sandy Clay Loam	
10 - 18	10YR 2/1	98	10YR 4/3	2	C	M	Sandy Clay	
18 - 24	10Y 3/1	98	10YR 5/2	2	D	М	Sandy Clay	
-								
	contration D-Doplation PM		Matrix MS_Mackad Sand	Crains	[2] Location		ining M-Matrix	
J Type. C=Con				Grains	[2] LOCALIOI	1. T L-T UIC L	linning, wi–waurix.	-lle [2].
yanc Son maica	alors: (applicable to all LRI	RS, UNIESS (otnerwise noted)			Ind	Calors for Problematic Hydric Sc	nis [3]:
	(4.0)			eyea Matri	((54)		Coast Prairie Redox (AT6)	
] Histic Epipedo	n (A2)		Sandy Re	dox (S5)			Dark Surface (S7)	
] Black Histic (A	3)		Stripped i	Natrix (S6)			Iron-Manganese Masses (F12)	
] Hydrogen Sull	ide (A4)		Loamy Mu	ucky Miner	al (F1)		Very Shallow Dark Surface (TF12)	
Stratified Laye	nrs (A5)		Loamy Gl	eyed Matri	x (F2)		Other (explain in soil remarks)	
] 2 cm Muck (A'	10)		Depleted	Matrix (F3))			
Depleted Belo	w Dark Surface (A11)		✓ Redox Da	rk Surface	(F6)			
] Thick Dark Su	rface (A12)		Depleted	Dark Surfa	ce (F7)	[3]	Indicators of hydrophytic vegeta	tion and wetland hydrology
Sandy Mucky	Mineral (S1)		Redox De	pressions	(F8)	mu	ist be present, unless disturbed o	r problematic.
」 5 cm Mucky P	eat or Peat (S3)							
estrictive Layer	(if present): Type:		Dept	h (inches)):		Hydric soil present?	Yes
oil Remarks:						-		
YDROLOG	ŝΥ							
etland Hydrolo	gy Indicators:							
rimary Indicator	rs (minimum of one require	d; check all	that apply)			See	condary Indicators (minimum of t	wo required)
Surface Water	- (A1)		Water-Stained Leave	es (B9)			Surface Soil Cracks (B6)	
] High Water Ta	ble (A2)		✓ Aquatic Fauna (B13)				Drainage Patterns (B10)	
Saturation (A3)		True Aquatic Plants	′B14)			Dry-Season Water Table (C2)	
Water Marks (B1)		Hydrogen Sulfide Og	or (C1)			Crayfish Burrows (C8)	
Sediment Dep	osits (B2)		Oxidized Rhizospher	es on Livin	a Roots (C3)		Saturation Visible on Aerial Imager	v (C9)
Drift Deposits	(B3)		Presence of Reduce	d Iron (C4)	9		Stunted or Stressed Plants (D1)) ()
Algal Mator C	rust (B4)		Recent Iron Reduction	n in Tilled	Soils (C6)		Geomorphic Position (D2)	
Iron Denosite	(B5)		Thin Muck Surface (2010 (00)		EAC-Neutral Test (D5)	
			Gaune or Well Data) (D9)		V		
Inundation Vis Sparsely Vege	ible on Aerial Imagery (B7) etated Concave Surface (B8)		Other (explain in rem	arks)				
eld Observatio	าร:						Indicators of wetland hydrolo	gy present? <u>Yes</u>
urface water pre	esent?		Surface Water Depth (ir	nches):			Describe Recorded Data:	
/ater table prese	ent?		Water Table Depth (incl	hes):	9			
aturation prese	nt? (includes capillary fring	ie) 🔽	Saturation Depth (inche	es):	2			
ecorded Data [.]	Aerial Photo	1 Monitorin	a Well 🔲 Stream Gauc		revious Insr	pections		
vdrologv Rema	rks:	1						
,								

Appendix B

Site Photographs

Photo 1 – October 11, 2016 Bassett Creek Park Pond General view of the shallow open water community of Bassett Creek Park Pond.	
Dhata 2 October 11 2010	
Photo 2 – October 11, 2016	
Bassett Creek Park Pond	
Shallow marsh fringe area located on the west side of the pond.	Bib - 1 k -
Photo 3 – October 11, 2016 Bassett Creek Park Pond Excavated deep marsh community located on the northwest side of the basin within shrub swamp.	ZDES/LI/LI LIS 58 DES/LI/LI LI DES/LI/LI LIS 58 DES/LI/LI LI LIS 58 DES/LI/LI/LI LI LIS 58 DES/LI/LI/LI LI/LI/LI/LI LI/LI/LI/LI/LI/LI/

Photo 4 – October 11, 2016	
Bassett Creek Park Pond	
Shrub swamp "island" community surrounded by shallow open water community located beyond open water.	
Photo 5 – October 11, 2016	
Bassell Creek Park Pond	
Bassett Creek extending through floodplain forest community on the northwest side of the basin.	
Photo 6 – October 11, 2016	
winnetka Pond	and the state of the second
Typical view of the shallow open water community.	
	2016×11×11 11 57 12 37-12 11 11 10001.9

Photo 7 – October 11, 2016	
Winnetka Pond	
Steep and abrupt wetland edge leading into shallow open water community on the north side.	Designed of the second se
Photo 8 – October 11, 2016	
Winnetka Pond	
Typical view of floodplain forest community on the west side of the basin.	

Appendix D

Bathymetric Survey Figures





LEGEND:

EXISTING MAJOR CONTOUR

EXISTING MINOR CONTOUR

- PROPOSED CONTOURS

----- SURVEYED WATER LEVEL

BASIS OF DRAWING FILE: <u>DATE OF SURVEY:</u> 08-11-2016

ORIGIN/DATE OF BASE: 08-11-2016 COORDINATE SYSTEM: HENNEPIN COUNTY HORIZONTAL DATUM: NADB3 (2011) REF. VRS VERTICAL DATUM: NAVD88 REF. VRS ADDITIONAL FILE INFORMATION:

BASSETT CREEK PARK CRYSTAL, MINNESOTA

BASSETT CREEK PARK POND EXISTING CONTOUR COMPARISON

23/27-005	1.37
CLIENT PROJECT No).
DWG. No.	REV. No

ARR PROJECT



DATE RELEASED

GNATURE ____

_LICENSE #__

DATE ____

REVISION DESCRIPTION

NO. BY CHK.APP. DATE



LEGEND:

EXISTING MAJOR CONTOUR

EXISTING MINOR CONTOUR

- PROPOSED CONTOURS

----- SURVEYED WATER LEVEL

BASIS OF DRAWING FILE: DATE OF SURVEY: 08-11-2016 ORIGIN/DATE OF BASE: 08-11-2016 COORDINATE SYSTEM: HENNEPIN COUNTY

HORIZONTAL DATUM: NAD83 (2011) REF. VRS VERTICAL DATUM: NAVD88 REF. VRS ADDITIONAL FILE INFORMATION:

BARR PROJECT No. 23/27-0051.37 CLIENT PROJECT No. BASSETT CREEK PARK CRYSTAL, MINNESOTA BASSETT CREEK PARK POND ALTERNATIVE 2 EXISTING CONTOUR COMPARISON DWG, No



					I HERE OR RE	REBY CERTIFY THAT THIS PLAN, SPECIFICATION,				_		_	Pr	oject Office:	Scale	AS SHOWN	
	_				Dir	RECT SUPERVISION AND THAT I AM A DULY		_	+ +		+	_	B	ARR ENGINEERING CO.	Date	1-10-17	
	_					LAWS OF THE STATE OF MINNESOTA.		-		_		_	RARR 4	300 MARKETPOINTE DRIVE	Drawn	CMH3	BASSEII CREEK WAIERSHEL
					PRINTE	TED NAME								INNEAPOLIS. MN 55435	Checked		MINNFAPOLIS MINNFSOTA
					SIGNA		RELEASED	A E		0 1	2	3	Corporate Headquarters: p	h: 1-800-632-2277	Designed		
NO.	BY	снк.	APP	. DATE	REVISION DESCRIPTION	LICENSE #	TO/FOR		DATE R	RELEASED	,		Ph: 1-800-632-2277 w	ax: (952) 832-2601 ww.barr.com	Approved		



LEGEND





					I HEREBY CERTIFY	THAT THIS PLAN, SPECIFICATION,									Project Office:	Scale	AS SHOWN			
					DIRECT SUPERVI	SION AND THAT I AM A DULY									BARR ENGINEERING CO.	Date	3-9-17	1		
					LICENSED PROFE	SSIONAL ENGINEER UNDER THE							1	DADD	4300 MARKETPOINTE DRIVE	Drawn	04117	I RASSETT	CRFFK	WATERSHED
					DAWS OF I	HE STATE OF MINNESUTA.								BARR	Suite 200	01 1 1	СМНЭ	D, OOLII		W/ (TEROTIED
					PRINTED NAME								i		MINNEAPOLIS, MN 55435	Checked		MINN	FAPOLIS. N	AINNESOTA
					SIGNATURE			A	в	CO	1	2 3	3	Corporate Headquarters:	Ph: 1-800-632-2277	Designed		1	•,	
NO.	BY	снк. А	PP. [DATE	REVISION DESCRIPTION DATE	LICENSE #	TO/FOR		DA	TE RELE	EASED		ļ	Ph: 1-800-632-2277	Fax: (952) 832-2601 www.barr.com	Approved				



LEGEND





						I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION,									Project Office:	Scale	AS SHOWN	
						DIRECT SUPERVISION AND THAT I AM A DULY			\square						BARR ENGINEERING CO.	Date	3-9-17	1
						LICENSED PROFESSIONAL ENGINEER UNDER THE			$ \downarrow \downarrow$		_			DADD	4300 MARKETPOINTE DRIVE	Drawn	CMH3	I BASSETT CREEK WATERSHED
						Early of the state of minitesona.								DARK	Suite 200		CIVILIO	
						PRINTED NAME									MINNEAPOLIS, MN 55435	Checked		MINNEAPOLIS, MINNESOTA
						SIGNATURE		A	B	CO	1	2	3	Corporate Headquarters:	Ph: 1-800-632-2277	Designed		
NO.	BY	HK. AF	PP.	DATE	REVISION DESCRIPTION		TO/FOR			ATE REL	EASED			Ph: 1-800-632-2277	Fax: (952) 832-2601 www.barr.com	Approved		
		_					· ·									-		

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Appendix E

Detailed Cost Estimates

Table E-2. Cost Estimate, Bassett Creek Park Pond - Alternative 2: Deepen Southeast Section

						Erosion Control
		Estimated				
Description	Unit	Quantity	Unit Price	Extension		Item
Mobilization/Demobilization	L.S.	1	\$88,100	\$88,100	10% of project cost	Erosion Control Construction Entrance
Erosion Control	L.S.	1	\$18,000	\$18,000		Street Sweeping
Clearing and Grubbing	L.S.	1	\$5,000	\$5,000		Inlet Protection
Floatation Silt Curtain	L.F.	450	\$15	\$6 <i>,</i> 548		Erosion Control Siltation Logs
Control of Water, Dewatering	L.S.	1	\$20,000	\$20,000		
Pond Dreding of MPCA Dredged Material Level 1- Removal and					unit price based on RWMWD Dec 2016	Total
Disposal	C.Y.	15,461	\$25	\$386,525	Markham Pond bid prices	
Pond Dreding of MPCA Dredged Material Level 3- Removal and					unit price based on RWMWD 2016 CIP bid	
Disposal	C.Y.	6,755	\$55	\$371,525	prices - Dec 2015 bid	
Site Grading	S.Y.	800	\$4	\$3,200		Restoration (6 access points, 24' wide, 50' long)
Top Soil Borrow	C.Y.	67	\$26	\$1,733		
Flexterra HP-FGM	S.Y.	800	\$5	\$4,000		
Trail Replacement	S.Y.	2,000	\$30	\$60,000	10' width	
Traffic Control/Pedestrian Control/Trail Closure	L.S.	1	\$4,000	\$4,000		
Subtotal				\$968,631		
Contingency (30%)				\$290,589		
Total				\$1,259,220		
Engineering (30%)				\$290,589		
Total w/Engineering				\$1,549,809		

1. This assumes half of the material is Level 1 and half is Level 3 based on the sampling completed to date. Additional sampling will be needed to determine the break point between unregulated fill and contaminated material.

30-yr and Annualized Cost analysis		
Estimated life span (years)	30	
Expected annual maintenance \$	-	
End of life span maintenance \$	256,000	based on sediment accumulation rate of 35 CY per year (from P8 model) (35*30=1050cy)
Future Capital Cost \$	3,761,800	
Future annual maintenance \$	-	
Future end of life span cost \$	622,000	
Total Future Worth \$	4,383,800	
Annualized Cost \$	92,100	

Unit	Est. Quanti	Unit Price	Extension
Each	1	1,045.00	1045
L.S.	1	1,000.00	1000
Each	5	194.00	970
L.F.	2000	7.50	15000

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Table E-1. Cost Estimate, Bassett Creek Park Pond - Baseline Alternative: Remove Accumulated Sediment

						Erosion Control
		Estimated	l –		7	
Description	Unit	Quantity	Unit Price	Extension		Item
Mobilization/Demobilization	L.S.	1	\$66,300	\$66,300	10% of project cost	Erosion Control Construction Entrance
Erosion Control	L.S.	1	\$18,000	\$18,000	7	Street Sweeping
Clearing and Grubbing	L.S.	1	\$5,000	\$5,000		Inlet Protection
Floatation Silt Curtain	L.F.	450	\$15	\$6,548		Erosion Control Siltation Logs
Control of Water, Dewatering	L.S.	1	\$20,000	\$20,000		
Pond Dreding of MPCA Dredged Material Level 1- Removal and					unit price based on RWMWD Dec 2016	Total
Disposal	C.Y.	6,755	\$25	\$168,875	Markham Pond bid prices	
Pond Dreding of MPCA Dredged Material Level 3- Removal and					unit price based on RWMWD 2016 CIP bid	
Disposal	C.Y.	6,755	\$55	\$371,525	prices - Dec 2015 bid	
Site Grading	S.Y.	800	\$4	\$3,200		Restoration (6 access points, 24' wide, 50' lo
Top Soil Borrow	C.Y.	67	\$26	\$1,733		
Flexterra HP-FGM	S.Y.	800	\$5	\$4,000		
Trail Replacement	S.Y.	2,000	\$30	\$60,000	10' width	
Traffic Control/Pedestrian Control/Trail Closure	L.S.	1	\$4,000	\$4,000		
Subtotal				\$729,181		
Contingency (30%)				\$218,754	7	
Total				\$947,935		
Engineering (30%)				\$218,754]	
Total w/Engineering				\$1,166,689		

1. This assumes half of the material is Level 1 and half is Level 3 based on the sampling completed to date. Additional sampling will be needed to determine the break point between unregulated fill and contaminated material.

30-yr and Annualized Cost analysis		
Estimated life span (years)	30	
Expected annual maintenance \$	-	
End of life span maintenance \$	256,335	based on sediment accumulation rate of 35 CY per year (from P8 model) (35*30=1050 cy)
Future Capital Cost \$	2,831,900	
Future annual maintenance \$	-	
Future end of life span cost \$	623,000	
Total Future Worth \$	3,454,900	
Annualized Cost \$	72,600	

Unit	Est. Quanti	Unit Price	Extension
Each	1	1,045.00	1045
L.S.	1	1,000.00	1000
Each	5	194.00	970
L.F.	2000	7.50	15000

18015

wide, 50' long)

Table E-3. Cost Estimate, Bassett Creek Park Pond - Add-on 1: Create Sediment Forebay in Northern Section of Pond

		Estimated			
Description	Unit	Quantity	Unit Price	Extension	
Mobilization/Demobilization	L.S.	1	\$10,400	\$10,400	10% of project cost
Erosion Control	L.S.	0	\$18,000	\$0	
Clearing and Grubbing	L.S.	0	\$5,000	\$0	
Floatation Silt Curtain	L.F.	0	\$15	\$0	
Control of Water, Dewatering	L.S.	0	\$20,000	\$0	
Pond Dreding of MPCA Dredged Material Level 1- Removal and					
Disposal	C.Y.	0	\$25	\$0	unit price based on RWMWD Dec 2016 Markham Pond bid prices
Pond Dreding of MPCA Dredged Material Level 3- Removal and					
Disposal	C.Y.	1,604	\$55	\$88,216	unit price based on RWMWD 2016 CIP bid prices - Dec 2015 bid
Berm Construction (Rock Gabions)	Each	35	\$450	\$15,750	
Site Grading	S.Y.				
		0	\$4	\$0	
Top Soil Borrow	C.Y.	0	\$26	\$0	
Flexterra HP-FGM	S.Y.	0	\$5	\$0	
Trail Replacement	S.Y.	0	\$30	\$0	10' width
Traffic Control/Pedestrian Control/Trail Closure	L.S.	0	\$4,000	\$0	
Subtotal				\$114,366	1
Contingency (30%)				\$34,310]
Total				\$148,676	
Engineering (30%)				\$34,310	
Total w/Engineering				\$182,985	

1. This assumes half of the material is Level 1 and half is Level 3 based on the sampling completed to date. Additional sampling will be needed to determine the break point between unregulated fill and contaminated material.

30-yr and Annualized Cost analysis

Estimated life span (years)

Expected annual maintenance End of life span maintenance Future Capital Cost Future annual maintenance Future end of life span cost **Total Future Worth** Annualized Cost

30

based on sediment accumulation rate of 35 CY per year (from P8 model) 10,900 (35*30=1050cy)

- \$ 444,200

\$

\$

- 518,570 \$ \$
- \$ 962,800
- 20,200 \$

	Estimated		
Annual Maintenance	Quantity	Unit Price	Extension
Mobilization/Demobilization	1	992.5	992.5
Erosion Control	1	3000	3000
Pond Dreding of MPCA Dredged Material Level 3-			
Removal and Disposal	35	55	1925
Restoration	1	2000	2000
Sediment Sampling	1	3000	3000
Total			10917.5

Erosion Control

Total

Erosion Control				
Item	Unit	Est. Quanti	Unit Price	Extension
Erosion Control Construction Entrance	Each	1	1,045.00	1045
Street Sweeping	L.S.	1	1,000.00	1000
Inlet Protection	Each	5	194.00	970
Erosion Control Siltation Logs	L.F.	2000	7.50	15000

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Restoration (6 access points, 24' wide, 50' long)

Table E-4. Cost Estimate, Bassett Creek Park Pond - Add-on 1: Create Sediment Forebay in Northern Section of Pond (No Other Pond Excavation)

		Estimated			
Description	Unit	Quantity	Unit Price	Extension	
Mobilization/Demobilization	L.S.	1	\$54,300	\$54,300	10% of project cost
Erosion Control	L.S.	1	\$8,500	\$8,500	
Clearing and Grubbing	L.S.	1	\$5,000	\$5,000	
Floatation Silt Curtain	L.F.	145	\$15	\$2,110	
Control of Water, Dewatering	L.S.	1	\$15,000	\$15,000	
Pond Dreding of MPCA Dredged Material Level 1- Removal and					
Disposal	C.Y.	0	\$25	\$0	unit price based on RWMWD Dec 2016 Markham Pond bid prices
Pond Dreding of MPCA Dredged Material Level 3- Removal and					
Disposal	C.Y.	8,221	\$55	\$452,151	unit price based on RWMWD 2016 CIP bid prices - Dec 2015 bid
Berm Construction (Rock Gabions)	Each	35	\$450	\$15,750	
Site Grading	S.Y.				
		400	\$4	\$1,600	
Top Soil Borrow	C.Y.	33	\$26	\$867	
Flexterra HP-FGM	S.Y.	400	\$5	\$2,000	
Trail Replacement	S.Y.	1,200	\$30	\$36,000	10' width
Traffic Control/Pedestrian Control/Trail Closure	L.S.	1	\$4,000	\$4,000	
Subtotal				\$597,277	
Contingency (30%)				\$179,183	
Total				\$776,461	
Engineering (30%)				\$179,183	
Total w/Engineering				\$955,644	

1. This assumes half of the material is Level 1 and half is Level 3 based on the sampling completed to date. Additional sampling will be needed to determine the break point between unregulated fill and contaminated material.

30-yr and Annualized Cost analysis

Estimated life span (years)

Expected annual maintenance End of life span maintenance Future Capital Cost Future annual maintenance Future end of life span cost **Total Future Worth** Annualized Cost

30 based on sediment accumulation rate of 35 CY per year (from P8

\$ 10,900 model)(35*30=1050 cy) \$

\$ 2,319,600

\$ 518,570

\$ \$ 2,838,200

59,700 \$

	Estimated		
Annual Maintenance	Quantity	Unit Price	Extension
Mobilization/Demobilization	1	992.5	992.5
Erosion Control	1	3000	3000
Pond Dreding of MPCA Dredged Material Level 3-			
Removal and Disposal	35	55	1925
Restoration	1	2000	2000
Sediment Sampling	1	3000	3000
Total			10917.5

Erosion Control

Total

Erosion Control				
Item	Unit	Est. Quanti	Unit Price	Extension
Erosion Control Construction Entrance	Each	1	1,045.00	1045
Street Sweeping	L.S.	1	1,000.00	1000
Inlet Protection	Each	5	194.00	970
Erosion Control Siltation Logs	L.F.	700	7.50	5250

8265

Restoration (6 access points, 24' wide, 50' long)

Table E-5. Cost Estimate, Bassett Creek Park Pond - Add-on 2: Create Native Vegetation Buffer Around Pond

		Estimated			7
Description	Unit	Quantity	Unit Price	Extension	
Mobilization/Demobilization	L.S.	1	\$4,800	\$4,800	10% of project cost
Vegetation Establishment and Maintenance	Acre	4	\$11,000	\$47,980	
					_
					_
					-
					-
					-
					10' width
Subtotal				\$52,780	
Contingency (30%)				\$15,834	
Total				\$68,614	
Engineering (30%)				\$15,834	
Total w/Engineering				\$84,448	

30-yr and Annualized Cost analysis

Estimated life span (years)

Expected annual maintenance
End of life span maintenance
Future Capital Cost
Future annual maintenance
Future end of life span cost
Total Future Worth
Annualized Cost

assume \$2,000/ac based on information from Golden Valley (avg of \$1,500/yr over 8,724 20 years) 21,112 assume 25% of total project cost, based on Plymouth Creek cost estimate 205,000 415,030

30

39,000

13,900

659,000

\$

\$

\$

\$

\$

\$

\$

	Estimated		
Annual Maintenance	Quantity	Unit Price	Extension
Mobilization/Demobilization	1	4650	4650
Erosion Control	1	3000	3000
Pond Dreding of MPCA Dredged Material Level 3-			
Removal and Disposal	700	55	38500
Restoration	1	2000	2000
Sediment Sampling	1	3000	3000
Total			51150

Erosion Contro Street Sweepir Inlet Protection Erosion Contro

Total

bl				
	Unit	Est. Quanti	Unit Price	Extension
l Construction Entrance	Each	1	1,045.00	1045
ng	L.S.	1	1,000.00	1000
n	Each	5	194.00	970
l Siltation Logs	L.F.	2000	7.50	15000

18015

Restoration (6 access points, 24' wide, 50' long)

Table E-6. Cost Estimate, Winnetka Pond East - Baseline Alternative: Remove Accumulated Sediment

	1	Estimated			7	
Description	Unit	Quantity	Unit Price	Extension		Ite
Mobilization/Demobilization	L.S.	1	\$14,700	\$14,700	10% of project cost	Erc
Erosion Control	L.S.	1	\$12,000	\$12,000]	Str
Clearing and Grubbing	L.S.	0	\$5,000	\$0]	Inle
Floatation Silt Curtain	L.F.	70	\$14.55	\$1,018.50]	Erc
Control of Water, Dewatering	L.S.	1	\$15,000	\$15,000		
Pond Dreding of MPCA Dredged Material Level 1- Removal and					unit price based on RWMWD Dec 2016	Tot
Disposal	C.Y.	4,090	\$25	\$102,250	Markham Pond bid prices	
Pond Dreding of MPCA Dredged Material Level 3- Removal and					unit price based on RWMWD 2016 CIP bid	
Disposal	C.Y.	0	\$55	\$0	prices - Dec 2015 bid	
Site Grading	S.Y.					Res
		1,300	\$4	\$5,200		to
Top Soil Borrow	C.Y.	108	\$26	\$2,817		
Flexterra HP-FGM	S.Y.	1,300	\$5	\$6,500		
Trail Replacement	S.Y.	0	\$30	\$0	10' width	
Traffic Control/Pedestrian Control/Trail Closure	L.S.	1	\$2,000	\$2,000		
Subtotal				\$161,485		
Contingency (30%)				\$48,446]	
Total				\$209,931		
Engineering (30%)				\$48,446		
Total w/Engineering				\$258,376		

Erosion Control				
Item	Unit	Est. Quanti	Unit Price	Extension
Erosion Control Construction Entrance	Each	1	1,045.00	1045
Street Sweeping	L.S.	1	1,000.00	1000
Inlet Protection	Each	4	194.00	776
Erosion Control Siltation Logs	L.F.	1200	7.50	9000

tal

storation (3 access points, 24' wide, 50' long, one 260'x24' access ne corner)

30-yr and Annualized Cost analysis

Estimated life span (years)	20
Expected annual maintenance	\$ -
End of life span maintenance	\$ 80,000
Future Capital Cost	\$ 627,100
Future annual maintenance	\$ -
Future end of life span cost	\$ 195,000
Total Future Worth	\$ 822,100
Annualized Cost	\$ 17,300

20 -0,000 based on sediment accumulation rate of 10 CY per year (fromP8 model)(10*30=300 cy) 7,100

11821

1293.333 SY

Table E-7. Cost Estimate, Winnetka Pond East - Alternative 2: Deepen Entire Pond to 4.2 feet

		Estimated								
Description	Unit	Quantity	Unit Price	Extension		Item	Unit	Est. Quant	i Unit Price	Extension
Mobilization/Demobilization	L.S.	1	\$35,100	\$35,100	10% of project cost	Erosion Control Construction Entrance	Each	1	1,045.00	1045
Erosion Control	L.S.	1	\$12,000	\$12,000		Street Sweeping	L.S.	1	1,000.00	1000
Clearing and Grubbing	L.S.	0	\$5,000	\$0		Inlet Protection	Each	4	194.00	776
Floatation Silt Curtain	L.F.	70	\$15	\$1,019		Erosion Control Siltation Logs	L.F.	1200	7.50	9000
Control of Water, Dewatering	L.S.	1	\$15,000	\$15,000						
Pond Dreding of MPCA Dredged Material Level 1- Removal and Disposal	C.Y.	12.234	\$25	\$305.850	bottom elev 875.9 (4.2 ft deep) - quantity revised per 5/02/17 calculations; unit price based on RWMWD Dec 2016 Markham Ponc bid prices	Total				11821
Pond Dreding of MPCA Dredged Material Level 3- Removal and	0.11	12,231	<i>\</i> 23	<i><i><i></i></i></i>	unit price based on RWMWD 2016 CIP bid					11021
Disposal	C.Y.	0	\$55	\$0	prices - Dec 2015 bid					
Site Grading	S.Y.	1,300	\$4	\$5,200		Restoration (3 access points, 24' wide, 50' long, one 260'x24' access to ne corner)	1293.333	s sy		
Top Soil Borrow	C.Y.	108	\$26	\$2,817	7					
Flexterra HP-FGM	S.Y.	1,300	\$5	\$6,500						
Trail Replacement	S.Y.	0	\$30	\$0	10' width					
Traffic Control/Pedestrian Control/Trail Closure	L.S.	1	\$2,000	\$2,000						
Subtotal				\$385,485						
Contingency (30%)				\$115,646						
Total				\$501 <i>,</i> 131						
Engineering (30%)				\$115,646						
Total w/Engineering				\$616,776						

30-yr and Annualized Cost analysis		
Estimated life span (years)	30	
Expected annual maintenance \$	-	
End of life span maintenance \$	80,000	based on sediment accumulation rate of 10 CY per year (fromP8 model) (30*10=300 cy)
Future Capital Cost \$	1,497,100	
Future annual maintenance \$	-	
Future end of life span cost\$	195,000	
Total Future Worth \$	1,692,100	
Annualized Cost \$	35,600	

Erosion Control

Table E-8. Cost Estimate, Winnetka Pond East - Alternative 3: Deepen Entire Pond to 6.0 feet

					_	Erosion Control				
		Estimated								
Description	Unit	Quantity	Unit Price	Extension		Item	Unit	Est. Quant	i Unit Price	Extension
Mobilization/Demobilization	L.S.	1	\$50,500	\$50,500	10% of project cost	Erosion Control Construction Entrance	Each	1	1,045.00	1045
Erosion Control	L.S.	1	\$12,000	\$12,000		Street Sweeping	L.S.	1	1,000.00	1000
Clearing and Grubbing	L.S.	0	\$5,000	\$0		Inlet Protection	Each	4	194.00	776
Floatation Silt Curtain	L.F.	70	\$15	\$1,019		Erosion Control Siltation Logs	L.F.	1200	7.50	9000
Control of Water, Dewatering	L.S.	1	\$15,000	\$15,000						
					bottom elevation 874.1 = 6.0 feet deep; unit	Total				
Pond Dreding of MPCA Dredged Material Level 1- Removal and					price based on RWMWD Dec 2016 Markham	1				
Disposal	C.Y.	18,394	\$25	\$459 <i>,</i> 850	Pond bid prices					11821
Pond Dreding of MPCA Dredged Material Level 3- Removal and					unit price based on RWMWD 2016 CIP bid					
Disposal	C.Y.	0	\$55	\$0	prices - Dec 2015 bid					
Site Grading	S.Y.					Restoration (3 access points, 24' wide, 50' long, one 260'x24' access				
		1,300	\$4	\$5,200		to ne corner)	1293.333	SY		
Top Soil Borrow	C.Y.	108	\$26	\$2,817						
Flexterra HP-FGM	S.Y.	1,300	\$5	\$6,500						
Trail Replacement	S.Y.	0	\$30	\$0	10' width					
Traffic Control/Pedestrian Control/Trail Closure	L.S.	1	\$2,000	\$2,000						
Subtotal				\$554,885						
Contingency (30%)				\$166,466						
Total				\$721,351]					
Engineering (30%)				\$166,466						
Total w/Engineering				\$887,816						

30-yr and Annualized Cost analysis	
Estimated life span (years)	30
Expected annual maintenance \$	-
End of life span maintenance \$	80,000 based on sediment accumulation rate of 10 CY per year (fromP8 model) (10*30 = 300 c
Future Capital Cost \$	2,155,000
Future annual maintenance \$	-
Future end of life span cost \$	195,000
Total Future Worth \$	2,350,000
Annualized Cost \$	49,400

Table E-9. Cost Estimate, Winnetka Pond - Add-on 1: Create Native Vegetation Buffer Around Pond (50-foot buffer)

		Estimated			
Description	Unit	Quantity	Unit Price	Extension	
Mobilization/Demobilization	L.S.	1	\$1,000	\$1,000	10% of project cost
Vegetation Establishment and Maintenance	Acre	0.85	\$11,000	\$9 <i>,</i> 350	
					_
					_
					_
					_
					4
					-
					-
					-
					-
Subtotal				\$10,350	=
Contingency (30%)				\$3,105	
Total				\$13,455	
Engineering (30%)				\$3,105	
Total w/Engineering				\$16,560	

30-yr and Annualized Cost analysis

Estimated life span (years)	
Expected annual maintenance	\$
End of life span maintenance	\$
Future Capital Cost	\$
Future annual maintenance	\$
Future end of life span cost	\$
Total Future Worth	\$
Annualized Cost	\$

30

1,700 assume \$2,000/ac based on information from Golden Valley (avg of \$1,500/yr over 20 years)

4,140 assume 25% of total project cost, based on Plymouth Creek cost estimate

40,200

80,880 8,000

129,100

2,700

, - -

Table E-10. Cost Estimate, Winnetka Pond - Add-on 2: Goose Management

		Estimated		
Description	Unit	Quantity	Unit Price	Extension
Goose Management	L.S.	1	\$5,000	\$5,000
Subtotal				\$5,000
Contingency (30%)				\$1,500
Total				\$6,500
Engineering (30%)				\$1,500
Total w/Engineering				\$8,000

30-yr and Annualized Cost analysis

Estimated life span (years)	30
Expected annual maintenance	\$ 5,000
End of life span maintenance	\$ -
Future Capital Cost	\$ -
Future annual maintenance	\$ 237,880
Future end of life span cost	\$ -
Total Future Worth	\$ 237,900
Annualized Cost	\$ 5,000